

HEATER, AIR CONDITIONER AND VENTILATION

CONTENTS

E55AA--

HEATER	2	HEATER CONTROL ASSEMBLY	11
SPECIFICATIONS	2	REAR BLOWER SWITCH	13
General Specifications	2	HEATER UNIT*	16
Service Specifications	2	BLOWER ASSEMBLY	17
SPECIAL TOOL	2	VENTILATORS*	19
TROUBLESHOOTING	3	REAR HEATER	22
SERVICE ADJUSTMENT PROCEDURES	11	REAR AIR MIX DAMPER MOTOR ASSEMBLY, CONTROL SWITCH AND RESISTOR	24
Power Relay Check	11		

SUPPLEMENTAL RESTRAINT SYSTEM (SRS) – AIR BAG

- (1) An SRS air bag for the driver's side seat is optional equipment in this vehicle.
- (2) The SRS includes the following components: impact sensors, SRS diagnosis unit: SRS warning lamp, air bag module, clock spring, 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 (*).

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), before beginning any service or maintenance of any component of the SRS or any SRS-related component.

AIR CONDITIONER	25	Power Relay Check	71
SPECIFICATIONS	25	Idle-up Operation Check	71
General Specifications	25	Idle-up Solenoid Valve Check <4D56, 4M40>	72
Service Specifications	26	Lever Position Switch Check <4D56, 4M40-Vehicles with A/T>	73
Lubricants	26		
Sealant	26		
SPECIAL TOOLS	27	AIR CONDITIONER SWITCH	73
TROUBLESHOOTING	28	REAR BLOWER SWITCH	74
SAFETY PRECAUTIONS	59	FRONT EVAPORATOR	77
SERVICE ADJUSTMENT PROCEDURES	60	REAR EVAPORATOR, REAR COOLER AMPLIFIER AND RESISTOR	79
Test Procedures	60	REAR VENTILATORS	83
Compressor Drive Belt Adjustment	62	ENGINE COOLANT TEMPERATURE SWITCH	84
Charging <Vehicles using R-12 refrigerant>	62	LEVER POSITION SWITCH <4D56-A/T, 4M40-A/T>	86
Charging <Vehicles using R-134a refrigerant>	67-1	CONDENSER AND CONDENSER FAN	87
Performance Test	68	REFRIGERANT LINE	89
Refrigerant Leak Repair Procedure	69-1		
Handling Tubing and Fittings	69-2		
Compressor Noise	70	COMPRESSOR AND TENSION PULLEY	92

NOTES

HEATER

SPECIFICATIONS

GENERAL SPECIFICATIONS

E55CA-1

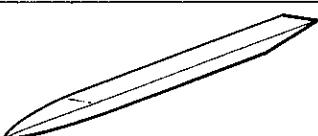
Items	Specifications
Type	
Front	Three-way-flow full-air-mix system
Rear	Air-mix system
Performance	KJ/h (kcal/h, B.T.U./h)
Front <6G72, 4G64, 6G74> <4D56, 4M40>	16.744 (4,000, 15,873) 17.581 (4,200, 16,666)
Rear	5.860 (1,400, 5,555)

SERVICE SPECIFICATIONS

E55CB-1

Items	Standard value	Remarks
Resistance value of temperature adjustment selector <Vehicles with dual air conditioner>	Ω	
At MAX. COOL	0-4	Between terminals 3-4
At MAX. HOT	2400	Between terminals 5-6
Resistance value of resistor (for blower motor)	Ω	Between terminals 2-4 Between terminals 1-2 Between terminals 2-3
Resistance value of resistor (for rear heater)	Ω	Between terminals 2-3 Between terminals 1-2

SPECIAL TOOL

Tool	Number	Name	Use
	MB990784	Ornament remover	Removal of side defroster grille

TROUBLESHOOTING

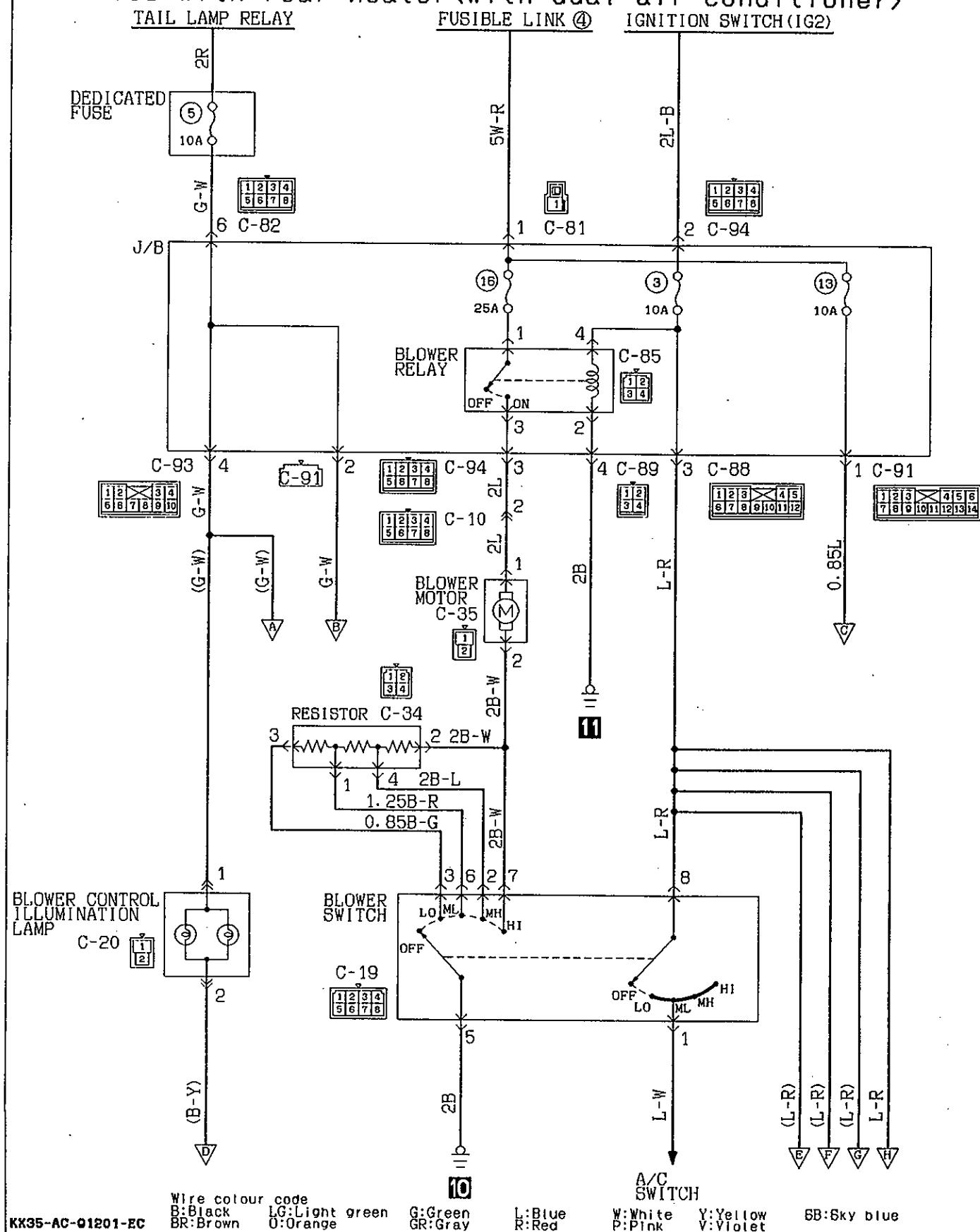
E55EAAP

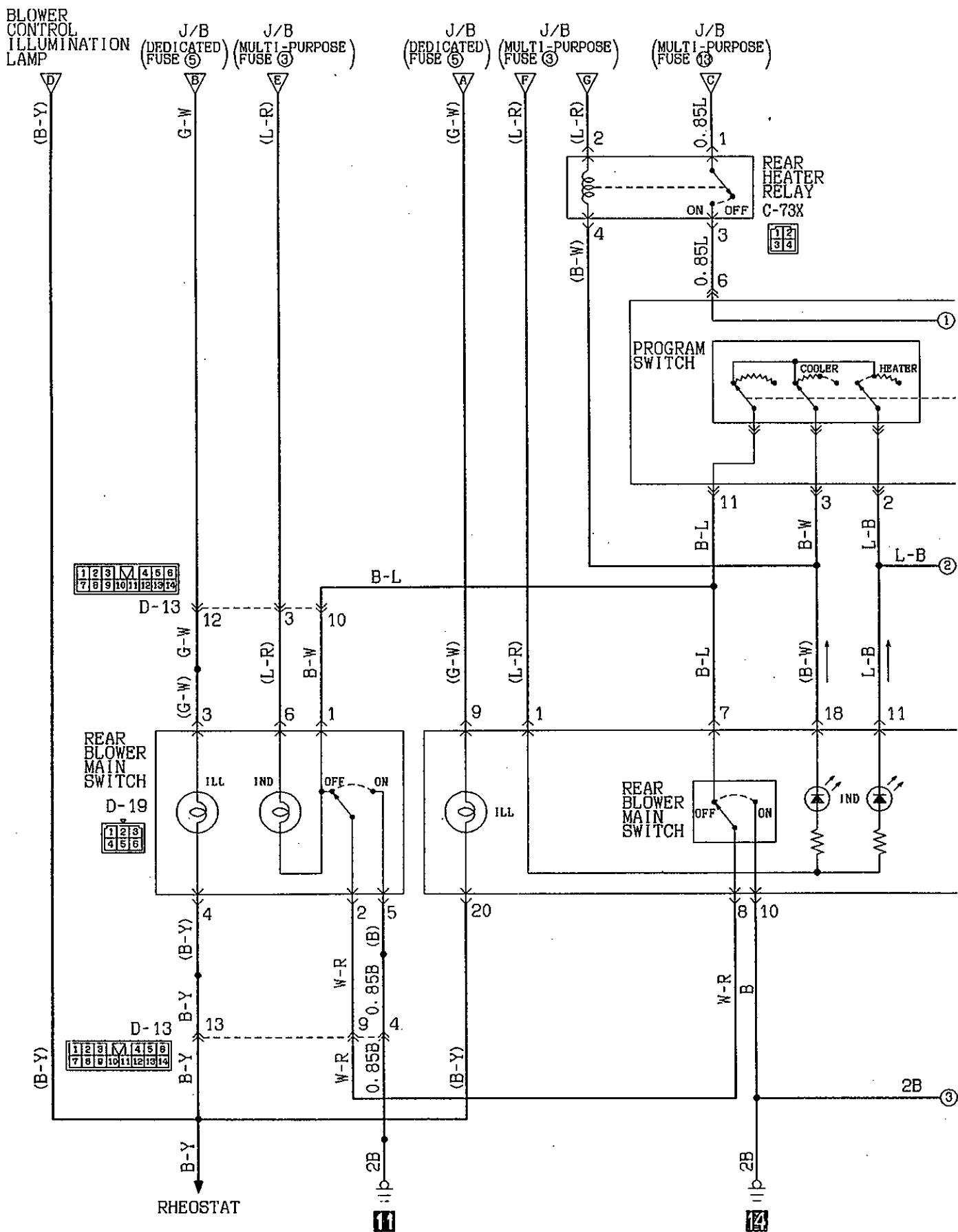
Symptom	Probable cause	Remedy
Improper heat	Obstructed floor outlets	Correct
	Changeover dampers improperly adjusted or binding	Correct
	Obstructed heaters hoses	Replace
	Improperly adjusted control cables	
	Damper motor malfunction <Vehicles with dual air conditioner>	Replace
	Control switch is defective	Replace
	Plugged partially plugged heater core	Clearn 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

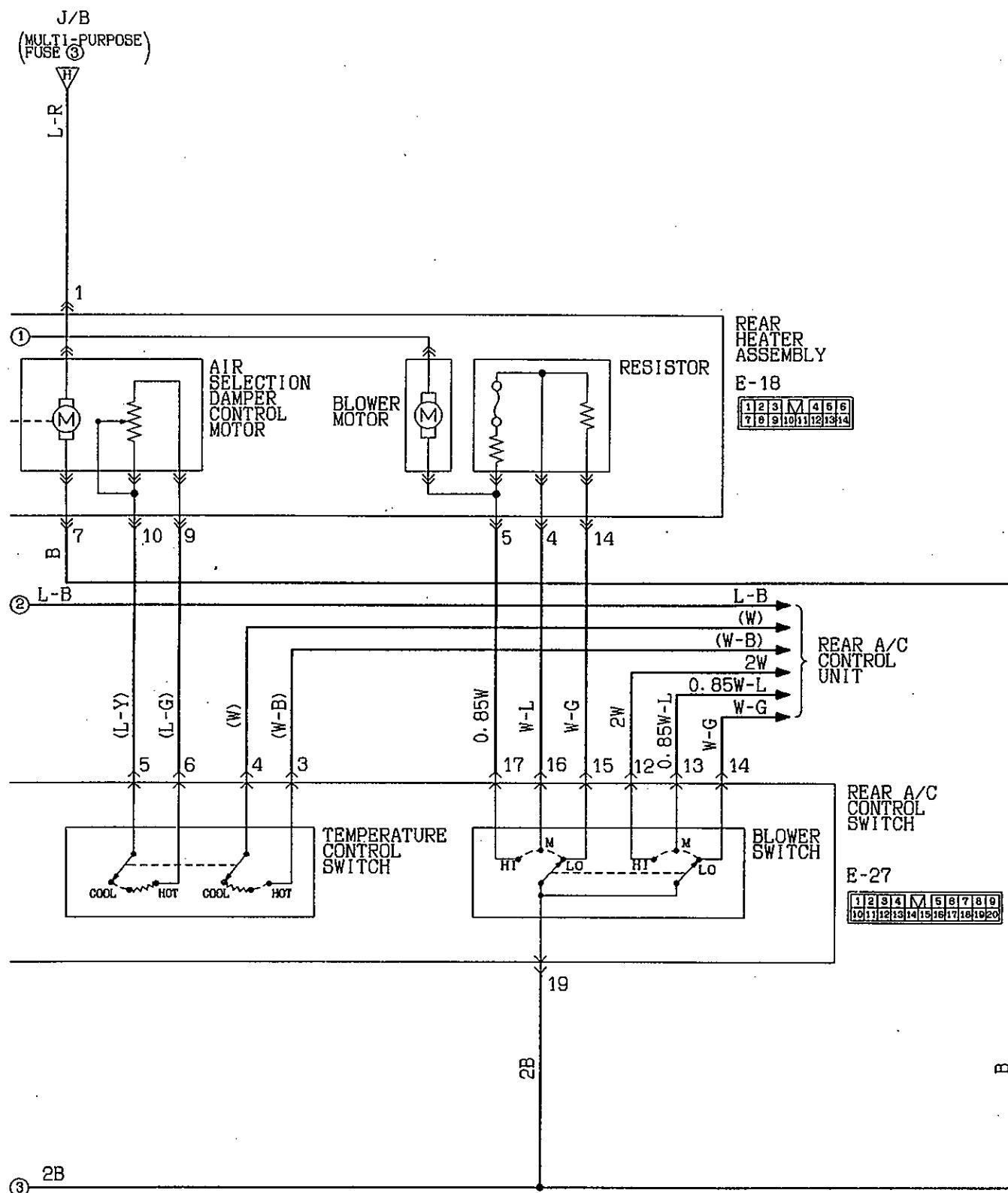
HEATER

<Vehicles built up to October, 1993>

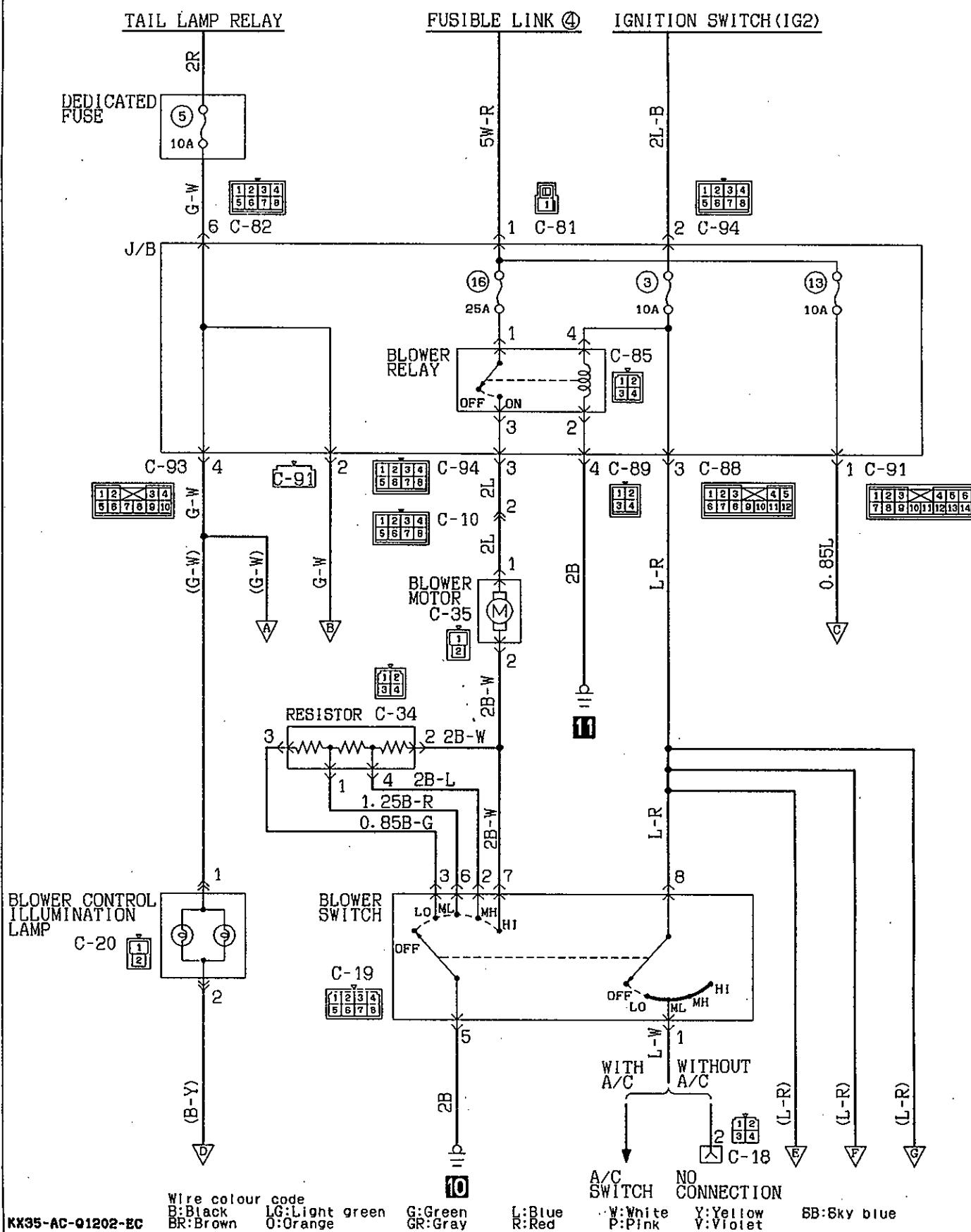
Vehicles with rear heater<with dual air conditioner>







Vehicles with rear heater<without dual air conditioner>



Wire colour code

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

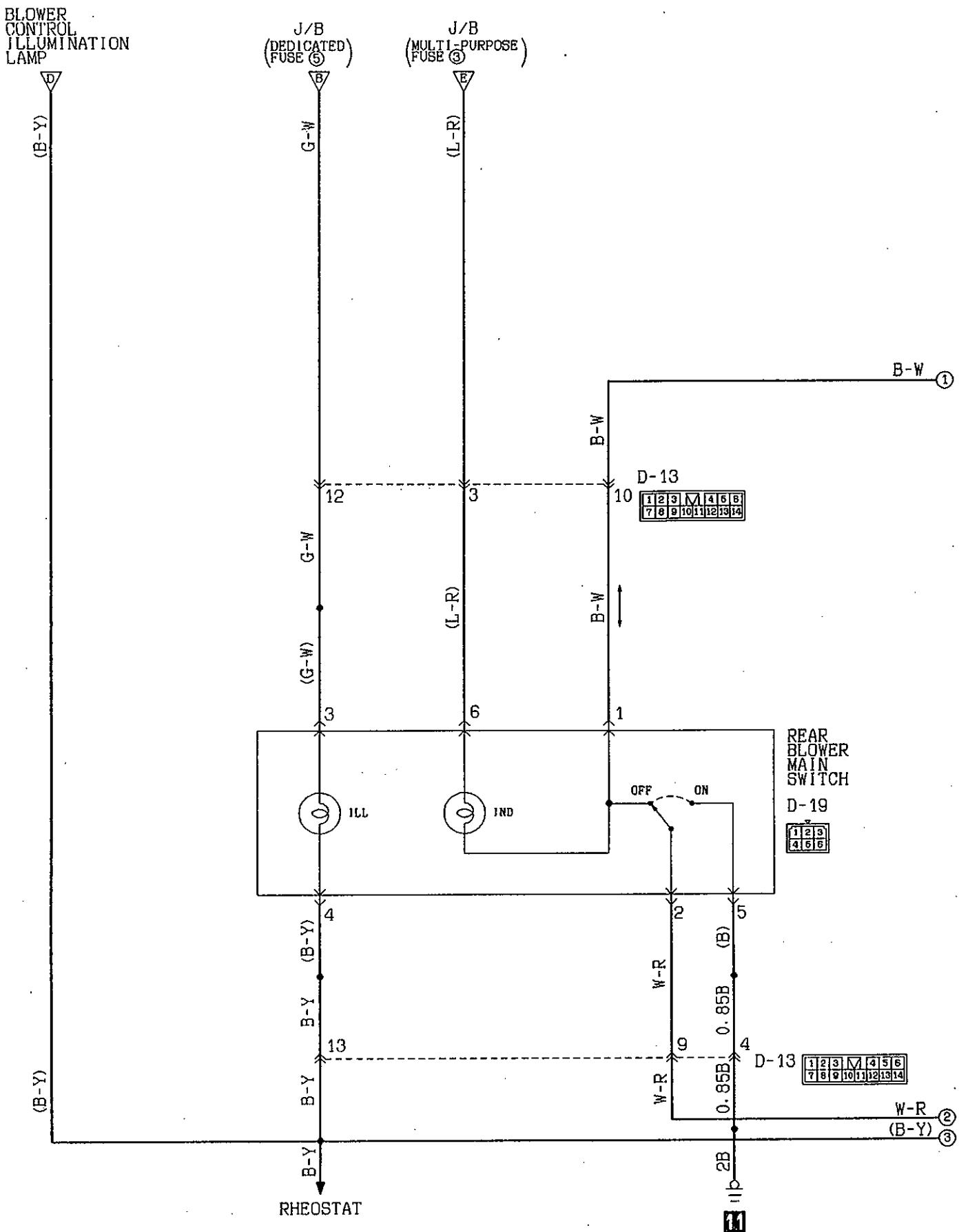
en G:Green
GR:Gray

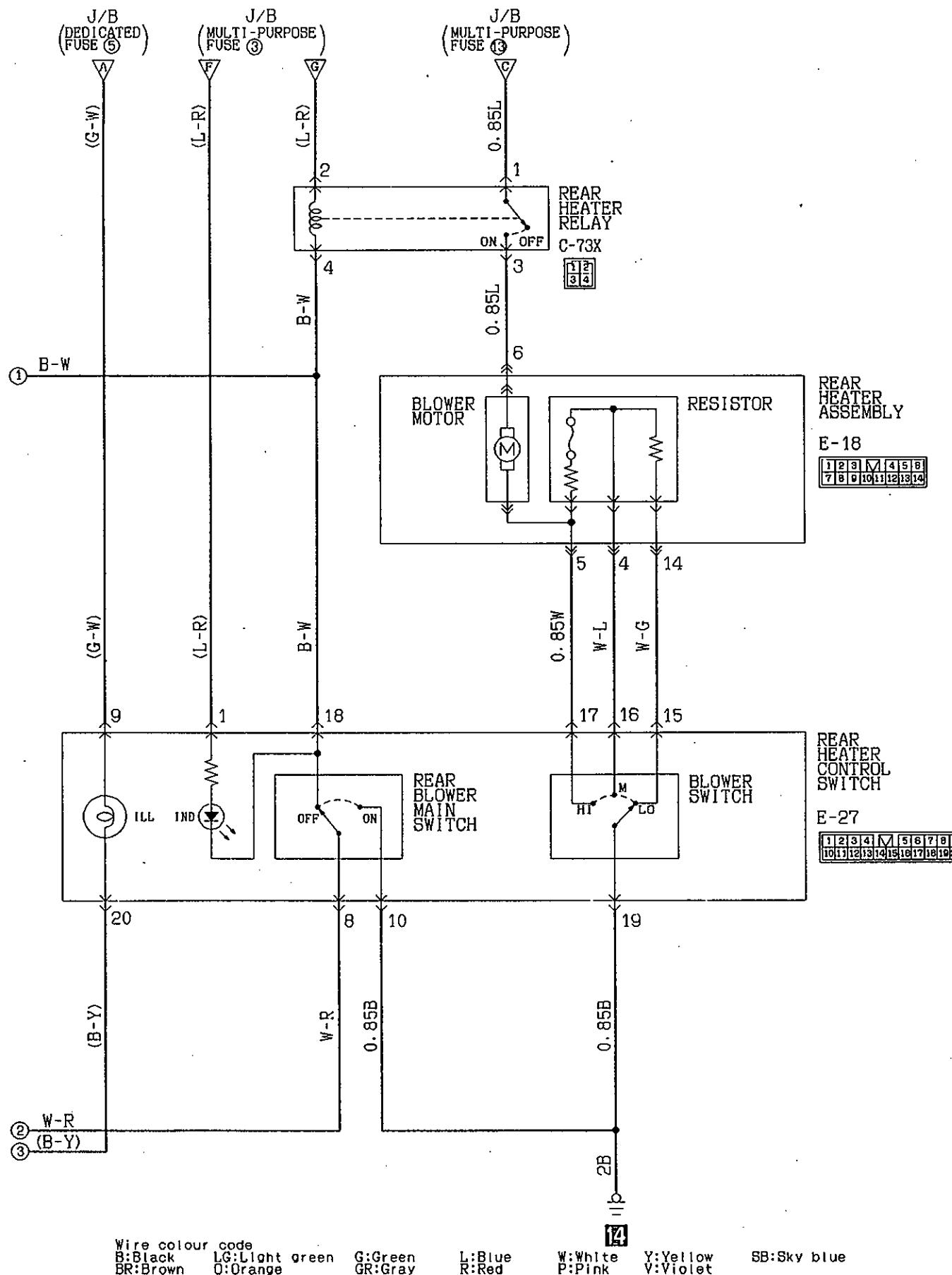
2018 Blue
Rec

W:White
P:Pink

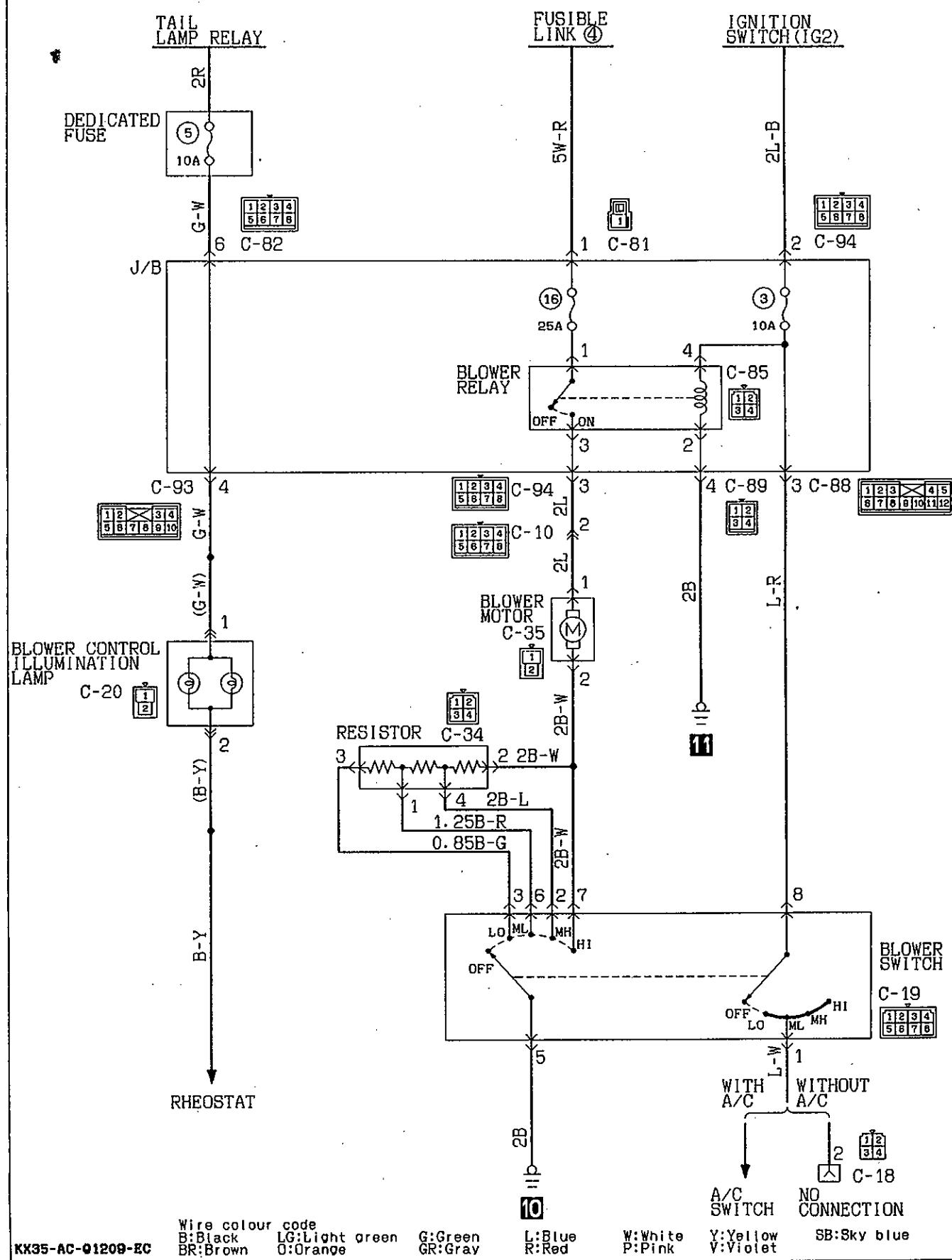
Y:Yellow
V:Violet

SB:Sky blue





Vehicles without rear heater



Wire colour code

B:Black LG:Light green G:Green
BR:Brown O:Orange GR:Gray

L:Blue
R:Red

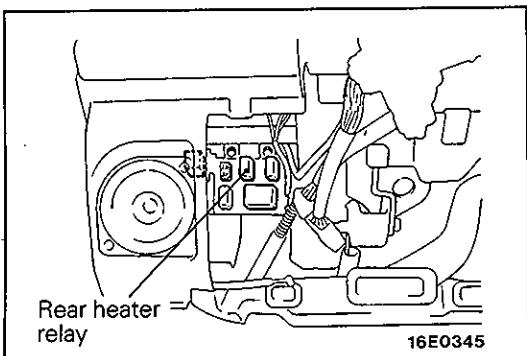
W:White
P:Pink

Y:Yellow
V:Violet

SB:Sky blue

HEATER**<Vehicles built from November, 1993>**

Refer to "HEATER" of '94 PAJERO Workshop Manual Electrical Wiring (Pub No. PHJE9026).



SERVICE ADJUSTMENT PROCEDURES

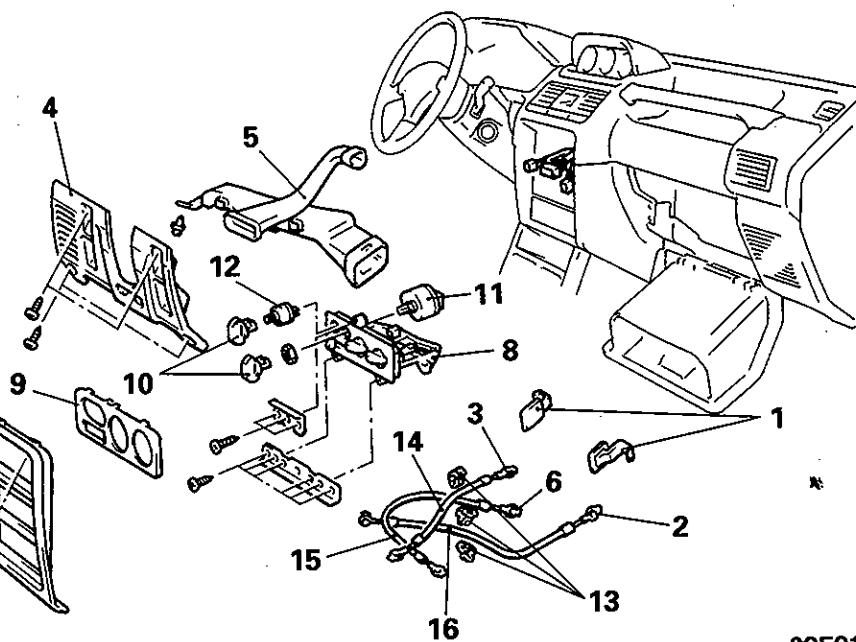
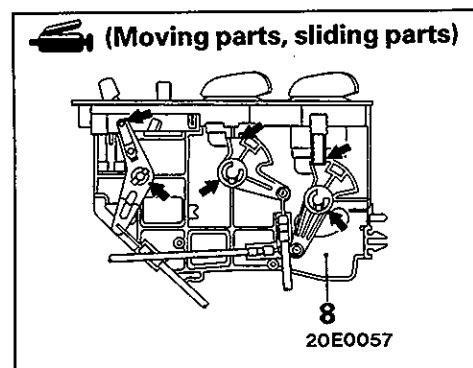
POWER RELAY CHECK

- (1) Remove each power relay.
 - ① Remove the heater relay from the junction block located at the left lower of the instrument panel.
 - ② Remove the rear heater relay from the relay box.
- (2) Check the continuity between the each terminal.

HEATER CONTROL ASSEMBLY

REMOVAL AND INSTALLATION

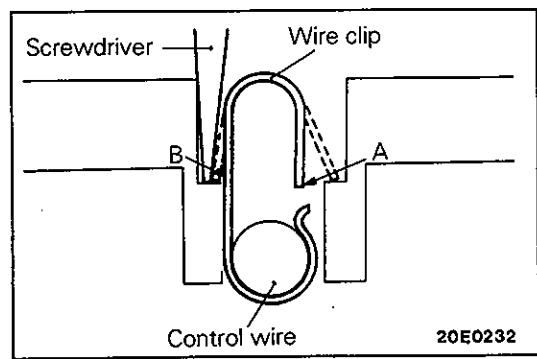
E55GA--



20E0141

Removal steps

- ➡ 1. Stopper
- ➡ 2. Connection for the air-selection control wire (Blower case side)
- ➡ 3. Connection for the temperature control wire (Heater unit side)
- ➡ 4. Instrument under cover (Refer to Group 52 – Instrument Panel)
- ➡ 5. Lap cooler duct A and foot shower duct (LH)
- ➡ 6. Connection for the mode selection control wire (Heater unit side)
- ➡ 7. Center panel
- ➡ 8. Heater control assembly
- ➡ 9. Bezel
- ➡ 10. Knob
- ➡ 11. Blower switch
- ➡ 12. Air conditioner switch
- ➡ 13. Wire clip
- ➡ 14. Temperature control wire
- ➡ 15. Mode selection control wire
- ➡ 16. Air-selection control wire



SERVICE POINT OF REMOVAL

E55GBAL

13. REMOVAL OF WIRE CLIP

Remove the wire clip by inserting a screwdriver in the position shown in the illustration and pushing the wire clip in the directions A and B.

E55GCAL

INSPECTION

BLOWER SWITCH CHECK

Operate the switch and use a circuit tester to check the continuity between the terminals.

Terminal No. Switch position	5	3	6	2	7	8	1	4	Remark
(LO) •	○	○				○	○		○—○ indicates that there is a continuity between the terminals.
(ML) •	○		○			○	○		
(MH) •	○			○		○	○	○	
(HI) •	○				○	○	○	○	

AIR CONDITIONER SWITCH CHECK

<Vehicles with air conditioner>

Operate the switch and use a circuit tester to check the continuity between the terminals.

Terminal No. Switch position	1	3	4	Remark
ECONO	○	○		○—○ indicates that there is a continuity between the terminals
A/C	○	○	○	

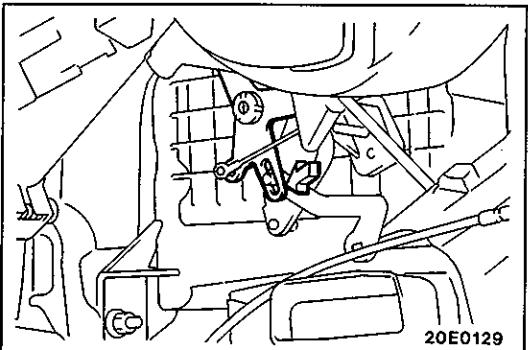
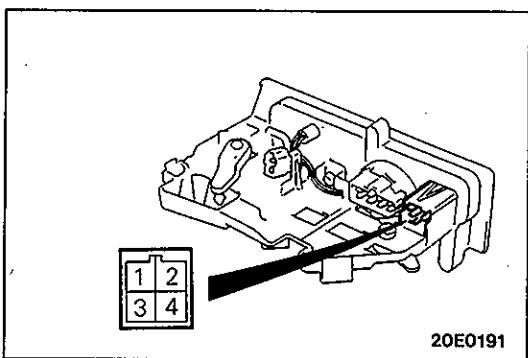
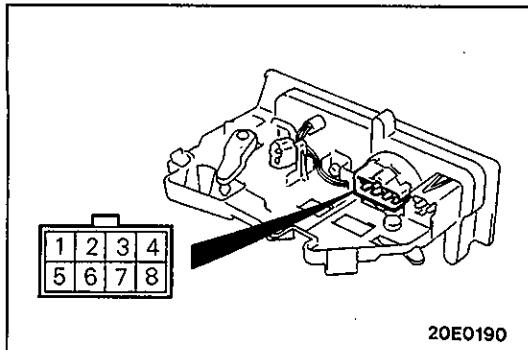
SERVICE POINTS OF INSTALLATION

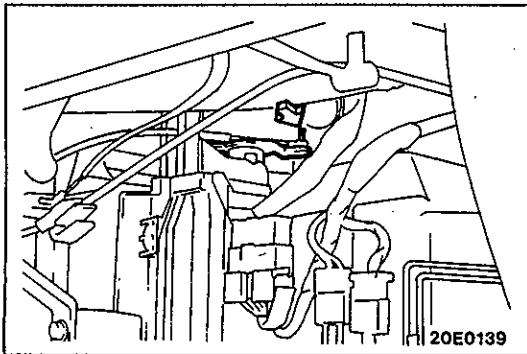
E55GDAM

6. INSTALLATION OF MODE SELECTION CONTROL WIRE (HEATER UNIT SIDE)

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  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 secure the outer cable by using a clip.

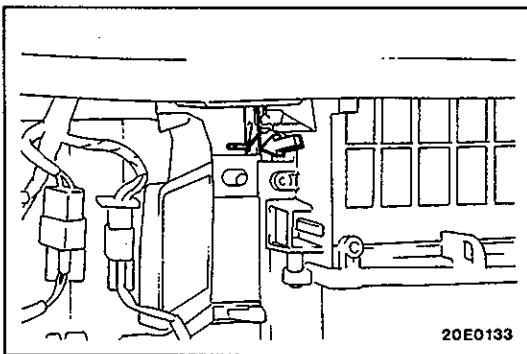




3. INSTALLATION OF TEMPERATURE CONTROL WIRE (HEATER UNIT SIDE)

Connect the temperature control wire to the blend air damper lever by following the steps below.

- (1) Move the temperature control lever to the rightmost 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 secure the outer cable by using a clip.



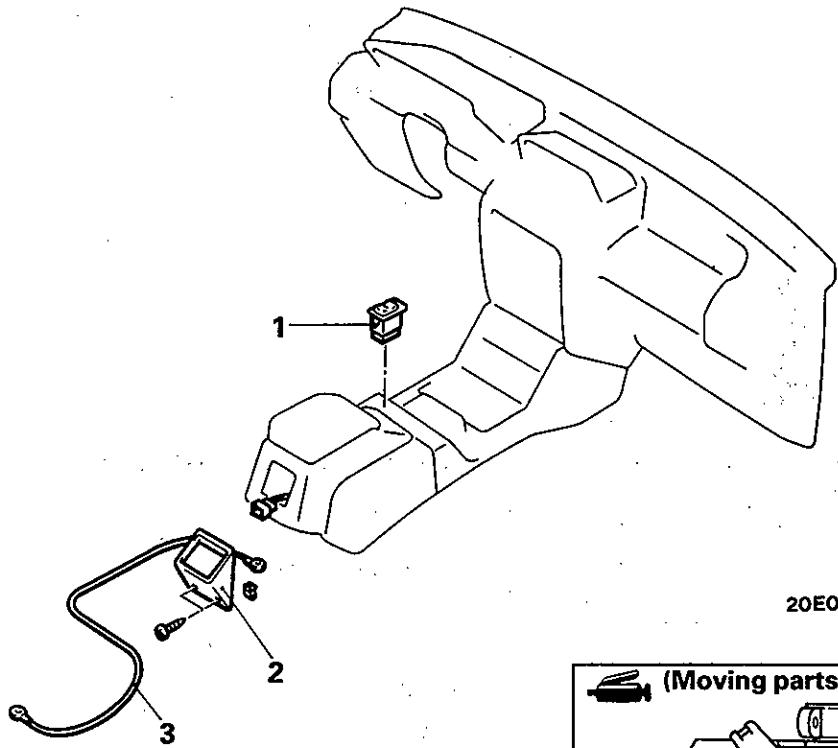
2. INSTALLATION OF AIR SELECTION CONTROL WIRE (BLOWER CASE SIDE)

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  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 secure the outer cable by using a clip.

