

INSPECTION

1. INSPECT DIAGNOSTIC MODE

(MULTI-INFORMATION DISPLAY)

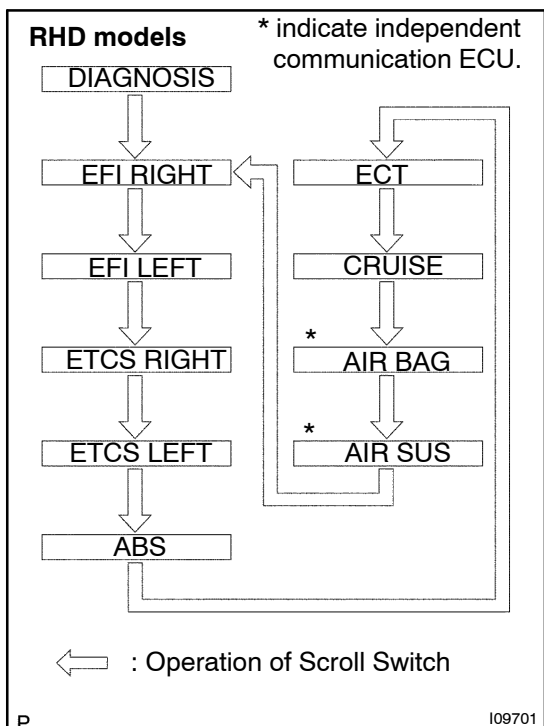
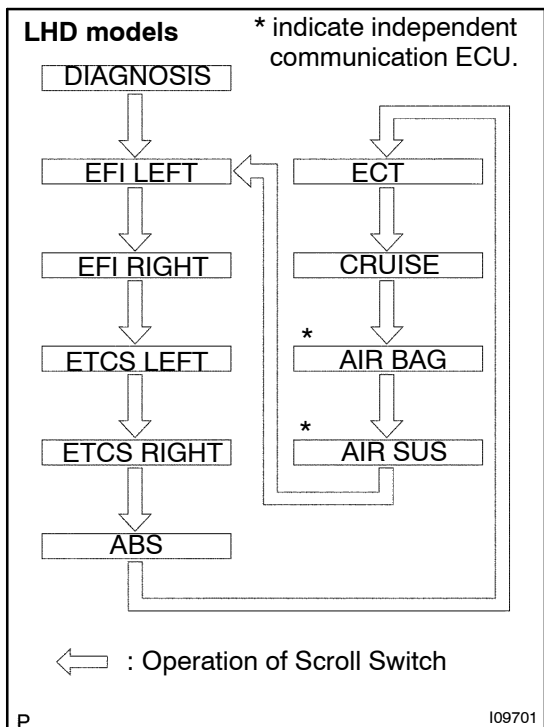
- (a) Short-circuit the circuit between diagnosis connector 11 (Tc) and 3 (E1) terminals, or DLC3 13 (Tc) and 4 (CG) terminals.
- (b) The multi-information display indicates a "DIAGNOSIS" upon turning ignition switch ON or starting the engine.
- (c) Press the scroll switch to select and ECU name to be checked.

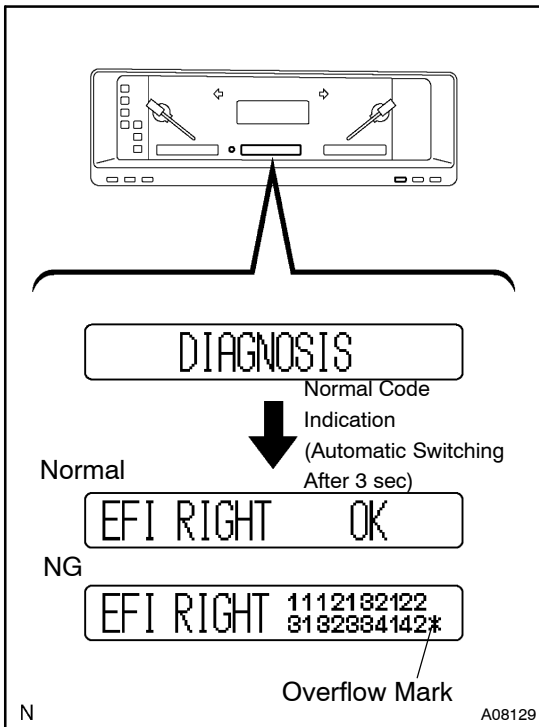
HINT:

There are 2 types of ECU's that can be checked in the diagnostic mode, those are, multiplex and independent communication ECU's.

2. READING DIAGNOSTIC CODE (MULTIPLEX COMMUNICATION ECU)

- (a) A diagnostic code is indicated against the indicated ECU when no scroll switch input is received for 3 seconds.

