ELECTRONICALLY MODULATED AIR SUSPENSION

SYSTEM OUTLINE

THIS SYSTEM CONSISTS OF A PNEUMATIC CYLINDER WHICH HAS PRESSURED AIR IN AN AIR CHAMBER, AN ECU WHICH AUTOMATICALLY SWITCHES THE SPRING RATE AND VEHICLE HEIGHT BETWEEN TWO RANGES (NORMAL AND HIGH) ACCORDING TO THE DRIVING CONDITIONS AND ALSO TWO (2) MODES (NORMAL AND HIGH) WHICH THE DRIVER CAN CHOOSE FROM ACCORDING TO PREFERENCE.

ALSO, THE DAMPING FORCE OF THE SHOCK ABSORBER IS AUTOMATICALLY SWITCHED BY THE ECU BETWEEN THREE LEVELS (SOFT, MEDIUM AND HARD) AND THE DRIVER CAN CHOOSE ONE OF TWO (2) MODES (NORMAL, SPORT) ACCORDING TO PREFERENCE.

COMBINED CONTROL OF THE SPRING RATE, VEHICLE HEIGHT AND DAMPING FORCE SUPPRESSES CHANGES IN THE VEHICLE'S ATTITUDE SUCH AS A ROLL, NOSE DIVE AND SQUAT TO PROVIDE OUTSTANDING RIDING COMFORT AND CONTROLLABILITY.

1. INPUT SIGNALS

(1) STEERING SENSOR SIGNAL

ROTATION ANGLE OF THE STEERING WHEEL IS INPUT TO **TERMINAL SS1** AND **SS2** OF AIR SUSPENSION ECU.

(2) THROTTLE POSITION SENSOR SIGNAL

THE THROTTLE VALVE OPENING ANGLE IS DETECTED AND THE SIGNAL IS INPUT TO **TERMINAL L1** OF THE AIR SUSPENSION ECU VIA THE ENGINE CONTROL MODULE.

(3) VEHICLE SPEED SENSOR SIGNAL

THE VEHICLE SPEED IS DETECTED BY VEHICLE SPEED SENSOR AND THE SIGNAL IS INPUT TO **TERMINAL SPD** OF THE AIR SUSPENSION ECU.

(4) STOP LIGHT SW SIGNAL

THE BRAKE OPERATION SIGNAL IS DETECTED AND A SIGNAL IS INPUT TO **TERMINAL STP** OF AIR SUSPENSION ECU.

(5) HEIGHT CONTROL SW SIGNAL

WHETHER THE HEIGHT CONTROL SW IS IN NORMAL OR HIGH MODE IS DETECTED AND THE SIGNAL IS INPUT TO **TERMINAL HSW** OF THE AIR SUSPENSION ECU.

(6) HEIGHT CONTROL SENSOR SIGNAL

THE VEHICLE HEIGHT AND THE DIFFERENT LEVELS OF THE ROAD SURFACE ARE DETECTED BY THE HEIGHT CONTROL SENSOR AND THE SIGNAL IS INPUT TO **TERMINALS SHFL, SHFR, SHRL** AND **SHRR** OF THE AIR SUSPENSION ECU.

(7) DOOR COURTESY SW SIGNAL

WHETHER THE DOOR IS OPEN OR CLOSED IS DETECTED AND INPUT TO THE AIR SUSPENSION ECU.

2. AIR SUSPENSION OPERATION

*HIGH POSITION

SIGNALS FROM THE VEHICLE SPEED SENSOR, HEIGHT CONTROL SENSOR AND SO ON ARE INPUT TO THE AIR SUSPENSION ECU, WHICH ORERATES SO THAT THE CURRENT FLOWS FROM THE AIR SUSPENSION ECU TO FRONT AND REAR HEIGHT CONTROL VALVE TO OPEN THE PNEUMATIC CYLINDER VALVE.

AS A RESULT, THE PASSAGE IS OPENED AS FAR AS THE HEIGHT CONTROL DRYER. THEN, THE CURRENT FLOWING TO THE AIR SUS RELAY FLOWS TO THE HEIGHT CONTROL COMPRESSOR. CONTROL OF THIS CURRENT BY THE AIR SUSPENSION ECU CAUSE THE COMPRESSOR TO OPERATE AND AIR FLOWS INTO THE PNEUMATIC CYLINDER TO RAISE THE VEHICLE HEIGHT.

