

INSTRUMENT PANEL

Entire Article
2000 Lexus RX 300

ARTICLE BEGINNING

2000 ACCESSORIES & EQUIPMENT
Lexus Instrument Panels

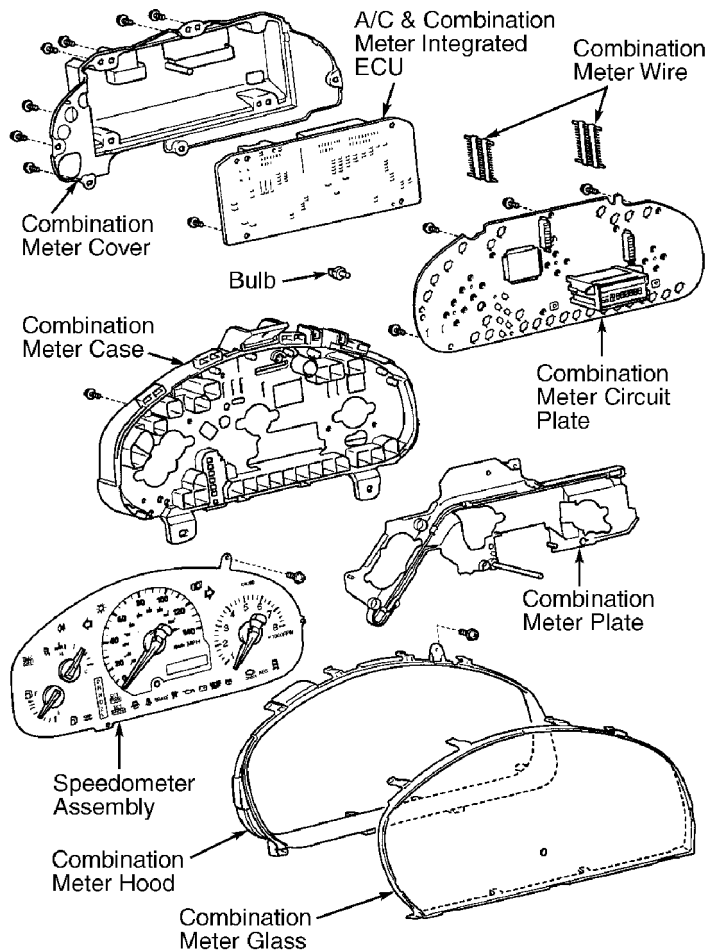
RX300

* PLEASE READ THIS FIRST *

WARNING: Deactivate air bag system before performing any service operation. See AIR BAG RESTRAINT SYSTEMS article. DO NOT apply electrical power to any component on steering column without first deactivating air bag system. Air bag may deploy.

DESCRIPTION & OPERATION

Instrument cluster uses analog (needle-type) speedometer, tachometer and gauges. A circuit plate on back of instrument cluster conducts current between components and receives data from other control units. See Fig. 1.



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Fig. 1: Exploded View Of Instrument Cluster
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COMPONENT LOCATIONS

COMPONENT LOCATIONS

Component	Location
ABS ECU	Behind Right Side Of Instrument Panel
Body ECU	Behind Left Side Of Instrument Panel
Brake Fluid Level Warning Switch	In Brake Fluid Reservoir
Data Link Connector No. 3 (DLC3)	Under Instrument Panel, Below Steering Column
DOME Fuse (10-Amp)	In Junction Block At Left Side Of Engine Compartment
Door Unlock Detection Switch	Integral With Each Door Lock Assembly
ECM	Behind Right Side Of Instrument Panel
ECU-B Fuse (7.5-Amp)	In Junction Block At Left Side Of Engine Compartment
HEATER Fuse (15-Amp)	In Instrument Panel Junction Block
Ignition Coil & Igniter	On Top Of Each Respective Cylinder
Instrument Panel Junction Block	Behind Left Side Of Instrument Panel
Light Failure Sensor	Left Side Of Luggage Compartment
Low Oil Pressure Warning Switch	On Left Front Corner Of Engine
Main Fuel Gauge Sending Unit	On Top Of Fuel Tank
Occupant Detection Sensor	Under Passenger's Seat
Parking Brake Switch	On Parking Brake Pedal Support Bracket
Park/Neutral Position (PNP) Switch	On Transaxle
Seat Belt Buckle Switch	On Respective Seat Belt Buckle
Sub Fuel Gauge Sending Unit	On Top Of Fuel Tank
Washer Fluid Level Warning Switch	In Right Front Corner Of Engine Compartment

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TROUBLE SHOOTING

Verify customer complaint. Perform a visual inspection, checking for blown fuses, disconnected or damaged wire harnesses and components. Ensure all fluid levels are correct. Repair or replace items as necessary and recheck.

Verify proper multiplex control system operation and ensure no Diagnostic Trouble Codes (DTC) are present. See MULTIPLEX CONTROL SYSTEMS - RX300 article. Repair as necessary. If no DTCs are present, diagnose by symptom. See appropriate SYMPTOM DIAGNOSIS table.

SYMPTOM DIAGNOSIS (GAUGES)

Symptom	Inspect
Speedometer Inoperative Or Abnormal Operation	(1) Speedometer Circuit (2) ABS ECU
Tachometer Inoperative Or Abnormal Operation	(1) Tachometer Circuit (1) Igniter Signal Circuit
Fuel Gauge Inoperative Or Abnormal Operation	(1) Fuel Gauge Circuit (3) Wire Harness (4) Instrument Cluster
Engine Coolant Temperature Gauge Inoperative Or Abnormal Operation	(1) Engine Coolant Temperature Gauge Circuit (3) Wire Harness (4) Instrument Cluster
<p>(1) - Perform appropriate circuit test under CIRCUIT TESTS. If more than one circuit test is listed, perform tests in order listed.</p> <p>(2) - See ANTI-LOCK BRAKES article in WIRING DIAGRAMS.</p> <p>(3) - Inspect wire harness and repair as necessary. See WIRING DIAGRAMS.</p> <p>(4) - See INSTRUMENT CLUSTER under CIRCUIT TESTS.</p>	

SYMPTOM DIAGNOSIS (INDICATORS & WARNING LIGHTS)

Symptom	Inspect
Shift Indicator Light Does Not Illuminate	(1) Bulb Circuit (2) A/T Shift Indicator Light Switch (2) Transmission Control Switch