REAR BLOWER SWITCH REMOVAL AND INSTALLATION

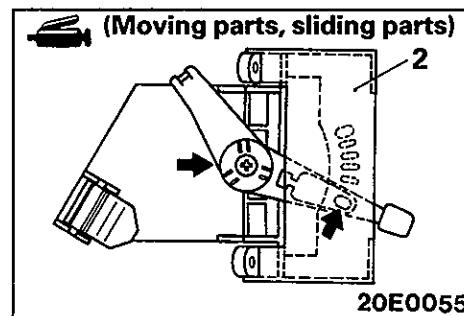
E55TA-C

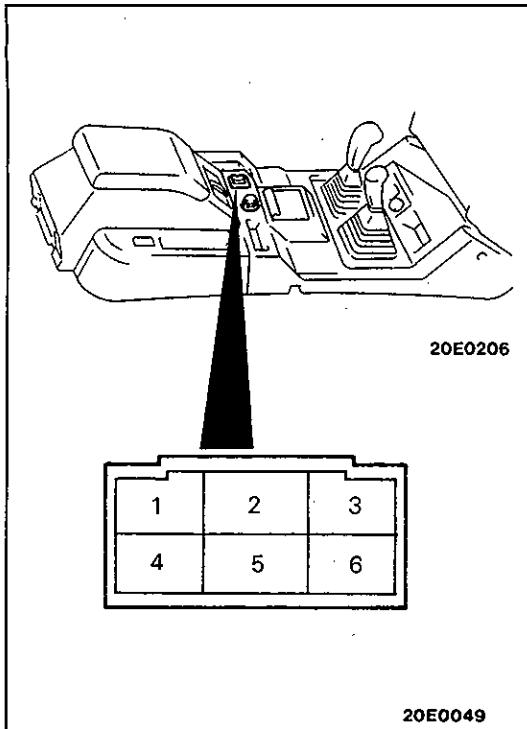


1. Rear blower main switch (Floor console side)

Removal steps of rear heater control assembly

2. Rear heater control assembly
3. Connection for the rear heater temperature control wire (Rear heater control assembly side)
<Except for vehicles with dual A/C>



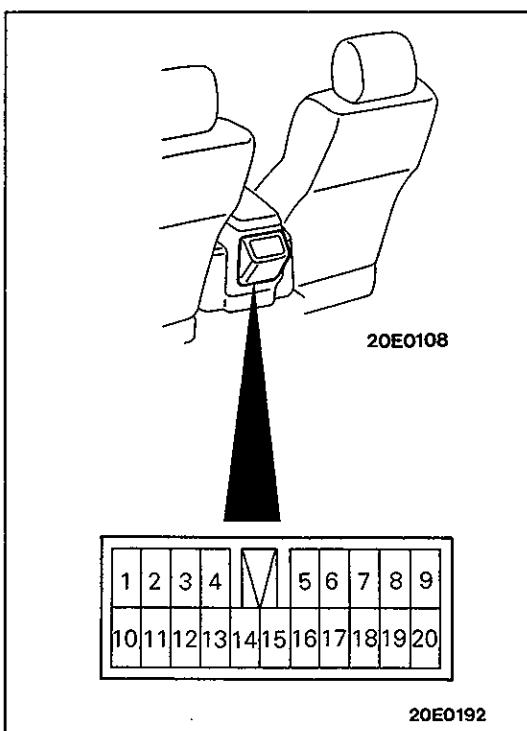


INSPECTION

REAR BLOWER MAIN SWITCH CHECK
(FLOOR CONSOLE SIDE)

Operate the switch and use a circuit tester to check the continuity between the switch terminals.

Terminal No. Switch position	1	2	5	6	3	4	Remark
5	○—○			○	○—○		○—○ indicates that there is a continuity between the terminals
REAR		○—○			○—○		

REAR BLOWER SWITCH AND REAR BLOWER MAIN SWITCH CHECK
(REAR HEATER CONTROL ASSEMBLY SIDE)

Operate the switch and use a circuit tester to check the continuity between the terminals.

<Vehicles without dual A/C>

Terminal No. Switch position	7	8	10	15	16	17	19	Remark
OFF		○—○						○—○ indicates that there is a continuity between the terminals.
■		○—○						
● (Lo)				○		○		
● (Me)					○	○—○		
● (Hi)						○—○		

<Vehicles with dual A/C>

Terminal No. Switch position	7	8	10	12	13	14	15	16	17	19	Remark
OFF		○—○									○—○ indicates that there is a continuity between the terminals.
■		○—○									
● (Lo)					○—○						
● (Me)					○	○—○					
● (Hi)					○		○—○				

TEMPERATURE ADJUSTMENT SELECTOR CHECK
<Vehicles with dual A/C>

(1) Operate the switch and use a circuit tester to check the continuity between the terminals.

Switch position	
At MAX. COOL	No continuity between terminals 3-4
At MAX. HOT	No continuity between terminals 5-6

(2) Operate the switch and measure the resistance between the terminals.

Switch position	Standard value	Ω
At MAX. COOL	Between terminals 3-4: 0-4	
At MAX. HOT	Between terminals 5-6: 2400	

HEATER UNIT

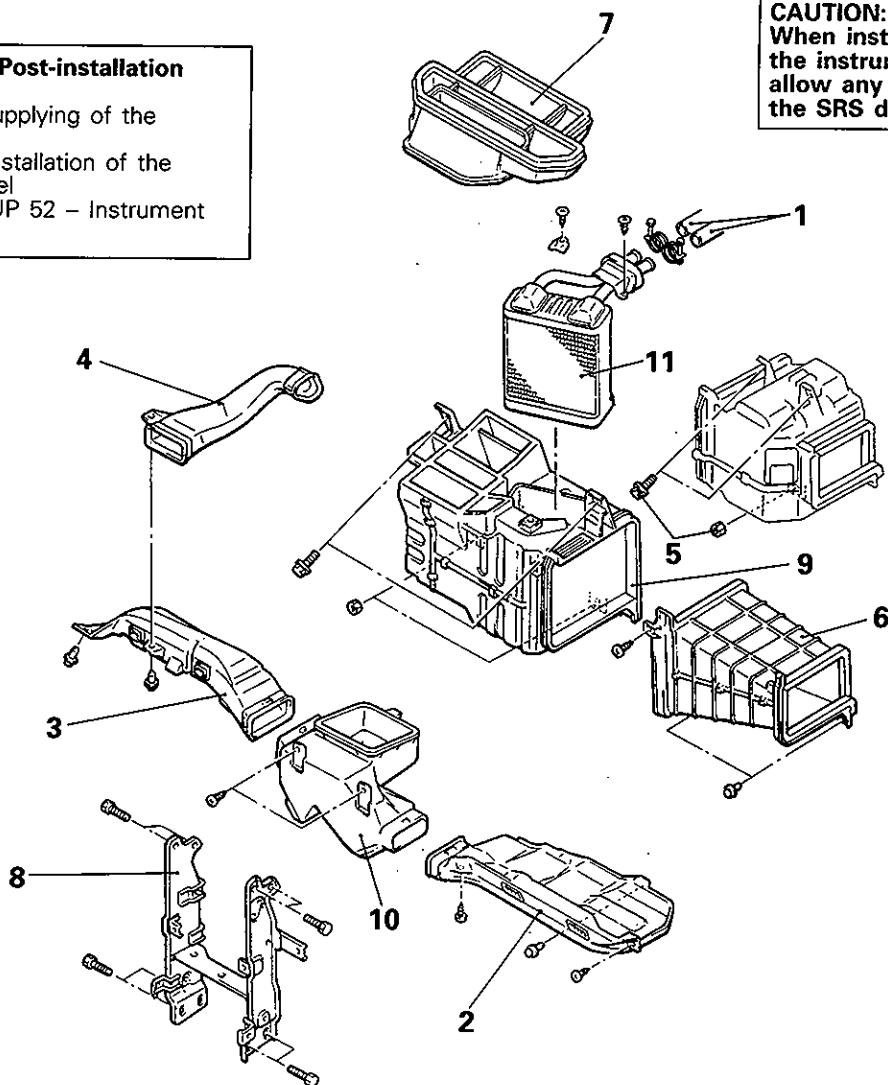
REMOVAL AND INSTALLATION

E55IA--

Per-removal and Post-installation Operation

- Draining and Supplying of the Coolant
- Removal and Installation of the Instrument Panel
(Refer to GROUP 52 - Instrument Panel.)

CAUTION: SRS
When installing or removing the instrument panel, don't allow any impact or shock to the SRS diagnosis unit.



20E0175

Removal steps

1. Connection for water hoses
2. Foot shower duct (RH)
3. Foot shower duct (LH)
4. Lap cooler duct A
5. Evaporator mounting bolt and nut
<Vehicles with air conditioner>
6. Joint duct <Vehicles without A/C>
7. Center duct assembly
8. Center reinforcement
9. Heater unit
10. Foot distribution duct
11. Heater core

INSPECTION

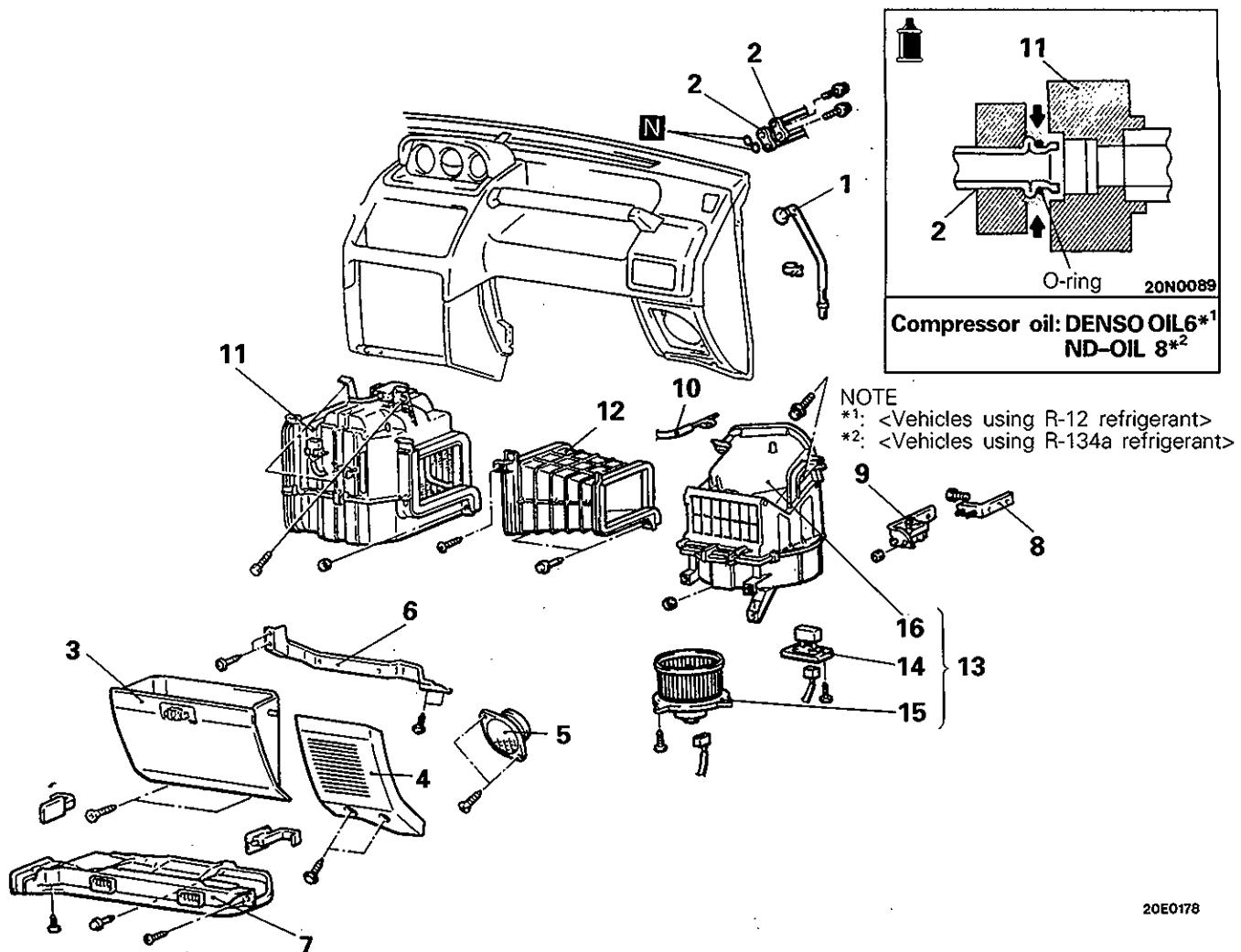
E55ICAI

- Check the operation of dampers and link mechanism.
- Check the heater core for clogging and water leakage.

BLOWER ASSEMBLY

REMOVAL AND INSTALLATION

E55KA--



Removal steps

- Discharge and Charging of Refrigerant
(Refer to P.55-62, 67.)
<Vehicles with air conditioner>
- 1. Drain hose <Vehicles with air conditioner>
- 2. Connection for liquid pipe and suction hose
<Vehicles with air conditioner>
- 3. Glove box
- 4. Speaker garnish
- 5. Speaker
- 6. Lower frame
- 7. Foot shower duct <RH>
- 8. Engine control relay assembly
<Petrol-powered vehicles>
or fuel line heater relay assembly
<Vehicles with fuel line heater>
- 9. Bracket <Petrol-powered vehicles and
vehicles with fuel line heater>
- 10. Connection for the air-selection control wire
- 11. Evaporator <Vehicles with air conditioner>
- 12. Joint duct <Vehicles without A/C>
- 13. Blower assembly
- 14. Resistor
- 15. Blower motor assembly
- 16. Blower case assembly

Removal steps of blower motor assembly

- 7. Foot shower duct <RH>
- 15. Blower motor assembly

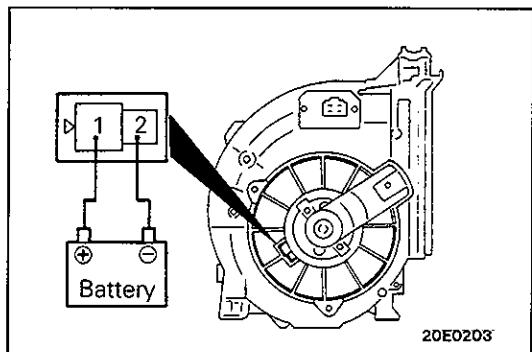
Removal steps of resistor

- 7. Foot shower duct <RH>
- 14. Resistor

INSPECTION

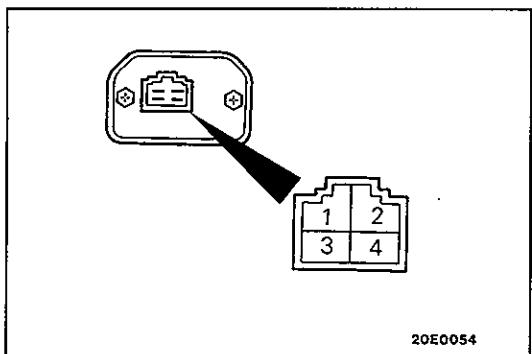
E55KCAM

- Check for bending or abnormal deflection of the rotating shaft of the blower motor assembly.
- Check for damage to the fan.
- Check for damage of the blower case.
- Check the operation of the inside/outside air-selection damper, and for damage.



BLOWER MOTOR ASSEMBLY CHECK

- (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.



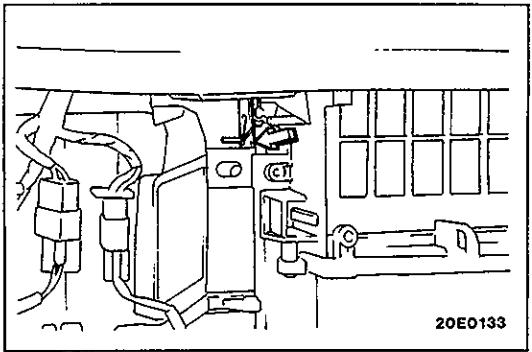
RESISTOR CHECK

Using a circuit tester, 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

Terminals measured	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. $0.33 \pm 7\%$



SERVICE POINT OF INSTALLATION

E55KDAF

10. INSTALLATION OF AIR SELECTION CONTROL WIRE

Connect the air selection control wire to the air selection damper lever by following the steps below.

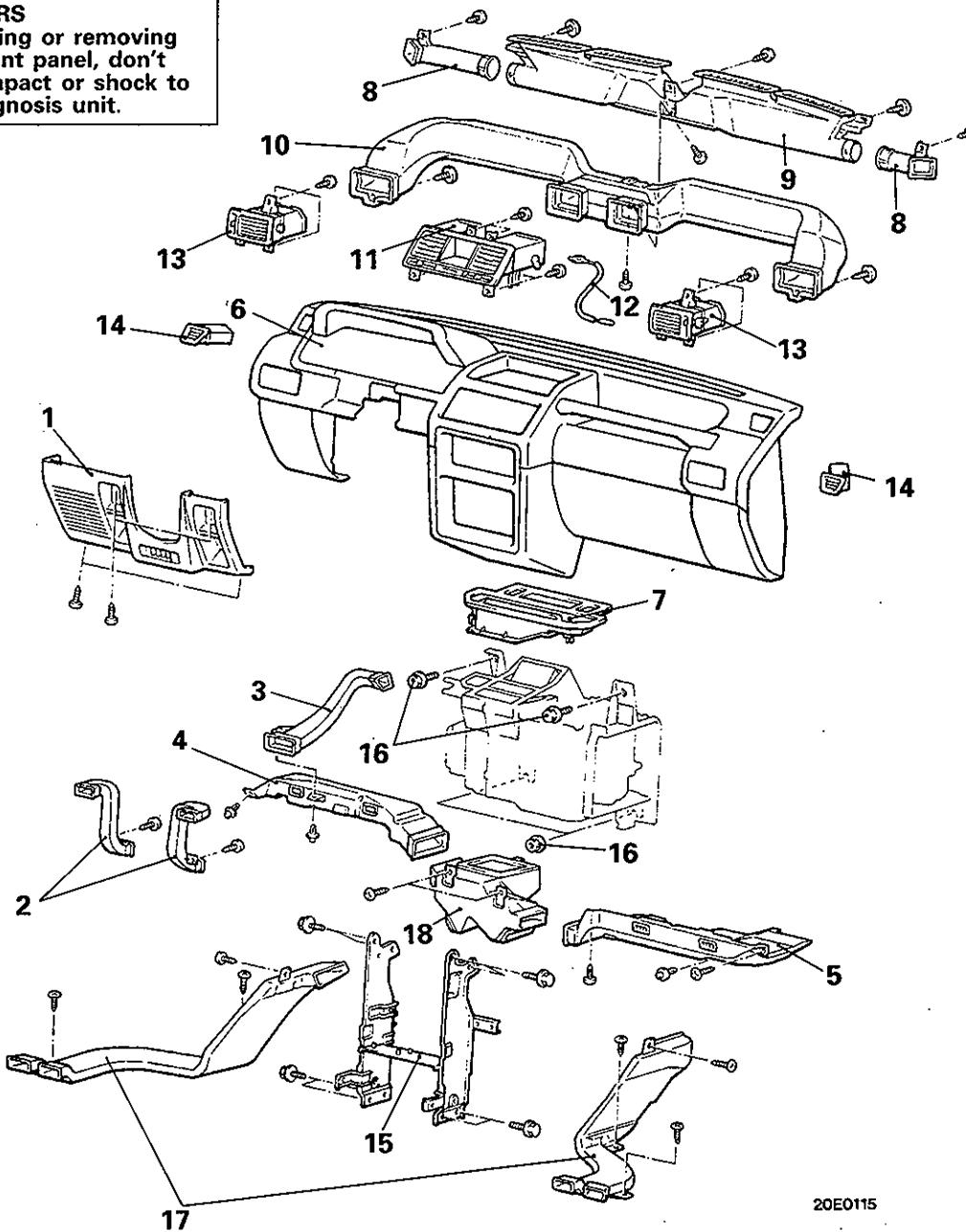
- (1) Move the air selection control lever to the  position.
- (2) With the air selection damper lever pressed inward in the direction indicated by the arrow, connect the inner cable of the air selection control wire to the end of the air selection lever, and then secure outer cable by using a clip.

VENTILATORS (INSTRUMENT PANEL AND FLOOR)

REMOVAL AND INSTALLATION

E55MA-1

CAUTION: SRS
When installing or removing the instrument panel, don't allow any impact or shock to the SRS diagnosis unit.



Removal steps

1. Instrument under cover
(Refer to GROUP 52 – Instrument panel)
2. Lap cooler duct B
3. Lap cooler duct A
4. Foot shower duct (LH)
5. Foot shower duct (RH)
6. Instrument panel
(Refer to GROUP 52 – Instrument panel)
7. Center duct assembly
8. Side defroster duct
9. Defroster nozzle
10. Distribution duct
11. Center outlet assembly
12. Ventilation control wire
13. Side outlet assembly
14. Side defroster grille
15. Center reinforcement
16. Heater unit mounting bolts and nuts
17. Rear heater duct
18. Foot distribution duct



SERVICE POINT OF REMOVAL

E55MBBE

17. REMOVAL OF REAR HEATER DUCT

Remove the front seat, front scuff plate and cowl side trim, and after taking out the floor carpet, remove the rear heater duct.

(Refer to GROUP 52 – Seats and Trims.)

SERVICE POINT OF INSTALLATION

E55MCBA

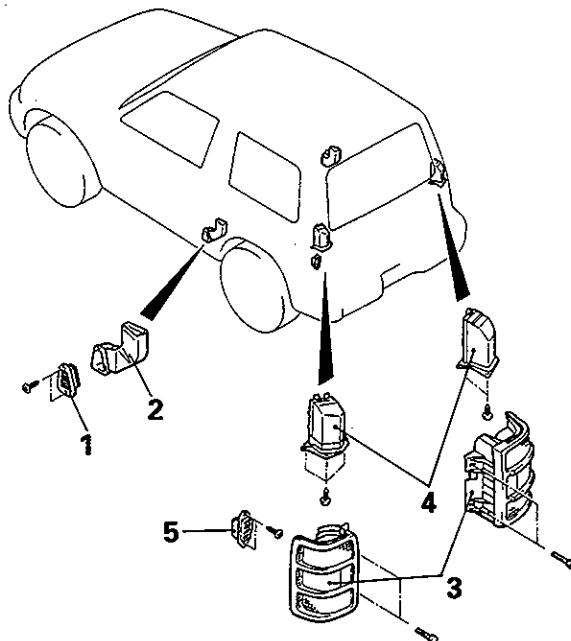
17. INSTALLATION OF REAR HEATER DUCT

After installing the duct, replace the floor carpet and install the front seat, front scuff plate and cowl side trim. (Refer to GROUP 52 – Seats and Trims.)

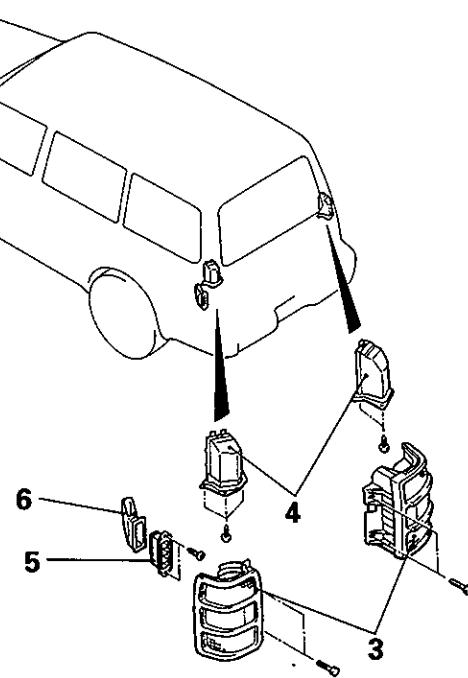
VENTILATORS (AIR OUTLET)

REMOVAL AND INSTALLATION

E55MA-2



20E0112



20E0113

**Removal steps of rear ventilator duct
<Except for Vehicles with Long Wheelbase>**

1. Rear ventilator garnish
2. Rear ventilator duct

**Removal steps of rear ventilator duct assembly
<Except for Canvas Top>**

3. Rear combination lamp assembly
(Refer to Group 54 – Rear Combination Lamp)
4. Rear ventilator duct assembly
5. Air outlet garnish assembly
6. Air outlet duct <Long Body>

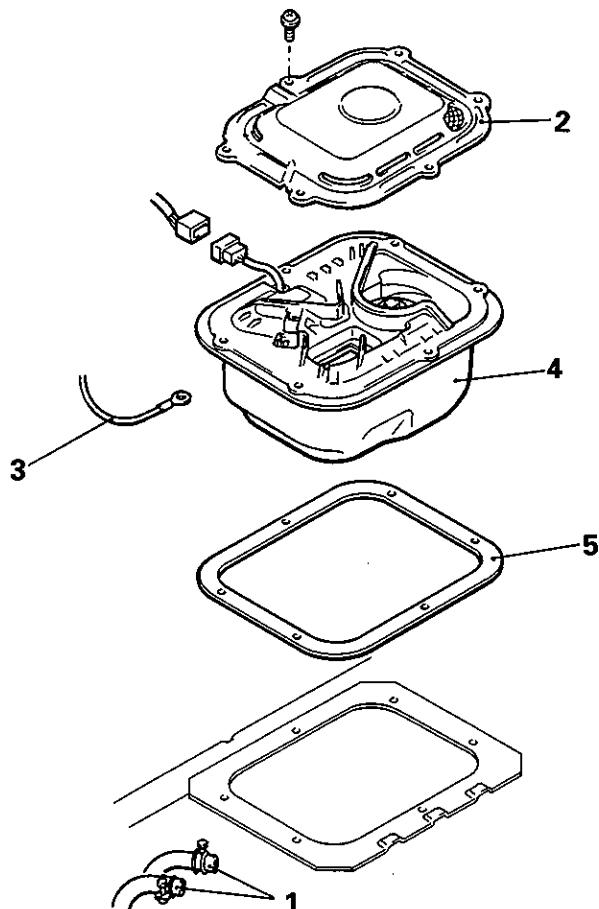
REAR HEATER

REMOVAL AND INSTALLATION

E55RA--

Pre-removal and Post-installation Operation

- Draining and Supplying of the Coolant
- Removal and Installation of the Rear Seat (Refer to GROUP 52 – Seat) <Except for Long Body Wagon>
- Removal and Installation of the Rear Differential Lock Control Unit (Refer to GROUP 27 – Rear Differential Lock) <Long Body>



20E0183

Removal steps

1. Connection for water hoses
2. Cover
3. Connection for rear heater temperature control wire <Vehicles without A/C>
4. Rear heater unit
5. Seal

INSPECTION

E55RCAC

- Check the operation of dampers and link mechanism.
- Check the heater core for clogging and water leakage.

REAR HEATER FAN MOTOR CHECK

When battery voltage is applied between the terminals, check that the motor turns without making any abnormal noise.

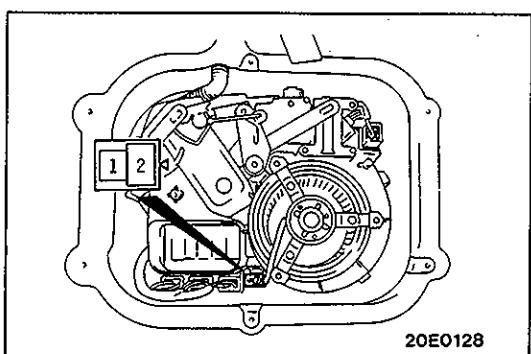
SERVICE POINT OF INSTALLATION

E55RDAD

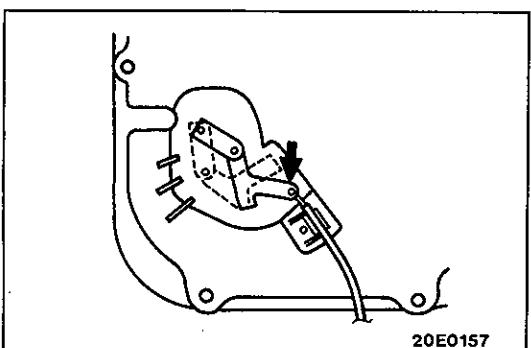
3. INSTALLATION OF REAR HEATER TEMPERATURE CONTROL WIRE

Connect the rear heater temperature control wire to the blend air damper lever by following the steps below.

- (1) Move the rear heater temperature control lever to the rightmost 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 rear heater temperature control wire to the end of the blend air damper lever, and then secure the outer cable by using a clip.



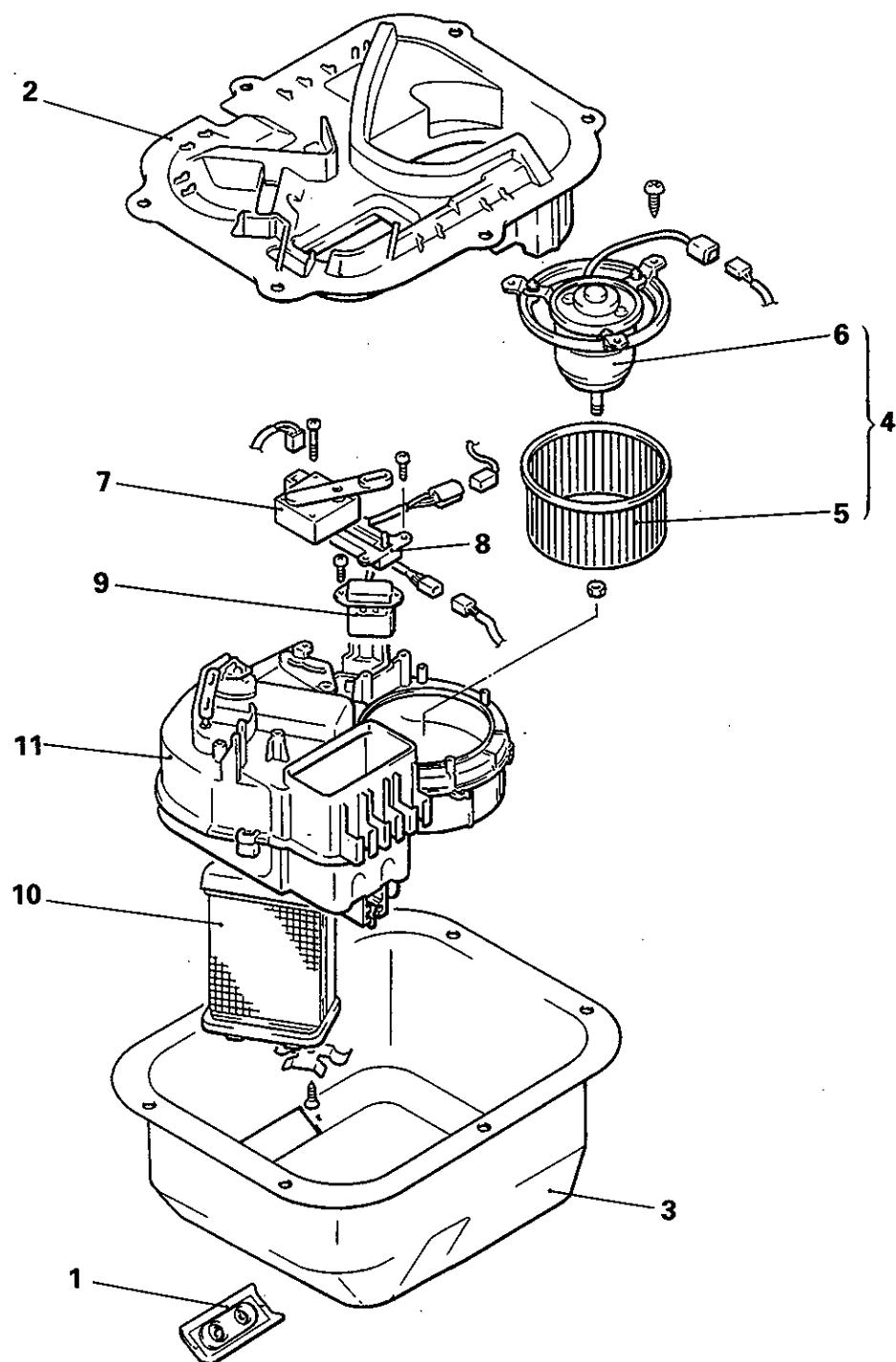
20E0128



20E0157

DISASSEMBLY AND REASSEMBLY

E55UA--



Disassembly steps

20E0233

1. Plate
2. Air guide
3. Rear heater cover
4. Rear heater fan motor assembly
5. Rear heater fan
6. Rear heater fan motor
7. Rear air mix damper motor assembly
8. Control switch assembly
9. Resistor
10. Rear heater core
11. Rear heater case

REAR AIR MIX DAMPER MOTOR ASSEMBLY, CONTROL SWITCH AND RESISTOR

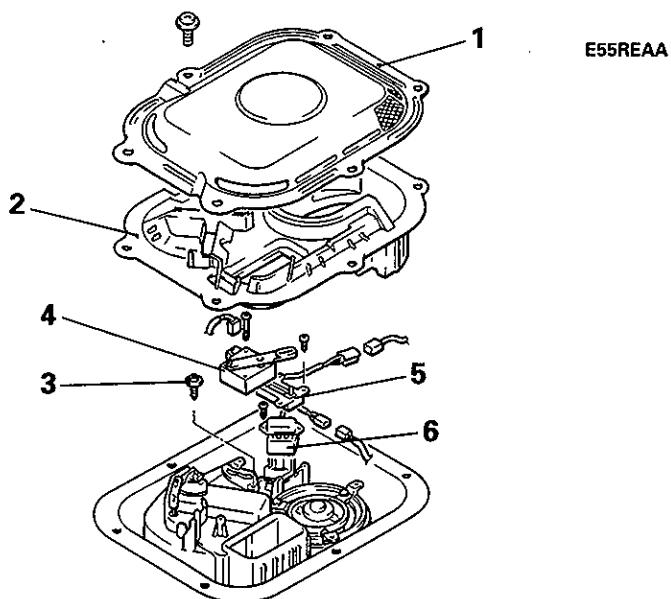
REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation

- Removal and Installation of the Rear Seat
(Refer to GROUP 52 – Seat)
<Except for Long Body Wagon>

Removal steps

- Cover
- Air guide
- Linkage mounting screw
- Rear air mix damper motor assembly
<Vehicles with dual A/C>
- Control switch assembly
<Vehicles with dual A/C>
- Resistor



20E0146

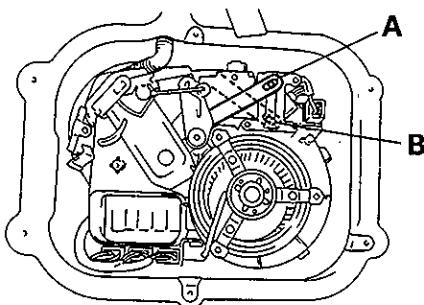
E55REAA

INSPECTION

E55REBA

REAR AIR MIX DAMPER MOTOR ASSEMBLY CHECK

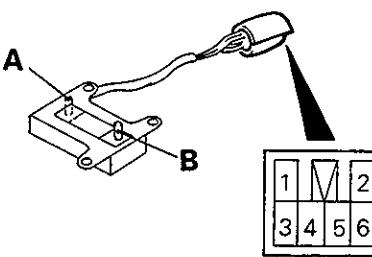
- Check that the temperature adjustment selector is normal. (Refer to P.55-15.)
- After the engine has warmed up, check that the link of the damper motor is at position A when the temperature adjustment selector is at the MAX.COOL position, and that it is at position B when the temperature adjustment selector is at the MAX.HOT position.



20E0127

CONTROL SWITCH CHECK

Operate the switch and use a circuit tester to check the continuity between the terminals in both the A and B positions.



20E0121

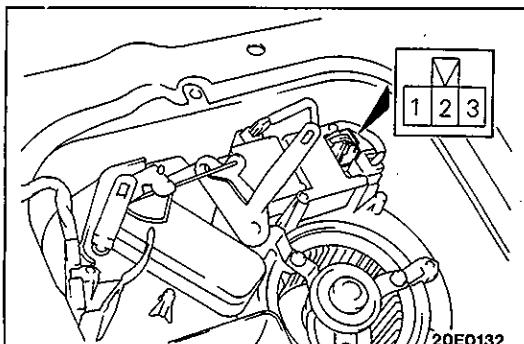
Terminal No. Switch position	1	4	3	2	6	Remark
A position	○	—	○	—	—	○—○ indicates that there is a continuity between the terminals.
B position	○	○	—	○	○	

RESISTOR CHECK

Use a circuit tester to measure the resistance between the terminals shown below. Check that the values measured are within the standard values.

Standard value:

Measurement terminal	Standard value Ω
Between terminals ②—③	4.3 \pm 7%
Between terminals ①—②	1.2 \pm 7%



20E0132

AIR CONDITIONER

SPECIFICATIONS

GENERAL SPECIFICATIONS

E55CA-2

<Vehicles using R-12 refrigerant>

Items	4G64 and 6G72	4D56
Compressor		
Model	10PA 15 Inclined-plate type	10PA 15 Inclined-plate type
No. of cylinders and displacement	10 cylinders	10 cylinders
	cm ³ (cu.in.)	cm ³ (cu.in.)
Compressor oil	155.3 (9.5) DENSO oil 6	155.3 (9.5) DENSO oil 6
	80 ± 20 (4.9 ± 1.2)	80 ± 20 (4.9 ± 1.2)
	150 ± 20 (9.2 ± 1.2)*	150 ± 20 (9.2 ± 1.2)*
Protective equipment		
Dual pressure switch	kPa (kg/cm ² , psi)	
Lower-pressure side		
OFF	210 ± 20 (2.1 ± 0.2, 30 ± 3)	210 ± 20 (2.1 ± 0.2, 30 ± 3)
Differential	25 (0.25, 3.6) or less	25 (0.25, 3.6) or less
High-pressure side		
OFF	2,700 ± 200 (27 ± 2, 384 ± 28)	2,700 ± 200 (27 ± 2, 384 ± 28)
ON	2,100 ± 200 (21 ± 2, 299 ± 28)	2,100 ± 200 (21 ± 2, 299 ± 28)
Engine coolant temperature switch	°C(°F)	
Air conditioner switch off		
OFF	15 ± 3 (239 ± 5)	116 ± 2 (2,44 ± 4)
ON	108 (226)	109 (224)
Condenser fan		
OFF	—	97 (204)
ON	—	102 ± 3 (212 ± 6)
Freezer prevention		
Air thermo sensor	°C(°F)	
OFF	3 (37)	3 (37)
ON	4 (39)	4 (39)
Fusible plug		
(Burn out Temperature)	°C(°F)	103 ± 3 (217 ± 5)
Refrigerant and quantity	g (lbs.)	R-12 (CFC-12) 750–850 (1.6–1.9) 1,200–1,300 (2.6–2.9)*
		R-12(CFC-12) 750–850 (1.6–1.9) 1,200–1,300 (2.6–2.9)*

NOTE

*: Vehicles with dual A/C

<Vehicles using R-134a refrigerant>

Items	Specifications	
Compressor		
Model		10PA 15 Inclined-plate type
No. of cylinders and displacement	10 cylinders cm ³ (cu.in.)	155.3 (9.5)
Compressor oil	cm ³ (cu.in.)	ND-OIL 8 80 ± 20 (4.9 ± 1.2), 150 ± 20 (9.2 ± 1.2)
Protective equipment		
Dual pressure switch	kPa (kg/cm ² , psi)	
Lower-pressure side		
OFF		200 ± 20 (2.0 ± 0.2, 28 ± 3)
Differential		20 (0.20, 28) or less
High-pressure side		
OFF		3,200 ± 200 (32 ± 2, 455 ± 28)
ON		2,600 ± 200 (26 ± 2, 370 ± 28)
Engine coolant temperature switch	°C (°F)	
Air conditioner switch off		
OFF		115 ± 3 (239 ± 4) <Except 4D56 engine>
ON		116 ± 2 (244 ± 4) <4D56>
Condenser fan		108 (226) <Except 4D56 engine>
OFF		109 (244) <4D56>
ON		
Freezer prevention		
Air thermo sensor	°C (°F)	
OFF		3 (37)
ON		4 (39)
Refrigerant and quantity	g (lbs.)	R134a (HFC-134a) 500–550 (1.1–1.2), 850–900 (1.9–2.0)* <4M40> 600–650 (1.3–1.4), 1,000–1,050 (2.2–2.3)* <Except 4M40 engine>

NOTE

*: Vehicles with dual A/C

NOTES

SERVICE SPECIFICATIONS

E55CB-2

Items	Standard value	Remarks
Engine coolant temperature switch °C (°F) (For air conditioner cut)	More than 112–118 (234–244) More than 114–118 (237–244)	Except 4D56 engine 4D56
(For condenser fan) ON OFF	More than 99–105 (210–221) Less than 97 (206)	
Idle speed r/min 6G72, 6G74 4D56, 4G64 4M40	700 ± 100 750 ± 100 800 ± 30 900 ± 100	"N" or "P" range for A/T
Idle-up speed r/min	Approx. 40	
Resistance between idle-up solenoid valve terminals Ω		
Resistance value of temperature adjustment selector Ω		
<Vehicles with dual air conditioner> At MAX. COOL At MAX. HOT	0–4 3000	Between terminals 3–9 Between terminals 3–9
<Vehicles with dual air conditioner and rear heater> At MAX. COOL At MAX. HOT	0–4 2400	Between terminals 3–4 Between terminals 5–6
Resistance value of resistor (for rear cooling unit) Ω	Approx. 0.8 Approx. 2.98 Approx. 4.57	Between terminals 2–3 Between terminals 3–4 Between terminals 1–3
Shaft starting torque Nm (kgm, ft.lbs.)	5.0 (0.5, 3.6)	
Clutch clearance mm (in)	0.35–0.65 (0.0138–0.0256)	

LUBRICANTS

E55CD--

Items	Specified lubricants	Quantity
<Vehicles using R-12 refrigerant> Each connection of refrigerant line Compressor refrigerant unit lubricant cm ³ (cu.in.)	DENSO OIL 6	As required 80 (4.9), 150 (9.2)*
<Vehicles using R-134a refrigerant> Each connection of refrigerant line Compressor refrigerant unit lubricant cm ³ (cu.in.)	ND-OIL 8	As required 80 (4.9), 150 (9.2)*

NOTE

*: Vehicles with dual A/C

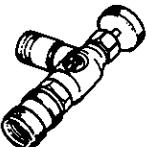
SEALANT

E55CE--

Items	Specified sealant and adhesive	Remarks
Engine coolant temperature switch threaded part	3M Nut Locking Part No. 4171 or equivalent	Drying sealant

SPECIAL TOOLS

E55DA--

Tool	Number	Name	Use
	MB 991402	Vacuum gauge	Vacuum check
	MB991403 (for high pressure) MB991404 (for low pressure)	Adaptor valve	Supplying refrigerant gas Replenishment of refrigerant gas Draining of refrigerant gas Performance test
	MB990784	Ornament remover	Removal of air outlet grille

TROUBLESHOOTING

Before replacing or repairing air conditioning components, first determine if the malfunction is due to refrigerant charge, air flow, or compressor related.

