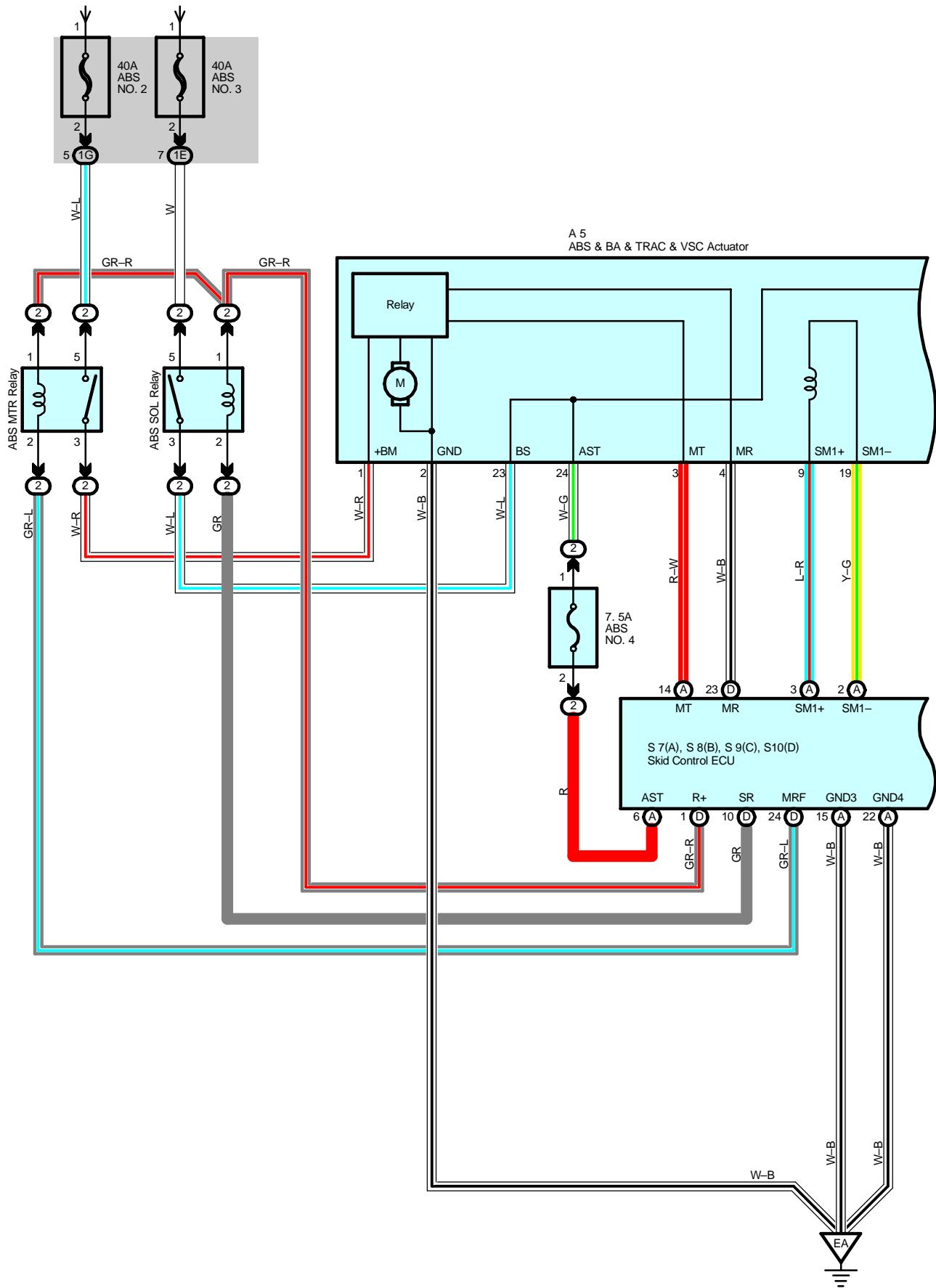
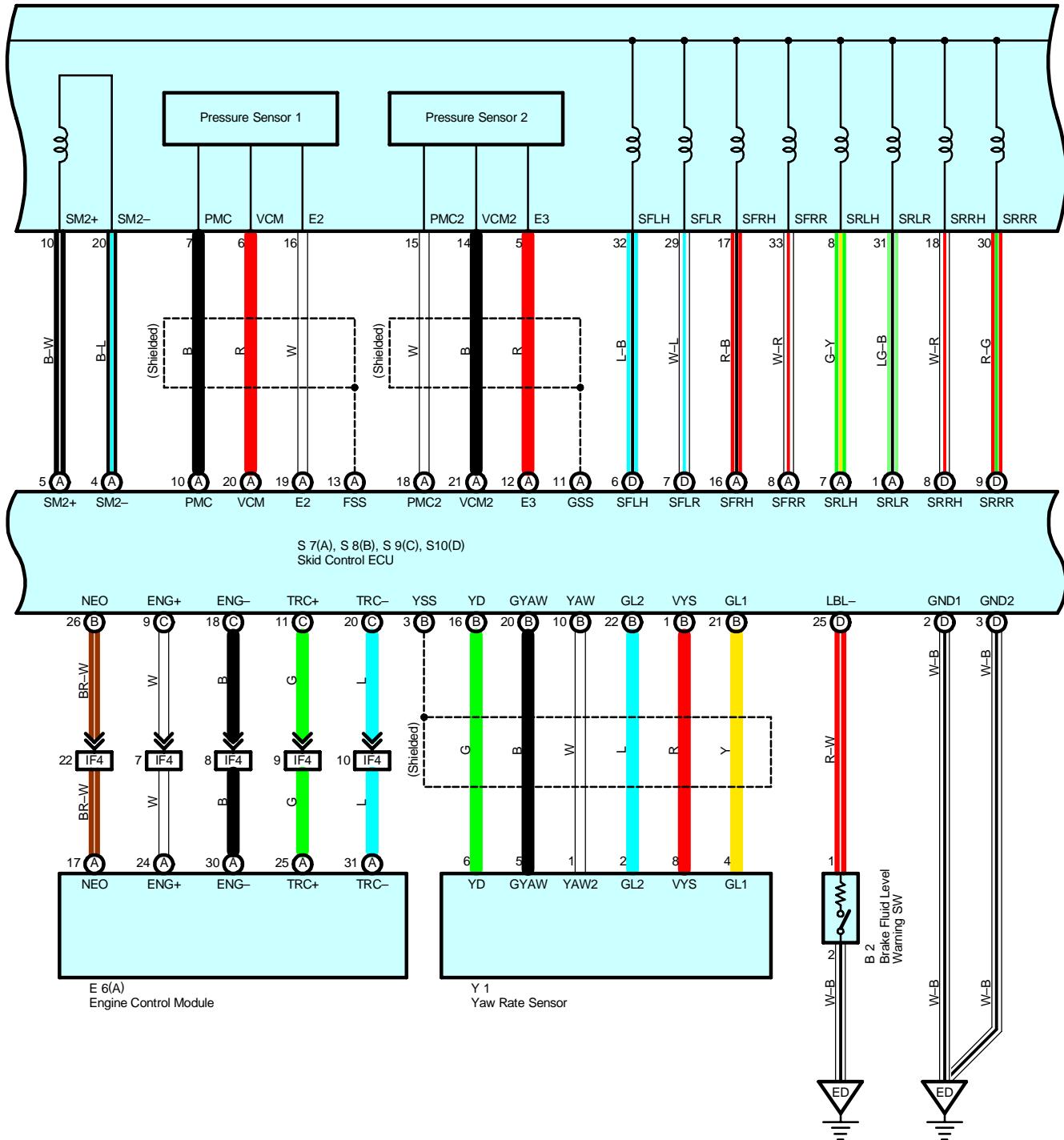


