

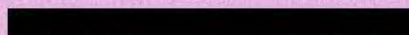
DP19-004
CAPISTRANO TOYOTA
9-19-2019
ATTACHMENT
SECTION 4.1



SECTION 4

For Prius Hybrids, Camry Hybrids, and Avalon Hybrids, Toyota's DTC code definitions for C1391, C1256, C1253, C1252, U0293, and other DTC codes stored when the brake booster pump assembly malfunctions

PRIUS HYBRID



Last Modified: 7-1-2019	6.8:8.0.48	Doc ID: [REDACTED]
Model Year Start: 2010	Model: Prius	Prod Date Range: [04/2009 -]
Title: NETWORKING: CAN COMMUNICATION SYSTEM: FAIL-SAFE CHART; 2010 MY Prius [04/2009 -]		

FAIL-SAFE CHART

1. FAIL-SAFE FUNCTION

(a) When communication fails in any of the CAN bus wires (communication wires), a fail-safe function(s) will operate. The fail-safe function that is specified for each system operates to prevent those systems from malfunctioning.

(b) The following table shows the effects on each system when communication is impossible. (For further details, see the pages for each system.)

FUNCTION (FUNCTION DESCRIPTION)	CONTROL MASTER	SYSTEM RELATED	FAIL-SAFE OPERATION	DTC (DRIVER DETECTABLE)
Power switch (Power source control)	Power management control ECU	<ul style="list-style-type: none"> Transmission control ECU Skid control ECU Main body ECU 	<ul style="list-style-type: none"> Power switch does not change to on (READY) even when power switch is pressed with the brake pedal depressed Power switch off is prohibited 	U0073 U0129 U0293 (Warning and indicator lights come on)
Hybrid driving control	Power management control ECU	ECM	Only motor operation is used (Engine is not used)	U0100 (Warning and indicator lights come on)
Shift position indicator display	Transmission control ECU	<ul style="list-style-type: none"> Transmission control ECU Main body ECU Combination meter 	Shift position indicator is not displayed	U0146 (Warning and indicator lights come on)
Regenerative braking control	Power management control ECU	Skid control ECU	Regenerative braking will stop (ABS/VSC control gradually stops)	U0073 U0129 U0293 (Warning and indicator lights come on)

FUNCTION (FUNCTION DESCRIPTION)	CONTROL MASTER	SYSTEM RELATED	FAIL-SAFE OPERATION	DTC (DRIVER DETECTABLE)
VSC control (Controls driving force while VSC operating)	Skid control ECU	<ul style="list-style-type: none"> Power management control ECU Yaw rate sensor Steering angle sensor 	ABS/VSC control is inoperative (ABS/VSC control gradually stops)	U0073 U0123 U0124 U0126 U0293 (Warning and indicator lights come on)
ABS control (Controls driving force while ABS operating)	Skid control ECU	Yaw rate sensor	ABS control is inoperative (ABS control gradually stops)	U0073 U0123 U0124 (Warning and indicator lights come on)
TRAC control (Engine power control by VSC/TRAC)	Skid control ECU	<ul style="list-style-type: none"> Power management control ECU Yaw rate sensor Steering angle sensor 	ABS/VSC control is inoperative (ABS/VSC control gradually stops)	U0073 U0123 U0124 U0126 U0293 (Warning and indicator lights come on)
Electric power steering control (Speed of vehicle Induction type torque control)	Power steering ECU	<ul style="list-style-type: none"> Power management control ECU Skid control ECU 	Depression of EPS assist (Deterioration of steering assist)	U0129 U0293 (Warning light comes on)
Air conditioning control (Air conditioning control is in cabin)	Air conditioning amplifier	<ul style="list-style-type: none"> Power management control ECU ECM Combination meter Main body ECU 	Air conditioning function and PTC heater function stop	U0100 U0142 U0155 U0293 (Air conditioning is inoperative)

FUNCTION (FUNCTION DESCRIPTION)	CONTROL MASTER	SYSTEM RELATED	FAIL-SAFE OPERATION	DTC (DRIVER DETECTABLE)
Entry function/Power door lock control	<ul style="list-style-type: none"> • Certification ECU • Main Body ECU 	<ul style="list-style-type: none"> • ECM • Combination meter • Power management control ECU 	Unlock permitted	U0100 U0142 U0155 U0293 U0327 (Wireless door lock cannot operate)
Vehicle-to-vehicle distance control	Driving support ECU	<ul style="list-style-type: none"> • Power management control ECU • Skid control ECU • ECM • Steering angle sensor • Yaw rate sensor 	Vehicle-to-vehicle distance control does not operate	U0122 U0123 U0126 U0293 (Warning and indicator lights come on)
Lane keeping assist system	Driving support ECU	<ul style="list-style-type: none"> • Main body ECU • Skid control ECU • Yaw rate sensor • EPS ECU 	Lane-keeping assist is Inoperative	U0122 U0123 U0131 (Warning and indicator lights come on)
Pre-collision system	Driving support ECU	<ul style="list-style-type: none"> • Power management control ECU • Skid control ECU • ECM • Steering angle sensor • Yaw rate sensor • Seat belt control ECU 	Pre-collision control is inoperative	U0122 U0123 U0126 U0293 U1104 U1100 (Warning and indicator lights come on)

FUNCTION (FUNCTION DESCRIPTION)	CONTROL MASTER	SYSTEM RELATED	FAIL-SAFE OPERATION	DTC (DRIVER DETECTABLE)
	Seat belt control ECU	<ul style="list-style-type: none"> • Skid control ECU • Driving support ECU • Center airbag sensor • Main body ECU 	Pre-collision control is inoperative	U0122 U0140 U0151 U1104 (Warning and indicator lights come on)
Advanced parking guidance system	Parking assist ECU	<ul style="list-style-type: none"> • Power management control ECU • EPS ECU • Skid control ECU • Steering angle sensor • Main body ECU • Air conditioning amplifier 	Advanced parking guidance is inoperative	U0073 U0126 U0129 U0131 U0140 U0293



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Model Year Start: 2010	Model: Prius	Prod Date Range: [04/2009 -]
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: ELECTRONICALLY CONTROLLED BRAKE SYSTEM: FAIL-SAFE CHART; 2010 MY Prius [04/2009 -]		

FAIL-SAFE CHART

1. FAIL-SAFE FUNCTION OF CONTROL SYSTEM

- (a) When a malfunction is detected in the brake control system, the skid control ECU turns the ABS warning, brake warning / red (malfunction), brake warning / yellow (minor malfunction) and slip indicator lights come on, as well as prohibits ABS, BA, TRAC and VSC operations.
- (b) If the skid control ECU detects that a system related to the hybrid control system is malfunctioning, it will prohibit operation of the TRAC and VSC system in order to prevent further malfunctions and to protect the system.

ITEM	OPERATION
Malfunction in the ABS system	ABS, BA, TRAC and VSC control prohibited
Malfunction in the BA system	ABS, BA, TRAC and VSC control prohibited
Malfunction in the EBD system	ABS, EBD, BA, TRAC and VSC control prohibited
Malfunction in the TRAC system	ABS, BA, TRAC and VSC control prohibited
Malfunction in the VSC system	ABS, BA, TRAC and VSC control prohibited

2. FAIL-SAFE FUNCTION OF HYDRAULIC SYSTEM

- (a) If a malfunction is detected in the brake booster with master cylinder (skid control ECU or brake actuator) or an individual sensor, control will be stopped and brake effort will be generated by the brake booster with master cylinder (hydraulic brake booster).
- (b) If brake control is stopped due to a malfunction in the hydraulic pressure source, the pressure generated in the master cylinder by the driver is applied to the wheel cylinders to ensure braking force.

ITEM	OPERATION
Skid control ECU malfunction	Brake booster with master cylinder (hydraulic brake booster) generated braking force
Hydraulic pressure controlling components malfunction	Brake booster with master cylinder (hydraulic brake booster) generated braking force
Power supply components (Hydraulic pressure source) malfunction	Braking force solely generated by the driver



Last Modified: 7-1-2019	6.8:8.0.48	Doc ID: [REDACTED]
Model Year Start: 2010	Model: Prius	Prod Date Range: [04/2009 -]
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: ELECTRONICALLY CONTROLLED BRAKE SYSTEM: C1252/52,C1253/53; Brake Booster Pump Motor on Time Abnormally Long; 2010 MY Prius [04/2009 -]		

DTC	C1252/52	Brake Booster Pump Motor on Time Abnormally Long
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DTC	C1253/53	Pump Motor Relay Malfunction
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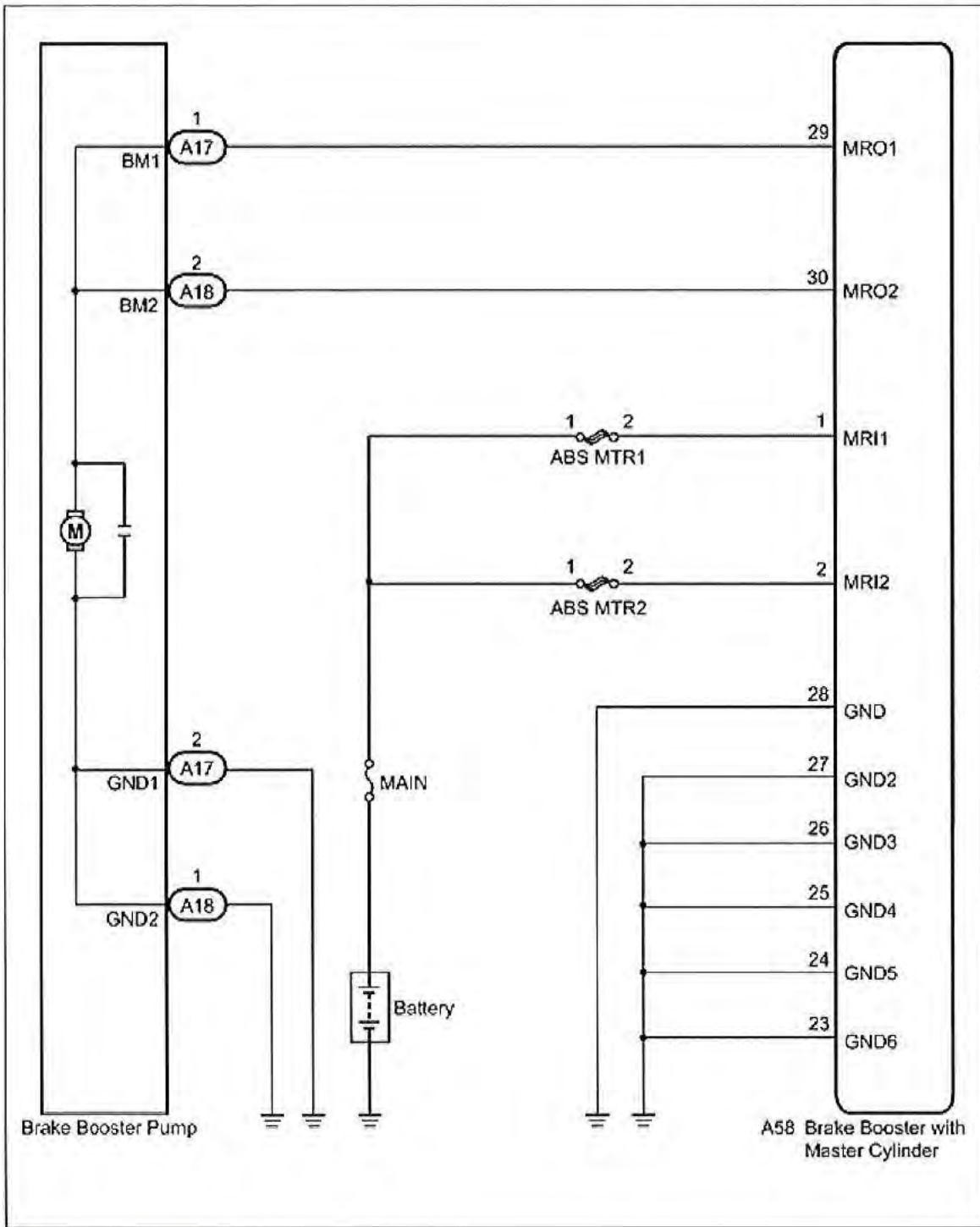
DESCRIPTION

The skid control ECU detects decreases in the accumulator pressure according to the data from the accumulator pressure sensor, and then starts and stops the pump motor by operating the motor relay.

DTC CODE	INF CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1252/52	311	The pump motor is operating continuously for 178 seconds or more. (When relay malfunction is 98 seconds or more.)	<ul style="list-style-type: none"> Short in motor circuit or motor monitor circuit Motor relay stuck Accumulator pressure sensor malfunction in brake actuator Brake booster with master cylinder (Skid control ECU)
C1253/53	321	With the IG1 terminal voltage 9.5 V or more, the motor drive monitor remains off for 0.2 seconds or more after a motor drive on request.	<ul style="list-style-type: none"> Open in motor circuit or motor monitor circuit Brake booster with master cylinder (Skid control ECU)
↑	322	The motor drive monitor remains on for 2 seconds or more after a motor drive off request.	<ul style="list-style-type: none"> Short in motor circuit or motor monitor circuit Brake booster with master cylinder (Skid control ECU)
↑	323	The skid control ECU internal motor drive logical inconsistency continues for 2 seconds or more.	Brake booster with master cylinder (Skid control ECU)

DTC CODE	INF CODE	DTC DETECTION CONDITION	TROUBLE AREA
↑	324	An open circuit in both skid control ECU internal motor relays 1 and 2.	<ul style="list-style-type: none"> • Open in motor circuit or motor monitor circuit • Brake booster with master cylinder (Skid control ECU)
↑	325	An open circuit in both skid control ECU internal motor relays 1 and 3.	↑
↑	326	An open circuit in both skid control ECU internal motor relays 2 and 3.	↑
↑	327	An open circuit in skid control ECU internal motor relay 1.	↑
↑	328	An open circuit in skid control ECU internal motor relay 2.	↑
↑	329	An open circuit in skid control ECU internal motor relay 3.	↑

WIRING DIAGRAM




INSPECTION PROCEDURE

NOTICE:

When replacing the brake booster with master cylinder (skid control ECU or brake actuator), perform initialization and calibration of the linear solenoid valve **WFO**.

PROCEDURE


- PERFORM ACTIVE TEST USING TECHSTREAM (ABS MOTOR RELAY)**

- (a) Connect the Techstream to the DLC3.
- (b) Turn the power switch on (IG).
- (c) Select the Active Test on the Techstream  .

ABS/VSC/TRAC

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
ECB* Motor Relay	ABS motor relay	Relay ON/OFF	-

*: Electronically Controlled Brake System

- (d) Select the Data List on the Techstream  .


ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
ECB* Motor Relay	ABS motor relay / ON or OFF	ON: Relay on OFF: Relay off	-

*: Electronically Controlled Brake System

- (e) Check the operating condition of the ABS motor relay when operating it with the Techstream.

RESULT	PROCEED TO
ABS motor relay in the Data List turns ON/OFF using the Active Test	A
ABS motor relay in the Data List does not change using the Active Test	B

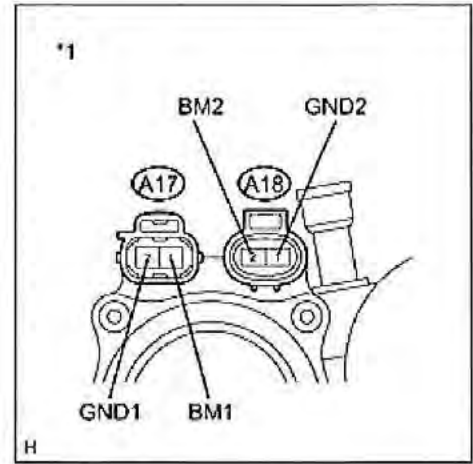
B  **GO TO STEP 6**

A



2.	INSPECT BRAKE BOOSTER PUMP
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- (a) Turn the power switch off.



- (b) Make sure that there is no looseness at the locking part and the connecting part of the connectors.
- (c) Disconnect the brake booster pump connectors.
- (d) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A17-1 (BM1) - A17-2 (GND1)	Always	Below 10 Ω
A18-2 (BM2) - A18-1 (GND2)	Always	Below 10 Ω
A17-1 (BM1) - A18-2 (BM2)	Always	Below 1 Ω
A17-2 (GND1) - A18-1 (GND2)	Always	Below 1 Ω

Text in Illustration

*1	Component without harness connected (Brake Booster Pump)
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NG ▶ REPLACE BRAKE BOOSTER PUMP

OK
▼

3. INSPECT BRAKE BOOSTER PUMP (GND TERMINAL)

- (a) Measure the resistance according to the value(s) in the table below.