*LOW POSITION

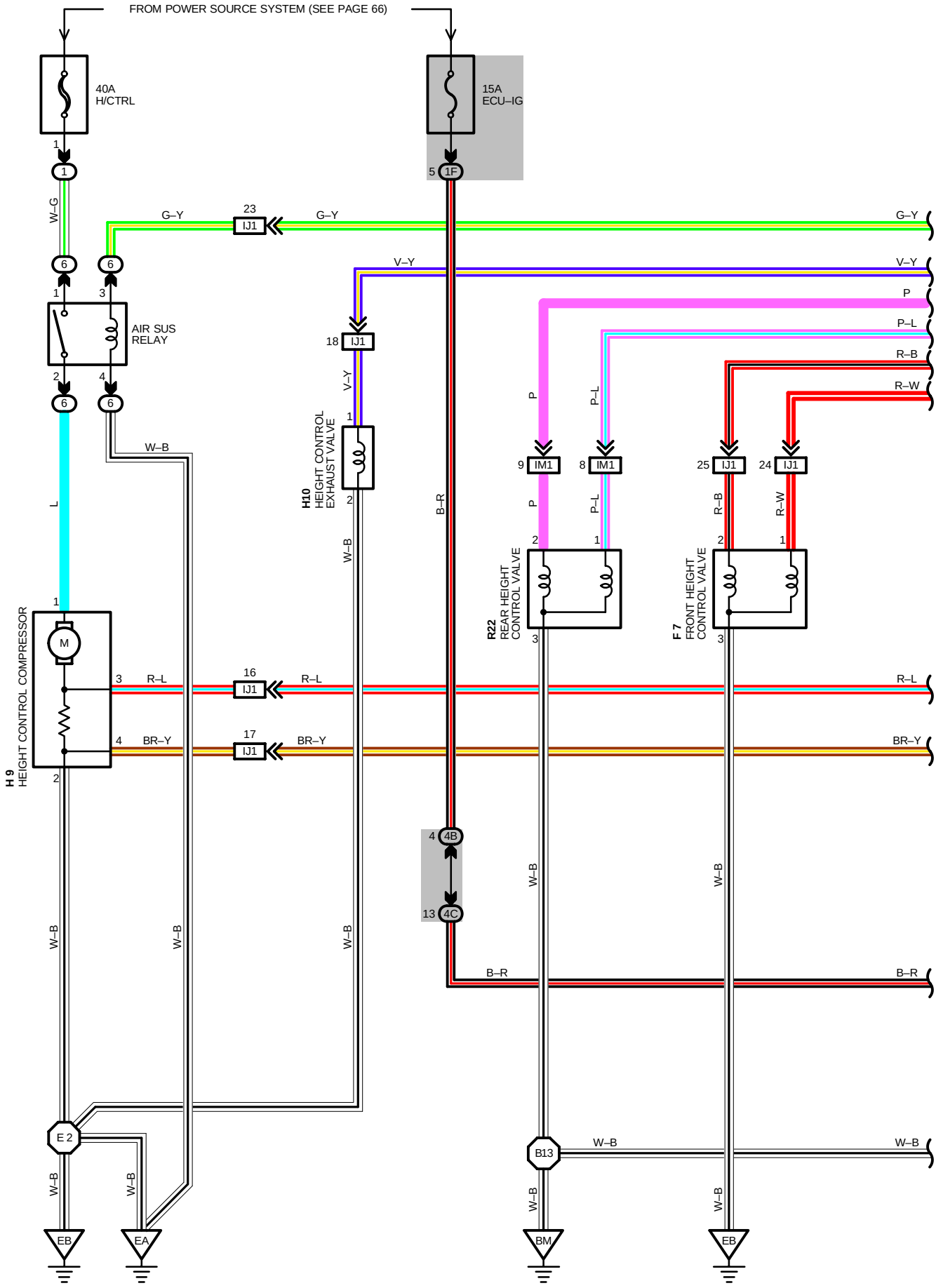
SIGNALS FROM THE VEHICLE SPEED SENSOR, HEIGHT CONTROL SENSOR AND SO ON ARE INPUT TO THE AIR SUSPENSION ECU, WHICH OPERATES SO THAT CURRENT FLOWS FROM THE AIR SUSPENSION ECU TO FRONT AND REAR HEIGHT CONTROL VALVE TO OPEN THE PNEUMATIC CYLINDER VALVE.

