

A 5 (A) BLACK



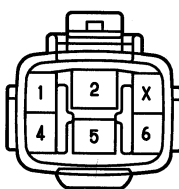
A 6 (B) GRAY



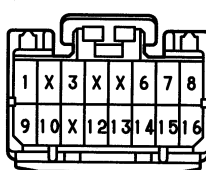
A 7 (A) GRAY



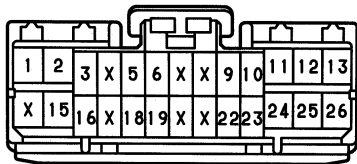
A 8 (B) GRAY



A19 (A) DARK GRAY



A20 (B) DARK GRAY



A26 GRAY



A27, A28



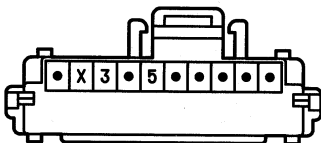
A29, A30



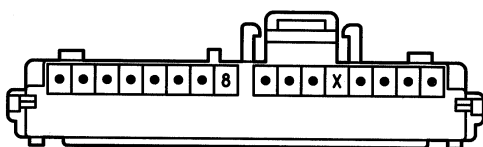
B 2 GRAY



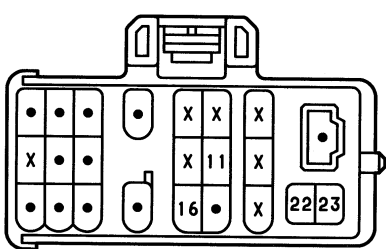
C10 (A) GRAY



C12 (B)



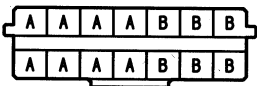
D 1 BLACK



F13

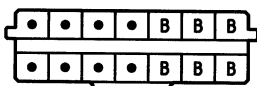
(SEE PAGE 20)

J 1



(HINT:SEE PAGE 7)

J 4 ORANGE



(HINT:SEE PAGE 7)