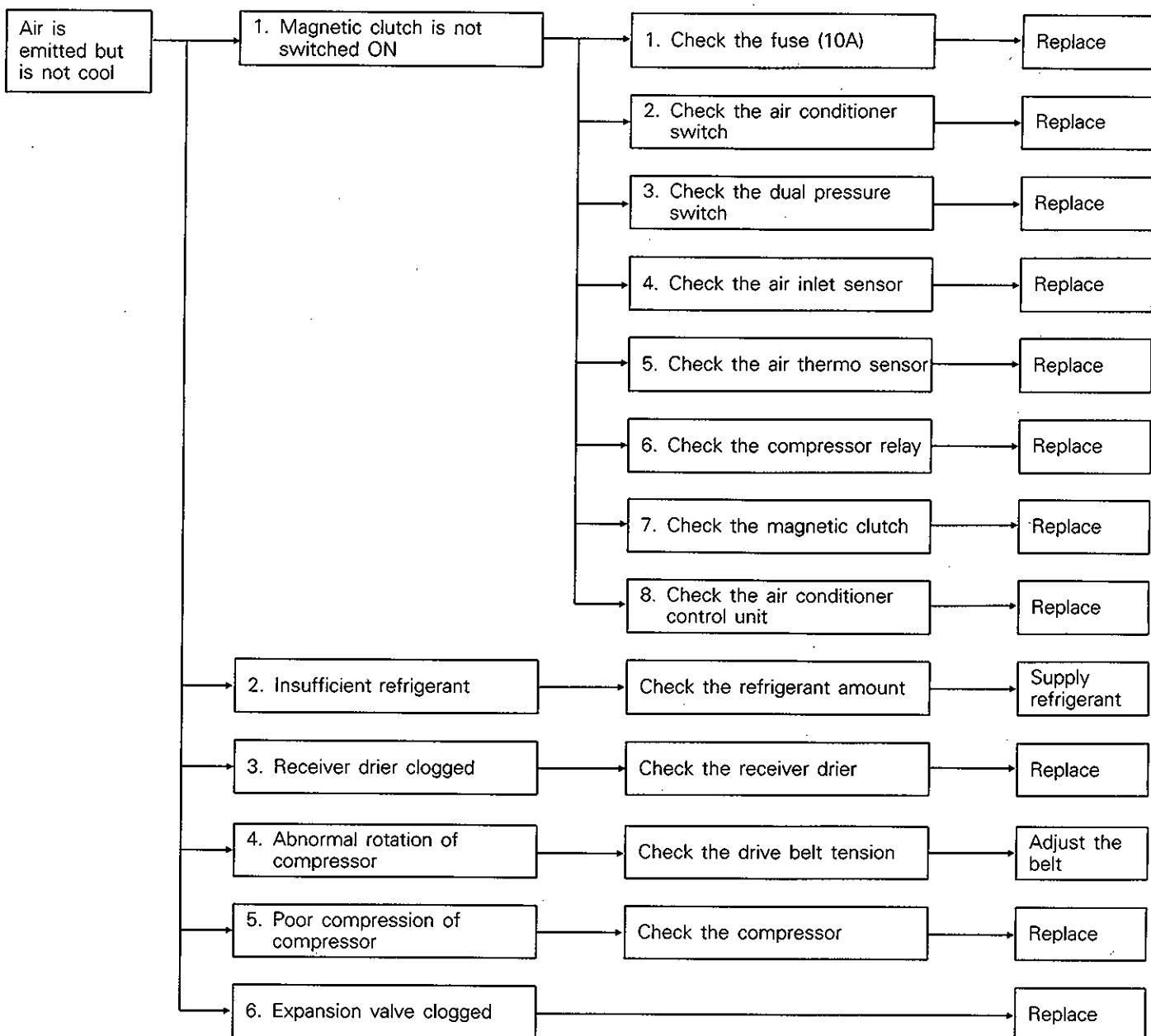
The following diagnostic charts have been developed as a "quick reference" and in deter-

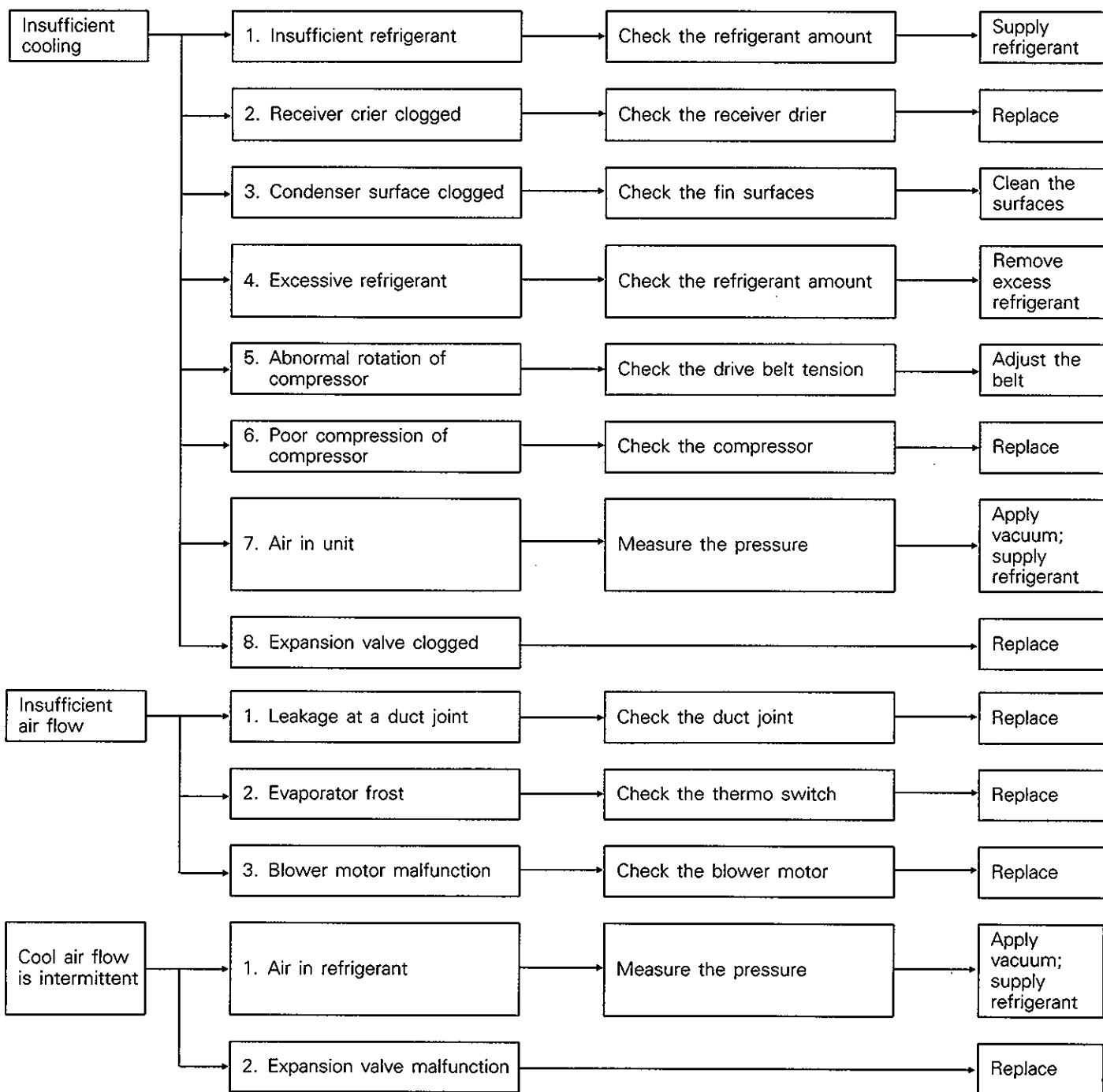
E55EAAQ

mining the cause of malfunction. If these charts do not satisfactorily describe the problem, refer to appropriate section for detailed explanation.

After correcting the malfunction, check out the complete system to assure satisfactory performance.

MALFUNCTION CAUSES AND REMEDIES (Numbers indicate checking/inspection order.)

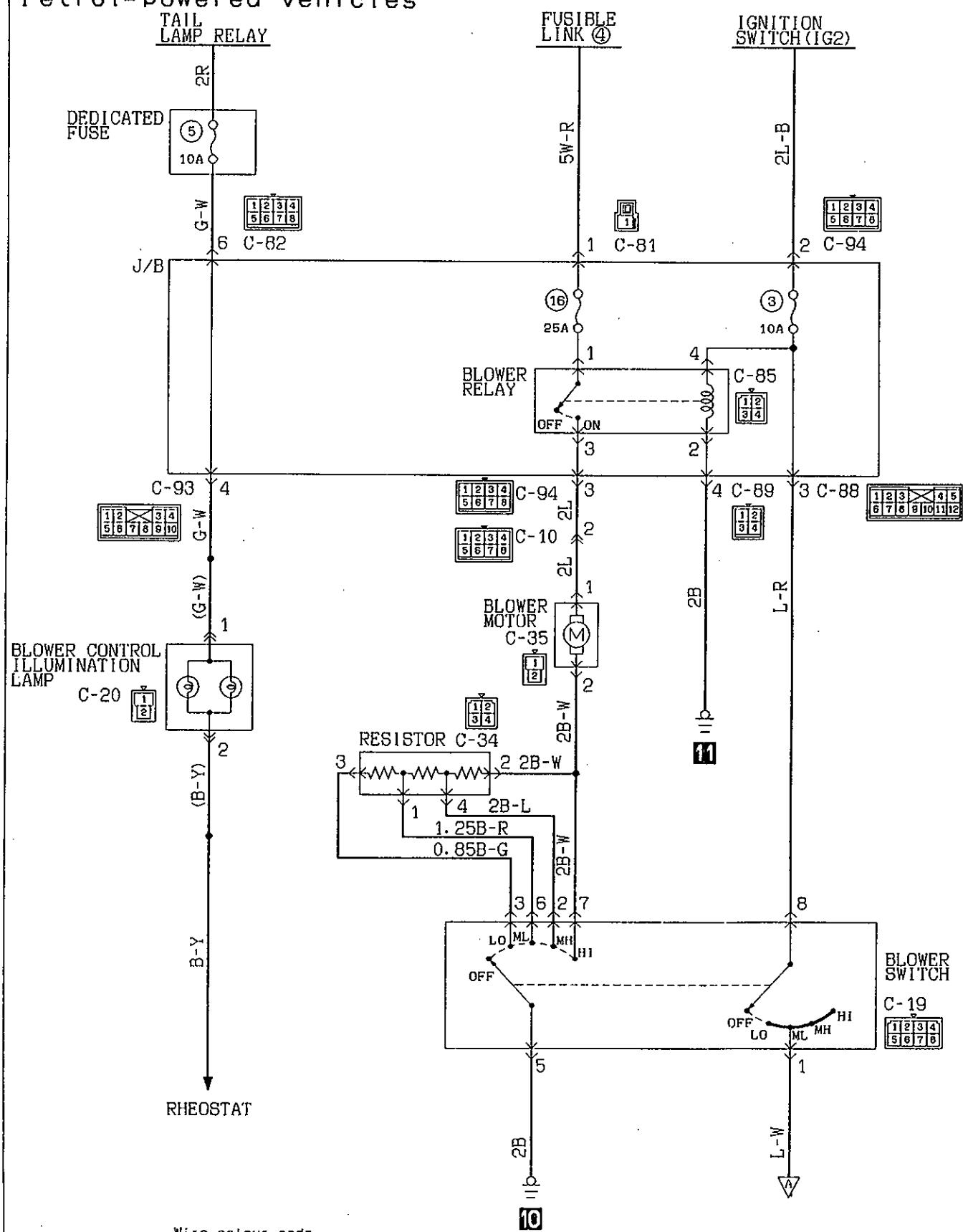


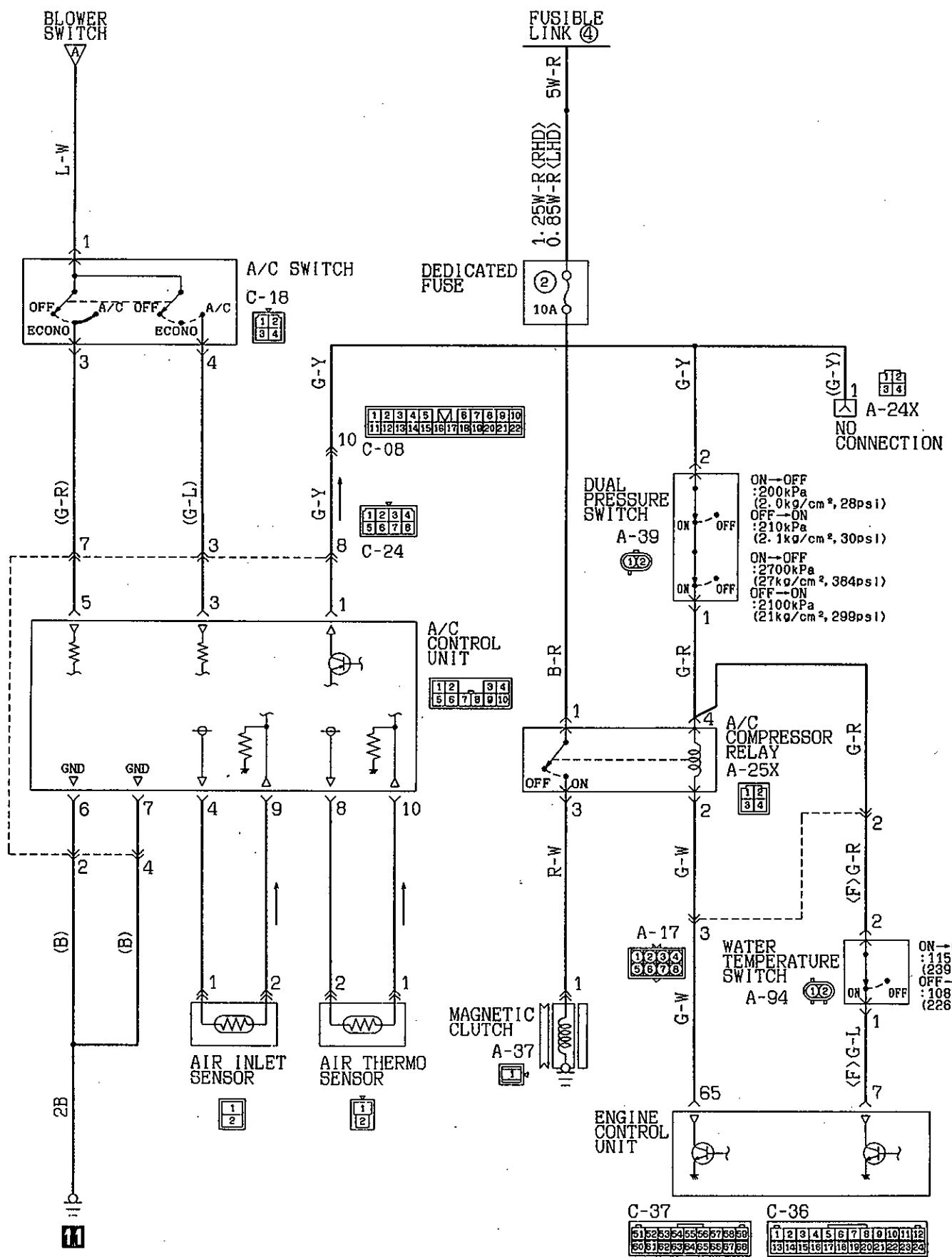


SINGLE AIR CONDITIONER

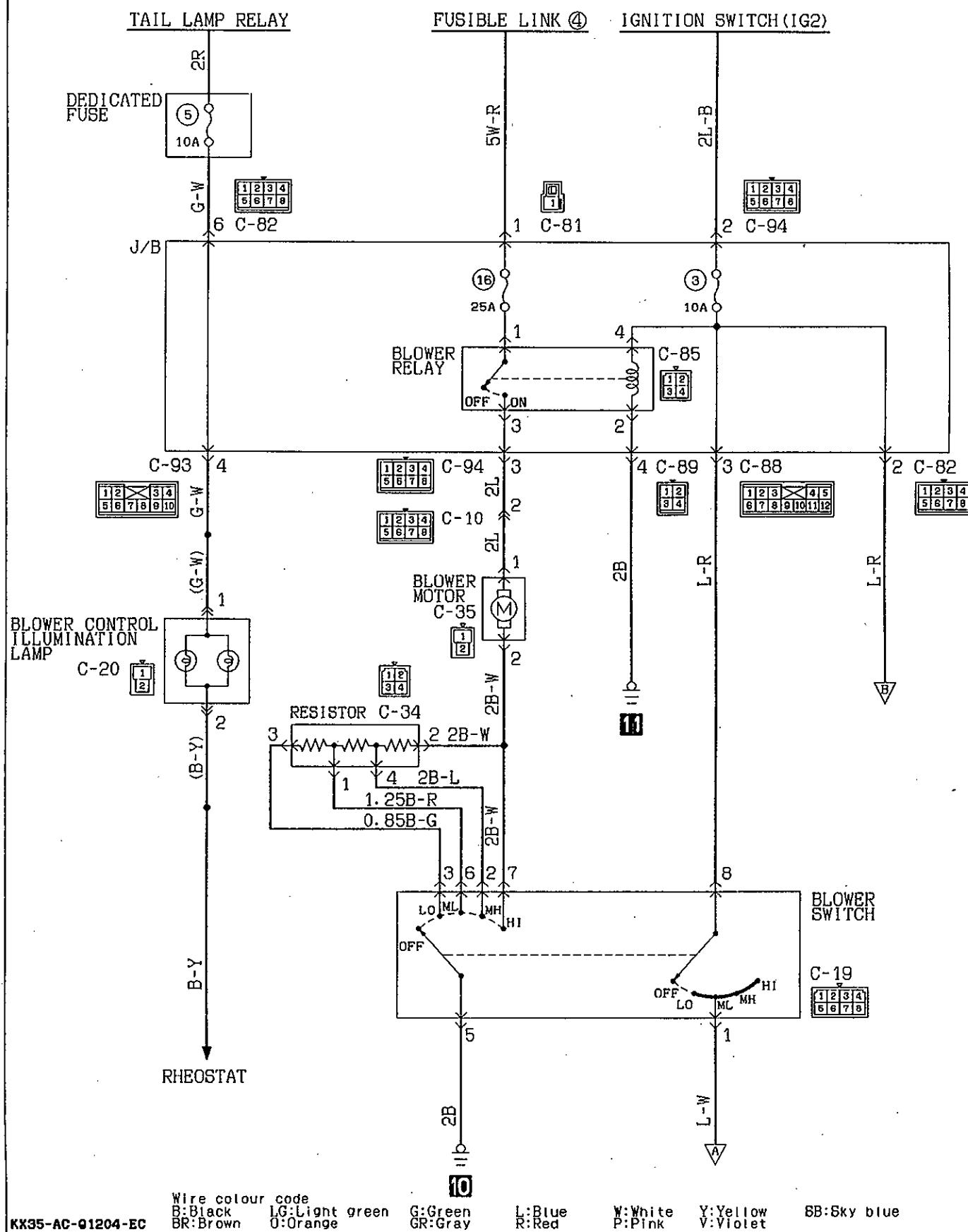
<Vehicles built up to October, 1993>

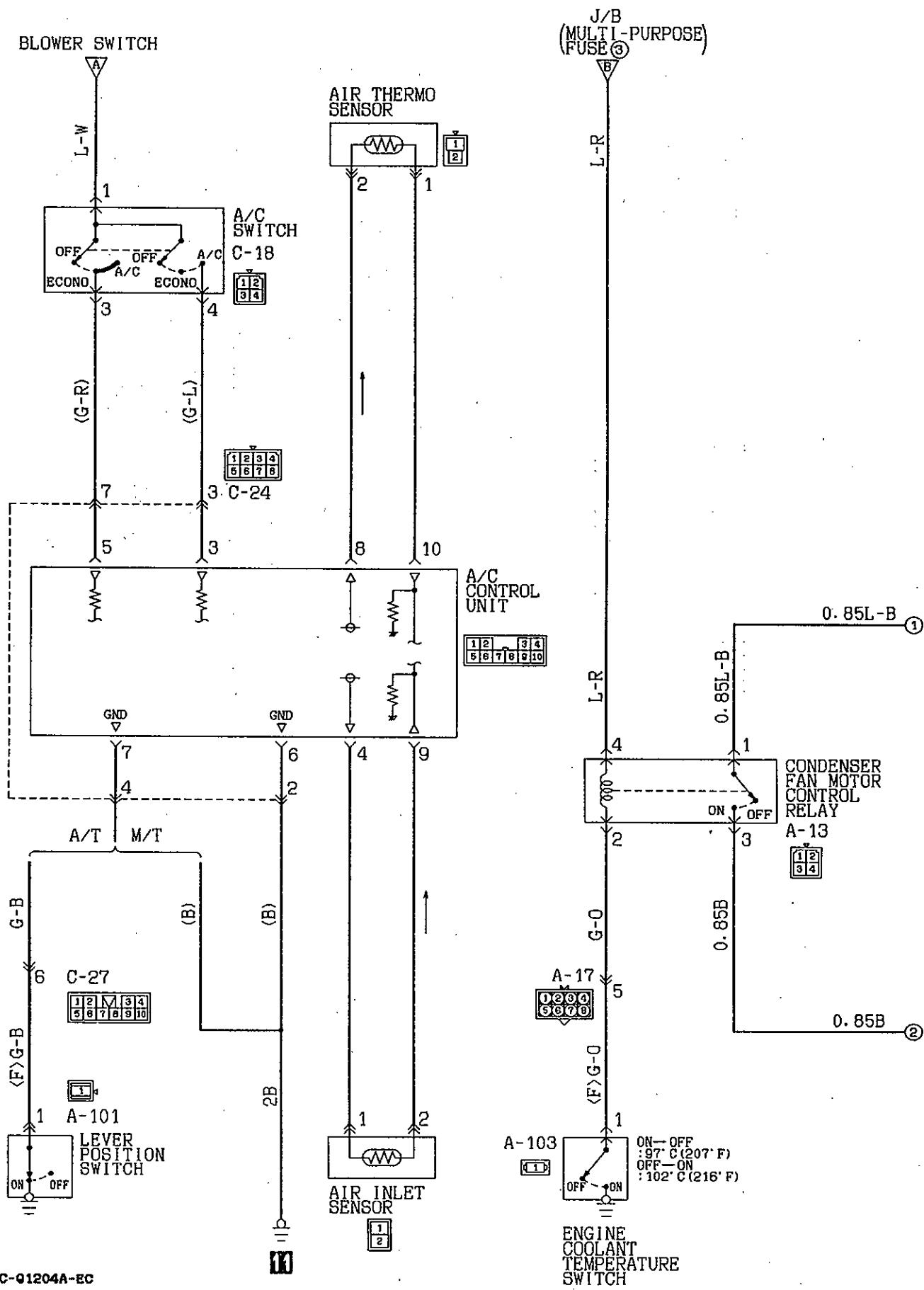
Petrol-powered vehicles

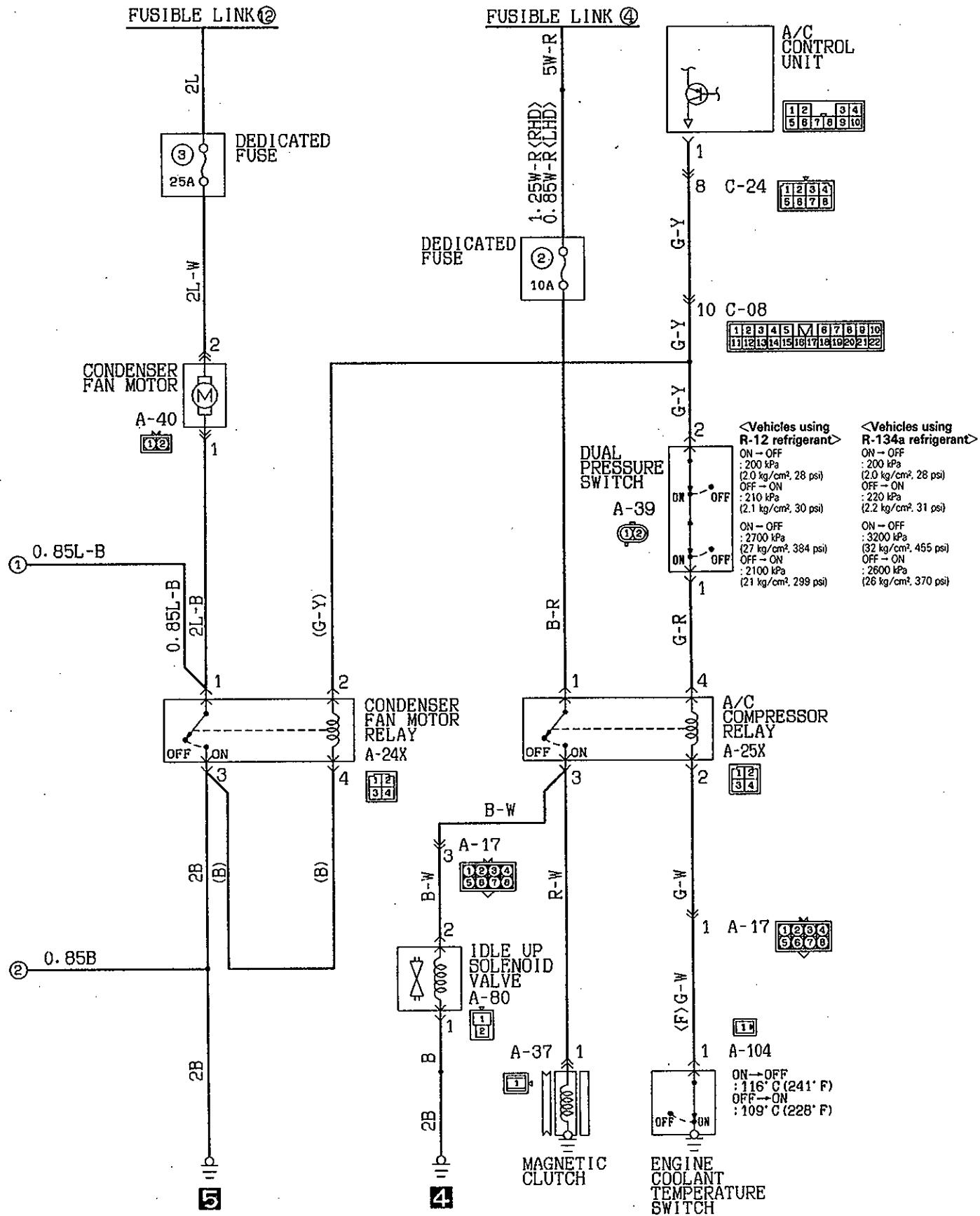




Diesel-powered vehicles







SINGLE AIR CONDITIONER

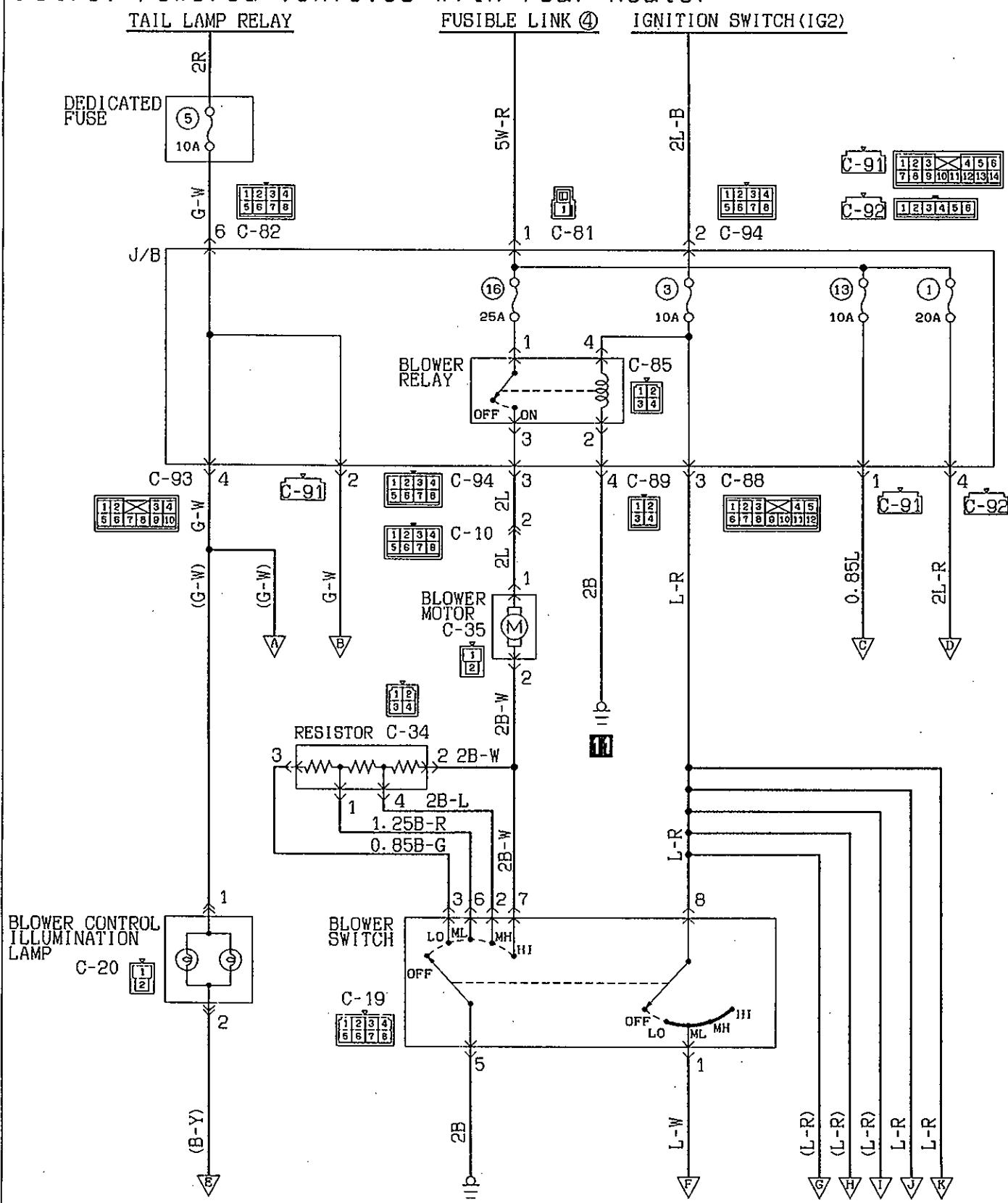
<Vehicles built from November, 1993>

Refer to "SINGLE AIR CONDITIONER" of '94 PAJERO Workshop Manual Electrical Wiring (Pub No. PHJE9026).