From Power Source System (See Page 62)

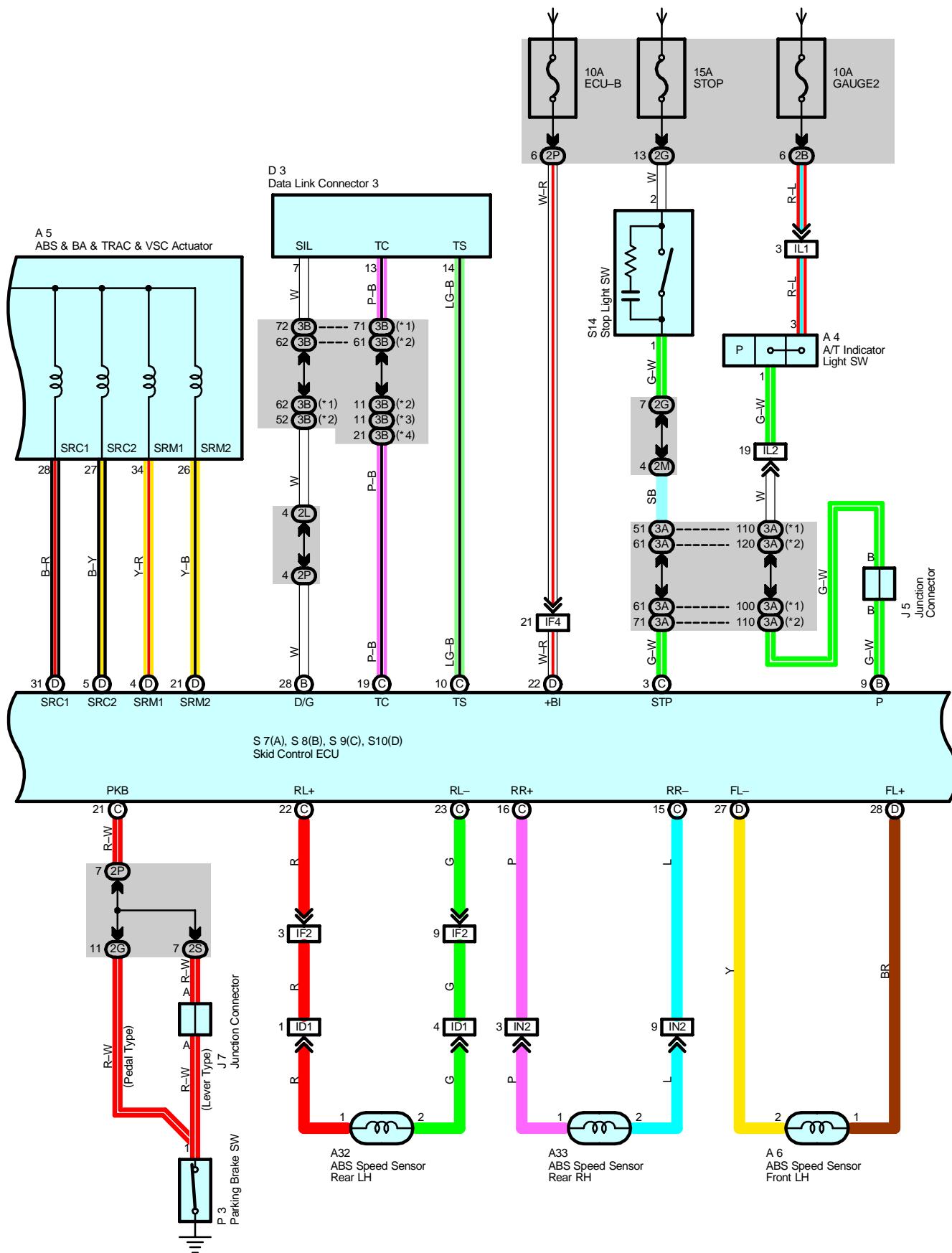


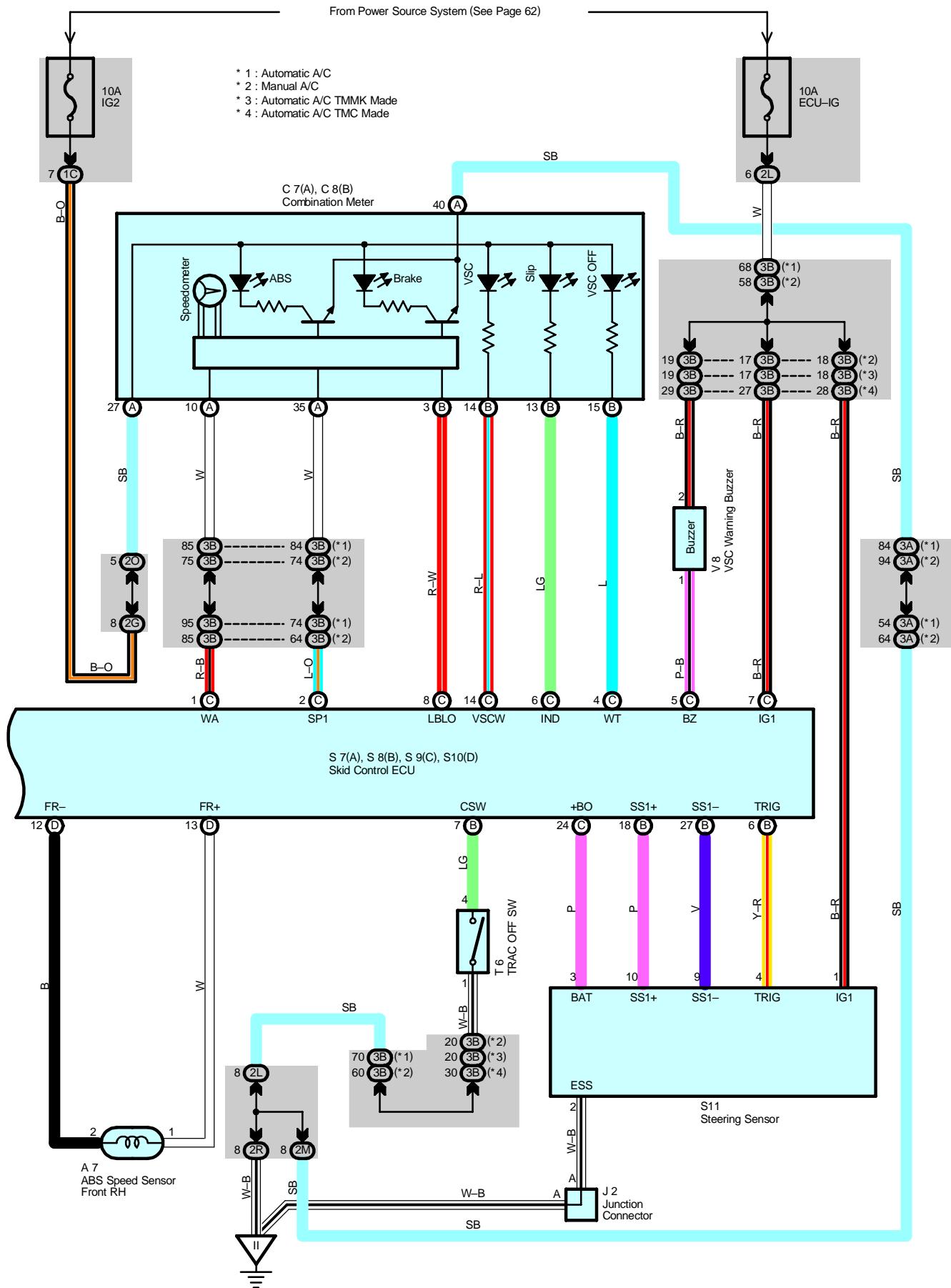
- * 1 : Automatic A/C
- * 2 : Manual A/C

A 5
ABS & BA & TRAC & VSC Actuator



From Power Source System (See Page 62)





System Outline

1. ABS Operation

If the brake pedal is depressed suddenly, the ABS controls the hydraulic pressure of the wheel cylinders for all the four wheels to automatically avoid wheel locking and ensure the directional and steering stability of the vehicle. If the brake pedal is depressed suddenly, the skid control ECU controls the solenoids in the actuators using the signals from the sensors to move the brake fluid to the reservoir in order to release the braking pressure applied to the wheel cylinder. If the skid control ECU detects that the fluid pressure in the wheel cylinder is insufficient, the ECU controls the solenoids in the actuators to increase the braking pressure.

2. Traction Control Operation

The traction control system controls the engine torque, the hydraulic pressure of the driving wheel cylinders, slipping of the wheels which may occur at start or acceleration of the vehicle, to ensure an optimal driving power and vehicle stability corresponding to the road conditions.

3. VSC Operation

Unexpected road conditions, vehicle speed, emergency situation, and any other external factors may cause large under- or over-steering of the vehicle. If this occurs, the VSC system automatically controls the engine power and wheel brakes to reduce the under- or over-steering.

To reduce large over-steering :

If the VSC system determines that the over-steering is large, it activates the brakes for the outer turning wheels depending on the degree of the over-steering to produce the moment toward the outside of the vehicle and reduce the over-steering.

To reduce large under-steering :

If the VSC system determines that the under-steering is large, it controls the engine power and activates the rear wheel brakes to reduce the under-steering.