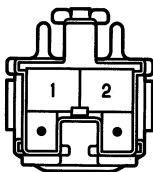
N 3 BLACK



P 2

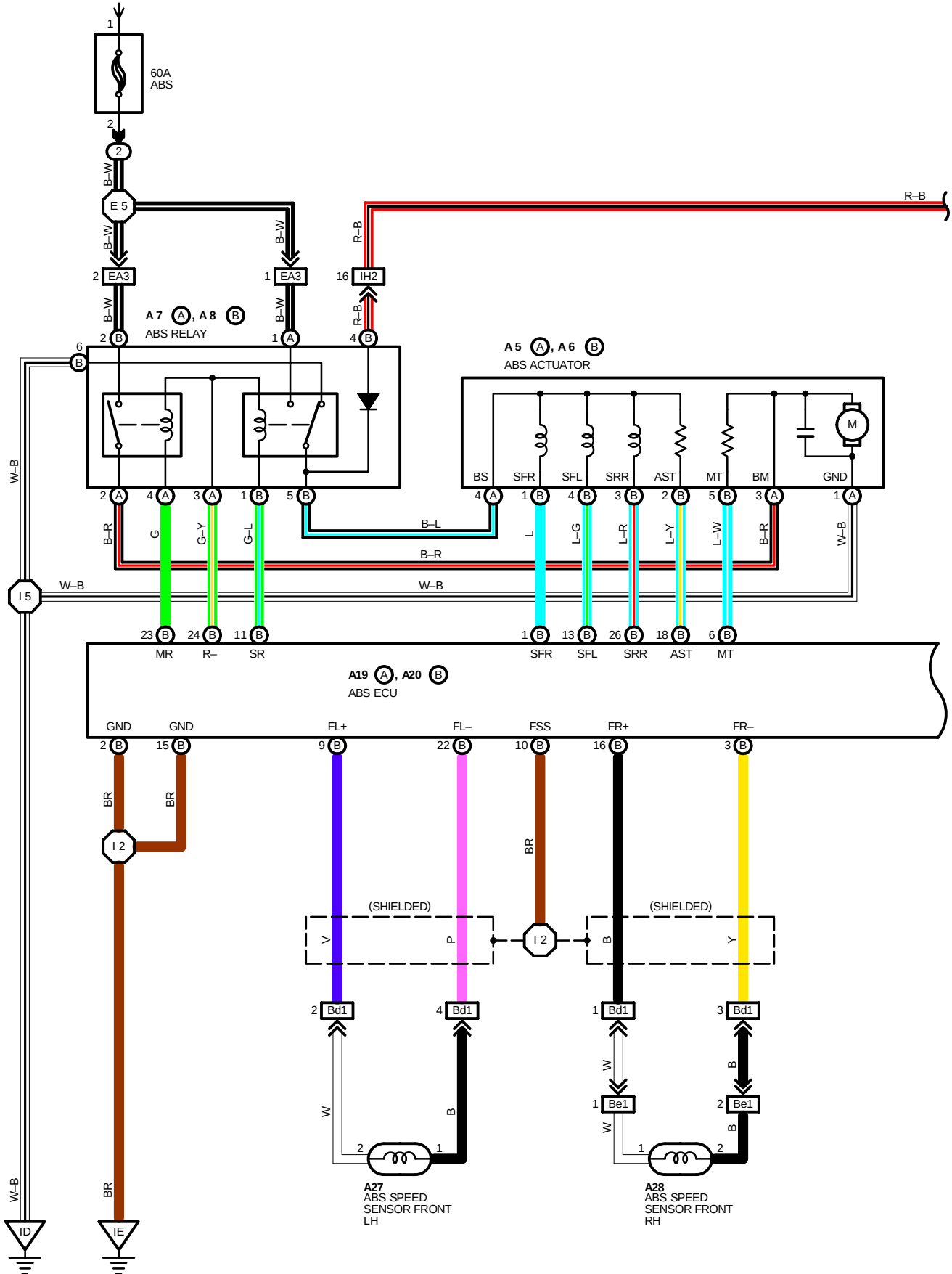


S 7



## ABS (ANTI-LOCK BRAKE SYSTEM)

FROM POWER SOURCE SYSTEM (SEE PAGE 46)





# ABS (ANTI-LOCK BRAKE SYSTEM)

## SYSTEM OUTLINE

THIS SYSTEM CONTROLS THE RESPECTIVE BRAKE FLUID PRESSURES ACTING ON THE DISC BRAKE CYLINDERS OF THE RIGHT FRONT WHEEL, LEFT FRONT WHEEL AND REAR WHEELS WHEN THE BRAKES ARE APPLIED IN A PANIC STOP SO THAT THE WHEELS DO NOT LOCK. THIS RESULTS IN IMPROVED DIRECTIONAL STABILITY AND STEERABILITY DURING PANIC BRAKING.

### 1. INPUT SIGNAL

- (1) SPEED SENSOR SIGNAL  
THE SPEED OF THE WHEELS IS DETECTED AND INPUT TO **TERMINALS FL+, FR+, RL+ AND RR+** OF THE ABS ECU.
- (2) STOP LIGHT SW SIGNAL  
A SIGNAL IS INPUT TO **TERMINAL STP** OF THE ABS ECU WHEN BRAKE PEDAL IS OPERATED
- (3) PARKING BRAKE SW SIGNAL  
A SIGNAL IS INPUT TO **TERMINAL PKB** OF THE ABS ECU WHEN THE PARKING BRAKE SW IS OPERATED.
- (4) DECELERATION SENSOR SIGNAL  
THE DEGREE OF VEHICLE DECELERATION IS DETECTED AND INPUT TO THE ABS ECU.
- (5) TRANSFER CONTROL SIGNAL  
WHILE THE TRANSFER SHIFT LEVER IS IN **L4** POSITION, THE CENTER DIFF. LOCK INDICATOR SW DETECTS A SIGNAL OF DIFF. LOCK AND THE SIGNAL IS INPUT TO **TERMINAL EXI** OF THE ABS ECU

### 2. SYSTEM OPERATION

(TRANSFER L4 POSITION)

WHEN THE TRANSFER SHIFT LEVER IS MOVED TO **L4** POSITION, THE CENTER DIFF. IS LOCKED, THEN THE ABS IS NOT IN OPERATION AND THE ABS WARNING LIGHT IS LIGHTED UP.

