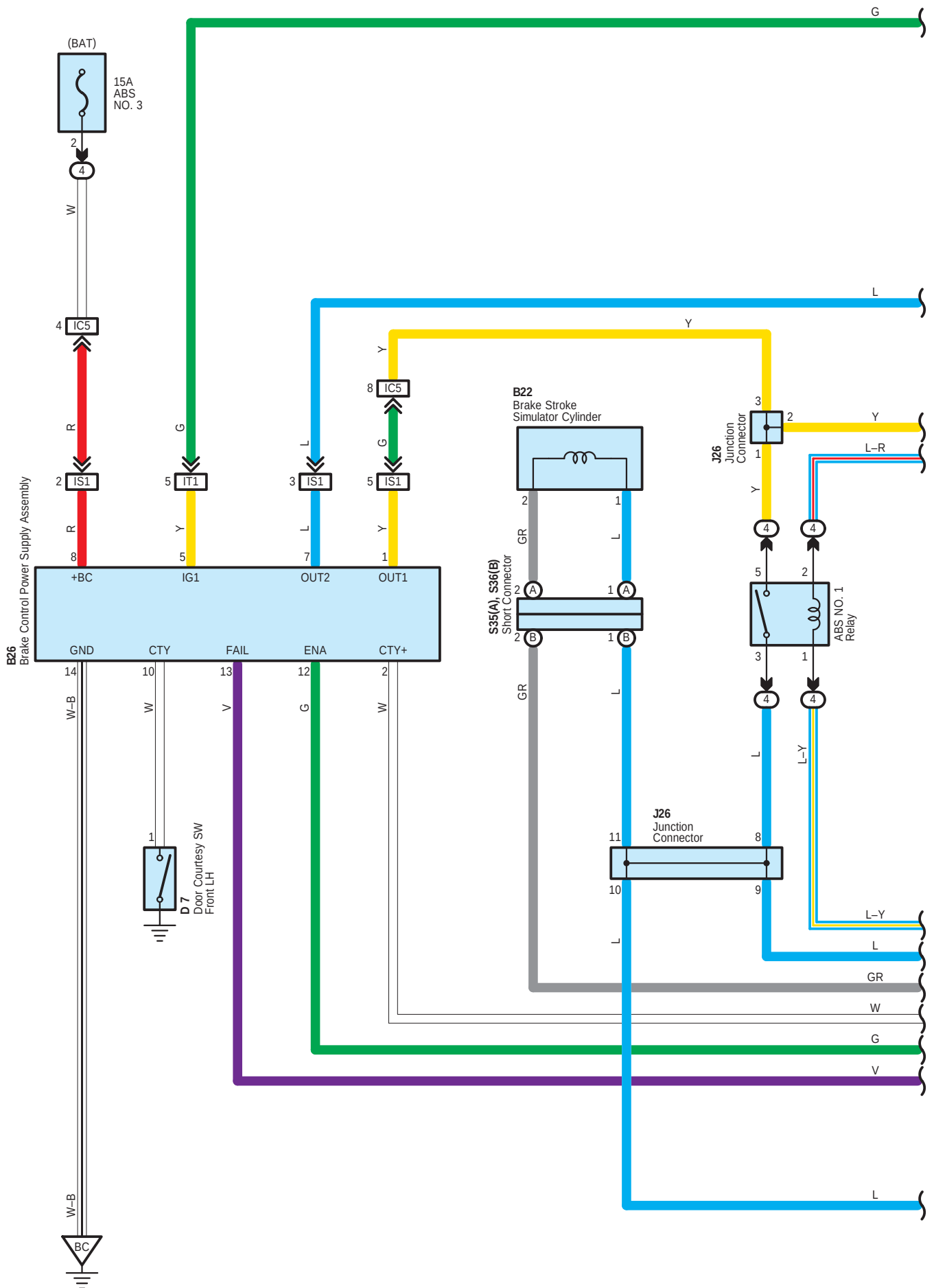
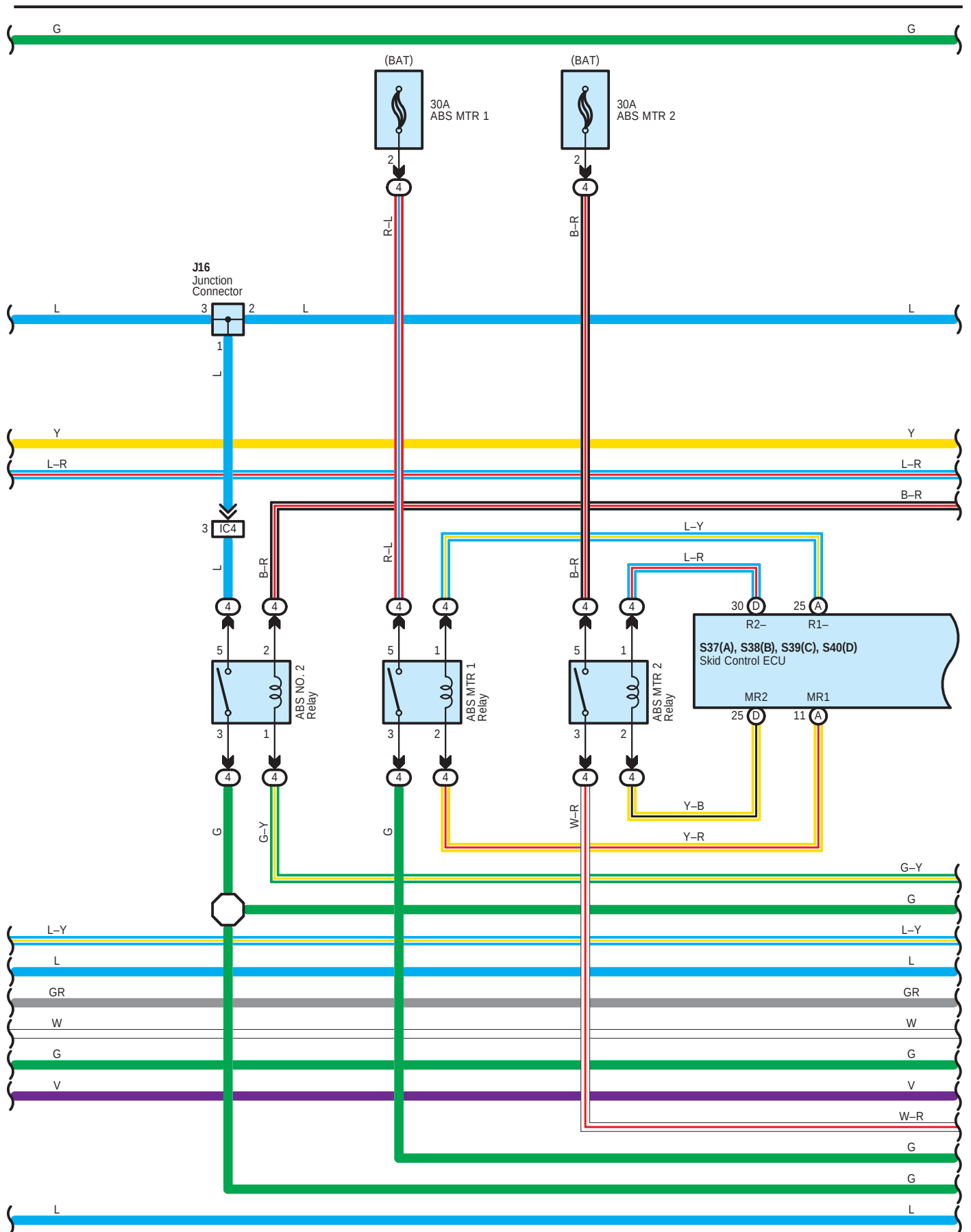