DUAL AIR CONDITIONER

<Vehicles built up to October, 1993>

Petrol-powered vehicles with rear heater



Wire colour code

B:Black

LG:Light green

G:Green

GR:Gray

L:Blue

R:Red

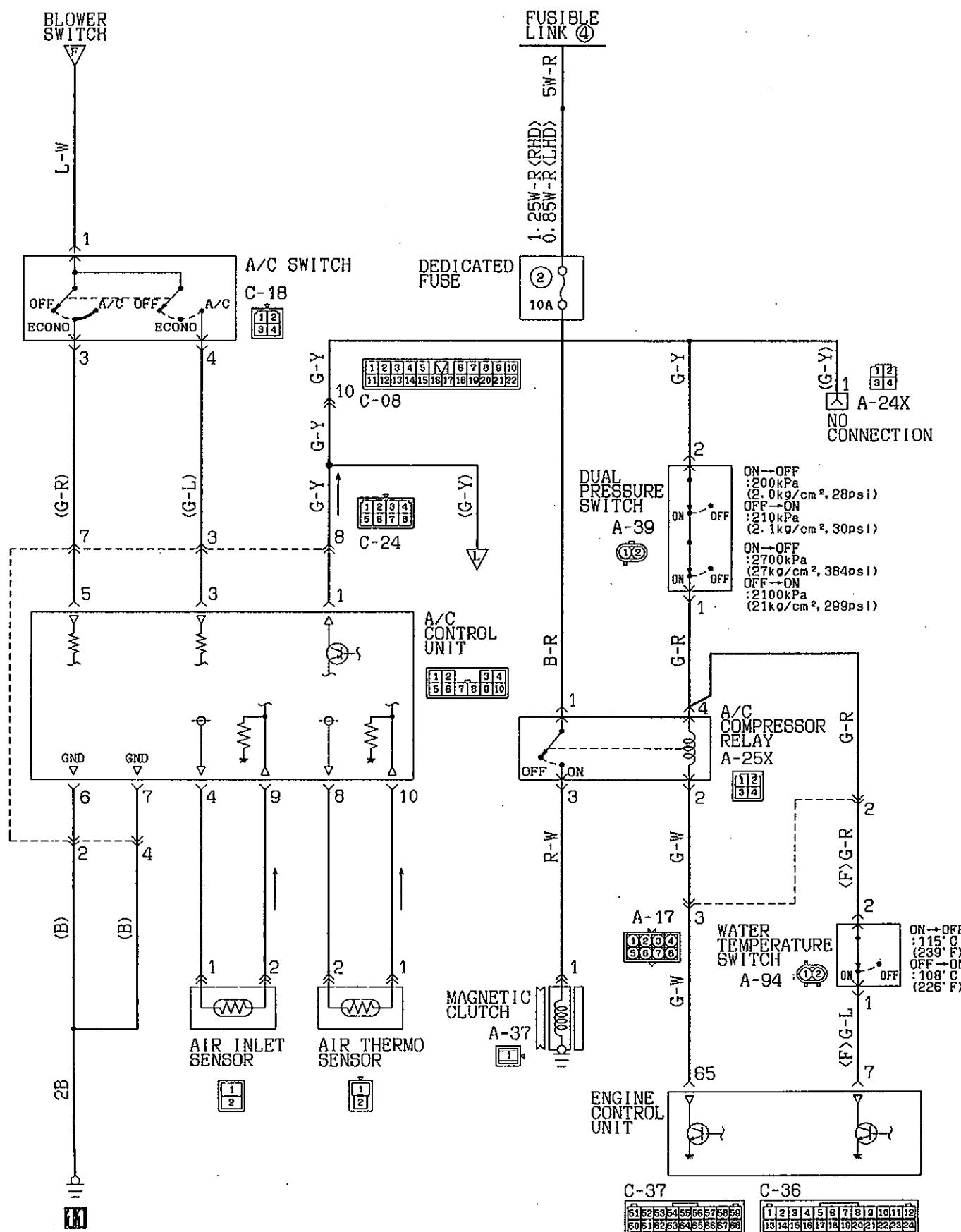
W:White

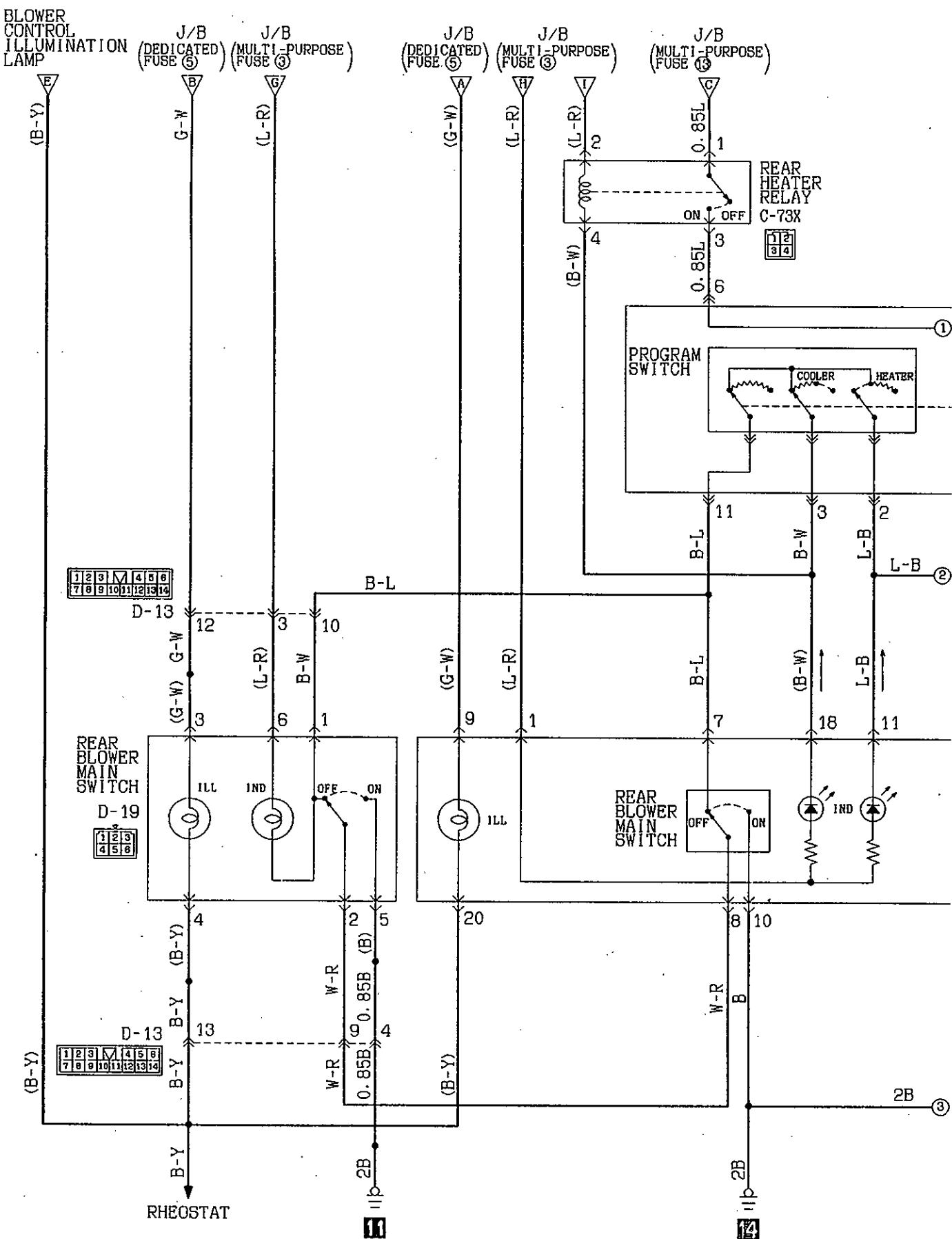
P:Pink

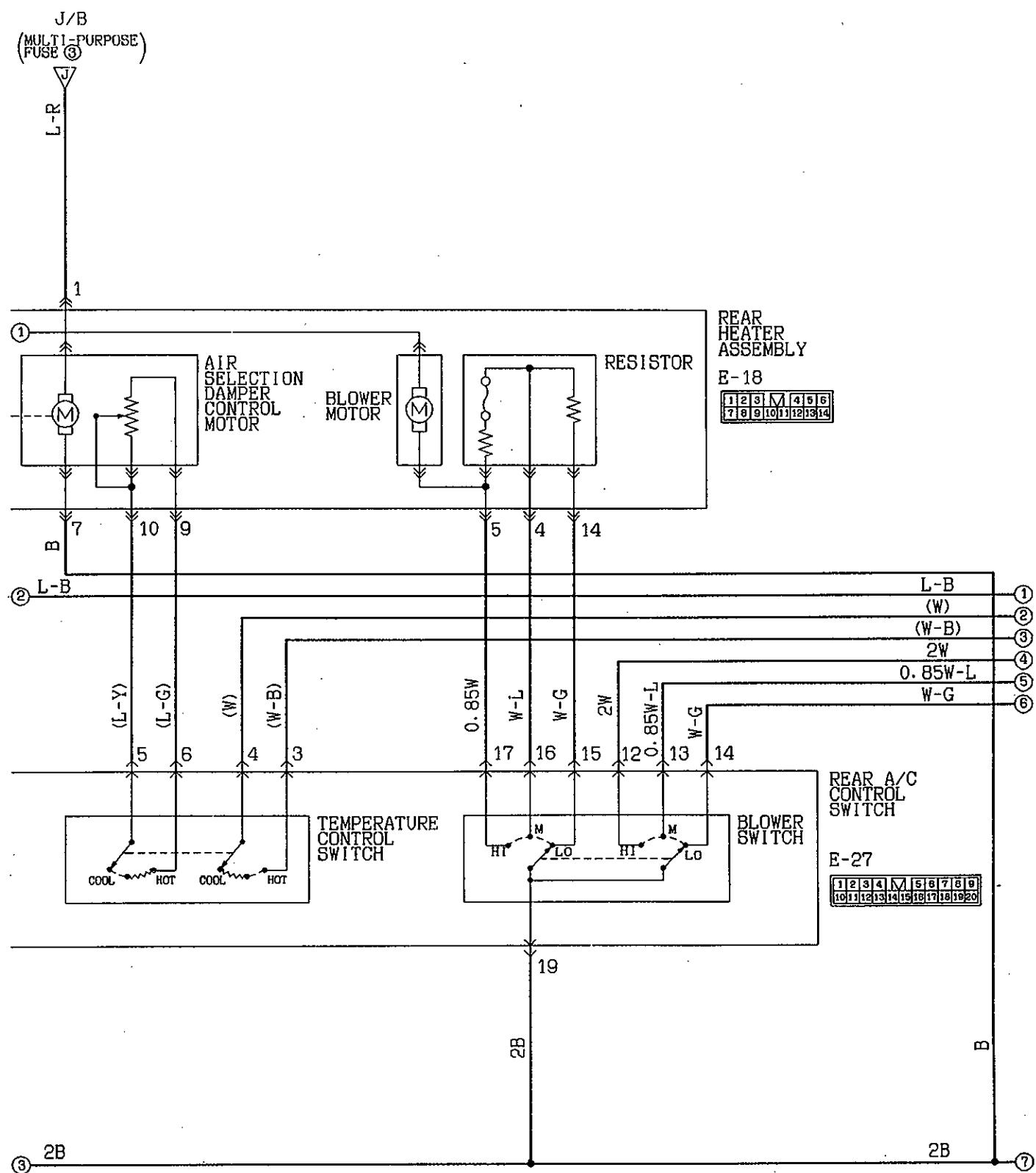
Y:Yellow

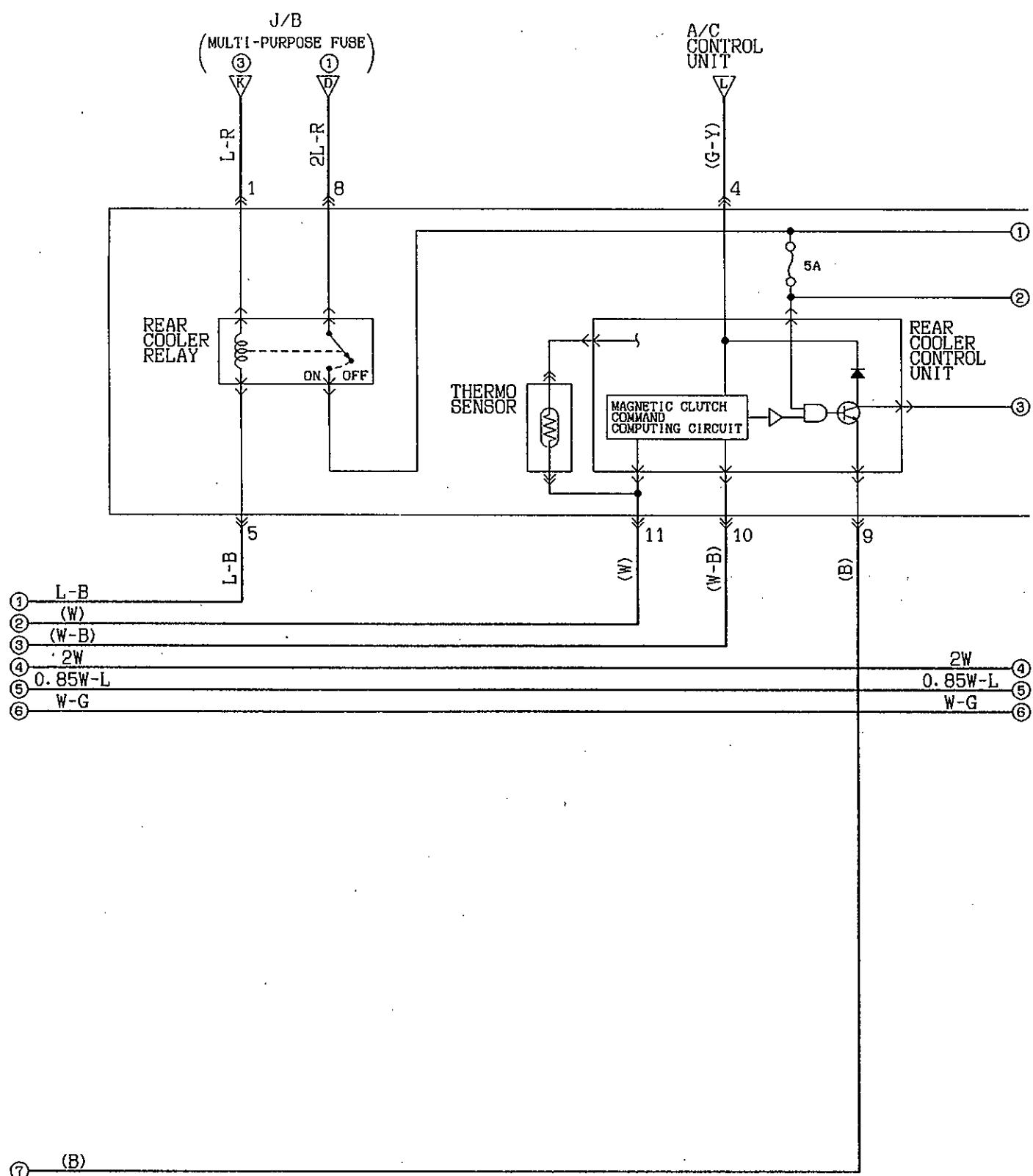
V:Violet

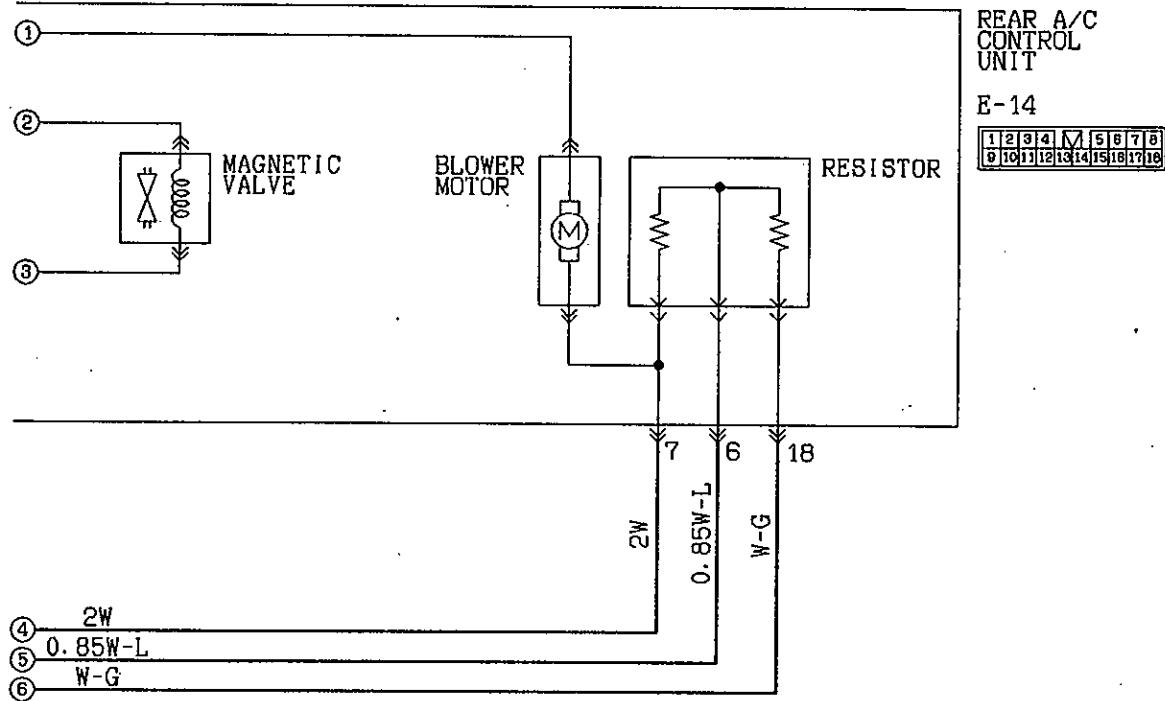
SB:Sky blue





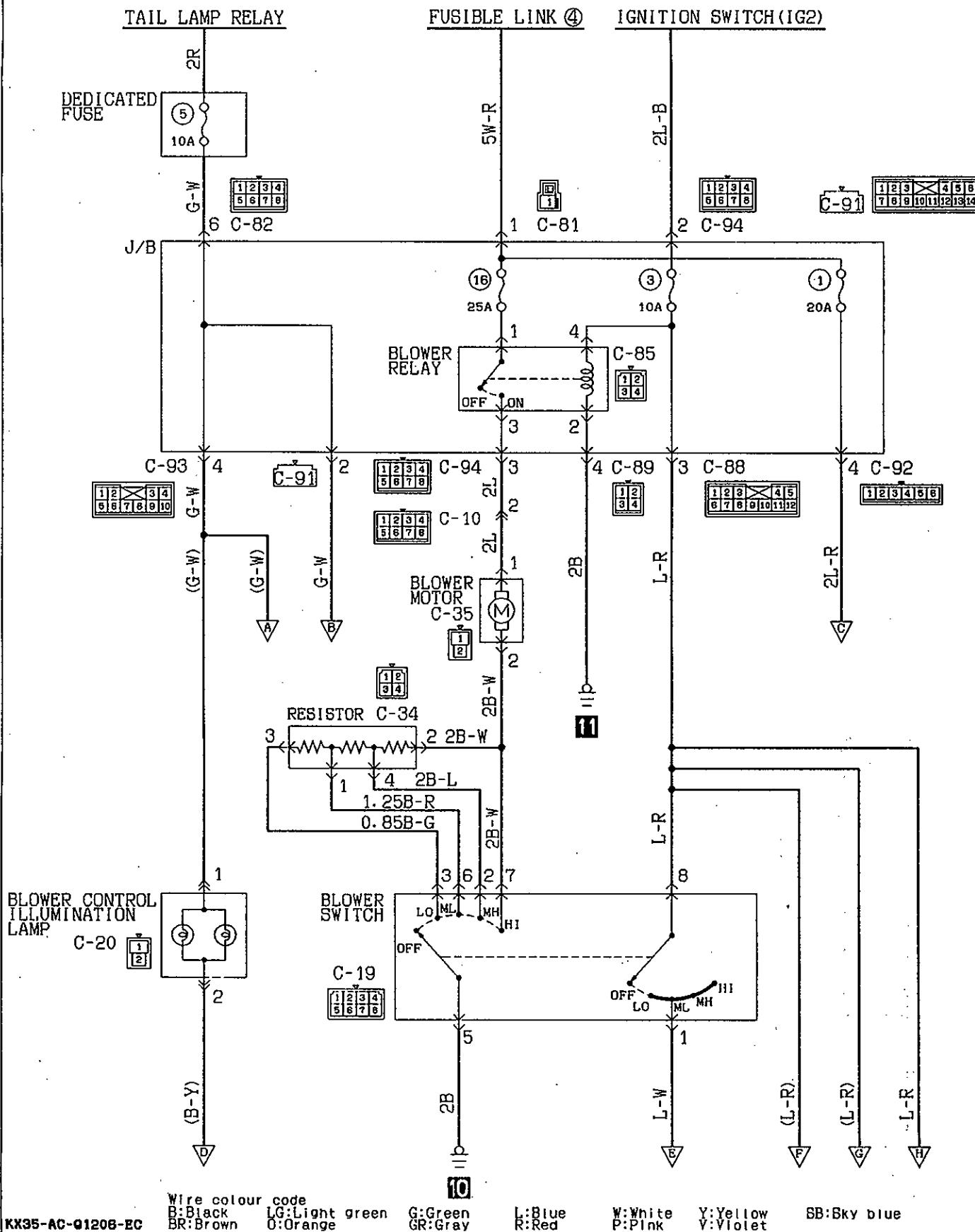






Wire colour code
 B:Black LG:Light green G:Green L:Blue W:White Y:Yellow SB:Sky blue
 BR:Brown O:Orange GR:Gray R:Red P:Pink V:Violet

Petrol-powered vehicles without rear heater



Wire colour code

White colour code
B:Black LG:Light
PP:Purple G:Green

BR:Brown O:Orange

BR:Brown O:Orange

green G:Green

GR:Gray

GR:Gray

L:Blue

R:Red

R:Red

W:White

P:Pink

P:Pink

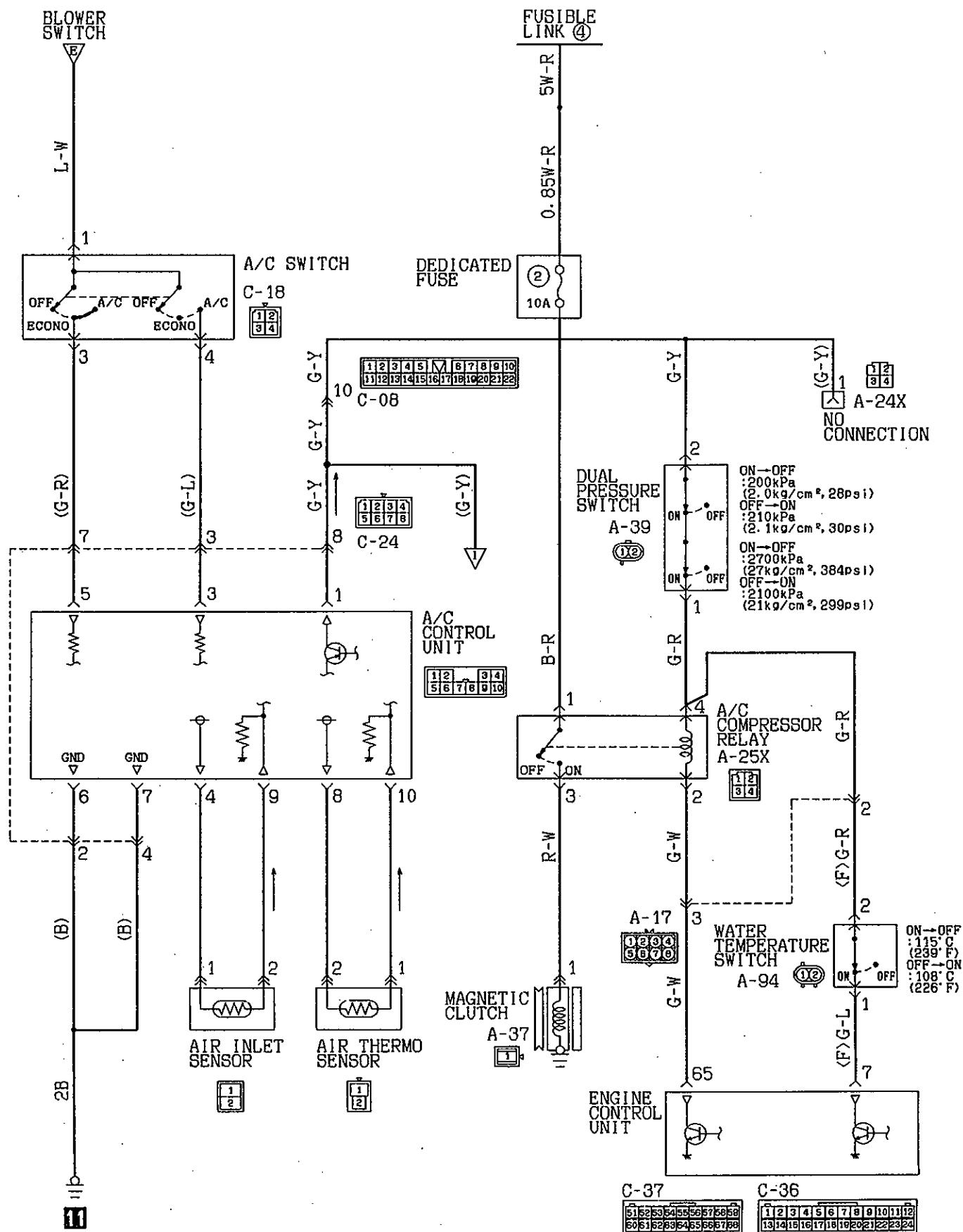
Y:Yellow

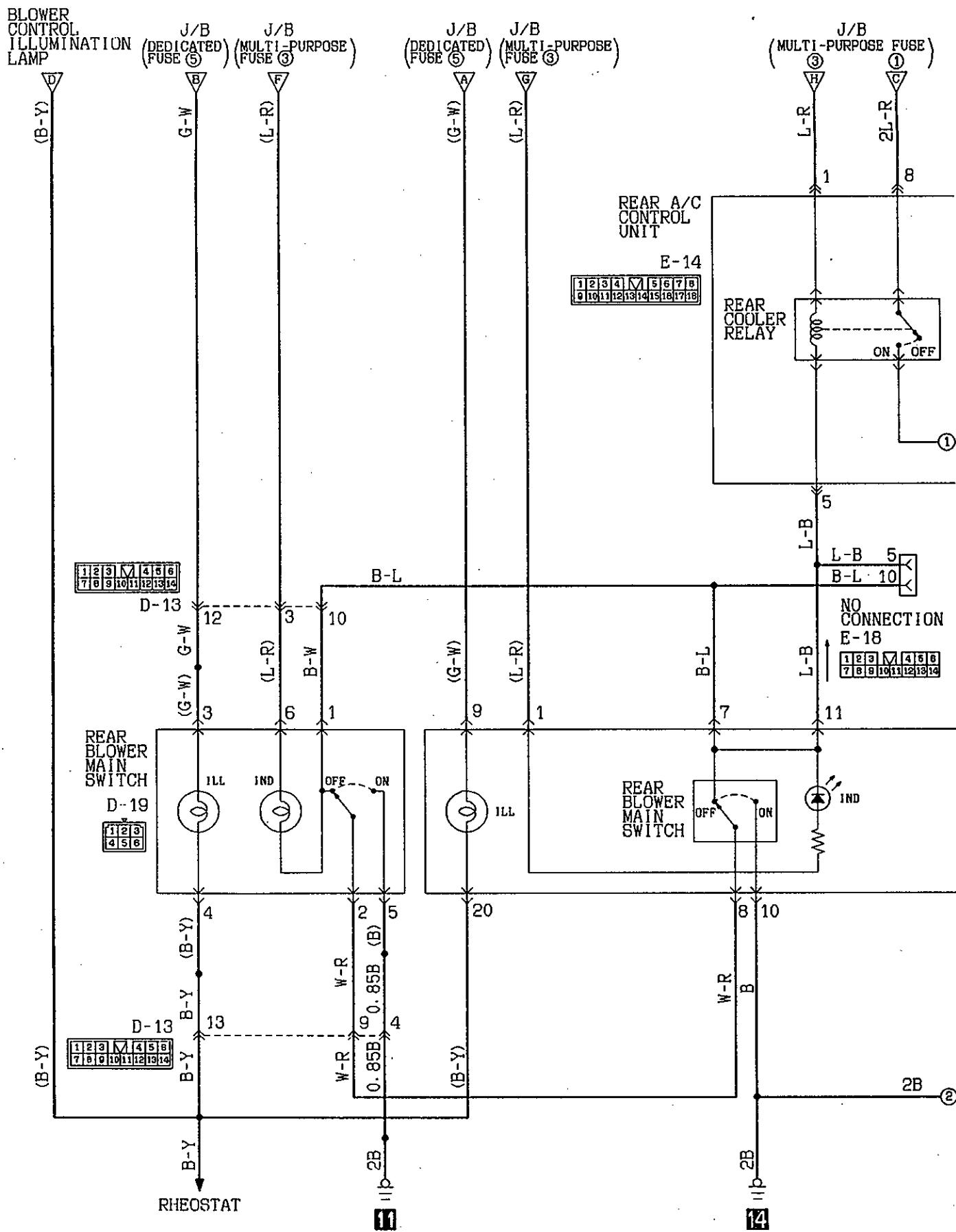
V:Violet

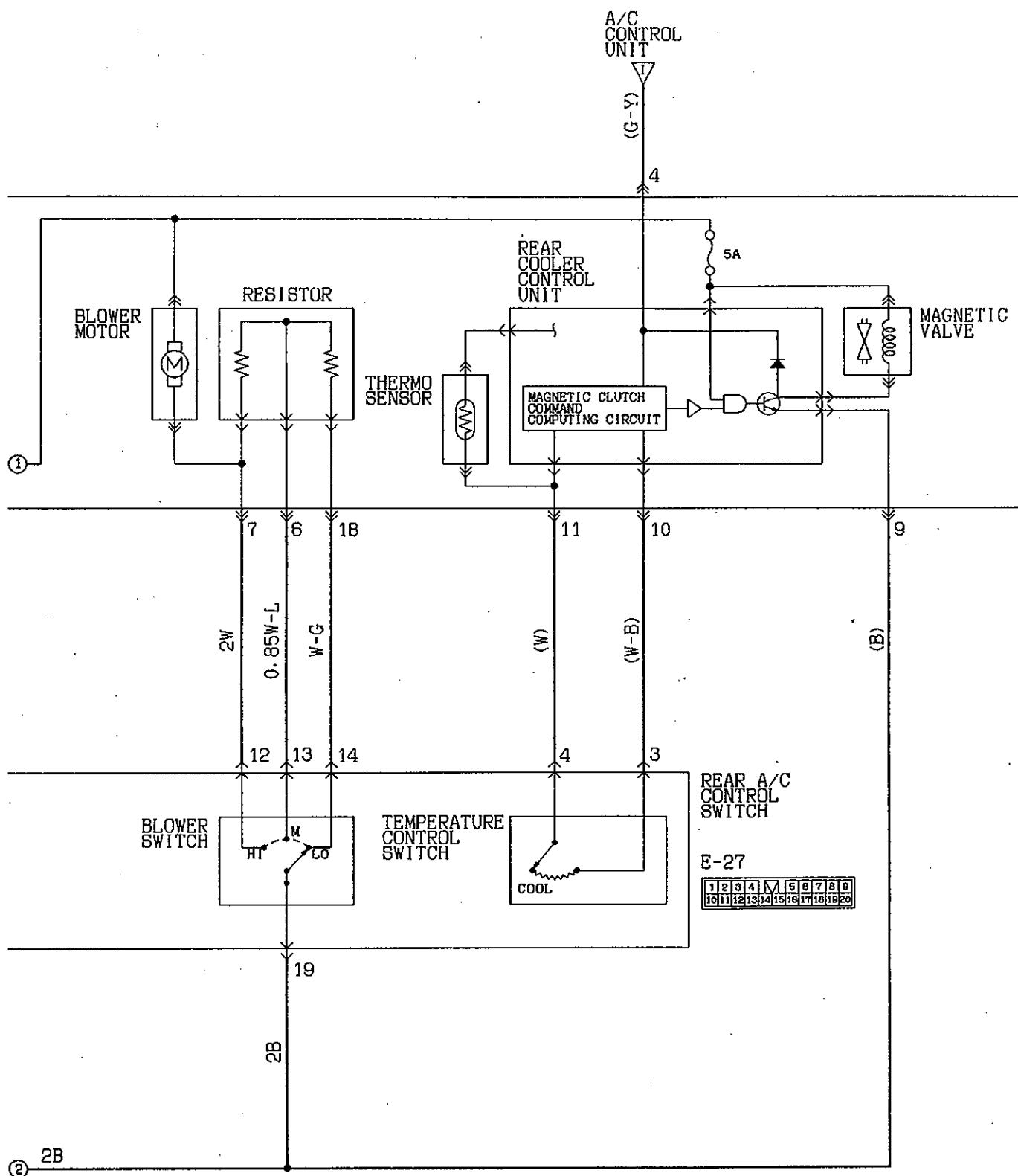
V:Violet

SB:Sky blue

BB-BR, 5140

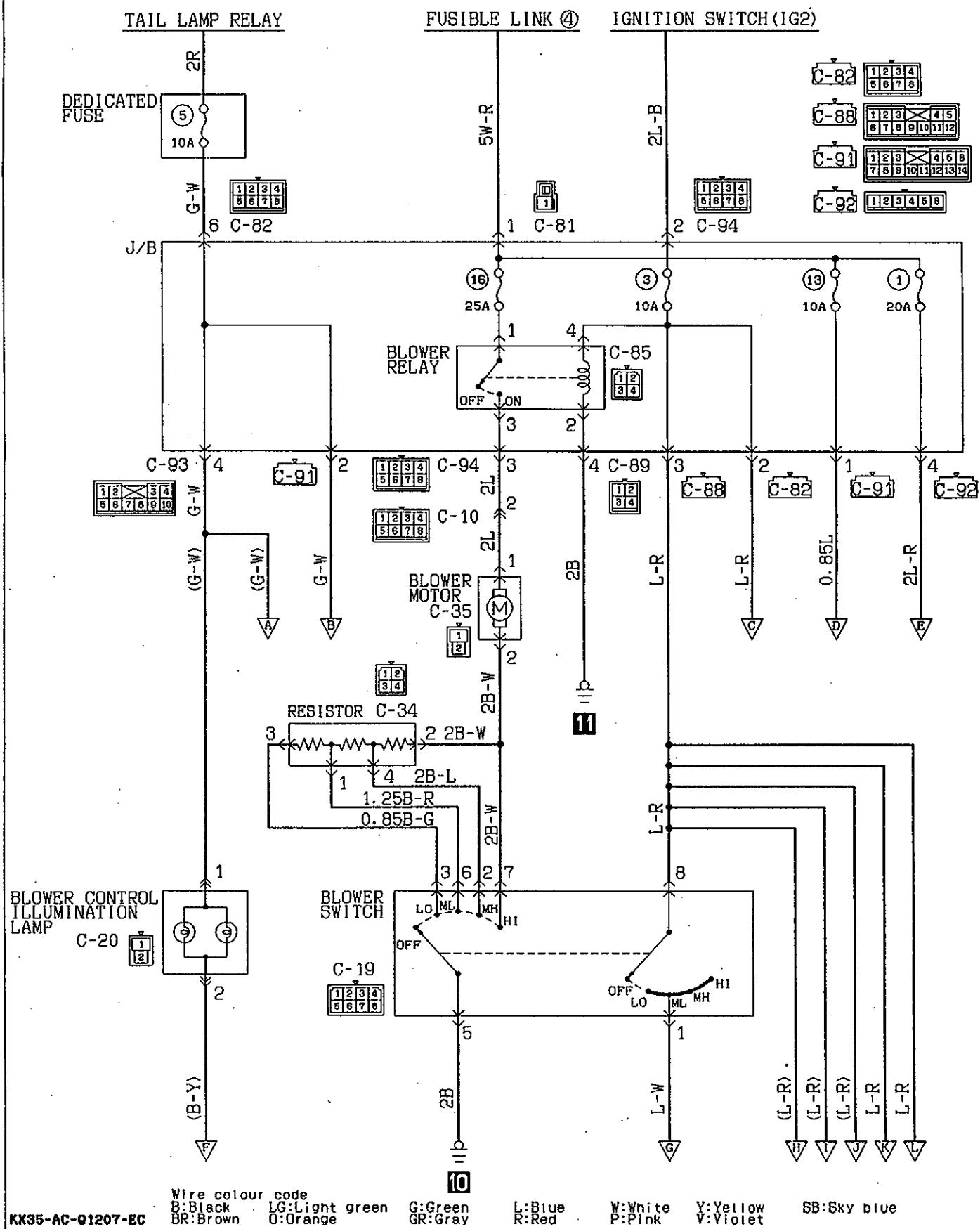


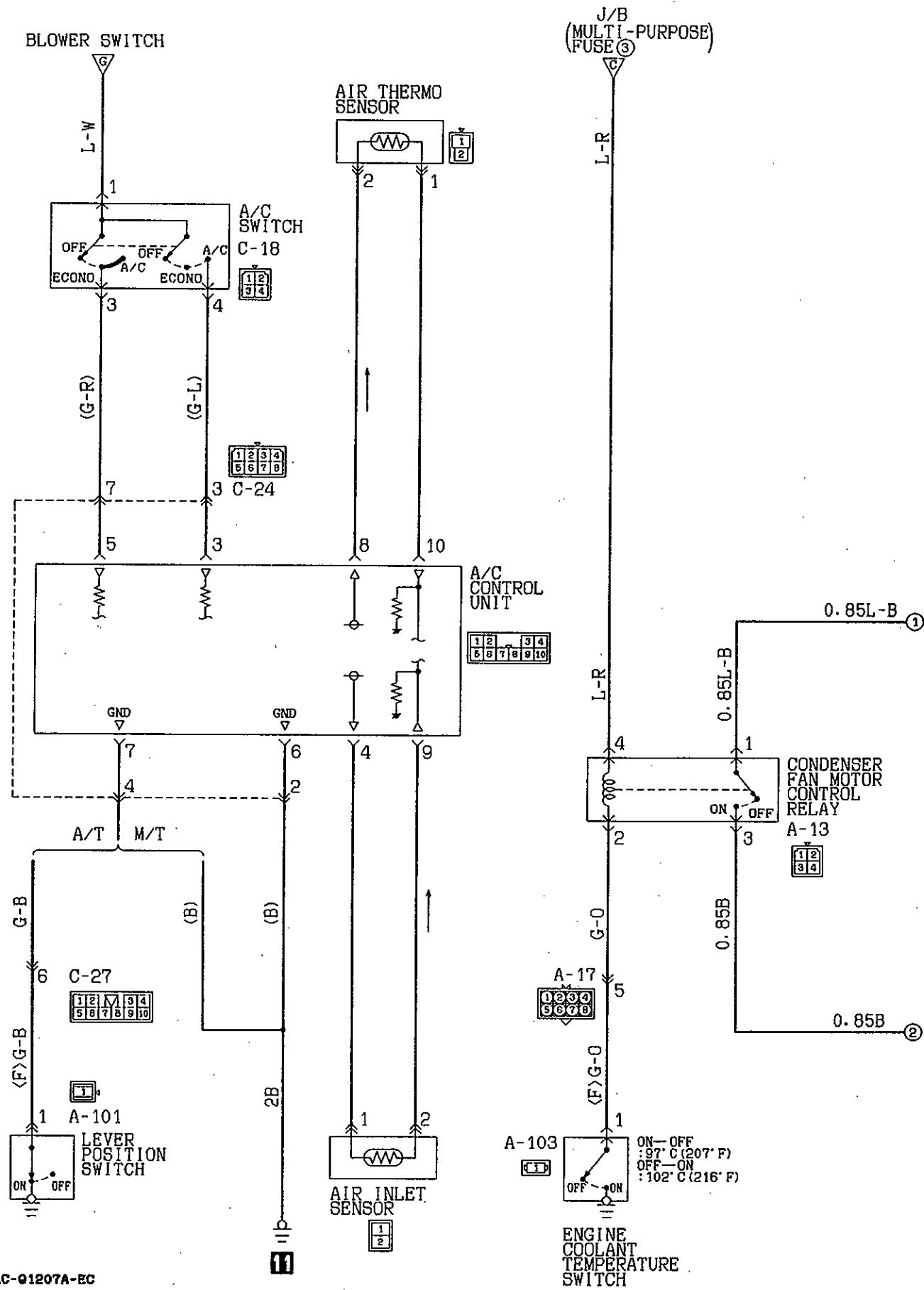


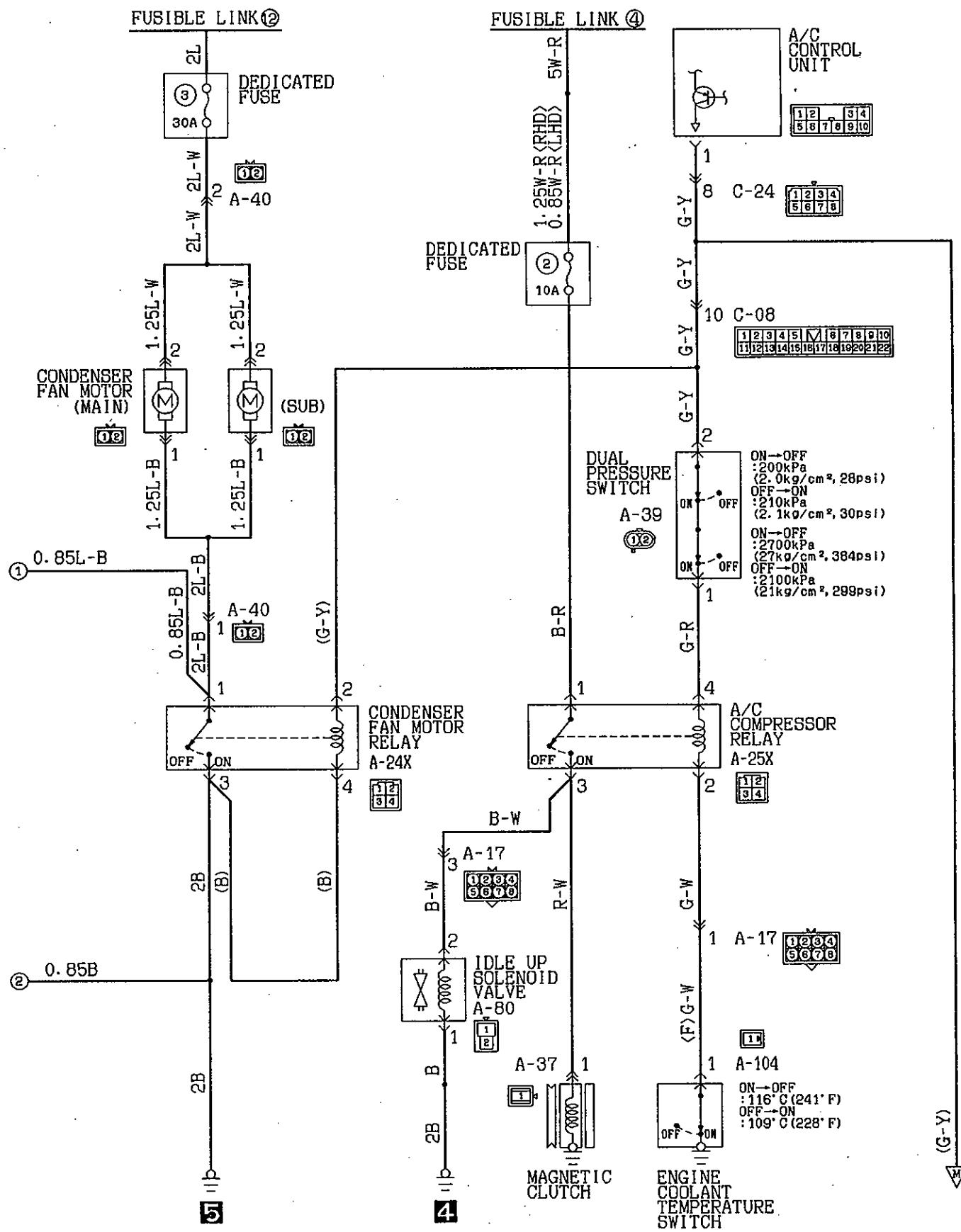


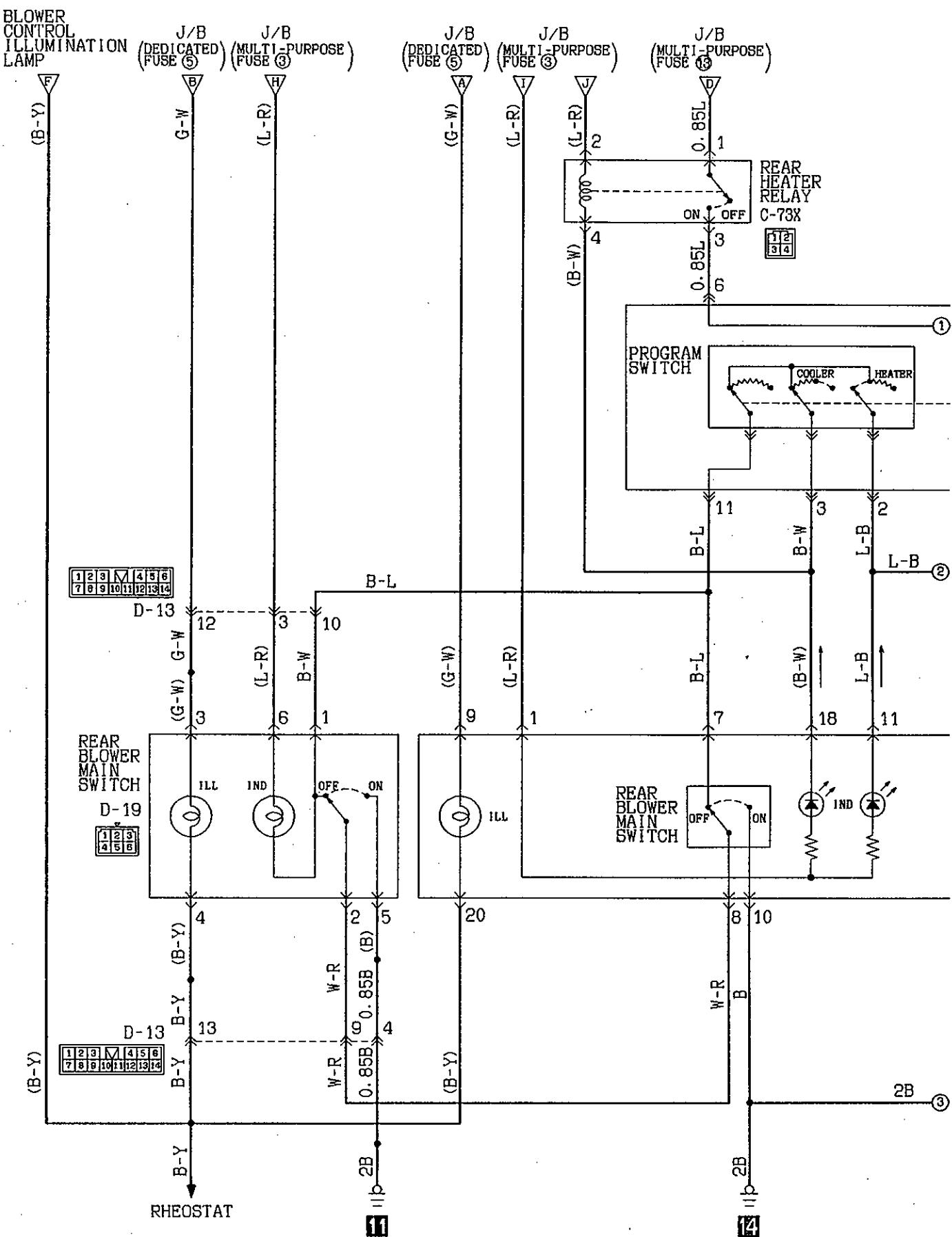
Wire colour code
 B:Black BR:Brown LG:Light green O:Orange G:Green GR:Gray L:Blue R:Red W:White P:Pink Y:Yellow V:Violet SB:Sky blue

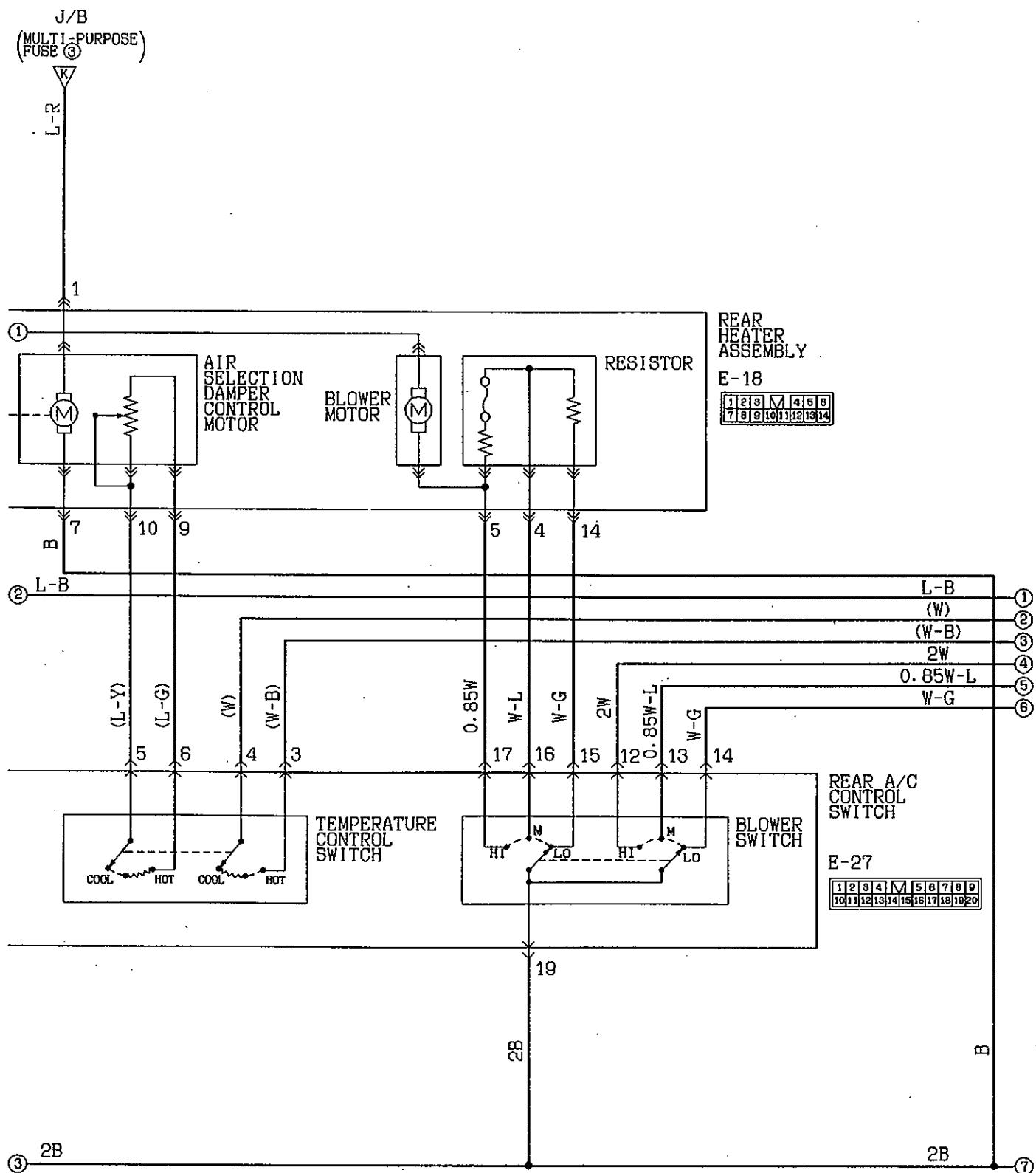
Diesel-powered vehicles with rear heater

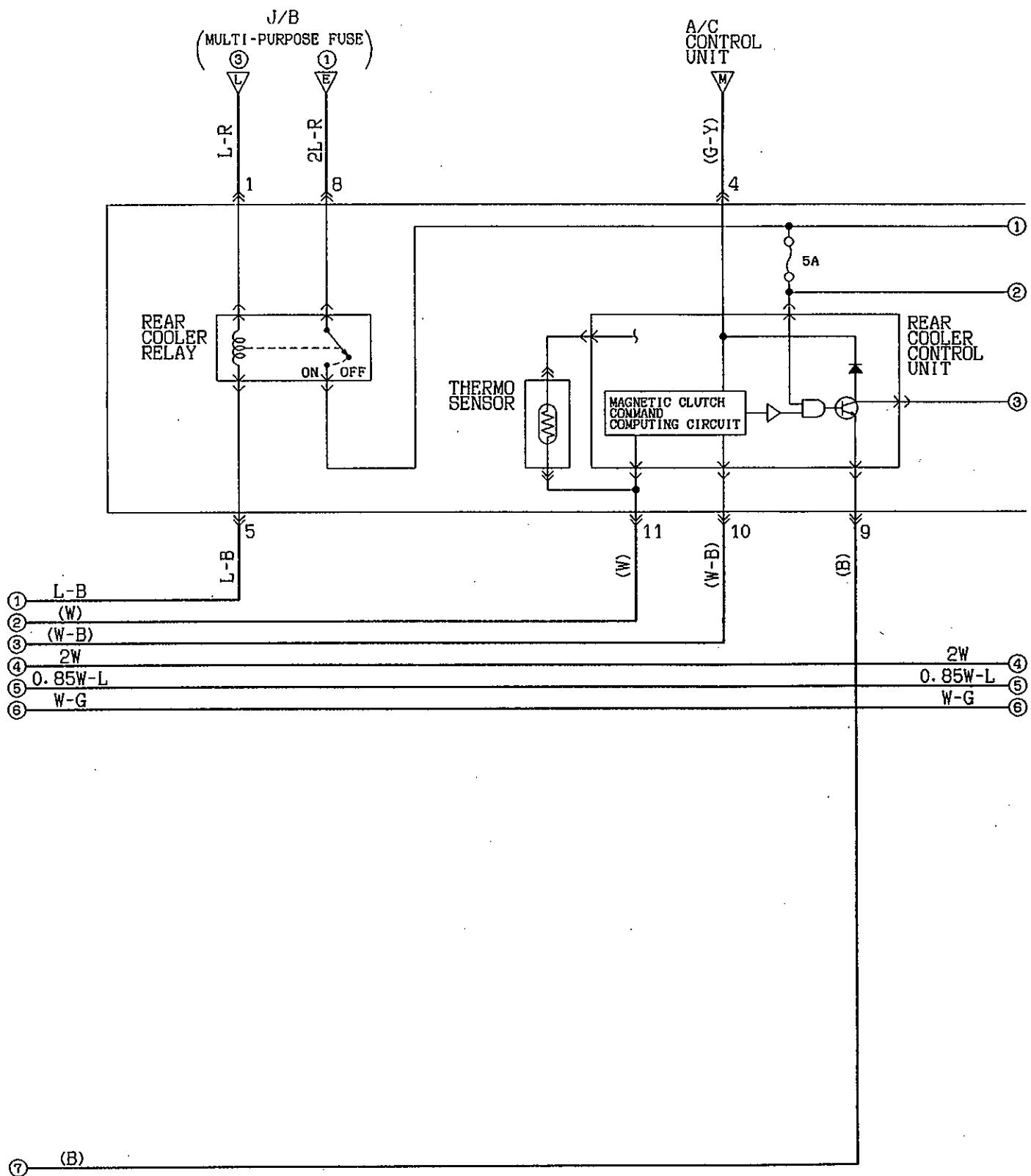


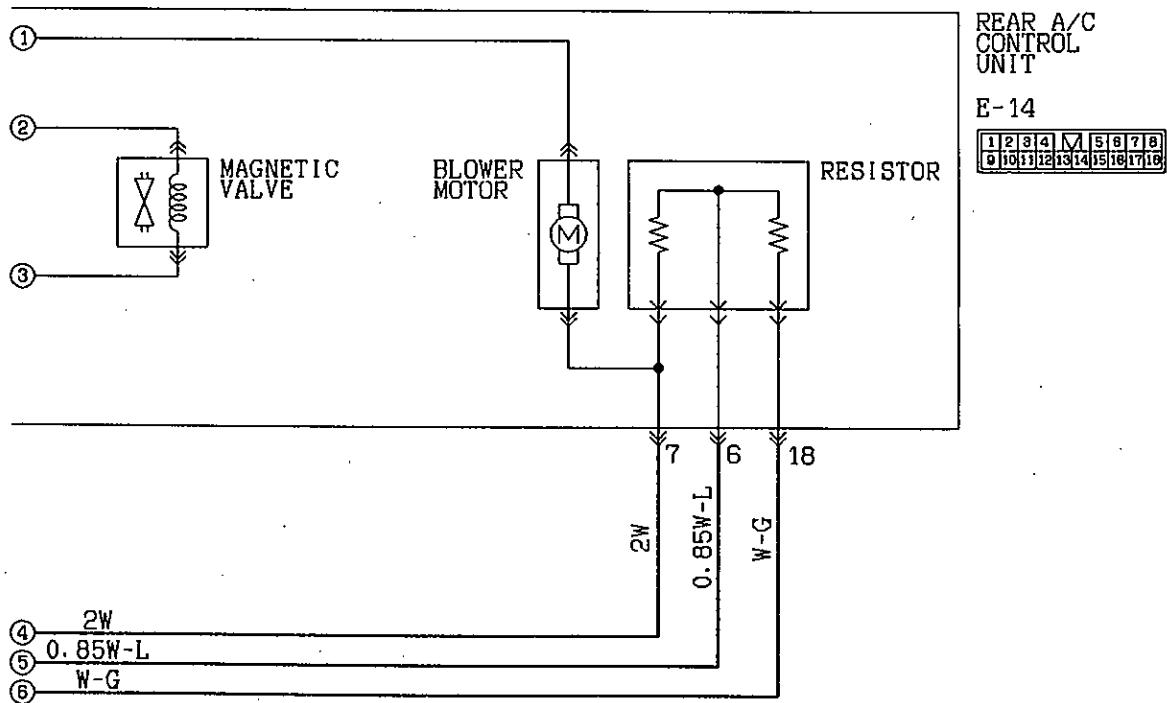












Wire colour code

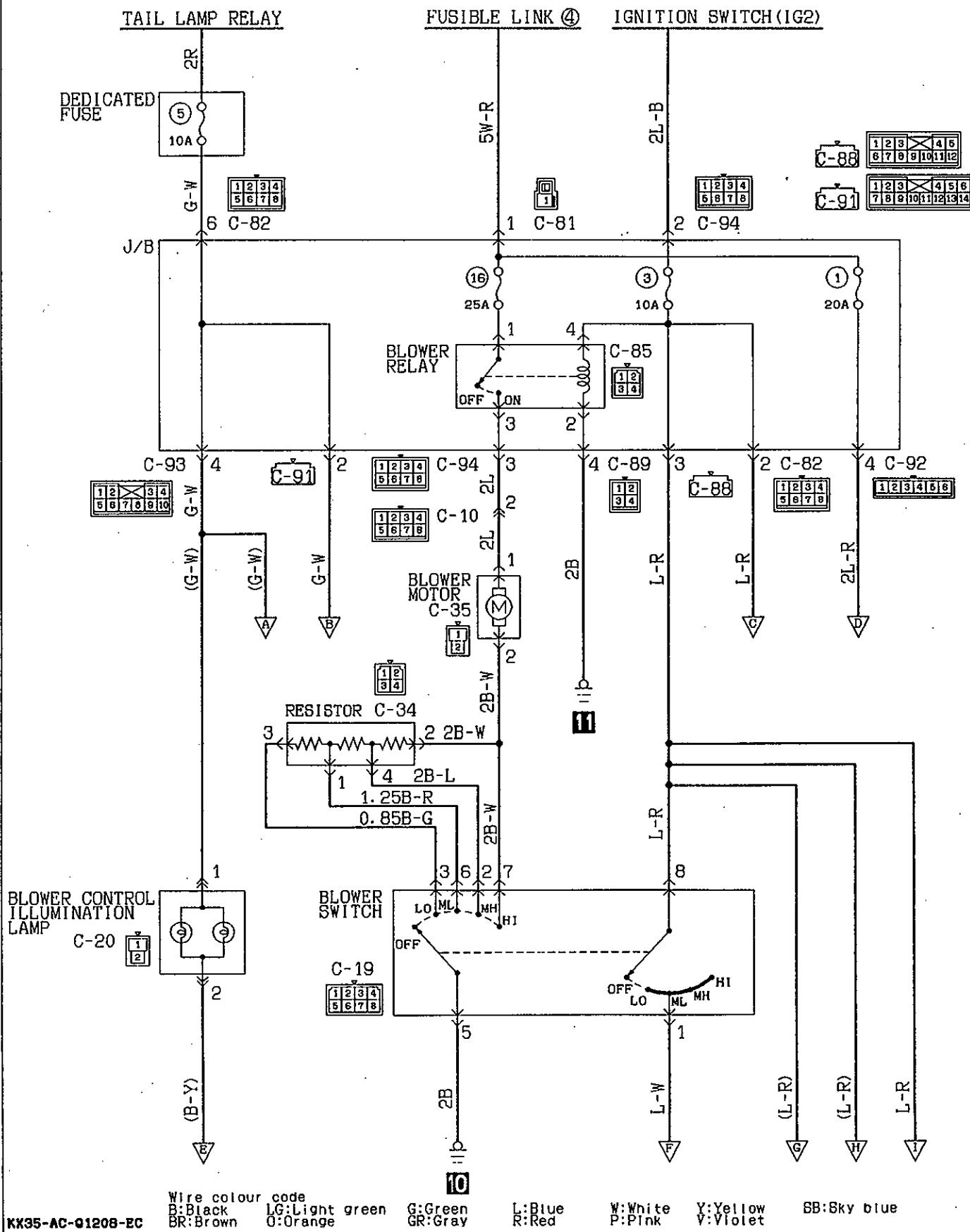
White colour code
B:Black LG:Light green G:Green
BR:Brown O:Orange GR:Gray

