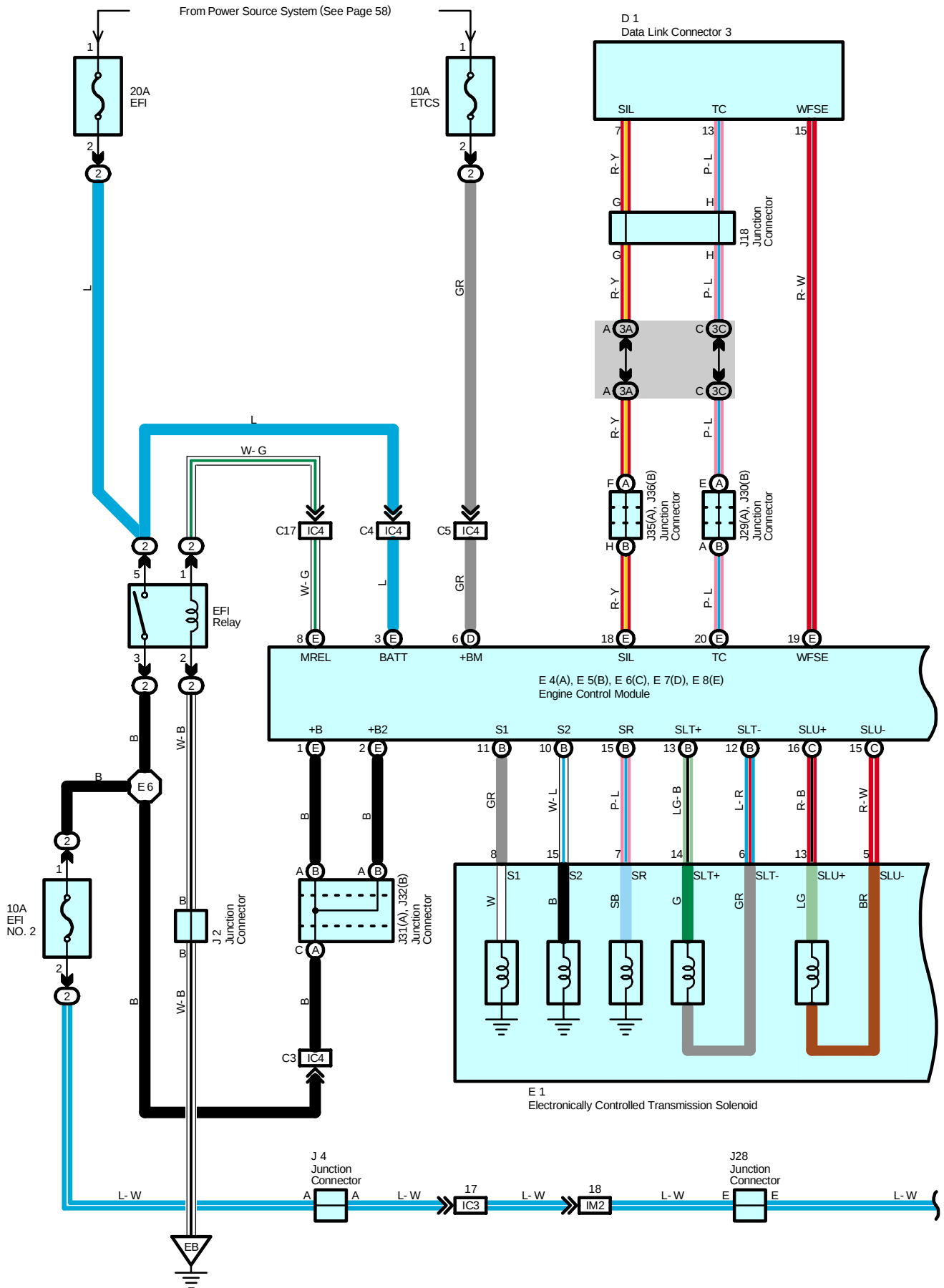