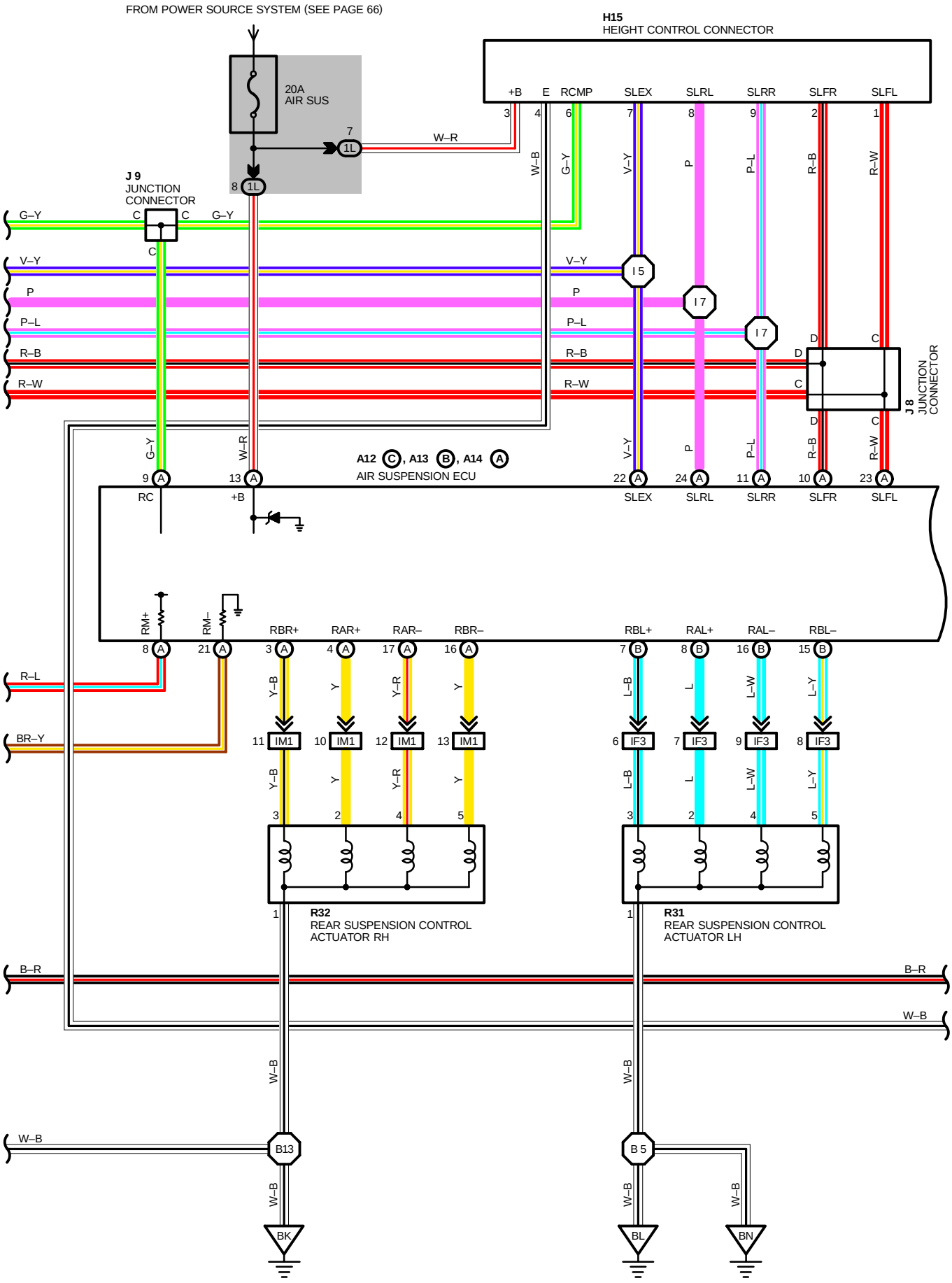
AS A RESULT, THE PASSAGE IS OPENED AS FAR AS THE HEIGHT CONTROL DRYER. THEN, THE CURRENT FLOWS TO THE HEIGHT CONTROL EXHAUST VALVE INSTALLED IN THE HEIGHT CONTROL DRYER, CONTROL OF THIS CURRENT BY THE AIR SUSPENSION ECU CAUSES THE VALVE TO OPEN SO THAT THE AIR INSIDE THE PNEUMATIC CYLINDER IS EXPELLED AND THE VEHICLE HEIGHT IS LOWERED.