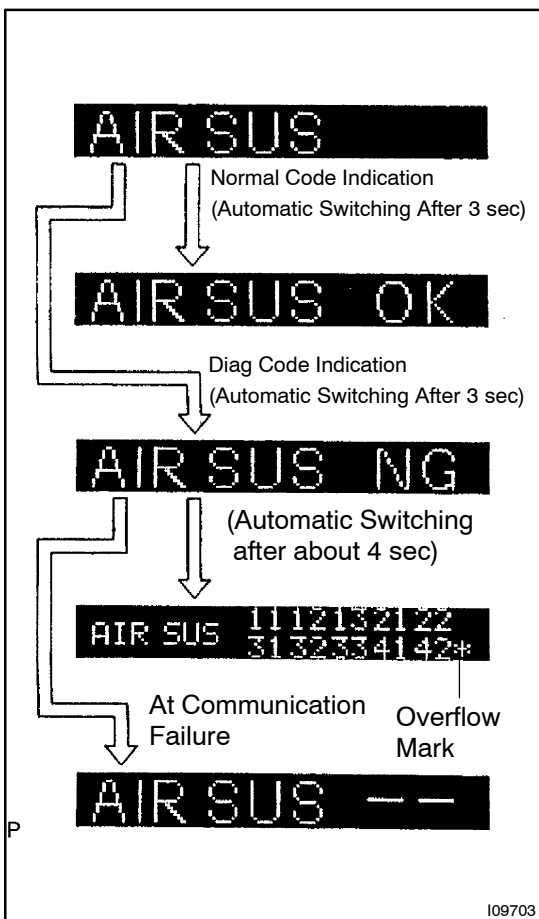




(b) If the indicated ECU is normal, an "OK" appears. If diagnostic codes are received, they are indicated on the display at a time.

HINT:

- The maximum number of diagnostic codes being indicated on the display at a time is 10.
- When 11 diagnostic codes or more exist, an asterisk mark (* indicating overflow) is attached to the 10th code.



3. READING DIAGNOSTIC CODE (INDEPENDENT COMMUNICATION ECU)

If the indicated ECU is normal, an "OK" appears. If diagnostic codes exist, an "NG" appears for about 4 sec and they are indicated on the display at a time.

HINT:

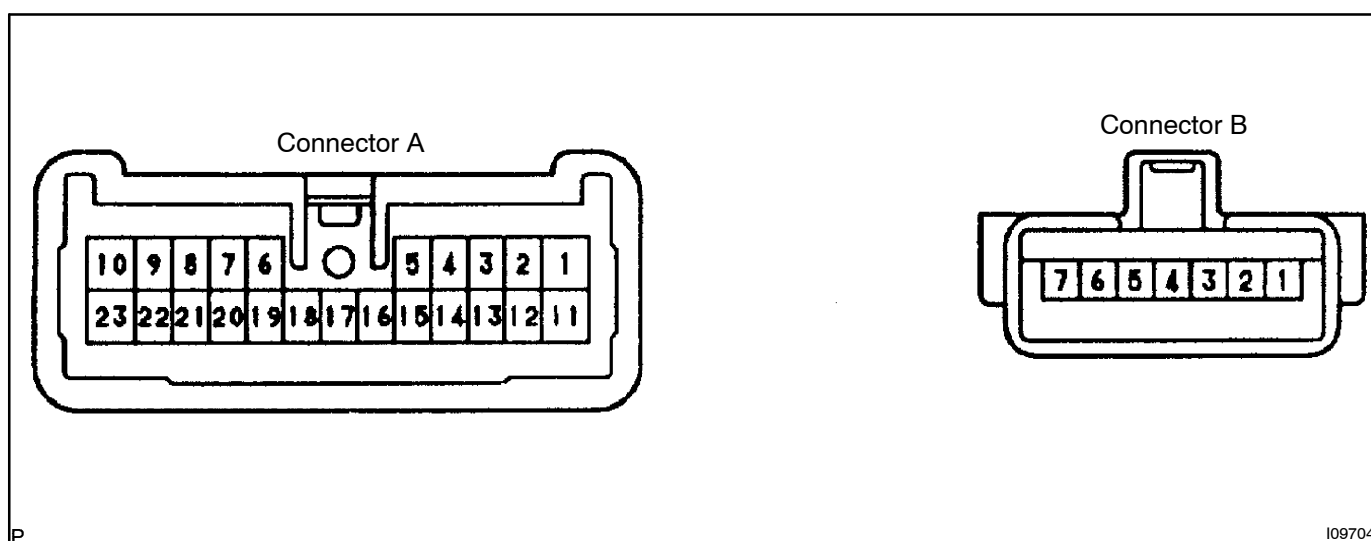
- The maximum number of diagnostic codes being indicated on the display at a time is 10.
- When 11 diagnostic codes or more exist, an asterisk mark (* indicating overflow) is attached to the 10th code.
- When signals are sent at out of the read permitted time, an "--" message appears for open or short circuit.

4. INSPECT METER ECU ASSEMBLY OPERATION

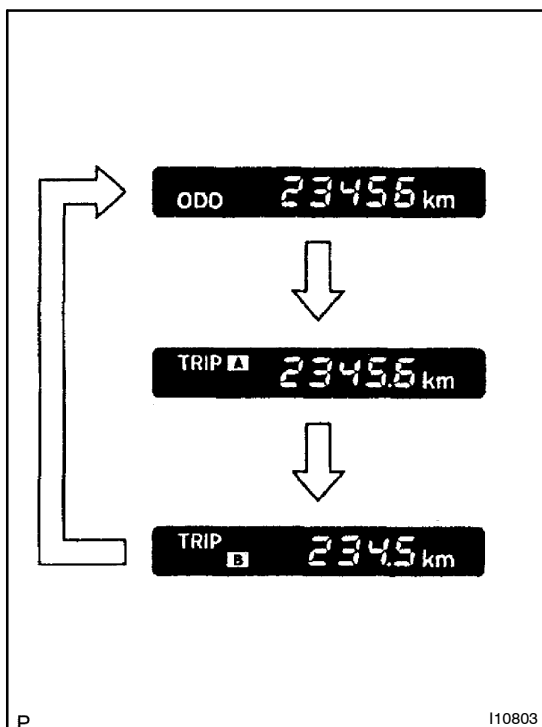
- (a) Connect mini-test leads to the Toyota electrical tester and then to respective terminals or between a terminal and body earth to measure.
- (b) Check pulses are generated between respective terminals or between a terminal and body earth using an oscilloscope.