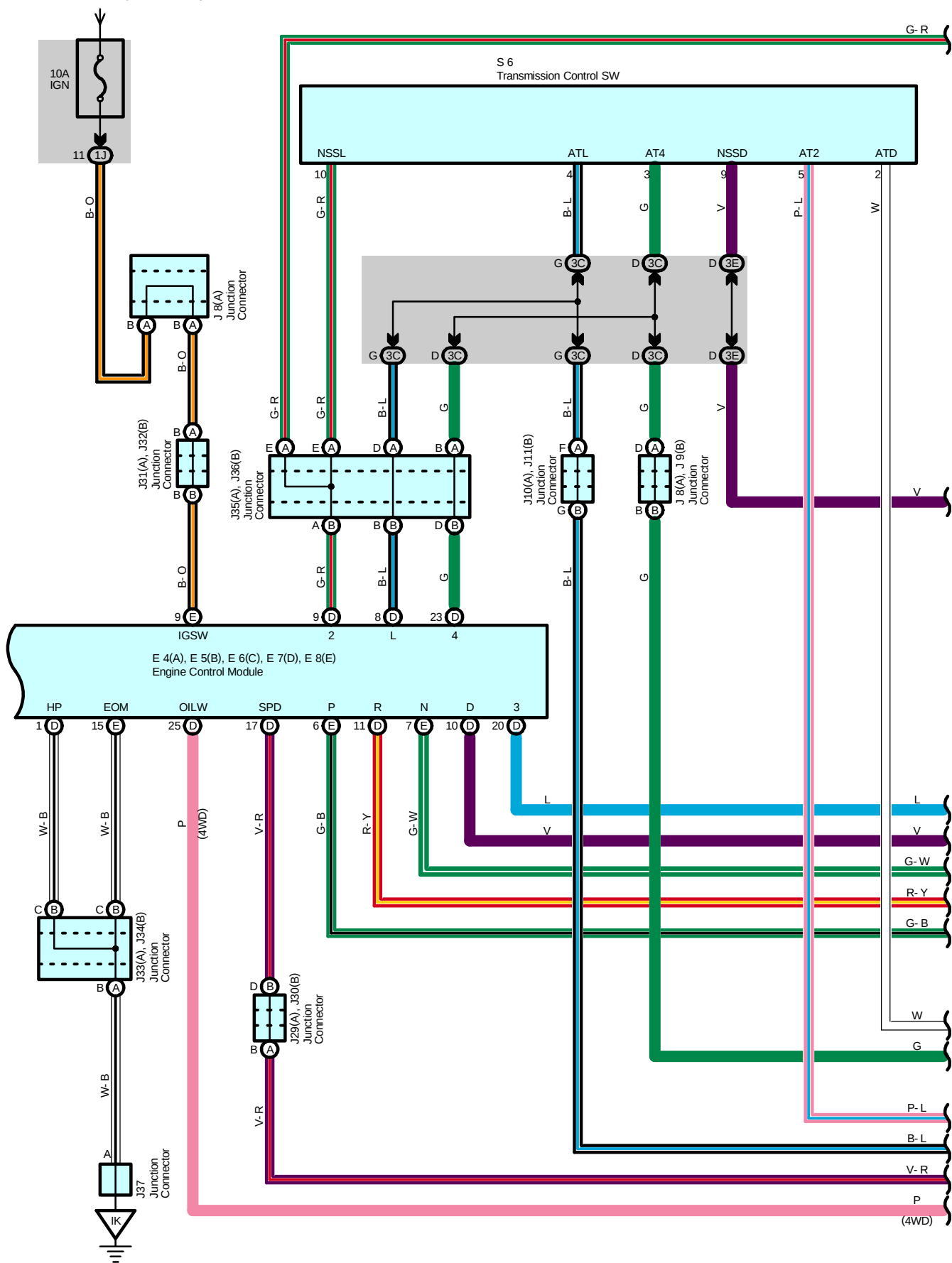