3. BASIC OPERATION OF SUSPENSION CONTROL ACTUATOR

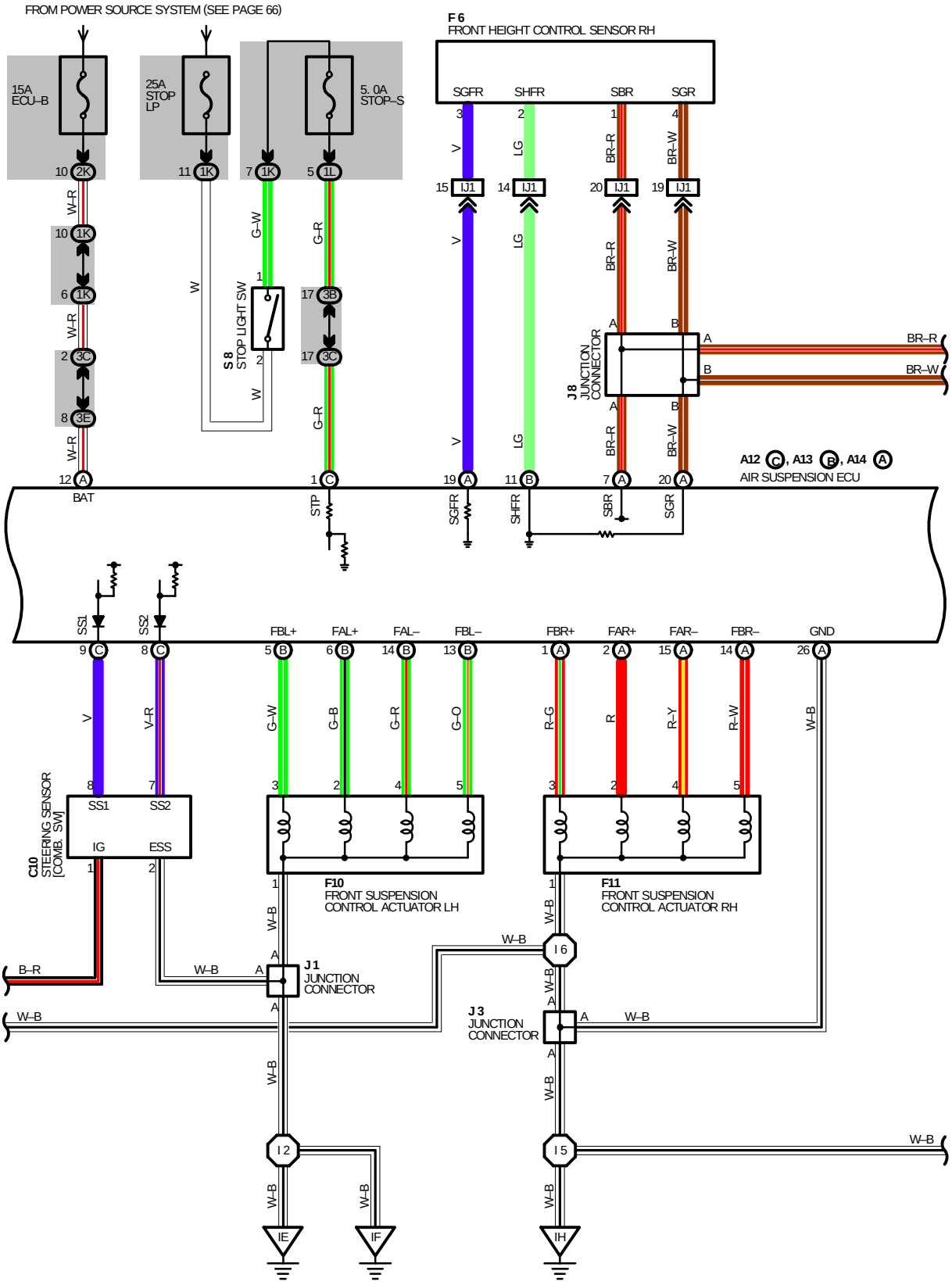
THE SUSPENSION CONTROL ACTUATOR CONTROLS THE DAMPING FORCE OF THE SHOCK ABSORBER INSIDE THE PNEUMATIC CYLINDER IN **9** STEPS. BASED ON SIGNALS FROM THE ACCELERATION SENSORS, VEHICLE SPEED SENSOR AND STOP LIGHT SWITCH, ETC., THE SUSPENSION ECU CONTROLS THE SUSPENSION CONTROL ACTUATOR TO ADJUST THE DAMPING FORCE OF THE SHOCK ABSORBER. AS THE FOLLOWING TABLE SHOWS, THE DAMPING FORCE OF THE SHOCK ABSORBER IS CHANGED BY CURRENT FLOWING FROM **TERMINALS 2, 3, 4** AND **5** OF THE SUSPENSION CONTROL ACTUATOR → **TERMINAL 1** → **GROUND**.