(TRANSFER EXCEPT L4 POSITION)

DURING SUDDEN BRAKING THE ABS ECU WHICH HAS SIGNALS INPUT FROM EACH SENSOR, CONTROLS THE CURRENT FLOWING TO THE SOLENOID INSIDE THE ACTUATOR AND LETS THE HYDRAULIC PRESSURE ACTING ON EACH WHEEL CYLINDER ESCAPE TO THE RESERVOIR. THE PUMP INSIDE THE ACTUATOR IS ALSO OPERATING AT THIS TIME AND IT RETURNS THE BRAKE FLUID FROM THE RESERVOIR TO THE MASTER CYLINDER. THUS PREVENTING LOCKING OF THE VEHICLE WHEELS. IF THE ECU JUDGES THAT THE HYDRAULIC PRESSURE ACTING ON THE WHEEL CYLINDER IS INSUFFICIENT, THE CURRENT ACTING ON THE SOLENOID IS CONTROLLED AND THE HYDRAULIC PRESSURE IS INCREASED. HOLDING OF THE HYDRAULIC PRESSURE IS ALSO CONTROLLED BY THE ECU, BY THE SAME METHOD AS ABOVE. BY REPEATED PRESSURE, REDUCTION, HOLDING AND INCREASED ARE REPEATED TO MAINTAIN VEHICLE STABILITY AND IMPROVE STEERABILITY AND TO IMPROVE STEERABILITY DURING SUDDEN BRAKING.

## SERVICE HINTS

(CONNECTOR THE ECU CONNECTOR)

(A)15-GROUND : APPROX. **12** VOLTS WITH THE IGNITION SW AT **ON** POSITION AND DATA LINK CONNECTOR 1

(CHECK CONNECTOR) **TS-E1** CONNECTED

(B) 5-GROUND : APPROX. **12** VOLTS WITH THE IGNITION SW AT **ON** POSITION AND DATA LINK CONNECTOR 1

(CHECK CONNECTOR) **TS-E1** CONNECTED

(B)13-GROUND : APPROX. **12** VOLTS WITH IGNITION SW AT **ON** POSITION AND ABS WARNING LIGHT GOES OFF

(B)11-GROUND : APPROX. **12** VOLTS WITH IGNITION SW AT **ON** POSITION AND ABS WARNING LIGHT GOES OFF

(B)18-GROUND : APPROX. **12** VOLTS WITH IGNITION SW AT **ON** POSITION AND ABS WARNING LIGHT GOES OFF

(B)26-GROUND : APPROX. **12** VOLTS WITH IGNITION SW AT **ON** POSITION AND ABS WARNING LIGHT GOES OFF

(B)13-GROUND : APPROX. **12** VOLTS WITH IGNITION SW AT **ON** POSITION AND ABS WARNING LIGHT GOES OFF

(B) 2-GROUND : ALWAYS CONTINUITY

(B)15-GROUND : ALWAYS CONTINUITY

(B)12-GROUND : APPROX. **12** VOLTS WITH IGNITION SW AT **ON** POSITION

(A) 6-GROUND : APPROX. **12** VOLTS WITH BRAKE PEDAL DEPRESSED

(B)25-GROUND : ALWAYS APPROX. **12** VOLTS

(B)14-GROUND : APPROX. **12** VOLTS WITH ENGINE RUNNING AND PARKING BRAKE LEVEL RELEASED

(DISCONNECT THE ECU CONNECTOR)