HINT:

- Check connectors from their reverse side, maintaining connections to the combination computer as they are.
- Measure voltages after checking that the tester is set to the volt range.



Terminal name	Tester connection	Measurement condition	Standard
BEAM	A1 → Ground	Head light dimmer switch: Other than Hi to Hi	1 V or less → 10 - 14 V
+B (MPX B)	A2 → Ground	Always	10 - 14 V
Temp. sender	A4 → Ground	At ignition switch ON and 90 °C water temp.	0.8 - 1.5 V
TURN L	A5 → Ground	At ignition switch ON and turn signal switch to left	1 V or less → 10 - 14 V
TURN R	A6 → Ground	At ignition switch ON and turn signal switch to right	1 V or less → 10 - 14 V
Air suspension	A7 → Ground	When air suspension circuit is normal	10 - 14 V
MPX+ (multiplex signal)	A8 → Ground	Ignition switch ON	Pulse generation
MPX- (multiplex signal)	A9 → Ground	Ignition switch ON	Pulse generation
Engine earth (E1)	A10 → Ground	Always	Continuity
HEATER (ECU B)	A11 → Ground	Always	10 - 14 V
IG+	A12 → Ground	Ignition switch from OFF to ON	1 V or less → 10 - 14 V
Oil pressure	A13 → Ground	From engine stopping to running	1 V or less → 10 - 14 V
Brtake pad	A14 → Ground	Ignition switch ON and brake pad indicator from ON to OFF	1 V or less → 10 - 14 V
Airbag control	A15 → Ground	Ignition switch ON and airbag pad indicator from ON to OFF	1 V or less → 10 - 14 V
ABS	A18 → Ground	Ignition switch ON and ABS indicator from ON to OFF	1 V or less → 10 - 14 V
ILL-	A19 → Ground	Ignition switch ON	Pulse generation
TC	A20 → Ground	Set light control switch from TAIL to HEAD and turn rheostat volume.	1.3 - 5 V
SI (vehicle speed input sig- nal)	A21 → Ground	Ignition switch ON and slowly turn drive wheel	1 V or less → 10 - 14 V
4P (vehicle speed output sig- nal)	A22 → Ground	Ignition switch ON and slowly turn drive wheel	1 V or less → 10 - 14 V
Power earth (E2)	A23 → Ground	Always	Continuity
SCROLL (MULTI)	B1 → Ground	SCROLL SW OFF → ON	4.5 - 5.5 → 1V or less
ODO/TRIP	B2 → Ground	ODO/TRIP SW OFF → ON	4.5 - 5.5 → 1V or less
RESET (TRIP)	B3 → Ground	RESET SW OFF → ON	4.5 - 5.5 → 1V or less
GND	B4 → Ground	Always	Continuity
km/MILES	B5 → Ground	km/MILE SW OFF → ON	4.5 - 5.5 → 1V or less



5. INSPECT ODO/TRIP METER OPERATION

- (a) Check that the indicated mode alters from ODO to TRIP A, TRIP B and then returns to ODO every time the ODO/TRIP selector switch is pressed after setting the ignition switch to ON.

HINT:

The mode being indicated immediately before turning the ignition switch off is indicated upon setting the ignition switch to ON.

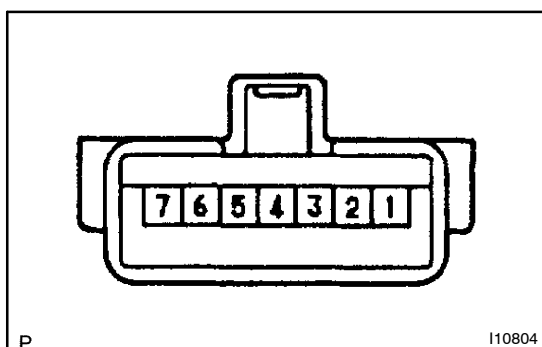
- (b) Check that the indicated data is reset when the RESET switch is pressed continuously for 0.5 sec or more while TRIP A or TRIP B mode is indicated.

6. INSPECT REVERSE WARNING OPERATION

Check that the R light of the shift position indicator light turns on and the reverse warning buzzer is activated upon shifting to the R range.

7. INSPECT REVERSE WARNING BUZZER

(Refer to "Automatic Transmission Axle", "Reverse Warning Buzzer" of "Unit Inspection".)