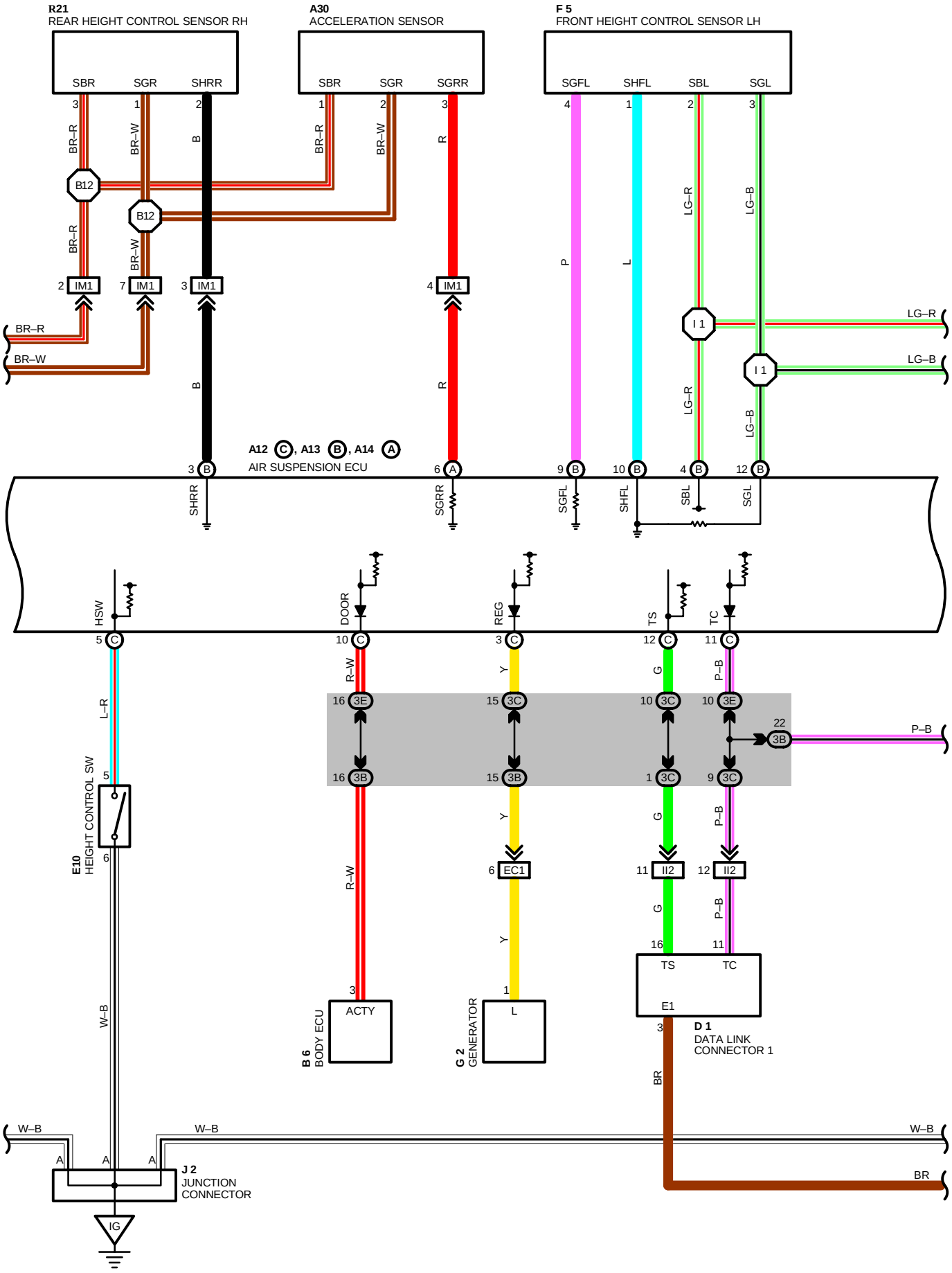
B+	GROUND	POSITION
TERMINAL 2 AND 3	1	SOFT 1 → 2
TERMINAL 3 AND 4	1	2 → 3
TERMINAL 4 AND 5	1	3 → 4
TERMINAL 5 AND 2	1	4 → 5
TERMINAL 2 AND 3	1	5 → 6
TERMINAL 3 AND 4	1	6 → 7
TERMINAL 4 AND 5	1	7 → 8
TERMINAL 5 AND 2	1	8 → 9 HARD


FROM POWER SOURCE SYSTEM (SEE PAGE 66)
40A
H/CTRL
15A
ECU–IG
AIR SUS
RELAY
HEIGHT CONTROL COMPRESSOR
H9
HEIGHT CONTROL
EXHAUST VALVE
H10
REAR HEIGHT
CONTROL VALVE
R22
FRONT HEIGHT
CONTROL VALVE
F7
IJ1
IM1
1F
4B
4C
E2
B13
EB
EA
BM
W–G
G–Y
V–Y
P
P–L
R–B
R–W
L
W–B
R–L
BR–Y
B–R