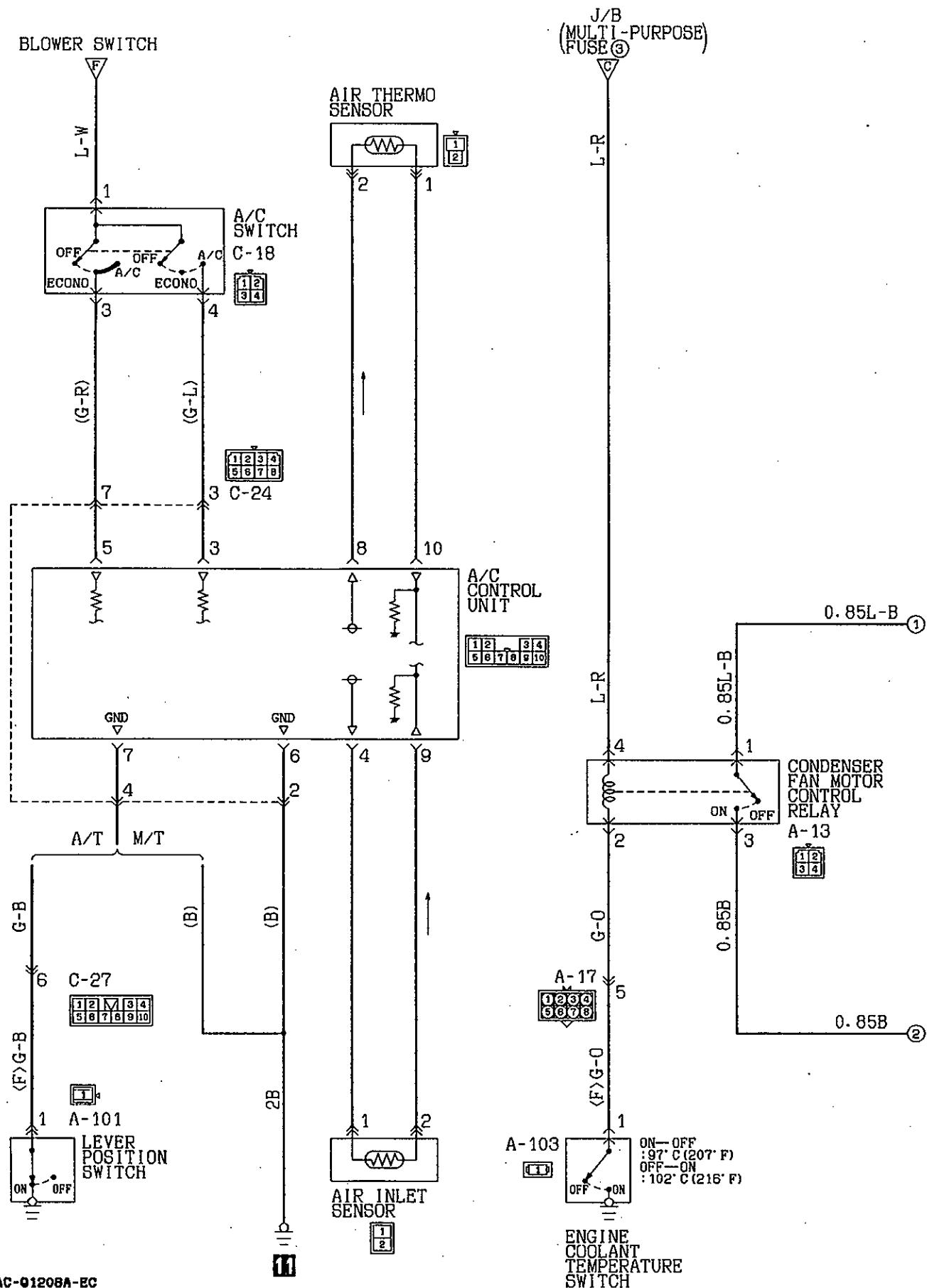
L:Blue
R:Red

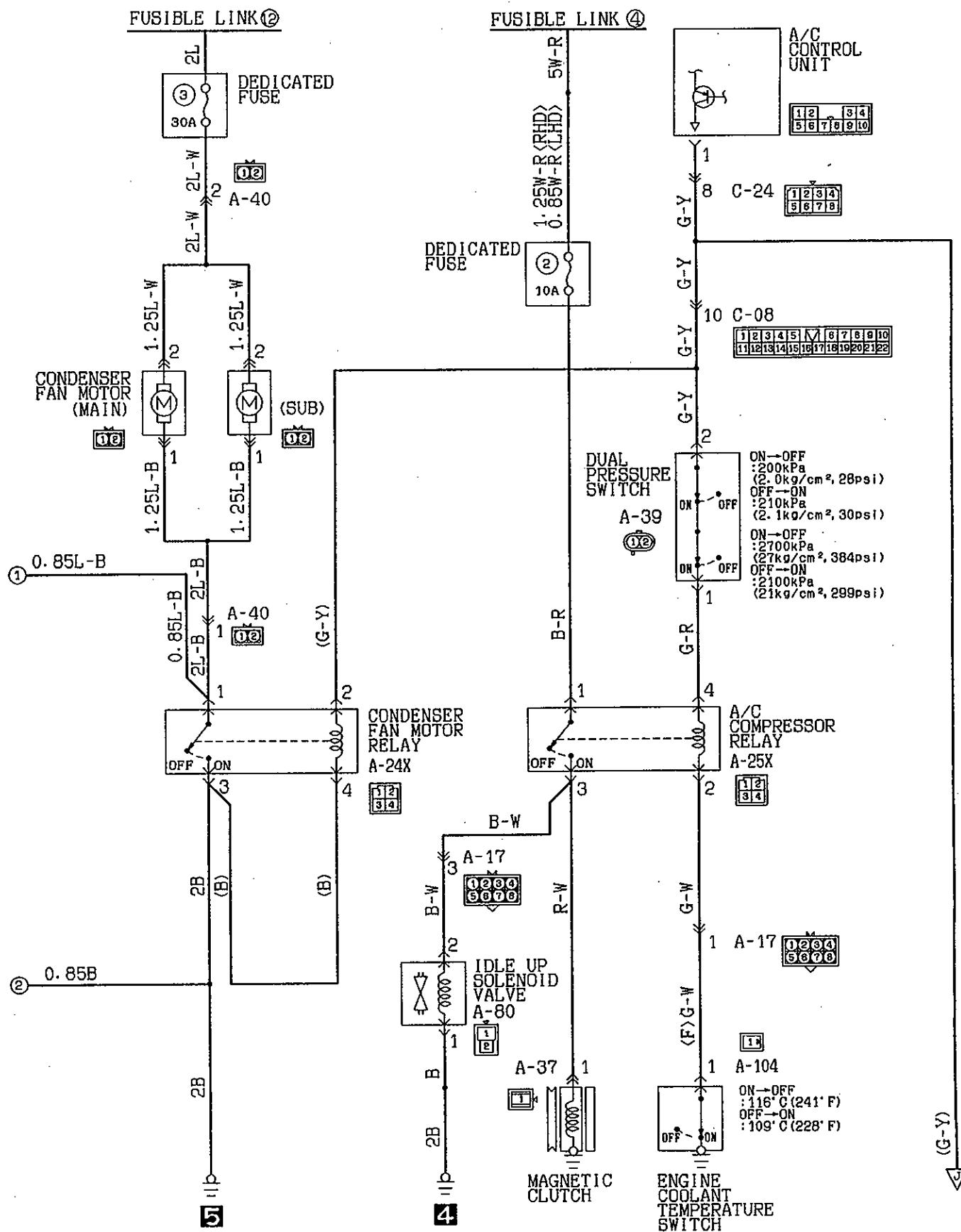
W:White Y:Yellow
P:Pink V:Violet

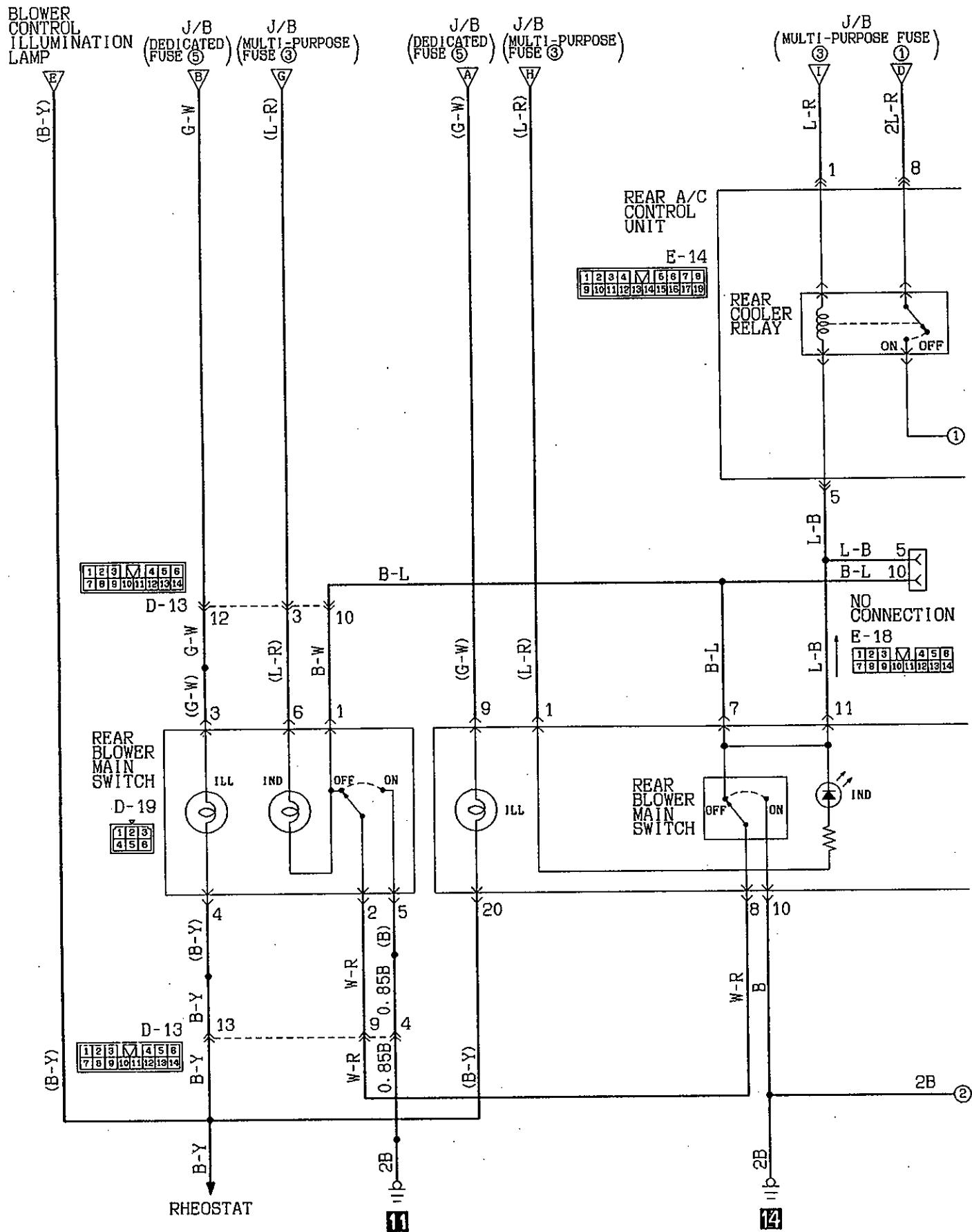
SB: Sky blue

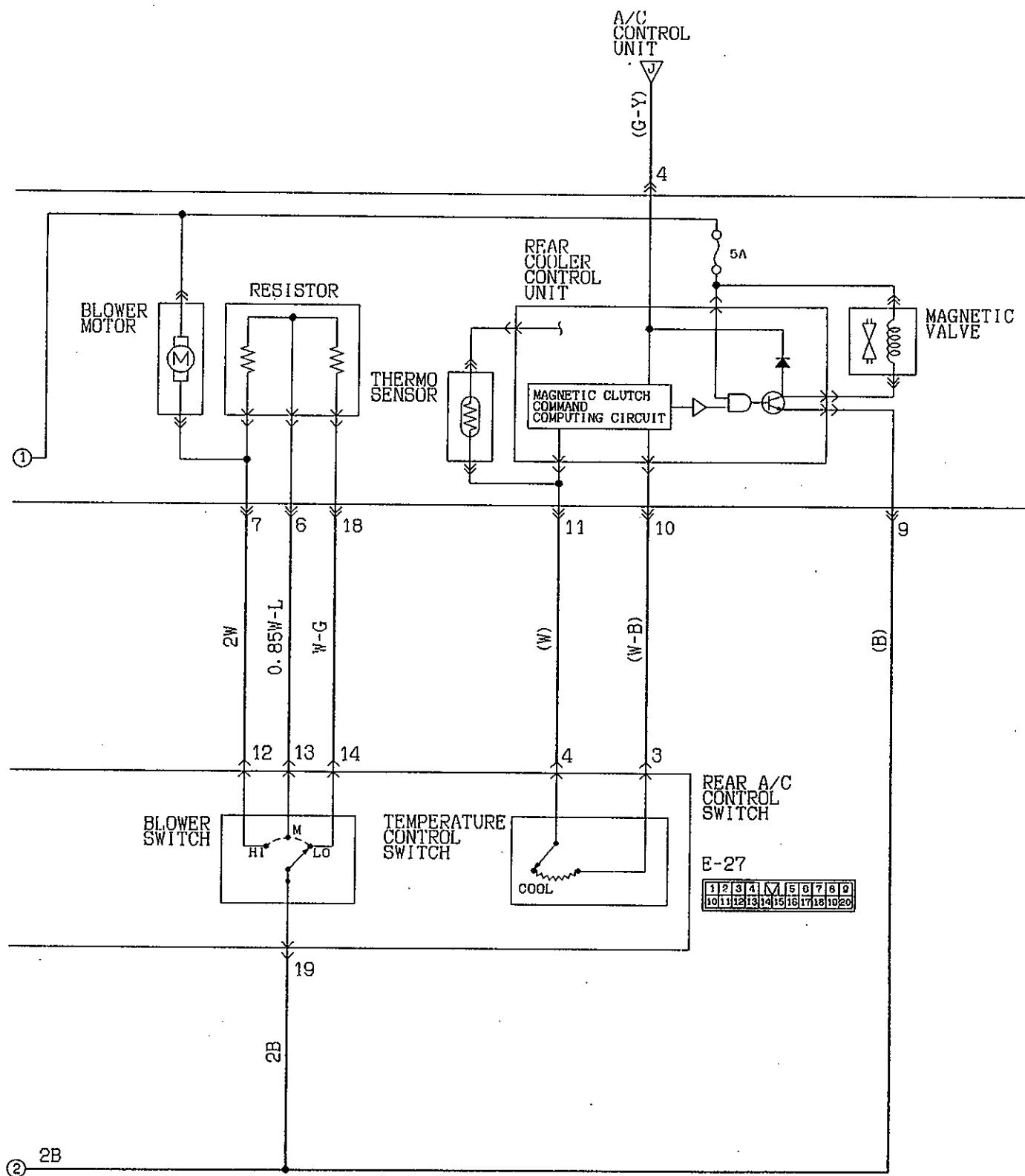
Diesel-powered vehicles without rear heater











Wire colour code
 B:Black
 BR:Brown

LG:Light green
 O:Orange

G:Green
 GR:Gray

L:Blue
 R:Red

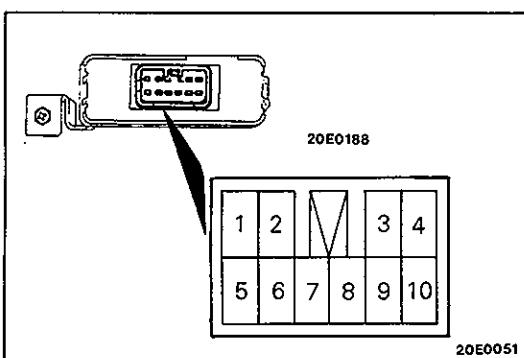
W:White
 P:Pink

Y:Yellow
 V:Violet

SB:Sky blue

DUAL AIR CONDITIONER**<Vehicles built from November, 1993>**

Refer to "DUAL AIR CONDITIONER" OF '94 PAJERO Workshop Manual Electrical Wiring (Pub No. PHJE 9026).



TROUBLESHOOTING HINTS

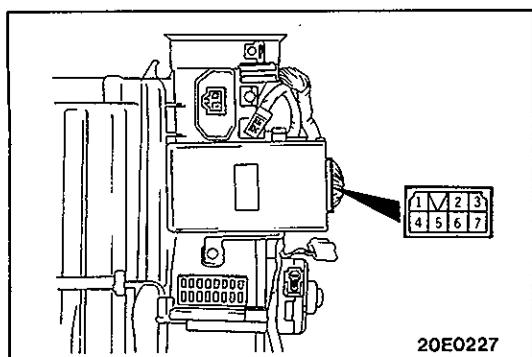
Inspection of Air Conditioner Control Unit

Disconnect the amplifier and inspect the connector on the wire harness side as shown in the chart below.

Test Conditions:

- (1) Ignition switch: ON
- (2) Air conditioner switch: ON
- (3) Temperature control lever: MAX. COOL
- (4) Blower switch: HI

Terminal No.	Signal	Conditions	Terminal voltage
1	Air conditioner output	When all conditions for switch-ON of the compressor are satisfied	System voltage
3	Air conditioner switch: A/C	Air conditioner switch A/C position	System voltage
4	Air-inlet sensor \oplus	Ignition switch, blower switch and air conditioner switch: ON	5.5 V
5	Air conditioner switch: ECONO or A/C	Air conditioner switch ECONO or A/C position	System voltage
6	Lever position switch	At all times	0 V
7	Air conditioner control unit ground	At all times	0 V
8	Air-thermo sensor \ominus	Between the terminals ⑧-⑩ [when the air temperature at the front evaporator outlet portion is 3°C (37°F)]	3.6 V
9	Air-inlet sensor \ominus	Between the terminals ④-⑨ [when the air temperature at the front evaporator inlet portion is 25°C (77°F)]	1.5 V
10	Air-thermo sensor \oplus	Ignition switch, blower switch and air conditioner switch: ON	5.5 V



Inspection of rear cooler amp.
<Vehicles with dual air conditioner>

Disconnect the amplifier and inspect the connector on the wire harness side as shown in the chart below.

Test Conditions:

- (1) Ignition switch: ON
- (2) Air conditioner switch: ON
- (3) Temperature control lever (front and rear): MAX. COOL
- (4) Blower switch (front and rear): HI

Terminal No.	Signal	Conditions	Terminal voltage
1	Air-thermo sensor \oplus	At all times	5.5 V
2	Magnetic valve	Compressor: ON	0 V
3	Rear blower switch	Rear blower switch: ON	System voltage
4	Rear heater control assembly	Between the terminals ④–⑤ [when the air temperature at the rear evaporator outlet portion is 3°C (37°F)]	1.9 V
5	Air-thermo sensor \ominus	At all times	0 V
6	Front air conditioner switch	Front air conditioner switch: ON	System voltage
7	GND	At all times	0 V

SAFETY PRECAUTIONS

<Vehicles using R-12 refrigerant>

R-12 refrigerant is a chlorofluoro-carbon (CFC) that can contribute to the depletion of the ozone layer in the upper atmosphere.

Ozone filters out harmful radiation from the sun. To assist in protecting the ozone layer, Mitsubishi Motors Corporation recommends that a R-12 refrigerant recycling device that meets SAE standard J1991 be used.

Contact an automotive service equipment supplier for refrigerant recycling equipment that is available in your area.

The refrigerant used in all air conditioner is R-12. It is transparent and colourless in both liquid and vapour state. Since it has a boiling point of -29.8°C (-21.7°F), at atmospheric pressure, it will be a vapour at all normal temperatures and pressures. The vapour is heavier than air, nonflammable, and nonexplosive. It is nonpoisonous except when it is in direct contact with open flame. It is noncorrosive except when combined with water. The following precautions must be observed when handling R-12.

Caution

Wear safety goggles when servicing the refrigeration system.

R-12 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. Should any liquid refrigerant get into the eyes, use a few drops of mineral oil to wash them out. R-12 is rapidly absorbed by the oil. Next, splash the eyes with plenty of cool water. Call your doctor immediately even though irritation has ceased after treatment.

Caution

Do not heat R-12 above 40°C (104°F).

In most instances, moderate heat is required to bring the pressure of the refrigerant 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 would raise temperature and pressure above this temperature. Do not weld or steam clean on or near the system components or refrigerant lines.

Caution

Keep R-12 containers upright when charging the system.

When adding R-12 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

Always work in a well-ventilated room.

Good ventilation is vital in the working area. Although R-12 vapour is normally nonpoisonous, contact with an open flame can cause the vapour to become very poisonous.

A poisonous gas is produced when using the flame-type leak detector. Avoid inhaling the fumes from the leak detector.

Caution

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.

<Vehicles using R-134a refrigerant>

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 Corporation 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 vapour at all normal temperatures and pressures. The vapor is heavier than air, non-flammable, 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 A/C system. Keep a bottle of sterile mineral oil handy when working on the refrigeration system. Should any liquid refrigerant get into the eyes, use a few drops of mineral oil to wash them out. R-134a is rapidly absorbed by the oil. Next splash the eyes with plenty of cool water. Call your doctor immediately even though 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 would raise 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.

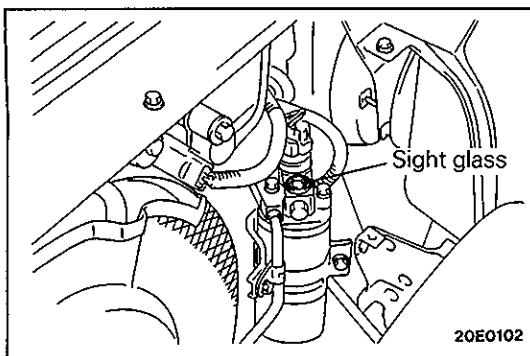
When adding R-134a into the refrigeration system keep the supply tank or cans in an upright position. If the refrigerant container is on its side or upside down, liquid refrigerant will enter the system and damage the compressor.

Caution

- 1. A leak detector for designed 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.

NOTES



SERVICE ADJUSTMENT PROCEDURES

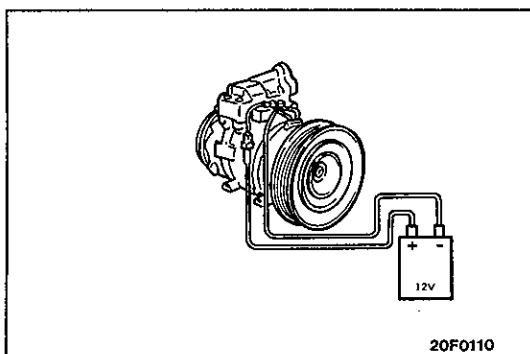
TEST PROCEDURES

E55FABC

SIGHT GLASS REFRIGERANT LEVEL TEST

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 conditioner 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 most of its refrigerant charge.
- (3) If the sight glass shows foam or bubbles, the system could be low on charge. The system has to be tested, leak checked then recharged with refrigerant.



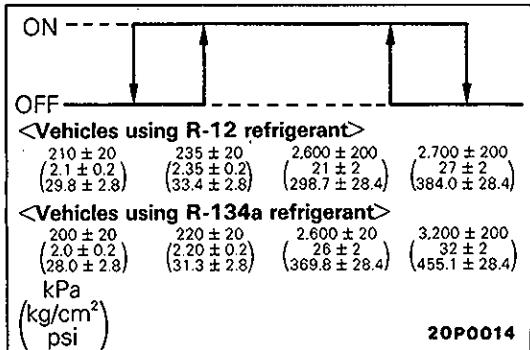
MAGNETIC CLUTCH

- (1) Disconnect the wiring from the magnetic clutch.
- (2) Connect battery (–) to compressor body.
- (3) Connect battery (+) voltage directly to wiring for the magnetic clutch.
- (4) 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

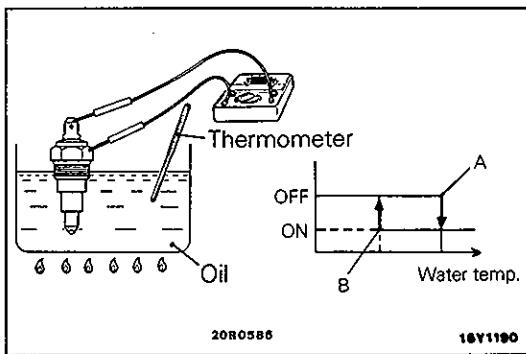
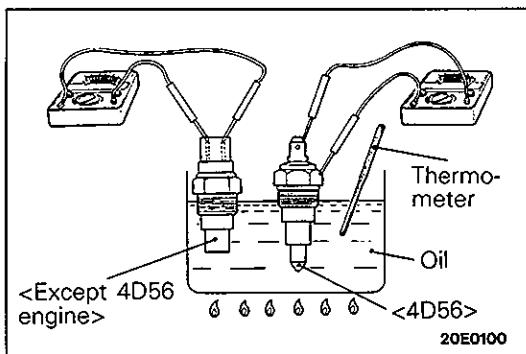
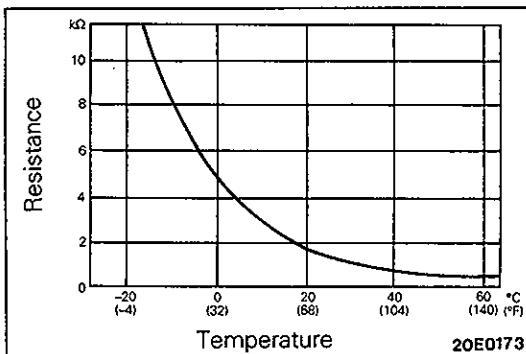
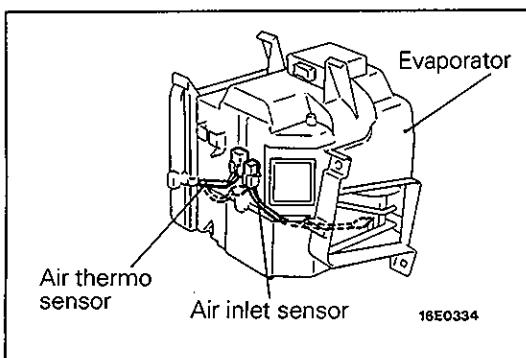
To Test the Receiver Drier

- (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 restricted.
Replace the receiver drier.



DUAL PRESSURE SWITCH

Measure the pressure at the high pressure side. When the dual pressure switch is ON as in the figure at left, and if there is continuity between the dual pressure switch terminals, then the condition is normal; if there is no continuity, replace the switch.



AIR-THERMO SENSOR AND AIR-INLET SENSOR

Disconnect the sensor's connector at the evaporator case and by using an ohmmeter, measure the resistance. If the resistance is within 10% of value of the characteristic curve, the sensor is functioning normally.

ENGINE COOLANT TEMPERATURE SWITCH

<For air conditioner switch off>

- (1) Dip the 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: **<Except 4D56 engine>**
More than 112–118°C (234–244°F)
<4D56>
More than 114–118°C (237–244°F)

<For condenser fan>

- (1) Dip the engine coolant temperature switch in oil as shown in the illustration.
- (2) Check the continuity with a circuit tester as the temperature of the oil changes, and the condition is normal if the continuity is within the following ranges.

<4D56>

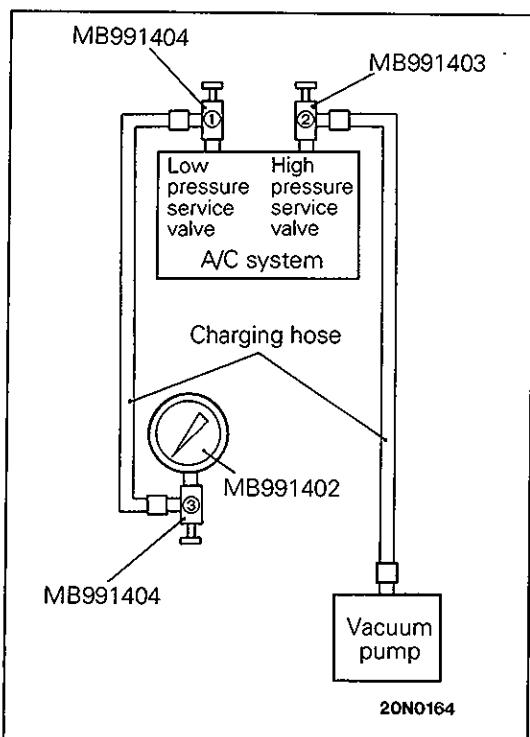
Item	Standard value
Continuity (temperature at point A)	More than 99–105°C (210–221°F)
No continuity (temperature at point B)	Less than 97°C (206°F)

<4M40>

Item	Standard value
Continuity (temperature at point A)	More than 101–105°C (214–221°F)
No continuity (temperature at point B)	Less than 98°C (208°F)

COMPRESSOR DRIVE BELT ADJUSTMENT E55FWAD

Refer to GROUP 11 – Engine Adjustment.



CHARGING <Vehicles using R-12 refrigerant> E55FUBB

CHARGING THE SYSTEM

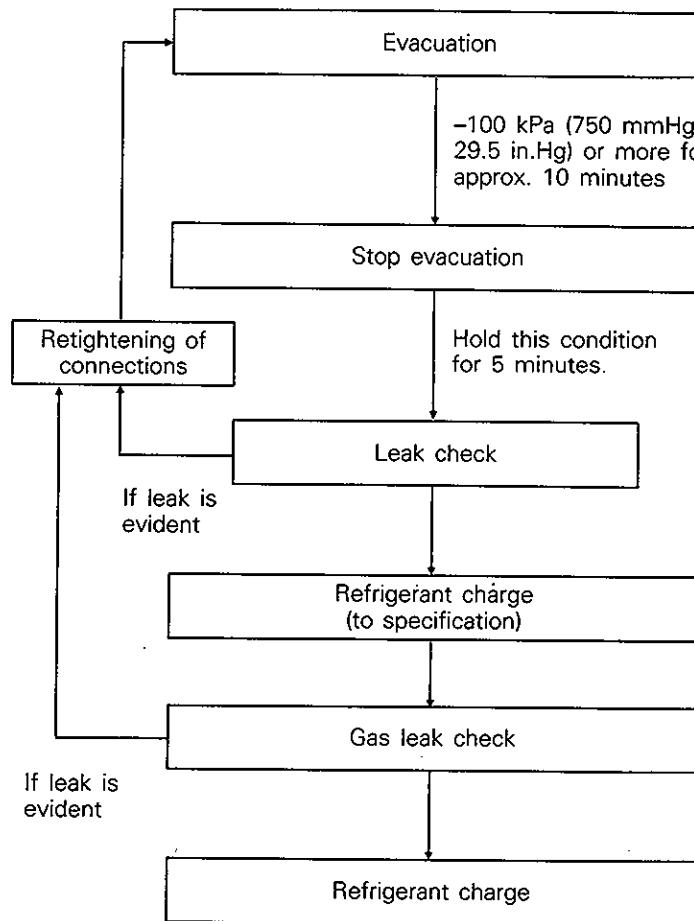
<In case the vacuum gauge is used>

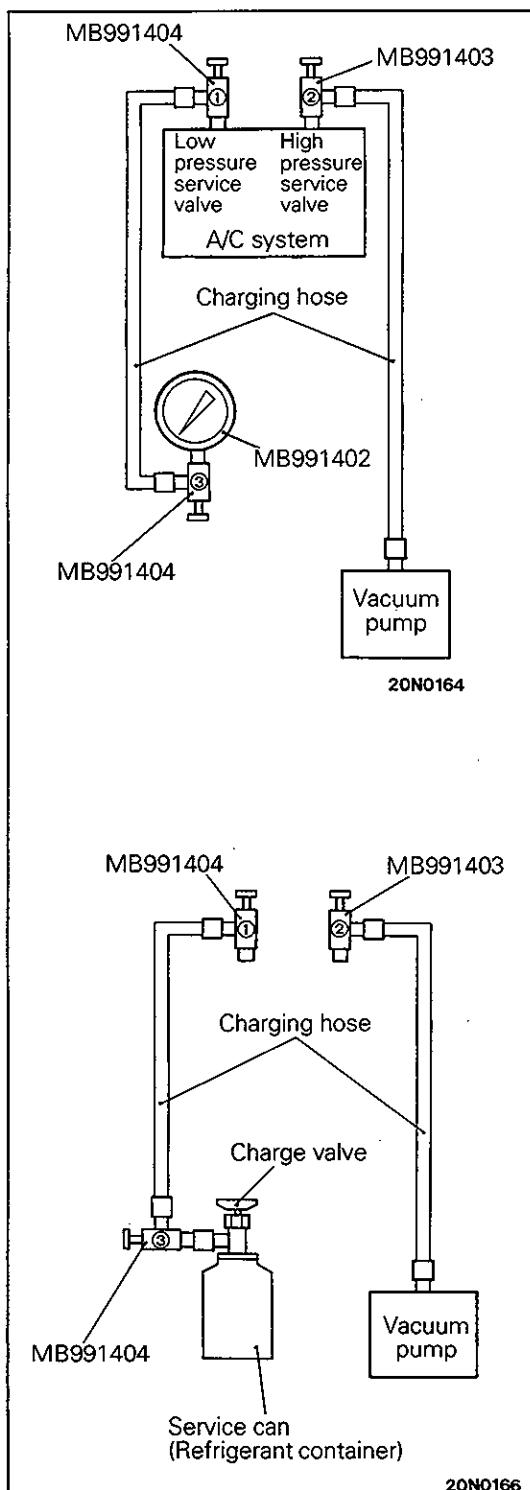
- (1) With the handle of the special tools ① and ② turned back all the way (valve closed), install the special tools ① and ② to each high and low pressure service valve.

NOTE

The high and low pressure service valves are attached to the compressor.

- (2) Tighten the handle of the special tools ① and ② (valve open).
- (3) Connect the charging hose to the special tools ① and ②.
- (4) With the handle of the special tool ③ tightened (valve open), install the special tool ③ to the low pressure charging hose.
- (5) Install the vacuum gauge (MB991402) to the special tool ③.
- (6) Install the vacuum pump to the high pressure charging hose.





- (7) Start up the vacuum pump.
- (8) Evacuate to a vacuum reading of -100 kPa (750 mmHg, 29.5 in.Hg) or higher (approx. 10 minutes).

Caution

The vacuum reading should always be made with the vacuum gauge in an upright position, otherwise the reading will be erratic.

- (9) Turn the handle of the special tool ② back all the way (valve closed).
- (10) Stop the vacuum pump and allow to stand for 5 minutes.
- (11) Check for leaks. (Good if the vacuum is held.)
- (12) With the handle of the charge valve turned back all the way (valve open), install the charge valve.
- (13) With the handle of the special tool ③ turned back all the way (valve closed), remove the vacuum gauge and install the service can.
- (14) Tighten the handle of charge valve (valve closed) to puncture the service can.
- (15) Turn the handle of charge valve back (valve open) and tighten the special tool ③ handle (valve open), to charge the system with refrigerant.
- (16) If the refrigerant is not drawn in, turn the handle of the special tool ① back all the way (valve closed).
- (17) Check for gas leaks using a leak detector.
- (18) Start the engine.
- (19) Operate the air conditioner and set at the lowest temperature. (MAX. COOL).
- (20) Fix the engine speed at 1,500 r/min.
- (21) Tighten the handle of the special tool ① fully (valve open) to charge the required volume of refrigerant.

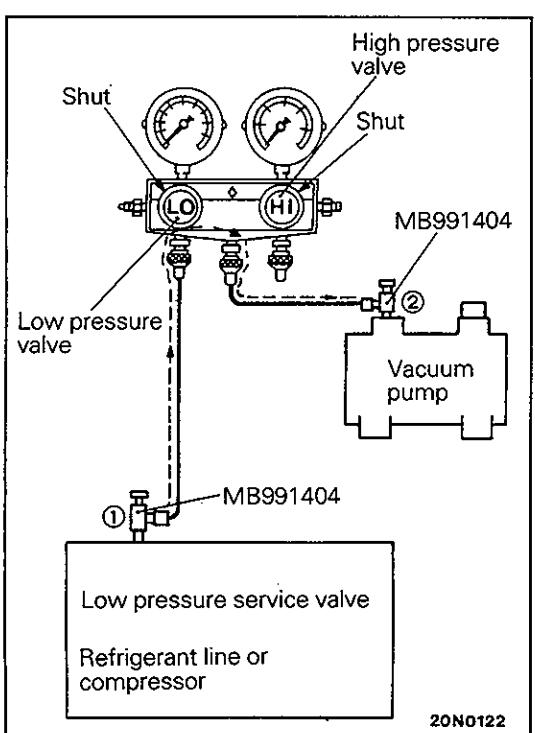
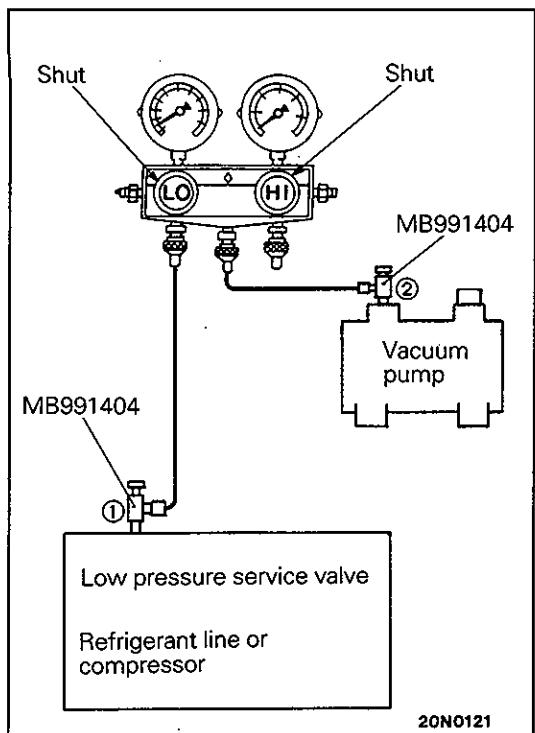
Caution

If the service can is inverted, liquid refrigerant may be drawn into the compressor damaging it by liquid compression. Keep the service can upright to ensure that refrigerant is charged in gas state.

- (22) After charging with refrigerant, turn the handle of the special tool ① back all the way (valve closed).
- (23) Tighten the charge valve handle (valve closed).
- (24) Remove the special tools ① and ② from the high and low pressure service valves.
- (25) Remove the service can.

NOTE

If the service can is not emptied completely, keep the charge valve and special tools ① and ③ in closed condition for next charging.



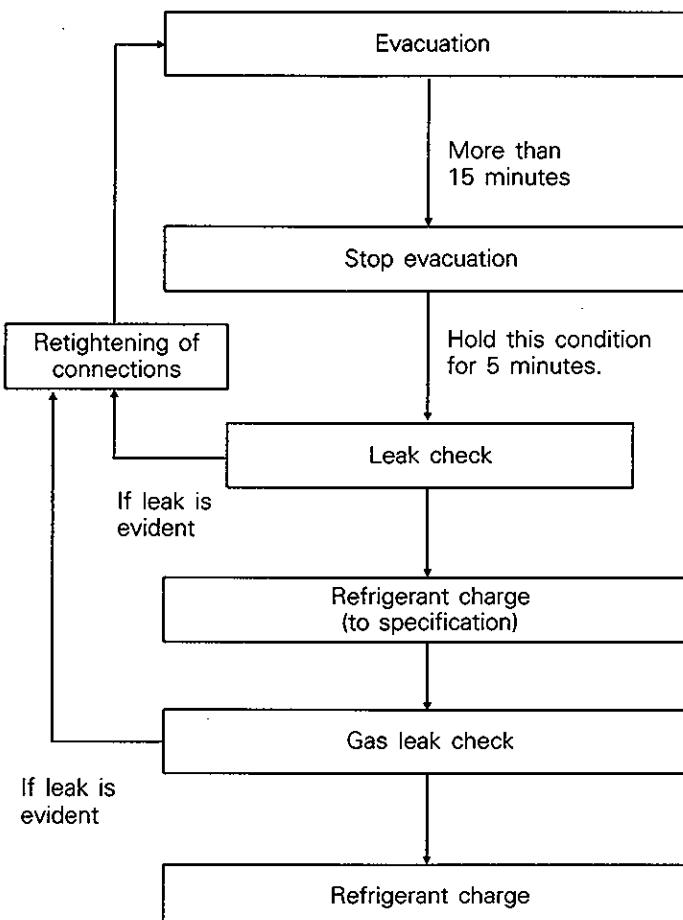
<In case the gauge manifold is used>

- Turn back the handle of the special tools ① and ② (valve closed) to install the special tools ① and ② the low pressure service valve and vacuum pump.