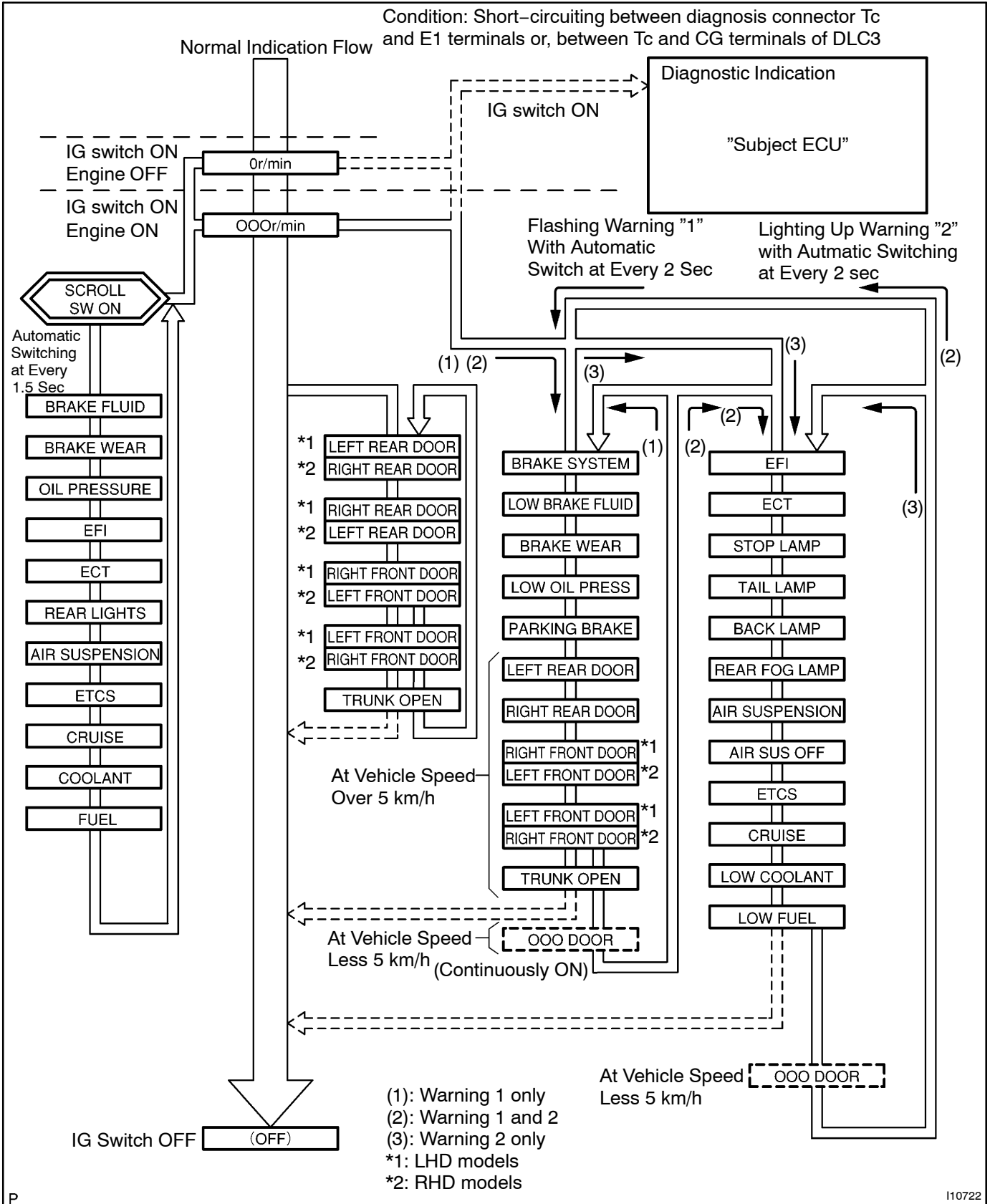


8. INSPECT TRIP ASSEMBLY CONTINUITY

Switch position	Tester connection	Condition
TRIP switch SCROLL	1 - 4	Continuity
TRIP switch ODO	2 - 4	Continuity
TRIP switch RESET	3 - 4	Continuity
km/MILES with	4 - 5	Continuity

If continuity is not as specified, replace the telltale light assembly.

9. MULTI-INFORMATION DISPLAY FLOWCHART



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10. INSPECT MULTI-INFORMATION DISPLAY

Check indications in the multi-information display and multi-warning according to the instructed check procedures and display conditions.

Indication on multi-information display	Multi-information display and multi-warning indication	Check procedure and indication condition
LEFT REAR DOOR (LHD) RIGHT REAR DOOR (RHD)	ON Flashing	(1) Lights up when the corresponding door is open (or half locked).
RIGHT REAR DOOR (LHD) RIGHT REAR DOOR (RHD)		(2) Flashes (linked to multi-warning) when the engine is ON under condition (1) above and at a vehicle speed of over 5 km/h. • Refer to Courtesy Light Switch Check of "Meter & Gauge", "Door Warning".
LEFT FRONT DOOR (LHD) RIGHT FRONT DOOR (RHD)		
RIGHT FRONT DOOR (RHD) LEFT FRONT DOOR (LHD)		
BRAKE SYSTEM *	Flashing	(1) When hydraulic brake system is faulty with engine ON.
LOW BRAKE FLUID	Flashing	(1) Short-circuit vehicle side connector terminals of brake level warning switch with engine ON. • Refer to Brake Level Warning Switch Check of "Meter & Gauge", "Brake Warning".
BRAKE WEAR	Flashing	(1) Short-circuit vehicle side connector terminals of brake level warning switch with engine ON. • Refer to Padware Indicator Sensor Check of Unit Inspection.
LOW OIL PRESS	Flashing	(1) Ground the oil pressure switch vehicle side connector 10 sec or more after engine ON. • Refer to Oil Pressure Switch Check of Unit Inspection.
PARKING BRAKE	Flashing	(1) Ground the vehicle side connector of parking brake switch. (2) Flashes when traveled at 5 km/h speed with engine ON and under condition (1) above. • Refer to Parking Brake Switch Check of "Meter & Gauge", "Brake Warning".
EFI	ON	(1) At EFI system failure with engine ON.
ECT	ON	(1) At ECT system failure with engine ON.
STOP LAMP	ON	(1) Remove respective bulb with engine ON.
TAIL LAMP	ON	
BACK LAMP	ON	
REAR FOG LAMP (w/ REAR FOG LAMP)	ON	
AIR SUSPENSION	ON	(1) At air suspension system failure with engine ON.
AIR SUS OFF	ON	(1) Short-circuit DLC3 OPD and CG terminals and engine ON • Refer to Notes of "Suspension & Accelerator", "Toyota Electronic Controlled Air Suspension".