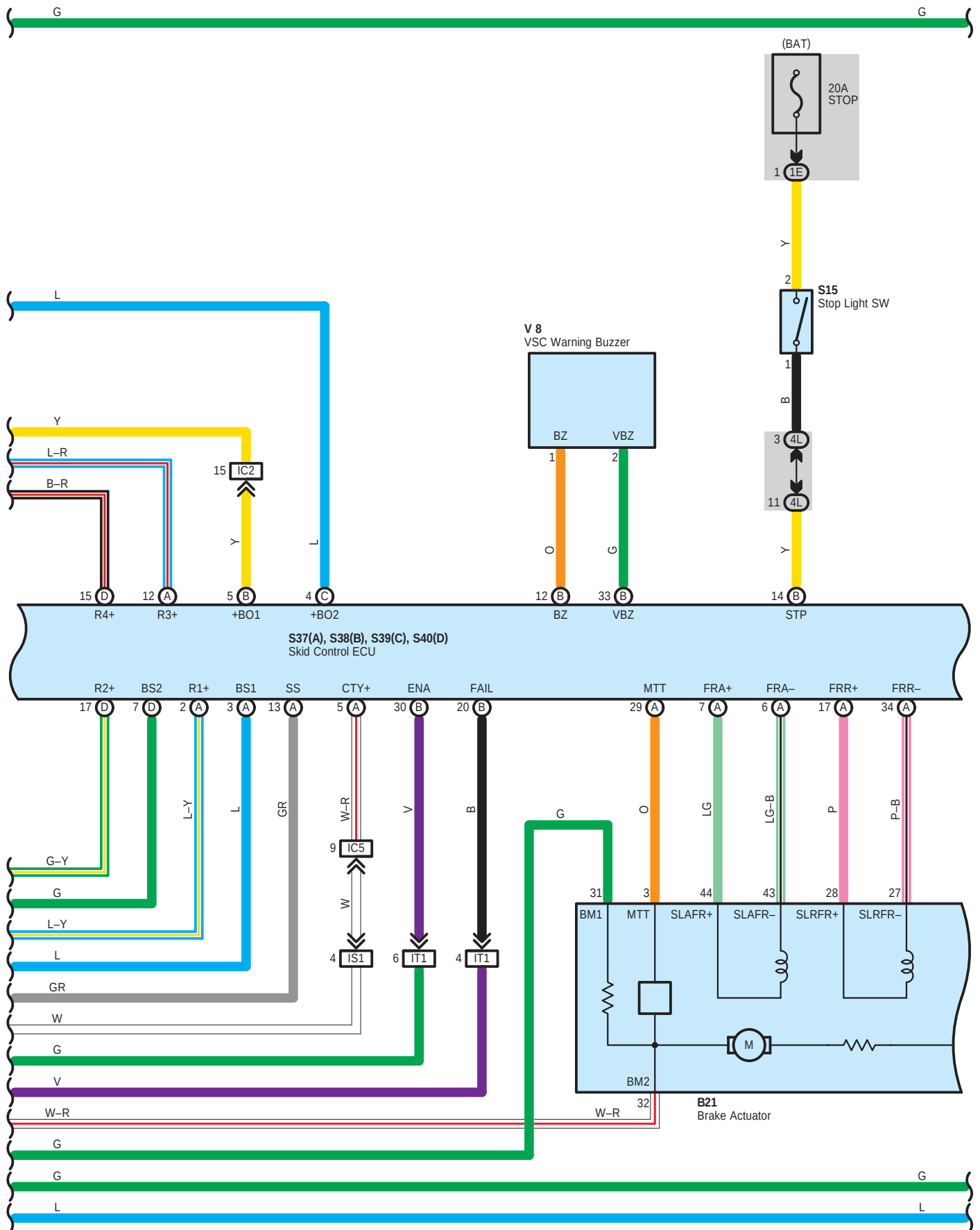