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AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3   Open Door Warning Light           3           (1) Bulb Circuit           3
3   Does Not Illuminate                ^AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3                                     3           (3) Door Courtesy Switch   3
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3   Driver's Seat Belt Warning         3           (1) Bulb Circuit           3
3   Light Does Not Illuminate          ^AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3                                     3           (4) Driver's Buckle Switch  3
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3   Passenger's Seat Belt              3           (1) Bulb Circuit           3
3   Warning Light Does Not            ^AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3   Illuminate                          3           (4) Passenger's Buckle Switch 3
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3   Low Oil Pressure Warning           3           (1) Bulb Circuit           3
3   Light Does Not Illuminate          ^AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3                                     3           (3) Low Oil Pressure Warning  3
3                                     3           Light Switch                 3
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3   Discharge Warning Light           3           (1) Bulb Circuit           3
3   Does Not Illuminate                ^AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3                                     3           (5) Generator                 3
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3 Brake Warning Light Does Not        3           (1) Bulb Circuit           3
3   Illuminate                          ^AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3                                     3           (3) Parking Brake Switch     3
3                                     ^AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3                                     3           (3) Brake Fluid Level Warning 3
3                                     ^AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3                                     3           (3) Instrument Cluster       3
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3   Headlight Indicator Light          3           (1) Bulb Circuit           3
3   Does Not Illuminate                ^AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3                                     3           (6) Headlight & Taillight System 3
3                                     ^AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3                                     3           (3) Instrument Cluster       3
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3 CRUISE MAIN Indicator Light         3           (1) Bulb Circuit           3
3   Does Not Illuminate                ^AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3                                     3           (7) Cruise Control Switch     3
3                                     ^AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3                                     3           (3) Instrument Cluster       3
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3   ECT SNOW Indicator Light          3           (1) Bulb Circuit           3
3   Does Not Illuminate                ^AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3                                     3           (2) ECT Pattern Indicator Signal 3
3                                     ^AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3                                     3           (3) Instrument Cluster       3
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3   ECT PWR Indicator Light           3           (1) Bulb Circuit           3
3   Does Not Illuminate                ^AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3                                     3           (2) ECT Pattern Indicator Signal 3
3                                     ^AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3                                     3           (3) Instrument Cluster       3
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^
3   TRAC OFF Indicator Light           3           (1) Bulb Circuit           3
3   Does Not Illuminate                ^AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA^

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(8) ABS, TRAC & VSC ECU
(3) Instrument Cluster
Washer Level Warning Light Does Not Illuminate
(1) Bulb Circuit
(3) Window Washer Level Warning Switch
(3) Instrument Cluster
Rear Lights Warning Light Does Not Illuminate
(1) Bulb Circuit
(1) Light Failure Sensor Circuit
(3) Instrument Cluster
Engine Oil Level Warning Light Does Not Illuminate
(1) Bulb Circuit
(9) Engine Oil Level Warning Sensor
(3) Instrument Cluster
All Indicator & Warning Lights Do Not Illuminate
(1) Bulb Circuit
(1) Combination Meter ECU Power Source Circuit
(3) Instrument Cluster
(1) - Perform appropriate circuit test under CIRCUIT TESTS.
If more than one circuit test is listed, perform tests in order listed.
(2) - See appropriate ELECTRONIC CONTROLS article in AUTOMATIC TRANSMISSIONS.
(3) - See appropriate test under COMPONENT TESTS.
(4) - See appropriate BODY CONTROL SYSTEMS article.
(5) - See GENERATORS & REGULATORS article in STARTING & CHARGING SYSTEMS.
(6) - See appropriate wiring diagram in EXTERIOR LIGHTS article.
(7) - See appropriate CRUISE CONTROL SYSTEMS article.
(8) - See ANTI-LOCK BRAKES article in WIRING DIAGRAMS.
(9) - Testing information is not available from manufacturer.

CIRCUIT TESTS

BULB CIRCUIT

NOTE: If Lexus hand-held tester is not available, begin testing with step 2).

1) Connect Lexus hand-held tester to Data Link Connector No. 3 (DLC3). With tester in ACTIVE TEST mode, operate appropriate indicator/warning light. If light operation is okay, perform next check listed in appropriate symptom diagnosis table. See TROUBLE SHOOTING. If light operation is not okay, go to next step.

2) Remove bulb in question. Using DVOM, check for continuity between bulb terminals. If continuity is present, go to next step. If continuity is not present, replace bulb.

3) Check combination meter circuit plate. See INSTRUMENT CLUSTER under COMPONENT TESTS. Repair as necessary. If combination meter circuit plate is okay, replace A/C and combination meter integrated ECU. See Fig. 1.

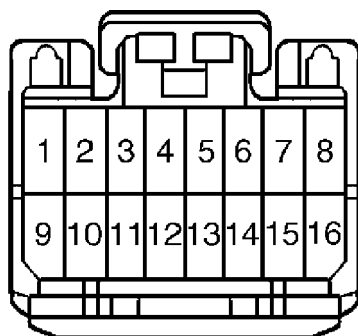
COMBINATION METER ECU POWER SOURCE CIRCUIT

NOTE: Combination meter is also known as instrument cluster.

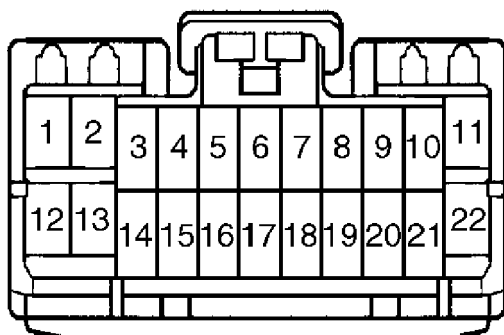
1) Check HEATER fuse (15-amp) and ECU-B fuse (7.5-amp). Replace if necessary. If fuses are okay, go to next step.

2) Remove instrument cluster. See INSTRUMENT CLUSTER under REMOVAL & INSTALLATION. With wire harnesses disconnected, measure voltage between ground and terminals No. 1 and 3 of harness connector "C". See Fig. 2. If battery voltage is present, perform next check listed in appropriate symptom diagnosis table. See TROUBLE SHOOTING. If battery voltage is not present, go to next step.

3) Check for open in harness or connector between GND terminal of combination meter and chassis ground. See WIRING DIAGRAMS. Repair as necessary. If circuit is okay, repair faulty circuit between combination meter and battery.



CONNECTOR "B"



CONNECTOR "C"

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Fig. 2: Identifying Instrument Cluster Harness Connector Terminals
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DOOR COURTESY SWITCH CIRCUIT**Driver & Passenger Doors**

Locate door courtesy switch to be tested. One switch is located in each door lock assembly (total of 4 switches). Disconnect 2-pin door courtesy switch connector. Using DVOM, measure voltage between terminal No. 2 (Red/White wire or Red/Yellow wire) and ground. Ensure battery voltage is present at all times. If battery voltage is not present, check power source or circuit. See WIRING DIAGRAMS. Repair as necessary.

Rear Door (Luggage Compartment)

1) Disconnect 2-pin harness connector from rear door lock motor assembly. Using DVOM, measure voltage between ground and terminal No. 1 (White/Black wire) at vehicle side of harness connector. Ensure battery voltage is present with luggage compartment door opener switch in ON position, and no voltage is present with switch in OFF position. Go to next step.

2) Measure voltage between ground and terminal No. 2 (White/Red wire) at vehicle side of harness connector. Ensure battery voltage is present at all times. If voltage is not as specified, check power source or circuit. See WIRING DIAGRAMS. Repair as necessary.

ENGINE COOLANT TEMPERATURE GAUGE CIRCUIT

NOTE: If Lexus hand-held tester is not available, begin testing with step 2).

1) Connect Lexus hand-held tester to Data Link Connector No. 3 (DLC3). With tester in ACTIVE TEST mode, operate engine coolant temperature gauge. If engine coolant temperature gauge needle moves as commanded by tester, replace A/C and combination meter integrated ECU. See Fig. 1. If engine coolant temperature gauge needle does not move as commanded by tester, go to next step.

2) Check for engine control DTCs. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. If DTCs P0115 or P0116 are set, repair as necessary. If DTCs are not set, go to next step.

3) Check engine coolant temperature gauge. See ENGINE COOLANT TEMPERATURE GAUGE under COMPONENT TESTS. Repair as necessary. If engine coolant temperature gauge is okay, replace combination meter circuit plate. See Fig. 1.

FUEL GAUGE CIRCUIT

NOTE: If Lexus hand-held tester is not available, begin testing with step 2).