ETCS	ON	(1) At electronic acceleration failure with engine ON.
LOW COOLANT	ON	(1) Engine ON Refer to Reservoir Tank Level Warning Switch of Unit Inspection.
LOW FULE	ON	(1) Engine ON and remove fuel sender gauge from fuel tank. • Refer to Fuel Sender Gauge Check of "Meter & Gauge", "Fuel Gauge".

11. INSPECT SPEEDOMETER ON-VEHICLE

Using a speedometer tester, inspect the speedometer for allowable indication error and check the operation of the odometer.

HINT:

Tire wear and tire over or under inflation will increase the indication error.

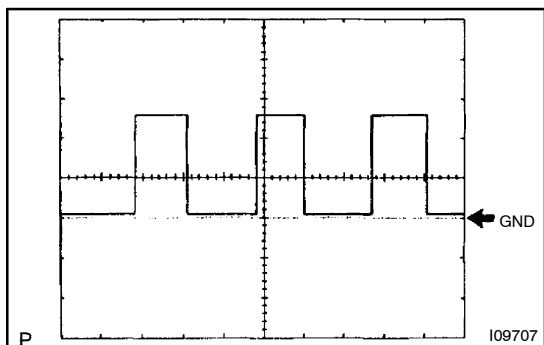
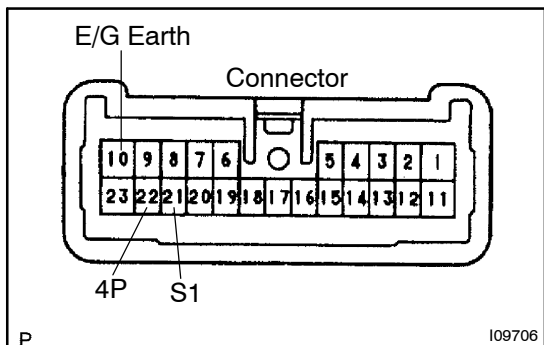
Europe Models:

(mph)		(km/h)	
Standard indication	Allowable range	Standard indication	Allowable range
20	20 - 24.5	20	20 - 26
40	40 - 46.5	40	40 - 48
60	60 - 68.5	60	60 - 70
80	80 - 90.5	80	80 - 92
100	100 - 112.5	100	100 - 114
		120	120 - 136
		140	140 - 158
		160	160 - 180

Others:

(mph)		(km/h)	
Standard indication	Allowable range	Standard indication	Allowable range
20	21 - 23.5	20	21 - 25
40	41.5 - 44	40	41.5 - 46
60	62.5 - 66	60	62.5 - 67
80	83 - 87	80	83 - 88
100	104 - 108.5	100	104 - 109
		120	125 - 130.5
		140	145.5 - 151.5
		160	166 - 173

If error is excessive, replace the speedometer.



12. INSPECT SPEEDOMETER I/O SIGNAL

Measure waveform of each combination meter connector terminal using an oscilloscope.

HINT:

Terminals to be checked

Speed signal input:

Between A21 (SI) and A10 (E/G earth) terminals

Speed signal output:

Between A22 (4P) and A10 (E/G earth) terminals

Oscilloscope settings: 5 V/DIV, 20 ms/DIV

Measurement condition: About 20 km/H traveling

NOTICE:

- Measure with ignition switch ON and the connector being connected.
- Check the connector from the reverse side with the connector being connected to the meter computer.
- The higher the vehicle speed, the shorter the waveform frequency.

13. INSPECT TACHOMETER/ ON-VEHICLE

(a) Connect a tune-up test tachometer, and start the engine.

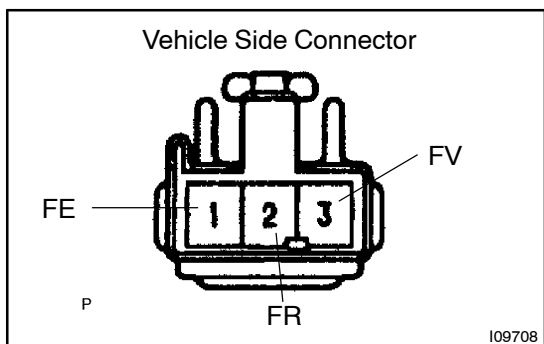
NOTICE:

- Reversing the connection of the tachometer will damage the transistors and diodes inside.
- When removing or installing the tachometer, be careful not to drop or subject it to heavy shocks.

(b) Compare the tester and tachometer indications.

DC 13.5 V 25 °C at (77 °F)

Standard indication	Allowable range
700	630 - 770
1,000	900 - 1,100
2,000	1,850 - 2,150
3,000	2,800 - 3,200
4,000	3,800 - 4,200
5,000	4,800 - 5,200
6,000	5,750 - 6,250
7,000	6,700 - 7,300



14. INSPECT FUEL RECEIVER GAUGE OPERATION

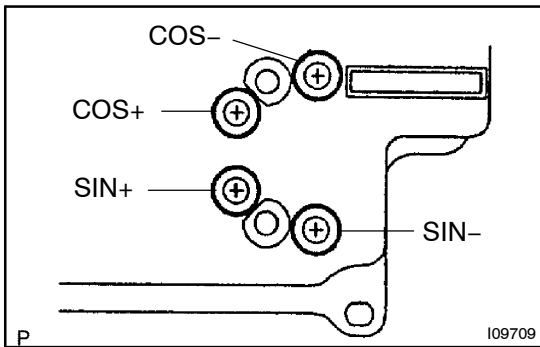
(a) Disconnect the connector from the sender gauge.

(b) Turn the ignition switch ON, check that the receiver gauge needle indicates EMPTY.

