

# AUTOMATIC AIR CONDITIONER

## SYSTEM OUTLINE

### 1. HEATER BLOWER MOTOR OPERATION

CURRENT IS APPLIED AT ALL TIMES THROUGH **HEATER FUSE (60A)** TO **TERMINAL 5** OF HEATER RELAY. WHEN THE IGNITION SW IS TURNED ON, CURRENT FLOWS THROUGH **HEATER FUSE (10A)** TO **TERMINAL 1** OF HEATER RELAY → **TERMINAL 3** → **TERMINAL HR** OF A/C CONTROL ASSEMBLY. AT THE SAME TIME, CURRENT ALSO FLOWS FROM **HEATER FUSE (10A)** TO **TERMINAL IG+** OF A/C CONTROL ASSEMBLY AND **TERMINAL 2** OF WATER VALVE VSV → **TERMINAL 1** → **TERMINAL WV** OF A/C CONTROL ASSEMBLY.

#### \* LOW SPEED OPERATION

WHEN THE BLOWER SW (A/C CONTROL ASSEMBLY) IS PUSHED TO **LOW SPEED** POSITION, THE CURRENT TO **TERMINAL HR** OF A/C CONTROL ASSEMBLY FLOWS TO **TERMINAL E** OF A/C CONTROL ASSEMBLY → **GROUND** AND TURNS THE HEATER RELAY. AS A RESULT, THE CURRENT TO **TERMINAL 5** OF HEATER RELAY FLOWS TO **TERMINAL 4** OF RELAY → **TERMINAL 2** OF BLOWER RESISTOR → **TERMINAL 1** → **GROUND** AND CAUSES THE BLOWER MOTOR TO ROTATE AT LOW SPEED.

#### \* MEDIUM (M1, M2, M3) AND HIGH SPEED OPERATION

WHEN THE BLOWER SW (A/C CONTROL ASSEMBLY) IS SELECTED TO **MEDIUM (M1, M2, M3)** OR **HIGH** POSITION, THE CURRENT TO **TERMINAL HR** OF A/C CONTROL ASSEMBLY FLOWS TO **TERMINAL E** → **GROUND** AND TURNS THE HEATER RELAY ON. THEN, THE CURRENT TO **TERMINAL IG+** OF A/C CONTROL ASSEMBLY FLOWS TO **TERMINAL BLR** → **TERMINAL (B)2** OF POWER TRANSISTOR → **TERMINAL (A)1** → **GROUND**. AS A RESULT, THE CURRENT TO **TERMINAL 5** OF HEATER RELAY FLOWS TO **TERMINAL 4** → **TERMINAL 2** OF BLOWER MOTOR → **TERMINAL 1** → **TERMINAL (A)2** OF POWER TRANSISTOR → **TERMINAL (A)1** → **GROUND** AND BLOWER MOTOR IS ROTATED AT SELECTED SPEED BY THE A/C CONTROL ASSEMBLY CONTROLLING THE CURRENT FLOW FROM **TERMINAL (B)2** OF POWER TRANSISTOR TO **TERMINAL (B)1**.

#### \* AUTO FUNCTION

WHEN THE AUTO SW IN HEATER CONTROL SW (A/C CONTROL ASSEMBLY) IS SELECTED, THE CURRENT FLOW IS THE SAME AS ABOVE MENTIONS, BUT THE A/C CONTROL ASSEMBLY DECIDES THE APPROPRIATE AIR FLOW VOLUME ACCORDING TO SET TEMPERATURE AND THE INPUT SIGNALS FROM EACH SENSOR. BY CONTROLLING THE CURRENT FLOW FROM **TERMINAL BLR** OF THE A/C CONTROL ASSEMBLY TO **TERMINAL (B)2** OF POWER TRANSISTOR → **TERMINAL (A)1** → **GROUND**, THE A/C CONTROL ASSEMBLY CONTROLS THE BLOWER MOTOR STEPLESSLY.