1) Connect Lexus hand-held tester to Data Link Connector No. 3 (DLC3). With tester in ACTIVE TEST mode, operate fuel gauge. If fuel gauge needle moves as commanded by tester, replace A/C and combination meter integrated ECU. See Fig. 1. If fuel gauge needle does not move as commanded by tester, go to next step.

2) Check fuel gauge sending unit. See FUEL GAUGE SENDING UNIT under COMPONENT TESTS. Repair as necessary. If fuel gauge sending unit is okay, go to next step.

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3) Check for short to battery voltage in harness or connector between A/C and combination meter integrated ECU and fuel gauge sending unit. Repair as necessary. If circuits are okay, go to next step.

4) Check fuel gauge. See FUEL GAUGE under COMPONENT TESTS. Repair as necessary. If fuel gauge is okay, replace combination meter circuit plate. See Fig. 1.

IGNITER SIGNAL CIRCUIT

With Lexus Hand-Held Tester

1) Using tester connected to Data Link Connector No. 3 (DLC3), enter DATALIST mode. Test drive vehicle and check tachometer parameter. If parameter value changes with engine speed, replace combination meter. If parameter value does not change, go to next step.

2) Check harness and connector between combination meter and ECM. Repair as necessary. If circuits are okay, repair ignition coil and/or wire harness.

Without Lexus Hand-Held Tester

1) Check harness and connector between combination meter and ECM. Repair as necessary. If circuits are okay, go to next step.

2) Check igniter circuit. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. Repair as necessary. If igniter circuit is okay, replace combination meter (instrument cluster).

INSTRUMENT CLUSTER CIRCUIT

Disconnect instrument cluster harness connectors "B" and "C". See Fig. 2. Using DVOM, check circuit values at appropriate instrument cluster harness connectors and ensure values are as specified. See INSTRUMENT CLUSTER CIRCUIT VALUES table. If circuit values are not as specified, repair appropriate circuit as necessary. See WIRING DIAGRAMS.

INSTRUMENT CLUSTER CIRCUIT VALUES

Tester	Condition	Circuit Value
B2 & Ground	Washer Level Warning Switch ON	Continuity
B6 & B7	Light Control Rheostat In Full	8-12 K/Ohms
	Right Position Light Control	
	Rheostat In Full	Zero Ohms
	Left Position	
B10 & B7	Constant	8-12 K/Ohms
B14 & B7	Light Control Rheostat In Full	No Continuity
	Left Position	
C1 & Ground	Ignition Switch In OFF Or ACC Position	Zero Volts

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	^AA^		^AA^
3	Ignition Switch In ON	3	Battery Voltage
3	Position	3	3
3	C3 & Ground	3	Battery Voltage
3	C8 & Ground	3	Battery Voltage
3	C9 & Ground	3	Battery Voltage
3	Or FLASH Position	3	3
3	C11 & Ground	3	Continuity
3	C12 & Ground	3	Battery Voltage
3	In TAIL Or HEAD Position	3	3
3	C14 & Ground	3	Battery Voltage
3	C15 & Ground	3	4 Ohms
3	Fuel Tank Full	3	107 Ohms
3	Fuel Tank Empty	3	3
3	C20 & Ground	3	Continuity
3	In HI Or FLASH Position	3	3
3	C22 & Ground	3	Continuity
3	Constant	3	Continuity
3	Constant	3	Continuity

LIGHT FAILURE SENSOR CIRCUIT

NOTE: Light failure sensor may also be known as light failure relay.

Disconnect 12-pin harness connector from light failure sensor. Check circuit values between ground and terminals on vehicle harness side of connector. See Fig. 3. Ensure circuit values are as specified. See LIGHT FAILURE SENSOR CIRCUIT VALUES table. If circuit values are as specified, replace light failure sensor. If circuit values are not as specified, check and repair related components or wiring harness as necessary. See COMPONENT TESTS. See WIRING DIAGRAMS.

LIGHT FAILURE SENSOR CIRCUIT VALUES

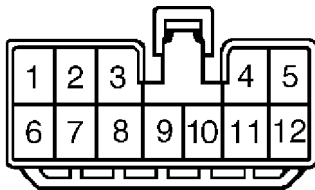
	^AA^		^AA^
3	Tester	3	Circuit Value
3	Connection	3	3
3	1 & Ground	3	(1) Continuity
3	2 & Ground	3	(1) Continuity
3	3 & Ground	3	No Voltage
3	In OFF Position	3	3
3	3 & Ground	3	Battery Voltage
3	Or HEAD Position	3	3

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^			^
3 4 & Ground 3	Ignition Switch In	3	No Voltage 3
3	LOCK Or ACC Position	3	3
^			^
3 4 & Ground 3	Ignition Switch In ON	3	Battery Voltage 3
3	Position	3	3
^			^
3 7 & Ground 3	Stoplight Switch In	3	No Voltage 3
3	OFF Position	3	3
^			^
3 7 & Ground 3	Stoplight Switch In	3	Battery Voltage 3
3	ON Position	3	3
^			^
3 8 & Ground 3	Ignition Switch In	3	No Voltage 3
3	LOCK Or ACC Position	3	3
^			^
3 8 & Ground 3	Ignition Switch In ON	3	Battery Voltage 3
3	Position	3	3
^			^
3 9 & Ground 3	Constant	3	(1) Continuity 3
^			^
3 11 & Ground 3	Constant	3	Continuity 3
^			^
3 (1) - Continuity is present due to bulb in circuit. 3			
^			^



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Fig. 3: Identifying Light Failure Sensor Harness Connector Terminals
Courtesy of Toyota Motor Sales, U.S.A., Inc.

PARKING BRAKE SWITCH CIRCUIT

NOTE: See BODY CONTROL SYSTEMS - RX300 article.

SPEEDOMETER CIRCUIT

NOTE: If Lexus hand-held tester is not available, begin testing with step 2).

1) Connect Lexus hand-held tester to Data Link Connector No. 3 (DLC3). With tester in ACTIVE TEST mode, operate speedometer. If speedometer needle moves as commanded by tester, replace A/C and combination meter integrated ECU. See Fig. 1. If speedometer needle does not move as commanded by tester, check for ABS DTCs. See ANTI-LOCK BRAKES article in WIRING DIAGRAMS. If any DTCs from DTC 31 to DTC 35 are set, repair as necessary. If no DTCs are set, go to next step.

2) Check for open or short in harness or connector between A/C and combination meter integrated ECU and ABS ECU. Repair as necessary. If circuits are okay, go to next step.

3) Check speedometer. See SPEEDOMETER under COMPONENT TESTS.

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Repair as necessary. If speedometer is okay, replace combination meter circuit plate. See Fig. 1.

TACHOMETER CIRCUIT

NOTE: If Lexus hand-held tester is not available, begin testing with step 2).

1) Connect Lexus hand-held tester to Data Link Connector No. 3 (DLC3). With tester in ACTIVE TEST mode, operate tachometer. If tachometer needle moves as commanded by tester, replace A/C and combination meter integrated ECU. See Fig. 1. If tachometer needle does not move as commanded by tester, go to next step.

2) Check igniter signal circuit. See IGNITER SIGNAL CIRCUIT. Repair as necessary. If igniter signal circuit is okay, go to next step.

3) Check tachometer. See TACHOMETER under COMPONENT TESTS. Repair as necessary. If tachometer is okay, replace combination meter circuit plate. See Fig. 1.