HINT:

Because of the silicon oil in the gauge, it will take a short time for needle to stabilize.

If operation is not as specified, inspect the receiver gauge resistance.

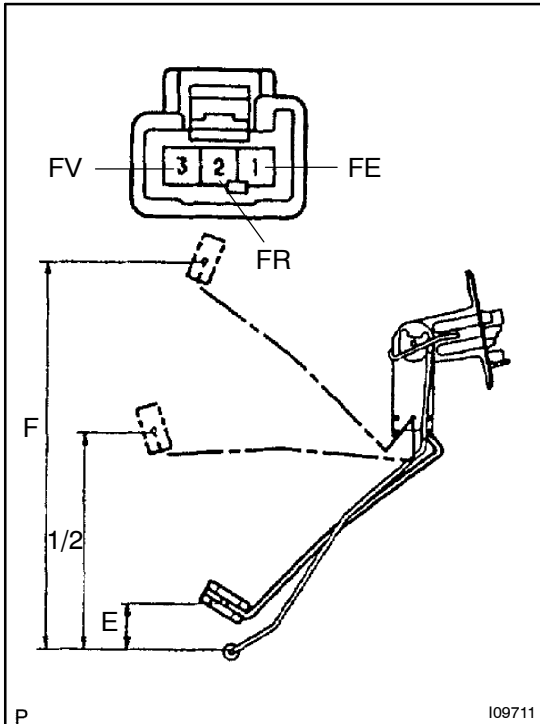


15. INSPECT FUEL RECEIVER GAUGE RESISTANCE

Measure the resistance between terminals with fixing pointer to the stopper.

Terminal name	Resistance (Ω)
SIN+ ↔ SIN-	151.8
COS+ ↔ COS-	164.2

If resistance value is not as specified, replace the receiver gauge.

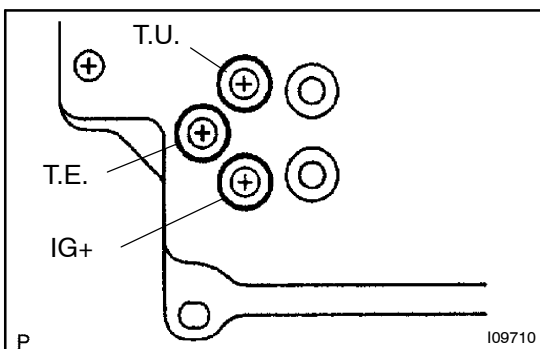


16. INSPECT FUEL SENDER GAUGE VOLTAGE

Measure the resistance between terminals 1 and 2 for each float position.

Float position mm (in.)	Voltage (V)
F: 310 (12.2) ± 3 (0.12)	4.6 ± 0.1
1/2: 172.4 (6.8) ± 3 (0.12)	2.43 ± 0.1
E: 35.2 (1.4) ± 3 (0.12)	0.35 ± 0.1

If resistance value is not as specified, replace the sub sender gauge.



17. INSPECT WATER TEMPERATURE RECEIVER GAUGE RESISTANCE

Measure the resistance between terminals with fixing pointer to the stopper.

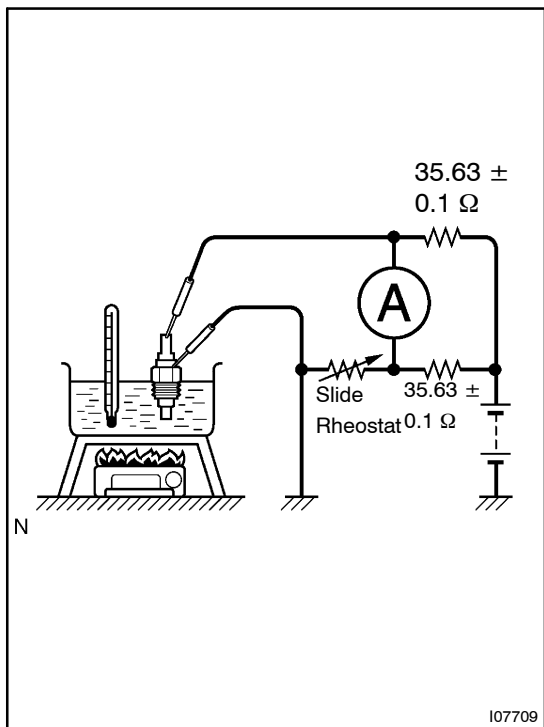
Measured terminal name	Resistance (Ω)
IG+ ↔ T.U.	54.0
IG+ ↔ T.E.	175.7
T.U.+ ↔ T.E.	229.7

If resistance value is not as specified, replace the receiver gauge.

HINT:

This circuit includes the diode.

If resistance value is not as specified, replace the receiver gauge.

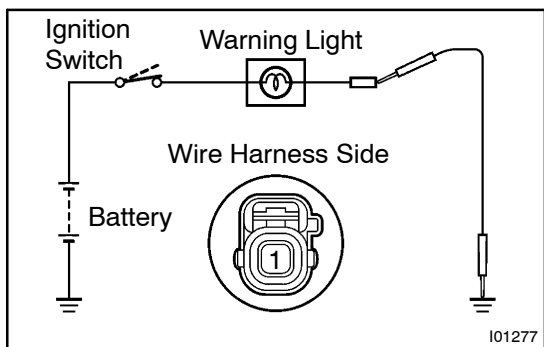


18. INSPECT WATER TEMPERATURE SENDER GAUGE RESISTANCE

Connect the wire harness as shown in the illustration, and adjust the ammeter pointer to indicate "0" using the slide rheostat, then rear the rheostat indication..