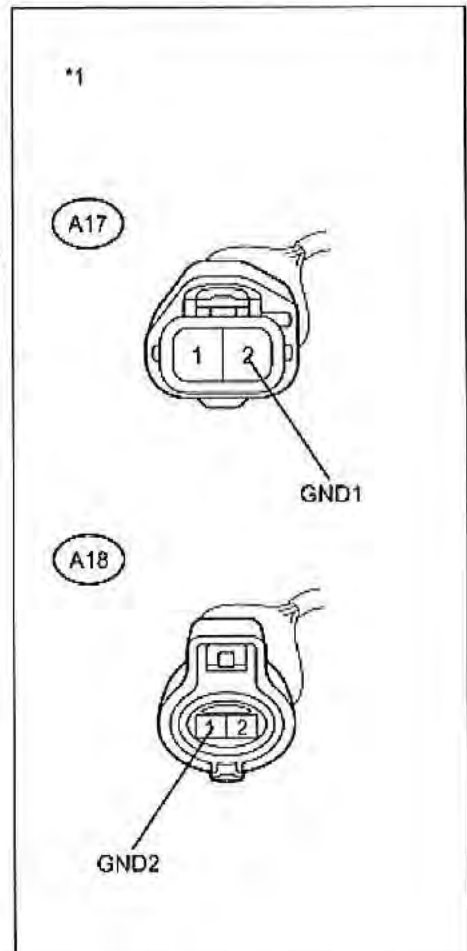
Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A17-2 (GND1) - Body ground	Always	Below 1 Ω
A18-1 (GND2) - Body ground	Always	Below 1 Ω

Text in Illustration

*1	Front view of wire harness connector (to Brake Booster Pump)
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NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (GND CIRCUIT)

OK
▼

4. READ VALUE USING TECHSTREAM (ACCUMULATOR PRESSURE SENSOR)

- (a) Reconnect the brake booster pump connectors.
- (b) Connect the Techstream to the DLC3.
- (c) Turn the power switch on (IG).
- (d) Select the Data List on the Techstream **DIAG**.

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Accumulator Sensor	Accumulator pressure sensor / Min.: 0 V, Max.: 5 V	Specified value: 2.9 to 4.2 V	When brake fluid is stored in the accumulator: Accumulator pressure changes in accordance with volume of fluid stored in the accumulator

(e) Wait for 30 seconds without depressing the brake pedal.

(f) Check that the accumulator pressure sensor output values change is within the specified range.

OK:

Accumulator pressure sensor output values change is within 0.55 V.


NG ► GO TO STEP 9

OK




5.	RECONFIRM DTC
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(a) Turn the power switch off.

(b) Clear the DTCs  .

(c) Turn the power switch on (IG).

(d) Check if the same DTC is recorded  .

RESULT	PROCEED TO
DTCs (C1252/52 and C1253/53) are not output	A
DTCs (C1252/52 and/or C1253/53) are output	B

B ► REPLACE BRAKE BOOSTER WITH MASTER CYLINDER

A ► CHECK FOR INTERMITTENT PROBLEMS

6.	INSPECT ABS MTR FUSES
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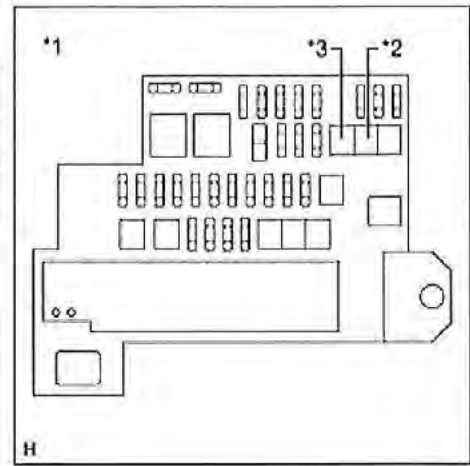
(a) Turn the power switch off.

(b) Remove the ABS MTR fuses.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
ABS MTR1 (30 A) fuse	Always	Below 1 Ω
ABS MTR2 (30 A) fuse	Always	Below 1 Ω



Text in Illustration

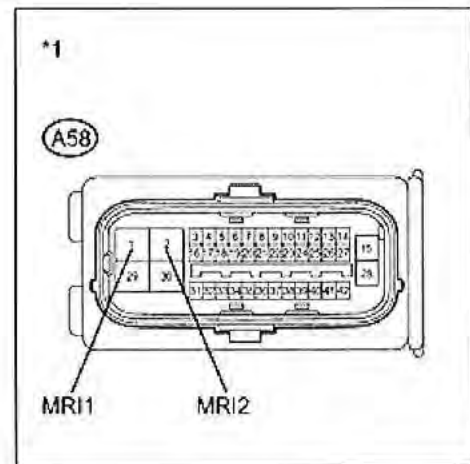
*1	Engine Room Relay Block
*2	ABS MTR1 Fuse
*3	ABS MTR2 Fuse

NG REPLACE ABS MTR FUSES

OK

7. INSPECT SKID CONTROL ECU (MRI TERMINAL)

(a) Install the ABS MTR fuses.



(b) Make sure that there is no looseness at the locking part and the connecting part of the connector.

(c) Disconnect the skid control ECU connector.

(d) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A58-1 (MRI1) - Body ground	Always	11 to 14 V
A58-2 (MRI2) - Body ground	Always	11 to 14 V

Text in Illustration

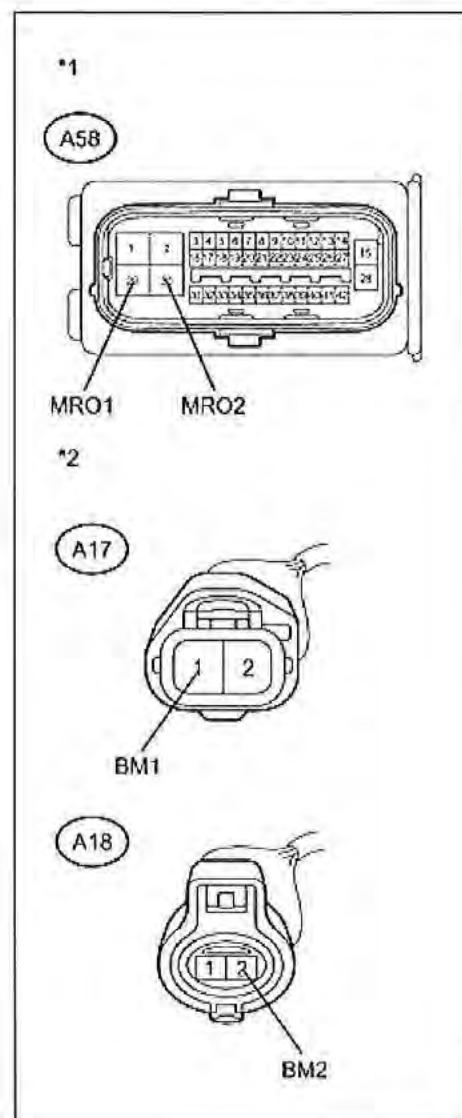
*1	Front view of wire harness connector (to Skid Control ECU)
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NG ► **REPAIR OR REPLACE HARNESS OR CONNECTOR (MRI CIRCUIT)**

OK
▼

8.	CHECK HARNESS AND CONNECTOR (SKID CONTROL ECU - BRAKE BOOSTER PUMP)
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(a) Make sure that there is no looseness at the locking part and the connecting part of the connectors.



(b) Disconnect the brake booster pump connectors.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A58-29 (MRO1) - A17-1 (BM1)	Always	Below 1 Ω
A58-29 (MRO1) - Body ground	Always	10 k Ω or higher
A58-30 (MRO2) - A18-2 (BM2)	Always	Below 1 Ω
A58-30 (MRO2) - Body ground	Always	10 k Ω or higher

Text in Illustration

*1	Front view of wire harness connector (to Skid Control ECU)
*2	Front view of wire harness connector (to Brake Booster Pump)

NG ► REPAIR OR REPLACE HARNESS OR CONNECTOR

OK ► REPLACE BRAKE BOOSTER WITH MASTER CYLINDER

9.	PERFORM ACTIVE TEST USING TECHSTREAM (SOLENOID VALVE)
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NOTICE:

- If DTCs are stored, Active Test cannot be performed.
- To protect the pump motor, do not clear the DTCs repeatedly.

(a) Clear the DTCs **WFO**.

(b) Select the Active Test on the Techstream **WFO**.

HINT:

The Active Test can be performed when the following conditions are met.


- ABS main relay is on.
- Park (P) selected.
- Parking brake is applied.
- Vehicle speed is 0 km/h (0 mph).

ABS/VSC/TRAC

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
ECB* Solenoid (SMC/SRC/SCC)	Switching solenoid valve (SMC/SRC/SCC)	Solenoid ON/OFF	<ul style="list-style-type: none"> • Operation sound of solenoid (clicking sound) can be heard • DTC is not output

*: Electronically Controlled Brake System

(c) Perform the Active Test of the solenoid using the Techstream within 2 minutes of clearing the DTCs.

(d) Select the Data List on the Techstream .

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Wheel Cylinder Pressure Sensor	Wheel cylinder pressure sensor / Min.: 0 V, Max.: 5 V	When brake pedal released: 0.1 to 0.9 V	Reading increases when brake pedal is depressed

(e) Check that the output value of wheel cylinder does not increase.

OK:

The output value of wheel cylinder does not increase.

HINT:

If any output value increases, there may be brake fluid leaks in the brake actuator.

NG  REPLACE BRAKE BOOSTER WITH MASTER CYLINDER

OK  REPLACE BRAKE BOOSTER PUMP



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Model Year Start: 2010	Model: Prius	Prod Date Range: [04/2009 -]
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: ELECTRONICALLY CONTROLLED BRAKE SYSTEM: DIAGNOSTIC TROUBLE CODE CHART; 2010 MY Prius [04/2009 -]		

DIAGNOSTIC TROUBLE CODE CHART

NOTICE:




When replacing the brake booster with master cylinder (skid control ECU), sensor, etc., make sure that the power switch is turned off, the stop light switch is off, and 2 minutes have elapsed since the driver's door was closed.

HINT:

- If no abnormality is found when inspecting parts, inspect the skid control ECU and ground points for poor connections.
- If a trouble code is displayed during the DTC check, check the circuit indicated by the DTC. For details of each code, refer to the page for the respective "DTC Code" in the DTC chart.
- When 2 or more DTCs are detected, perform circuit inspections one by one until the problem is identified.
- Inspect the fuses and relays before inspecting the trouble areas as shown in the table below.

ABS DTC

DTC CODE	DETECTION ITEM	INF CODE	TROUBLE AREA	SEE PAGE
42	Electronically Controlled Brake System Malfunction	-	Electronically controlled brake system	INFO
C0200/31	Front Speed Sensor RH Circuit	501 502 503 504 506 507 508	1. Open or short in speed sensor 2. Improperly installed speed sensor, or abnormal clearance between sensor and rotor 3. Open or short in wire harness 4. Improperly connected connector, deformation or corrosion of terminals 5. Front speed sensor RH 6. Brake booster with master cylinder (Skid control ECU)	INFO
C0205/32	Front Speed Sensor LH Circuit	511 512 513 514 516 517 518	1. Open or short in speed sensor 2. Improperly installed speed sensor, or abnormal clearance between sensor and rotor 3. Open or short in wire harness 4. Improperly connected connector, deformation or corrosion of terminals 5. Front speed sensor LH 6. Brake booster with master cylinder (Skid control ECU)	INFO

DTC CODE	DETECTION ITEM	INF CODE	TROUBLE AREA	SEE PAGE
C0210/33	Rear Speed Sensor RH Circuit	521 522 523 524 526 527 528	1. Open or short in speed sensor 2. Improperly installed speed sensor, or abnormal clearance between sensor and rotor 3. Open or short in wire harness 4. Improperly connected connector, deformation or corrosion of terminals 5. Rear speed sensor RH 6. Brake booster with master cylinder (Skid control ECU)	
C0215/34	Rear Speed Sensor LH Circuit	531 532 533 534 536 537 538	1. Open or short in speed sensor 2. Improperly installed speed sensor, or abnormal clearance between sensor and rotor 3. Open or short in wire harness 4. Improperly connected connector, deformation or corrosion of terminals 5. Rear speed sensor LH 6. Brake booster with master cylinder (Skid control ECU)	
C1235/35	Foreign Object is Attached on Tip of Front Speed Sensor RH	541	1. Speed sensor rotor malfunction (foreign object attached) 2. Foreign object attached to speed sensor 3. Open or short in speed sensor 4. Open or short in wire harness 5. Improperly connected connector, deformation or corrosion of terminals 6. Resistance in speed sensor circuit 7. Brake booster with master cylinder (Skid control ECU)	
C1236/36	Foreign Object is Attached on Tip of Front Speed Sensor LH	542	1. Speed sensor rotor malfunction (foreign object attached) 2. Foreign object attached to speed sensor 3. Open or short in speed sensor 4. Open or short in wire harness 5. Improperly connected connector, deformation or corrosion of terminals 6. Resistance in speed sensor circuit 7. Brake booster with master cylinder (Skid control ECU)	

DTC CODE	DETECTION ITEM	INF CODE	TROUBLE AREA	SEE PAGE
C1238/38	Foreign Object is Attached on Tip of Rear Speed Sensor RH	543	<ol style="list-style-type: none"> 1. Speed sensor rotor malfunction (foreign object attached) 2. Foreign object attached to speed sensor 3. Open or short in speed sensor 4. Open or short in wire harness 5. Improperly connected connector, deformation or corrosion of terminals 6. Resistance in speed sensor circuit 7. Brake booster with master cylinder (Skid control ECU) 	INFO
C1239/39	Foreign Object is Attached on Tip of Rear Speed Sensor LH	544	<ol style="list-style-type: none"> 1. Speed sensor rotor malfunction (foreign object attached) 2. Foreign object attached to speed sensor 3. Open or short in speed sensor 4. Open or short in wire harness 5. Improperly connected connector, deformation or corrosion of terminals 6. Resistance in speed sensor circuit 7. Brake booster with master cylinder (Skid control ECU) 	INFO
C1243/43	Acceleration Sensor Stuck Malfunction	561 562 563 564	Yaw rate and acceleration sensor internal stuck malfunction	INFO
C1244/44	Open or Short in Acceleration Sensor Circuit	571	<ol style="list-style-type: none"> 1. Yaw rate and acceleration sensor installed improperly 2. Yaw rate and acceleration sensor 	INFO
C1245/45	Acceleration Sensor Output Malfunction	581	<ol style="list-style-type: none"> 1. Yaw rate and acceleration sensor installed improperly 2. Yaw rate and acceleration sensor 	INFO
C1336/98	Zero Point Calibration of Acceleration Sensor Undone	-	<ol style="list-style-type: none"> 1. Zero point calibration undone 2. Yaw rate and acceleration sensor 3. Brake booster with master cylinder (Skid control ECU) <p>(Perform zero point calibration and check for DTCs. If no DTCs are output again, the sensor is normal.)</p>	INFO
C1381/97	Acceleration Sensor Power Supply Voltage Malfunction	601	<ol style="list-style-type: none"> 1. Yaw rate and acceleration sensor supply voltage shut down 2. Yaw rate and acceleration sensor 3. Brake booster with master cylinder (Skid control ECU) 	INFO
C1442/44	Invalid Data Received from Acceleration Sensor	572	Yaw rate and acceleration sensor	INFO

DTC CODE	DETECTION ITEM	INF CODE	TROUBLE AREA	SEE PAGE
U0124/95	Lost Communication with Lateral Acceleration Sensor Module	591 592	1. CAN communication line (CAN No. 1 bus) 2. Yaw rate and acceleration sensor 3. Brake booster with master cylinder (Skid control ECU)	INFO

VSC DTC

DTC CODE	DETECTION ITEM	INF CODE	TROUBLE AREA	SEE PAGE
43	ABS Control System Malfunction	-	ABS control system	INFO
45	Electronically Controlled Brake System Malfunction	-	Electronically controlled brake system	INFO
C1210/36	Zero Point Calibration of Yaw Rate Sensor Undone	-	1. Zero point calibration undone 2. Yaw rate and acceleration sensor 3. Brake booster with master cylinder (Skid control ECU) (Perform zero point calibration and check for DTCs. If no DTCs are output again, the sensor is normal.)	INFO
C1231/31	Steering Angle Sensor Circuit Malfunction	701 702 703	Steering angle sensor internal malfunction	INFO
C1234/34	Yaw Rate Sensor Malfunction	711 712 713 714	Yaw rate and acceleration sensor internal malfunction	INFO
C1290/66	Steering Angle Sensor Zero Point Malfunction	751	1. Yaw rate and acceleration sensor zero point calibration incomplete 2. Poor adjustment of the center position of the steering wheel 3. Poor adjustment of front wheel alignment	INFO
C1310/51	Malfunction in HV system	-	Power management control ECU (Hybrid vehicle control ECU)	INFO
C1380/64	Stop Light Control Relay Malfunction	761 762	1. Stop light switch 2. Stop light switch circuit 3. Stop light control relay 4. Stop light control relay circuit 5. Brake booster with master cylinder (Skid control ECU)	INFO
C1439/66	Steering Angle Sensor Initialization Incomplete	752	1. Steering angle sensor 2. Yaw rate and acceleration sensor 3. Brake booster with master cylinder (Skid control ECU)	INFO
C1440/98	Unusual Bank Angle Detected	-	Yaw rate and acceleration sensor	INFO
C1443/34	Invalid Data Received from Yaw Rate Sensor	715	Yaw rate and acceleration sensor	INFO

DTC CODE	DETECTION ITEM	INF CODE	TROUBLE AREA	SEE PAGE
C1445/66	Vehicle Driven with Steering Angle Sensor not Initialized	753	1. Steering angle sensor 2. Yaw rate and acceleration sensor 3. Brake booster with master cylinder (Skid control ECU)	INFO
U0123/62	Lost Communication with Yaw Rate Sensor Module	731 732	1. CAN communication line (CAN No. 1 bus) 2. Yaw rate and acceleration sensor 3. Brake booster with master cylinder (Skid control ECU)	INFO
U0126/63	Lost Communication with Steering Angle Sensor Module	741 742	1. CAN communication line (CAN No. 1 bus) 2. Steering angle sensor 3. Brake booster with master cylinder (Skid control ECU)	INFO