Traction control SW

The traction control SW is used to stop the TRAC function. After the engine is started, the TRAC system is stopped (turned off) and the VSC OFF indicator light lights up. When the traction control SW is pressed again, the TRAC system enters the stand-by mode. If the engine is stopped and restarted, the TRAC system enters the stand-by mode regardless of the traction control SW.

4. Mutual System Control

To efficiently operate the VSC system at its optimal level, the VSC system and other control systems are mutually controlled while the VSC system is being operated.

Engine throttle control

The engine power does not interfere with the VSC brake control by controlling the opening of the throttle and reducing the engine output.

Engine control and electronically controlled transmission control

The strong braking force does not interfere with the braking force control of the VSC system by turning off the accel. and reducing changes in the driving torque at shift-down.

VSC system operation indication

The Slip indicator light flashes and the buzzer sounds intermittently to warn the driver that the current road is slippery, while the VSC system is being operated.

5. Fail Safe Function

If an error occurs in the skid control ECU, sensor signals, and/or actuators, the skid control ECU inhibits the brake actuator control and inputs the error signal to the engine control module. According to the error signal, the brake actuator turns off the solenoid and the engine control module rejects any electronically controlled throttle open request from the VSC system. As a result, the vehicle functions regardless of the ABS, TRAC, and VSC systems.

Service Hints

S7 (A), S9 (C), S10 (D) Skid Control ECU

(C) 7-Ground : Approx. 12 volts with ignition SW at ON or ST position

(D) 22-Ground : Always approx. 12 volts

(A) 15, (D) 22, (D) 3-Ground : Always continuity

 : Parts Location

| Code | See Page | Code | See Page | Code | See Page |
|------|-------------|------|----------|------|----------|
| A4 | 38 (1MZ-FE) | C8 | B | 42 | S8 B 43 |
| A5 | 38 (1MZ-FE) | D3 | | 42 | S9 C 43 |
| A6 | 38 (1MZ-FE) | E6 | A | 42 | S10 D 43 |
| A7 | 38 (1MZ-FE) | J2 | | 43 | S11 43 |
| A32 | 44 | J5 | | 43 | S14 43 |
| A33 | 44 | J7 | | 43 | T6 43 |
| B2 | 38 (1MZ-FE) | P3 | | 43 | V8 43 |
| C7 | A | S7 | A | 43 | Y1 43 |

 : Relay Blocks

| Code | See Page | Relay Blocks (Relay Block Location) |
|------|----------|-------------------------------------|
| 2 | 23 | ABS R/B (Radiator Side Support LH) |

 : Junction Block and Wire Harness Connector

| Code | See Page | Junction Block and Wire Harness (Connector Location) |
|------|--|--|
| 1C | | |
| 1E | 25 | Engine Room Main Wire and Engine Room J/B (Engine Compartment Left) |
| 1G | | |
| 2B | 28 | Instrument Panel Wire and Driver Side J/B (Lower Finish Panel) |
| 2G | 28 | Engine Room Main Wire and Driver Side J/B (Lower Finish Panel) |
| 2L | | |
| 2M | | |
| 2O | | |
| 2P | 29 | Instrument Panel Wire and Driver Side J/B (Lower Finish Panel) |
| 2R | | |
| 2S | | |
| 3A | 34 (*1) 35 (*3) 36 (*2) 37 (*4) | Instrument Panel Wire and Passenger Side J/B (Instrument Panel Brace RH) |
| 3B | 34 (*1) 35 (*3) 36 (*2) 37 (*4) | |

* 1 : TMC Made Automatic A/C * 2 : TMC Made Manual A/C * 3 : TMMK Made Automatic A/C * 4 : TMMK Made Manual A/C

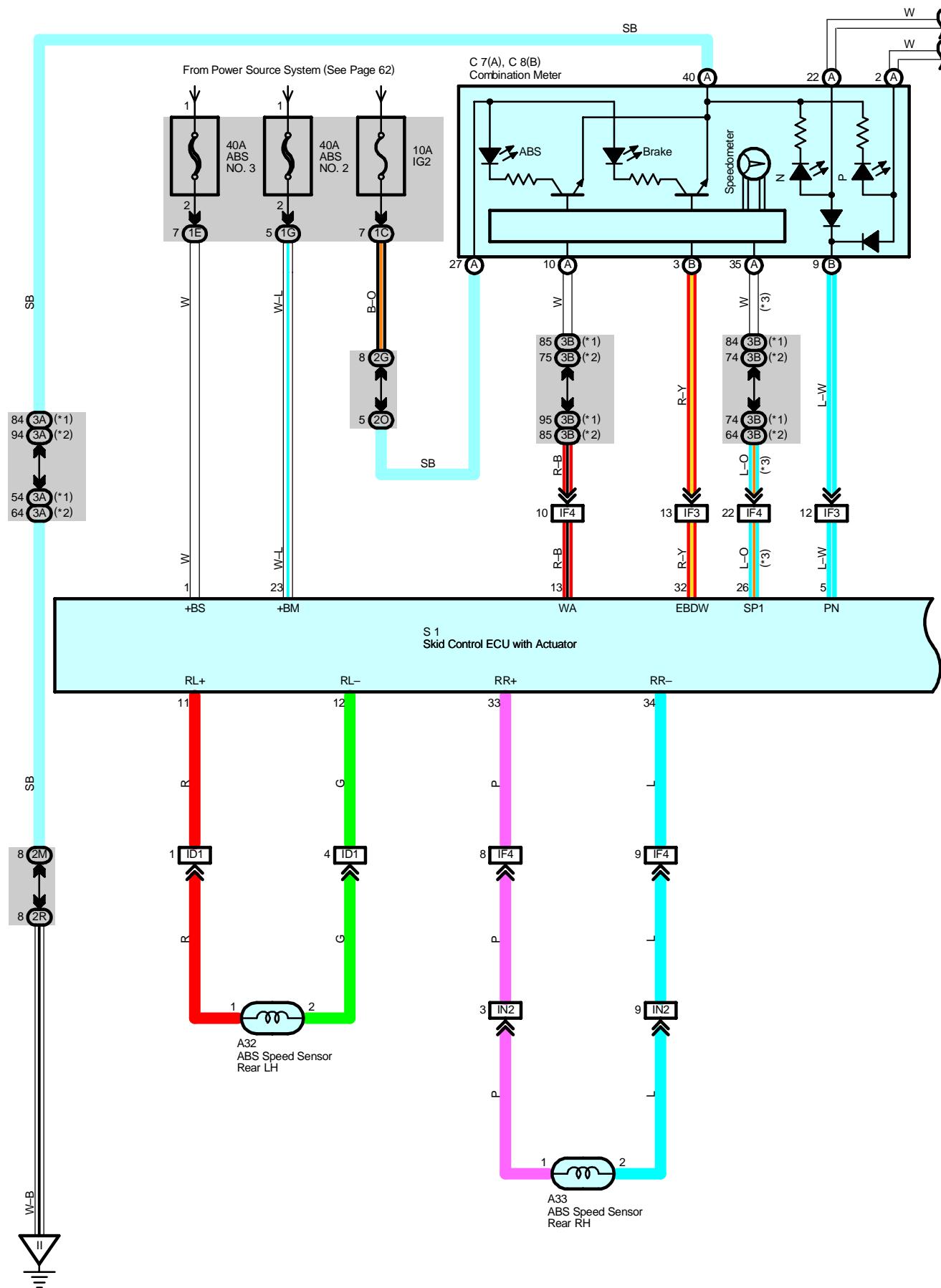
 : Connector Joining Wire Harness and Wire Harness