COMPONENT TESTS

BRAKE FLUID LEVEL WARNING SWITCH

Remove brake fluid reservoir cap and strainer. Disconnect brake fluid level warning switch connector. Using DVOM, check for continuity between switch terminals. Ensure continuity is not present with switch float up, and present with switch float down. If continuity is not as specified, replace brake fluid level warning switch.

BRAKE WARNING LIGHT

Disconnect brake fluid level warning switch connector. Release parking brake. Using jumper wire, connect harness side of switch terminals together. Start engine. Ensure brake warning light illuminates. If brake warning light does not illuminate, check bulb and circuit. See BULB CIRCUIT under CIRCUIT TESTS. Repair as necessary.

DOOR COURTESY SWITCH

Driver & Passenger Doors

Locate door courtesy switch to be tested. One switch is located in each door lock assembly (total of 4 switches). Disconnect 2-pin door courtesy switch connector. With door lock open, check for continuity between door courtesy switch terminals. Ensure continuity is present. Continuity should not be present with door lock closed. If continuity is not as specified, replace faulty door lock assembly.

Rear Door (Luggage Compartment)

Locate rear door courtesy switch. Switch is located in rear door lock motor assembly. Disconnect 2-pin rear door courtesy switch connector. Using DVOM, check for continuity between terminal No. 2 (White/Red wire) and ground. Ensure continuity is present only when switch is in ON position. If battery voltage is not present, replace

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rear door lock motor assembly.

ENGINE COOLANT TEMPERATURE GAUGE

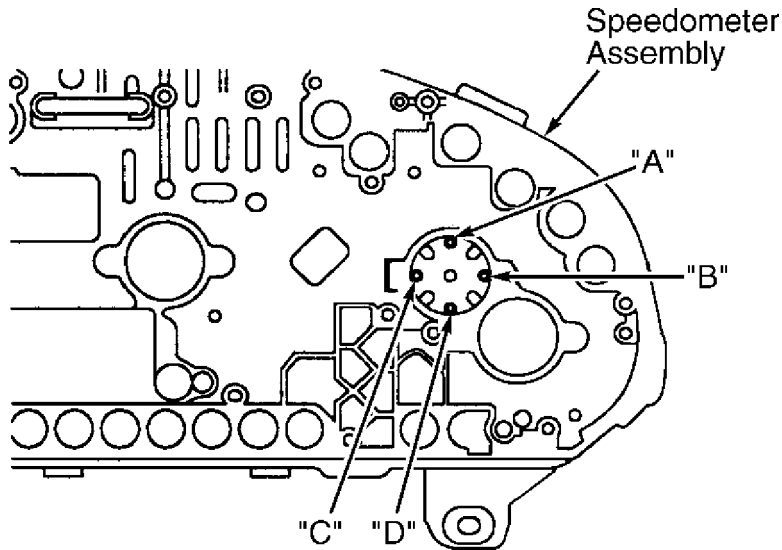
1) Remove instrument cluster. See INSTRUMENT CLUSTER under REMOVAL & INSTALLATION. Disassemble instrument cluster to access engine coolant temperature gauge terminals on back of speedometer assembly.

2) Ensure engine coolant temperature gauge needle is against COLD stop. Using DVOM, measure resistance between gauge terminals. See Fig. 4. Ensure resistance is as specified. See ENGINE COOLANT TEMPERATURE GAUGE RESISTANCE table. If resistance is not as specified, replace engine coolant temperature gauge.

ENGINE COOLANT TEMPERATURE GAUGE RESISTANCE

Tester Connection Ohms

A & B	140-185
C & D	130-175



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Fig. 4: Identifying Engine Coolant Temperature Gauge Terminals
Courtesy of Toyota Motor Sales, U.S.A., Inc.

FUEL GAUGE

On-Vehicle

1) Disconnect 5-pin main fuel gauge sending unit harness connector. Disconnect negative battery cable for 30 seconds, and then reconnect. Turn ignition on. Ensure fuel gauge indicates EMPTY. Turn ignition off, reconnect harness connector and go to next step.

2) Disconnect 2-pin sub fuel gauge sending unit harness connector. Disconnect negative battery cable for 30 seconds, and then reconnect. Turn ignition on. Ensure fuel gauge indicates EMPTY. If operation is not as specified, check fuel gauge resistance. See RESISTANCE CHECK.

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Resistance Check

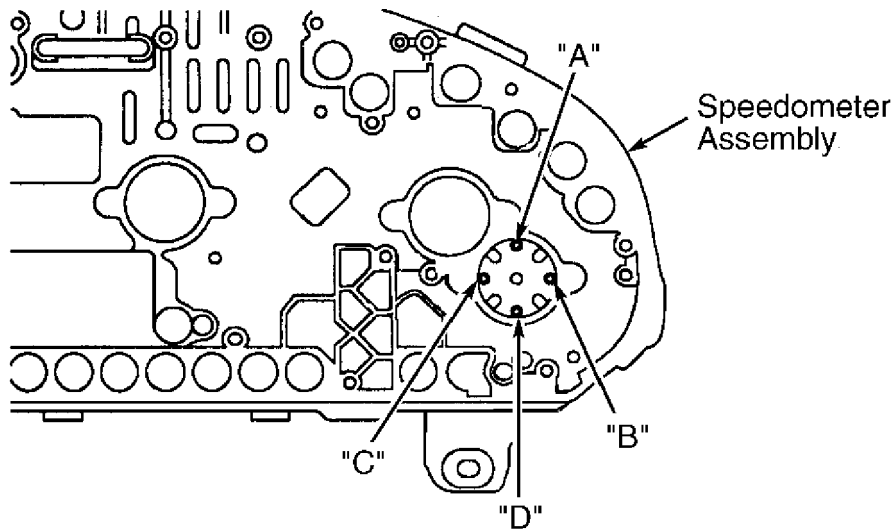
1) Remove instrument cluster. See INSTRUMENT CLUSTER under REMOVAL & INSTALLATION. Disassemble instrument cluster to access fuel gauge terminals on back of speedometer assembly.

2) Ensure fuel gauge needle is against EMPTY stop. Using DVOM, measure resistance between fuel gauge terminals. See Fig. 5. Ensure resistance is as specified. See FUEL GAUGE RESISTANCE table. If resistance is not as specified, replace fuel gauge.

FUEL GAUGE RESISTANCE

Tester Connection Ohms

A & B	140-185
C & D	130-175



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Fig. 5: Identifying Fuel Gauge Terminals
Courtesy of Toyota Motor Sales, U.S.A., Inc.

FUEL GAUGE SENDING UNIT

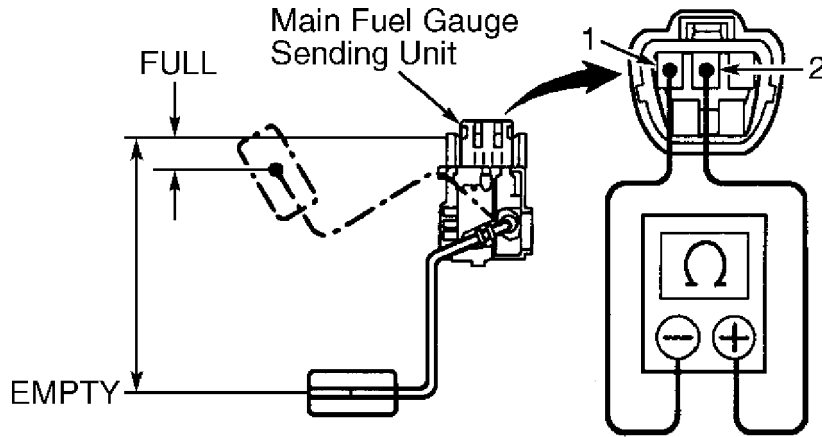
Main Sending Unit

Disconnect 5-pin main fuel gauge sending unit harness connector. Using DVOM, measure resistance between terminals No. 1 and 2. See Fig. 6. Ensure resistance is as specified in each float position. See MAIN FUEL GAUGE SENDING UNIT RESISTANCE table. If resistance is not as specified, replace main fuel gauge sending unit.