Electronically Controlled Brake System DTC

DTC CODE	DETECTION ITEM	INF CODE	TROUBLE AREA	SEE PAGE
36	ABS Control System Malfunction	-	ABS control system	INFO
C1202/68	Master Reservoir Level Malfunction	371	1. Low brake fluid level 2. Brake fluid leaks 3. Brake master cylinder reservoir (Brake fluid level warning switch) internal open circuit 4. Brake master cylinder reservoir (Brake fluid level warning switch) internal short circuit 5. Open in wire harness 6. Short in wire harness 7. Brake disc rotor excessive wear 8. Brake booster with master cylinder (Skid control ECU)	INFO
C1203/95	ECM Communication Circuit Malfunction	-	1. The wrong ECU and sensor was installed 2. Brake booster with master cylinder (Skid control ECU)	INFO
C1211/25	SLA Linear Solenoid	21 22 23 24	1. Supply voltage reduced 2. Brake booster with master cylinder (Skid control ECU or brake actuator)	INFO
C1212/26	SLR Linear Solenoid	31 32 33 34	1. Supply voltage reduced 2. Brake booster with master cylinder (Skid control ECU or brake actuator)	INFO
C1214/62	Hydraulic Control System Malfunction	431 432 433 434 435 436 437 438	1. Brake fluid leaks 2. Brake disc rotor excessive wear 3. Brake booster with master cylinder (Brake actuator)	INFO

DTC CODE	DETECTION ITEM	INF CODE	TROUBLE AREA	SEE PAGE
C1225/31	SA1 Solenoid Circuit	41 42 43 44	1. Supply voltage reduced 2. Brake booster with master cylinder (Skid control ECU or brake actuator)	INFO
C1226/32	SA2 Solenoid Circuit	51 52 53 54	1. Supply voltage reduced 2. Brake booster with master cylinder (Skid control ECU or brake actuator)	INFO
C1227/33	SA3 Solenoid Circuit	61 62 63 64	1. Supply voltage reduced 2. Brake booster with master cylinder (Skid control ECU or brake actuator)	INFO
C1228/34	STR Solenoid Circuit	71 72 73 74	1. Supply voltage reduced 2. Brake booster with master cylinder (Skid control ECU or brake actuator)	INFO
C1242/42	Open in IG1 / IG2 Power Source Circuit	111 112	1. Open or short in IG1 circuit 2. Open or short in IG2 circuit 3. Improperly connected connector, deformation or corrosion of terminals 4. Smart key system (IG start circuit) 5. Auxiliary battery 6. Hybrid control system (Charging circuit) 7. Brake booster with master cylinder (Skid control ECU)	INFO
C1246/46	Master Cylinder Pressure Sensor Malfunction	201 202 203 204 207	1. Brake pedal stroke sensor 2. Brake booster with master cylinder (Skid control ECU or brake actuator)	INFO
C1247/47	Stroke Sensor Malfunction	211 212 213 214 215 216 217 218 219 220 221 222 223	1. Open or short in brake pedal stroke sensor power supply circuit 2. Open or short in wire harness 3. Improperly connected connector, deformation or corrosion of terminals 4. Brake pedal stroke sensor 5. Brake booster with master cylinder (Skid control ECU)	INFO

DTC CODE	DETECTION ITEM	INF CODE	TROUBLE AREA	SEE PAGE
C1249/49	Open in Stop Light Switch Circuit	231	1. STOP fuse 2. Stop light switch 3. Stop light switch circuit 4. Brake booster with master cylinder (Skid control ECU)	INFO
C1252/52	Brake Booster Pump Motor on Time Abnormally Long	311	1. Short in motor circuit or motor monitor circuit 2. Motor relay stuck 3. Accumulator pressure sensor malfunction in brake actuator 4. Brake booster with master cylinder (Skid control ECU)	INFO
C1253/53	Pump Motor Relay Malfunction	321 322 323 324 325 326 327 328 329	1. Open or short in motor circuit or motor monitor circuit 2. Brake booster with master cylinder (Skid control ECU)	INFO
C1256/56	Accumulator Low Pressure	341	1. Accumulator pressure dropped due to frequent brake pedal operation (not a malfunction) 2. Pump motor malfunction 3. Accumulator deterioration 4. Accumulator pressure sensor 5. Supply voltage reduced	INFO
C1257/57	Power Supply Drive Circuit	361 362	Brake booster with master cylinder (Skid control ECU)	INFO
C1259/58	HV System Regenerative Malfunction	-	Power management control ECU (Hybrid vehicle control ECU)	INFO
C1300	Skid Control ECU Malfunction	-	Brake booster with master cylinder (Skid control ECU)	INFO
C1311/11	Open in Main Relay 1 Circuit	1	1. Open or short in ABS main relay circuit 2. Brake booster with master cylinder (Skid control ECU)	INFO
C1312/12	Short in Main Relay 1 Circuit	2	1. Short in ABS main relay circuit 2. ABS main relay internal stuck 3. Brake booster with master cylinder (Skid control ECU)	INFO
C1345/66	Linear Solenoid Valve Offset Learning Undone	-	Perform linear valve offset learning and check for DTCs. If no DTCs are output again, the valve is normal.	INFO
C1352/21	FR Solenoid	11 12	Brake booster with master cylinder (Skid control ECU or brake actuator)	INFO
C1353/23	RR Solenoid	15 16	Brake booster with master cylinder (Skid control ECU or brake actuator)	INFO
C1356/22	FL Solenoid	13 14	Brake booster with master cylinder (Skid control ECU or brake actuator)	INFO

DTC CODE	DETECTION ITEM	INF CODE	TROUBLE AREA	SEE PAGE
C1357/24	RL Solenoid	17 18	Brake booster with master cylinder (Skid control ECU or brake actuator)	INFO
C1364/61	Wheel Cylinder Pressure Sensor Malfunction	421 422 423 424 426	Brake booster with master cylinder (Skid control ECU or brake actuator)	INFO
C1365/54	Accumulator Pressure Sensor Malfunction	331 332 333 334	Brake booster with master cylinder (Skid control ECU or brake actuator)	INFO
C1368/67	Linear Solenoid Valve Offset Malfunction	-	1. Perform linear valve offset learning and check for DTCs. If no DTCs are output again, the valve is normal. 2. Brake booster with master cylinder (Brake actuator)	INFO
C1391/69	Accumulator Leak Malfunction	351	1. Brake fluid leaks 2. Brake booster with master cylinder (Brake actuator) (Malfunctioning internal seal, low gas pressure in accumulator, etc.)	INFO
C1392/48	Stroke Sensor Zero Point Calibration Undone	-	1. Brake pedal stroke sensor zero point calibration incomplete (Initialization and calibration of linear solenoid valve incomplete) 2. Brake booster with master cylinder (Skid control ECU)	INFO
C1451/72	Motor Drive Permission Malfunction	-	1. Brake fluid leaks 2. Air bleeding not performed	INFO
U0073/94	Control Module Communication Bus OFF	461 462 463 464 465 466	1. CAN communication line (CAN No. 1 bus) 2. Yaw rate and acceleration sensor 3. Steering angle sensor 4. Brake booster with master cylinder (Skid control ECU)	INFO
U0293/59	Communication Error from HV ECU	411 412 413	1. CAN communication line (Power management bus) 2. Power management control ECU (Hybrid vehicle control ECU) 3. Brake booster with master cylinder (Skid control ECU)	INFO











ABS and Electronically Controlled Brake System DTC

DTC CODE	DETECTION ITEM	INF CODE	TROUBLE AREA	SEE PAGE
C1241/41	Low Battery Positive Voltage	101*1 102*1 551*2 552*2 553*2	1. Improperly connected connector, deformation or corrosion of terminals 2. Auxiliary battery 3. Hybrid control system (Charging circuit) 4. Brake booster with master cylinder (Skid control ECU)	INFO


*1: Electronically Controlled Brake System DTC

*2: ABS DTC

ABS Test Mode DTC


DTC CODE	DETECTION ITEM	INF CODE	TROUBLE AREA	SEE PAGE
C1271/71	Low Output Signal of Front Speed Sensor RH (Test Mode DTC)	-	1. Front speed sensor RH 2. Sensor installation 3. Speed sensor rotor	
C1272/72	Low Output Signal of Front Speed Sensor LH (Test Mode DTC)	-	1. Front speed sensor LH 2. Sensor installation 3. Speed sensor rotor	
C1273/73	Low Output Signal of Rear Speed Sensor RH (Test Mode DTC)	-	1. Rear speed sensor RH 2. Sensor installation 3. Speed sensor rotor	
C1274/74	Low Output Signal of Rear Speed Sensor LH (Test Mode DTC)	-	1. Rear speed sensor LH 2. Sensor installation 3. Speed sensor rotor	
C1275/75	Abnormal Change in Output Signal of Front Speed Sensor RH (Test Mode DTC)	-	1. Front speed sensor RH 2. Speed sensor rotor	
C1276/76	Abnormal Change in Output Signal of Front Speed Sensor LH (Test Mode DTC)	-	1. Front speed sensor LH 2. Speed sensor rotor	
C1277/77	Abnormal Change in Output Signal of Rear Speed Sensor RH (Test Mode DTC)	-	1. Rear speed sensor RH 2. Speed sensor rotor	
C1278/78	Abnormal Change in Output Signal of Rear Speed Sensor LH (Test Mode DTC)	-	1. Rear speed sensor LH 2. Speed sensor rotor	
C1279/79	Acceleration Sensor Output Voltage Malfunction (Test Mode DTC)	-	1. Sensor installation 2. Yaw rate and acceleration sensor	
C1281/81	Master Cylinder Pressure Sensor Output Malfunction (Test Mode DTC)	-	1. Stop light switch 2. Regulator pressure sensor	

VSC Test Mode DTC

DTC CODE	DETECTION ITEM	INF CODE	TROUBLE AREA	SEE PAGE
C0371/71	Yaw Rate Sensor (Test Mode DTC)	-	1. Sensor installation 2. Yaw rate and acceleration sensor	

Electronically Controlled Brake System Test Mode DTC

DTC CODE	DETECTION ITEM	INF CODE	TROUBLE AREA	SEE PAGE

DTC CODE	DETECTION ITEM	INF CODE	TROUBLE AREA	SEE PAGE
C1346/71	Stroke Sensor Zero Point Learning Malfunction (Test Mode DTC)	-	1. Brake pedal stroke sensor 2. Brake pedal stroke sensor circuit	



Last Modified: 7-1-2019	6.8:8.0.48	Doc ID: [REDACTED]
Model Year Start: 2010	Model: Prius	Prod Date Range: [04/2009 -]
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: ELECTRONICALLY CONTROLLED BRAKE SYSTEM: C1391/69; Accumulator Leak Malfunction; 2010 MY Prius [04/2009 -]		

DTC	C1391/69	Accumulator Leak Malfunction
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DESCRIPTION

The DTC is stored if internal or external brake fluid leaks are detected due to improper sealing in the brake actuator or brake booster pump. Internal leaks are suspected if the pump motor operates frequently without braking.

DTC CODE	INF CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1391/69	351	Either of the following is detected: <ol style="list-style-type: none"> 1. Accumulator pressure sensor input does not increase before braking or while the pump motor is operating. 2. Accumulator pressure sensor input reduction rate exceeds the specification before braking and while the pump motor is not operating. 	<ul style="list-style-type: none"> • Brake fluid leaks • Brake booster with master cylinder (Brake actuator) (Malfunctioning internal seal, low gas pressure in accumulator, etc.)

INSPECTION PROCEDURE

NOTICE:

When replacing the brake booster with master cylinder (brake actuator), perform initialization and calibration of the linear solenoid valve .

PROCEDURE

1.	CHECK FOR FLUID LEAK
-----------	-----------------------------

(a) Check that there is no fluid leaks in the brake line between the brake actuator and the wheel cylinder which is indicated by DTCs.

(b) Check that the brake is not dragging.

OK:

There is no fluid leaks or dragging.

NG  **REPAIR OR REPLACE APPLICABLE PART**

OK



2. RECONFIRM DTC

- (a) Clear the DTCs **W03**.
- (b) Turn the power switch on (READY).
- (c) Check if the same DTC is recorded **W03**.

RESULT	PROCEED TO
DTC (C1391/69) is output	A
DTC (C1391/69) is not output	B

B ▶ REPLACE BRAKE BOOSTER WITH MASTER CYLINDER

A

3. PERFORM ACTIVE TEST USING TECHSTREAM (SOLENOID VALVE)

NOTICE:

- If DTCs are stored, Active Test cannot be performed.
- To protect the pump motor, do not clear the DTCs repeatedly.

- (a) Turn the power switch off.
- (b) Connect the Techstream to the DLC3.
- (c) Turn the power switch on (IG).
- (d) Clear the DTCs **W03**.
- (e) Select the Active Test on the Techstream **W03**.

HINT:

The Active Test can be performed when the following conditions are met.


- ABS main relay is on.
- Park (P) selected.
- Parking brake is applied.
- Vehicle speed is 0 km/h (0 mph).

ABS/VSC/TRAC

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
ECB* Solenoid (SMC/SRC/SCC)	Switching solenoid valve (SMC/SRC/SCC)	Solenoid ON/OFF	<ul style="list-style-type: none"> • Operation sound of solenoid (clicking sound) can be heard • DTC is not output

*: Electronically Controlled Brake System

(f) Perform the Active Test of the solenoid using the Techstream within 2 minutes of clearing the DTCs.

(g) Select the Data List on the Techstream  .

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Wheel Cylinder Pressure Sensor	Wheel cylinder pressure sensor / Min.: 0 V, Max.: 5 V	When brake pedal released: 0.1 to 0.9 V	Reading increases when brake pedal is depressed

(h) Check that the output value of wheel cylinder does not increase.

OK:

The output value of wheel cylinder does not increase.

HINT:

If any output value increases, there may be brake fluid leaks in the brake actuator.


RESULT	PROCEED TO
The output value of wheel cylinder increases	A
The output values of wheel cylinders do not increase	B

B  **REPLACE BRAKE BOOSTER PUMP**

A



4.	REPLACE BRAKE BOOSTER WITH MASTER CYLINDER
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(a) Replace the brake booster with master cylinder (brake actuator)  .

NEXT  **REPLACE BRAKE BOOSTER PUMP**



Last Modified: 7-1-2019	6.8:8.0.48	Doc ID: [REDACTED]
Model Year Start: 2010	Model: Prius	Prod Date Range: [04/2009 -]
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: ELECTRONICALLY CONTROLLED BRAKE SYSTEM: C1256/56; Accumulator Low Pressure; 2010 MY Prius [04/2009 -]		

DTC	C1256/56	Accumulator Low Pressure
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DESCRIPTION

The accumulator pressure sensor is built into the actuator and detects the accumulator pressure.

The skid control ECU turns on the brake warning light / red (malfunction) and brake warning light / yellow (minor malfunction), and sounds the skid control buzzer if it senses a decrease in the accumulator pressure.

DTC C1256/56 may be output if the accumulator pressure drops due to frequent braking (this is not a malfunction).

DTC CODE	INF CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1256/56	341	Significant drop in accumulator pressure continues. (DTCs will be stored and the buzzer will operate when either condition is met.)	<ul style="list-style-type: none"> • Accumulator pressure dropped due to frequent brake pedal operation (not a malfunction) • Pump motor malfunction • Accumulator deterioration • Accumulator pressure sensor • Supply voltage reduced

WIRING DIAGRAM

Refer to DTCs C1252/52 and C1253/53 [WDC](#) .

INSPECTION PROCEDURE

NOTICE:

When replacing the brake booster with master cylinder (brake actuator), perform initialization and calibration of the linear solenoid valve [SFC](#) .

HINT:

When C1202/68, C1241/41, C1252/52, C1253/53 and/or C1391/69 are output together with C1256/56, inspect and repair the trouble areas indicated by C1202/68, C1241/41, C1252/52, C1253/53 and/or C1391/69 first [WE](#) , [SFC](#) , [WDC](#) , or [SFC](#)).

PROCEDURE

1.	BRAKE PROBLEM CHECK
-----------	----------------------------

(a) Ask the customer if frequent braking was performed while the brake warning light / yellow (minor malfunction) was on.

OK:

RESULT	PROCEED TO
Frequent braking was not performed	A
Frequent braking was performed	B

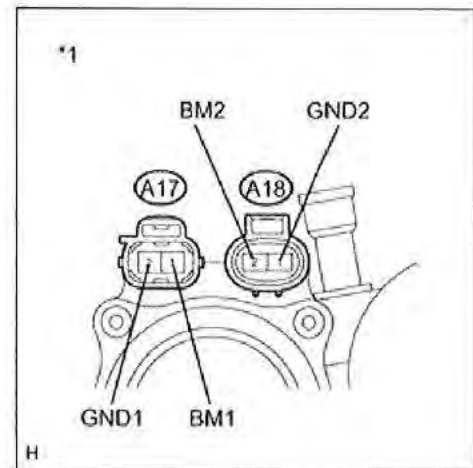
HINT:

This DTC is output even if the accumulator pressure drops only temporarily due to frequent braking.