Temperature °C (°F)	Resistance (Ω)
50 (122.0)	160 - 240
120 (248.0)	17.1 - 21.2

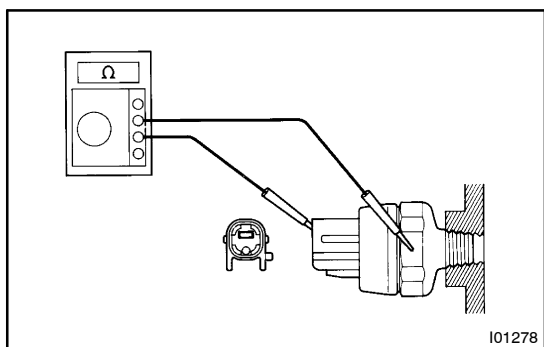
If resistance value is not as specified, replace the water temperature sender gauge.



19. INSPECT LOW OIL PRESSURE WARNING LIGHT

- (a) Disconnect the connector from the warning switch and ground terminal on the wire harness side connector.
- (b) Turn the ignition switch ON and check that the warning light lights up.

If the warning light does not light up, test the bulb.

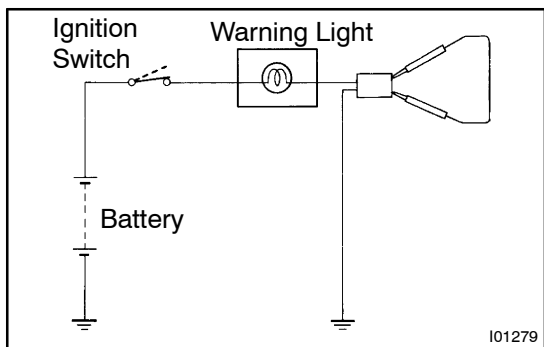


20. INSPECT LOW OIL PRESSURE SWITCH CONTINUITY

- (a) Disconnect the connector from the switch.
- (b) Check that continuity exists between terminal and ground with the engine stopped.
- (c) Check that no continuity exists between terminal and ground with the engine running.

HINT:

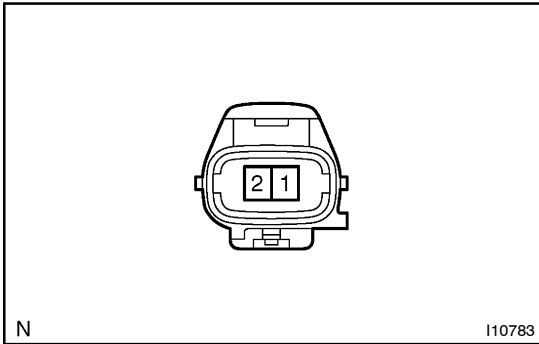
Oil pressure should be over 24.5 kPa (0.25 kg/cm², 3.55 psi). If operation is not as specified, replace the switch.



21. INSPECT BRAKE WARNING LIGHT

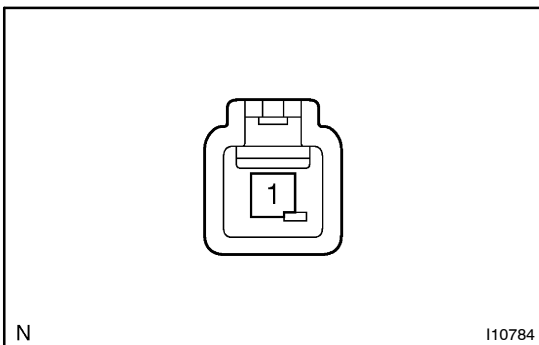
- (a) Disconnect the connector from the brake fluid warning switch.
- (b) Release the parking brake pedal.
- (c) Connect the terminals on the wire harness side of the level warning switch connector.
- (d) Start the engine, check that the warning light lights up.

If the warning light does not light up, test the bulb or wire harness.



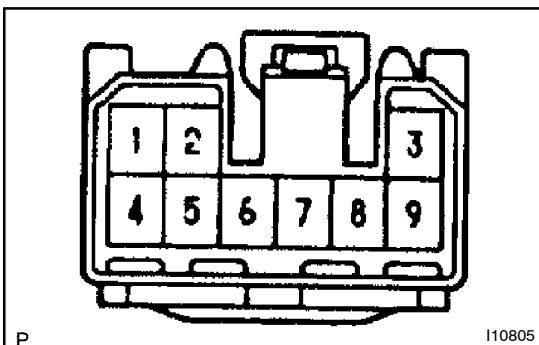
22. INSPECT BRAKE FLUID LEVEL WARNING SWITCH CONTINUITY

- Remove the reservoir tank cap and strainer.
 - Disconnect the connector.
 - Check that no continuity exists between the terminals with the switch OFF (float up).
 - Use siphon, etc. to take fluid out of the reservoir tank.
 - Check that continuity exists between the terminals with the switch ON (float down)
 - Pour the fluid back in the reservoir tank.
- If operation is not as specified, replace the switch.



23. INSPECT PARKING BRAKE SWITCH CONTINUITY

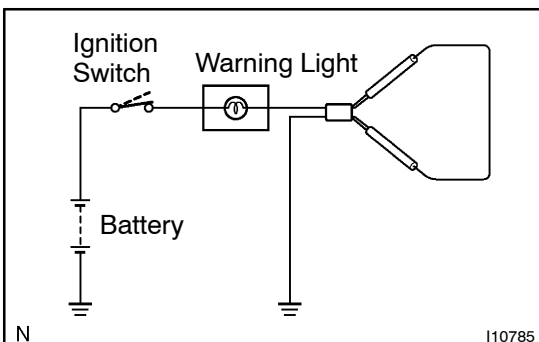
- Check that continuity exists between the terminal and switch body with the switch ON (switch pin released).
 - Check that no continuity exists between the terminal and switch body with the switch OFF (switch pin pushed in).
- If operation is not as specified, replace the switch or inspect ground point.