MAIN FUEL GAUGE SENDING UNIT RESISTANCE

Float Position	Distance From Top Of Sending Unit - In. (mm)	Ohms (Approximate)
Full362-.598 (9.2-15.2)	1.0-3.0
Empty	4.244-4.480 (107.8-113.8)	42.3-44.3

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Fig. 6: Testing Main Fuel Gauge Sending Unit
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Sub Sending Unit

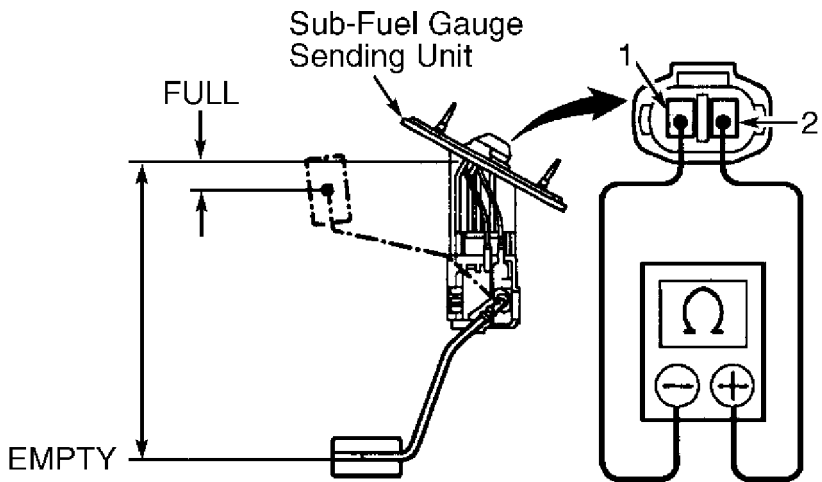
Disconnect 2-pin sub fuel gauge sending unit harness connector. Using DVOM, measure resistance between terminals No. 1 and 2. See Fig. 7. Ensure resistance is as specified in each float position. See SUB FUEL GAUGE SENDING UNIT RESISTANCE table. If resistance is not as specified, replace sub fuel gauge sending unit.

SUB FUEL GAUGE SENDING UNIT RESISTANCE

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Float Position	Distance From Top Of Sending Unit - In. (mm)	Ohms (Approximate)
Full319-.555 (8.1-14.1)	1.0-3.0
Empty	6.165-6.402 (156.6-162.6)	42.3-44.3

AA



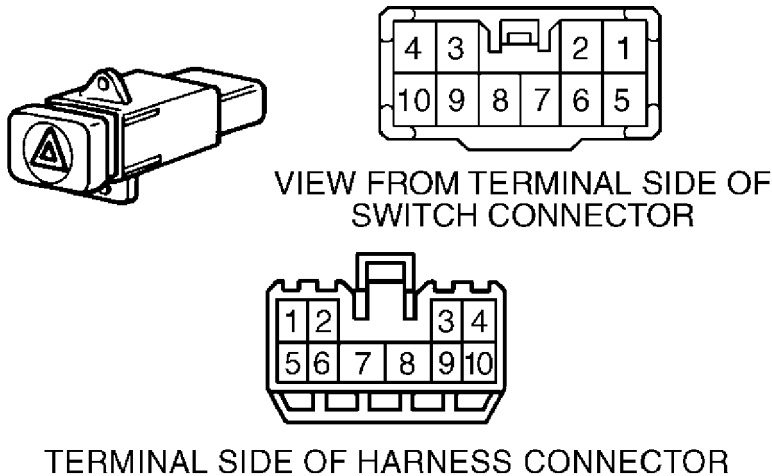
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Fig. 7: Testing Sub Fuel Gauge Sending Unit
Courtesy of Toyota Motor Sales, U.S.A., Inc.

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HAZARD WARNING SWITCH

Remove hazard warning switch. With hazard warning switch in ON position, continuity should be present between switch terminals No. 5 and 6. See Fig. 8. With hazard warning switch in OFF position, continuity should not be present between terminals No. 5 and 6. With hazard warning switch in either position, continuity should be present between terminals No. 8 and 9 (illumination circuit). If continuity is not as specified, replace hazard warning switch.



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Fig. 8: Identifying Hazard Warning Switch & Harness Connector Terminals
Courtesy of Toyota Motor Sales, U.S.A., Inc.

INSTRUMENT CLUSTER

Combination Meter ECU Circuit

Remove instrument cluster. See INSTRUMENT CLUSTER under REMOVAL & INSTALLATION. Using DVOM, check for continuity between appropriate instrument cluster connector terminals. See Fig. 9. Ensure continuity is as specified. See COMBINATION METER ECU CIRCUIT VALUES table. If continuity is not as specified, check and replace appropriate bulb as necessary. If bulb is okay, replace instrument cluster.

COMBINATION METER ECU CIRCUIT VALUES

AA

Tester Connection	Indicator/Warning Light	Circuit Value
F1 & E11, E12, E13	Right Turn	Continuity
F2 & E11, E12, E13	Left Turn	Continuity
F3 & E3, E4	SLIP	Continuity
F4 & E3, E4	TRAC OFF	Continuity
F5 & E3, E4	CRUISE MAIN	Continuity
F6 & E3, E4	MIL	Continuity
F7 & E3, E4	ABS	Continuity
F8 & F10	HI-Beam	Continuity
F9 & F14	SRS	Continuity
F12 & E3, E4	O/D OFF	Continuity

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F13 & E3, E4 Washer Level Continuity
AA

Instrument Panel Integration ECU Circuit

Remove instrument cluster. See INSTRUMENT CLUSTER under REMOVAL & INSTALLATION. Using DVOM, check for continuity between appropriate instrument cluster connector terminals. See Fig. 9. Ensure continuity is as specified. See INSTRUMENT PANEL INTEGRATION ECU CIRCUIT VALUES table. If continuity is not as specified, replace instrument cluster.

