

TERMINALS OF ECU

1. CHECK BATTERY VOLTAGE

- (a) Measure the battery voltage.

Standard: 10 to 14 V

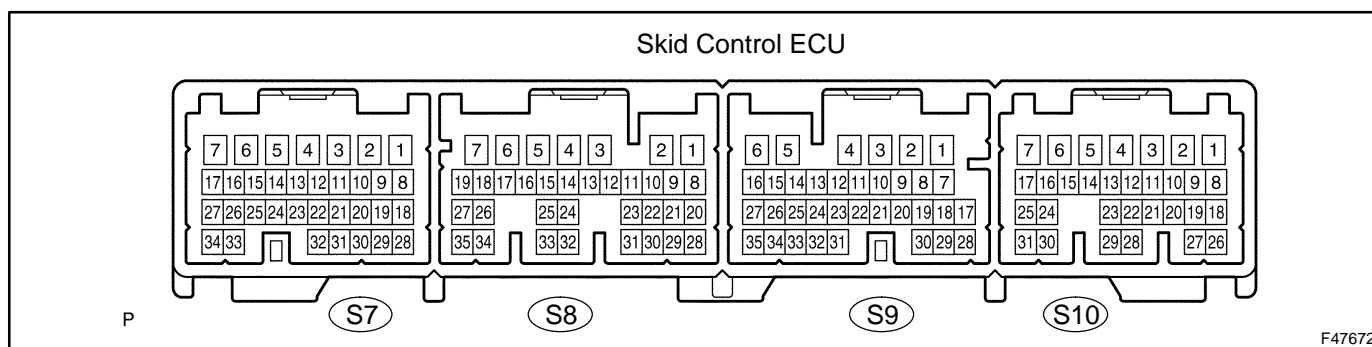
2. SKID CONTROL ECU ASSY INSPECTION

- (a) Measure the voltage between each terminal or between each terminal and the body ground.
- (b) Connect the hand-held tester to the DLC3, and check the communication condition with the skid control ECU.
- (c) Using an oscilloscope, check that the pulse generates between each terminal or between each terminal and the body ground.

NOTICE:

- Inspection should be performed from the back of the connector with the connector connected to the skid control ECU.
- The voltage between terminals of the brake actuator assy may become 0 V due to the fail safe function when the ECB warning light comes on (malfunctioning).

SKID CONTROL ECU



F47672

HINT: Inspect the ECU from the wire harness side while the connector is connected.

Symbols (Terminals No.)	Wiring Color	Terminal Description	Condition	Specified Condition
R1+ (S7-2) – GND (S7-1)	P – W	Main relay power 1	Push start switch ON (READY)	9.1 to 13.6 V
BS1 (S7-3) – GND (S7-1)	B – W	Battery source 1	Push start switch ON (READY) Approx. 1.5 sec. after pushing start switch ON (READY)	8.8 to 14 V
SMC1 (S7-4) – GND (S7-1)	Y – W	Master cut solenoid 1 output	Push start switch ON (READY) Brake pedal depressed approx. 1.5 sec. after pushing start switch ON (READY)	Below 1.5 V
+BCTY (S7-5) – GND (S7-1)	V – W	Courtesy power input	Driver door open → close	Approx. 5 sec. 8 to 16 V → Below 1 V
SLAFR- (S7-6) – GND (S7-1)	W – W	FR solenoid (-) output	Push start switch ON (READY) Approx. 1.5 sec. after pushing start switch ON (READY)	Below 1.5 V
SLAFR+ (S7-7) – GND (S7-1)	R – W	FR solenoid (+) output	Push start switch ON (READY) Brake pedal depressed approx. 1.5 sec. after pushing start switch ON (READY)	Pulse generation (see waveform 1)
E (S7-8) – GND (S7-1)	L – W	Pressure sensor ground	Push start switch OFF	Below 1 Ω
VCM1 (S7-9) – GND (S7-1)	P – W	Pressure sensor power	Push start switch ON (READY)	4.75 to 5.25 V