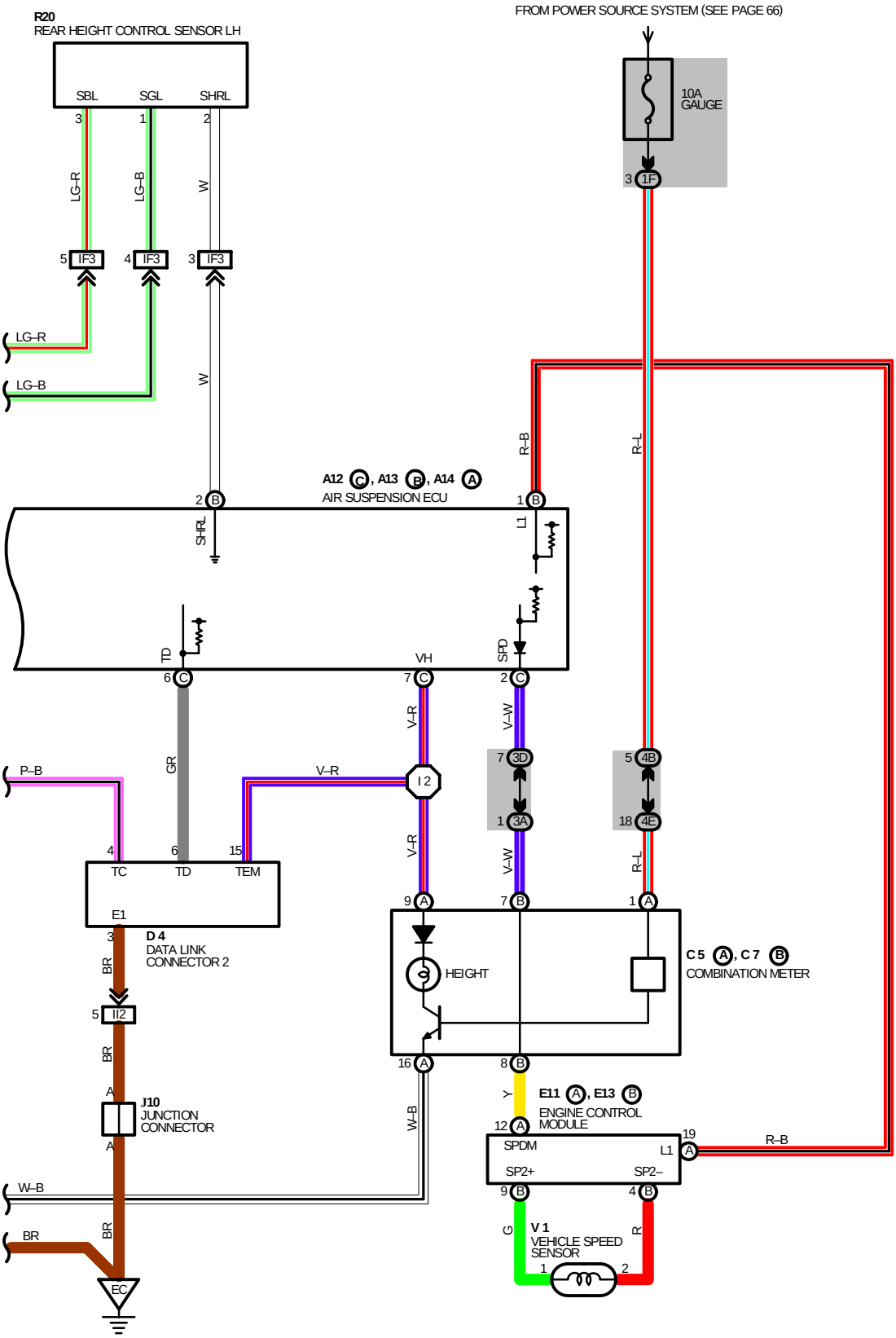

FROM POWER SOURCE SYSTEM (SEE PAGE 66)
20A
AIR SUS
H15
HEIGHT CONTROL CONNECTOR
+B
E
RCMP
SLEX
SLRL
SLRR
SLFR
SLFL
W–R
W–B
G–Y
V–Y
P
P–L
R–B
R–W
J 9
JUNCTION
CONNECTOR
I 5
I 7
J 8
JUNCTION
CONNECTOR
A12 C, A13 B, A14 A
AIR SUSPENSION ECU
RC
+B
RM+
RM–
RBR+
RAR+
RAR–
RBR–
RBL+
RAL+
RAL–
RBL–
R–L
BR–Y
Y–B
Y
Y–R
L–B
L
L–W
L–Y
IM1
IF3
R32
REAR SUSPENSION CONTROL
ACTUATOR RH
R31
REAR SUSPENSION CONTROL
ACTUATOR LH
B–R
B13
B 5
BK
BL
BN

ELECTRONICALLY MODULATED AIR SUSPENSION




R21
REAR HEIGHT CONTROL SENSOR RH
SBR
SGR
SHRR
A30
ACCELERATION SENSOR
SBR
SGR
SGRR
F 5
FRONT HEIGHT CONTROL SENSOR LH
SGFL
SHFL
SBL
SGL
BR–R
BR–W
B
R
P
L
LG–R
LG–B
B12
IM1
BR–R
BR–W
B
R
LG–R
LG–B
I 1
A12 C, A13 B, A14 A
AIR SUSPENSION ECU
SHRR
SGRR
SGFL
SHFL
SBL
SGL
HSW
DOOR
REG
TS
TC
R–W
Y
G
P–B
3E
3C
3B
22
P–B
E10
HEIGHT CONTROL SW
L–R
W–B
EC1
II2
TS
TC
E1
D 1
DATA LINK
CONNECTOR 1
B 6
BODY ECU
ACTY
G 2
GENERATOR
L
BR
W–B
J 2
JUNCTION
CONNECTOR
IG