INSTRUMENT PANEL INTEGRATION ECU CIRCUIT VALUES

AA

Tester Connection Circuit Value

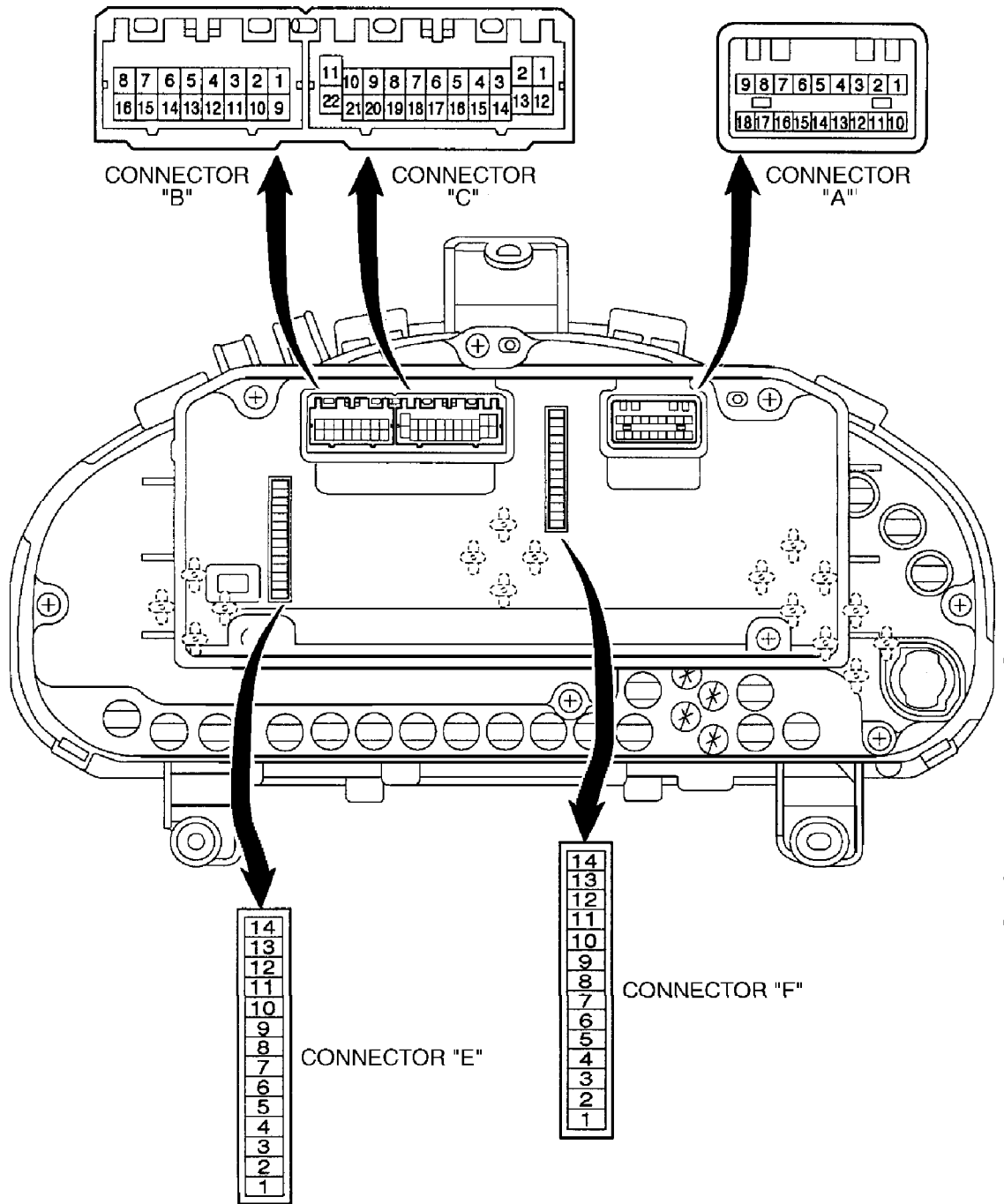
E1 & C14	.....	Continuity
E2 & C14	.....	Continuity
E3 & C1	.....	Continuity
E4 & C1	.....	Continuity
E11 & C22	.....	Continuity
E12 & C22	.....	Continuity
E13 & C22	.....	Continuity
E14 & C11	.....	Continuity
F1 & A10	.....	Continuity
F2 & A11	.....	Continuity
F3 & A12	.....	Continuity
F4 & A13	.....	Continuity
F5 & A14	.....	Continuity
F6 & A16	.....	Continuity
F7 & A18	.....	Continuity
F8 & C9	.....	Continuity
F9 & C8	.....	Continuity
F10 & C20	Continuity
F12 & C6	Continuity
F13 & B2	Continuity
F14 & C19	Continuity

AA

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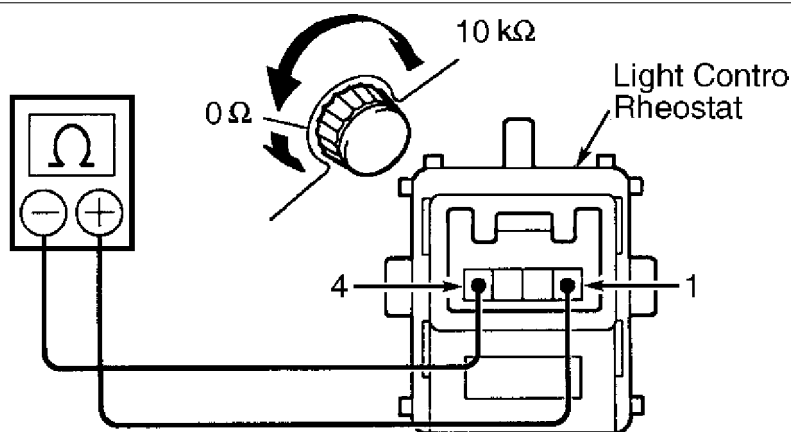


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Fig. 9: Identifying Instrument Cluster Connector Terminals
(Component Side)
Courtesy of Toyota Motor Sales, U.S.A., Inc.

LIGHT CONTROL RHEOSTAT

Remove light control rheostat. Measure resistance between light control rheostat terminals No. 1 and 4. See Fig. 10. Resistance should decrease from 10 k/ohms to zero ohms when rheostat knob is turned clockwise. If resistance is not as specified, replace light control rheostat.



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Fig. 10: Testing Light Control Rheostat
Courtesy of Toyota Motor Sales, U.S.A., Inc.

LOW OIL PRESSURE WARNING LIGHT

Disconnect low oil pressure warning switch connector. Using jumper wire, ground harness side of switch terminal. Turn ignition on. Ensure low oil pressure warning light illuminates. If light does not illuminate, check bulb and circuit. See BULB CIRCUIT under CIRCUIT TESTS. Repair as necessary.

LOW OIL PRESSURE WARNING SWITCH

NOTE: Ensure engine oil pressure is greater than 3.5 psi (.25 kg/cm²).

Disconnect low oil pressure warning switch connector. Using DVOM, ensure continuity is present between switch terminal and ground with engine off, and not present with engine running. If continuity is not as specified, replace low oil pressure warning switch.

OCCUPANT DETECTION SENSOR

Disconnect 2-pin occupant detection sensor harness connector located under passenger's seat. Check for continuity between sensor terminals. Continuity should be present only when pressing on sensor. If continuity is not as specified, replace occupant detection sensor.

OPEN DOOR WARNING LIGHT

Disconnect appropriate door courtesy switch connector. Using jumper wire, jumper connector terminal to ground. Ensure open door warning light illuminates. If warning light does not illuminate, check bulb and circuit. See BULB CIRCUIT under CIRCUIT TESTS.

PARKING BRAKE SWITCH

Disconnect parking brake switch connector. Using DVOM, check for continuity between switch terminal and switch body. Ensure continuity is present with switch pin released, and not present with switch pin pushed in. If continuity is not as specified, check switch

ground point or replace switch as necessary.