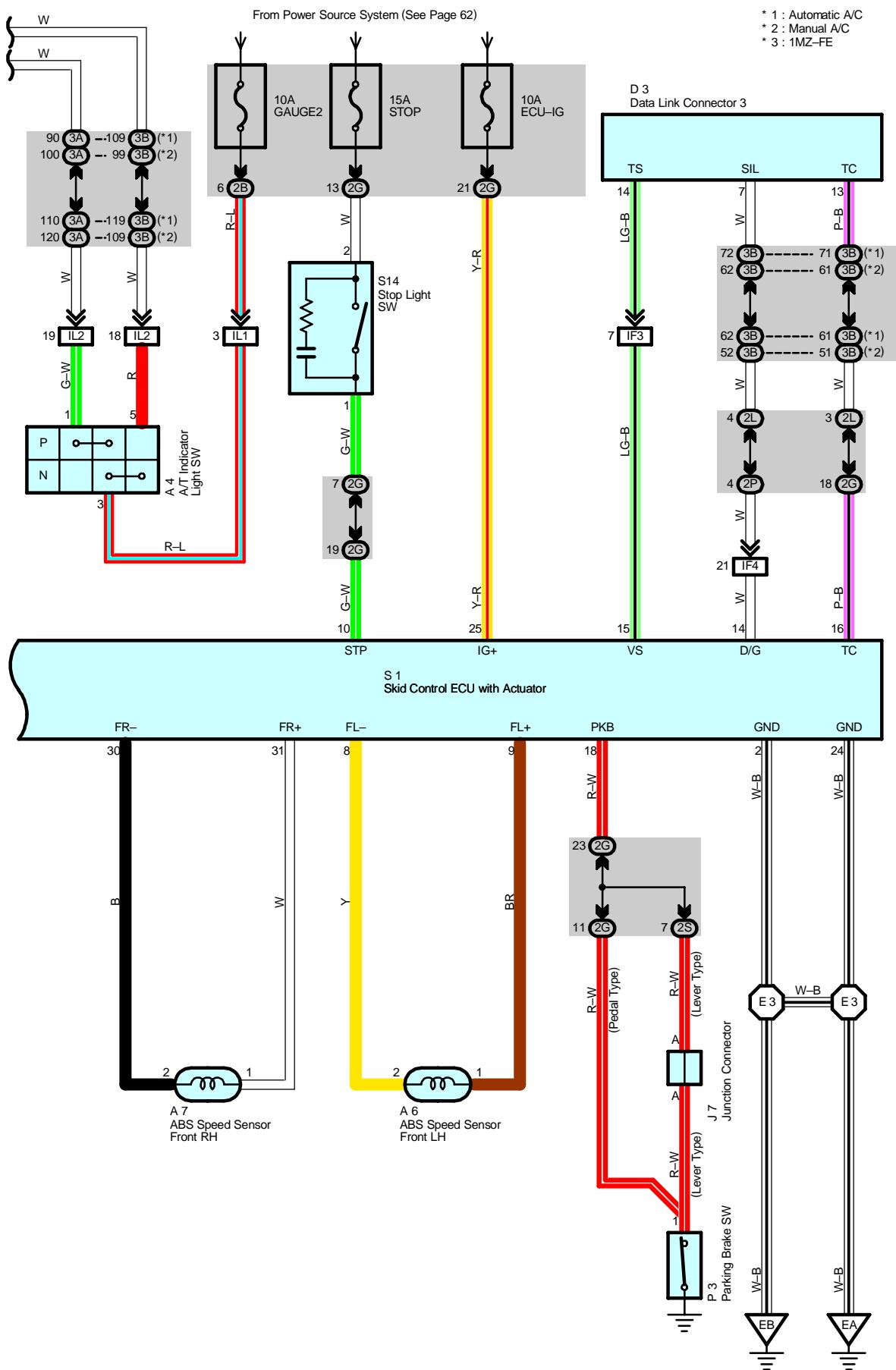
| Code | See Page | Joining Wire Harness and Wire Harness (Connector Location) |
|------|----------|--|
| ID1 | 52 | Engine Room Main Wire and Floor Wire (Left Side of Driver Side J/B) |
| IF2 | 52 | Engine Room Main Wire and Instrument Panel Wire (Right Side of Steering Column Tube) |
| IF4 | | |
| IL1 | 54 | Engine Wire and Instrument Panel Wire (Behind the Glove Box) |
| IL2 | | |
| IN2 | 54 | Instrument Panel Wire and Floor No.2 Wire (Right Kick Panel) |