DIAGNOSTICS – ELECTRONICALLY CONTROLLED BRAKE SYSTEM

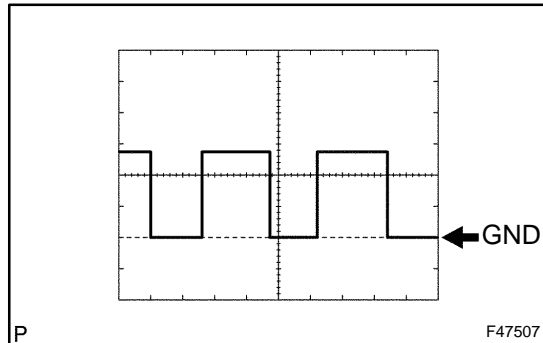
MR1+ (S7-11) – GND (S7-1)	GR – W	Motor relay power 1	Push start switch ON (READY) Approx. 1.5 sec. after pushing start switch ON (READY)	8.8 to 14 V
SR1 (S7-12) – GND (S7-1)	L – W	Main relay output 1	Push start switch ON (READY) Approx. 1.5 sec. or more after pushing start switch ON (READY)	Below 1 V
SCSS (S7-13) – GND (S7-1)	BR – W	Stroke simulator cut solenoid output	Push start switch ON (READY) Brake pedal depressed	Below 1.5 V
SLARL+ (S7-15) – GND (S7-1)	L – W	RL solenoid (+) output	Push start switch ON (READY) Brake pedal depressed approx. 1.5 sec. after pushing start switch ON (READY)	Pulse generation (see waveform 1)
SLRRL+ (S7-16) – GND (S7-1)	W – W	RL solenoid (+) output	Push start switch ON (READY) Brake pedal depressed approx. 1.5 sec. after pushing start switch ON (READY)	Pulse generation (see waveform 1)
SLRFR+ (S7-17) – GND (S7-1)	Y – W	FR solenoid (+) output	Push start switch ON (READY) After approx. 1.5 sec., brake pedal depressed → released	Pulse generation (see waveform 2)
PRL (S7-18) – GND (S7-1)	G – W	RL pressure sensor input	Push start switch ON (READY) Brake pedal released	0.3 to 0.8 V
SG1 (S7-20) – GND (S7-1)	BR – W	Pressure sensor shield ground 1	Push start switch OFF	Below 1 Ω
PACC (S7-21) – GND (S7-1)	W – W	Accumulator pressure sensor input	Push start switch ON (READY) After pump motor operates and stops by pedal operation	3.3 to 4.7 V
FR- (S7-22) – GND (S7-1)	L – W	FR sensor (-) input	Push start switch OFF	Below 1 Ω
PFR (S7-23) – GND (S7-1)	Y – W	FR pressure sensor input	Push start switch ON (READY) Brake pedal released	0.3 to 0.8 V
MR1 (S7-25) – GND (S7-1)	L – W	Motor relay output 1	Push start switch ON (READY) Pump motor is operating	Below 1.5 V
SLRRL- (S7-26) – GND (S7-1)	P – W	RL solenoid (-) output	Push start switch ON (READY) Approx. 1.5 sec. after pushing start switch ON (READY)	Below 1.5 V
SLARL- (S7-27) – GND (S7-1)	LG – W	RL solenoid (-) output	Push start switch ON (READY) Approx. 1.5 sec. after pushing start switch ON (READY)	Below 1.5 V
MTT (S7-29) – GND (S7-1)	R – W	Motor test input	Push start switch ON (READY) Pump motor is operating	3.5 V or higher
PMC1 (S7-30) – GND (S7-1)	R – W	Master pressure sensor input 1	Push start switch ON (READY) Brake pedal released	0.3 to 0.8 V
PCK1 (S7-31) – GND (S7-1)	B – W	Pressure sensor check output 1	Push start switch ON (READY) Approx. 1.5 sec. after pushing start switch ON (READY)	4.75 to 5.25 V
FR+ (S7-32) – GND (S7-1)	P – W	FR sensor (+) input	Vehicle speed input	Pulse generation (see waveform 3)
SLRFR- (S7-34) – GND (S7-1)	B – W	FR solenoid (-) output	Push start switch ON (READY) Approx. 1.5 sec. after pushing start switch ON (READY)	Below 1.5 V
+BI1 (S8-3) – GND (S8-1, 2)	B – W	Main relay power input 1	Push start switch OFF	10 to 14 V
+BO1 (S8-5) – GND (S8-1, 2)	Y – W	Main relay power output 1	Push start switch ON	8.8 to 14 V
IG1 (S8-7) – GND (S8-1, 2)	B – W	IG1 power	Push start switch ON	10 to 14 V