NOTE

The high and low pressure service valve are attached to the compressor.

- Close the high and low pressure valves of the gauge manifold.
- Connect the charging hose to the special tools ① and ② as illustrated.
- Tighten the handle of the special tools ① and ② (valve open).

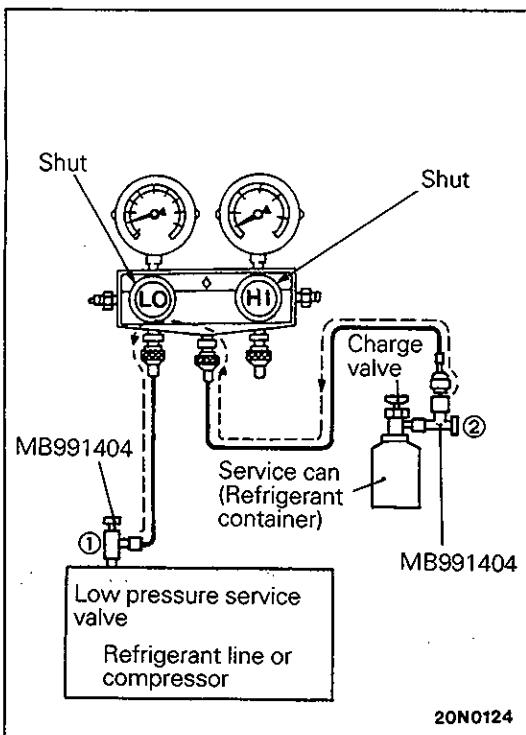


- Start up the vacuum pump.

Caution

- Do not use the compressor for evacuation.**
- Do not operate the compressor in the vacuum condition; damage may occur.**

- Evacuate to a vacuum reading of -100 kPa (1.0 kg/cm², 14.2 psi) or higher (approx. 10 minutes).
- Turn back the handle of the adaptor valve ② (valve closed).
- Stop the vacuum pump and allow to stand for 5 minutes.
- Check for leaks. (Good if the vacuum is held.)



- (10) Tighten the charge valve handle to puncture the service can.
- (11) Turn back the handle of the charge valve tighten the handle of the adaptor valve ② (valve open).

- (12) Open the low pressure valve of the gauge manifold to charge refrigerant.

Caution

If the service can is inverted, liquid refrigerant may be drawn into the compressor damaging it by liquid compression. Keep the service can upright to ensure that refrigerant is charged in gas state.

- (13) When refrigerant is no longer drawn in, turn back the handle of the adaptor valve ① (valve closed).
- (14) Check for gas leaks using a leaks detector.
- (15) Start the engine.
- (16) Operate the air conditioner and set it to the lowest temperature (MAX. COOL).
- (17) Fix the engine at 1,500 r/min.
- (18) Tighten the handle of the special tool ① (valve open) and charge refrigerant to the specified amount.

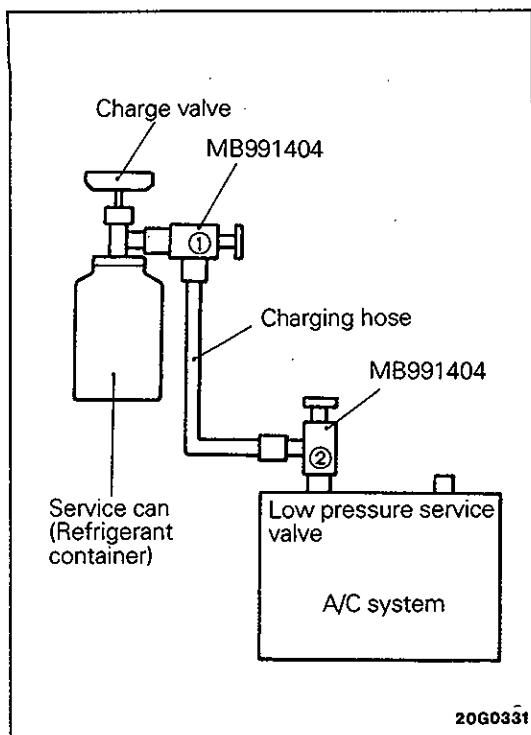
Caution

If the service can is inverted, liquid refrigerant may be drawn into the compressor damaging it by liquid compression. Keep the service can upright to ensure that refrigerant is charged in gas state.

- (19) After finishing charging refrigerant, turn back the handle of the special tool ① (valve closed).
- (20) Tighten the charge valve handle (valve closed).
- (21) Remove the special tool ① from the low pressure service valve.
- (22) Remove the service can.

NOTE

If the service can is not emptied completely, keep the charge valve and special tool ② in closed condition for next charging.



CORRECTING LOW REFRIGERANT LEVEL

In case the service can is used

- (1) Install the charge valve to the service can with its handle turned back all the way (valve opened).
- (2) Install to the charge valve with the special tool ① tightened (valve open).
- (3) Install the charging hose to the special tool ①.
- (4) Turn back the handle of the special tool ② all the way (valve closed) to install the charging hose.
- (5) Tighten the handle of charge valve (valve closed) to puncture the service can.
- (6) Turn back the handle of the charge valve all the way to open the valve (valve open), operate the handle of the special tool ② to vacuum the air.
- (7) Install the special tool ② to the low pressure side service valve.

Caution

Never use the high pressure side as this may cause refrigerant to flow back, causing rupture of the service can and charging hose.

- (8) Start the engine.
- (9) Operate the air conditioner and set it to the lowest temperature (MAX. COOL).
- (10) Fix the engine speed at 1,500 r/min.
- (11) Tighten the handle of the special tool ② (valve open) and charge refrigerant checking level with the sight glass.
- (12) After working, make certain that the handle of the special tool ② is turned back all the way (valve closed) and then remove the special tool ②.

NOTE

If the service can is not emptied completely, keep the charge valve and special tools ① and ② in closed condition for next charging.

In case the refrigerant recovery and recycling unit is used

Charge the refrigerant by using a refrigerant and recycling unit.

NOTE

Refer to the refrigerant recovery and recycling unit instruction manual for operation of the unit.

DISCHARGING 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.

REFILLING OF OIL IN THE AIR-CONDITIONER 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 80 cm³ (4.9 cu.in.), *150 cm³ (9.2 cu.in.) 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.

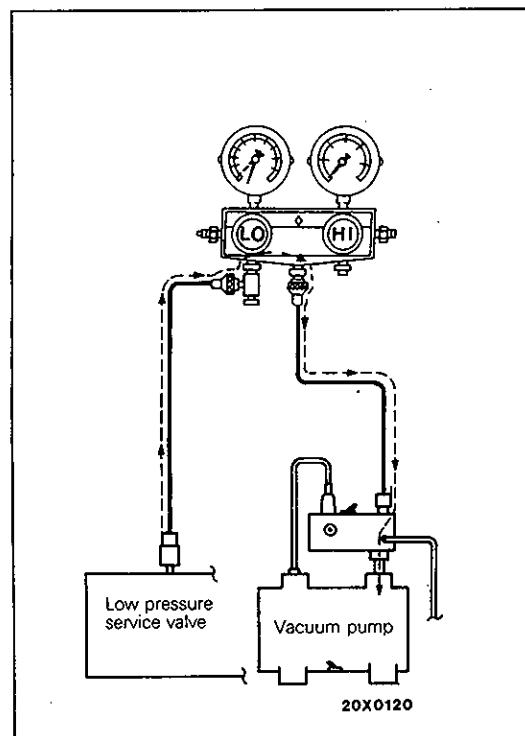
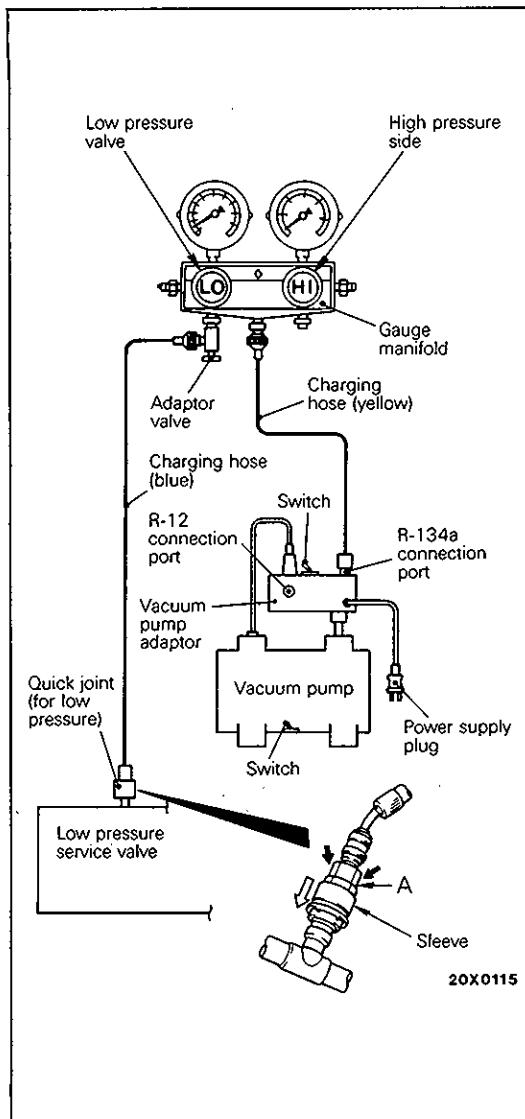
When the following system components are charged, it is necessary to add oil to the system to replace the oil being removed with the component.

Compressor oil: DENSO oil 6**Quantity:**

Evaporator:	60 cm ³ (3.6 cu.in.)
Condenser:	30 cm ³ (1.8 cu.in.)
Suction hose:	10 cm ³ (0.6 cu.in.)
Receiver:	10 cm ³ (0.6 cu.in.)

NOTE

* : Vehicles with dual air conditioner.



CHARGING <Vehicles using R-134a refrigerant

E55AF05AA

- With the handles turned back all the way (valve closed) install the adaptor valve to the low-pressure side of the gauge manifold.
- Connect the charging hose (blue) to the adaptor valve.
- Connect the quick joint (for low pressure) to the charging hose (blue).
- 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

- Use tools that are designed for R-134a.**
- To install 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.

- Close the high and low pressure valves of the gauge manifold.
- Install the vacuum pump adaptor to the vacuum pump.
- Connect the vacuum pump plug to the vacuum pump adaptor.
- Connect the charging hose (yellow) to the R-134a connection port of the vacuum pump adaptor.
- Tighten the adaptor valve handle (valve open).
- Open the low pressure valve of the gauge manifold.
- 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).

- Turn the vacuum pump adaptor switch to the R-134a side to start the vacuum pump.

Caution

Do not operate the compressor during evacuation.

- Evacuate to a vacuum reading of -100 kPa (1.0 kg/cm², 14.2 psi) or higher (takes approx. 10 minutes).
- Turn the vacuum pump adaptor switch OFF and allow to stand it for 5 minutes.

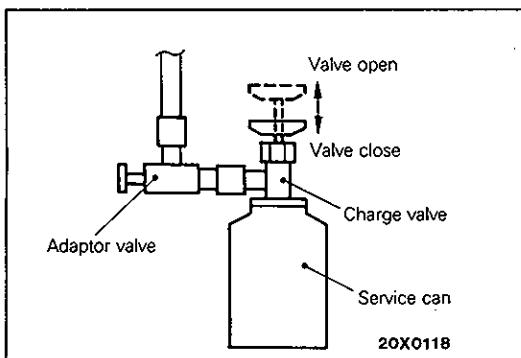
Caution

Do not operate the compressor in the vacuum condition; damage may occur.

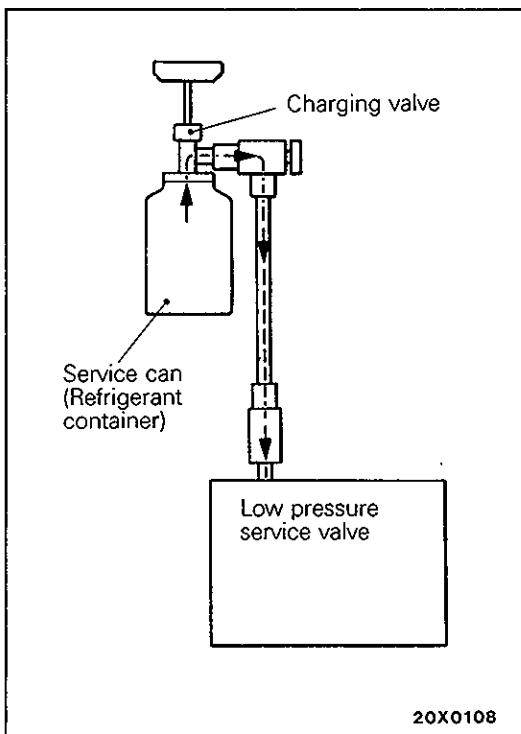
- Carry out a leak test. (Good if the negative pressure does not drop.)

Caution

If the negative pressure (vacuum) is lost, check for loose connections. Then, repeat the evacuation procedure from step (12). If negative pressure (vacuum) is still lost, add 1 lb of refrigerant and check system using an R-134a compatible leak detector.



16. With the handle turned out all the way (valve open), install the charging valve to the service can.
17. Turn the handle of the adaptor valve back all the way (valve closed), remove it from the gauge manifold and install the service can.
18. Tighten the handle of the charging valve (valve closed) to puncture the service can.



19. Turn the handle of the charging valve back (valve open) and tighten the handle of the adaptor valve (valve open) to charge the system with refrigerant.

Caution

If the service can is inverted, liquid refrigerant may be drawn into the compressor damaging it by liquid compression. Keep the service can upright to ensure that refrigerant is charged in gas state.

20. If the refrigerant is not drawn in, turn the handle of the adaptor valve back all the way (valve closed).
21. Check for gas leaks using a leak detector. 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.

22. Start the engine.
23. Operate the A/C and set to the lowest temperature (MAX. COOL).
24. Fix the engine speed at 1,500 r/min.
25. Tighten the handle of the adaptor valve (valve open) to charge the required volume of refrigerant.

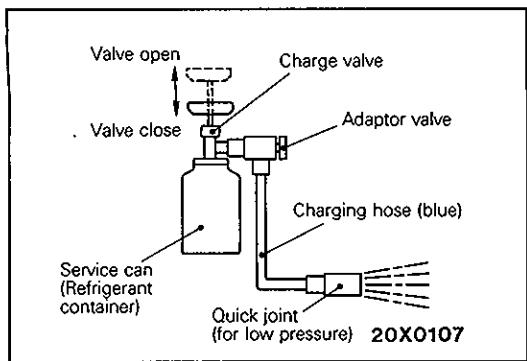
Caution

If the service can is inverted, liquid refrigerant may be drawn into the compressor damaging it by liquid compression. Keep the service can upright to ensure that refrigerant is charged in gas state.

26. After charging with refrigerant, turn the handle of the adaptor valve back all the way (valve closed).
27. Tighten the charging valve handle (valve closed). Remove the quick joint (for low pressure) from the low-pressure service valve.

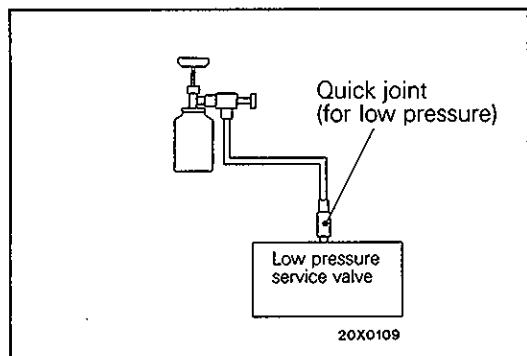
NOTE

If the service can is not emptied completely, keep the handles of the charging valve and adaptor valve closed for the next charging.



CORRECTING LOW REFRIGERANT LEVEL IN CASE THE SERVICE CAN IS USED

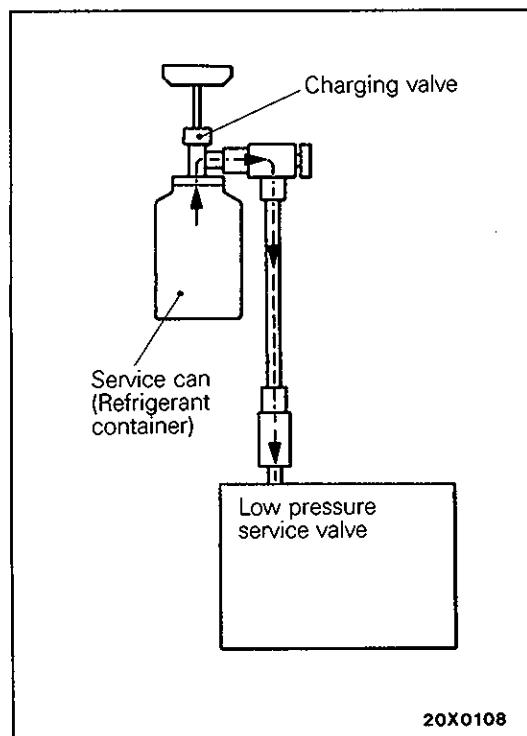
1. Install the charge valve with the handle turned all the way out (valve open) of the service can.
2. Install the adaptor valve with the handle turned all the way back (valve close) to the charging valve.
3. Connect the charging hose (blue) to the adaptor valve.
4. Connect the charging hose (blue) to the quick joint (for low pressure).
5. Tighten the handle of the charge valve (valve close), and pierce the service can.
6. Turn the handle of the adaptor valve to bleed the air.



7. Install the quick joint (for low pressure) to the low pressure service valve.

NOTE

The low-pressure service valve should be connected to the compressor.



8. Start the engine.
9. Operate the air conditioner and set at the lowest temperature (MAX. COOL).
10. Fix the engine speed at 1,500 r/min.
11. Tighten the handle of the adaptor valve (valve open), and replenish refrigerant checking the quantity through the sight glass.

Caution

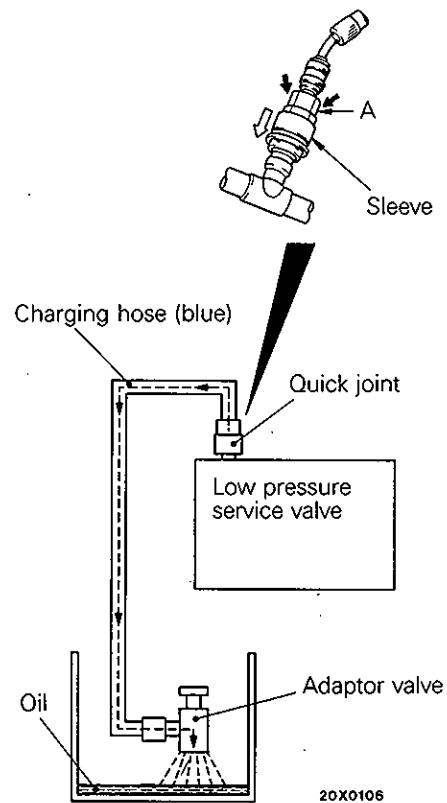
If the service can is inverted, liquid refrigerant may be drawn into the compressor damaging it by liquid compression. Keep the service can upright to ensure that refrigerant is charged in gas state.

12. After replenishing is completed, turn the handle of the adaptor valve all the way back (valve close), and remove the quick joint.

NOTE

If any refrigerant is remaining in the service can, close the adaptor valve and save the refrigerant for another vehicle. Do not release into the atmosphere.

E65AF05CA



DISCHARGING SYSTEM

1. Turn the engine at an engine speed of 1200–1500 r/min for approximately 5 minutes with the A/C operating to return the oil.

NOTE

Returning the oil will be more effective if it is done while driving.

2. Stop the engine.
3. Connect the charging hose (blue) to the adaptor valve with its handle turned back all the way (valve closed).
4. Connect the quick joint to the charging hose (blue).
5. Install the quick joint to the low pressure service valve.

NOTE

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. Place the adaptor valve inside the container and discharge the refrigerant by opening the handle gradually so that oil does not gush out.

NOTE

Any oil remaining in the container should be returned to the A/C system.

REFILLING OF OIL IN THE AIR-CONDITIONER 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 80 cm³ (4.9 cu.in.), *150 cm³ (9.2 cu.in.) of refrigerant oil.

NOTE

* : for dual A/C

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 charged, it is necessary to add oil to the system to replace the oil being removed with the component.

Compressor oil: ND – OIL 8

Quantity:

- Vehicles with single A/C

Evaporator: 40 cm³ (2.4 cu.in.)

Condenser: 40 cm³ (2.4 cu.in.)

Suction hose: 10 cm³ (0.6 cu.in.)

Receiver: 10 cm³ (0.6 cu.in.)

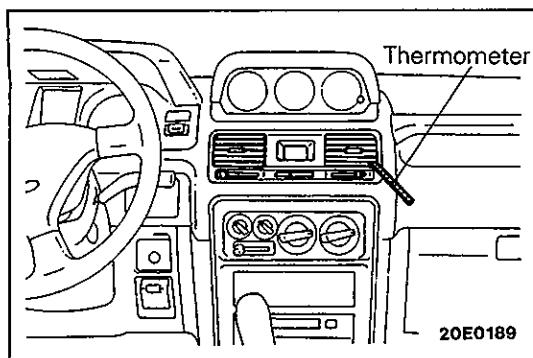
- Vehicles with dual A/C

Evaporator: 60 cm³ (3.6 cu.in.)

Condenser: 30 cm³ (1.8 cu.in.)

Suction hose: 10 cm³ (0.6 cu.in.)

Receiver: 10 cm³ (0.6 cu.in.)



PERFORMANCE TEST

E55FTA1

<Vehicles using R-12 refrigerant>

- (1) The vehicle to be tested should be in a place that is not in direct sunlight.
- (2) Connect a tachometer.
- (3) Turn back the handle of the special tools (MB991403, MB991404) (valve closed) and install the special tools (MB991403, MB991404) to the high pressure and low pressure service valves.
- (4) Connect the gauge manifold to the special tools (MB991403, MB991404).
- (5) Tighten the handle of the special tools (MB991403, MB991404) (valve open).
- (6) Start the engine.
- (7) Set the A/C controls as follows:
 Air conditioning switch: Air conditioner – ON position
 Mode selection: Face position
 Temperature control: Max. cooling position
 Air selection: Recirculation position
 Blower switch: HI (Fast) position
- (8) Adjust engine speed to 1,000 r/min with air conditioner clutch engaged.
- (9) Engine should be warmed up with doors, windows closed and bonnet opened.
- (10) <Vehicles with single air conditioner>
 Insert a thermometer in the left center air conditioner outlet and operate the engine for 20 minutes.
 <Vehicles with dual air conditioner>
 Insert a thermometer at the air conditioning outlet at the left center of the instrument panel and the one at the ceiling front left side, and then let engine run for 20 minutes.
- (11) Note the discharge air temperature.

NOTE

If the clutch cycles, take the reading before the clutch disengages.

Performance Temperature Chart

SINGLE AIR CONDITIONER

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 (37.4–44.6)	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 (kg/cm ² , psi)	980–1,230 (9.8–12.3, 139.4–174.9)	1,050–1,300 (10.5–13.0, 149.3–184.9)	1,130–1,380 (11.3–13.8, 160.7–196.3)	1,270–1,580 (12.7–15.8, 180.6–224.7)	1,330–1,740 (13.3–17.4, 189.2–247.5)
Compressor suction pressure kPa (kg/cm ² , psi)	120–220 (1.2–2.2, 17.1–31.3)	120–230 (1.2–2.3, 17.1–32.7)	130–240 (1.3–2.4, 18.5–34.1)	150–270 (1.5–2.7, 21.3–38.4)	170–280 (1.7–2.8, 24.2–39.8)

DUAL AIR CONDITIONER

Garage ambient temperature °C (°F)		21 (70)	26.7 (80)	32.2 (90)	37.8 (100)	43.3 (110)
Discharge air temperature °C (°F)	Front	2–8 (35–46)	3–9 (37–48)	4–10 (39–50)	7–14 (45–57)	12–18 (54–64)
	Rear	2–8 (35–46)	3–9 (37–48)	4–10 (39–50)	7–14 (45–57)	12–18 (54–64)
Compressor discharge pressure kPa (kg/cm ² , psi)	981–1,373 (9.81–13.73, 142–199)	981–1,373 (9.81–13.73, 142–199)	1,079–1,472 (10.79–14.72, 156–213)	1,373–1,766 (13.73–17.66, 199–256)	1,668–2,060 (16.68–20.06, 242–299)	
Compressor suction pressure kPa (kg/cm ² , psi)	108–206 (1.08–2.06, 16–30)	108–206 (1.08–2.06, 16–30)	128–226 (1.28–2.26, 18–33)	206–304 (2.06–3.04, 30–44)	226–324 (2.26–3.24, 33–47)	

<Vehicles using R-134a refrigerant>

- (1) The vehicles to be tested should be in a place that is not in direct sunlight.
- (2) Close the high and low pressure valve of the gauge 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 gauge manifold.
- (4) Install 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 is on high-pressure pipe B, and the low-pressure service valve is on the low-pressure hose.

Caution

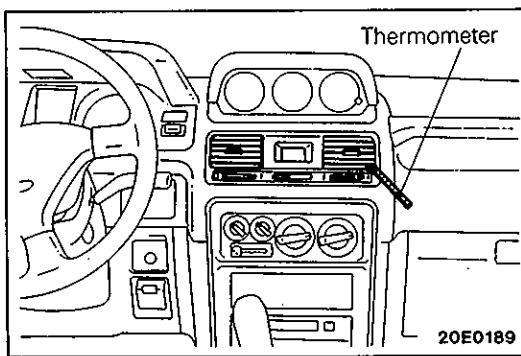
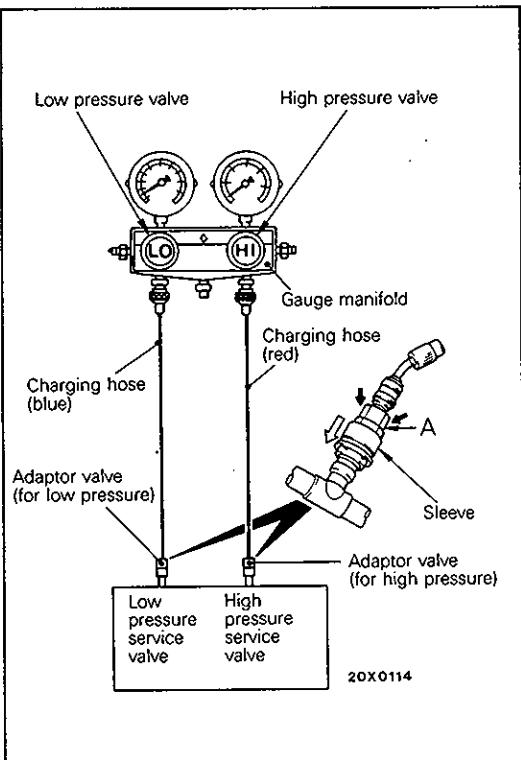
To connect the quick joint, press section A firmly against the service valve until a click is heard.

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 A/C controls as follows:
A/C switch: A/C – ON position
Mode selection: Face position
Temperature control: Max. cooling position
Air selection: Recirculation position
Blower switch: HI (Fast) position
- (8) Adjust engine speed to 1,000 r/min with A/C clutch engaged.
- (9) Engine should be warmed up with doors and windows closed.
- (10) Insert a thermometer in the left center A/C outlet and operate 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 (37–43)	3.0–7.0 (37–45)	3.5–7.5 (38–46)	4.0–8.0 (39–46)	4.5–8.5 (40–47)
Compressor discharge pressure kPa (kg/cm ² , psi)	961–1402 (9.8–14.3, 139–203)	1029–1471 (10.5–15.0, 149–213)	1108–1549 (11.3–15.8, 151–225)	1215–1745 (12.7–17.8, 181–253)	1304–1902 (13.3–19.4, 189–276)
Compressor suction pressure kPa (kg/cm ² , psi)	98–216 (1.0–2.2, 14–31)	98–226 (1.0–2.3, 14–33)	108–235 (1.1–2.4, 16–34)	137–265 (1.4–2.7, 20–38)	157–275 (1.6–2.8, 23–40)

REFRIGERANT LEAK REPAIR PROCEDURE E55F UAE

Lost Charge

If the system has lost all charge due to a leak:

- (1) Evacuate the system. (See procedure.)
- (2) Charge the system with approximately one pound of refrigerant.
- (3) Check, for leaks.
- (4) Discharge the system.
- (5) Repair leaks.
- (6) Replace 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 low refrigerant level.

HANDLING TUBING AND FITTINGS

E55FVAD

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 rebend 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. O-ring used on connections are not reusable.

COMPRESSOR NOISE

E55FXAA

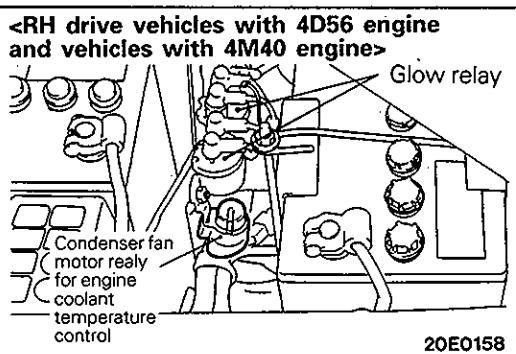
When investigating an air conditioning related noise, you must first know the conditions when the noise occurs. These conditions are weather, vehicle speed, in gear or neutral, engine temperature or any other special conditions. Noises that develop during air conditioning operation can often be misleading. 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. Verify accessory drive belt tension (power steering, alternator 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 within the compressor.

Adjustment Procedures

- (1) Select a quiet area for testing. Duplicate conditions as much as possible. Switch compressor on and off several times to clearly identify compressor noise.

To duplicate high ambient conditions (high head pressure), restrict air-flow through condenser. Install manifold gauge set to make sure discharge pressure does not exceed 2,070 kPa (21.1 kg/cm², 300 psi): R-12, 2,550 kPa (26 kg/cm², 370 psi): R-134a.

- (2) Tighten all compressor mounting bolts, clutch mounting bolt, and compressor drive belt. Check to assure clutch coil is tight (no rotation or wobble).
- (3) Check refrigerant hoses for rubbing or interference that can cause unusual noises.
- (4) Check refrigerant charge (See "Charging the System").
- (5) Recheck compressor noise as in Step 1.
- (6) If noise still exists, loosen compressor mounting bolts and retorque. Repeat Step 1.
- (7) If noise continues, replace compressor and repeat Step 1.



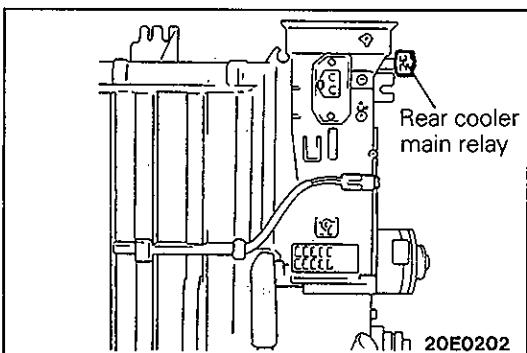
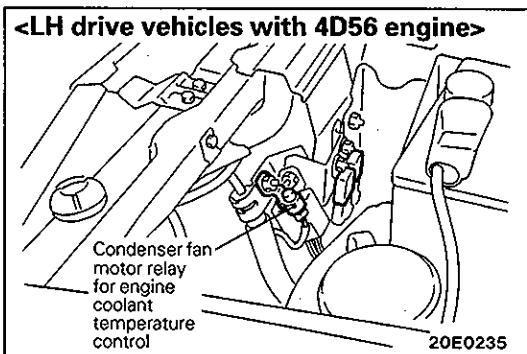
POWER RELAY CHECK

(1) Remove each power relay.

① Remove the condenser fan motor relay and the compressor relay from the relay box in the engine compartment.

② Remove the condenser fan motor relay for engine coolant temperature control that is mounted on the side of the battery tray.

③ Remove the condenser fan motor relay for engine coolant temperature control which is co-tightened with the high pressure hose attaching clamp.



④ Remove the rear cooler main relay from the rear evaporator.

(2) Check the continuity between each terminal.

IDLE-UP OPERATION CHECK

(1) Before inspection, set the vehicle to the following condition:

- Engine coolant temperature: 80–90°C (176–194°F)
- Lights and all accessories: OFF
- Selector lever: "N" or "P" (A/T)
- Shift lever: Neutral (M/T)
- Steering wheel: Straight forward position

(2) Check that the idle speed is within the standard value.

Standard value: $700 \pm 100 \text{ r/min}$ <6G72, 6G74>

$750 \pm 100 \text{ r/min}$ <4G64, 4D56>

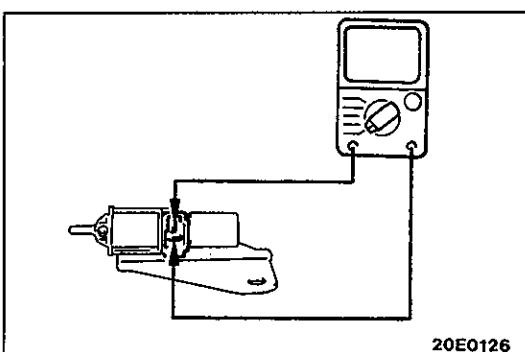
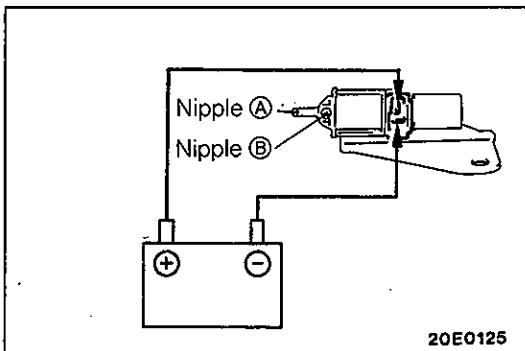
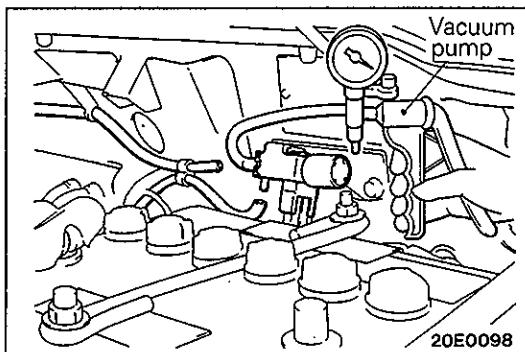
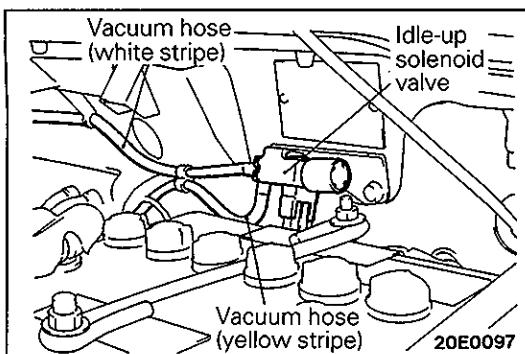
$800 \pm 30 \text{ r/min}$ <4M40>

(3) Turn the air conditioner switch to ON and check that the idle speed is at the standard value when the air conditioner is operating.

Standard value: $900 \pm 100 \text{ r/min}$

NOTE

If the idle speed is outside the standard value, refer to GROUP 11 – Engine Adjustment.



IDLE-UP SOLENOID VALVE CHECK <4D56, 4M40>

- (1) Remove the vacuum hose from the idle-up solenoid valve.

NOTE

When installing the vacuum hose, be careful not to mistake the connection ends.

- (2) Disconnect the idle-up solenoid valve connection.

- (3) Connect the vacuum pump (Mighty Vac) to nipple Ⓐ.

- (4) Check if air is pumped by the vacuum pump (Mighty Vac) when battery voltage is applied to the terminals of the idle-up solenoid valve, and when it is not applied.

Battery voltage	Nipple Ⓑ	Vacuum condition
Applied	Open	Vacuum leak at nipple Ⓑ
	Covered with a finger ¹	Vacuum is maintained
Not applied	Open	Vacuum is maintained
	Covered with a finger ²	

NOTE

At ¹, negative pressure can be felt by the finger, but at ², it cannot be felt.

- (5) Measure the resistance between the idle-up solenoid valve terminals.

Standard value: Approx. 40Ω

LEVER POSITION SWITCH CHECK

<4D56, 4M40 — VEHICLES WITH A/T>

- (1) When the air conditioner switch is turned to ON (air conditioner operation condition: magnetic clutch is ON), and the vehicle is at full acceleration (accelerator pedal depression amount is approximately $90\% \pm 7\%$), check that the magnetic clutch turns OFF for a period of approximately 7 seconds.
- (2) If there is a malfunction, adjust the installation position of the lever position switch by the following procedure.

- ① Check that the idle speed is at the standard value, and adjust it if necessary.

**Standard value: $750 \pm 100 \text{ r/min}$ <4D56>
 $800 \pm 30 \text{ r/min}$ <4M40>**

- ② Adjust the accelerator cable.
- ③ Depress the accelerator pedal fully to fully open the throttle lever of the fuel injection pump.

Caution

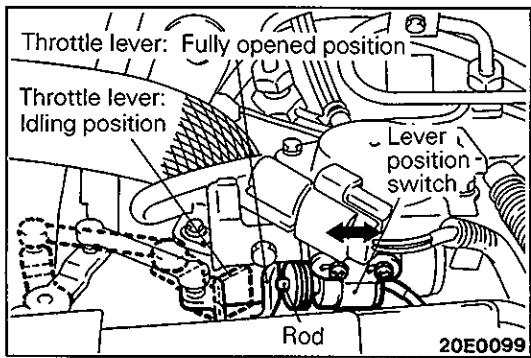
When fully opening the throttle lever of the fuel injection pump, always open it by the accelerator pedal, not from the injection pump side.

- ④ Adjust the stroke of the lever position switch rod by moving the lever position switch so that the rod is pushed down $4 \pm 1 \text{ mm}$ ($0.16 \pm 0.04 \text{ in.}$) from the free position.

AIR CONDITIONER SWITCH

E55QA--

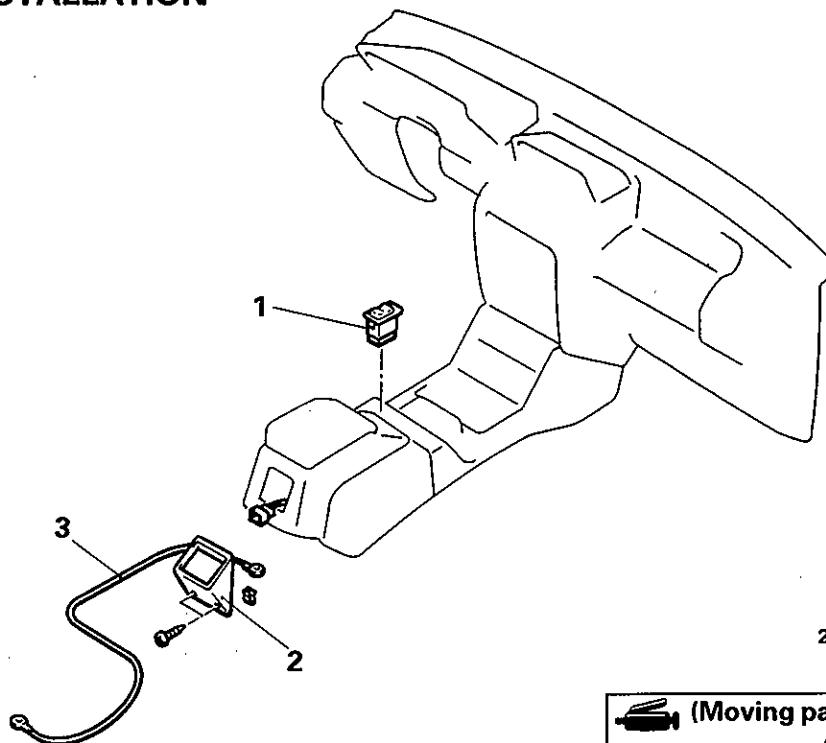
Refer to the Heater Control Assembly for the removal, installation and inspection procedures of the air conditioner switch.



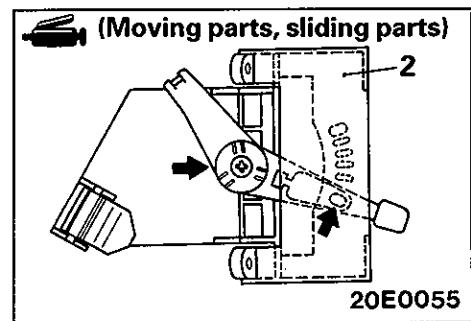
REAR BLOWER SWITCH

REMOVAL AND INSTALLATION

E55TA-D



20E0228



20E0055

1. Rear blower main switch (Floor console side)

Rear heater control assembly removal steps

2. Rear heater control assembly
3. Connection for the rear heater temperature control wire (Rear heater control assembly side)

<Vehicles without dual A/C>

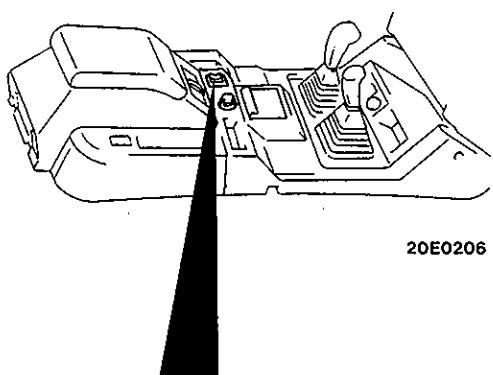
INSPECTION

E55TCBC

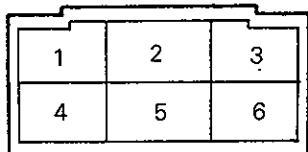
**REAR BLOWER MAIN SWITCH
(BLOWER CONTROL SIDE)**

Operate the main switch and use a circuit tester to check the continuity between the switch terminals.