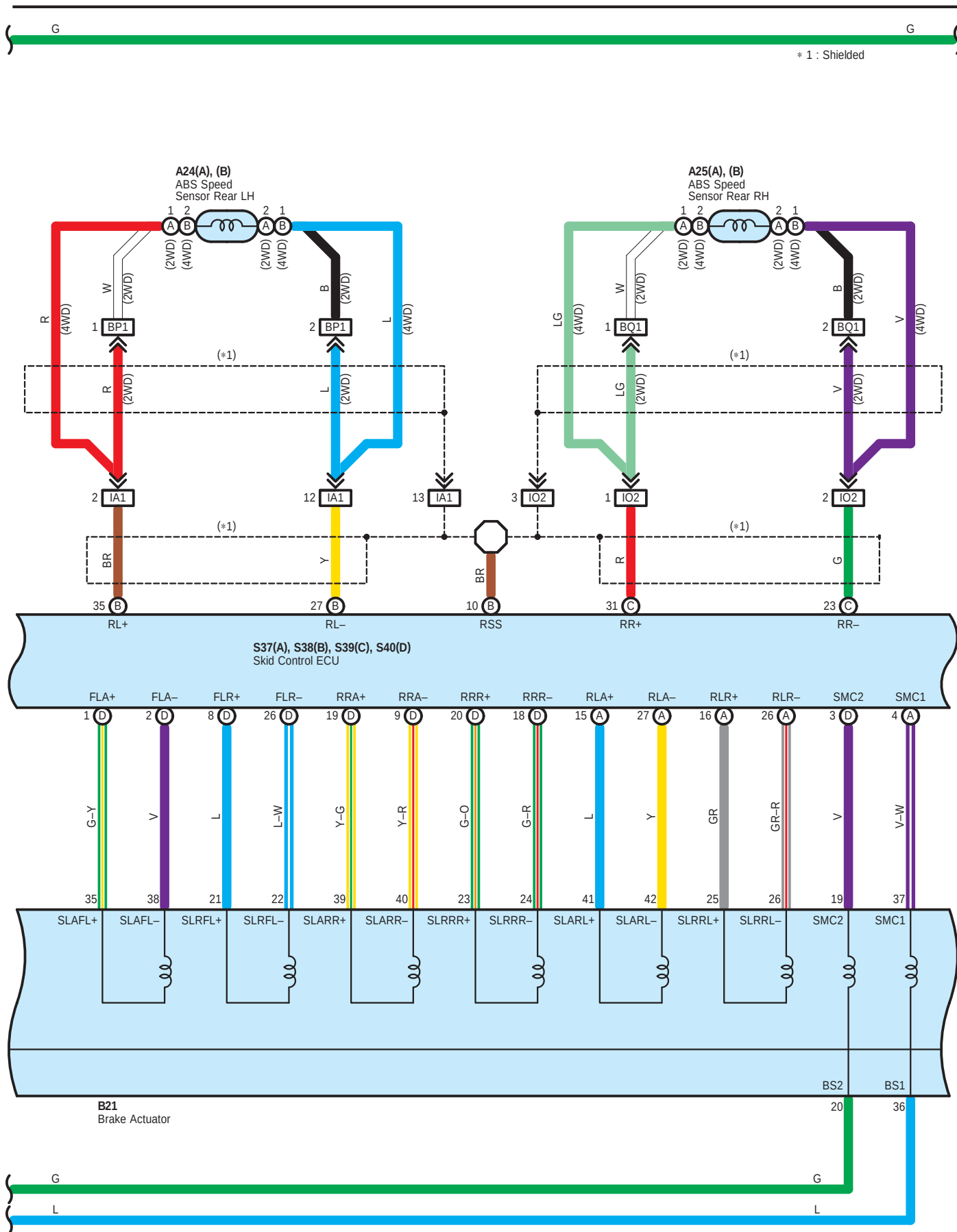
Brake Control System



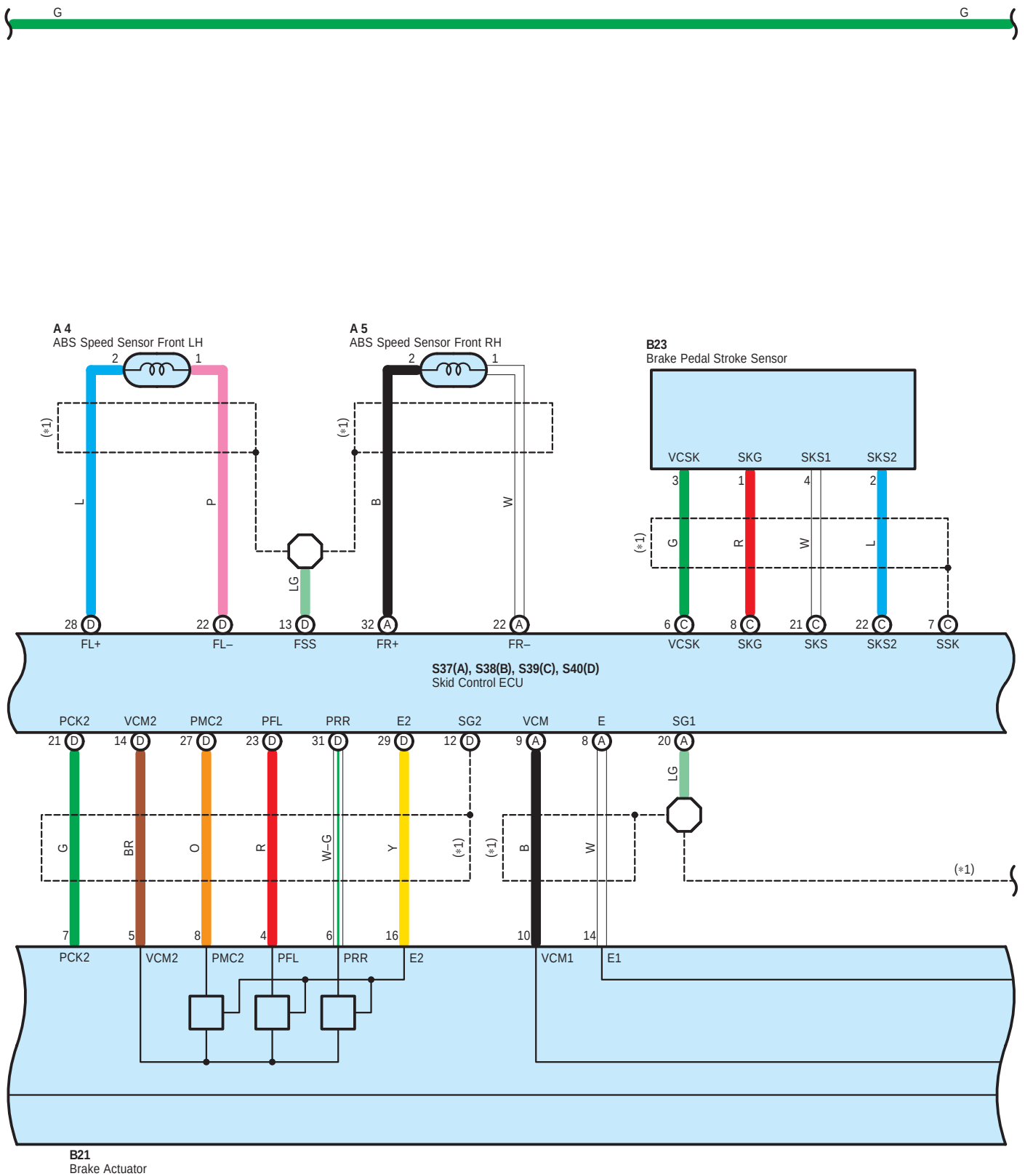


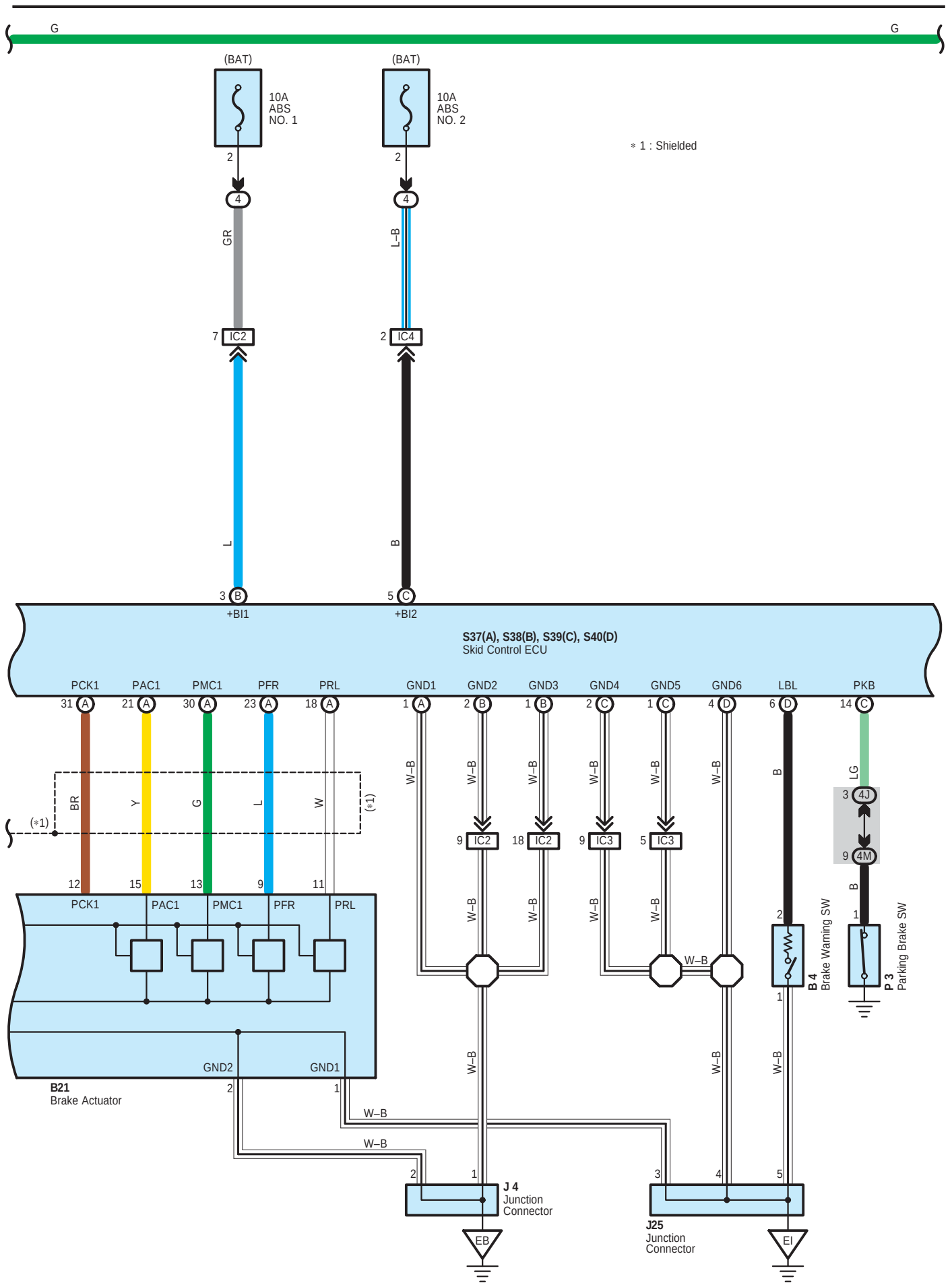
Brake Control System





Brake Control System



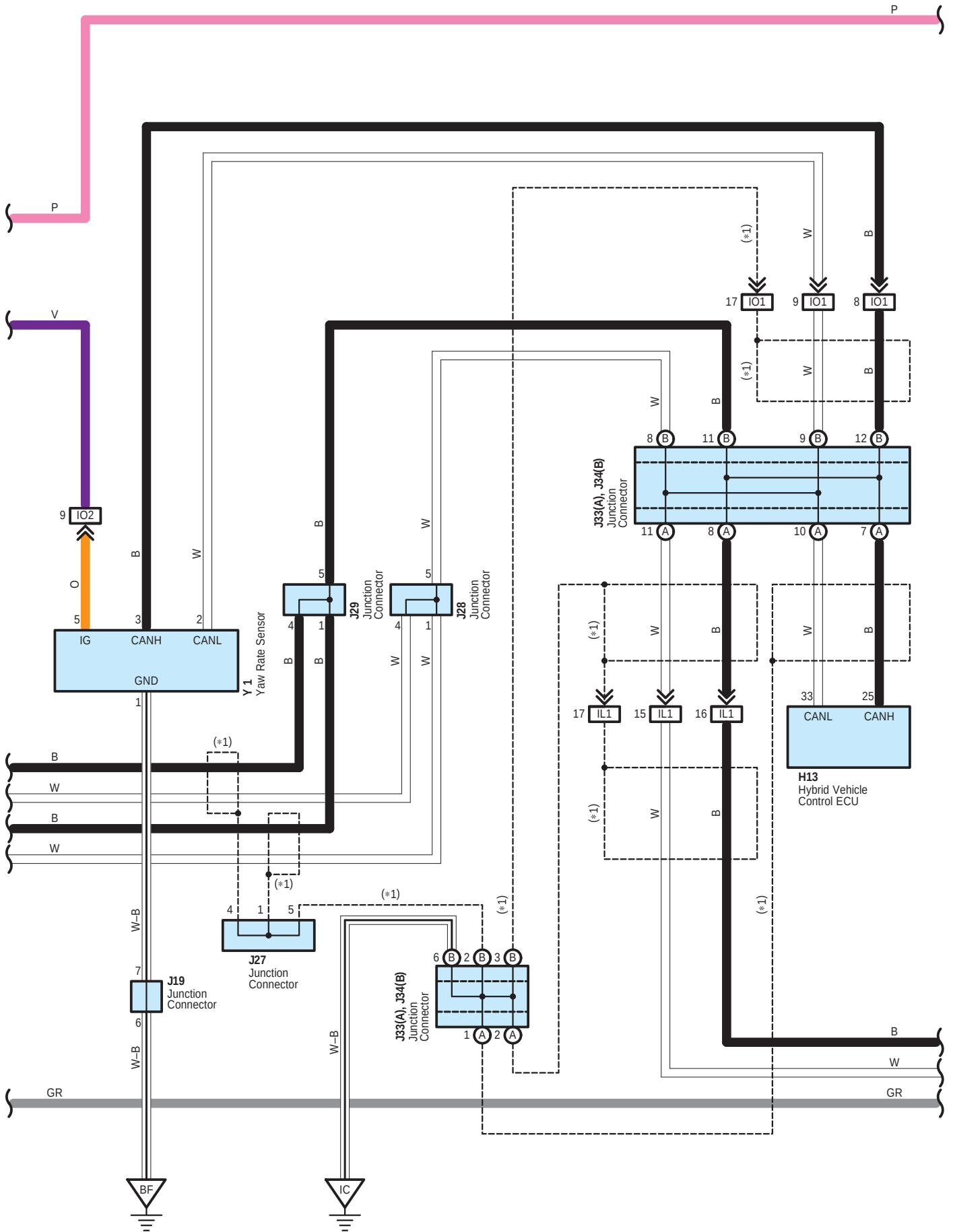


The diagram illustrates the electrical wiring for the Skid Control ECU (S37(A), S38(B), S39(C), S40(D)). The ECU is connected to several key components:

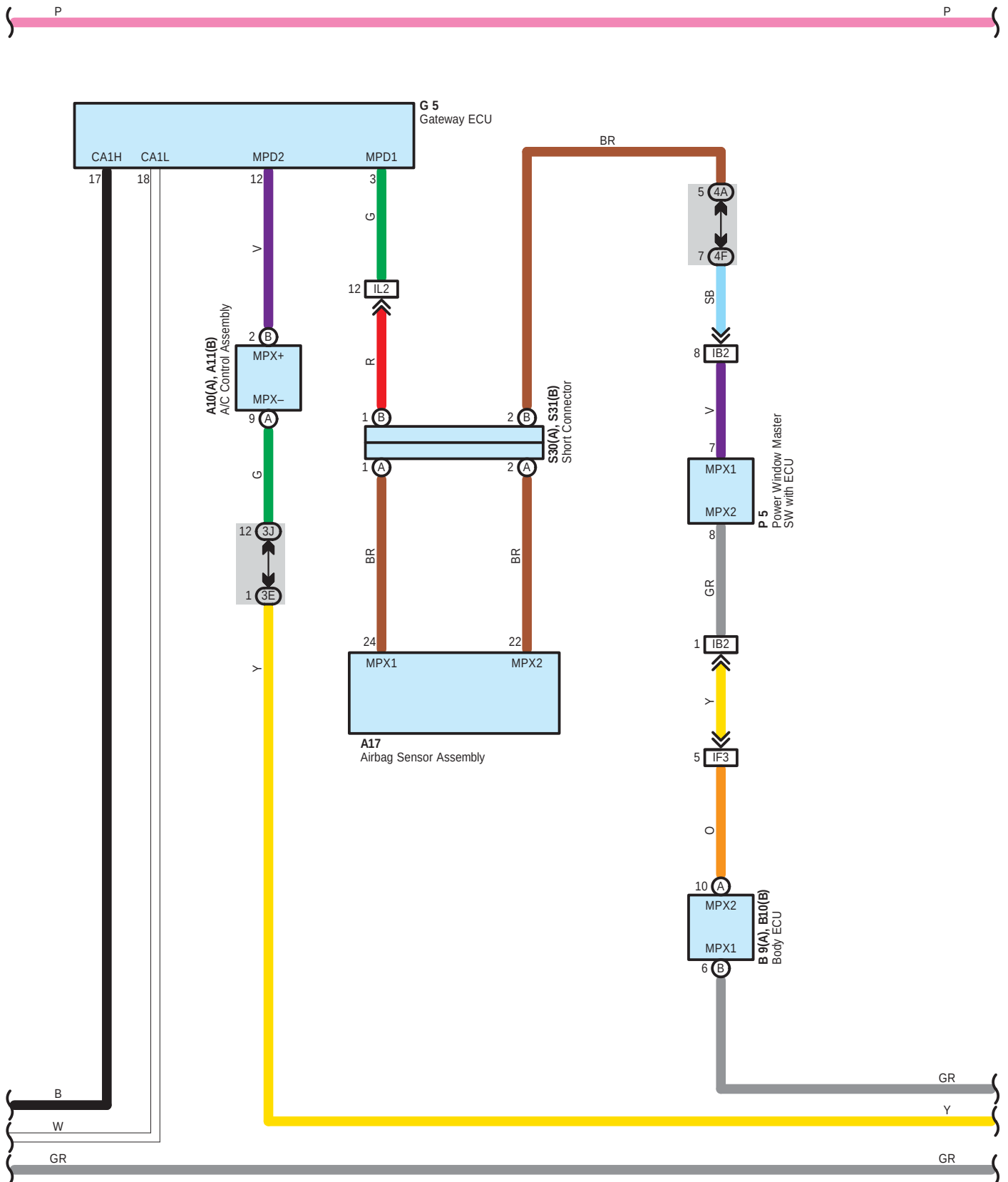
- Power Sources:**
 - (IG) 10A IGN:** Connected to terminal 6 (1G) and terminal 4 (4M).
 - (BAT) 7.5A ECU-B NO. 1:** Connected to terminal 2 (7) and terminal 7 (A).
 - (IG) 10A ECU-IG:** Connected to terminal 10 (1D) and terminal 9 (1D).
- ECU Connections:**
 - SP1 (22 B):** Connected to terminal 18 (IF3) and terminal 12 (GR).
 - TS (32 B):** Connected to terminal 12 (GR) and terminal 15 (V).
 - WFSE (4 B):** Connected to terminal 15 (V) and terminal 12 (GR).
 - CANL (18 B):** Connected to terminal 12 (GR) and terminal 15 (V).
 - CANH (19 B):** Connected to terminal 12 (GR) and terminal 15 (V).
- Other Components:**
 - J6 Junction Connector:** Connected to terminal 18 (17) and terminal 16 (16).
 - J31(A), J32(B) Junction Connector:** Connected to terminal 7 (A) and terminal 12 (B).
 - J17 Junction Connector:** Connected to terminal 10 (1G) and terminal 9 (1D).
 - S14 Steering Sensor:** Connected to terminal 2 (W-B) and terminal 7 (W-B).