RSS (S8-10) – GND (S8-1, 2)	BR – W	Speed sensor shield ground	Push start switch OFF	Below 1 Ω
BZ (S8-12) – GND (S8-1, 2)	BR – W	Warning buzzer output	Push start switch ON (READY) Buzzer is operating	Below 1 V
STP (S8-14) – GND (S8-1, 2)	R – W	Stop light switch signal input	Push start switch ON (READY) Brake pedal depressed → released	10 to 12 V → Below 1.5 V
CAN-L (S8-18) – GND (S8-1, 2)	W – W	CAN communication (Send and receive-)	Check DTC using hand-held tester	CAN communication's DTC is not output
CAN-H (S8-19) – GND (S8-1, 2)	B – W	CAN communication (Send and receive+)	Check DTC using hand-held tester	CAN communication's DTC is not output
FAIL (S8-20) – GND (S8-1, 2)	P – W	Capacitor communication (Receive)	Push start switch ON (READY) Approx. 1.5 sec. after pushing start switch ON (READY)	Pulse generation (see waveform 5)
SP1 (S8-22) – GND (S8-1, 2)	V – W	Speed meter output	Vehicle speed input	Pulse generation (see waveform 4)
RL- (S8-27) – GND (S8-1, 2)	B – W	RL sensor (-) input	Push start switch OFF	Below 1 Ω
D/G (S8-28) – GND (S8-1, 2)	W – W	Diagnosis output	Push start switch ON (READY)	9.1 to 13.6 V
ENA (S8-30) – GND (S8-1, 2)	B – W	Capacitor communication (Send)	Push start switch ON (READY) Approx. 1.5 sec. after pushing start switch ON (READY)	Pulse generation (see waveform 6)
TS (S8-32) – GND (S8-1, 2)	L – W	Sensor diagnosis check input	Push start switch ON (READY)	Below 1.5 V → 9.1 to 13.6 V
VBZ (S8-33) – GND (S8-1, 2)	B – W	Warning buzzer power	Push start switch ON (READY)	9.1 to 13.6 V
RL+ (S8-35) – GND (S8-1, 2)	W – W	RL sensor (+) input	Vehicle speed input	Pulse generation (see waveform 3)
+BO2 (S9-4) – GND (S9-1, 2)	W – W-B	Main relay power output 2	Push start switch ON (READY)	8.8 to 14 V
+BI2 (S9-5) – GND (S9-1, 2)	R – W-B	Main relay power input 2	Push start switch OFF	10 to 14 V
VCSK (S9-6) – GND (S9-1, 2)	B – W-B	Stroke sensor power	Push start switch ON (READY)	3.75 to 4.95 V
SSK (S9-7) – GND (S9-1, 2)	Shielded – W-B	Stroke sensor shield ground	Push start switch OFF	Below 1 Ω
SKG (S9-8) – GND (S9-1, 2)	W – W-B	Stroke sensor ground	Push start switch OFF	Below 1 Ω
PKB (S9-14) – GND (S9-1, 2)	R – W-B	Parking brake signal input	Parking brake applied → released	Below 1.5 V → 9.1 to 13.6 V
SKS1 (S9-21) – GND (S9-1, 2)	R – W-B	Stroke sensor signal input 1	Push start switch ON (READY) Brake pedal released	0.46 to 1.35 V
SKS2 (S9-22) – GND (S9-1, 2)	G – W-B	Stroke sensor signal input 2	Push start switch ON (READY) Brake pedal released	2.56 to 4.35 V
RR- (S9-23) – GND (S9-1, 2)	B – W-B	RR sensor (-) input	Push start switch OFF	Below 1 Ω
RR+ (S9-31) – GND (S9-1, 2)	W – W-B	RR sensor (+) input	Vehicle speed input	Pulse generation (see waveform 3)
SLAFL+ (S10-1) – GND (S10-4)	P – W-B	FL solenoid (+) output	Push start switch ON (READY) Brake pedal depressed approx. 1.5 sec. after pushing start switch ON (READY)	Pulse generation (see waveform 1)
SLAFL- (S10-2) – GND (S10-4)	O – W-B	FL solenoid (-) output	Push start switch ON (READY) Approx. 1.5 sec. after pushing start switch ON (READY)	Below 1.5 V
SMC2 (S10-3) – GND (S10-4)	LG – W-B	Master cut solenoid 2 output	Push start switch ON (READY) Brake pedal depressed approx. 1.5 sec. after pushing start switch ON (READY)	Below 1.5 V