24. INSPECT OPEN DOOR WARNING LIGHT

- Check that the warning light turns on when one of doors is open.
- Disconnect the connectors and check the warning light turns on when the wiring harness side connector terminals 6 and 8 are short-circuited.

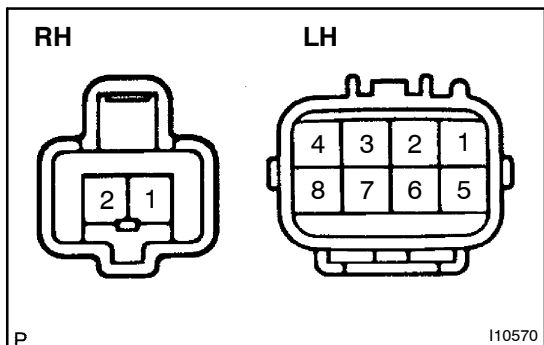
If the warning light does not light up, inspect the bulb or wire harness.



25. INSPECT SEAT BELT WARNING LIGHT

- Check that the seat belt warning light turns on when the ignition switch is set to ON and turns off when the tang plate is set.
- Disconnect the buckle switch connector of the driver's seat seat belt.
- Set the ignition switch to ON and check the seat belt warning light status when the wiring harness side connector is short-circuited.

Standard: Warning light turns on.



26. INSPECT FRONT SEAT INNER BELT BUCKLE SWITCH CONTINUITY

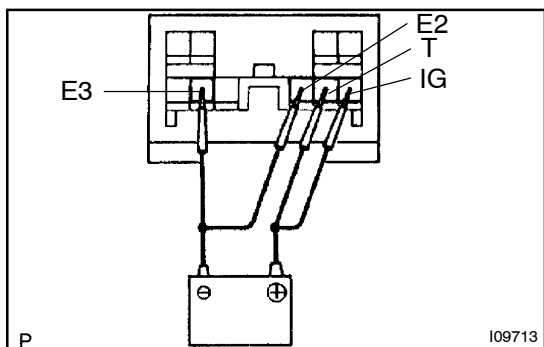
Right side:

Condition	Terminal	Specified condition
When connected	1 - 2	continuity
When disconnected	1 - 2	No continuity

Left side:

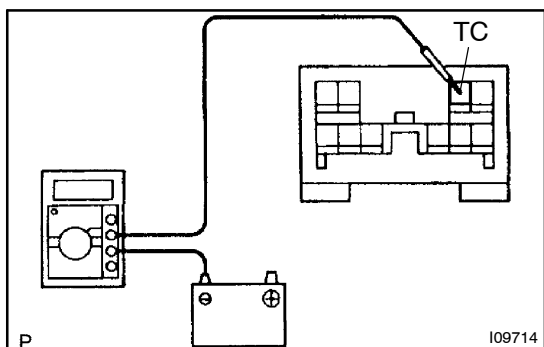
Condition	Terminal	Specified condition
When connected	1 - 2	continuity
	2 - 6	continuity
When disconnected	1 - 2	No continuity
	2 - 6	continuity

If continuity is not as specified, replace the switch.



27. INSPECT LIGHT CONTROL RHEOSTAT OPERATION

- (a) Remove the rheostat and connect the battery (+) and (-) to terminals 5 (IG) and 6 (T), and terminals 7 (E2) and 9 (E3), respectively.*1



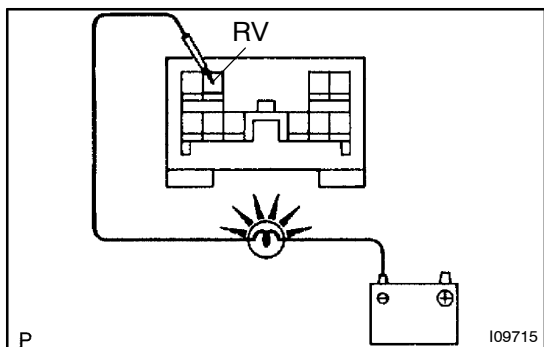
- (b) Connect the heater between the 2 (Tc) terminal and battery (-) from the *1 condition above, and measure the voltage.

Standard: At tail cancellation: 10 - 14V

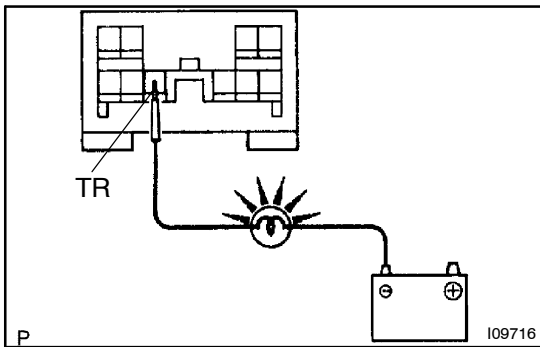
At release of tail cancellation: 1 V or less

HINT:

The tail cancellation represents the condition when the rheostat volume is turned all the way clockwise.



- (c) Connect a 3.4 W bulb between the 3 (RV) terminal and battery (-) from the condition of *1 above.
- (d) Check that intensity of the bulb changes as the rheostat volume is turned.



- (e) Connect a 3.4 W bulb between the 8 (TR) terminal and battery (-) from the condition of *1 above.
- (f) Check that intensity of the bulb changes as the rheostat volume is turned.