### 2. OPERATION OF AIR INLET CONTROL SERVO MOTOR

(SWITCHING FROM FRESH TO RECIRC)

WITH IGNITION SW TURNED ON, THE CURRENT FLOWS FROM **HEATER FUSE (10A)** TO **TERMINAL IG+** OF A/C CONTROL ASSEMBLY → **TERMINAL MREC** → **TERMINAL 6** OF AIR INLET CONTROL SERVO MOTOR → **TERMINAL 2** → **TERMINAL MFRS** OF A/C CONTROL ASSEMBLY → **TERMINAL E** → **GROUND**, THE MOTOR ROTATES AND THE DAMPER MOVES TO THE RECIRC SIDE. WHEN THE DAMPER OPERATES WITH THE A/C SW AT **RECIRC** POSITION, THE **DAMPER** POSITION SIGNAL IS INPUT FROM **TERMINAL 5** OF THE SERVO MOTOR TO **TERMINAL TPI** OF THE ECU (BUILT INTO THE A/C CONTROL ASSEMBLY). AS A RESULT, CURRENT TO THE SERVO MOTOR CIRCUIT IS CUT OFF BY THE ECU, SO THE DAMPER STOPS AT THAT POSITION.

(SWITCHING FROM RECIRC TO FRESH)

WITH IGNITION SW TURNED ON, WHEN THE RECIRC/FRESH SW IS SWITCHED TO THE FRESH SIDE, THE CURRENT FLOWS FROM **TERMINAL IG+** OF A/C CONTROL ASSEMBLY → **TERMINAL MFRS** → **TERMINAL 2** OF AIR INLET CONTROL SERVO MOTOR → **TERMINAL 6** → **TERMINAL MREC** OF A/C CONTROL ASSEMBLY → **TERMINAL E** → **GROUND**, THE MOTOR ROTATES AND THE DAMPER STOPS AT THAT POSITION.

### 3. OPERATION OF AIR VENT MODE CONTROL SERVO MOTOR

WITH IGNITION SW TURNED ON, THE CURRENT FLOWS FROM **HEATER FUSE (10A)** TO **TERMINAL IG+** OF A/C CONTROL ASSEMBLY.

(SWITCHING FROM DEF TO FACE)

THE CURRENT FLOWS FROM **TERMINAL MFACE** OF A/C CONTROL ASSEMBLY → **TERMINAL 4** OF AIR VENT CONTROL SERVO MOTOR → **TERMINAL 5** → **TERMINAL MDEF** OF A/C CONTROL ASSEMBLY → **TERMINAL E** → **GROUND**. THE MOTOR ROTATES AND THE DAMPER MOVES TO THE FACE SIDE. WHEN THE DAMPER OPERATES WITH THE A/C SW AT **FACE** POSITION, THE **DAMPER** POSITION SIGNAL IS INPUT FROM **TERMINAL 1** OF THE SERVO MOTOR TO THE **TERMINAL TPM** OF THE ECU (BUILT INTO THE A/C CONTROL ASSEMBLY). AS A RESULT, CURRENT TO THE SERVO MOTOR CIRCUIT IS CUT OFF BY THE ECU, SO THE DAMPER STOPS AT THAT POSITION.

(SWITCHING FROM FACE TO DEF)

THE CURRENT FLOWS FROM **TERMINAL DEF** OF A/C CONTROL ASSEMBLY → **TERMINAL 5** OF AIR VENT CONTROL SERVO MOTOR → **TERMINAL 4** → **TERMINAL MFACE** OF A/C CONTROL ASSEMBLY → **TERMINAL E** → **GROUND**, THE MOTOR ROTATES AND THE DAMPER STOPS AT THAT POSITION.

#### 4. OPERATION OF AIR MIX CONTROL SERVO MOTOR

WHEN THE TEMPERATURE SW IS TURNED TO THE "COOL" SIDE, THE CURRENT FLOWS FROM **TERMINAL MC** OF A/C CONTROL ASSEMBLY → **TERMINAL 4** OF AIR MIX CONTROL SERVO MOTOR → MOTOR → **TERMINAL 5** → **TERMINAL MH** OF A/C CONTROL ASSEMBLY → **GROUND** AND THE MOTOR ROTATES. THE DAMPER OPENING ANGLE AT THIS TIME IS INPUT FROM **TERMINAL 1** OF SERVO MOTOR TO **TERMINAL TP** OF A/C CONTROL ASSEMBLY, THIS IS USED TO DETERMINE THE **DAMPER STOP** POSITION AND MAINTAIN THE SET TEMPERATURE.

WHEN THE TEMPERATURE CONTROL SW IS TURNED TO THE "HOT" SIDE, THE CURRENT FLOWS FROM SERVO MOTOR → **TERMINAL MH** OF A/C CONTROL ASSEMBLY → **TERMINAL 5** OF AIR MIX CONTROL SERVO MOTOR → MOTOR → **TERMINAL 1** → **TERMINAL MC** OF A/C CONTROL ASSEMBLY, ROTATING THE MOTOR IN REVERSE AND SWITCHING THE DAMPER FROM "COOL" TO "HOT" SIDE.