**: Ground Points**

| Code | See Page | Ground Points Location |
|------|-----------------------------|------------------------|
| EA | 48 (1MZ-FE) | Right Fender |
| ED | 48 (1MZ-FE) | Left Fender |
| II | 52 | Cowl Side Panel LH |

ABS (TMC Made)





ABS (TMC Made)

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 Signals

(1) Speed sensor signal

The speed of the wheels is detected and input to TERMINALS 9, 11, 31 and 33 of the skid control ECU with actuator.

(2) Stop light SW signal

A signal is input to TERMINAL 10 of the skid control ECU with actuator when the brake pedal is depressed.

2. System Operation

During sudden braking the skid control ECU with actuator has signals input from each sensor, which controls the current 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 skid control ECU with actuator judges that the hydraulic pressure acting on the wheel cylinder is insufficient, the current on the solenoid is controlled and the hydraulic pressure is increased. Holding of the hydraulic pressure is also controlled by the skid control ECU with actuator, by the same method as above. Pressure reduction, holding and increase are repeated to maintain vehicle stability and to improve steerability during sudden braking.

Service Hints

A6, A7 ABS Speed Sensor Front LH, RH

2-1 : Approx. 1.6 kΩ

A32, A33 ABS Speed Sensor Rear LH, RH

2-1 : Approx. 1.6 kΩ

S1 Skid Control ECU with Actuator

2, 24-Ground : Always continuity

25-Ground : Approx. 12 volts with the ignition SW at ON position

10-Ground : Approx. 12 volts with the brake pedal depressed

1, 25-Ground : Always approx. 12 volts

○ : Parts Location

| Code | See Page | Code | See Page | Code | See Page |
|------|-------------|------|----------|------|-------------|
| A4 | 38 (1MZ-FE) | A32 | 44 | P3 | 43 |
| | 40 (2AZ-FE) | A33 | 44 | S1 | 39 (1MZ-FE) |
| A6 | 38 (1MZ-FE) | C7 | A | | 41 (2AZ-FE) |
| | 40 (2AZ-FE) | C8 | B | S14 | 43 |
| A7 | 38 (1MZ-FE) | D3 | 42 | | |
| | 40 (2AZ-FE) | J7 | 43 | | |

 : Junction Block and Wire Harness Connector

| Code | See Page | Junction Block and Wire Harness (Connector Location) |
|------|--|--|
| 1C | | |
| 1E | 25 | Engine Room Main Wire and Engine Room J/B (Engine Compartment Left) |
| 1G | | |
| 2B | 28 | Instrument Panel Wire and Driver Side J/B (Lower Finish Panel) |
| 2G | 28 | Engine Room Main Wire and Driver Side J/B (Lower Finish Panel) |
| 2L | | |
| 2M | | |
| 2O | 29 | Instrument Panel Wire and Driver Side J/B (Lower Finish Panel) |
| 2P | | |
| 2R | | |
| 2S | | |
| 3A | 34 (*1) 36 (*2) | |
| 3B | 34 (*1) 36 (*2) | Instrument Panel Wire and Passenger Side J/B (Instrument Panel Brace RH) |

* 1 : TMC Made Automatic A/C * 2 : TMC Made Manual A/C

 : Connector Joining Wire Harness and Wire Harness

| Code | See Page | Joining Wire Harness and Wire Harness (Connector Location) |
|------|--------------------|--|
| ID1 | 52 | Engine Room Main Wire and Floor Wire (Left Side of Driver Side J/B) |
| IF3 | 52 | Engine Room Main Wire and Instrument Panel Wire (Right Side of Steering Column Tube) |
| IF4 | | |
| IL1 | 54 | Engine Wire and Instrument Panel Wire (Behind the Glove Box) |
| IL2 | | |
| IN2 | 54 | Instrument Panel Wire and Floor No.2 Wire (Right Kick Panel) |