B END

A

2. INSPECT BRAKE BOOSTER PUMP



(a) Make sure that there is no looseness at the locking part and the connecting part of the connectors.

(b) Disconnect the brake booster pump connectors.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A17-1 (BM1) - A17-2 (GND1)	Always	Below 10 Ω
A18-2 (BM2) - A18-1 (GND2)	Always	Below 10 Ω
A17-1 (BM1) - A18-2 (BM2)	Always	Below 1 Ω
A17-2 (GND1) - A18-1 (GND2)	Always	Below 1 Ω

Text in Illustration

*1	Component without harness connected (Brake Booster Pump)
----	--

NG REPLACE BRAKE BOOSTER PUMP

OK

3. READ VALUE USING TECHSTREAM (ACCUMULATOR PRESSURE SENSOR)

- (a) Reconnect the brake booster pump connectors.
- (b) Connect the Techstream to the DLC3.
- (c) Turn the power switch on (IG).
- (d) Select the Data List on the Techstream .

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Accumulator Sensor	Accumulator pressure sensor / Min.: 0 V, Max.: 5 V	Specified value: 2.9 to 4.2 V	When brake fluid is stored in the accumulator: Accumulator pressure changes in accordance with volume of fluid stored in the accumulator

- (e) Wait for 30 seconds without depressing the brake pedal.
- (f) Check that the accumulator pressure sensor output values change is within the specified range.

OK:

Accumulator pressure sensor output values change is within 0.55 V.

NG **GO TO STEP 4**

OK **CHECK FOR INTERMITTENT PROBLEMS**

4. PERFORM ACTIVE TEST USING TECHSTREAM (SOLENOID VALVE)

- (a) Turn the power switch off.
- (b) Connect the Techstream to the DLC3.
- (c) Turn the power switch on (IG).
- (d) Select the Active Test on the Techstream .

HINT:

The Active Test can be performed when the following conditions are met.

- ABS main relay is on.


- Park (P) selected.
- Parking brake is applied.
- Vehicle speed is 0 km/h (0 mph).

ABS/VSC/TRAC

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
ECB* Solenoid (SMC/SRC/SCC)	Switching solenoid valve (SMC/SRC/SCC)	Solenoid ON/OFF	Operation sound of solenoid (clicking sound) can be heard

*: Electronically Controlled Brake System

(e) Perform the Active Test of the solenoid using the Techstream.

(f) Select the Data List on the Techstream  .

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Wheel Cylinder Pressure Sensor	Wheel cylinder pressure sensor / Min.: 0 V, Max.: 5 V	When brake pedal released: 0.1 to 0.9 V	Reading increases when brake pedal is depressed

(g) Check that the output value of wheel cylinder does not increase.

OK:

The output value of wheel cylinder does not increase.

HINT:

If any output value increases, there may be brake fluid leaks in the brake actuator.

NG  **REPLACE BRAKE BOOSTER WITH MASTER CYLINDER**

OK  **REPLACE BRAKE BOOSTER PUMP**



DP19-004

CAPISTRANO TOYOTA

9-19-2019

ATTACHMENT

SECTION 4.2

CAMRY HYBRID

Last Modified: 6-28-2019	6.8:8.0.48	Doc ID [REDACTED]
Model Year Start: 2012	Model: Camry HV	Prod Date Range: [10/2011 -]
Title: NETWORKING: CAN COMMUNICATION SYSTEM: FAIL-SAFE CHART; 2012 MY Camry HV [10/2011 -]		

FAIL-SAFE CHART

1. FAIL-SAFE FUNCTION

(a) When communication fails in any of the CAN bus lines (communication lines), a fail-safe function(s) will operate. The fail-safe function that is specified for each system operates to prevent those systems from malfunctioning.

(b) The following table shows the effects on each system when communication is impossible. (For further details, see the pages for each system.)

FUNCTION	CONTROL MASTER	SYSTEM RELATED	FAIL-SAFE OPERATION	DRIVER DETECTABLE	DTC DETECTION (ECU THAT STORED DTC)
Air conditioning control <ul style="list-style-type: none"> • Corrects engine speed, such as for Idle up • Controls outlet air temperature, outlet mode change and airflow volume based on engine coolant temperature signal • Corrects engine coolant temperature map and changes compressor lock judgment value 	Air conditioning amplifier assembly	Power management control ECU	Control is performed based on default coolant temperature of 80°C (176°F).	-	U0293 (Air conditioning amplifier assembly)
Simple load control <ul style="list-style-type: none"> • Performs electric load control according to load control level signal 	Air conditioning amplifier assembly	Power steering ECU assembly	Load control is not performed.	-	U0131 (Air conditioning amplifier assembly)
Panel dimming control <ul style="list-style-type: none"> • Outputs dimmer signal to LIN connected panels according to display dimmer signal 	Air conditioning amplifier assembly	Main body ECU (Multiplex network body ECU)	Dimming mode and non-dimming mode cannot be switched.	-	U0142 (Air conditioning amplifier assembly)

FUNCTION	CONTROL MASTER	SYSTEM RELATED	FAIL-SAFE OPERATION	DRIVER DETECTABLE	DTC DETECTION (ECU THAT STORED DTC)
Ambient temperature correction control <ul style="list-style-type: none"> Switches air conditioning system operation condition and corrects value of displayed ambient temperature according to vehicle speed signal 	Air conditioning amplifier assembly	Combination meter assembly	Control is performed based on default vehicle speed of 0 km/h (0 mph).	<ul style="list-style-type: none"> Correction level for displayed ambient temperature declines. Correction level for outlet airflow declines. 	U0155 (Air conditioning amplifier assembly)
Air conditioning Eco mode control <ul style="list-style-type: none"> Performs control in Eco mode using B_ECOMI 	Air conditioning amplifier assembly	Power management control ECU	Maintains the latest state (Maintained in normal condition after reset)	-	U0293 (Air conditioning amplifier assembly)
Fuel Consumption display <ul style="list-style-type: none"> Displays graph of fuel consumption per minute and history of total fuel consumption 	<ul style="list-style-type: none"> Navigation ECU sub-assembly*1*2 Radio and display receiver assembly*3 	<ul style="list-style-type: none"> Brake booster with master cylinder assembly (Skid control ECU) Combination meter assembly ECM Power management control ECU 	When communication with ECM or skid control ECU is interrupted: <ul style="list-style-type: none"> Display is not updated. When communication with combination meter is interrupted: <ul style="list-style-type: none"> Display is not updated. Numeric part of driveable mileage is cleared. 	-	-
HV energy flow display <ul style="list-style-type: none"> Creates energy flow screen which indicates regeneration status and drive force transmission status 	<ul style="list-style-type: none"> Navigation ECU sub-assembly*1*2 Radio and display receiver assembly*3 	Power management control ECU	If communication stops while the energy flow screen is displayed, the energy flow display disappears and the latest value is maintained for the SOC (state of charge) level display.	-	U0293 (Navigation ECU sub-assembly*1*2) (Radio and display receiver assembly*3)
Parking assist monitor control <ul style="list-style-type: none"> Displays rear view monitor based on steering sensor, vehicle speed and vehicle information 	Navigation ECU sub-assembly*2	<ul style="list-style-type: none"> Steering sensor Main body ECU (Multiplex network body ECU) 	When communication with steering angle sensor is interrupted: <ul style="list-style-type: none"> Message is shown indicating that guide lines cannot be displayed. 	-	U0073 U0126 U0140 (Navigation ECU sub-assembly*2)

FUNCTION	CONTROL MASTER	SYSTEM RELATED	FAIL-SAFE OPERATION	DRIVER DETECTABLE	DTC DETECTION (ECU THAT STORED DTC)
Vehicle customization function <ul style="list-style-type: none"> Allows changing of operation and control conditions for vehicle functions via multi-display operation 	<ul style="list-style-type: none"> Navigation ECU sub-assembly*1*2 Radio and display receiver assembly*3 	<ul style="list-style-type: none"> Main body ECU (Multiplex network body ECU) Smart key ECU assembly (Certification ECU) Air conditioning amplifier assembly 	When an application that uses phase 4 remote communication is activated (customization/remote diagnosis), the process will be performed regardless of main body ECU (multiplex network body ECU) remote communication permit/prohibit state.	-	U0140 (Navigation ECU sub-assembly*1*2) (Radio and display receiver assembly*3)
Door lock <ul style="list-style-type: none"> Controls key linked and automatic door lock/unlock function, key confinement prevention function, etc. 	Main body ECU (Multiplex network body ECU)	<ul style="list-style-type: none"> Combination meter assembly ECM Power management control ECU 	<ul style="list-style-type: none"> Speed sensitive automatic lock control does not occur. Shift linked automatic lock control does not occur. Shift linked automatic unlock control does not occur. Automatic lock/unlock cannot be changed. 	-	U0100 U0101 U0155 (Main body ECU (Multiplex network body ECU))
Display automatic dimming <ul style="list-style-type: none"> Display dimming control 	Main body ECU (Multiplex network body ECU)	Combination meter assembly	Automatic dimming control for displays does not operate when taillights are turned on.	-	U0155 (Main body ECU (Multiplex network body ECU))
Luggage compartment door opener/luggage compartment door open control <ul style="list-style-type: none"> (Accepts luggage compartment door opener request) 	Main body ECU (Multiplex network body ECU)	<ul style="list-style-type: none"> Combination meter assembly ECM Power management control ECU 	Luggage compartment door does not open.	-	U0100 U0101 U0155 (Main body ECU (Multiplex network body ECU))
Illumination control	Main body ECU (Multiplex network body ECU)	<ul style="list-style-type: none"> Smart key ECU assembly (Certification ECU) Power management control ECU 	<ul style="list-style-type: none"> Interior lights turn off. Inside handle light turn off. 	When communication with smart key ECU is interrupted: <ul style="list-style-type: none"> Interior lights do not turn off right after getting out of the vehicle. 	U0293 U0327 (Main body ECU (Multiplex network body ECU))

FUNCTION	CONTROL MASTER	SYSTEM RELATED	FAIL-SAFE OPERATION	DRIVER DETECTABLE	DTC DETECTION (ECU THAT STORED DTC)
Entry function/wireless control	Smart key ECU assembly (Certification ECU)	Main body ECU (Multiplex network body ECU)	Entry lock/unlock control is not possible.	-	U0327 (Main body ECU (Multiplex network body ECU))
Drive torque control <ul style="list-style-type: none"> Controls the engine, MG1 and MG2 based on engine information received 	Power management control ECU	ECM	Vehicle drives using only the motor	Displays messages on the multi-information display.	U0100 (Power management control ECU (Hybrid control system))
Regenerative operation <ul style="list-style-type: none"> Provides maximum amount of regeneration based on cooperative control with the ECB system 	Power management control ECU	Brake booster with master cylinder assembly (Skid control ECU)	Regeneration is prohibited.	Displays messages on the multi-information display.	U0129 (Power management control ECU (Hybrid control system))
High voltage shut off control when the vehicle is damaged <ul style="list-style-type: none"> Receives the SRS collision detection signal (CDT-HV) and shuts off the system main relays 	Power management control ECU	Airbag sensor assembly	Normal driving	Displays messages on the multi-information display.	U0151 (Power management control ECU (Hybrid control system))
HV system power processing <ul style="list-style-type: none"> Determines that an IG2 malfunction cannot be judged when a power supply ECU communication error occurs 	Power management control ECU (Hybrid control system)	Power management control ECU (Power management control CPU)	Normal driving	Displays messages on the multi-information display.	U1107 (Power management control ECU (Hybrid control system))

FUNCTION	CONTROL MASTER	SYSTEM RELATED	FAIL-SAFE OPERATION	DRIVER DETECTABLE	DTC DETECTION (ECU THAT STORED DTC)
<p>Air conditioning control</p> <ul style="list-style-type: none"> Sends a signal from the air conditioning amplifier assembly to the power management control ECU (HV CPU) and from the power management control ECU (HV CPU) to the inverter for the air conditioning system. 	Air conditioning amplifier assembly	Power management control ECU	Air conditioning cooling operation is stopped.	-	U0164 (Power management control ECU)
<p>Engine start/stop switch (Power source mode change)</p> <ul style="list-style-type: none"> Using start/stop switch signal as trigger, changes power source mode automatically and requests starter operation when conditions are met 	Power management control ECU (Power management control CPU)	<ul style="list-style-type: none"> Main body ECU (Multiplex network body ECU) Combination meter assembly Power management control ECU (Hybrid control system) 	None	-	U0140 U0155 U0293 (Power management control ECU (Power management control CPU))
<p>Cruise control</p> <ul style="list-style-type: none"> Calculates demand drive force to maintain vehicle speed 	Power management control ECU	Brake booster with master cylinder assembly (Skid control ECU)	Cruise control is canceled.	<ul style="list-style-type: none"> Displays messages on the multi-information display. Master warning light turns on. 	U0122 (Power management control ECU)
<p>PTC heater</p> <ul style="list-style-type: none"> When there is a heat demand signal that requires operation of the PTC heater (including heating from coolant), Idle up is performed. 	Air conditioning amplifier assembly	ECM	<ul style="list-style-type: none"> Engine idle speed changes. Heating performance deteriorates. PTC heater does not operate. 	-	-

FUNCTION	CONTROL MASTER	SYSTEM RELATED	FAIL-SAFE OPERATION	DRIVER DETECTABLE	DTC DETECTION (ECU THAT STORED DTC)
Charge control <ul style="list-style-type: none"> Performs idle up according to charging request 	Power management control ECU	Air conditioning amplifier assembly	Idle up according to charging request is not performed.	Taillights flicker and blower airflow changes.	-
Power steering control <ul style="list-style-type: none"> Calculates assist current according to torque sensor value and vehicle speed and drives motor 	Power steering ECU assembly	<ul style="list-style-type: none"> Power management control ECU Brake booster with master cylinder assembly (Skid control ECU) 	<ul style="list-style-type: none"> Control is performed based on default assist current for a vehicle speed of 140 km/h (87 mph). Drivability degrades (compensation control using steering angle is stopped). 	EPS warning light illuminates.	U0129 U0293 (Power steering ECU assembly)
Steering assist calculation <ul style="list-style-type: none"> Changes assist force based on vehicle speed 	Power steering ECU assembly	<ul style="list-style-type: none"> Power management control ECU Brake booster with master cylinder assembly (Skid control ECU) 	When communication with skid control ECU is interrupted: <ul style="list-style-type: none"> Control continues based on a default speed of 140 km/h (87 mph) because vehicle speed is unrecognizable. 	EPS warning light illuminates.	U0129 U0293 (Power steering ECU assembly)
Assist map selection <ul style="list-style-type: none"> Selects proper assist map according to destination, engine type, etc. 	Power steering ECU assembly	<ul style="list-style-type: none"> ECM Brake booster with master cylinder assembly (Skid control ECU) 	Default map is used to assist because proper assist map cannot be selected. (Steering feel may be different.)	EPS warning light illuminates.	-
Steering assist compensation control <ul style="list-style-type: none"> Provides steering assist with compensation amount based on vehicle speed 	Power steering ECU assembly	Brake booster with master cylinder assembly (Skid control ECU)	Control is performed based on a default vehicle speed of approximately 140km/h (87 mph).	EPS warning light illuminates.	U0129 (Power steering ECU assembly)

FUNCTION	CONTROL MASTER	SYSTEM RELATED	FAIL-SAFE OPERATION	DRIVER DETECTABLE	DTC DETECTION (ECU THAT STORED DTC)
<p>Entry function</p> <ul style="list-style-type: none"> Entry lock/unlock, entry luggage compartment open Warning Performs entry illumination (Interior illumination etc) 	<ul style="list-style-type: none"> Main body ECU (Multiplex network body ECU) Smart key ECU assembly (Certification ECU) 	<ul style="list-style-type: none"> Main body ECU (Multiplex network body ECU) Combination meter assembly 	Entry unlock is performed again.	<ul style="list-style-type: none"> Entry lock/unlock or entry luggage compartment open does not operate. Warning functions (Key confinement, Key not in vehicle, Key reminder etc.) do not operate, Key confinement prevention control does not operate. Entry illumination does not operate. 	<p>U0327 (Main body ECU (Multiplex network body ECU))</p> <p>U0142 (Smart key ECU assembly (Certification ECU))</p>
<p>Wireless function</p> <ul style="list-style-type: none"> Locks and unlocks doors etc. via remote operation 	Main body ECU (Multiplex network body ECU)	Smart key ECU assembly (Certification ECU)	Wireless lock, unlock and luggage compartment opener do not operate.	-	U0142 (Smart key ECU assembly (Certification ECU))
<p>Power switch backlighting control</p> <ul style="list-style-type: none"> Turns on/off power switch illumination linked with interior lights etc. 	Smart key ECU assembly (Certification ECU)	Main body ECU (Multiplex network body ECU)	power switch backlighting does not illuminate according to interior lights operation	-	U0142 (Smart key ECU assembly (Certification ECU))
Vehicle speed display	Combination meter assembly	Brake booster with master cylinder assembly (Skid control ECU)	Speedometer is controlled based on a default vehicle speed of 0 km/h (0 mph).	<ul style="list-style-type: none"> The needle points at 0 km/h (0 mph). Drive monitor calculation is stopped. 	U0129 (Combination meter assembly)
Airbag (Airbag warning light control)	Combination meter assembly	Airbag sensor assembly	None	Airbag warning light illuminates.	U0151 (Combination meter assembly)
EPS warning (EPS warning light control)	Combination meter assembly	Power steering ECU assembly	None	EPS warning light illuminates.	U0131 (Combination meter assembly)