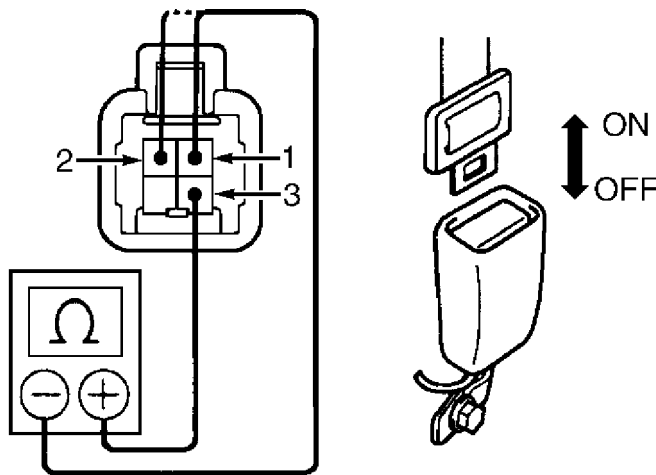
REAR LIGHTS WARNING LIGHT

Disconnect 12-pin harness connector from light failure sensor. Using jumper wire, ground terminal No. 3 at harness side of connector. See Fig. 3. Start engine. Ensure rear lights warning light illuminates. If light does not illuminate, check bulb and circuit. See BULB CIRCUIT under CIRCUIT TESTS. Repair as necessary.

SEAT BELT BUCKLE SWITCH

Driver's Side

Disconnect seat belt buckle switch connector. Connector is located at base of inner seat belt. Using DVOM, ensure continuity is present between switch terminals No. 2 and 3 with seat belt fastened. See Fig. 11. Ensure continuity is not present between switch terminals No. 1 and 3 with seat belt unfastened. If continuity is not as specified, replace seat belt buckle switch.



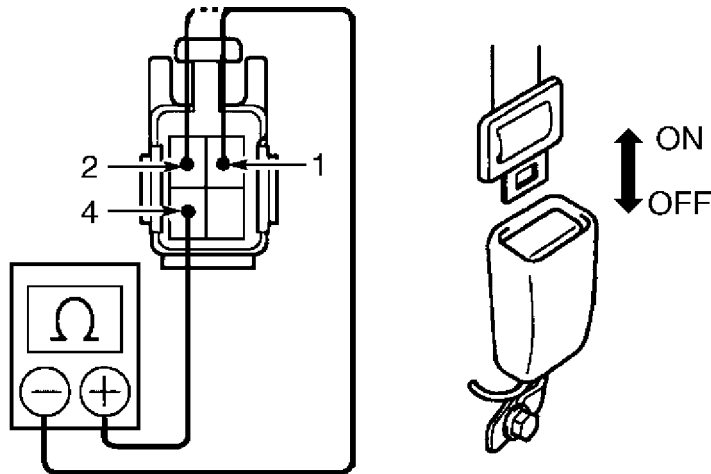
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Fig. 11: Testing Seat Belt Buckle Switch (Driver's Side)
Courtesy of Toyota Motor Sales, U.S.A., Inc.

Passenger's Side

Disconnect seat belt buckle switch connector. Connector is located at base of inner seat belt. Using DVOM, ensure continuity is present between switch terminals No. 1 and 4 with seat belt fastened. See Fig. 12. Ensure continuity is not present between switch terminals No. 2 and 4 with seat belt unfastened. If continuity is not as specified, replace seat belt buckle switch.

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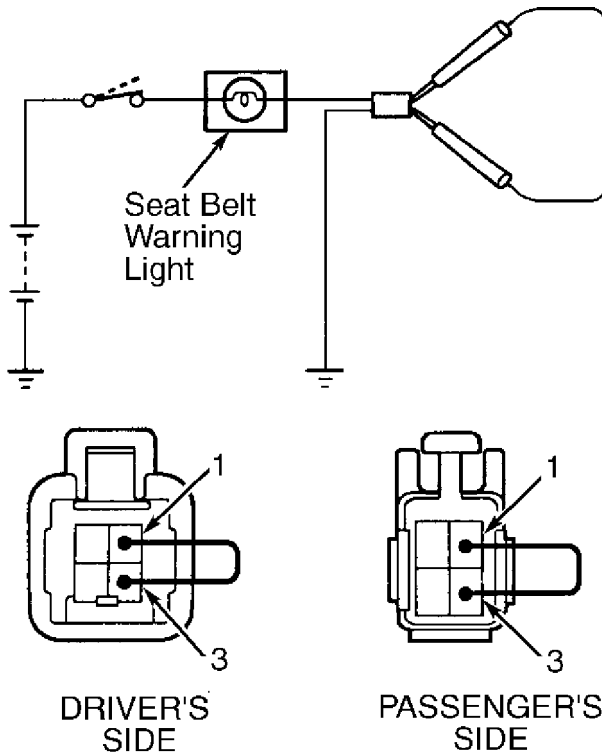


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Fig. 12: Testing Seat Belt Buckle Switch (Passenger's Side)
Courtesy of Toyota Motor Sales, U.S.A., Inc.

SEAT BELT WARNING LIGHT

Disconnect seat belt buckle switch connector. Connector is located at base of inner seat belt. Using jumper wire, jumper appropriate terminals together at harness connector. See Fig. 13. Turn ignition on. If warning light illuminates, bulb and circuit are okay. If warning light does not illuminate, check wire harness. See WIRING DIAGRAMS. Repair as necessary. If wire harness is okay, check bulb. See BULB CIRCUIT under CIRCUIT TESTS.



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Fig. 13: Identifying Seat Belt Buckle Switch Harness Connector
Terminals

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SPEEDOMETER

On-Vehicle

Ensure tires are of correct size and are inflated properly. Place vehicle on standard speedometer tester. Compare tester reading with speedometer reading at listed vehicle speeds. See SPEEDOMETER TEST table. If vehicle speedometer readings are not within allowable range, replace speedometer.

SPEEDOMETER TEST

Vehicle Speed (Actual MPH)	Allowable Range (Indicated MPH)
20	18-24
40	38-44
60	56-66
80	78-88
100	98-110
120	118-132

Resistance Check

1) Remove instrument cluster. See INSTRUMENT CLUSTER under REMOVAL & INSTALLATION. Disassemble instrument cluster to access speedometer terminals on back of speedometer assembly.

2) Ensure speedometer needle is against zero MPH stop. Using DVOM, measure resistance between speedometer terminals. See Fig. 14. Ensure resistance is as specified. See SPEEDOMETER RESISTANCE table. If resistance is not as specified, replace speedometer.

SPEEDOMETER RESISTANCE

Tester Connection	Ohms
A & B	140-185
C & D	130-175

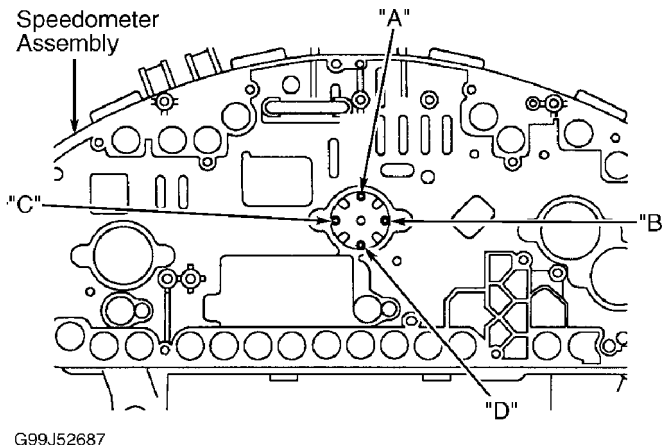


Fig. 14: Identifying Speedometer Terminals
Courtesy of Toyota Motor Sales, U.S.A., Inc.

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TACHOMETER

On-Vehicle

Connect a test tachometer to ignition system. Start engine and compare vehicle tachometer reading to test tachometer reading. If vehicle tachometer reading is outside allowable range, replace tachometer. See TACHOMETER TEST table.