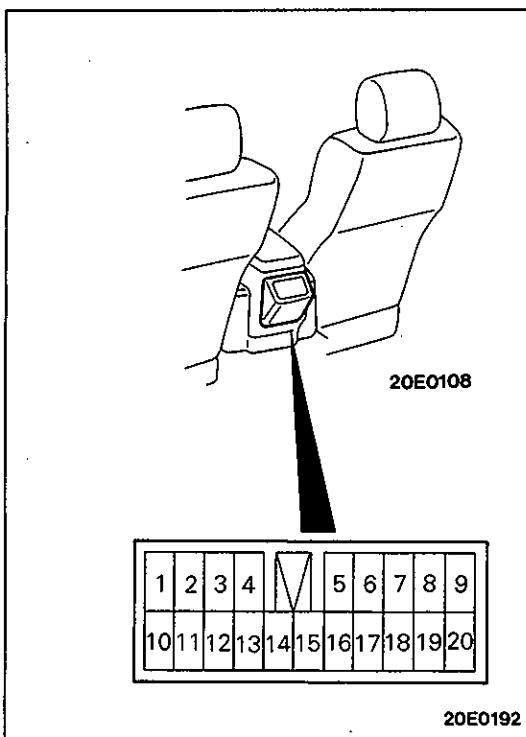
Terminal No. Switch position	1	2	5	6	3	4	Remark
•	○	○	—	○	○	○	○—○ indicates that there is a continuity between the terminals
REAR	—	○	○	—	○	○	



20E0206



20E0049



INSPECTION OF REAR BLOWER SWITCH, TEMPERATURE ADJUSTMENT SELECTOR AND REAR BLOWER MAIN SWITCH

(REAR HEATER CONTROL ASSEMBLY SIDE)

<Vehicles with rear heater>

(1) Operate the rear blower main switch and rear blower switch and use a circuit tester to check the continuity between the terminals.

Terminal No. Switch position	7	8	10	12	13	14	15	16	17	19	Remark
■		○	○								○—○ indicates that there is a continuity between the terminals.
■		○	○								
● (Lo)						○	○			○	
● (Me)						○		○		○	
● (Hi)					○				○	○	

(2) Operate the temperature adjustment selector and use a circuit tester to check the continuity between the terminals.

Switch position	
At MAX. COOL	No continuity between terminals 3–4
At MAX. HOT	No continuity between terminals 5–6

(3) Operate the temperature adjustment selector and use a circuit tester to check the continuity between the terminals.

Switch position	Standard value Ω
At MAX. COOL	Between terminals 3–4: 0–4
At MAX. HOT	Between terminals 5–6: 2400

<Vehicles without rear heater>

(1) Operate the rear blower main switch and rear blower switch and use a circuit tester to check the continuity between the terminals.

Terminal No. Switch position	7	8	10	12	13	14	19	Remark
	○-○							
	○-○							
● (Lo)					○-○			
● (Me)					○	○		
● (Hi)				○		○		

○-○ indicates that there is a continuity between the terminals.

(2) Operate the temperature adjustment selector and use a circuit tester to check the continuity between the terminals ④-⑤.

Switch position	Standard value Ω
At ●	3000
At MAX. COOL	0-4

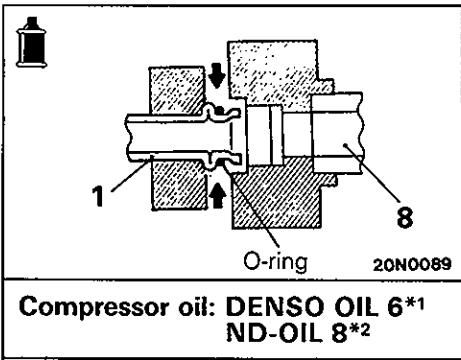
FRONT EVAPORATOR

REMOVAL AND INSTALLATION

E55JA-1

Pre-removal and Post-installation Operation

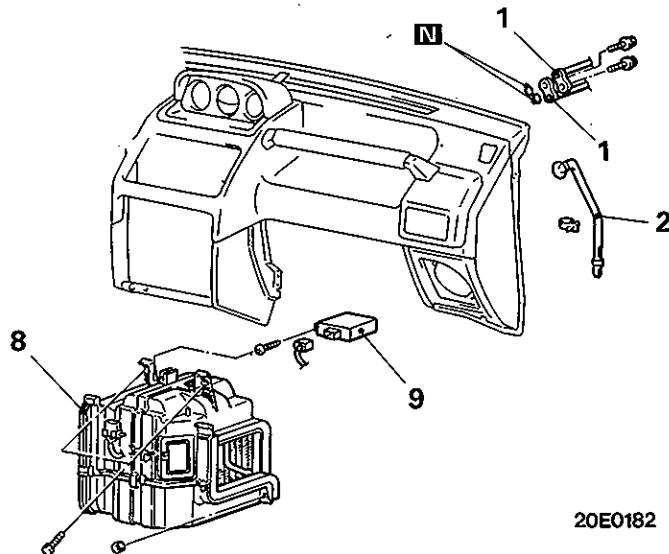
- Discharge and Charging of Refrigerant (Refer to P.55-62, 67, 67-1, 67-4.)



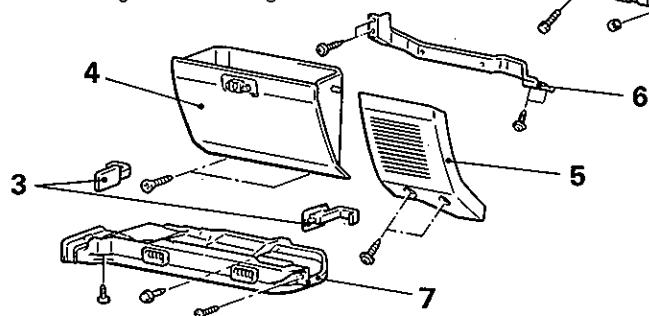
Compressor oil: DENSO OIL 6*¹
ND-OIL 8*²

NOTE

- *¹ : <Vehicles using R-12 refrigerant>
- *² : <Vehicles using R-134a refrigerant>



20E0182



Removal steps

1. Connection for discharge pipe/suction hose
2. Drain hose
3. Stopper
4. Glove box
5. Speaker garnish
6. Lower frame
7. Foot washer duct (RH)
8. Front evaporator
9. A/C control unit

SERVICE POINTS OF REMOVAL

1. DISCONNECTION OF DISCHARGE PIPE AND SUCTION HOSE

If the hoses or pipes are disconnected, cap the hoses or pipes with a blank plug to prevent entry of dust, dirt, and water.

INSPECTION

E55JFAH

- Check for damage of the evaporator fin part.
- Check for damage or collapse of the drain hose.
- Check for peeling or cracking of the insulator.

SERVICE POINTS OF INSTALLATION**8. INSTALLATION OF FRONT EVAPORATOR**

When replacing the evaporator, refill the evaporator with a specified amount of compressor oil.

<Vehicles using R-12 refrigerant>

Compressor oil: **DENSO OIL 6**
Quantity: **60 cm³ (3.6 cu.in.)**

<Vehicles using R-134a refrigerant>

Compressor oil: **ND – OIL 8**

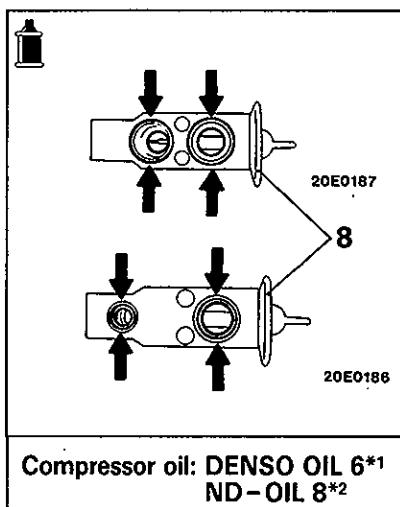
Quantity:

Vehicles with single A/C: **40 cm³ (2.4 cu.in.)**
Vehicles with dual A/C: **60 cm³ (3.6 cu.in.)**

NOTES

DISASSEMBLY AND REASSEMBLY

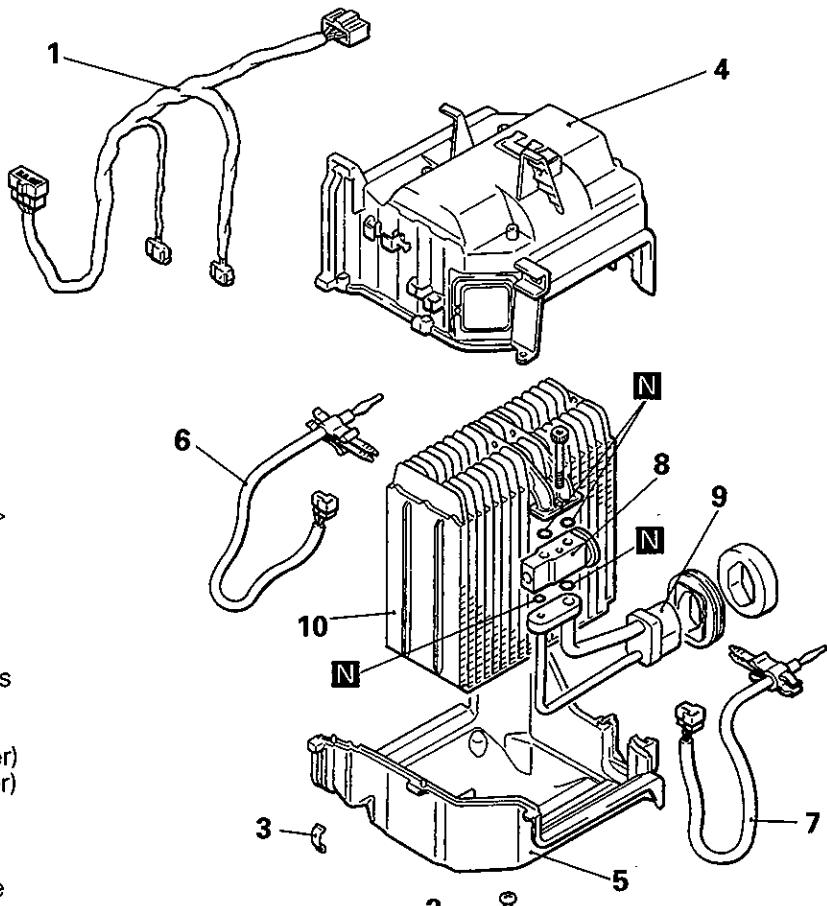
E55JC-1



**Compressor oil: DENSO OIL 6*1
ND-OIL 8*2**

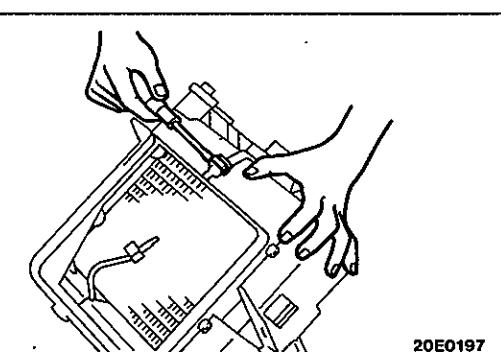
NOTE

*1: <Vehicles using R-12 refrigerant>
*2: <Vehicles using R-134a refrigerant>



Disassembly steps

1. Air conditioner harness
2. Screw
3. Clip
4. Evaporator case (upper)
5. Evaporator case (lower)
6. Air thermo sensor
7. Air inlet sensor
8. Expansion valve
9. Suction/discharge pipe
10. Evaporator

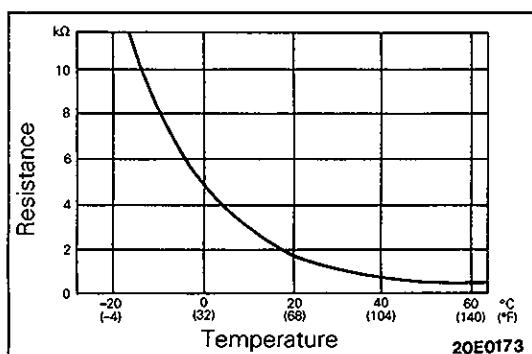


SERVICE POINT OF DISASSEMBLY

E55JDA1

3. REMOVAL OF CLIPS

Remove the clips with a screwdriver covered with a shop towel to prevent damage to case surfaces.



INSPECTION

E55JFAH

AIR THERMO SENSOR AND AIR INLET SENSOR CHECK

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.

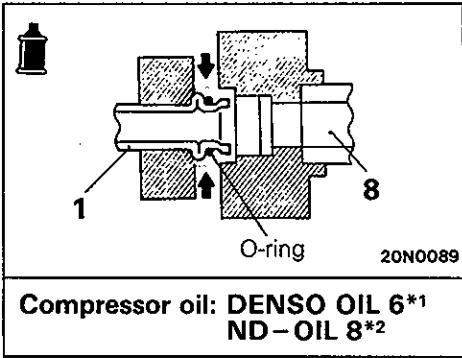
REAR EVAPORATOR, REAR COOLER AMPLIFIER AND RESISTOR

REMOVAL AND INSTALLATION

E55JA-2

Pre-removal and Post-installation Operation

- Removal and Installation of Rear Roof Rail Trim and Rear Pillar Trim (Refer to GROUP 52 – Trims.)



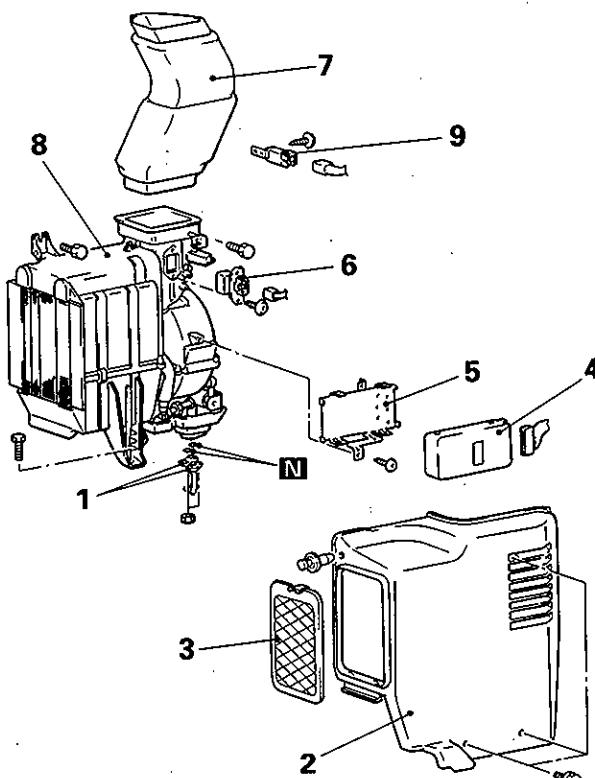
Compressor oil: DENSO OIL 6*¹
ND-OIL 8*²

NOTE

- *¹ : <Vehicles using R-12 refrigerant>
- *² : <Vehicles using R-134a refrigerant>

Removal steps of rear evaporator

- Discharge and charging of refrigerant (Refer to P.55-62, 67.)
- ◆ 1. Connection of suction pipe and discharge pipe
- 2. Cover
- 3. Filter
- 4. Rear cooler amplifier
- 5. Rear cooler amplifier bracket
- 6. Resistor
- 7. Duct
- 8. Rear evaporator
- 9. Rear cooler main relay



Removal steps of rear cooler amplifier

- 2. Cover
- 4. Rear cooler amplifier

Removal steps of resistor

- 2. Cover
- 6. Resistor

SERVICE POINTS OF REMOVAL

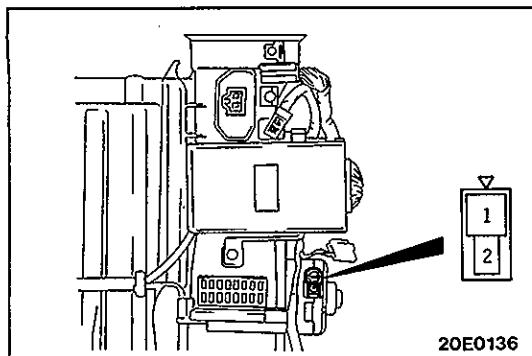
1. DISCONNECTION OF SUCTION PIPE AND DISCHARGE PIPE

If the hoses or pipes are disconnected, cap the hoses or pipes with a blank plug to prevent entry of dust, dirt, and water.

INSPECTION

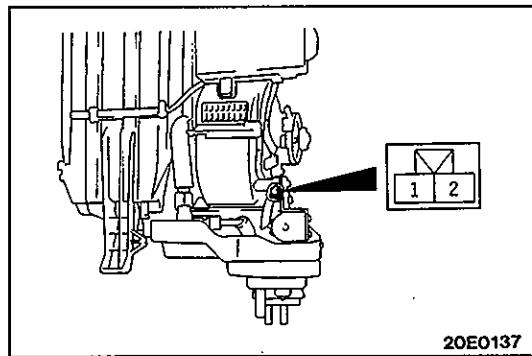
E55JFA1

- Check for damage of the evaporator fin part.
- Check for damage or collapse of the drain hose.
- Check for peeling or cracking of the insulator.



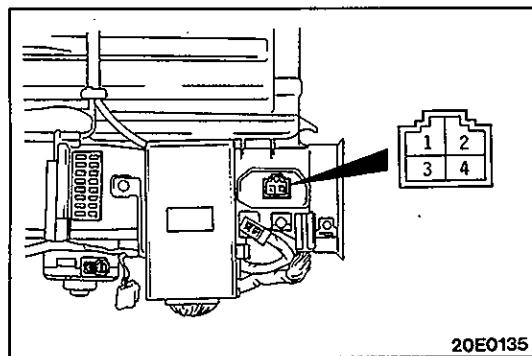
INSPECTION OF BLOWER MOTOR ASSEMBLY

When battery voltage is applied between the terminals, check that the motor turns without making any abnormal noise.



INSPECTION OF MAGNETIC VALVE

When battery voltage is applied to the magnetic valve terminal ① and terminal ② is earthed, the condition is normal if the magnetic valve operating sound can be heard.



INSPECTION OF RESISTOR

Use a circuit tester to measure the resistance between the terminals as shown below. The condition is normal if the measured values are within the standard values.

Measurement terminal	Standard value Ω
Between terminals ②-③	Approx. 0.8
Between terminals ③-④	Approx. 2.98
Between terminals ①-③	Approx. 4.57

SERVICE POINTS OF INSTALLATION

8. INSTALLATION OF REAR EVAPORATOR

When replacing the evaporator, refill the evaporator with a specified amount of compressor oil.

<Vehicles using R-12 refrigerant>

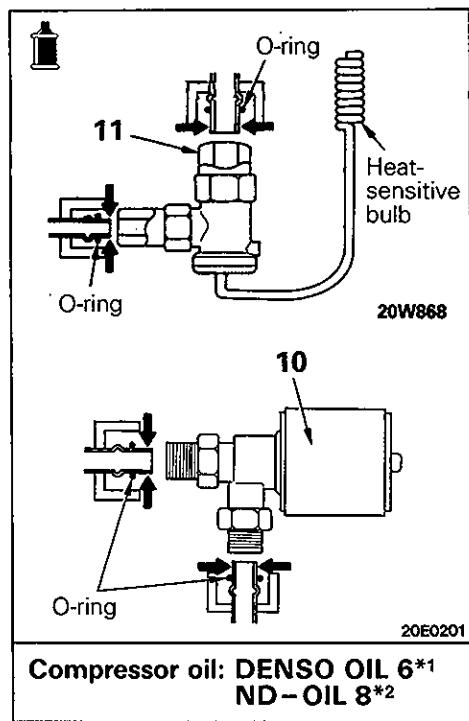
Compressor oil: **DENSO OIL 6**
Quantity: **60 cm³ (3.6 cu.in.)**

<Vehicles using R-134a refrigerant>

Compressor oil: **ND-OIL 8**
Quantity:
Vehicles with single A/C: **40 cm³ (2.4 cu.in.)**
Vehicles with dual A/C: **60 cm³ (2.4 cu.in.)**

DISASSEMBLY AND REASSEMBLY

E55JC-2

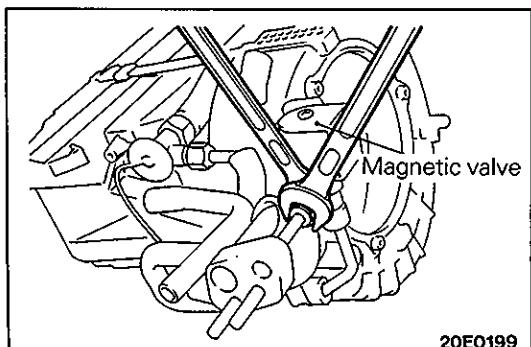
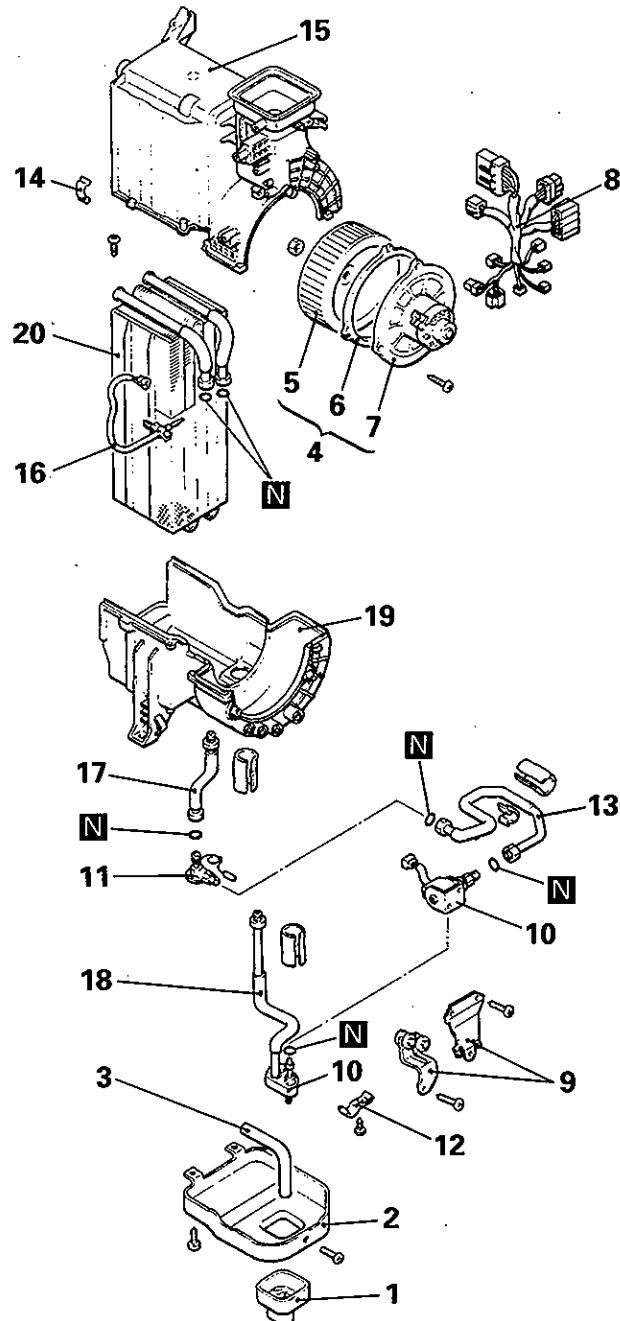


NOTE

*¹ : <Vehicles using R-12 refrigerant>*² : <Vehicles using R-134a refrigerant>

Disassembly steps

1. Grommet
2. Tray
3. Drain hose
4. Blower motor assembly
5. Blower fan
6. Packing
7. Blower motor
8. A/C harness
9. Bracket
10. Magnetic valve
11. Expansion valve
12. Pipe bracket
13. Liquid pipe A
14. Clip
15. Case (upper)
16. Air thermo sensor
17. Liquid pipe B
18. Suction pipe
19. Case (lower)
20. Evaporator

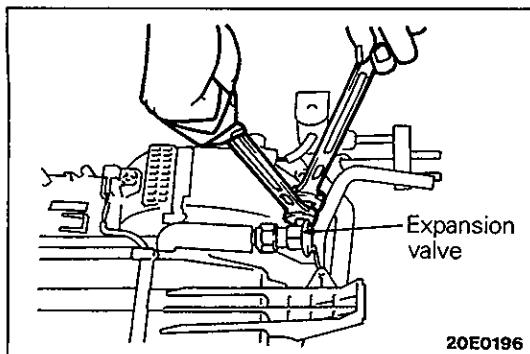


SERVICE POINTS OF DISASSEMBLY

E55JDAG

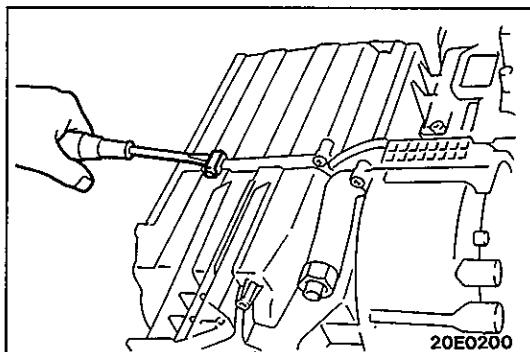
10. REMOVAL OF MAGNETIC VALVE

Use two wrenches to loosen the flare nut on the pipe connection (for both the inlet and outlet).



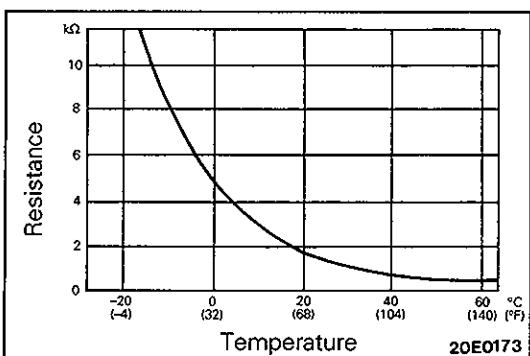
11. REMOVAL OF EXPANSION VALVE

Use two wrenches to loosen the flare nut on the pipe connection (for both the inlet and outlet).



14. REMOVAL OF CLIP

Remove the clips with a screwdriver covered with a shop towel to prevent damage to case surfaces.



INSPECTION

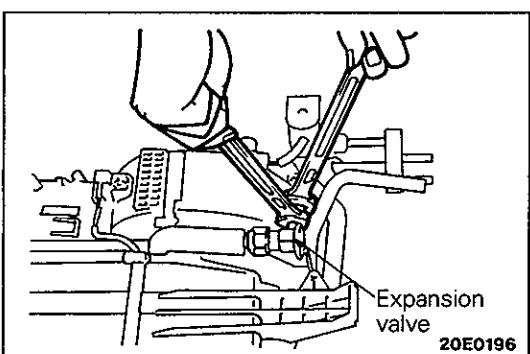
E55JFA1

AIR THERMO SENSOR INSPECTION

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.

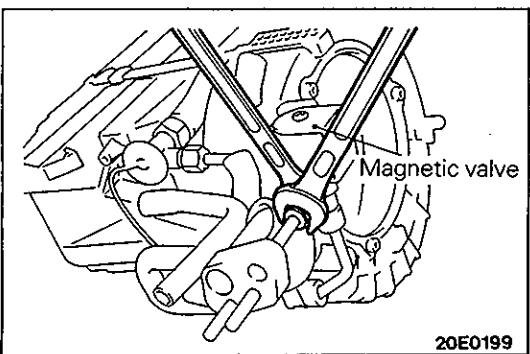


SERVICE POINTS OF REASSEMBLY

E55JEAH

11. INSTALLATION OF EXPANSION VALVE

Use two wrenches to tighten the flare nut on the pipe connection (for both the inlet and outlet).



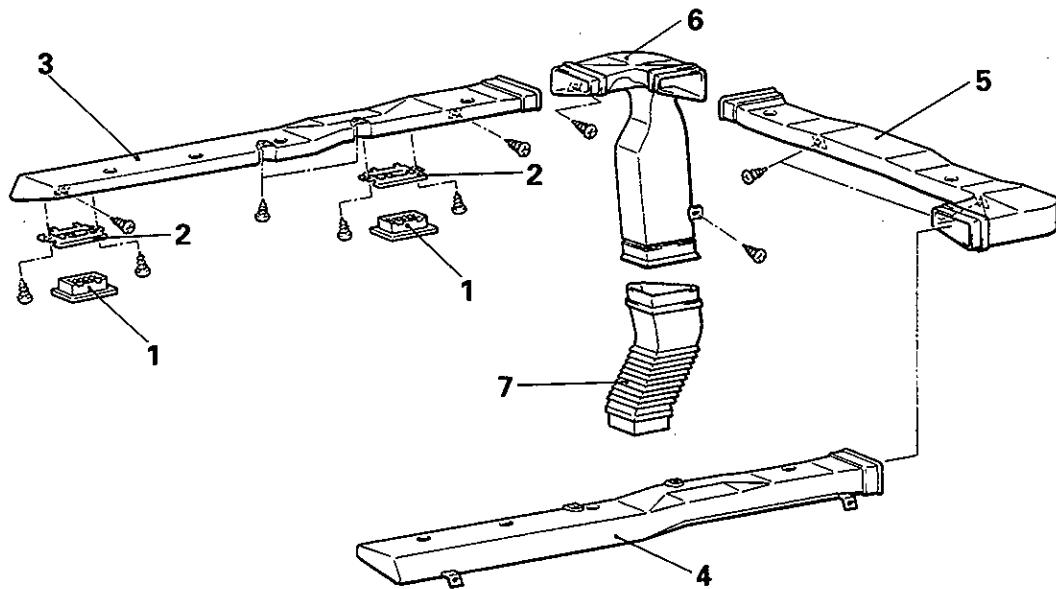
10. INSTALLATION OF MAGNETIC VALVE

Use two wrenches to tighten the flare nut on the pipe connection (for both the inlet and outlet).

REAR VENTILATORS

REMOVAL AND INSTALLATION

E55MA-3



20E0111

Removal steps

1. Air outlet grille
2. Retainer B
- Rear headlining
(Refer to GROUP 52 - Headlining.)
- Front headlining
<Vehicles without sun roof>
(Refer to GROUP 52 - Headlining.)
3. Roof duct assembly (RH)
4. Roof duct assembly (LH)
5. Rear roof duct assembly
6. Pillar duct
7. Duct

ENGINE COOLANT TEMPERATURE SWITCH

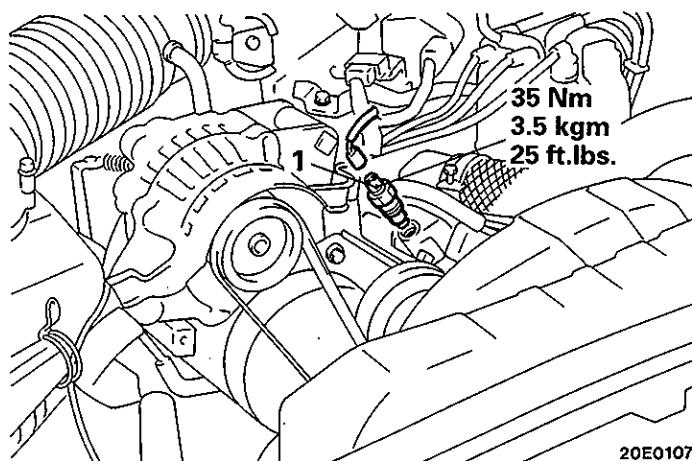
REMOVAL AND INSTALLATION

E55HA-1

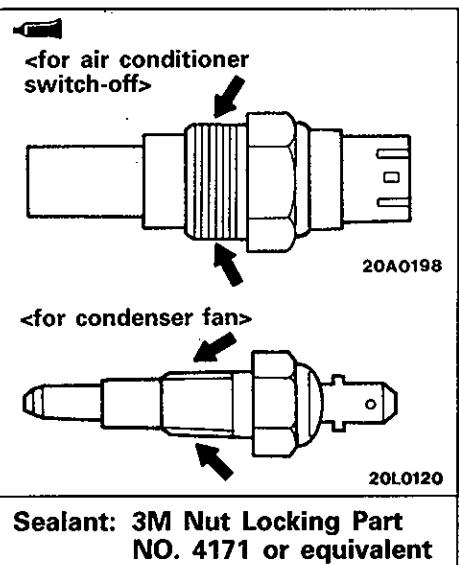
Pre-removal and Post-installation Operation

- (1) Draining and Supplying of Coolant
- (2) Removal and Installation of Intercooler <4D56, 4M40> (Refer to GROUP 15-Intercooler.)

<6G72>

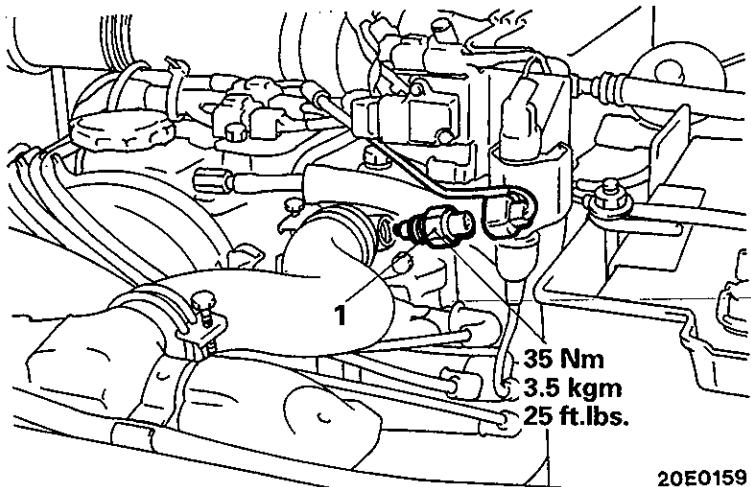


1. Engine coolant temperature switch (for air conditioner switch-off)
2. Engine coolant temperature switch (for condenser fan) <4D46, 4M40>

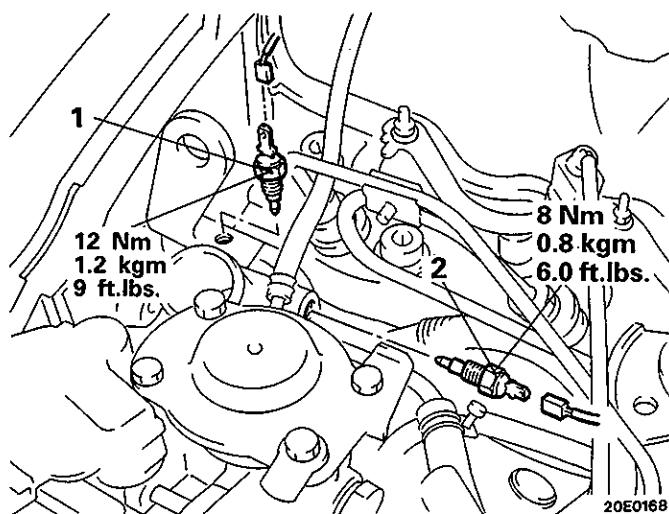


Sealant: 3M Nut Locking Part NO. 4171 or equivalent

<4G64>



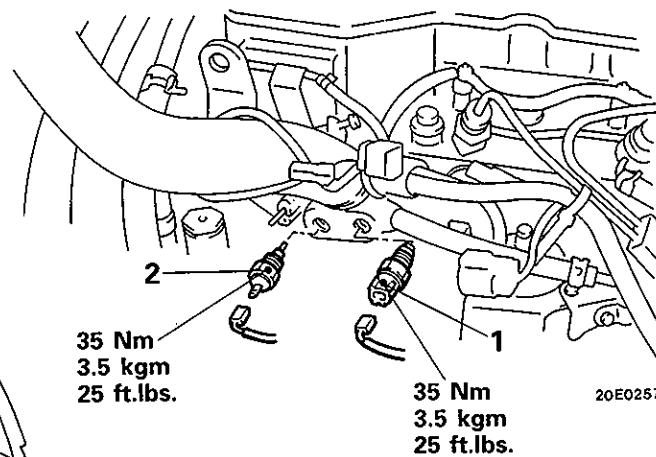
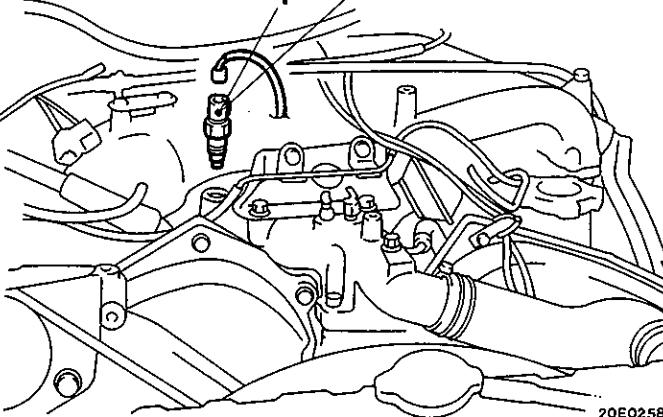
<4D56>



<4M40>

<6G74>

1
35 Nm
3.5 kgm
25 ft.lbs.



INSPECTION

E55HCAO

ENGINE COOLANT TEMPERATURE SWITCH CHECK

<For air conditioner Switch-off>

- (1) Dip the 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: <Except 4D56 engine>

More than 112–118°C (234–244°F)

<4D56>

More than 114–118°C (237–244°F)

<For condenser fan>

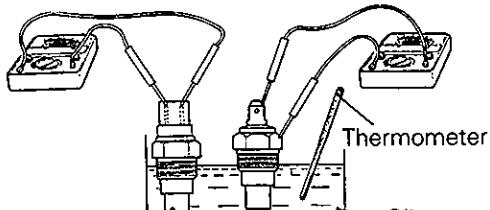
- (1) Dip the engine coolant temperature switch in oil as shown in the illustration.
- (2) Check the continuity with a circuit tester as the temperature of the oil changes, and the condition is normal if the continuity is within the following ranges.

<4D56>

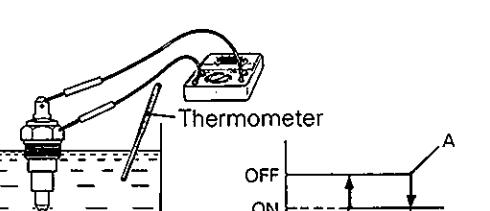
Item	Standard value
Continuity (temperature at point A)	More than 99–105°C (210–221°F)
No continuity (temperature at point B)	Less than 97°C (206°F)

<4M40>

Item	Standard value
Continuity (temperature at point A)	More than 101–105°C (214–221°F)
No continuity (temperature at point B)	Less than 98°C (208°F)

<Except 4D56
engine> 

20E0100

<4D56> 

20R0886 16Y1190

Item

Standard value

More than
99–105°C (210–221°F)

Less than
97°C (206°F)

Standard value

More than
101–105°C (214–221°F)

Less than
98°C (208°F)

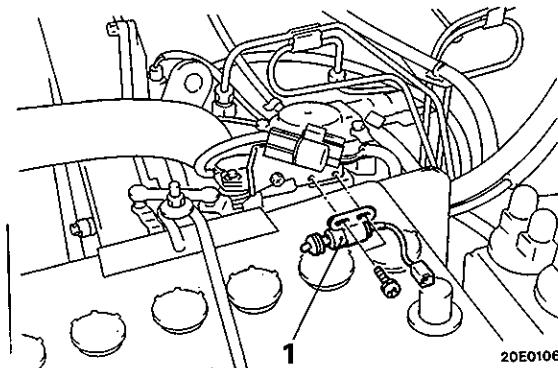
LEVER POSITION SWITCH <4D56-A/T, 4M40-A/T>

REMOVAL AND INSTALLATION

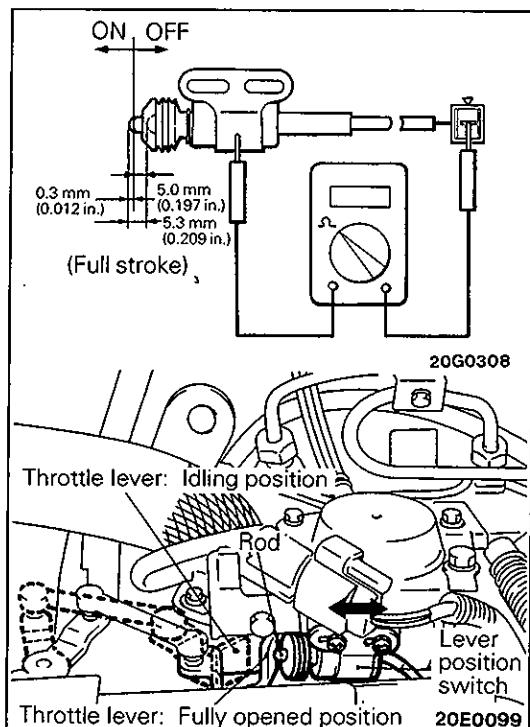
E55HA-2

Pre-removal and Post-installation Operation

- Removal and Installation of Intercooler
(Refer to GROUP 15 – Intercooler.)



► 1. Lever position switch



INSPECTION

E55HCA

INSPECTION OF LEVER POSITION SWITCH

- (1) Connect a circuit tester as shown in the diagram, and check that there is continuity in the section 0.3 mm (0.012 in.) from the full length (full stroke), and that there is no continuity for the remainder of the stroke (5.0 mm [0.197 in.]).
- (2) If there is a defect, replace the component.

SERVICE POINT OF INSTALLATION

E55HD

INSTALLATION OF LEVER POSITION SWITCH

- ① Check that the idle speed is at the standard value, and adjust it if necessary.

Standard value: 750 ± 100 r/min

- ② Adjust the accelerator cable.
- ③ Depress the accelerator pedal fully to fully open the throttle lever of the fuel injection pump.

Caution

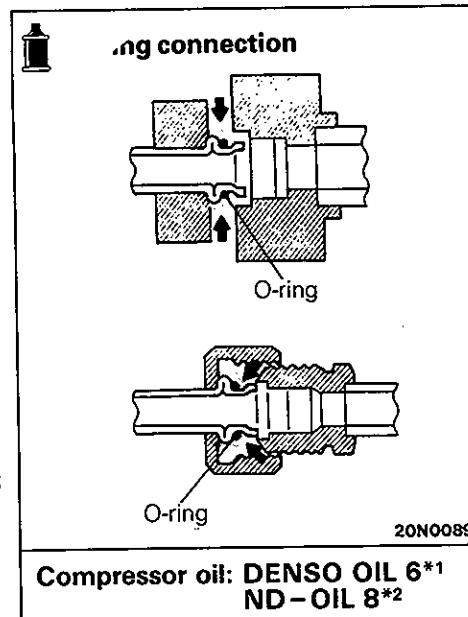
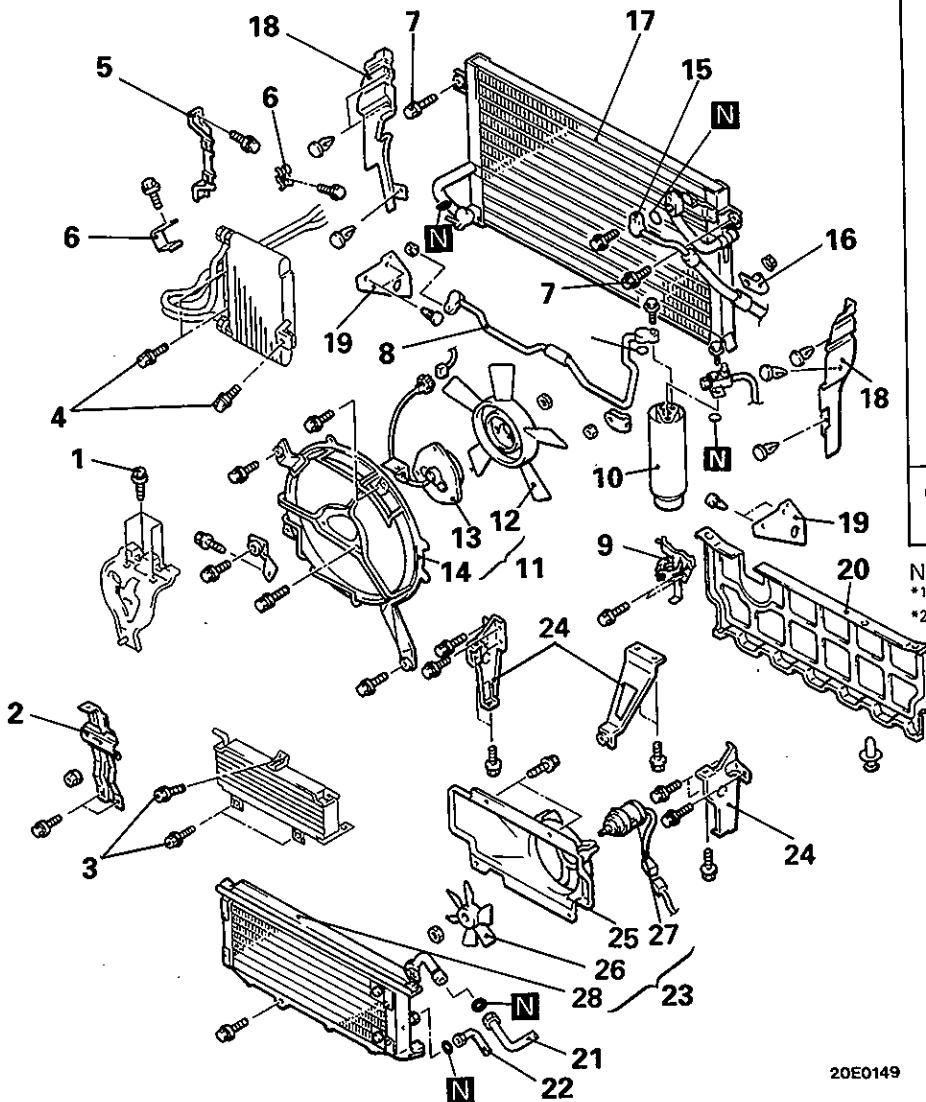
When fully opening the throttle lever of the fuel injection pump, always open it by the accelerator pedal, not from the injection pump side.