FUNCTION	CONTROL MASTER	SYSTEM RELATED	FAIL-SAFE OPERATION	DRIVER DETECTABLE	DTC DETECTION (ECU THAT STORED DTC)
SLIP warning (SLIP warning light control)	Combination meter assembly	Brake booster with master cylinder assembly (Skid control ECU)	None	SLIP indicator illuminates.	-
ABS/TRC/VSC control	Brake booster with master cylinder assembly (Skid control ECU)	<ul style="list-style-type: none"> Airbag sensor assembly (built-in type yaw rate sensor) Yaw rate sensor (separate type yaw rate sensor) 	<ul style="list-style-type: none"> When control is being performed: When back-up control (vehicle behavior stabilization) is complete, braking returns to normal operation and further control is prohibited. When control is not being performed: Control will not be started. 	<ul style="list-style-type: none"> Brake warning light (red) illuminates. ABS warning light illuminates. SLIP indicator illuminates. Brake warning light (yellow) illuminates. 	U0073 U0123 U0124 U0126 U0293 (Brake booster with master cylinder assembly (Skid control ECU))
HAC2 control <ul style="list-style-type: none"> Maintains brake pressure for 2 seconds when the brake pedal has been depressed further after stopping the vehicle 	Brake booster with master cylinder assembly (Skid control ECU)	<ul style="list-style-type: none"> Power management control ECU Steering sensor Airbag sensor assembly 	<ul style="list-style-type: none"> When control is being performed: Once control (depressurization control) has completed, further hill-start assist control is prohibited. When control is not being performed: Hill-start assist control does not start. 	<ul style="list-style-type: none"> Brake warning light (red) illuminates. ABS warning light illuminates. SLIP indicator illuminates. Brake warning light (yellow) illuminates. 	U0073 U0123 U0124 U0126 U0293 (Brake booster with master cylinder assembly (Skid control ECU))
Hybrid regenerative operation <ul style="list-style-type: none"> Regenerative cooperative control with the HV system 	Brake booster with master cylinder assembly (Skid control ECU)	Power management control ECU	<ul style="list-style-type: none"> When control is being performed: HV cooperative control is continued based on the latest value and gradually decreased. After this, HV cooperative control is prohibited. When control is not being performed: HV cooperative control does not start. 	<ul style="list-style-type: none"> Brake warning light (red) illuminates. ABS warning light illuminates. SLIP indicator illuminates. Brake warning light (yellow) illuminates. 	U0073 U0293 (Brake booster with master cylinder assembly (Skid control ECU))

FUNCTION	CONTROL MASTER	SYSTEM RELATED	FAIL-SAFE OPERATION	DRIVER DETECTABLE	DTC DETECTION (ECU THAT STORED DTC)
Blind spot monitor control <ul style="list-style-type: none"> • Detects vehicle in blind spot of adjacent lane and informs driver 	Blind spot monitor sensor RH	<ul style="list-style-type: none"> • Steering sensor • Brake booster with master cylinder assembly (Skid control ECU) • Main body ECU (Multiplex network body ECU) • Power management control ECU 	Control stops	Displays messages on the multi-information display.	U0100 U0126 U0129 U0142 U0232 U0293 (Blind spot monitor sensor RH)
	Blind spot monitor sensor LH	<ul style="list-style-type: none"> • Steering sensor • Brake booster with master cylinder assembly (Skid control ECU) • Main body ECU (Multiplex network body ECU) • Power management control ECU 	Control stops	Displays messages on the multi-information display.	U0100 U0126 U0129 U0142 U0233 U0293 (Blind spot monitor sensor LH)
Gateway system (between V bus and sub bus 11) <ul style="list-style-type: none"> • Relays data between V bus and sub bus 11, and monitors ECUs connected to sub bus 11 	Power management control ECU	<ul style="list-style-type: none"> • Blind spot monitor sensor LH • Blind spot monitor sensor LH 			U0232 U0233 U1002 (Power management control ECU (Gateway system))

HINT:

- *1: for Navigation receiver type
- *2: for Radio and display type (w/ Intuitive parking assist system)
- *3: for Radio and display type (w/o Intuitive parking assist system)



Last Modified: 6-28-2019	6.8:8.0.48	Doc ID [REDACTED]
Model Year Start: 2012	Model: Camry HV	Prod Date Range: [10/2011 -]
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: ELECTRONICALLY CONTROLLED BRAKE SYSTEM: FAIL-SAFE CHART; 2012 MY Camry HV [10/2011 -]		

FAIL-SAFE CHART

1. FAIL-SAFE FUNCTION OF CONTROL SYSTEM

- (a) When a malfunction is detected in the brake control system, the skid control ECU turns the ABS warning, brake warning / red (malfunction), brake warning / yellow (minor malfunction) and slip indicator lights on, as well as prohibits ABS, BA, TR(A)C and VSC operations.
- (b) If the skid control ECU detects that a system related to the hybrid control system is malfunctioning, it will prohibit operations of the TR(A)C and VSC systems in order to prevent further malfunctions and to protect the systems.

ITEM	OPERATION
Malfunction in the ABS system.	ABS, BA, TR(A)C and VSC control prohibited.
Malfunction in the BA system.	ABS, BA, TR(A)C and VSC control prohibited.
Malfunction in the EBD system.	ABS, EBD, BA, TR(A)C and VSC control prohibited.
Malfunction in the TR(A)C system.	ABS, BA, TR(A)C and VSC control prohibited.
Malfunction in the VSC system.	ABS, BA, TR(A)C and VSC control prohibited.

2. FAIL-SAFE FUNCTION OF HYDRAULIC SYSTEM

- (a) If a malfunction is detected in the skid control ECU (brake booster with master cylinder assembly) or brake actuator (brake booster with master cylinder assembly) or an individual sensor, control will be stopped and brake effort will be generated by the hydraulic brake booster (brake booster with master cylinder assembly).
- (b) If brake control is stopped due to a malfunction in the hydraulic pressure source, the pressure generated in the master cylinder by the driver is applied to the wheel cylinders to ensure braking force.

ITEM	OPERATION
Skid control ECU (Brake booster with master cylinder assembly) malfunction.	Hydraulic brake booster (brake booster with master cylinder assembly) generates braking force.
Hydraulic pressure controlling components malfunction.	Hydraulic brake booster (brake booster with master cylinder assembly) generates braking force.
Power supply components (Hydraulic pressure source) malfunction.	Braking force solely generated by the driver.



Last Modified: 6-28-2019	6.8:8.0.48	Doc ID: [REDACTED]
Model Year Start: 2012	Model: Camry HV	Prod Date Range: [10/2011 -]
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: ELECTRONICALLY CONTROLLED BRAKE SYSTEM: C1391/69; Accumulator Leak Malfunction; 2012 MY Camry HV [10/2011 -]		

DTC	C1391/69	Accumulator Leak Malfunction
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DESCRIPTION

The DTC is stored if internal or external brake fluid leaks are detected due to improper sealing in the brake actuator (brake booster with master cylinder assembly) or brake booster pump assembly. Internal leaks are suspected if the pump motor operates frequently without braking.

DTC NO.	INF CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1391/69	351	Either of the following is detected: <ol style="list-style-type: none"> 1. Accumulator pressure sensor input does not increase before braking or while the pump motor is operating. 2. Accumulator pressure sensor input reduction rate exceeds the specification before braking and while the pump motor is not operating. 	<ul style="list-style-type: none"> • Brake fluid leaks • Brake actuator (Brake booster with master cylinder assembly) (Malfunctioning internal seal, low gas pressure in accumulator, etc.)

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator (brake booster with master cylinder assembly), perform initialization and calibration of the linear solenoid valve .

PROCEDURE

1.	CHECK FOR FLUID LEAK
-----------	-----------------------------

(a) Check that there are no fluid leaks in the brake lines between the brake actuator (brake booster with master cylinder assembly) and the wheel cylinders.

(b) Check that the brakes are not dragging.

OK:

There are no fluid leaks or dragging.

NG  **REPAIR OR REPLACE APPLICABLE PART**

OK



2. RECONFIRM DTC

- (a) Clear the DTCs  .
- (b) Turn the power switch on (READY).
- (c) Check if the same DTC is output  .


RESULT	PROCEED TO
DTC C1391/69 is output.	A
DTC C1391/69 is not output.	B

B ▶ REPLACE BRAKE BOOSTER WITH MASTER CYLINDER ASSEMBLY

A



3. PERFORM ACTIVE TEST USING TECHSTREAM (SOLENOID VALVE)

- (a) Turn the power switch off.
- (b) Connect the Techstream to the DLC3.
- (c) Turn the power switch on (IG).
- (d) Select the Active Test on the Techstream  .

HINT:


The Active Test can be performed when the following conditions are met.

- ABS main relay is on.
- Shift lever is in P.
- Parking brake is applied.
- Vehicle speed is 0 km/h (0 mph).

ABS/VSC/TRAC

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
ECB* Solenoid (SMC/SRC/SCC)	Switching solenoid valve (SMC/SRC/SCC)	Solenoid ON/OFF	Operation sound of solenoid (clicking sound) can be heard

*: Electronically Controlled Brake System

- (e) Perform the Active Test of the solenoid using the Techstream.
- (f) Select the Data List on the Techstream  .

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Wheel Cylinder Pressure Sensor	Wheel cylinder pressure sensor / Min.: 0.00 V, Max.: 5.00 V	When brake pedal released: 0.10 to 0.90 V	Reading increases when brake pedal is depressed

(g) Check that the output value of the wheel cylinder pressure sensor does not increase.

OK:

The output value of the wheel cylinder pressure sensor does not increase.

HINT:


If the output value increases, there may be brake fluid leaks in the brake actuator.

RESULT	PROCEED TO
The output value of the wheel cylinder pressure sensor increases.	A
The output values of the wheel cylinder pressure sensor does not increase.	B

B ▶ REPLACE BRAKE BOOSTER PUMP ASSEMBLY

A
▼

4.	REPLACE BRAKE BOOSTER WITH MASTER CYLINDER ASSEMBLY
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(a) Replace the brake actuator (brake booster with master cylinder assembly)  .

NEXT ▶ REPLACE BRAKE BOOSTER PUMP ASSEMBLY



Last Modified: 6-28-2019	6.8:8.0.48	Doc ID: [REDACTED]
Model Year Start: 2012	Model: Camry HV	Prod Date Range: [10/2011 -]
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: ELECTRONICALLY CONTROLLED BRAKE SYSTEM: C1202/68; Master Reservoir Level Malfunction; 2012 MY Camry HV [10/2011 -]		

DTC	C1202/68	Master Reservoir Level Malfunction
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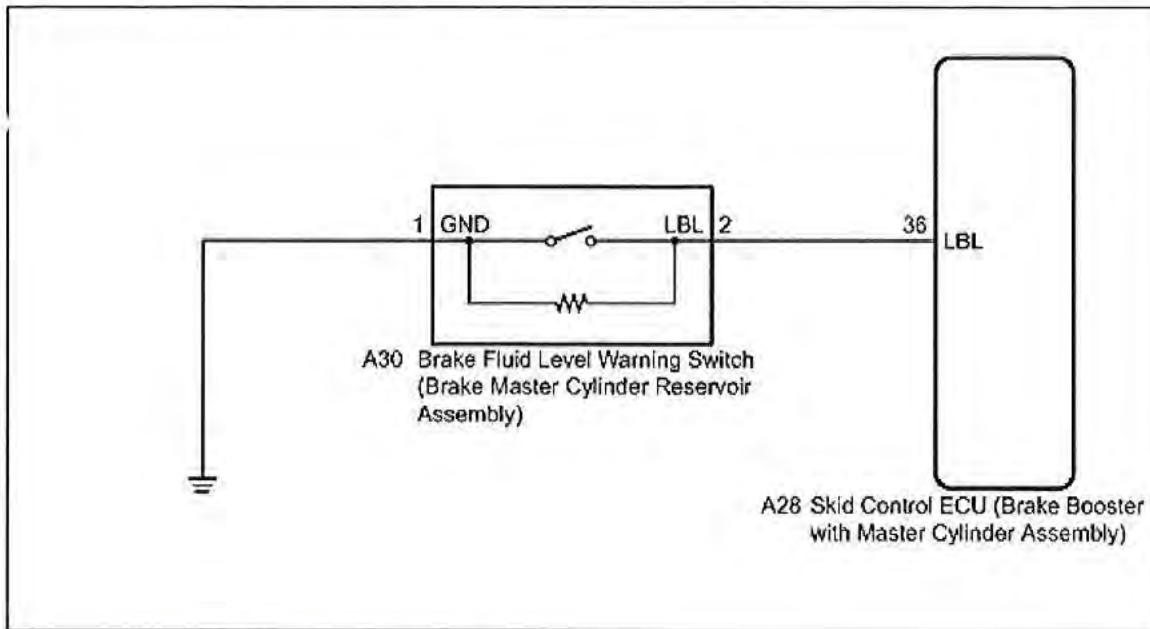
DESCRIPTION

When a fluid level drop in the brake master cylinder reservoir assembly is detected, a signal is sent to the skid control ECU.

If the DTC for the fluid level drop is memorized, the warning will be canceled and the DTC will not be stored when the fluid level returns to normal.

DTC NO.	INF CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1202/68	371	An open is detected in the switch signal circuit for 2 seconds or more.	<ul style="list-style-type: none"> • Brake fluid level warning switch (Brake master cylinder reservoir assembly) internal open circuit • Open in wire harness • Skid control ECU (Brake booster with master cylinder assembly)
↑	-	The reservoir level remains low.	<ul style="list-style-type: none"> • Low brake fluid level • Brake fluid leaks • Brake fluid level warning switch (Brake master cylinder reservoir assembly) internal short circuit • Short in wire harness • Brake disc rotor excessive wear • Skid control ECU (Brake booster with master cylinder assembly)

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

When replacing the skid control ECU (brake booster with master cylinder assembly), perform initialization and calibration of the linear solenoid valve [INFO](#).

HINT:

Before releasing the parking brake, check the wheels for safety.

PROCEDURE

1.	CHECK BRAKE FLUID LEVEL
-----------	--------------------------------

(a) Check that the brake fluid level is sufficient.

OK:

Brake fluid level is sufficient.

HINT:

If the fluid level is low, check for fluid leaks, and repair as necessary.

(1) Check for brake fluid leaks (Connection between the brake booster pump assembly, brake master cylinder reservoir assembly and brake booster with master cylinder assembly, and the brake booster with master cylinder assembly and wheel cylinders).

HINT:

If no leaks exist, add and adjust fluid using the Techstream [INFO](#).

(2) Check that the DTC is not output again [INFO](#).

(b) Check that there are no leaks from the connections between the brake booster pump assembly and brake booster with master cylinder assembly.

HINT:

As a visual check is very difficult, perform the check with the following procedure.

- (1) Bleed the air from the brake system **INFO**.
- (2) Connect the Techstream to the DLC3.
- (3) Turn the power switch on (IG).
- (4) Select the Data List on the Techstream **INFO**.

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Accumulator Sensor	Accumulator pressure sensor / Min.: 0.00 V, Max.: 5.00 V	Specified value: 2.90 to 4.20 V	When brake fluid is stored in the accumulator; Accumulator pressure changes in accordance with volume of fluid stored in the accumulator

- (5) Wait for 30 seconds without depressing the brake pedal.
- (6) Check that the accumulator pressure sensor output value change is within the specified range.
OK:
Accumulator pressure sensor output value change is less than 0.55 V.

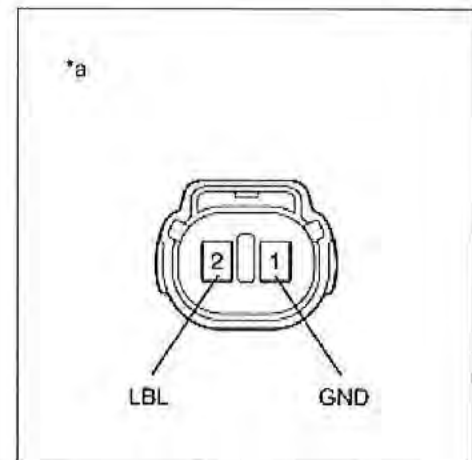
NG ► **CHECK AND REPAIR BRAKE FLUID LEAKS OR ADD FLUID**

OK



2.	INSPECT BRAKE FLUID LEVEL WARNING SWITCH
-----------	---

- (a) Turn the power switch off.



- (b) Remove the reservoir filler cap.
- (c) Make sure that there is no looseness at the locking part and the connecting part of the connector.
- (d) Disconnect the brake fluid level warning switch (brake master cylinder reservoir assembly) connector.

(e) Measure the resistance according to the value(s) in the table below.

HINT:

A float is located inside the reservoir. Its position changes according to the level of brake fluid.

Standard Resistance:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
1 (GND) - 2 (LBL)	Brake fluid level warning switch OFF (Float up)	1.84 to 2.16 k Ω
1 (GND) - 2 (LBL)	Brake fluid level warning switch ON (Float down)	Below 1 Ω

Text in Illustration

*a	Component without harness connected (Brake Fluid Level Warning Switch (Brake Master Cylinder Reservoir Assembly))
----	--

NG  **REPLACE BRAKE MASTER CYLINDER RESERVOIR ASSEMBLY**

OK



3.	CHECK HARNESS AND CONNECTOR (SKID CONTROL ECU - BRAKE FLUID LEVEL WARNING SWITCH)
----	--

(a) Make sure that there is no looseness at the locking part and the connecting part of the connector.