#### 5. AIR CONDITIONER OPERATION

THE A/C CONTROL ASSEMBLY RECEIVES VARIOUS SIGNALS, I.E., THE ENGINE RPM FROM THE IGNITER, OUTLET TEMPERATURE SIGNAL FROM THE A/C THERMISTOR, COOLANT TEMPERATURE FROM THE WATER TEMP. SENSOR AND THE LOCK SIGNAL FROM THE A/C COMPRESSOR, ETC.

WHEN THE ENGINE IS STARTED AND THE A/C SW (A/C CONTROL ASSEMBLY) IS ON, A SIGNAL IS INPUT TO THE ECU. (BUILT IN THE A/C CONTROL ASSEMBLY).

AS A RESULT, THE GROUND CIRCUIT IN A/C CONTROL ASSEMBLY IS CLOSED AND CURRENT FLOWS FROM **HEATER FUSE** (10A) TO **TERMINAL 2** OF MAGNETIC CLUTCH RELAY → **TERMINAL 3** → **TERMINAL ACMG** OF ENGINE AND ECT ECU → **TERMINAL E** OF A/C CONTROL ASSEMBLY → **GROUND**, TURNING THE MAGNETIC CLUTCH RELAY ON, SO THAT THE MAGNETIC CLUTCH IS ON AND THE A/C COMPRESSOR OPERATES.

AT THE SAME TIME, THE ENGINE AND ECT ECU DETECTS THE MAGNETIC CLUTCH IS ON AND THE A/C COMPRESSOR OPERATES.

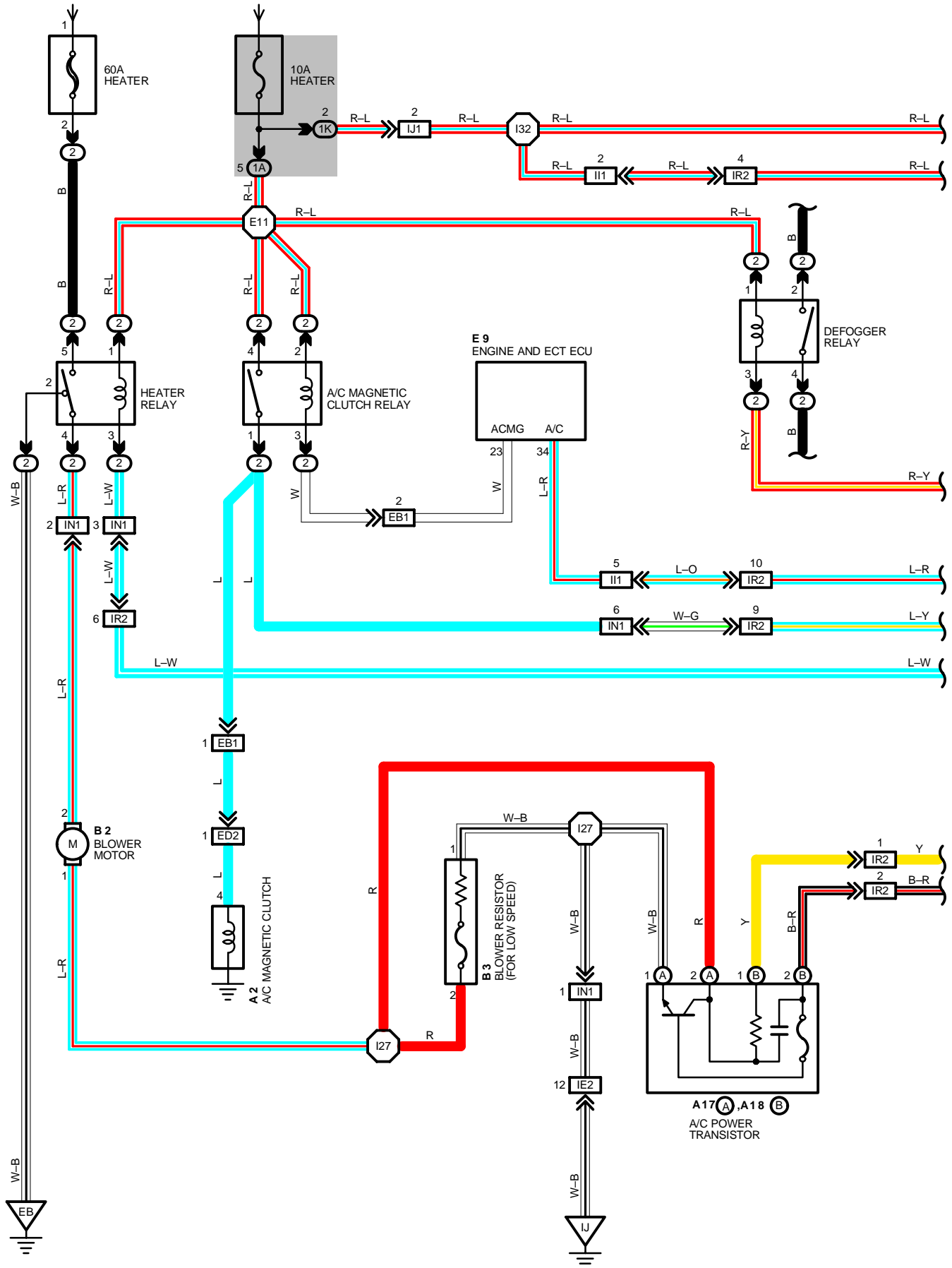
OPEN DIRECTION TO AVOID LOWERING THE ENGINE RPM DURING A/C OPERATING.