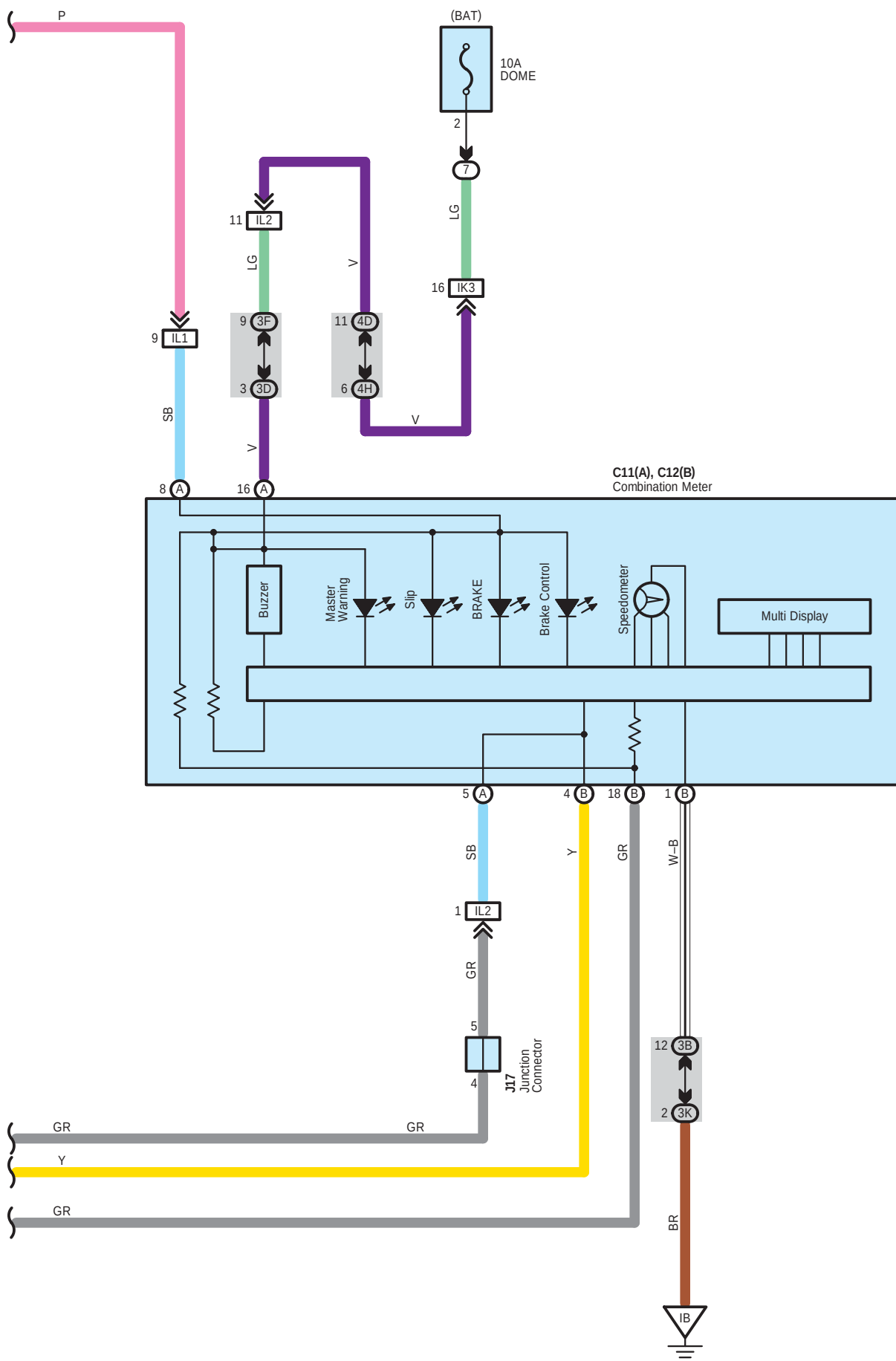
The diagram uses color-coded wires to represent different circuits: Pink for Power (P), Green for Ground (G), Yellow for Ignition (Y), Blue for CANL (L), and Purple for CANH (H). The ECU is shown as a central component with multiple terminals for power, ground, and data communication.

