DTC P0504/51 BRAKE SWITCH ”A”/”B” CORRELATION

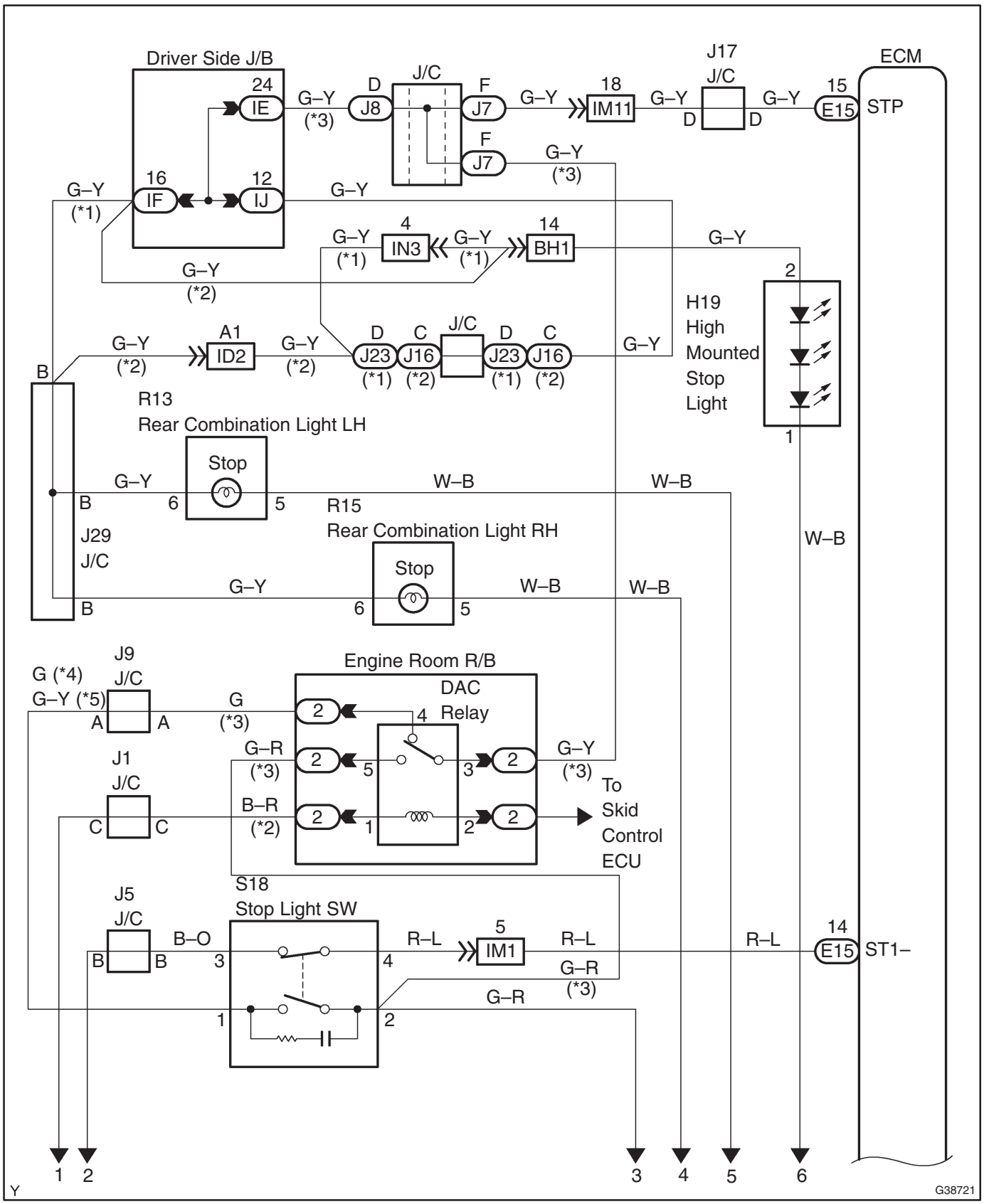
CIRCUIT DESCRIPTION

In this system, the signals of the stop lamp switch’s duplex system (STP and ST1–) are used to judge whether the brake system is abnormal or not. When the signals of depressing and releasing the brake pedal are detected simultaneously, the ECM interprets this as a malfunction of the stop lamp switch.
HINT:
Normal condition is shown in the table below.