- ④ Adjust the stroke of the lever position switch rod by moving the lever position switch so that the rod is pushed down 4 ± 1 mm (0.16 ± 0.04 in.) from the free position.

CONDENSER AND CONDENSER FAN

REMOVAL AND INSTALLATION

E55NA-1



Compressor oil: DENSO OIL 6*¹
ND-OIL 8*²

NOTE

- *¹ : <Vehicles using R-12 refrigerant>
- *² : <Vehicles using R-134a refrigerant>

Removal steps of condenser and condenser fan

1. Hood latch bracket assembly mounting bolt
2. Hood latch stay
3. A/T oil cooler mounting bolt <AT>
4. Engine oil cooler mounting bolt
5. Engine oil cooler bracket
6. Bracket
7. Condenser mounting bolt
8. Discharge pipe A
9. Receiver bracket
10. Receiver
11. Condenser fan motor assembly
12. Fan
13. Motor
14. Shroud
15. Connection for discharge hose
16. Discharge hose bracket
17. Condenser
18. Headlamp side seal
19. Frame side seal
20. Under seal

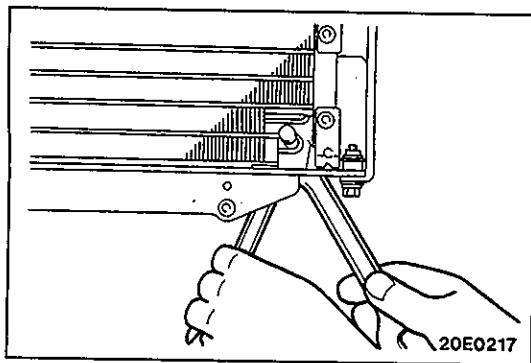
<Vehicles with condenser fan>

Pre-removal and Post-installation Operation

- (1) Discharge and Charging of Refrigerant (Refer to P.55-62, 67, 67-1, 67-4.)
- (2) Removal and Installation of Radiator Grille

Removal steps of sub-condenser fan
<Vehicles with sub-condenser fan>

- Removal and installation of skid plate
- 21. Discharge pipe D connection
- 22. Discharge pipe E connection
- 23. Sub-condenser assembly
- 24. Sub-condenser bracket
- 25. Sub condenser shroud
- 26. Sub condenser fan
- 27. Sub condenser motor
- 28. Sub-condenser



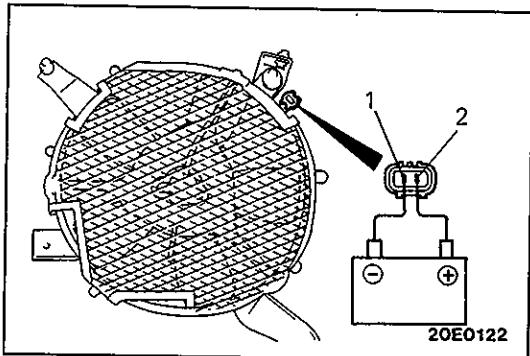
SERVICE POINTS OF REMOVAL

E55NBAN

21. CONNECTION OF DISCHARGE PIPE D/22. CONNECTION OF DISCHARGE PIPE E

Caution

Remove the discharge pipes D and E with connected portions fixed by using spanners, etc. so that excessive force will not be applied to the discharge pipe for the sub-condenser connected portion.

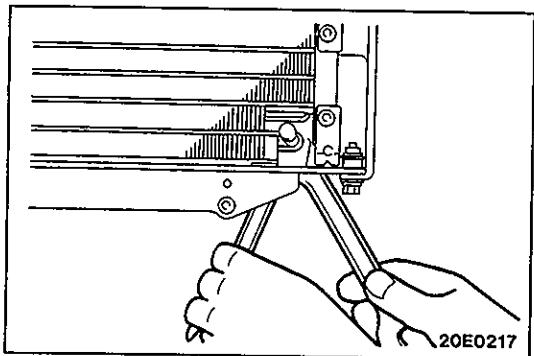
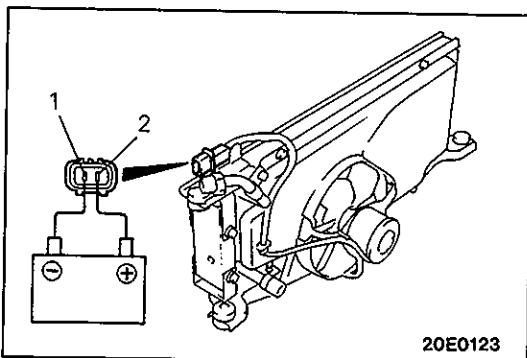


INSPECTION

E55NEAC

INSPECTION OF CONDENSER FAN MOTOR AND SUB CONDENSER FAN MOTOR

When battery voltage is applied to the terminal (2) and terminal (1) is earthed, check that the condenser fan motor turns.



SERVICE POINTS OF INSTALLATION

E55NDAH

22. CONNECTION OF DISCHARGE PIPE E/21. CONNECTION OF DISCHARGE PIPE D

Caution

Remove the discharge pipes D and E with connected portions fixed by using spanners, etc. so that excessive force will not be applied to the discharge pipe for the sub-condenser connected portion.

17. INSTALLATION OF CONDENSER

When replacing the condenser, refill the condenser with a specified amount of compressor oil.

<Vehicles using R-12 refrigerant>

Compressor oil: DENSO OIL 6
Quantity: 30 cm³ (1.8 cu.in.)

<Vehicles using R-134a refrigerant>

Compressor oil: ND-OIL 8
Quantity:

Vehicles with single A/C: 40 cm³ (2.4 cu.in.)
Vehicles with dual A/C: 30 cm³ (1.8 cu.in.)

REFRIGERANT LINE

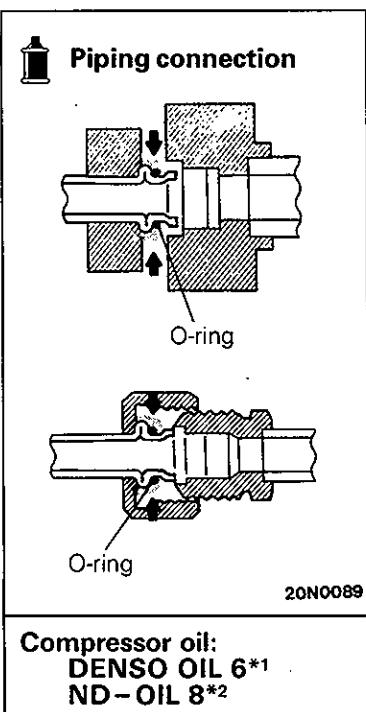
REMOVAL AND INSTALLATION

E55NA-2

Pre-removal and Post-installation

Operation

- Discharge and Charging of Refrigerant
(Refer to P.55-62, 67, 67-1, 67-4.)

Single air conditioner
<R.H. drive vehicles>

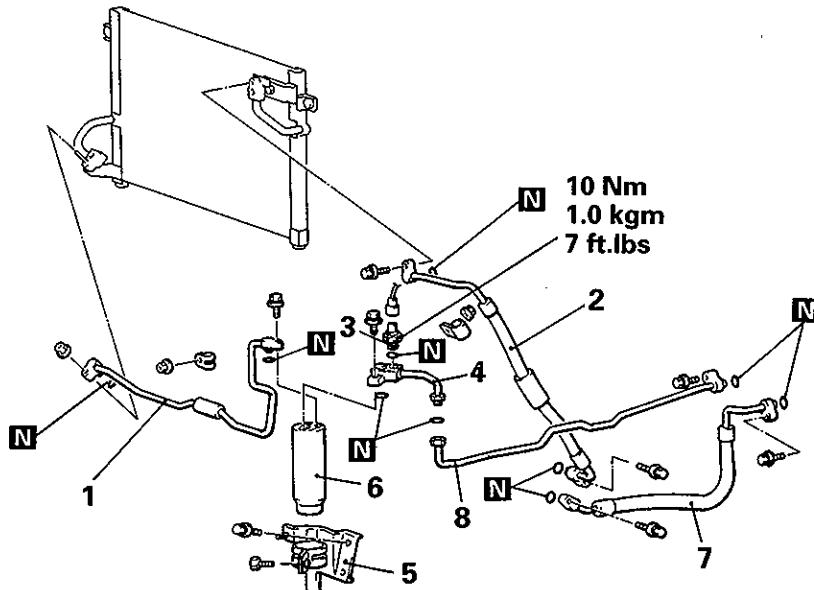
Compressor oil:
DENSO OIL 6*¹
ND-OIL 8*²

NOTE

*¹ : <Vehicles using R-12 refrigerant>

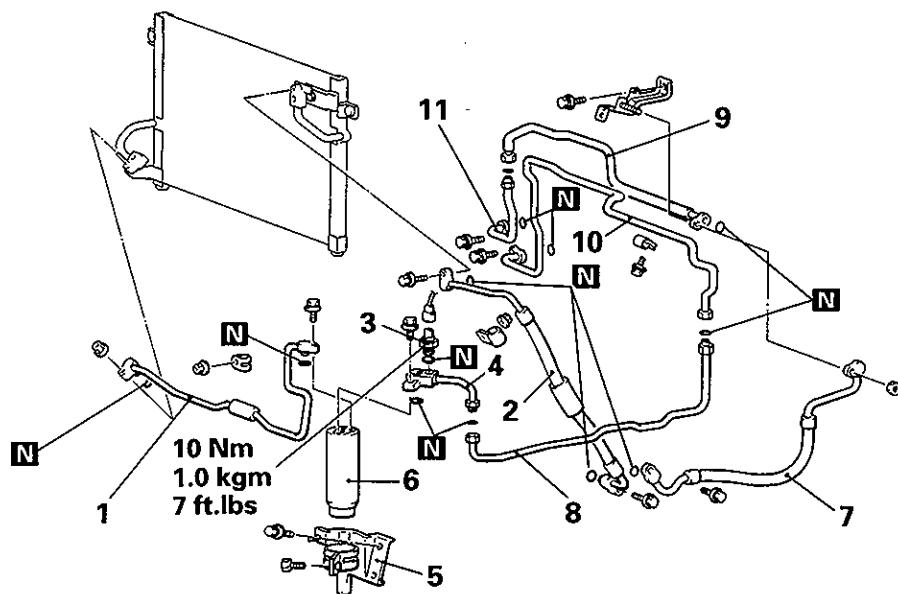
*² : <Vehicles using R-134a refrigerant>

<L.H. drive vehicles>

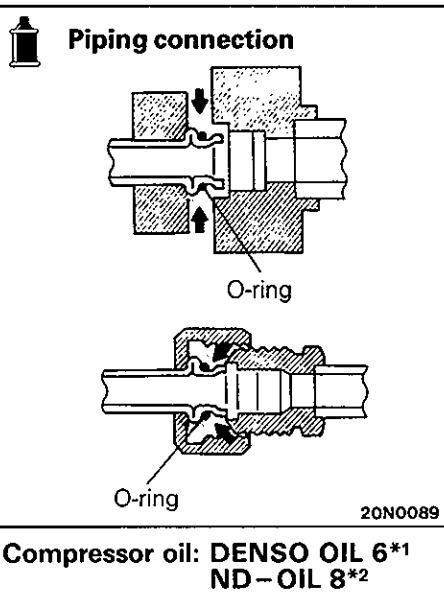
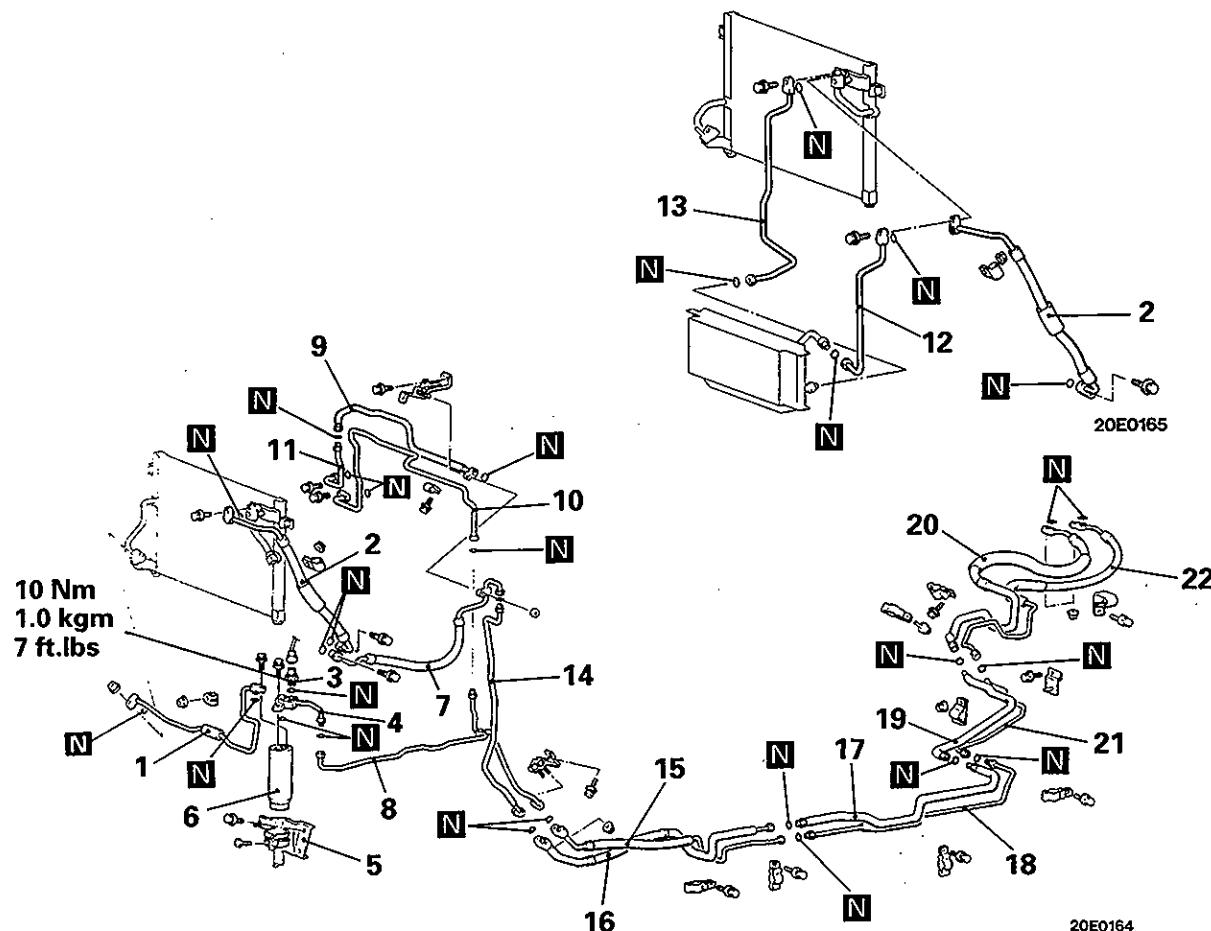


Removal steps

1. Discharge pipe A
2. Discharge hose
3. Dual pressure switch
4. Discharge pipe B
5. Receiver bracket
6. Receiver
7. Suction hose
8. Discharge pipe C
● Link bracket
(Refer to GROUP 13 – Auto-cruise.)
<L.H. drive vehicles with automatic
cruise control>
9. Suction pipe A
10. Discharge pipe D
11. Suction pipe B



Dual air conditioner
<L.H. drive vehicles>



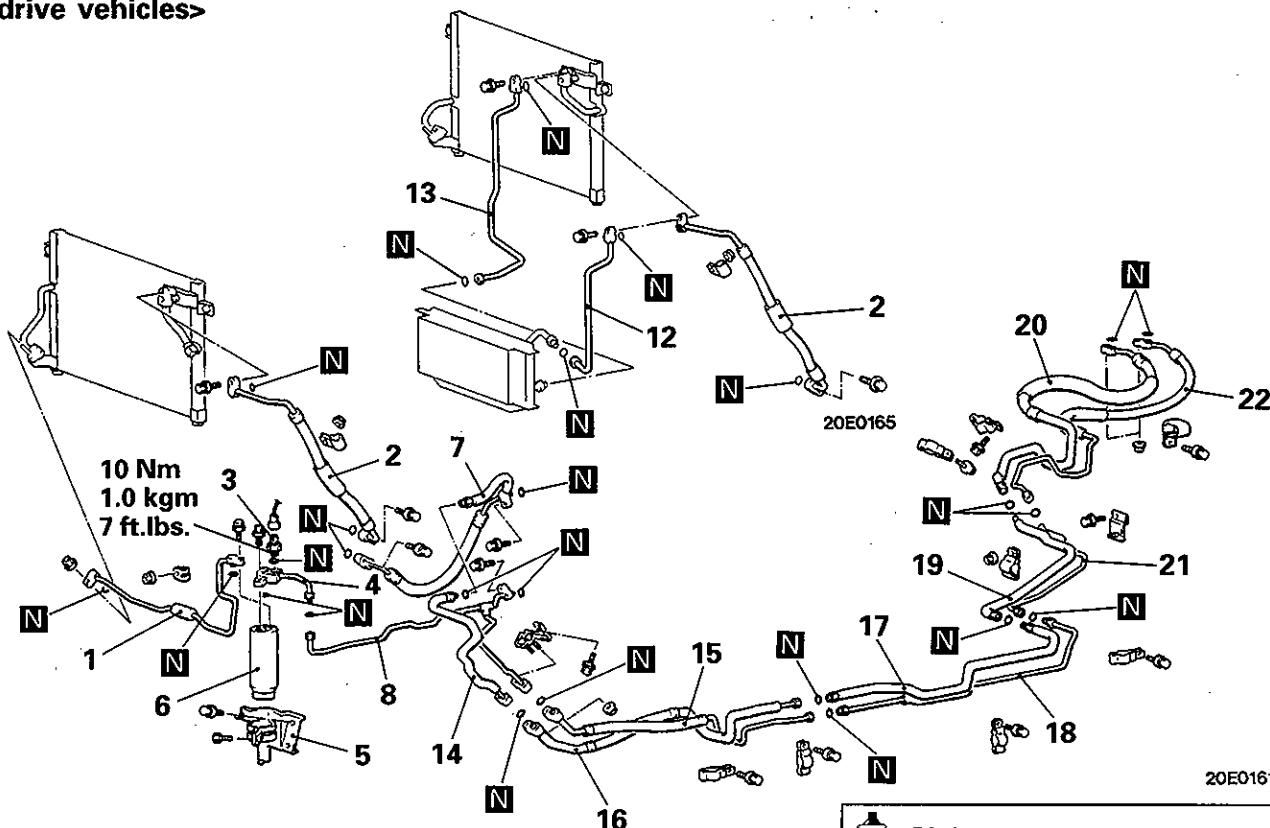
NOTE

*¹ : <Vehicles using R-12 refrigerant>
 *² : <Vehicles using R-134a refrigerant>

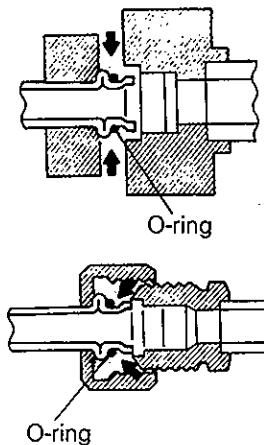
Removal steps

1. Discharge pipe A
2. Discharge hose
3. Dual pressure switch
4. Discharge pipe B
5. Receiver bracket
6. Receiver
7. Suction hose
8. Discharge pipe C
9. Suction pipe A
10. Discharge pipe D
11. Suction pipe B
12. Discharge pipe E <4D56>
13. Discharge pipe F <4D56>
14. Suction pipe C
15. Discharge pipe G
16. Suction pipe D
17. Suction pipe E
18. Discharge pipe H
19. Suction pipe F
20. Suction hose A
21. Discharge hose I
22. Discharge hose A

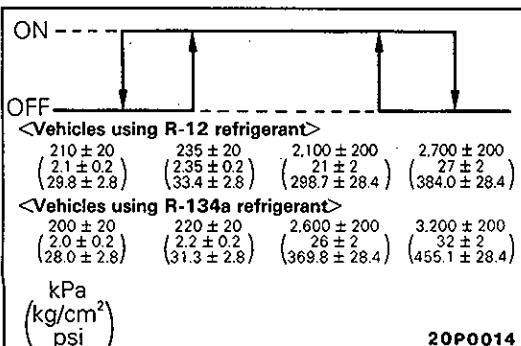
<R.H. drive vehicles>

**Removal steps**

1. Discharge pipe A	14. Suction pipe C
2. Discharge hose	15. Discharge pipe G
3. Dual pressure switch	16. Suction pipe D
4. Discharge pipe B	17. Suction pipe E
5. Receiver bracket	18. Discharge pipe H
6. Receiver	19. Suction pipe F
7. Suction hose	20. Suction hose A
8. Discharge pipe C	21. Discharge pipe I
12. Discharge pipe E <4D56>	22. Discharge pipe A
13. Discharge pipe F <4D56>	

Piping connection

20N0089

**Compressor oil: DENSO OIL 6*¹
ND-OIL 8*²****NOTE***¹ : <Vehicles using R-12 refrigerant>*² : <Vehicles using R-134a refrigerant>**INSPECTION**

E55NEAB

DUAL PRESSURE SWITCH CHECK

Measure the pressure at the high pressure side. When the dual pressure switch is ON as in the figure at left, and if there is continuity between the dual pressure switch terminals, then the condition is normal; if there is no continuity, replace the switch.

COMPRESSOR AND TENSION PULLEY

REMOVAL AND INSTALLATION

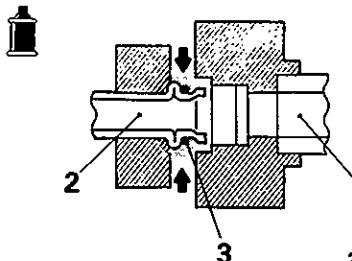
E55LA--

Pre-removal Operation

- Removal of Battery and Battery Tray
- Removal of Radiator Shroud Cover <6G72, 6G74, 4D56, 4M40> (Refer to GROUP 14–Radiator)
- Removal of Steering Shaft Joint Assembly <4M40–L.H. drive vehicles> (Refer to GROUP 37–Steering Column and Shaft)

Post-installation Operation

- Adjustment of the Compressor Drive Belt (Refer to P.55-62.)
- Installation of the Radiator Shroud Cover <6G72, 6G74, 4D56, 4M40> (Refer to GROUP 14–Radiator)
- Installation of the Battery and Battery Tray
- Installation of Steering Shaft Joint Assembly <4M40–L.H. drive vehicles> (Refer to GROUP 37–Steering Column and Shaft)



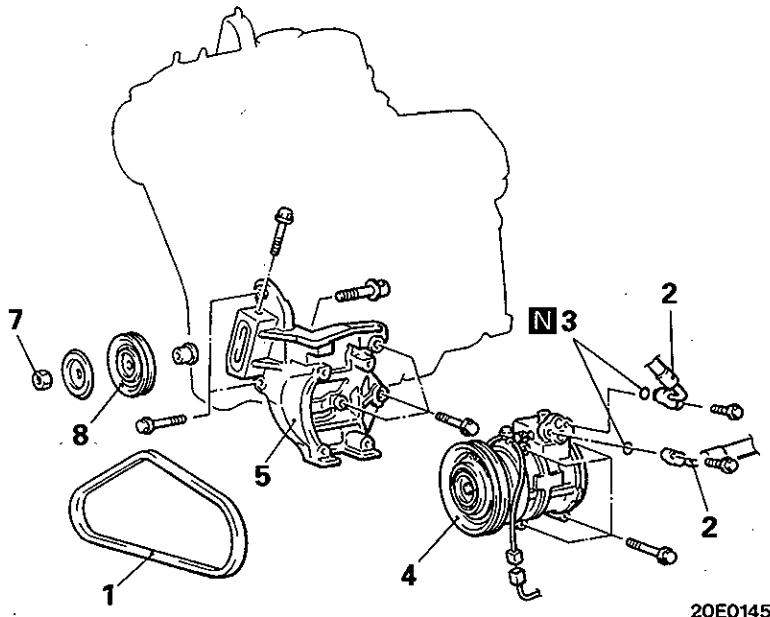
20N0089

**Compressor oil: DENSO OIL 6*¹
ND – OIL 8*²**

NOTE

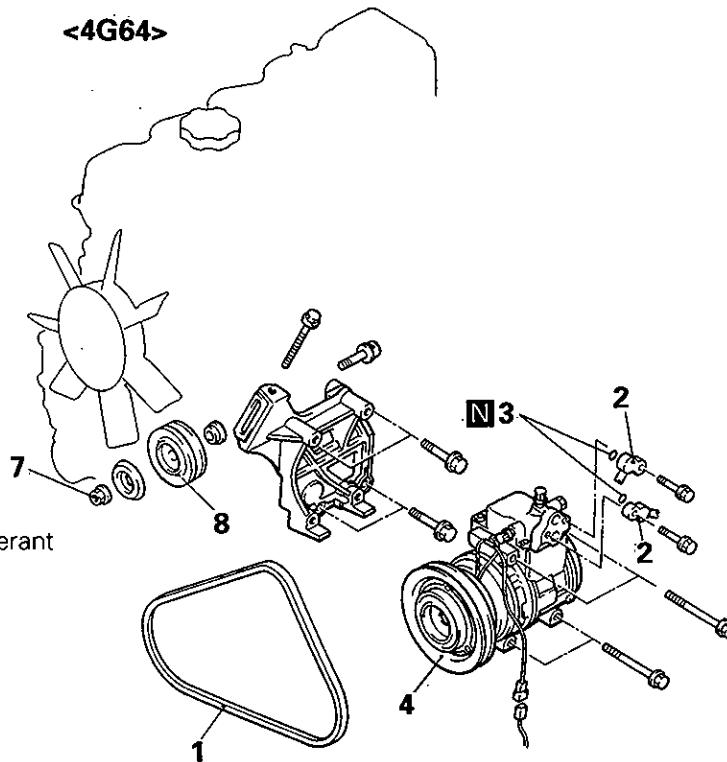
*¹ : <Vehicles using R-12 refrigerant>*² : <Vehicles using R-134a refrigerant>

<6G72, 6G74>



20E0145

<4G64>



20E0204

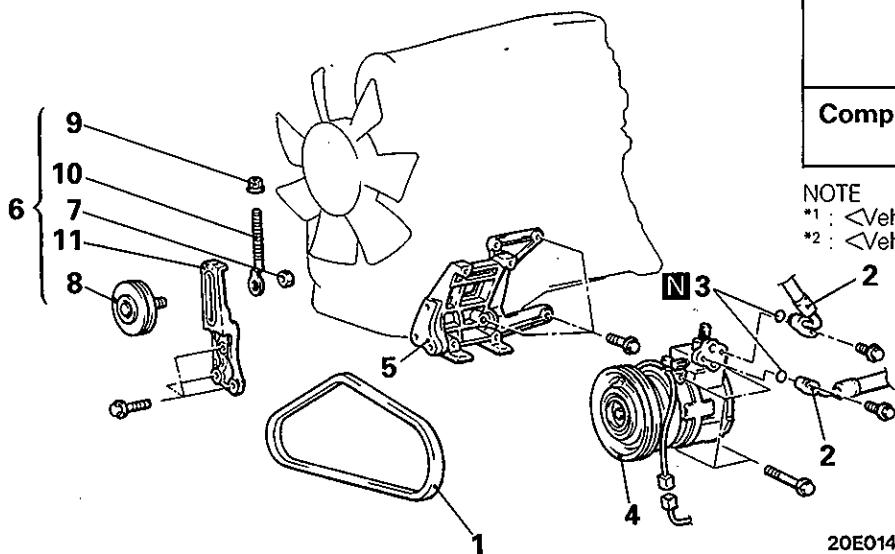
Removal steps of compressor

- Discharging and Charging of Refrigerant (Refer to P.55-62, 67, 67-1, 67-4.)
- 1. V-belt for A/C
- 2. Connection for discharge hose and suction hose
- 3. O-ring
- 4. Compressor
- 5. Compressor bracket

Removal steps of tension pulley

1. V-belt for A/C
7. Tension pulley mounting nut
8. Tension pulley

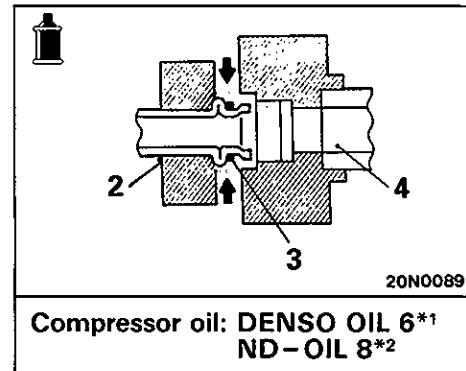
<4D56, 4M40>



Removal steps of compressor

Discharging and Charging of Refrigerant (Refer to P.55-62, 67, 67-1, 67-4.)

- ◀◀ 1. V-belt for A/C
- 2. Connection for discharge hose and suction hose
- 3. O-ring
- ◀◀ ▶▶ 4. Compressor
- 5. Compressor bracket



Compressor oil: DENSO OIL 6*¹
ND-OIL 8*²

NOTE

*1 : <Vehicles using R-12 refrigerant>

*2 : <Vehicles using R-134a refrigerant>

Removal steps of compressor pulley

1. V-belt for A/C
6. Tension pulley bracket assembly
7. Tension pulley mounting nut
8. Tension pulley
9. Adjusting bolt
10. Adjusting bolt
11. Tension pulley bracket

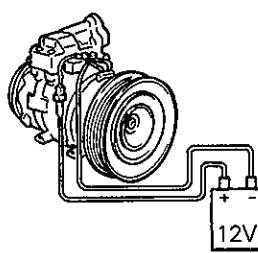
SERVICE POINTS OF REMOVAL

2. DISCONNECTION OF DISCHARGE HOSE AND SUCTION HOSE

If the hoses are disconnected, cap the hoses with a blank plug to prevent entry of dust, dirt, and water.

4. REMOVAL OF COMPRESSOR <4M40>

- (1) Remove the power steering oil pump with the hose still connected, and place it somewhere where it will not be in the way while working.
(Refer to GROUP 37-Power Steering Oil Pump)
- (2) Affix insulation tape to the brake pipe under the battery tray to protect the brake pipe.



INSPECTION

E55LGAF

COMPRESSOR MAGNETIC CLUTCH OPERATION INSPECTION

Connect the battery (+) terminal to the compressor side terminal, and earth the battery (-) terminal to the body of the compressor. The condition is normal if the sound of the magnetic clutch (click) can be heard.

SERVICE POINTS OF INSTALLATION

4. INSTALLATION OF COMPRESSOR

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 cm³ (X cu.in.)] of oil within the removed compressor.
- (2) Wipe away (from the new compressor) the amount of oil calculated according to the following formula, and then install the new compressor.

Amount of oil in new compressor:

$$80 \text{ cm}^3 (4.9 \text{ cu.in.})^{*1} \\ 150 \text{ cm}^3 (9.2 \text{ cu.in.})^{*2} \} - X \text{ cm}^3 (X \text{ cu.in.}) = Y \text{ cm}^3 (Y \text{ cu.in.})$$

NOTE

- (1) *1 : Compressor for single A/C
- (2) *2 : Compressor for dual A/C
- (3) Y cm³ (Y cu.in.) indicates the amount of oil in the refrigerant line, the condenser, the cooling unit, etc.
- (4) If replacing any of the following parts at the same time as the compressor, subtract the specified amount of oil for each of the parts from Y cm³ (Y cu.in.), and then remove this amount of oil from the new compressor.

Quantity:

<Vehicles using R-12 refrigerant>

Evaporator	60 cm ³ (3.6 cu.in.)
Condenser	30 cm ³ (1.8 cu.in.)
Suction hose	10 cm ³ (0.6 cu.in.)
Receiver	10 cm ³ (0.6 cu.in.)

<Vehicles using R-134a refrigerant>

● Compressor for single A/C

Evaporator	40 cm ³ (2.4 cu.in.)
Condenser	40 cm ³ (2.4 cu.in.)
Suction hose	10 cm ³ (0.6 cu.in.)
Receiver	10 cm ³ (0.6 cu.in.)

● Compressor for dual A/C

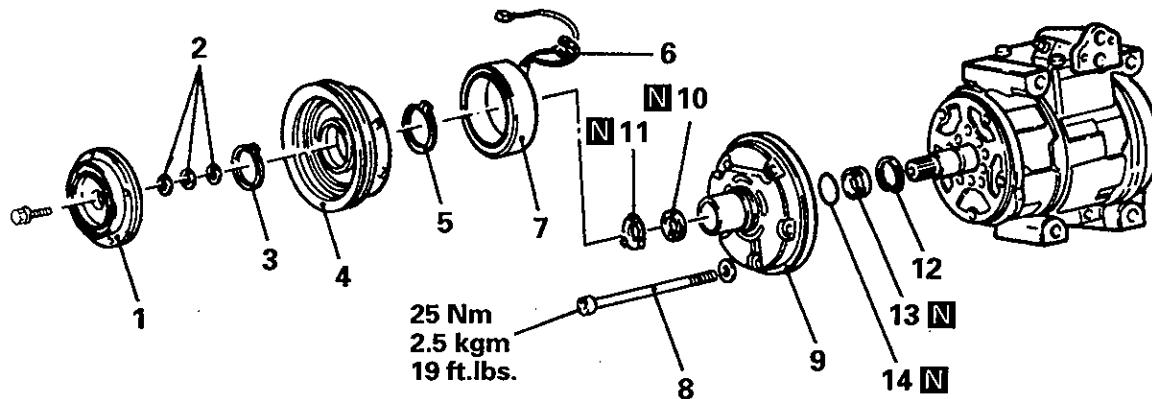
Evaporator	60 cm ³ (3.6 cu.in.)
Condenser	30 cm ³ (1.8 cu.in.)
Suction hose	10 cm ³ (0.6 cu.in.)
Receiver	10 cm ³ (0.6 cu.in.)

- (5) Install the compressor with the compressor mounting bolts attached to the compressor
<4D56, 4M40>

NOTES

DISASSEMBLY AND REASSEMBLY

E55LB--



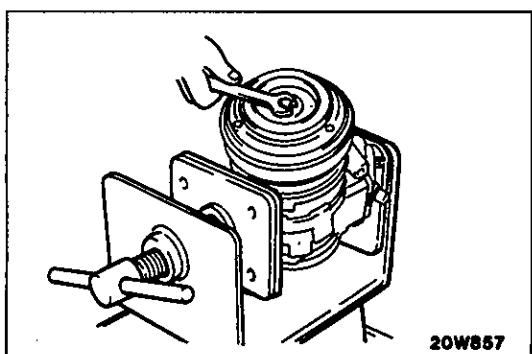
20W856

Magnetic clutch disassembly steps

- Adjustment of clutch clearance
- 1. Clutch hub
- 2. Shims
- 3. Snap ring
- 4. Rotor assembly
- 5. Snap ring
- 6. Ground terminal
- 7. Clutch coil

Compressor front housing and shaft seal disassembly steps

- 8. Through bolt
- 9. Front housing
- 10. Felt
- 11. Felt holder
- 12. Snap ring
- 13. Shaft seal
- 14. O-ring



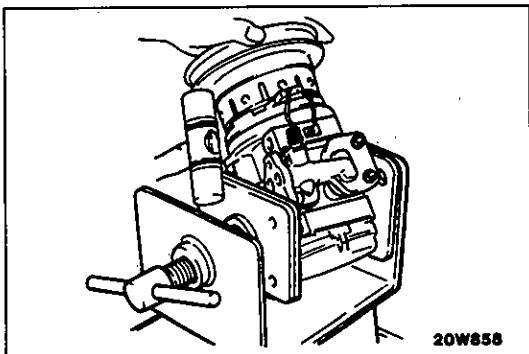
20W857

SERVICE POINTS OF DISASSEMBLY

E55LCAG

1. REMOVAL OF CLUTCH HUB

- (1) Secure the compressor in a vise.
- (2) If the clutch hub cannot be pulled off by hand, screw in an 8 mm (0.315 in.) completely threaded bolt so as to raise the clutch hub so it can be removed.



4. REMOVAL OF ROTOR ASSEMBLY

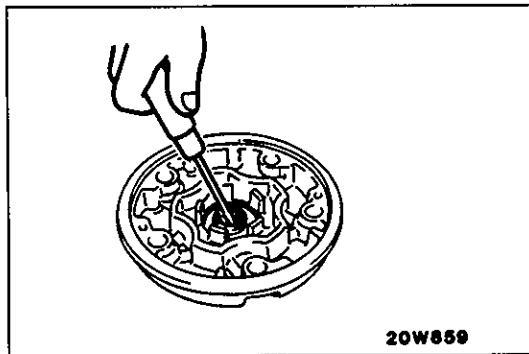
Using a plastic hammer, lightly tap the rotor off the shaft.

8. REMOVAL OF THROUGH BOLT

Remove the through bolt after first securing the rear housing of the compressor by placing it in a vise.

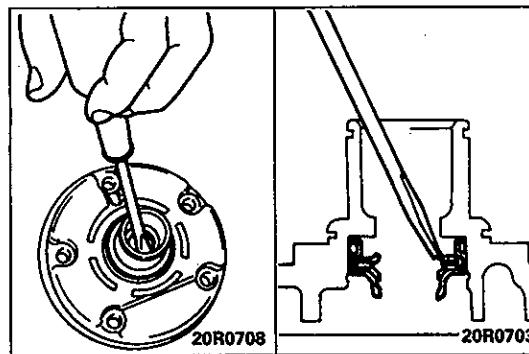
Caution

If the through bolt is removed without first doing so, the rear housing will become uncoupled and compressor oil will escape.



10. REMOVAL OF FELT

Using a screwdriver, remove the felt from the front housing.



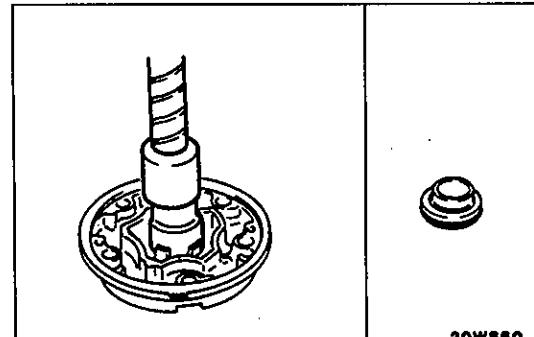
13. REMOVAL OF SHAFT SEAL

Using a screwdriver, remove the shaft seal from the front housing.

INSPECTION

E55LDAE

- 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.



SERVICE POINTS OF REASSEMBLY

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13. INSTALLATION OF SHAFT SEAL

- (1) Lubricate the shaft seal with specified compressor oil.

Specified compressor oil:

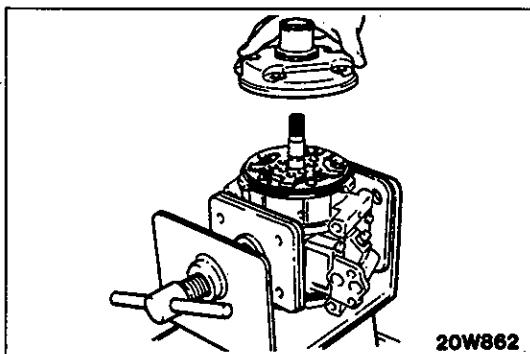
<Vehicles using R-12 refrigerant>

DENSO OIL 6

<Vehicles using R-134a refrigerant>

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) Using a 21 mm (0.83 in.) socket, install the shaft seal.



9. INSTALLATION OF FRONT HOUSING

- Apply the specified compressor oil on the shaft.

Specified compressor oil:

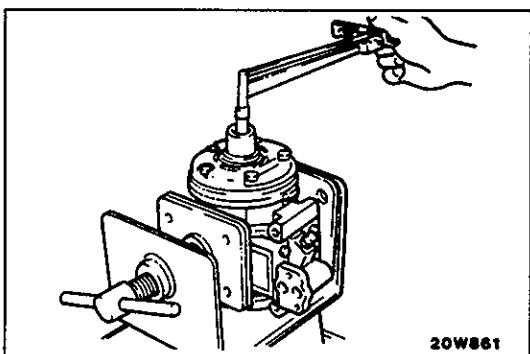
⟨Vehicles using R-12 refrigerant⟩

DENSO OIL 6

⟨Vehicles using R-134a refrigerant⟩

ND-OIL 8

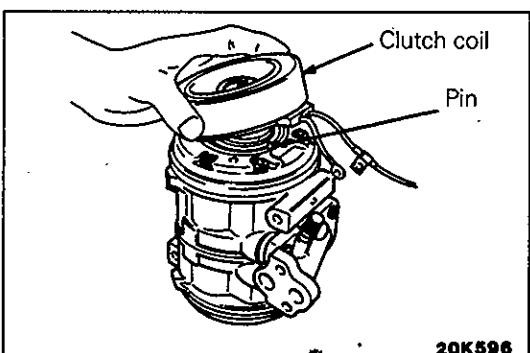
- Install the front housing, taking care not to damage the lip part of the shaft seal.



- Mount the bolt on the shaft, and then measure the shaft starting torque.

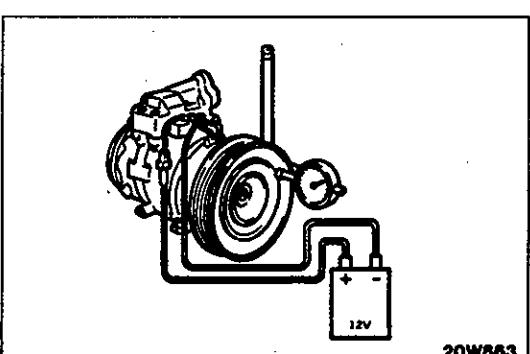
Standard value: 5.0 Nm (0.5 kgm, 3.6 ft.lbs.) or less

- Remove the bolt from the shaft.



7. INSTALLATION OF CLUTCH COIL

The clutch coil must be aligned with the pin in the compression housing.



• ADJUSTMENT OF CLUTCH CLEARANCE

- Connect the magnetic clutch to the battery.
- The clutch hub will be attracted to and fit closely to the rotor.
- 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
(0.0138–0.0256 in.)**