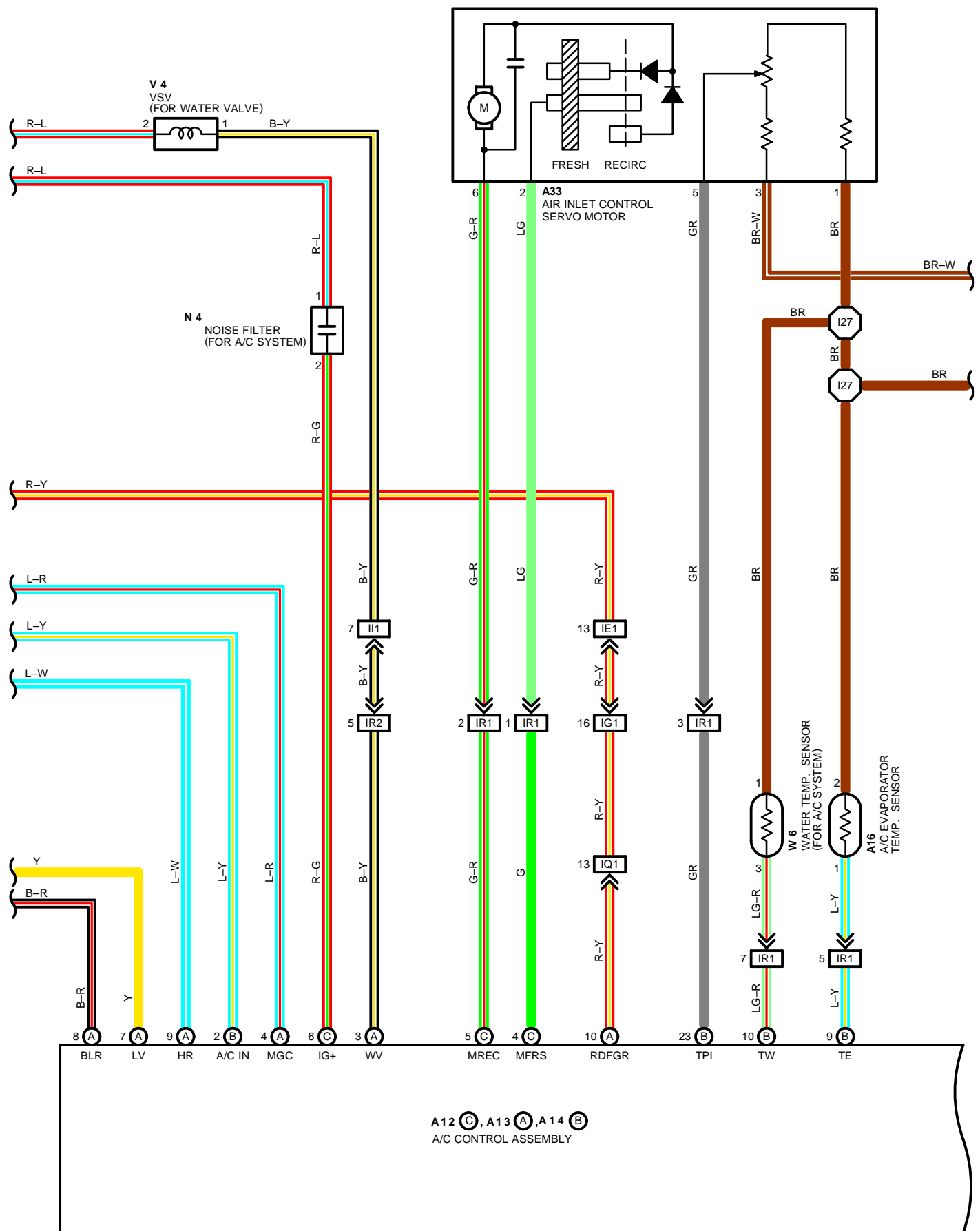
WHEN ANY OF THE FOLLOWING SIGNALS ARE INPUT TO THE A/C CONTROL ASSEMBLY, THE CONTROL ASSEMBLY OPERATES TO TURN OFF THE AIR CONDITIONING.