Signal	Brake Pedal Released	In Transition	Brake Pedal Depressed
STP	OFF	ON	ON
ST1–	ON	ON	OFF

DTC No.	DTC Detection Condition	Trouble Area
P0504/51	Conditions (a), (b) and (c) continue for 0.5 seconds or more: (a) Ignition switch is ON (b) Brake pedal is released (c) STP signal is OFF when ST1– signal is OFF	• Short in stop lamp switch signal circuit • Stop lamp switch • ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

Read freeze frame data using the intelligent tester II. Freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, freeze frame data can help determine if the vehicle was running or stopped, if the engine was warmed up or not, and other data from the time the malfunction occurred.

When using intelligent tester II:

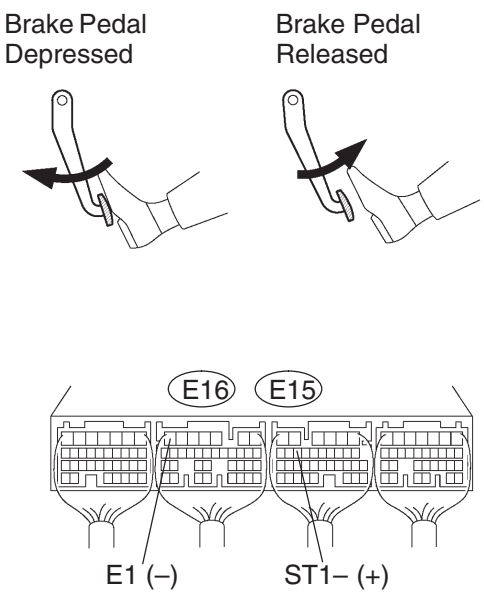
1 CHECK STOP LAMP (OPERATION)

(a) Check if the stop lamps turn ON and OFF normally when the brake pedal is depressed and released.
OK: Stop lamps turn ON and OFF when brake pedal is depressed and released.

NG → **REPAIR OR REPLACE STOP LAMP SWITCH CIRCUIT**

OK

2 READ DATA LIST (STP, ST1– VOLTAGE)



(a) Connect the intelligent tester II to the DLC3.
(b) Turn the ignition switch ON and turn the intelligent tester II ON.
(c) Enter the following menus: Powertrain / Engine / Data List / Stop Light SW.
(d) Check the result.
OK:

Brake Pedal	Specified Condition
Depressed	STP signal ON
Released	STP signal OFF

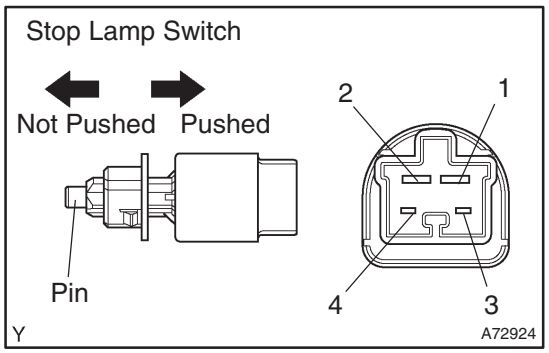
(e) Measure the voltage of the ECM connectors.
Standard:

Tester Connection	Brake Pedal Condition	Specified Condition
E15–14 (ST1–) – E16–7 (E1)	Depressed	Below 1.5 V
E15–14 (ST1–) – E16–7 (E1)	Released	7.5 to 14 V

OK → **CHECK FOR INTERMITTENT PROBLEMS (See page 05–439)**

NG

3 INSPECT STOP LAMP SWITCH ASSY



(a) Remove the S18 switch.
(b) Measure the resistance of the stop lamp switch.