TACHOMETER TEST

Engine Speed (Actual RPM)	Allowable Range (Indicated RPM)
700	630-770
1000	900-1100
2000	1850-2150
3000	2800-3200
4000	3800-4200
5000	4800-5200
6000	5750-6250
7000	6700-7300

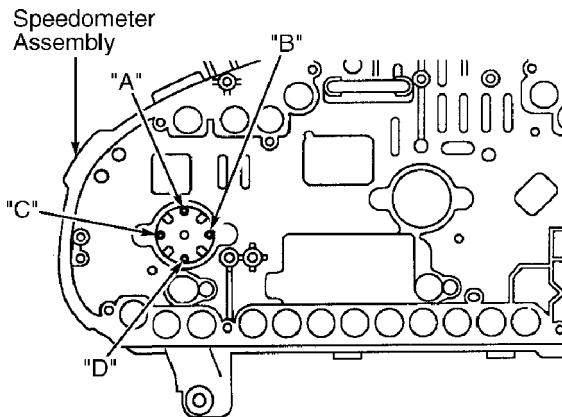
Resistance Check

1) Remove instrument cluster. See INSTRUMENT CLUSTER under REMOVAL & INSTALLATION. Disassemble instrument cluster to access tachometer terminals on back of speedometer assembly.

2) Ensure tachometer needle is against zero RPM stop. Using DVOM, measure resistance between tachometer terminals. See Fig. 15. Ensure resistance is as specified. See TACHOMETER RESISTANCE table. If resistance is not as specified, replace tachometer.

TACHOMETER RESISTANCE

Tester Connection	Ohms
A & B	140-185
C & D	130-175



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Fig. 15: Identifying Tachometer Terminals
Courtesy of Toyota Motor Sales, U.S.A., Inc.

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WINDOW WASHER LEVEL WARNING LIGHT

Disconnect 2-pin window washer level switch connector. Using jumper wire, jumper switch terminal No. 1 (Blue/White wire) to ground. If warning light illuminates, bulb and circuit are okay. If warning light does not illuminate, check circuit. See WIRING DIAGRAMS. Repair as necessary. If circuit is okay, check bulb. See BULB CIRCUIT under CIRCUIT TESTS.

WASHER FLUID LEVEL WARNING SWITCH

Disconnect washer fluid level warning switch 2-pin connector. Check for continuity between switch terminals. With float up, continuity should not be present. With float down, continuity should be present. If continuity is not as specified, replace washer fluid level warning switch.

REMOVAL & INSTALLATION

WARNING: Deactivate air bag system before performing any service operation. See AIR BAG RESTRAINT SYSTEMS article. DO NOT apply electrical power to any component on steering column without first deactivating air bag system. Air bag may deploy.

NOTE: Steering wheel removal may be necessary to access instrument cluster. See AIR BAG RESTRAINT SYSTEMS article.

INSTRUMENT CLUSTER

Removal & Installation

1) Disconnect negative battery cable. Remove steering wheel, if necessary. Remove 2 retaining screws from under top of instrument cluster finish panel. Using a screwdriver protected with tape, gently pry instrument cluster finish panel outward to release clips securing lower portion.

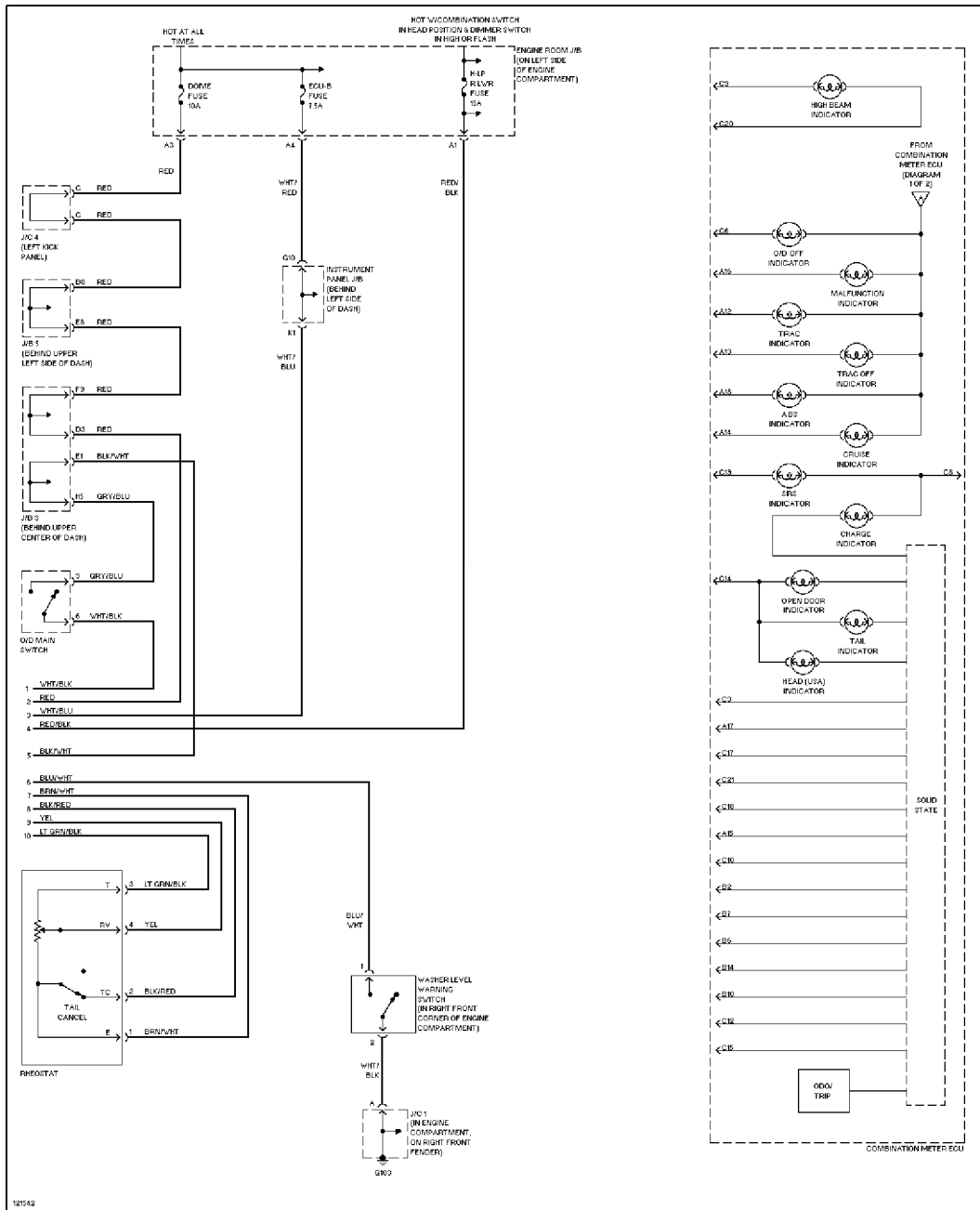
2) Pull instrument cluster finish panel outward and remove. Remove 3 instrument cluster retaining screws. Pull instrument cluster outward and disconnect harness connectors. Remove instrument cluster. For disassembly of instrument cluster, refer to illustration. See Fig. 1. To install, reverse removal procedure.

WIRING DIAGRAMS

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Fig. 17: Instrument Panel Wiring Diagram (RX300 - 2 Of 2)

END OF ARTICLE