- \* ENGINE HIGH TEMP. SIGNAL IS HIGH.
- \* COOLANT HIGH TEMP. SIGNAL IS HIGH.
- \* A SIGNAL THAT THE TEMPERATURE AT THE AIR OUTLET IS LOW.
- \* A SIGNAL THAT THERE IS A LARGE DIFFERENCE BETWEEN ENGINE RPM AND COMPRESSOR RPM.
- \* A SIGNAL THAT THE REFRIGERANT PRESSURE IS ABNORMALLY HIGH OR LOW.

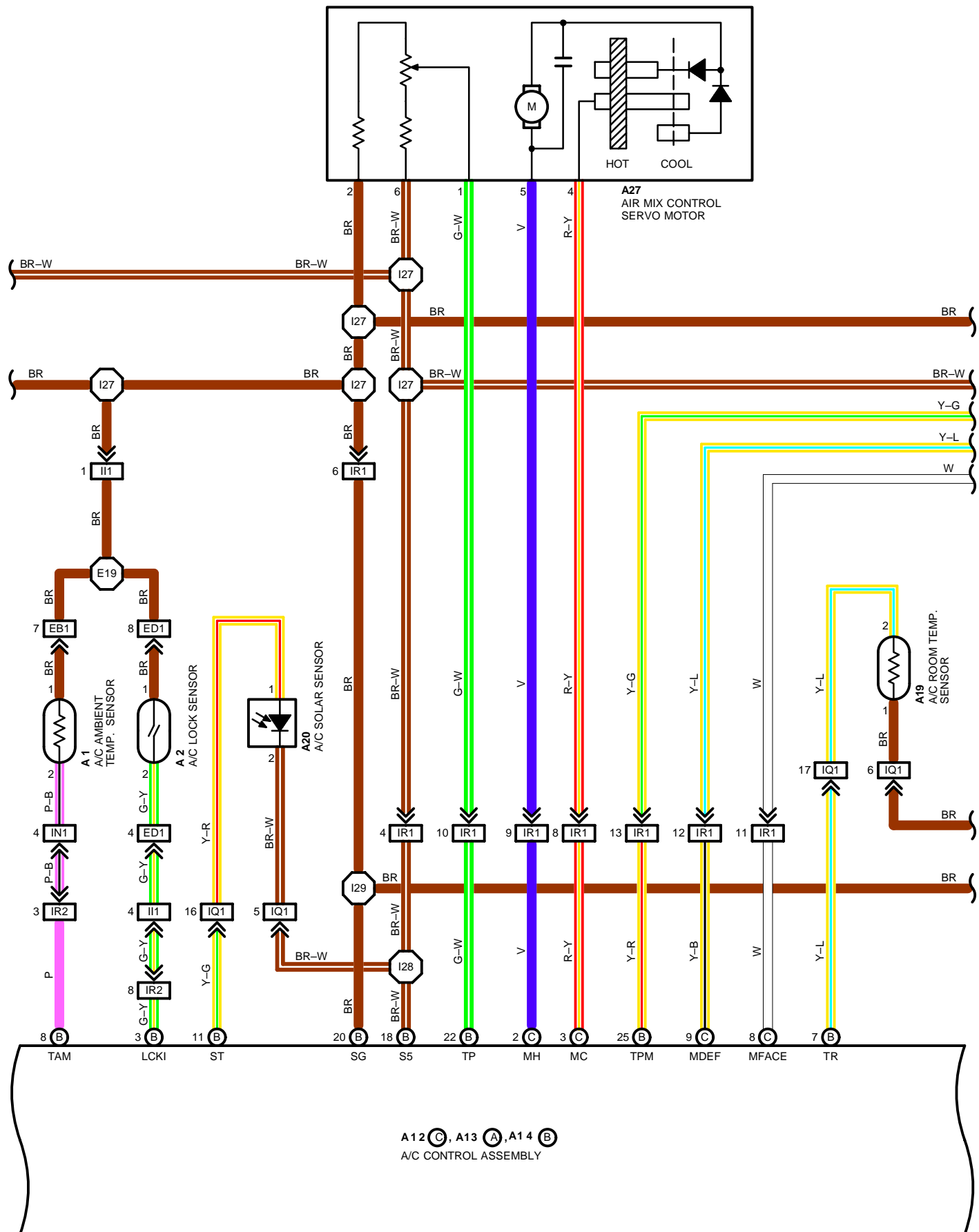