(B) 1 – (B)18 : APPROX. **6**  $\Omega$

(B)13 – (B) 18 : APPROX. **6**  $\Omega$

(B)26 – (B) 18 : APPROX. **6**  $\Omega$

(B) 9 – (B) 22 : **0.8–1.3** K $\Omega$

(B)16 – (B) 3 : **0.8–1.3** K $\Omega$

(B)11 – (B) 24 : **60–100**  $\Omega$

(B)23 – (B) 24 : **50–80**  $\Omega$

(A) 1 – (A) 9 : **1.1–1.7** K $\Omega$

(A)19 – (A) 20 : **1.1–1.7** K $\Omega$

 : PARTS LOCATION

| CODE |   | SEE PAGE | CODE |    | SEE PAGE | CODE |  | SEE PAGE |
|------|---|----------|------|----|----------|------|--|----------|
| A 5  | A | 22       | A27  | 24 | D 1      | 22   |  |          |
| A 6  | B | 22       | A28  | 24 | F13      | 23   |  |          |
| A 7  | A | 22       | A29  | 24 | J 1      | 23   |  |          |
| A 8  | B | 22       | A30  | 24 | J 4      | 23   |  |          |
| A19  | A | 23       | B 2  | 22 | N 3      | 23   |  |          |
| A20  | B | 23       | C10  | A  | P 2      | 24   |  |          |
| A26  |   | 24       | C12  | B  | S 7      | 23   |  |          |

 : RELAY BLOCKS

| CODE | SEE PAGE | RELAY BLOCKS (RELAY BLOCK LOCATION)   |
|------|----------|---------------------------------------|
| 2    | 18       | R/B NO. 2 (FRONT SIDE OF LEFT FENDER) |

 : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

| CODE | SEE PAGE | JOINING WIRE HARNESS AND WIRE HARNESS (CONNECTOR LOCATION)                  |
|------|----------|-----------------------------------------------------------------------------|
| EA3  | 26       | COWL WIRE AND ENGINE ROOM MAIN WIRE (LEFT FENDER)                           |
| ID2  | 28       | COWL WIRE AND FLOOR NO. 1 WIRE (LEFT KICK PANEL)                            |
| ID3  |          |                                                                             |
| IH2  | 28       | ENGINE WIRE AND COWL WIRE (BEHIND GLOVE BOX)                                |
| BQ2  | 30       | FLOOR NO. 3 WIRE AND FLOOR NO. 1 WIRE (LEFT QUARTER PANEL INNER)            |
| Bd1  | 32       | COWL WIRE AND SPEED SENSOR NO. 1 WIRE (LEFT KICK PANEL)                     |
| Be1  | 32       | SPEED SENSOR NO. 2 WIRE AND SPEED SENSOR NO. 1 WIRE (FRONT AXLE HOUSING LH) |
| Bf1  | 32       | FRAME NO. 2 WIRE AND SPEED SENSOR NO. 3 WIRE (REAR AXLE HOUSING LH)         |
| Bg1  | 32       | FRAME NO. 2 WIRE AND SPEED SENSOR NO. 3 WIRE (REAR AXLE HOUSING RH)         |
| Bh1  | 32       | FLOOR NO. 3 WIRE AND FRAME WIRE (LEFT QUARTER PANEL INNER)                  |

 : GROUND POINTS

| CODE | SEE PAGE | GROUND POINTS LOCATION       |
|------|----------|------------------------------|
| ID   | 28       | LEFT KICK PANEL              |
| IE   | 28       | RIGHT KICK PANEL             |
| BF   | 30       | UNDER THE CENTER CONSOLE BOX |

 : SPLICE POINTS

| CODE | SEE PAGE | WIRE HARNESS WITH SPLICE POINTS | CODE | SEE PAGE | WIRE HARNESS WITH SPLICE POINTS |
|------|----------|---------------------------------|------|----------|---------------------------------|
| E 5  | 26       | ENGINE ROOM MAIN WIRE           | I 6  | 28       | COWL WIRE                       |
| I 2  | 28       | COWL WIRE                       | B 7  | 32       | FLOOR NO. 1 WIRE                |
| I 3  |          |                                 | B16  | 32       | FRAME NO. 2 WIRE                |
| I 5  |          |                                 | B21  | 32       | FLOOR NO. 3 WIRE                |