Electronically Controlled Transmission and A/T Indicator (2UZ-FE)

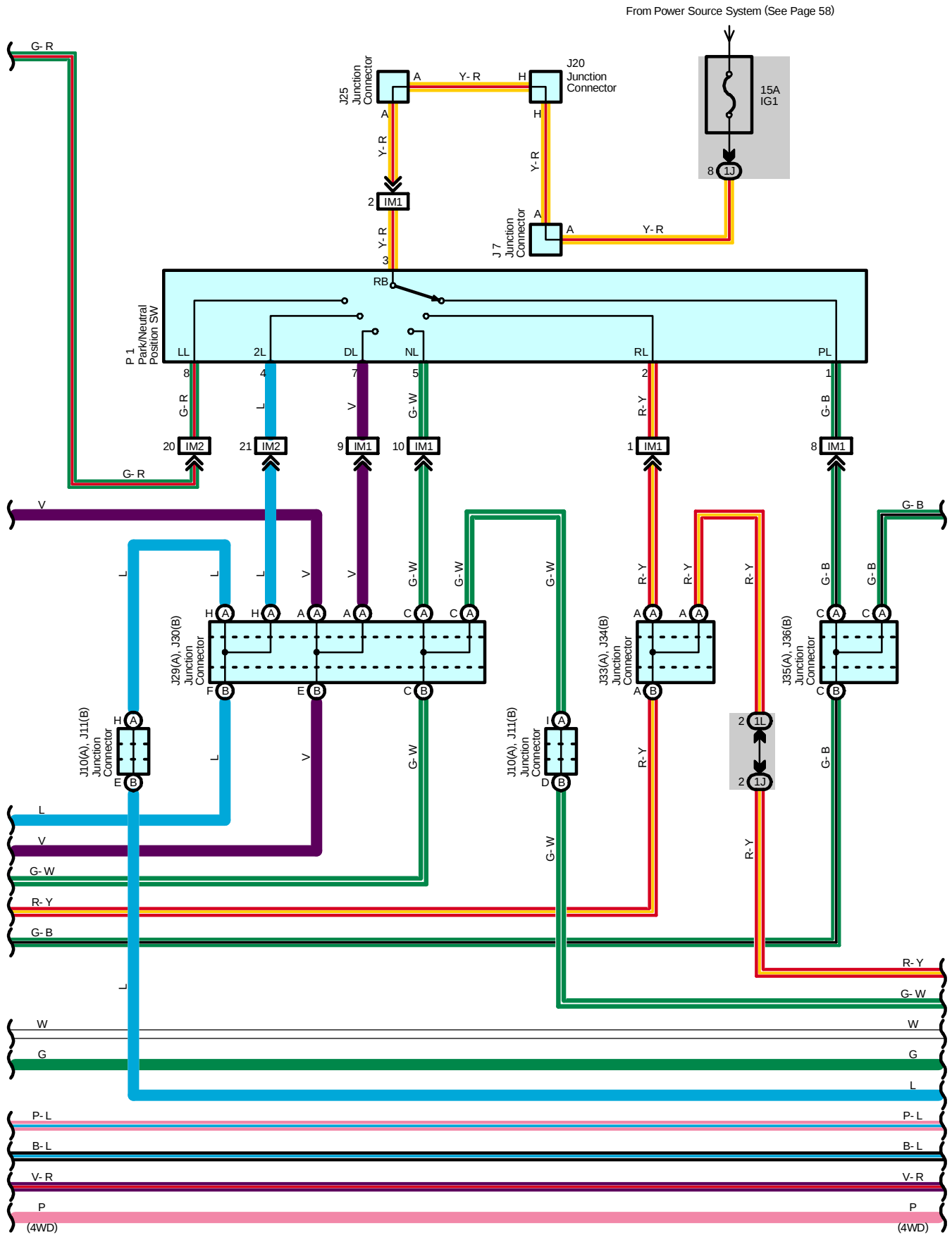


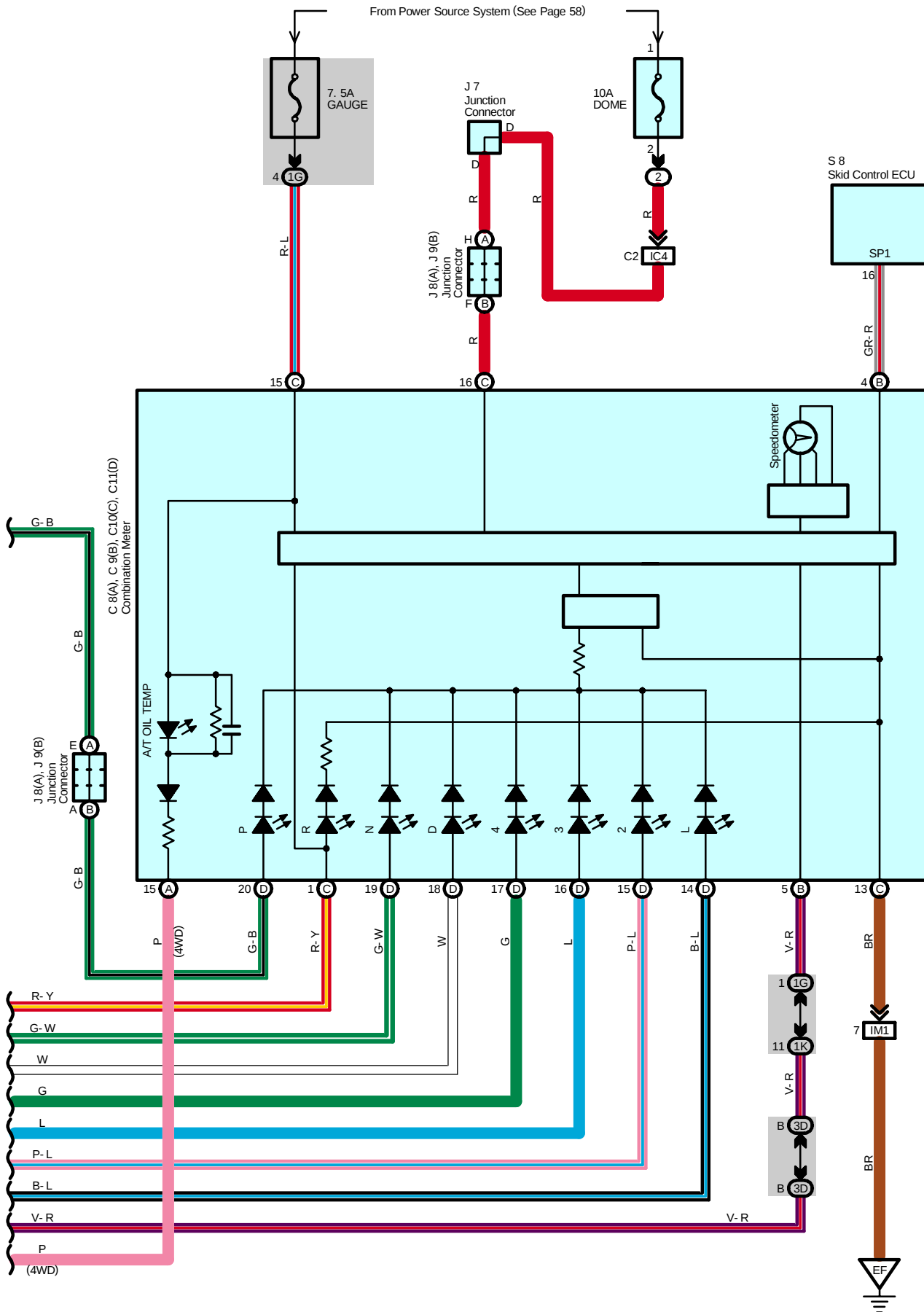


From Power Source System (See Page 58)



Electronically Controlled Transmission and A/T Indicator (2UZ-FE)





Electronically Controlled Transmission and A/T Indicator (2UZ-FE)

System Outline

Previous automatic transmissions have selected each gear shift using mechanically controlled throttle hydraulic pressure, governor hydraulic pressure and lock-up hydraulic pressure. The electronically controlled transmission, however, electrically controls the line pressure, throttle pressure, lock-up pressure and accumulator pressure etc. through the solenoid valve. The electronically controlled transmission is a system which precisely controls gear shift timing and lock-up timing in response to the vehicle's driving conditions and the engine condition detected by various sensors. It makes smooth driving possible by shift selection for each gear which is the most appropriate to the driving conditions at that time, and by preventing downing, squat and gear shift shock when starting off.

1. Gear Shift Operation

When driving, the engine warm up condition is input as a signal to TERMINAL THW of the engine control module from the engine coolant temp. sensor and the vehicle speed signal from vehicle speed sensor is input to TERMINAL SP2+ of the engine control module. At the same time, the throttle valve opening signal from the throttle position sensor is input to TERMINALS VTA1 and VTA2 of the engine control module as throttle angle signal.

Based on these signals, the engine control module selects the best shift position for the driving conditions and sends current to the electronically controlled transmission solenoid.

2. Line Hydraulic Pressure Control

The engine control module adjusts the line hydraulic pressure to the optimal level by controlling TERMINAL SLT+ of the module according to the engine torque data. This realizes the smooth gear shifting.