# AUTOMATIC AIR CONDITIONER

FROM POWER SOURCE SYSTEM (SEE PAGE 56)

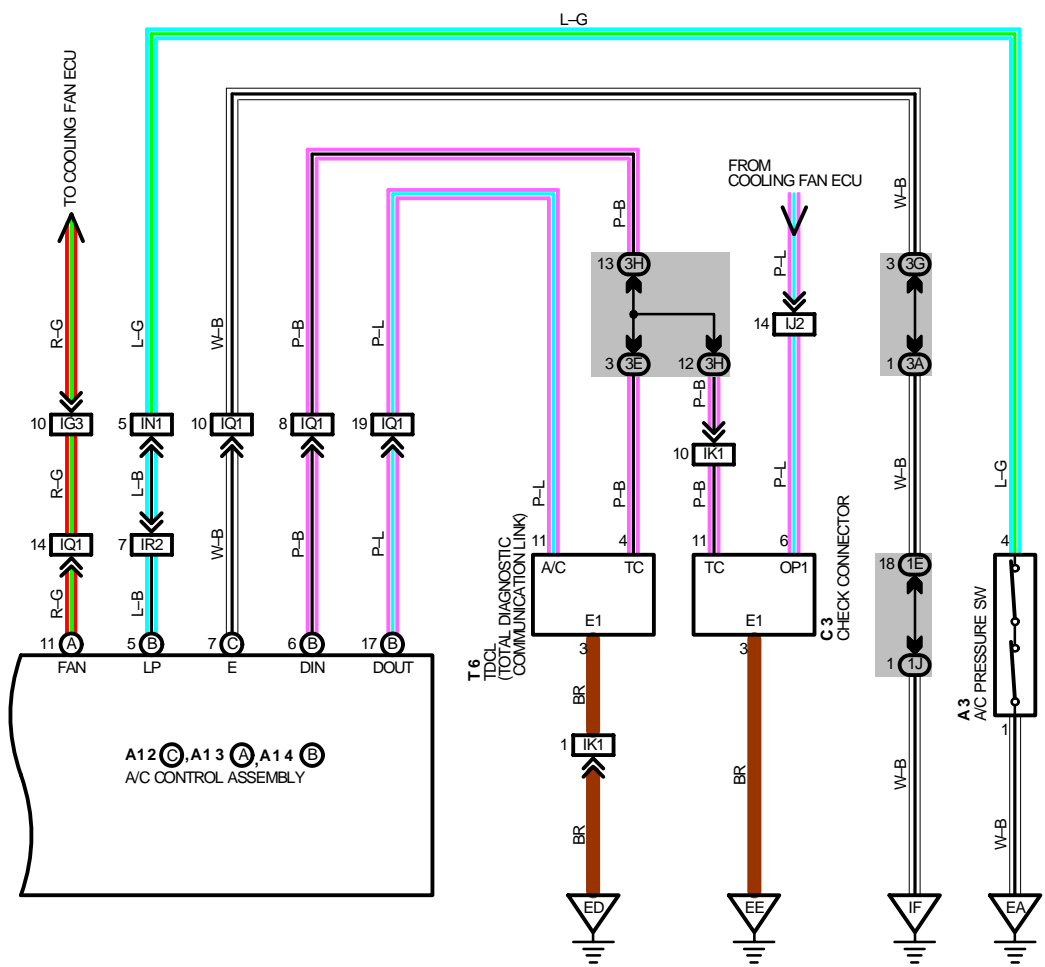




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## SERVICE HINTS

### A 2 A/C MAGNETIC CLUTCH

4-GROUND : APPROX. 3.7Ω

### A 3 A/C PRESSURE SW

4-1 : OPEN ABOVE APPROX. 15.5KG/CM<sup>2</sup> (30 PSI, 206 KPA) OR 27 KG/CM<sup>2</sup> (384 PSI, 2648 KPA)