DIAGNOSTICS – ELECTRONICALLY CONTROLLED BRAKE SYSTEM

IG2 (S10-5) – GND (S10-4)	O – W-B	IG2 power	Push start switch ON (READY)	10 to 14 V
LBL (S10-6) – GND (S10-4)	P – W-B	Brake fluid level switch input	Reservoir level switch OFF → ON	4 to 4.65 → Below 1.5 V
BS2 (S10-7) – GND (S10-4)	P – W-B	Battery source 2	Push start switch ON (READY) Approx. 1.5 sec. after pushing start switch ON (READY)	8.8 to 14 V
SLRFL+ (S10-8) – GND (S10-4)	Y – W-B	FL solenoid (+) output	Push start switch ON (READY) After approx. 1.5 sec., brake pedal depressed → released	Pulse generation (see waveform 2)
SLARR- (S10-9) – GND (S10-4)	P – W-B	RR solenoid (-) output	Push start switch ON (READY) Approx. 1.5 sec. after pushing start switch ON (READY)	Below 1.5 V
SG2 (S10-12) – GND (S10-4)	Shielded – W-B	Pressure sensor shield ground 2	Push start switch OFF	Below 1 Ω
FSS (S10-13) – GND (S10-4)	BR – W-B	Speed sensor shield ground	Push start switch OFF	Below 1 Ω
VCM2 (S10-14) – GND (S10-4)	B – W-B	Pressure sensor power 2	Push start switch ON (READY)	4.75 to 5.25 V
SR2 (S10-15) – GND (S10-4)	V – W-B	Main relay output 2	Push start switch ON (READY) Approx. 1.5 sec. after pushing start switch ON (READY)	Below 1 V
R2+ (S10-17) – GND (S10-4)	Y – W-B	Main relay power 2	Push start switch ON (READY)	9.1 to 13.6 V
SLRRR- (S10-18) – GND (S10-4)	BR – W-B	RR solenoid (-) output	Push start switch ON (READY) Approx. 1.5 sec. after pushing start switch ON (READY)	Below 1.5 V
SLARR+ (S10-19) – GND (S10-4)	V – W-B	RR solenoid (+) output	Push start switch ON (READY) Brake pedal depressed approx. 1.5 sec. after pushing start switch ON (READY)	Pulse generation (see waveform 1)
SLRRR+ (S10-20) – GND (S10-4)	R – W-B	RR solenoid (+) output	Push start switch ON (READY) Brake pedal depressed approx. 1.5 sec. after pushing start switch ON (READY)	Pulse generation (see waveform 1)
PCK2 (S10-21) – GND (S10-4)	L – W-B	Pressure sensor check output 2	Push start switch ON (READY)	4.75 to 5.25 V
FL- (S10-22) – GND (S10-4)	G – W-B	FL sensor (-) input	Push start switch OFF	Below 1 Ω
PFL (S10-23) – GND (S10-4)	R – W-B	FL pressure sensor input	Push start switch ON (READY) Brake pedal released	0.3 to 0.8 V
MR2+ (S10-25) – GND (S10-4)	R – W-B	Motor relay power 2	Push start switch ON (READY) Approx. 1.5 sec. after pushing start switch ON (READY)	8.8 to Below 14 V
SLRFL- (S10-26) – GND (S10-4)	L – W-B	FL solenoid (-) output	Push start switch ON (READY) Approx. 1.5 sec. after pushing start switch ON (READY)	Below 1.5 V
PMC2 (S10-27) – GND (S10-4)	W – W-B	Master pressure sensor input 2	Push start switch ON (READY) Brake pedal released	0.3 to 0.8 V
FL+ (S10-28) – GND (S10-4)	R – W-B	FL sensor (+) input	Vehicle speed input	Pulse generation (see waveform 3)
E2 (S10-29) – GND (S10-4)	G – W-B	Pressure sensor ground 2	Push start switch OFF	Below 1 Ω

MR2 (S10-30) – GND (S10-4)	G – W-B	Motor relay output 2	Push start switch ON (READY) Pump motor is operating	Below 1.5 V
PRR (S10-31) – GND (S10-4)	Y – W-B	RR pressure sensor input	Push start switch ON (READY) Brake pedal released	0.3 to 0.8 V



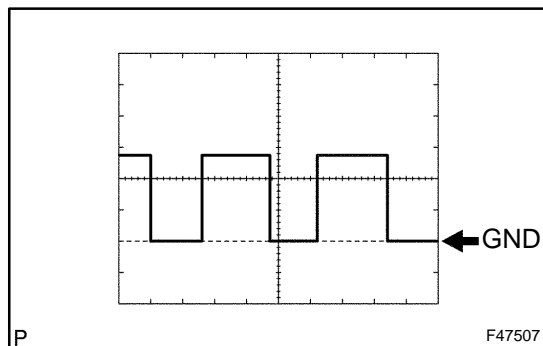
Waveform 1

NOTICE:

Normal waveform is output only when BS 1 and 2 voltages are normal (10 to 14 V).