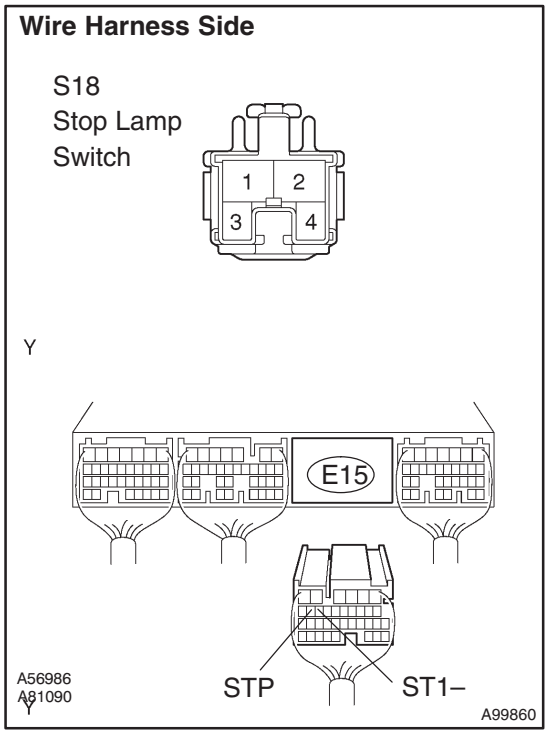
Standard:

Tester Connection	Switch Condition	Specified Condition
1 – 2	Pin not pushed	Below 1 Ω
3 – 4	Pin not pushed	10 kΩ or higher
1 – 2	Pin pushed	10 kΩ or higher
3 – 4	Pin pushed	Below 1 Ω

NG → **REPLACE STOP LAMP SWITCH ASSY**

OK

4 CHECK WIRE HARNESS (STOP LAMP SWITCH – ECM)



(a) Disconnect the S18 switch connector.
(b) Disconnect the E15 ECM connector.
(c) Measure the resistance of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
S18–1 – E15–15 (STP)	Below 1 Ω
S18–4 – E15–14 (ST1–)	Below 1 Ω
S18–1 or E15–15 (STP) – Body ground	10 kΩ or higher
S18–4 or E15–14 (ST1–) – Body ground	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

REPLACE ECM (See Pub. No. RM990E, page 10–34)

NOTICE:
After replacing the ECM, allow for ECM learning start the engine and idle it until it is fully warmed up.

When not using intelligent tester II:

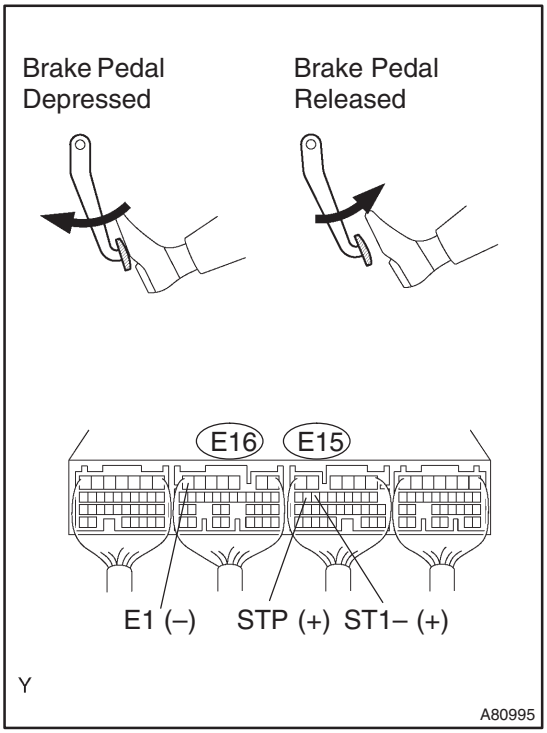
1	CHECK STOP LAMP (OPERATION)

(a) Check if the stop lamps turn ON and OFF normally when the brake pedal is depressed and released.
OK: Stop lamps turn ON and OFF when brake pedal is depressed and released.