### A17, A18 POWER TRANSISTOR

(B)1- (A)2 : APPROX. 2.0-2.4KΩ

### A12, A13, A14 A/C CONTROL ASSEMBLY

+B - GROUND: ALWAYS APPROX. 10-14 VOLTS

IG + - GROUND: APPROX. 10-14 VOLTS WITH IGNITION SW AT **ON** POSITION

HR - GROUND: APPROX. 10-14 VOLTS WITH IGNITION SW AT **ON** POSITION AND DO NOT TURN THE BLOWER MOTOR  
BELOW 1 VOLTS WITH IGNITION SW AT **ON** POSITION AND TURN THE BLOWER MOTOR

LP - GROUND: NO CONTINUITY WITH PRESSURE LESS THAN 2.1 KG/CM<sup>2</sup> (30 PSI, 206 KPA) OR ABOVE 27 KG/CM<sup>2</sup>  
(384 PSI, 2648 KPA)

ACC - GROUND: APPROX. 10-14 VOLTS WITH IGNITION SW AT **ACC** OR **ON** POSITION

WV - GROUND: 10-14 VOLTS AT START THE ENGINE AND MAX. COLD POSITION OF A/C TEMP. CONTROL SW  
BELOW 1 VOLTS AT START THE ENGINE AND MAX. WARM POSITION OF A/C TEMP. CONTROL SW

MGC - GROUND: BELOW 1 VOLTS AT START THE ENGINE, PUSH THE A/C AUTO SW AND A/C SW **ON** POSITION  
10-14 VOLTS AT START THE ENGINE, PUSH THE A/C AUTO SW AND A/C SW **OFF** POSITION

BLR - GROUND: BELOW 1.5 VOLTS WITH THE IGNITION SW ON AND TURN THE BLOWER MOTOR

S5 - GROUND: 4-6 VOLTS WITH THE IGNITION SW ON

SG - GROUND: ALWAYS CONTINUITY

MH - MC : 13-19 VOLTS WITH IGNITION SW OFF

MFRS - GROUND: APPROX. 12 VOLTS WITH FRESH SW ON

MREC - GROUND: APPROX. 12 VOLTS WITH RECIRC SW ON

MFACE - GROUND: APPROX. 12 VOLTS WITH FACE SW ON

MDEF - GROUND: APPROX. 12 VOLTS WITH DEF SW ON

E - GROUND: ALWAYS CONTINUITY

### B 3 BLOWER RESISTOR (FOR LOW SPEED)

1-2 : APPROX. 2.6-3.0Ω

## ○ : PARTS LOCATION

CODE	SEE PAGE	CODE	SEE PAGE	CODE	SEE PAGE
A 1	26	A18	B 28	E 9	A 28
A 2	26	A19	28	E10	B 28
A 3	26	A20	28	I 2	27
A12	C 28	A27	28	N 4	29
A13	A 28	A28	28	T 6	29
A14	B 28	A33	28	V 4	27
A15	28	B 2	28	W 6	29
A16	28	B 3	28		
A17	A 28	C 3	26		

## ○ : RELAY BLOCKS

CODE	SEE PAGE	RELAY BLOCKS (RELAY BLOCK LOCATION)
2	19	ENGINE COMPARTMENT LEFT

## ○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

CODE	SEE PAGE	JUNCTION BLOCK AND WIRE HARNESS (CONNECTOR LOCATION)
1A	20	ENGINE ROOM MAIN WIRE
1B		
1E		
1J	20	COWL WIRE
1K		
3A		
3B	23	INSTRUMENT PANEL WIRE
3E		
3G		
3H		

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## : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