ELECTRONICALLY MODULATED AIR SUSPENSION



SERVICE HINTS

A12 (C), A14 (A) AIR SUSPENSION ECU
(A) 12–GROUND : ALWAYS APPROX. **12** VOLTS
(A) 13–GROUND : APPROX. **12** VOLTS WITH IGNITION SW AT **ON** OR **ST** POSITION
(C) 1–GROUND : APPROX. **12** VOLTS WITH STOP LIGHT SW ON
(A) 26–GROUND : ALWAYS CONTINUOUS
H10 HEIGHT CONTROL EXHAUST VALVE
1–2 : APPROX. **12** Ω
F 7, R22 FRONT, REAR HEIGHT CONTROL VALVE
1, 2–3 : APPROX. **12** Ω
F10, F11 R31, R32 SUSPENSION CONTROL ACTUATOR
2, 3, 4, 5–1 : APPROX. **1.52** Ω

: PARTS LOCATION

CODE	SEE PAGE	CODE	SEE PAGE	CODE	SEE PAGE
A12 C	32	**E13** B	32	**J 3**	33
A13 B	32	**F 5**	30	**J 8**	33
A14 A	32	**F 6**	30	**J 9**	33
A30	36	**F 7**	30	**J10**	33
B 6	32	**F10**	30	**R20**	37
C 5 A	32	**F11**	30	**R21**	37
C 7 B	32	**G 2**	30	**R22**	37
C10	32	**H 9**	30	**R31**	37
D 1	30	**H10**	30	**R32**	37
D 4	32	**H15**	32	**S 8**	33
E10	32	**J 1**	33	**V 1**	31
E11 A	32	**J 2**	33		

: RELAY BLOCKS

CODE	SEE PAGE	RELAY BLOCKS (RELAY BLOCK LOCATION)
1	28	ENGINE ROOM R/B (ENGINE COMPARTMENT LEFT)
6	28	R/B NO.6 (UNDER THE HEADLIGHT LH)

: JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

CODE	SEE PAGE	JUNCTION BLOCK AND WIRE HARNESS (CONNECTOR LOCATION)
1F	20	COWL WIRE AND INSTRUMENT PANEL J/B (REAR OF PARKING BRAKE RELEASE LEVER)
1K		
1L		
2K	22	COWL WIRE AND ENGINE ROOM J/B (ENGINE COMPARTMENT LEFT)
3A	24	COWL WIRE AND CENTER J/B (BEHIND THE COMBINATION METER)
3B		
3C		
3D		
3E		
4B	26	COWL WIRE AND DRIVER SIDE J/B (LEFT KICK PANEL)
4C		
4E		

: CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

CODE	SEE PAGE	JOINING WIRE HARNESS AND WIRE HARNESS (CONNECTOR LOCATION)
EC1	40	ENGINE NO.3 WIRE AND COWL WIRE (FRONT SIDE OF LEFT FENDER)
IF3	42	FLOOR NO.2 WIRE AND COWL WIRE (LEFT KICK PANEL)
II2	44	ENGINE WIRE AND COWL WIRE (LEFT SIDE OF BLOWER UNIT)
IJ1	44	ENGINE ROOM MAIN WIRE AND COWL WIRE (RIGHT SIDE OF INSTRUMENT PANEL)
IM1	44	FLOOR WIRE AND COWL WIRE (RIGHT KICK PANEL)

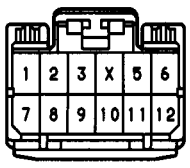
: GROUND POINTS

CODE	SEE PAGE	GROUND POINTS LOCATION
EA	40	FRONT SIDE OF RIGHT FENDER
EB	40	FRONT SIDE OF LEFT FENDER
EC	40	REAR SIDE OF CYLINDER HEAD RH
IE	42	LEFT SIDE OF INSTRUMENT PANEL J/B
IF	42	BEHIND THE COMBINATION METER
IG	42	INSTRUMENT PANEL BRACE RH
IH	42	RIGHT SIDE OF INSTRUMENT PANEL
BK	48	UNDER THE FRONT PASSENGER'S SEAT
BL	48	UNDER THE DRIVER'S SEAT
BM	48	UNDER THE RIGHT REAR PILLAR
BN	48	BACK PANEL RIGHT