NG → **REPAIR OR REPLACE STOP LAMP SWITCH CIRCUIT**

OK

2	CHECK ECM (STP, ST1– VOLTAGE)



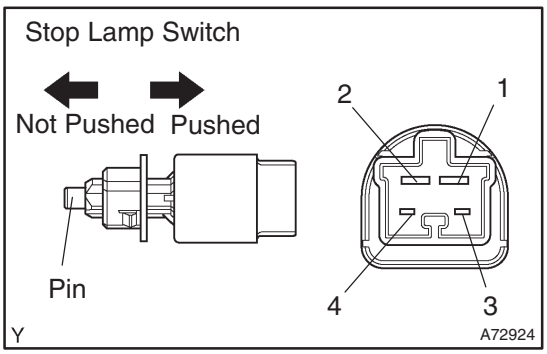
(a) Turn the ignition switch ON.
(b) Measure the voltage of the ECM connectors.
Standard:

Tester Connection	Brake Pedal Condition	Specified Condition
E15–15 (STP) – E16–7 (E1)	Depressed	7.5 to 14 V
E15–15 (STP) – E16–7 (E1)	Released	Below 1.5 V
E15–14 (ST1–) – E16–7 (E1)	Depressed	Below 1.5 V
E15–14 (ST1–) – E16–7 (E1)	Released	7.5 to 14 V

OK → **CHECK FOR INTERMITTENT PROBLEMS (See page 05–439)**

NG

3	INSPECT STOP LAMP SWITCH ASSY



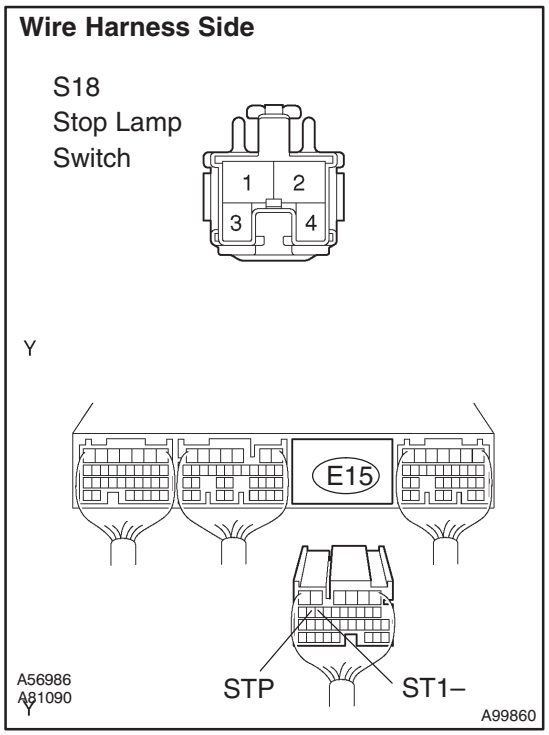
(a) Remove the S18 switch.
(b) Measure the resistance of the switch.
Standard:

Tester Connection	Switch Condition	Specified Condition
1 – 2	Pin not pushed	Below 1 Ω
3 – 4	Pin not pushed	10 kΩ or higher
1 – 2	Pin Pushed	10 kΩ or higher
3 – 4	Pin Pushed	Below 1 Ω

NG → **REPLACE STOP LAMP SWITCH ASSY**

OK

4 CHECK WIRE HARNESS (STOP LAMP SWITCH – ECM)



(a) Disconnect the S18 switch connector.
(b) Disconnect the E15 ECM connector.
(c) Measure the resistance of the wire harness side connector.

Standard:

Tester Connection	Specified Condition
S18–1 – E15–15 (STP)	Below 1 Ω
S18–4 – E15–14 (ST1–)	Below 1 Ω
S18–1 or E15–15 (STP) – Body ground	10 kΩ or higher
S18–4 or E15–14 (ST1–) – Body ground	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

REPLACE ECM (See Pub. No. RM990E, page 10–34)

NOTICE:
After replacing the ECM, allow for ECM learning start the engine and idle it until it is fully warmed up.