CODE	SEE PAGE	JOINING WIRE HARNESS AND WIRE HARNESS (CONNECTOR LOCATION)
EB1	34	ENGINE WIRE AND ENGINE ROOM MAIN WIRE (FRONT SIDE OF R/B NO. 2)
ED1	34	ENGINE NO. 2 WIRE AND ENGINE WIRE (REAR SIDE OF AIR INTAKE CHAMBER)
ED1		
IE1	36	ENGINE ROOM MAIN WIRE AND COWL WIRE (R/B NO. 4)
IE2	38	ENGINE ROOM MAIN WIRE AND COWL WIRE (BEHIND GLOVE BOX)
IG1	36	INSTRUMENT PANEL WIRE AND COWL WIRE (R/B NO. 5)
IG3	38	INSTRUMENT PANEL WIRE AND COWL WIRE (RIGHT KICK PANEL)
II1	36	ENGINE WIRE AND A/C WIRE (BEHIND GLOVE BOX)
IJ1	36	ENGINE WIRE AND COWL WIRE (RIGHT KICK PANEL)
IJ2		
IK1	36	ENGINE WIRE AND INSTRUMENT PANEL WIRE (RIGHT KICK PANEL)
IN1	38	ENGINE ROOM MAIN WIRE AND A/C WIRE (BEHIND GLOVE BOX)
IQ1	38	INSTRUMENT PANEL WIRE AND CONSOLE BOX WIRE (UNDER THE INSTRUMENT PANEL CENTER)
IR1	38	CONSOLE BOX WIRE AND A/C SUB WIRE (BEHIND GLOVE BOX)
IR2		

## : GROUND POINTS

CODE	SEE PAGE	GROUND POINTS LOCATION
EA	34	FRONT SIDE OF RIGHT FENDER
EB	34	FRONT SIDE OF LEFT FENDER
ED	34	REAR SIDE OF CYLINDER HEAD RH
EE	34	REAR SIDE OF CYLINDER HEAD LH
IF	36	LEFT KICK PANEL
IJ	36	RIGHT KICK PANEL

## : SPLICE POINTS

CODE	SEE PAGE	WIRE HARNESS WITH SPLICE POINTS	CODE	SEE PAGE	WIRE HARNESS WITH SPLICE POINTS
E11	34	ENGINE ROOM MAIN WIRE	I28	38	CONSOLE BOX WIRE
E19	34	ENGINE WIRE	I29		
I19	38	INSTRUMENT PANEL WIRE	I32	38	ENGINE WIRE
I27	38	A/C WIRE			

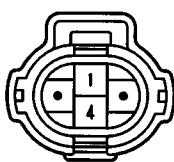
A 1.V 4 BLACK



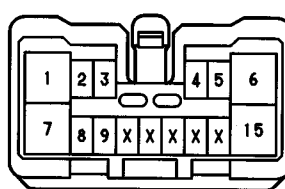
A 2 GRAY



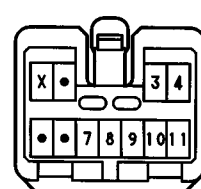
A 3 GRAY



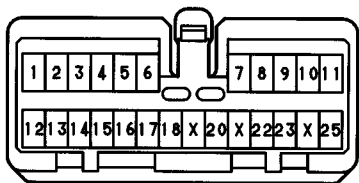
A12 C



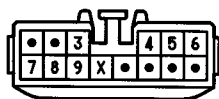
A13 A



A14 B



A15



A16, A18 B



A17 A



A19 BLACK



A20



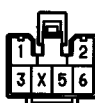
A27



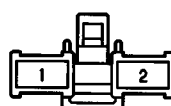
A28



A33



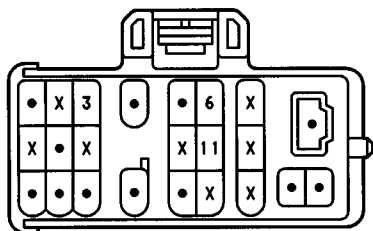
B 2



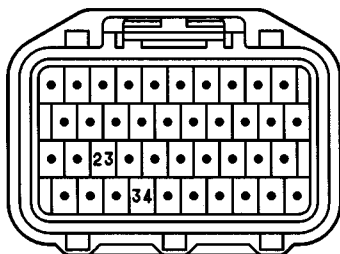
B 3



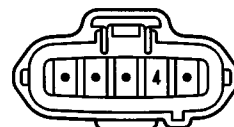
C 3 BLACK



E 9 DARK GRAY



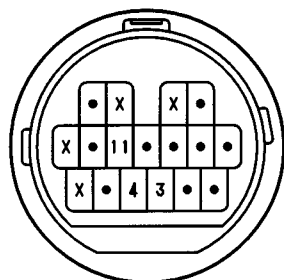
I 2 BLACK



N 4



T 6 DARK GRAY



W 6