HINT:

- While driving at approximately 12 mph (20 km/h).
- 5V/DIV, 200 ms/DIV.
- Brake pedal depressed.



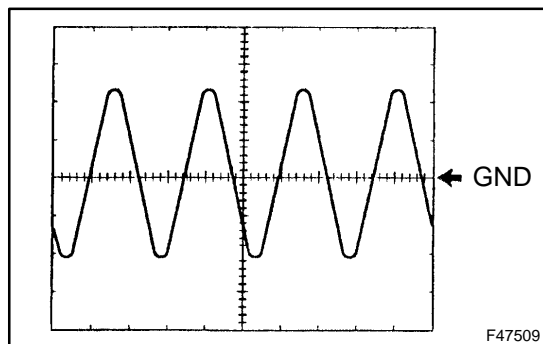
Waveform 2

NOTICE:

Normal waveform is output only when BS 1 and 2 voltages are normal (10 to 14 V).

HINT:

- While driving at approximately 12 mph (20 km/h).
- 5V/DIV, 200 ms/DIV.
- Brake pedal depress → released



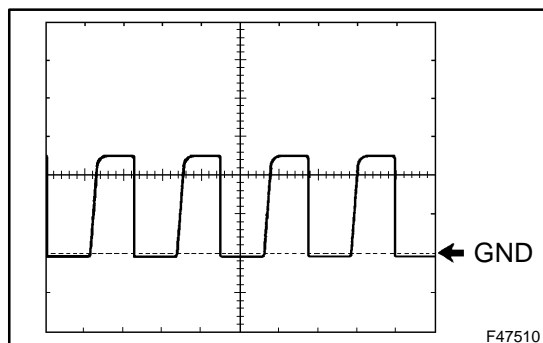
Waveform 3

NOTICE:

As the vehicle speed (tire rotating speed) becomes faster the cycle becomes shorter and the output voltage larger.

HINT:

- 1V/DIV, 2 ms/DIV.
- While driving at approximately 18 mph (30 km/h).



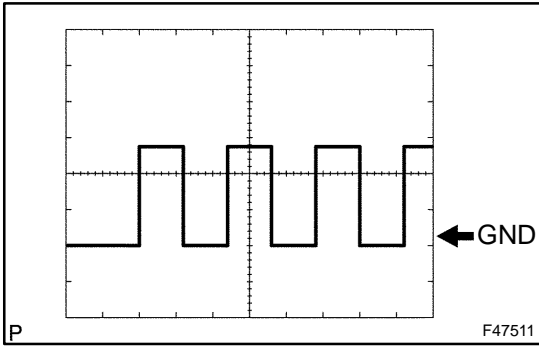
Waveform 4

NOTICE:

As the vehicle speed (tire rotating speed) becomes faster the cycle becomes shorter.

HINT:

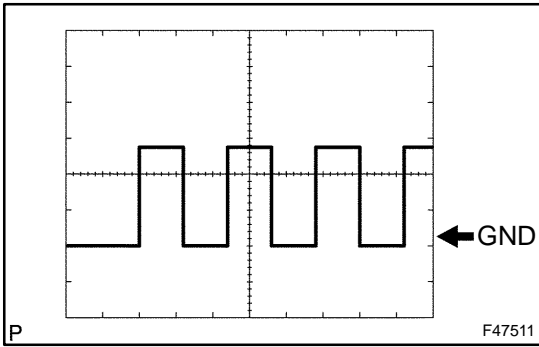
- 5V/DIV, 50 ms/DIV.
- While driving at approximately 12 mph (20 km/h).



Waveform 5

HINT:

- 5V/DIV, 200 ms/DIV.
- Power switch ON (READY)



Waveform 6

HINT:

- 5V/DIV, 100 ms/DIV.
- Power switch ON (READY)