* 1 : Shielded



Brake Control System





System Outline

1. ABS Operation

If the brake pedal is depressed suddenly, the ABS controls the hydraulic pressure of all the four wheel cylinders to automatically avoid wheel locking and to ensure the directional and steering stability of the vehicle. Under the situation, 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. Electronic Brake-Force Distribution

Skid control ECU distributes appropriate brake-force to front and rear wheels (Control of brake-force distribution to front and rear wheels) corresponding to the vehicle driving conditions. It also makes effective use of rear wheel brake-force to match loading condition and decelerating of the vehicle, resulting to reduce depressing of brake pedal and to ensure effective braking. In braking during making a turn, the ECU controls appropriate brake-force distribution to right and left wheels (Control of brake-force distribution to right and left wheels) to ensure stability and braking of the vehicle.

4. Brake Assist System

Skid control ECU recognizes emergency braking from detecting applying speed of brake pedal and brake travel, and controls braking effectiveness to supply strong brake-force for the emergency braking.

5. VSC Operation

Unexpected road conditions, emergency situation, and any other external factors may cause large under- or over-steering of the vehicle. If they occur, the VSC system automatically controls the driving 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 driving power and activates the front wheel brakes and rear inner side wheel brake to reduce the under-steering.

If there is malfunction in the VSC system, the VSC indicator lights up to warn the driver.

6. Mutual System Control

Due to cooperative control with hybrid vehicle control ECU, skid control ECU controls hydraulic brake to collect much electrical energy by making the most use of regenerative brake.

Skid control ECU also improves stability of the vehicle, performing cooperative control with power steering ECU to give steering torque assistance, corresponding to driving conditions.

7. Electric Source Backup Function

Electric charge is stored in brake control power supply assembly. If voltage of vehicle electricity is declined, electric charge is released to cover electric supply to the system.

8. Fail Safe Function

Skid control ECU monitors the system component parts electrically. In case there is abnormality in ECU, sensor signal and actuator, normal parts except parts with abnormality continue braking operation.

Even in case braking is shut off due to malfunction of oil pressure source, braking is secured as master cylinder pressure made by manpower works on wheel cylinder.

In case only regenerative brake is not effective due to abnormality in communication with hybrid vehicle control ECU, control will be changed to have oil pressure brake generate all the braking force

 : Parts Location

Code		See Page		Code		See Page		Code		See Page	
A4		42		C12	B	44		J33	A	45	
A5		42		D3		44		J34	B	45	
A10	A	44		D7		46		P3		45	
A11	B	44		G5		44		P5		46	
A17		44		H13		44		S14		45	
A24	A	46		J4		43		S15		45	
	B	46		J6		45		S30	A	45	
A25	A	46		J16		45		S31	B	45	
	B	46		J17		45		S35	A	43	
B4		42		J19		46		S36	B	43	
B9	A	44		J25		43		S37	A	45	
B10	B	44		J26		45		S38	B	45	
B21		42		J27		45		S39	C	45	
B22		42		J28		45		S40	D	45	
B23		44		J29		45		V8		45	
B26		46		J31	A	45		Y1		47	
C11	A	44		J32	B	45					

 : Relay Blocks

Code	See Page	Relay Blocks (Relay Block Location)
4	27	R/B No.4 (Engine Compartment Left)
7	24	Fusible Link Block (Engine Compartment Left)

 : Junction Block and Wire Harness Connector

Code	See Page	Junction Block and Wire Harness (Connector Location)
1D	31	Cowl Wire and Instrument Panel J/B (Lower Finish Panel)
1E		
1G		
3B	34	Instrument Panel Wire and J/B No.3 (Behind the Instrument Panel Center)
3D		
3E		
3F		
3J	35	
3K		
4A	39	Cowl Wire and J/B No.4 (Right Side of Glove Box)
4C		
4D		
4E		
4F		
4H		
4J	38	
4L		
4M		

Brake Control System

: Connector Joining Wire Harness and Wire Harness

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IA1	54	Cowl Wire and Floor No.2 Wire (Left Kick Panel)
IB2	54	Front Door LH Wire and Cowl Wire (Left Kick Panel)
IC2	54	Engine Room Main Wire and Cowl Wire (Left Cowl Side Panel)
IC3		
IC4		
IC5		
IF3	54	Instrument Panel Wire and Cowl Wire (Right Side of Instrument Panel J/B)
IK3	55	Engine Room Main Wire and Cowl Wire (Right Cowl Side Panel)
IL1	55	Instrument Panel Wire and Cowl Wire (Right Cowl Side Panel)
IL2		
IO1	55	Cowl Wire and Floor Wire (Right Kick Panel)
IO2		
IS1	55	Floor No.2 Wire and Cowl Wire (Left Kick Panel)
IT1	55	Floor No.2 Wire and Cowl Wire (Under the Shift Lever)
BP1	56	Skid Control LH Wire and Floor No.2 Wire (Left Rear Quarter Panel)
BQ1	56	Skid Control RH Wire and Floor Wire (Right Rear Quarter Panel)

: Ground Points

Code	See Page	Ground Points Location
EB	52	Right Front Fender Apron
EI		
IB	54	Right Instrument Panel Brace
IC	54	Right Cowl Side Panel
BC	56	Left Side of Rear Cross Member
BF	56	Near the Rear Side Marker Light RH