(b) Disconnect the skid control ECU (brake booster with master cylinder assembly) connector.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A28-36 (LBL) - A30-2 (LBL)	Always	Below 1 Ω
A28-36 (LBL) - Body ground	Always	10 k Ω or higher
A30-1 (GND) - Body ground	Always	Below 1 Ω

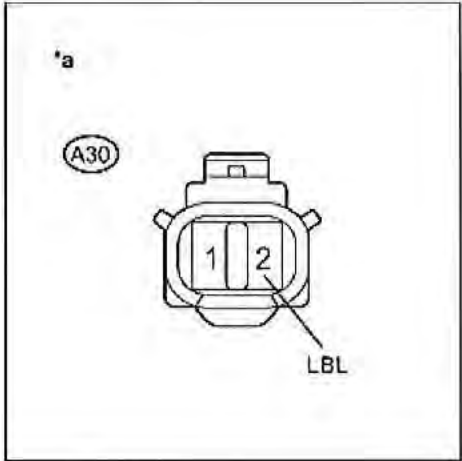
NG  **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK



4. INSPECT SKID CONTROL ECU (SWITCH INPUT)

(a) Reconnect the skid control ECU (brake booster with master cylinder assembly) connector.



(b) Turn the power switch on (IG).

(c) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A30-2 (LBL) - Body ground	Power switch on (IG)	11 to 14 V

Text in Illustration

*a	Front view of wire harness connector (to Brake Fluid Level Warning Switch (Brake Master Cylinder Reservoir Assembly))
----	---

NG ▶ **REPLACE BRAKE BOOSTER WITH MASTER CYLINDER ASSEMBLY**

OK
▼

5. CHECK BRAKE DISC

(a) Turn the power switch off.

(b) Reconnect the brake fluid level warning switch (brake master cylinder reservoir assembly) connector.



(c) Disconnect the brake pedal stroke sensor assembly connector.

(d) Perform a road test according to Freeze Frame Data or customer problem analysis. While driving, check for abnormal brake pedal vibration caused by brake discs that are worn or have excess runout.

OK:

Brake pedal does not vibrate during braking.


HINT:

- An unevenly worn disc may vibrate the caliper pistons and cause fluctuations in brake line pressure, triggering a malfunction detection condition.
- The brake pedal does not kick back due to caliper piston vibration during electronically controlled brake system control.
- If the brake pedal stroke sensor assembly connector is disconnected, the fail-safe function will prohibit electronically controlled brake system control.
- The Active Test does not prohibit electronically controlled brake system control when the vehicle is being driven, so disconnect the brake pedal stroke sensor assembly connector before continuing with inspection.
- Uneven disc wear can be checked by measuring the disc thickness variation  for front, or  for rear).

NG  **REPLACE BRAKE DISC****OK**


6.	RECONFIRM DTC
-----------	----------------------

(a) Reconnect the brake pedal stroke sensor assembly connector.

(b) Clear the DTCs .


(c) Turn the power switch on (READY).

(d) Perform a road test.

(e) Check if the same DTC is output .

RESULT	PROCEED TO
DTC C1202/68 is not output.	A
DTC C1202/68 is output.	B

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step .

B  **REPLACE BRAKE BOOSTER WITH MASTER CYLINDER ASSEMBLY**

A  **CHECK FOR INTERMITTENT PROBLEMS**



Last Modified: 6-28-2019	6.8:8.0.48	Doc ID: [REDACTED]
Model Year Start: 2012	Model: Camry HV	Prod Date Range: [10/2011 -]
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: ELECTRONICALLY CONTROLLED BRAKE SYSTEM: C1252/52,C1253/53; Brake Booster Pump Motor on Time Abnormally Long; 2012 MY Camry HV [10/2011 -]		

DTC	C1252/52	Brake Booster Pump Motor on Time Abnormally Long
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DTC	C1253/53	Pump Motor Relay Malfunction
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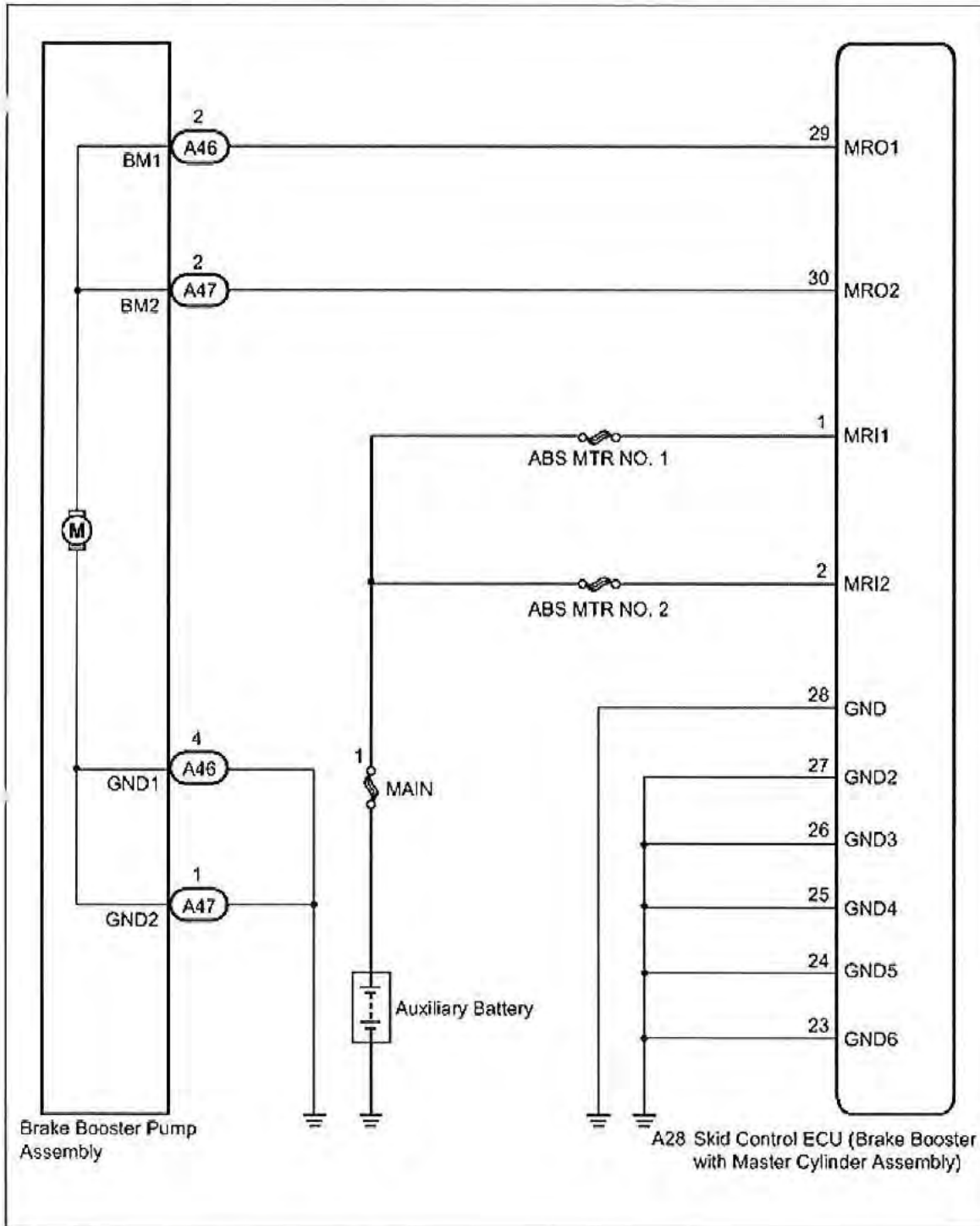
DESCRIPTION

The skid control ECU detects decreases in the accumulator pressure according to the data from the accumulator pressure sensor, and then starts and stops the pump motor by operating the motor relay.

DTC NO.	INF CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1252/52	311	The pump motor is operating continuously for 178 seconds or more. (When relay malfunction is 98 seconds or more.)	<ul style="list-style-type: none"> • Short in motor circuit or motor monitor circuit • Motor relay stuck • Accumulator pressure sensor malfunction in brake actuator (Brake booster with master cylinder assembly) • Skid control ECU (Brake booster with master cylinder assembly)
C1253/53	321	With the IG1 terminal voltage 9.5 V or more, the motor drive monitor remains off for 0.2 seconds or more after a motor drive on request.	<ul style="list-style-type: none"> • Open in motor circuit or motor monitor circuit • Skid control ECU (Brake booster with master cylinder assembly)
↑	322	The motor drive monitor remains on for 2 seconds or more after a motor drive off request.	<ul style="list-style-type: none"> • Short in motor circuit or motor monitor circuit • Skid control ECU (Brake booster with master cylinder assembly)
↑	323	The skid control ECU internal motor drive logical inconsistency continues for 2 seconds or more.	Skid control ECU (Brake booster with master cylinder assembly)
↑	324	An open circuit in both skid control ECU internal motor relays 1 and 2.	<ul style="list-style-type: none"> • Open in motor circuit or motor monitor circuit • Skid control ECU (Brake booster with master cylinder assembly)
↑	325	An open circuit in both skid control ECU internal motor relays 1 and 3.	↑

DTC NO.	INF CODE	DTC DETECTION CONDITION	TROUBLE AREA
↑	326	An open circuit in both skid control ECU internal motor relays 2 and 3.	↑
↑	327	An open circuit in skid control ECU internal motor relay 1.	↑
↑	328	An open circuit in skid control ECU internal motor relay 2.	↑
↑	329	An open circuit in skid control ECU internal motor relay 3.	↑

WIRING DIAGRAM




INSPECTION PROCEDURE

NOTICE:

When replacing the skid control ECU (brake booster with master cylinder assembly) or brake actuator (brake booster with master cylinder assembly), perform initialization and calibration of the linear solenoid valve INFO

PROCEDURE


1. **PERFORM ACTIVE TEST USING TECHSTREAM (ABS MOTOR RELAY)**

- (a) Connect the Techstream to the DLC3.
- (b) Turn the power switch on (IG).
- (c) Select the Active Test on the Techstream .

ABS/VSC/TRAC

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
ECB* Motor Relay	ABS motor relay	Relay ON/OFF	-

*: Electronically Controlled Brake System

- (d) Select the Data List on the Techstream .


ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
ECB* Motor Relay	ABS motor relay / ON or OFF	ON: Relay on OFF: Relay off	-

*: Electronically Controlled Brake System

- (e) Check the operating condition of the ABS motor relay when operating it using the Techstream.

RESULT	PROCEED TO
ABS motor relay in the Data List turns ON/OFF using the Active Test.	A
ABS motor relay in the Data List does not change using the Active Test.	B

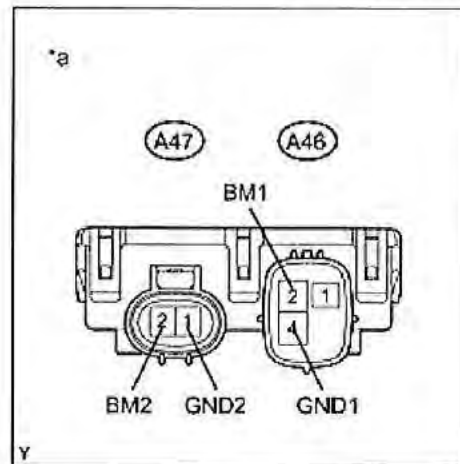
B  **GO TO STEP 6**

A



2.	INSPECT BRAKE BOOSTER PUMP ASSEMBLY
-----------	--

- (a) Turn the power switch off.



- (b) Make sure that there is no looseness at the locking part and the connecting part of the connectors.
- (c) Disconnect the brake booster pump assembly connectors.
- (d) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A46-2 (BM1) - A46-4 (GND1)	Always	Below 10 Ω
A47-2 (BM2) - A47-1 (GND2)	Always	Below 10 Ω
A46-2 (BM1) - A47-2 (BM2)	Always	Below 1 Ω
A46-4 (GND1) - A47-1 (GND2)	Always	Below 1 Ω

Text in Illustration

*a	Component without harness connected (Brake Booster Pump Assembly)
----	--

NG ▶ REPLACE BRAKE BOOSTER PUMP ASSEMBLY

OK



3. CHECK HARNESS AND CONNECTOR (GND TERMINAL)

- (a) Measure the resistance according to the value(s) in the table below.

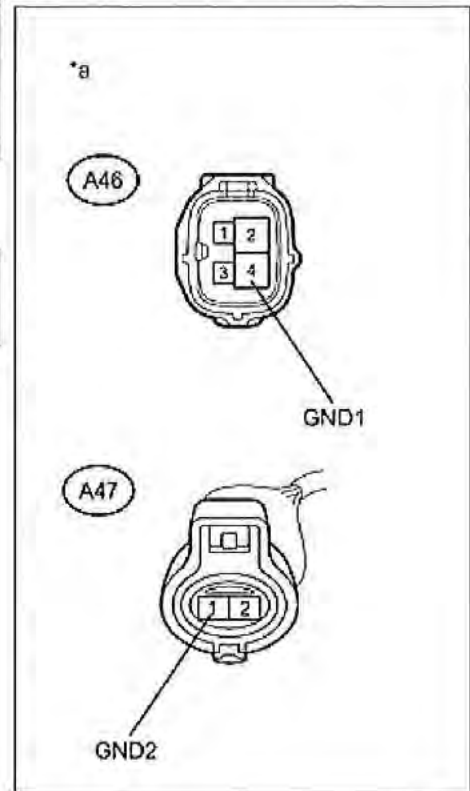
Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A46-4 (GND1) - Body ground	Always	Below 1 Ω
A47-1 (GND2) - Body ground	Always	Below 1 Ω

Text in Illustration

*a	Front view of wire harness connector (to Brake Booster Pump Assembly)
----	---



NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (GND CIRCUIT)

OK

4. READ VALUE USING TECHSTREAM (ACCUMULATOR PRESSURE SENSOR)

- (a) Reconnect the brake booster pump assembly connectors.
- (b) Connect the Techstream to the DLC3.
- (c) Turn the power switch on (IG).
- (d) Select the Data List on the Techstream **NP**.

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Accumulator Sensor	Accumulator pressure sensor / Min.: 0.00 V, Max.: 5.00 V	Specified value: 2.90 to 4.20 V	When brake fluid is stored in the accumulator: Accumulator pressure changes in accordance with volume of fluid stored in the accumulator

(e) Wait for 30 seconds without depressing the brake pedal.

(f) Check that the accumulator pressure sensor output value change is within the specified range.

OK:

Accumulator pressure sensor output value change is less than 0.55 V.

NG ▶ GO TO STEP 8

OK



5. RECONFIRM DTC

(a) Turn the power switch off.

(b) Clear the DTCs **WFO** .

(c) Turn the power switch on (IG).

(d) Check if the same DTC is output **WFO** .

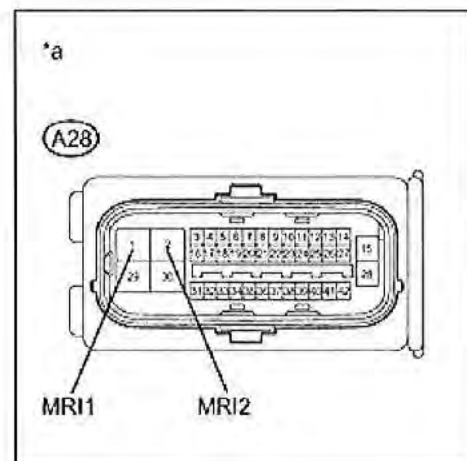
RESULT	PROCEED TO
DTCs C1252/52 and C1253/53 are not output.	A
DTCs C1252/52 and/or C1253/53 are output.	B

B ▶ REPLACE BRAKE BOOSTER WITH MASTER CYLINDER ASSEMBLY

A ▶ CHECK FOR INTERMITTENT PROBLEMS

6. CHECK HARNESS AND CONNECTOR (MRI TERMINAL)

(a) Turn the power switch off.



- (b) Check that the ABS MTR NO. 1 (50 A) and ABS MTR NO. 2 (50 A) fuses are normal.
- (c) Make sure that there is no looseness at the locking part and the connecting part of the connector.
- (d) Disconnect the skid control ECU (brake booster with master cylinder assembly) connector.
- (e) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A28-1 (MRI1) - Body ground	Always	11 to 14 V
A28-2 (MRI2) - Body ground	Always	11 to 14 V

Text in Illustration

*a	Front view of wire harness connector (to Skid Control ECU (Brake Booster with Master Cylinder Assembly))
----	---

NG ► REPAIR OR REPLACE HARNESS OR CONNECTOR (MRI CIRCUIT)

OK



7.	CHECK HARNESS AND CONNECTOR (SKID CONTROL ECU - BRAKE BOOSTER PUMP ASSEMBLY)
----	---

- (a) Make sure that there is no looseness at the locking part and the connecting part of the connectors.
- (b) Disconnect the brake booster pump assembly connectors.
- (c) Measure the resistance according to the value(s) in the table below.


Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A28-29 (MRO1) - A46-2 (BM1)	Always	Below 1 Ω
A28-29 (MRO1) - Body ground	Always	10 k Ω or higher
A28-30 (MRO2) - A47-2 (BM2)	Always	Below 1 Ω
A28-30 (MRO2) - Body ground	Always	10 k Ω or higher

NG ► REPAIR OR REPLACE HARNESS OR CONNECTOR

OK ► REPLACE BRAKE BOOSTER WITH MASTER CYLINDER ASSEMBLY

8. PERFORM ACTIVE TEST USING TECHSTREAM (SOLENOID VALVE)

(a) Select the Active Test on the Techstream .

HINT:

The Active Test can be performed when the following conditions are met.


- ABS main relay is on.
- Shift lever is in P.
- Parking brake is applied.
- Vehicle speed is 0 km/h (0 mph).

ABS/VSC/TRAC

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
ECB* Solenoid (SMC/SRC/SCC)	Switching solenoid valve (SMC/SRC/SCC)	Solenoid ON/OFF	Operation sound of solenoid (clicking sound) can be heard

*: Electronically Controlled Brake System

(b) Perform the Active Test of the solenoid using the Techstream.

(c) Select the Data List on the Techstream .

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Wheel Cylinder Pressure Sensor	Wheel cylinder pressure sensor / Min.: 0.00 V, Max.: 5.00 V	When brake pedal released: 0.10 to 0.90 V	Reading increases when brake pedal is depressed

(d) Check that the output value of the wheel cylinder pressure sensor does not increase.

OK:

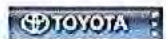
The output value of the wheel cylinder pressure sensor does not increase.

HINT:

If the output value increases, there may be brake fluid leaks in the brake actuator.

NG ► REPLACE BRAKE BOOSTER WITH MASTER CYLINDER ASSEMBLY

OK ► REPLACE BRAKE BOOSTER PUMP ASSEMBLY



Last Modified: 6-28-2019	6.8:8.0.48	Doc ID: [REDACTED]
Model Year Start: 2012	Model: Camry HV	Prod Date Range: [10/2011 -]
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: ELECTRONICALLY CONTROLLED BRAKE SYSTEM: C1256/56; Accumulator Low Pressure; 2012 MY Camry HV [10/2011 -]		

DTC	C1256/56	Accumulator Low Pressure
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DESCRIPTION

The accumulator pressure sensor is built into the brake actuator (brake booster with master cylinder assembly) and detects the accumulator pressure.

The skid control ECU turns on the brake warning light / red (malfunction) and brake warning light / yellow (minor malfunction), and sounds the meter buzzer if it senses a decrease in the accumulator pressure.

DTC C1256/56 may be stored if the accumulator pressure drops due to frequent braking (this is not a malfunction).

DTC NO.	INF CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1256/56	341	Significant drop in accumulator pressure continues. (DTCs will be stored and the buzzer will operate when either condition is met.)	<ul style="list-style-type: none"> • Accumulator pressure dropped due to frequent brake pedal operation (not a malfunction) • Pump motor malfunction • Accumulator deterioration • Accumulator pressure sensor (Brake booster with master cylinder assembly) • Supply voltage reduced

WIRING DIAGRAM

Refer to DTCs C1252/52 and C1253/53 [INFO](#) .

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator (brake booster with master cylinder assembly), perform initialization and calibration of the linear solenoid valve [INFO](#) .

HINT:

When C1202/68, C1241/41, C1252/52, C1253/53 and/or C1391/69 are output together with C1256/56, inspect and repair the trouble areas indicated by C1202/68, C1241/41, C1252/52, C1253/53 and/or C1391/69 first [INFO](#) , [INFO](#) , [INFO](#) , or [INFO](#)).

PROCEDURE

1.	BRAKE PROBLEM CHECK
-----------	----------------------------

(a) Ask the customer if frequent braking was performed while the brake warning light / yellow (minor malfunction) was on.

OK:

RESULT	PROCEED TO
Frequent braking was not performed.	A
Frequent braking was performed.	B

HINT:

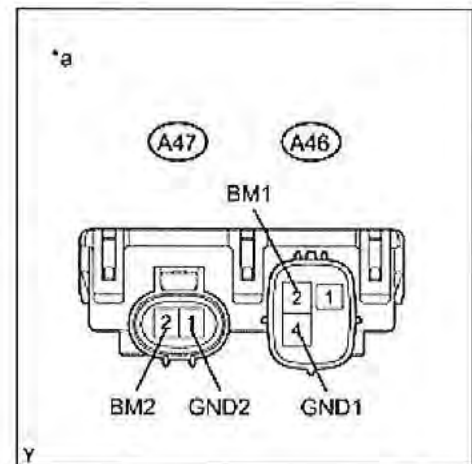
This DTC may be stored even if the accumulator pressure drops only temporarily due to frequent braking.

B ► END

A
▼

2.	INSPECT BRAKE BOOSTER PUMP ASSEMBLY
-----------	--

(a) Make sure that there is no looseness at the locking part and the connecting part of the connectors.



(b) Disconnect the brake booster pump assembly connectors.

(c) Measure the resistance according to the value(s) in the table below.


Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A46-2 (BM1) - A46-4 (GND1)	Always	Below 10 Ω
A47-2 (BM2) - A47-1 (GND2)	Always	Below 10 Ω
A46-2 (BM1) - A47-2 (BM2)	Always	Below 1 Ω
A46-4 (GND1) - A47-1 (GND2)	Always	Below 1 Ω

Text in Illustration

*a	Component without harness connected (Brake Booster Pump Assembly)
----	--

NG ▶ REPLACE BRAKE BOOSTER PUMP ASSEMBLY**OK****3. READ VALUE USING TECHSTREAM (ACCUMULATOR PRESSURE SENSOR)**

- (a) Reconnect the brake booster pump assembly connectors.
- (b) Connect the Techstream to the DLC3.
- (c) Turn the power switch on (IG).
- (d) Select the Data List on the Techstream  .

ABS/VSC/TRAC


TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Accumulator Sensor	Accumulator pressure sensor / Min.: 0.00 V, Max.: 5.00 V	Specified value: 2.90 to 4.20 V	When brake fluid is stored in the accumulator: Accumulator pressure changes in accordance with volume of fluid stored in the accumulator

- (e) Wait for 30 seconds without depressing the brake pedal.
- (f) Check that the accumulator pressure sensor output value change is within the specified range.

OK:

Accumulator pressure sensor output value change is less than 0.55 V.

NG ▶ GO TO STEP 4**OK** ▶ CHECK FOR INTERMITTENT PROBLEMS**4. PERFORM ACTIVE TEST USING TECHSTREAM (SOLENOID VALVE)**

- (a) Select the Active Test on the Techstream  .

HINT:

The Active Test can be performed when the following conditions are met.


- ABS main relay is on.
- Shift lever is in P.
- Parking brake is applied.
- Vehicle speed is 0 km/h (0 mph).

ABS/VSC/TRAC

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
ECB* Solenoid (SMC/SRC/SCC)	Switching solenoid valve (SMC/SRC/SCC)	Solenoid ON/OFF	Operation sound of solenoid (clicking sound) can be heard

*: Electronically Controlled Brake System

(b) Perform the Active Test of the solenoid using the Techstream.

(c) Select the Data List on the Techstream .

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Wheel Cylinder Pressure Sensor	Wheel cylinder pressure sensor / Min.: 0.00 V, Max.: 5.00 V	When brake pedal released: 0.10 to 0.90 V	Reading increases when brake pedal is depressed

(d) Check that the output value of the wheel cylinder pressure sensor does not increase.

OK:

The output value of the wheel cylinder pressure sensor does not increase.

HINT:

If the output value increases, there may be brake fluid leaks in the brake actuator.

NG ▶ REPLACE BRAKE BOOSTER WITH MASTER CYLINDER ASSEMBLY

OK ▶ REPLACE BRAKE BOOSTER PUMP ASSEMBLY



Last Modified: 6-28-2019	6.8:8.0.48	Doc ID [REDACTED]
Model Year Start: 2012	Model: Camry HV	Prod Date Range: [10/2011 -]
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: ELECTRONICALLY CONTROLLED BRAKE SYSTEM: C1345/66,C1368/67; Linear Solenoid Valve Offset Learning Undone; 2012 MY Camry HV [10/2011 -]		

DTC	C1345/66	Linear Solenoid Valve Offset Learning Undone
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DTC	C1368/67	Linear Solenoid Valve Offset Malfunction
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DESCRIPTION

The skid control ECU stores and corrects the individual differences in the brake pedal stroke sensor assembly, actuator solenoids, and stroke simulator solenoid. Perform initialization and calibration of the linear solenoid valve if any of these parts is replaced.

The skid control ECU receives the shift position P signal from the power management control ECU through the CAN communication system.

The DTCs are cleared when the linear valve offset learning results are normal.

DTC NO.	INF CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1345/66	-	Linear valve offset learning undone.	Perform linear valve offset learning and check for DTCs. If no DTCs are output again, the valve is normal.
C1368/67	-	Offset learned value out of specification.	<ul style="list-style-type: none"> Perform linear valve offset learning and check for DTCs. If no DTCs are output again, the valve is normal. Brake actuator (Brake booster with master cylinder assembly)

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator (brake booster with master cylinder assembly), perform initialization and calibration of the linear solenoid valve **INFO** .

HINT:

When C1451/72 is output together with C1345/66 and/or C1368/67, inspect and repair the trouble areas indicated by C1451/72 first **INFO** .



PROCEDURE

1.	CHECK DTC
-----------	------------------

(a) Clear the DTCs **INFO** .

(b) Turn the power switch off.

(c) Turn the power switch on (IG).

(d) Check the DTCs (electronically controlled brake system and hybrid control system) that are output  for the electronically controlled brake system, or  for the hybrid control system).

RESULT	PROCEED TO
DTCs (except C1345/66, C1368/67 and hybrid control system DTC) are not output.	A
Hybrid control system DTC is output.	B
DTCs (except C1345/66 and/or C1368/67) are output.	C

HINT:

Before performing initialization and calibration of the linear solenoid valve, C1203/95 will be output.

B ▶ **INSPECT HYBRID CONTROL SYSTEM**


C ▶ **REPAIR CIRCUITS INDICATED BY OUTPUT DTCs**

A



2.	PERFORM INITIALIZATION AND CALIBRATION OF LINEAR SOLENOID VALVE
-----------	--

(a) Turn the power switch off.


(b) Perform initialization and calibration of the linear solenoid valve .

NEXT




3.	RECONFIRM DTC
-----------	----------------------

(a) Turn the power switch off.

(b) Clear the DTCs .

(c) Turn the power switch on (IG).

(d) Check if the same DTC is output .

RESULT	PROCEED TO
DTCs C1345/66 and C1368/67 are not output.	A
DTCs C1345/66 and/or C1368/67 are output.	B

B ▶ REPLACE BRAKE BOOSTER WITH MASTER CYLINDER ASSEMBLY

A ▶ END



Last Modified: 6-28-2019	6.8:8.0.48	Doc ID: [REDACTED]
Model Year Start: 2012	Model: Camry HV	Prod Date Range: [10/2011 -]
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: ELECTRONICALLY CONTROLLED BRAKE SYSTEM: C1451/72; Motor Drive Permission Malfunction; 2012 MY Camry HV [10/2011 -]		

DTC	C1451/72	Motor Drive Permission Malfunction
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DESCRIPTION

If air bleeding has not been performed, the skid control ECU stores DTC C1451/72 to prevent the entry of air due to pump motor operation.

DTC C1451/72 is stored when Invalid Mode is selected, the system will not return to normal until the air bleeding procedure is performed.

DTC NO.	INF CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1451/72	-	Air bleeding has not been performed.	<ul style="list-style-type: none"> • Brake fluid leaks • Air bleeding not performed

INSPECTION PROCEDURE

PROCEDURE


1.	CHECK BRAKE FLUID LEVEL
-----------	--------------------------------


(a) Check that the brake fluid level is sufficient.

OK:

Brake fluid level is sufficient.

HINT:


- If the fluid level drops, check for fluid leaks, and repair as necessary.
- If no fluid leaks exist, add and adjust fluid .

NG  **CHECK AND REPAIR BRAKE FLUID LEAKS OR ADD FLUID**

OK



2.	PERFORM AIR BLEEDING
-----------	-----------------------------

(a) Bleed the air from the brake system .


HINT:

If air bleeding has been performed, this DTC will be cleared.

NEXT



3.	RECONFIRM DTC
-----------	----------------------

(a) Check if the same DTC is output  .


RESULT	PROCEED TO
DTC C1451/72 is output.	A
DTC C1451/72 is not output.	B

B  **END**

A



4.	CLEAR DTC
-----------	------------------

(a) Clear the DTCs  .

NEXT  **END**



DP19-004

CAPISTRANO TOYOTA

9-19-2019

ATTACHMENT

SECTION 4.3

AVALON HYBRID

Last Modified: 6-26-2019	6.8:8.0.48	Doc ID [REDACTED]
Model Year Start: 2013	Model: Avalon HV	Prod Date Range: [11/2012 -]
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: ELECTRONICALLY CONTROLLED BRAKE SYSTEM: FAIL-SAFE CHART; 2013 MY Avalon HV [11/2012 -]		

FAIL-SAFE CHART

1. FAIL-SAFE FUNCTION OF CONTROL SYSTEM

- (a) When a malfunction is detected in the brake control system, the skid control ECU (brake booster with master cylinder assembly) turns the ABS warning, brake warning / red (malfunction), brake warning / yellow (minor malfunction) and slip indicator lights on, as well as prohibits ABS, BA, TRAC and VSC operation.
- (b) If the skid control ECU (brake booster with master cylinder assembly) detects that a system related to the hybrid control system is malfunctioning, it will prohibit operations of the TRAC and VSC systems in order to prevent further malfunctions and to protect the systems.

ITEM	OPERATION
Malfunction in the ABS.	ABS, BA, TRAC and VSC control prohibited.
Malfunction in the BA system.	ABS, BA, TRAC and VSC control prohibited.
Malfunction in the EBD system.	ABS, EBD, BA, TRAC and VSC control prohibited.
Malfunction in the TRAC system.	ABS, BA, TRAC and VSC control prohibited.
Malfunction in the VSC system.	ABS, BA, TRAC and VSC control prohibited.

2. FAIL-SAFE FUNCTION OF HYDRAULIC SYSTEM

- (a) If a malfunction is detected in the skid control ECU (brake booster with master cylinder assembly) or brake actuator (brake booster with master cylinder assembly) or an individual sensor, control will be stopped and brake effort will be generated by the hydraulic brake booster (brake booster with master cylinder assembly).
- (b) If brake control is stopped due to a malfunction in the hydraulic pressure source, the pressure generated in the master cylinder by the driver is applied to the wheel cylinders to ensure braking force.

ITEM	OPERATION
Skid control ECU (Brake booster with master cylinder assembly) malfunction.	Hydraulic brake booster (brake booster with master cylinder assembly) generates braking force.
Hydraulic pressure controlling components malfunction.	Hydraulic brake booster (brake booster with master cylinder assembly) generates braking force.
Power supply components (Hydraulic pressure source) malfunction.	Braking force solely generated by the driver.



Last Modified: 6-26-2019	6.8:8.0.48	Doc ID: [REDACTED]
Model Year Start: 2013	Model: Avalon HV	Prod Date Range: [11/2012 -]
Title: NETWORKING: CAN COMMUNICATION SYSTEM: FAIL-SAFE CHART; 2013 MY Avalon HV [11/2012 -]		

FAIL-SAFE CHART

1. FAIL-SAFE FUNCTION

(a) When communication fails in any of the CAN bus lines (communication lines), a fail-safe function(s) will operate. The fail-safe function that is specified for each system operates to prevent those systems from malfunctioning.

(b) The following table shows the effects on each system when communication is impossible. (For further details, see the pages for each system.)