3. High Response Gear Shifting Control

The engine control module performs the high response engine torque up control to control the ignition-timing lag as well as opening the electronic throttle when shifting down. By doing this, the gear shifting is performed in a short period of time. Moreover, the engine control module uses the orifice switching control, which optimizes the speed of applying and reducing the hydraulic pressure. And it realizes the fine shifting condition by applying and reducing hydraulic pressure slowly when the gear shifting shock is important and quickly when the high response is required.

4. Clutch Hydraulic Pressure Control

The engine control module controls the clutch operation in the optimal timing and with the best hydraulic pressure according to the engine torque data and the number of the clutch revolution

5. Lock-Up and Flexible Lock-Up Control

The engine control module carries out the lock-up control by controlling the TERMINAL SLU+ of the module according to the shift position, vehicle speed, throttle opening degree and running conditions. The engine control module also steadily keeps applying the lock-up clutch a delicate slippage to improve the transmission efficiency (Fuel efficiency) of the torque converter.

6. Stop Light SW Circuit

If the brake pedal is depressed (Stop light SW on) when driving in lock-up condition, a signal is input to TERMINAL STP of the engine control module. The engine control module operates and cuts the current to the solenoid to release lock-up.

7. AI-Shift Control

The engine control module judges whether the road is downslope or upslope by detecting the throttle opening degree or the vehicle's speed. Moreover it can expect the winding roads by detecting the turning condition of the vehicle. The engine control module keeps unnecessary shifting up from the fourth gear from operating and carries out the automatic shifting down to the third gear in order to control the vehicle running according to the road conditions. The engine control module also reads the driver's intention during driving from his (her) accelerating operation and the running conditions of the vehicle. As a result of that, ideal shifting patters for each driver are automatically selected without any switching operations.

Service Hints

E4 (A), E5 (B), E6 (C), E7 (D), E8 (E) Engine Control Module

(E) 9-Ground : Approx. 12 volts with the ignition SW at ON position

(D) 6, (E) 3-Ground : Always approx. 12 volts

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

(D)19-Ground : Approx. 12 volts with the brake pedal depressed

(A) 6, (A) 7, (B) 8, (C) 1, (C) 4, (C) 7, (D) 1, (E) 15-Ground : Always continuity

P1 Park/Neutral Position SW

3-1 : Closed with the shift lever in P position

3-2 : Closed with the shift lever in R position

3-5 : Closed with the shift lever in N position

3-7 : Closed with the shift lever in D position or 4 position

3-4 : Closed with the shift lever in 3 position

3-8 : Closed with the shift lever in 2 position or L position

 : Parts Location

Code	See Page	Code	See Page	Code	See Page
A24	36	J4	38	J32	B 38
C8	A 37	J7	38	J33	A 38
C9	B 37	J8	A 38	J34	B 38
C10	C 37	J9	B 38	J35	A 38
C11	D 37	J10	A 38	J36	B 38
D1	37	J11	B 38	J37	38
E1	32 (2UZ-FE)	J18	38	M1	33 (2UZ-FE)
E2	32 (2UZ-FE)	J20	38	P1	33 (2UZ-FE)
E4	A 37	J25	38	S6	39
E5	B 37	J26	38	S8	39
E6	C 37	J28	38	S12	39
E7	D 37	J29	A 38	T2	33 (2UZ-FE)
E8	E 37	J30	B 38	T4	33 (2UZ-FE)
J2	33 (2UZ-FE)	J31	A 38	V11	33 (2UZ-FE)

 : Relay Blocks

Code	See Page	Relay Blocks (Relay Block Location)
2	22	Engine Room R/B (Engine Compartment Left)

 : Junction Block and Wire Harness Connector

Code	See Page	Junction Block and Wire Harness (Connector Location)
1G	25	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1J		
1K		
1L		
3A	28	Instrument Panel Wire and Center J/B (Instrument Panel Brace RH)
3C		
3D		
3E		

 : Connector Joining Wire Harness and Wire Harness

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IC3	48	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)
IC4		
IM1	52	Engine Wire and Instrument Panel Wire (Right Side of Blower Unit)
IM2		

 : Ground Points

Code	See Page	Ground Points Location
EB	44 (2UZ-FE)	Front Left Fender
EE	44 (2UZ-FE)	Rear Side of Right Bank Cylinder Block
EF	44 (2UZ-FE)	Rear Side of Left Bank Cylinder Block
IK	48	Right Kick Panel

 : Splice Points

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
E6	44 (2UZ-FE)	Engine Room Main Wire	I8	50	Engine Wire