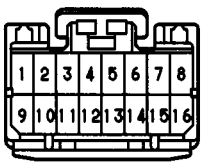
: SPLICE POINTS

CODE	SEE PAGE	WIRE HARNESS WITH SPLICE POINTS	CODE	SEE PAGE	WIRE HARNESS WITH SPLICE POINTS
E 2	40	ENGINE ROOM MAIN WIRE	**I 7**	44	COWL WIRE
I 1	44	COWL WIRE	**B 5**	48	FLOOR NO.2 WIRE
I 2			**B12**	48	FLOOR NO.1 WIRE
I 5			**B13**		
I 6					

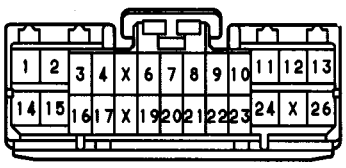
A12 (C)



A13 (B)

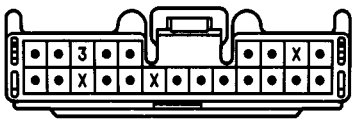


A14 (A)

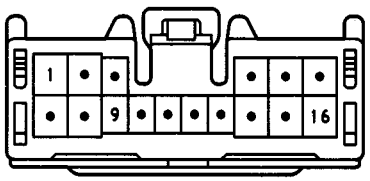


A30 BLACK

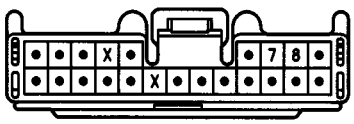
B 6



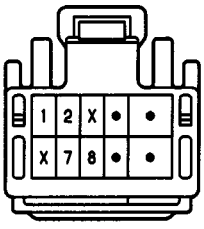
C 5 (A) BLUE



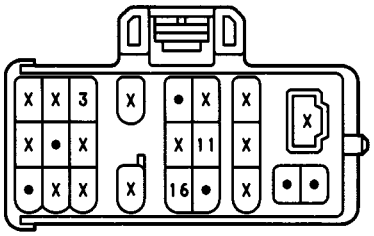
C 7 (B) GRAY



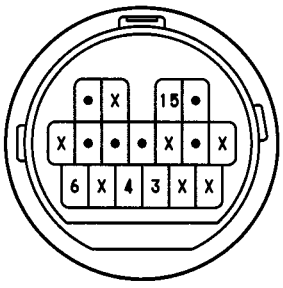
C10 GRAY



D 1 BLACK

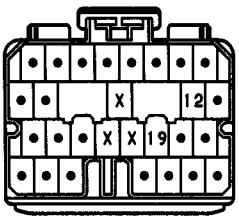


D 4

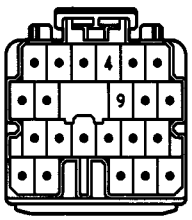


E10

E11 (A) DARK GRAY



E13 (B) DARK GRAY

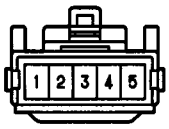


F 5

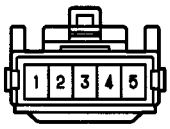
F 6

F 7 BLACK

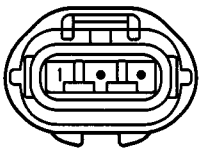
F10 GRAY



F11 GRAY

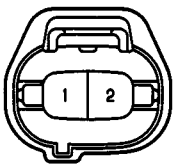


G 2 BLACK



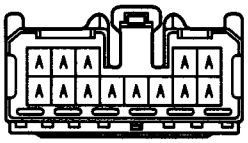
H 9 GRAY

H10 BLACK



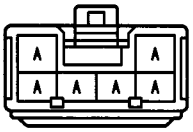
H15 ORANGE

J 1 ORANGE



(HINT:SEE PAGE 7)

J 2



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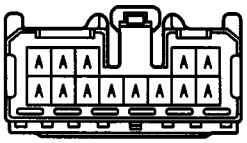
J 3 ORANGE



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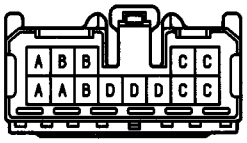
J 8 BLUE



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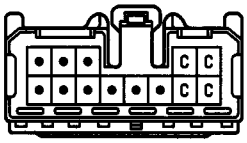
J 9 BLUE

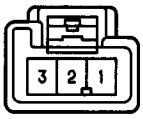


(HINT:SEE PAGE 7)

J10

(HINT:SEE PAGE 7)

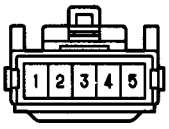
R20 GRAY



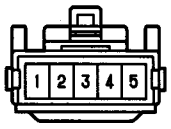
R21 GRAY

R22 BLACK

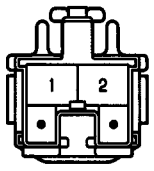
R31 GRAY



R32 GRAY



S 8 BLUE



V 1 GRAY