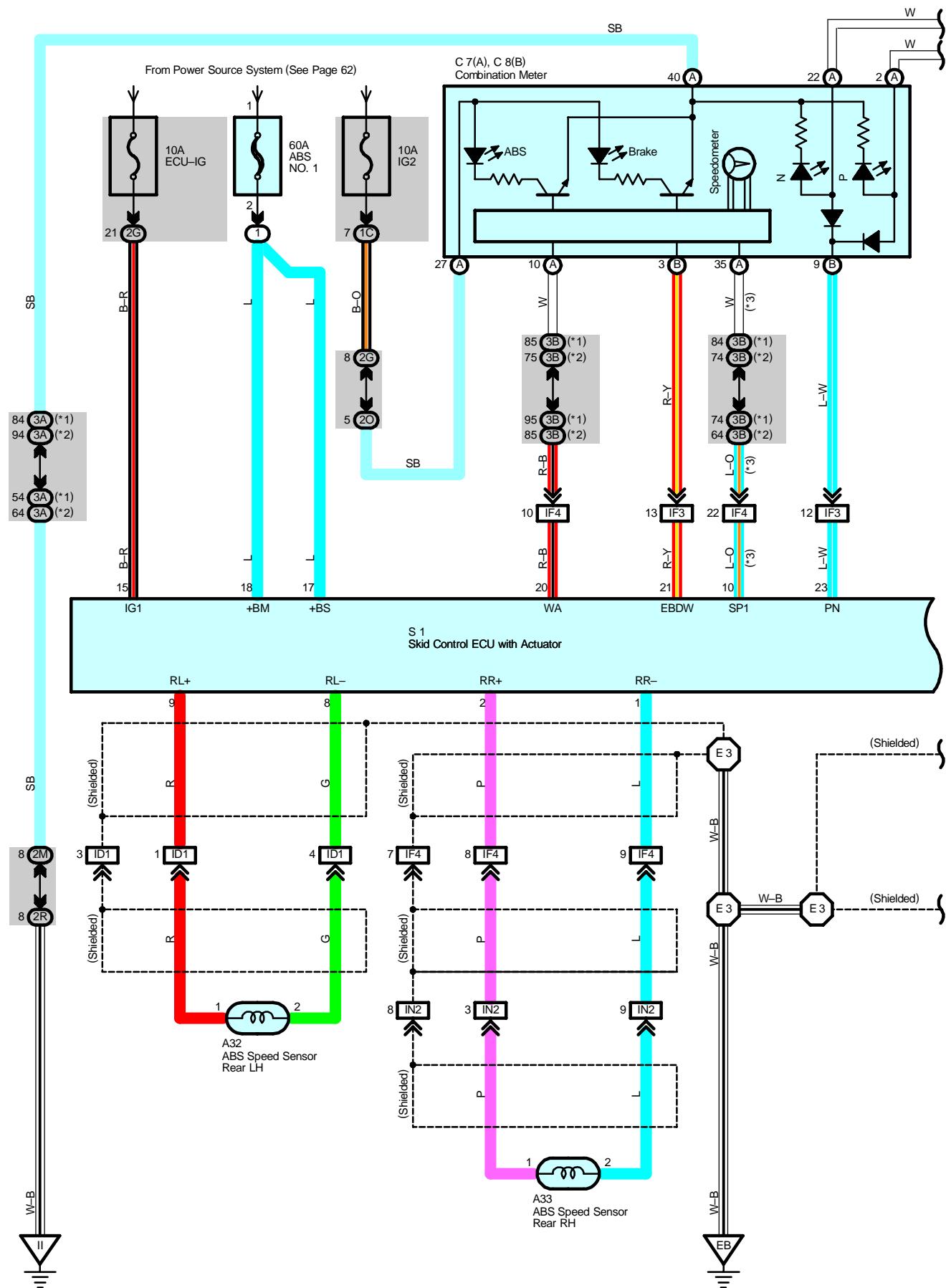
 : Ground Points

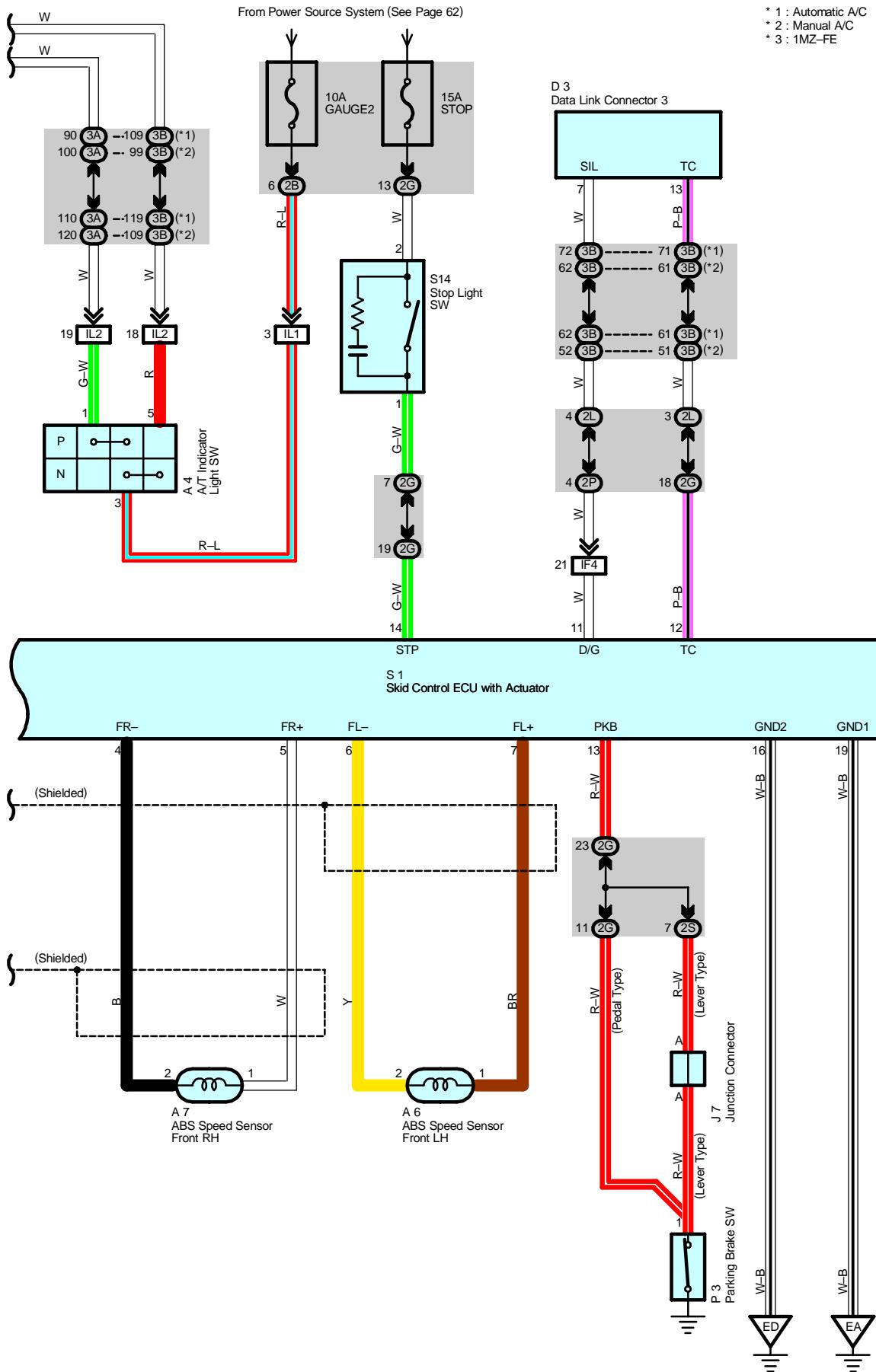
| Code | See Page | Ground Points Location |
|------|--|------------------------|
| EA | 48 (1MZ-FE) 50 (2AZ-FE) | Right Fender |
| EB | 48 (1MZ-FE) 50 (2AZ-FE) | |
| II | 52 | Cowl Side Panel LH |

 : Splice Points

| Code | See Page | Wire Harness with Splice Points | Code | See Page | Wire Harness with Splice Points |
|------|-----------------------------|---------------------------------|------|-----------------------------|---------------------------------|
| E3 | 48 (1MZ-FE) | Engine Room Main Wire | E3 | 50 (2AZ-FE) | Engine Room Main Wire |

ABS (TMMK Made)





ABS (TMMK Made)

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 Signals

(1) Speed sensor signal

The speed of the wheels is detected and input to TERMINALS 2, 5, 7 and 9 of the skid control ECU with actuator.

(2) Stop light SW signal

A signal is input to TERMINAL 14 of the skid control ECU with actuator when the brake pedal is depressed.

2. System Operation

During sudden braking the skid control ECU with actuator has signals input from each sensor, which controls the current 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 skid control ECU with actuator judges that the hydraulic pressure acting on the wheel cylinder is insufficient, the current on the solenoid is controlled and the hydraulic pressure is increased. Holding of the hydraulic pressure is also controlled by the skid control ECU with actuator, by the same method as above. Pressure reduction, holding and increase are repeated to maintain vehicle stability and to improve steerability during sudden braking.

Service Hints

A6, A7 ABS Speed Sensor Front LH, RH

2-1 : Approx. 1.6 kΩ

A32, A33 ABS Speed Sensor Rear LH, RH

2-1 : Approx. 1.6 kΩ

S1 Skid Control ECU with Actuator

16, 19-Ground : Always continuity

15-Ground : Approx. 12 volts with the ignition SW at ON position

14-Ground : Approx. 12 volts with the brake pedal depressed

17, 18-Ground : Always approx. 12 volts

○ : Parts Location

| Code | See Page | Code | See Page | Code | See Page |
|------|-------------|------|----------|------|-------------|
| A4 | 38 (1MZ-FE) | A32 | 44 | P3 | 43 |
| | 40 (2AZ-FE) | A33 | 44 | S1 | 39 (1MZ-FE) |
| A6 | 38 (1MZ-FE) | C7 | A | | 41 (2AZ-FE) |
| | 40 (2AZ-FE) | C8 | B | S14 | 43 |
| A7 | 38 (1MZ-FE) | D3 | 42 | | |
| | 40 (2AZ-FE) | J7 | 43 | | |

○ : Relay Blocks

| Code | See Page | Relay Blocks (Relay Block Location) |
|------|----------|---|
| 1 | 22 | Engine Room R/B (Engine Compartment Left) |

 : Junction Block and Wire Harness Connector

| Code | See Page | Junction Block and Wire Harness (Connector Location) |
|------|--|--|
| 1C | 25 | Engine Room Main Wire and Engine Room J/B (Engine Compartment Left) |
| 2B | 28 | Instrument Panel Wire and Driver Side J/B (Lower Finish Panel) |
| 2G | 28 | Engine Room Main Wire and Driver Side J/B (Lower Finish Panel) |
| 2L | | |
| 2M | | |
| 2O | | |
| 2P | 29 | Instrument Panel Wire and Driver Side J/B (Lower Finish Panel) |
| 2R | | |
| 2S | | |
| 3A | 35 (*3) 37 (*4) | |
| 3B | 35 (*3) 37 (*4) | Instrument Panel Wire and Passenger Side J/B (Instrument Panel Brace RH) |

* 3 : TMMK Made Automatic A/C * 4 : TMMK Made Manual A/C

 : Connector Joining Wire Harness and Wire Harness

| Code | See Page | Joining Wire Harness and Wire Harness (Connector Location) |
|------|--------------------|--|
| ID1 | 52 | Engine Room Main Wire and Floor Wire (Left Side of Driver Side J/B) |
| IF3 | 52 | Engine Room Main Wire and Instrument Panel Wire (Right Side of Steering Column Tube) |
| IF4 | | |
| IL1 | 54 | Engine Wire and Instrument Panel Wire (Behind the Glove Box) |
| IL2 | | |
| IN2 | 54 | Instrument Panel Wire and Floor No.2 Wire (Right Kick Panel) |

 : Ground Points

| Code | See Page | Ground Points Location |
|------|-----------------------------|------------------------|
| EA | 48 (1MZ-FE) | Right Fender |
| | 50 (2AZ-FE) | |
| EB | 48 (1MZ-FE) | |
| | 50 (2AZ-FE) | |
| ED | 48 (1MZ-FE) | Left Fender |
| | 50 (2AZ-FE) | |
| II | 52 | Cowl Side Panel LH |

 : Splice Points

| Code | See Page | Wire Harness with Splice Points | Code | See Page | Wire Harness with Splice Points |
|------|-----------------------------|---------------------------------|------|-----------------------------|---------------------------------|
| E3 | 48 (1MZ-FE) | Engine Room Main Wire | E3 | 50 (2AZ-FE) | Engine Room Main Wire |

Memo