FUNCTION	CONTROL MASTER	SYSTEM RELATED	FAIL-SAFE OPERATION	DRIVER DETECTABLE	DTC DETECTION (ECU THAT STORED DTC)
Air Conditioning Control <ul style="list-style-type: none"> • Corrects engine speed, such as for idle up. • Controls outlet air temperature, outlet mode change and airflow volume based on engine coolant temperature signal. • Corrects engine coolant temperature map and changes compressor lock judgment value. 	Air conditioning amplifier assembly	<ul style="list-style-type: none"> • ECM • Power management control ECU 	Control is performed based on default coolant temperature of 80°C (176°F).	-	U0100 U0293 (Air conditioning amplifier assembly)
Simple Load Control <ul style="list-style-type: none"> • Performs electric load control according to load control level signal. 	Air conditioning amplifier assembly	Power steering ECU assembly	Load control is not performed.	-	U0131 (Air conditioning amplifier assembly)

FUNCTION	CONTROL MASTER	SYSTEM RELATED	FAIL-SAFE OPERATION	DRIVER DETECTABLE	DTC DETECTION (ECU THAT STORED DTC)
Panel Dimming Control <ul style="list-style-type: none"> Outputs dimmer signal to LIN connected panels according to display dimmer signal. 	Air conditioning amplifier assembly	Main body ECU (Multiplex network body ECU)	Dimming mode and non-dimming mode cannot be switched.	-	U0142 (Air conditioning amplifier assembly)
Destination Identification Control <ul style="list-style-type: none"> Changes air conditioning control pattern according to destination. 	Air conditioning amplifier assembly	Main body ECU (Multiplex network body ECU)	Maintains the latest state.	-	U0142 (Air conditioning amplifier assembly)
Remote Start Control <ul style="list-style-type: none"> Controls air conditioning system operation condition according to remote start signal. 	Air conditioning amplifier assembly	Main body ECU (Multiplex network body ECU)	Air conditioning system does not activate based on remote start signal.	-	-
Ambient Temperature Correction Control <ul style="list-style-type: none"> Switches air conditioning system operation condition and corrects value of displayed ambient temperature according to vehicle speed signal. 	Air conditioning amplifier assembly	Combination meter assembly	Control is performed based on default vehicle speed of 0 km/h (0 mph).	<ul style="list-style-type: none"> Correction level for displayed ambient temperature declines. Correction level for outlet airflow declines. 	U0155 (Air conditioning amplifier assembly)
Air Conditioning Eco Mode Control <ul style="list-style-type: none"> Limits air conditioning system control. 	Air conditioning amplifier assembly	Power management control ECU	Maintains the latest state. (Maintained in normal condition after reset.)	-	U0101 (Air conditioning amplifier assembly)

FUNCTION	CONTROL MASTER	SYSTEM RELATED	FAIL-SAFE OPERATION	DRIVER DETECTABLE	DTC DETECTION (ECU THAT STORED DTC)
Power Steering Control <ul style="list-style-type: none"> Calculates assist current according to torque sensor value and vehicle speed and drives motor. 	Power steering ECU assembly	<ul style="list-style-type: none"> Power management control ECU Skid control ECU (Brake booster with master cylinder assembly) Steering sensor 	<p>When communication with power management control ECU is interrupted:</p> <ul style="list-style-type: none"> Power steering assist is not provided. <p>When communication with skid control ECU (brake booster with master cylinder assembly) is interrupted:</p> <ul style="list-style-type: none"> Control continues based on a default speed of 100 km/h (62 mph) because vehicle speed is unrecognizable. (Steering wheel feels heavy when the vehicle speed is below 100 km/h (62 mph) and feels light at speeds above 100 km/h (62 mph).) 	EPS warning light illuminates.	U0129 U0293 (Power steering ECU assembly)
Steering Assist Calculation <ul style="list-style-type: none"> Changes assist force based on vehicle speed. 	Power steering ECU assembly	Skid control ECU (Brake booster with master cylinder assembly)	Control continues based on a default speed of 100 km/h (62 mph) because vehicle speed is unrecognizable. (Steering wheel feels heavy when the vehicle speed is below 100 km/h (62 mph) and feels light at speeds above 100 km/h (62 mph).)	EPS warning light illuminates.	U0129 (Power steering ECU assembly)
Initialization and Zero Point Learning <ul style="list-style-type: none"> Performs steering angle sensor initialization and zero point learning. 	Power steering ECU assembly	<ul style="list-style-type: none"> Airbag ECU assembly Skid control ECU (Brake booster with master cylinder assembly) Steering sensor 	Steering angle sensor initialization and zero point learning are not performed.	EPS warning light illuminates.	U0129 (Power steering ECU assembly)

FUNCTION	CONTROL MASTER	SYSTEM RELATED	FAIL-SAFE OPERATION	DRIVER DETECTABLE	DTC DETECTION (ECU THAT STORED DTC)
Steering Assist Compensation Control <ul style="list-style-type: none"> Provides steering assist with compensation amount based on vehicle speed. 	Power steering ECU assembly	Skid control ECU (Brake booster with master cylinder assembly)	Control is performed based on a default vehicle speed of approximately 100 km/h (62 mph).	EPS warning light illuminates.	U0129 (Power steering ECU assembly)
Vehicle Speed Display	Combination meter assembly	Skid control ECU (Brake booster with master cylinder assembly)	Speedometer is controlled based on a default vehicle speed of 0 km/h (0 mph).	Needle of speedometer remains at 0 km/h (0 mph).	U0129 (Combination meter assembly)
Engine Coolant Temperature Receiver Gauge Control	Combination meter assembly	ECM	Control is performed based on signal value of 0.	Needle of engine coolant temperature receiver gauge is at the middle or below.	-
Hybrid System Indicator Display	Combination meter assembly	Power management control ECU	Control is performed based on signal value of 0.	Needle of hybrid system indicator remains at the bottom.	U0100 (Combination meter assembly)
Meter Display <ul style="list-style-type: none"> Displays vehicle condition and controls indicator lights. 	Combination meter assembly	<ul style="list-style-type: none"> Power management control ECU ECM Skid control ECU (Brake booster with master cylinder assembly) Airbag ECU assembly Main body ECU (Multiplex network body ECU) Certification ECU (Smart key ECU assembly) Power steering ECU assembly Seat belt control ECU Driving support ECU assembly Blind spot monitor sensor LH 	Lights do not illuminate or lights remain illuminated.	Abnormal light operation.	U0100 U0129 U0131 U0142 (Combination meter assembly)

FUNCTION	CONTROL MASTER	SYSTEM RELATED	FAIL-SAFE OPERATION	DRIVER DETECTABLE	DTC DETECTION (ECU THAT STORED DTC)
<p>Buzzer</p> <ul style="list-style-type: none"> Controls sounding of buzzer for various functions. 	<p>Combination meter assembly</p>	<ul style="list-style-type: none"> Power management control ECU ECM Skid control ECU (Brake booster with master cylinder assembly) Airbag ECU assembly Main body ECU (Multiplex network body ECU) Certification ECU (Smart key ECU assembly) Power steering ECU assembly Driving support ECU assembly 	<p>Buzzer stops sounding or does not sound.</p>	<p>None</p>	<p>U0100 U0129 U0131 (Combination meter assembly)</p>
<p>ABS Control</p>	<p>Skid control ECU (Brake booster with master cylinder assembly)</p>	<p>Airbag ECU assembly</p>	<ul style="list-style-type: none"> When control is being performed: When back-up control (vehicle behavior stabilization) is complete, braking returns to normal operation and further control is prohibited. When control is not being performed: Control will not be started. 	<ul style="list-style-type: none"> Brake warning light (red) illuminates. ABS warning light illuminates. SLIP indicator illuminates. Brake warning light (yellow) illuminates. 	<p>U0073 U0124 (Skid control ECU (Brake booster with master cylinder assembly))</p>

FUNCTION	CONTROL MASTER	SYSTEM RELATED	FAIL-SAFE OPERATION	DRIVER DETECTABLE	DTC DETECTION (ECU THAT STORED DTC)
<p>TRAC/VSC Control</p>	<p>Skid control ECU (Brake booster with master cylinder assembly)</p>	<ul style="list-style-type: none"> • Airbag ECU assembly • Steering sensor • Power management control ECU • Power steering ECU assembly 	<ul style="list-style-type: none"> • When control is being performed: When back-up control (vehicle behavior stabilization) is complete, braking returns to normal operation and further control is prohibited. • When control is not being performed: Control will not be started. 	<ul style="list-style-type: none"> • Brake warning light (red) illuminates. • ABS warning light illuminates. • SLIP indicator illuminates. • Brake warning light (yellow) illuminates. 	<p>U0073 U0124 U0126 U0293 (Skid control ECU (Brake booster with master cylinder assembly))</p>
<p>Hill-start Assist Control</p> <ul style="list-style-type: none"> • Maintains brake pressure for 2 seconds when the brake pedal has been depressed further after stopping the vehicle. 	<p>Skid control ECU (Brake booster with master cylinder assembly)</p>	<ul style="list-style-type: none"> • Power management control ECU • Airbag ECU assembly • Steering sensor 	<ul style="list-style-type: none"> • During control: When backup control (depressurization control) is complete, further control cannot be performed. • Not during control: Control cannot be started. 	<ul style="list-style-type: none"> • Brake warning light (red) illuminates. • ABS warning light illuminates. • SLIP indicator illuminates. • Brake warning light (yellow) illuminates. 	<p>U0073 U0124 U0126 U0293 (Skid control ECU (Brake booster with master cylinder assembly))</p>
<p>Hybrid Regenerative Operation</p> <ul style="list-style-type: none"> • Regenerative cooperative control with the HV system. 	<p>Skid control ECU (Brake booster with master cylinder assembly)</p>	<ul style="list-style-type: none"> • Power management control ECU • Airbag ECU assembly 	<ul style="list-style-type: none"> • When control is being performed: HV cooperative control is continued based on the latest value and gradually decreased. After this, HV cooperative control is prohibited. • When control is not being performed: HV cooperative control does not start. 	<ul style="list-style-type: none"> • Brake warning light (red) illuminates. • ABS warning light illuminates. • SLIP indicator illuminates. • Brake warning light (yellow) illuminates. 	<p>U0073 U0124 U0293 (Skid control ECU (Brake booster with master cylinder assembly))</p>

FUNCTION	CONTROL MASTER	SYSTEM RELATED	FAIL-SAFE OPERATION	DRIVER DETECTABLE	DTC DETECTION (ECU THAT STORED DTC)
Pre-collision Brake Control <ul style="list-style-type: none"> Applies brakes based on command from the driving support ECU assembly. 	Driving support ECU assembly	<ul style="list-style-type: none"> Skid control ECU (Brake booster with master cylinder assembly) Power management control ECU Airbag ECU assembly Steering sensor Driving support ECU assembly 	<ul style="list-style-type: none"> When control is being performed: Pre-collision brake control is stopped and then prohibited. When control is not being performed: Pre-collision brake control is prohibited. 	<ul style="list-style-type: none"> Brake warning light (red) illuminates. ABS warning light illuminates. SLIP indicator illuminates. Brake warning light (yellow) illuminates. 	U0073 U0124 U0126 U0293 (Skid control ECU (Brake booster with master cylinder assembly))
Brake Fluid Pressure Control <ul style="list-style-type: none"> Controls brake fluid pressure based on the brake pedal position and applies brakes as required. 	Skid control ECU (Brake booster with master cylinder assembly)	Airbag ECU assembly	<ul style="list-style-type: none"> When control is being performed: Brake fluid pressure control is stopped immediately and mechanical brake operation is performed. When control is not being performed: Mechanical brake operation is performed. 	<ul style="list-style-type: none"> Brake warning light (red) illuminates. ABS warning light illuminates. SLIP indicator illuminates. Brake warning light (yellow) illuminates. 	U0073 U0124 (Skid control ECU (Brake booster with master cylinder assembly))
Drive Torque Control <ul style="list-style-type: none"> Controls the engine, MG1 and MG2 based on engine information received. 	Power management control ECU	ECM	Vehicle drives using only the motor.	<ul style="list-style-type: none"> Master warning light illuminates. MIL illuminates. 	U0100 (Power management control ECU)
Regenerative Operation <ul style="list-style-type: none"> Provides maximum amount of regeneration based on cooperative control with the ECB system. 	Power management control ECU	Skid control ECU (Brake booster with master cylinder assembly)	<ul style="list-style-type: none"> Regeneration is prohibited. TRAC operation is prohibited. 	Master warning light illuminates.	U0129 (Power management control ECU)

FUNCTION	CONTROL MASTER	SYSTEM RELATED	FAIL-SAFE OPERATION	DRIVER DETECTABLE	DTC DETECTION (ECU THAT STORED DTC)
<p>High Voltage Shut Off Control when the Vehicle is Damaged.</p> <ul style="list-style-type: none"> Receives the SRS collision detection signal and shuts off the system main relays. 	Power management control ECU	Airbag ECU assembly	Normal driving	Master warning light illuminates.	U0151 (Power management control ECU)
<p>Air Conditioning Control</p> <ul style="list-style-type: none"> Sends a signal from the air conditioning amplifier assembly to the power management control ECU and from the power management control ECU to the inverter for the air conditioning system. 	Air conditioning amplifier assembly	Power management control ECU	Normal driving	Air conditioning cooling operation is stopped.	U0164 (Power management control ECU)
<p>Cruise Control (w/o Dynamic Radar Cruise Control System)</p> <ul style="list-style-type: none"> Calculates demand drive force to maintain vehicle speed. 	Power management control ECU	<ul style="list-style-type: none"> Skid control ECU (Brake booster with master cylinder assembly) Combination meter assembly 	Cruise control is canceled.	Displays messages on the multi-information display.	U0122 (Power management control ECU)

FUNCTION	CONTROL MASTER	SYSTEM RELATED	FAIL-SAFE OPERATION	DRIVER DETECTABLE	DTC DETECTION (ECU THAT STORED DTC)
<p>Fuel Consumption Display</p> <ul style="list-style-type: none"> Displays graph of fuel consumption per minute and history of total fuel consumption. 	<ul style="list-style-type: none"> Navigation ECU sub-assembly Radio and display receiver assembly 	<ul style="list-style-type: none"> Skid control ECU (Brake booster with master cylinder assembly) Combination meter assembly ECM Power management control ECU 	<p>When communication with ECM, power management control ECU or skid control ECU (brake booster with master cylinder assembly) is interrupted:</p> <ul style="list-style-type: none"> Display is not updated. <p>When communication with combination meter is interrupted:</p> <ul style="list-style-type: none"> Display is not updated. Numeric part of driveable mileage is cleared. 		<p>U0100 U0129 U0155 U0293 (Navigation ECU sub-assembly) (Radio and display receiver assembly)</p>
<p>HV Energy Flow Display</p> <ul style="list-style-type: none"> Creates energy flow screen which indicates regeneration status and drive force transmission status. 	<ul style="list-style-type: none"> Navigation ECU sub-assembly Radio and display receiver assembly 	<p>Power management control ECU</p>	<p>When communications are interrupted while energy flow screen is displayed, the energy flow display will be deleted and the last value will be retained as remaining battery charge.</p>	<p>Flow display on the energy flow screen disappears.</p>	<p>U0100 U0293 (Navigation ECU sub-assembly) (Radio and display receiver assembly)</p>
<p>Destination Identification</p> <ul style="list-style-type: none"> Identifies destination based on destination and destination package information, and selects the time zone and language used for the display. 	<ul style="list-style-type: none"> Navigation ECU sub-assembly Radio and display receiver assembly 	<p>Main body ECU (Multiplex network body ECU)</p>	<p>Destination is identified based on information received before communication is interrupted.</p>	<p>Time zone and language selection screen are different from actual destination.</p>	<p>U0140 (Navigation ECU sub-assembly) (Radio and display receiver assembly)</p>

FUNCTION	CONTROL MASTER	SYSTEM RELATED	FAIL-SAFE OPERATION	DRIVER DETECTABLE	DTC DETECTION (ECU THAT STORED DTC)
<p>Vehicle Customization Function</p> <ul style="list-style-type: none"> Allows changing of operation and control conditions for vehicle functions via multi-display operation. 	<ul style="list-style-type: none"> Navigation ECU sub-assembly Radio and display receiver assembly 	<ul style="list-style-type: none"> Main body ECU (Multiplex network body ECU) Certification ECU (Smart key ECU assembly) Air conditioning amplifier assembly Front power seat switch LH 	<p>When an application that uses phase 4 remote communication is activated (customization/remote diagnosis), the process will be performed regardless of main body ECU (multiplex network body ECU) remote communication permit/prohibit state.</p>	<p>Related customization items are not displayed or do not change to set values.</p>	<p>U0073 (Navigation ECU sub-assembly) (Radio and display receiver assembly)</p>
<p>Rear View Monitor System</p> <ul style="list-style-type: none"> Displays images from the rear view camera. 	<ul style="list-style-type: none"> Navigation ECU sub-assembly Radio and display receiver assembly 	<ul style="list-style-type: none"> Power management control ECU Main body ECU (Multiplex network body ECU) 	<p>-</p>	<p>Screen does not change to the camera screen.</p> <ul style="list-style-type: none"> Entry lock/unlock or entry luggage compartment 	<p>U0100 (Navigation ECU sub-assembly) (Radio and display receiver assembly)</p>
<p>Entry Function</p> <ul style="list-style-type: none"> Entry lock/unlock, entry luggage compartment open Warning Performs entry illumination (Interior illumination etc). 	<ul style="list-style-type: none"> Main body ECU (Multiplex network body ECU) Certification ECU (Smart key ECU assembly) 	<ul style="list-style-type: none"> Main body ECU (Multiplex network body ECU) Certification ECU (Smart key ECU assembly) Combination meter assembly ECM 	<p>Entry unlock is performed again.</p>	<p>open does not operate.</p> <ul style="list-style-type: none"> Warning functions (Key confinement, Key not in vehicle, Key reminder etc.) do not operate. Key confinement prevention control does not operate. Entry illumination does not operate. 	<p>U0155 (Main body ECU (Multiplex network body ECU))</p> <p>U0100 U0142 U0155 (Certification ECU (Smart key ECU assembly))</p>
<p>Power Switch Backlighting Control</p> <ul style="list-style-type: none"> Turns on/off power switch illumination linked with 	<p>Certification ECU (Smart key ECU assembly)</p>	<p>Main body ECU (Multiplex network body ECU)</p>	<p>Power switch backlighting does not illuminate according to interior lights operation.</p>	<p>-</p>	<p>U0142 (Certification ECU (Smart key ECU assembly))</p>

FUNCTION etc.	CONTROL MASTER	SYSTEM RELATED	FAIL-SAFE OPERATION	DRIVER DETECTABLE	DTC DETECTION (ECU THAT STORED DTC)
Door Lock <ul style="list-style-type: none"> Controls key linked and automatic door lock/unlock function, key confinement prevention function, etc. 	Main body ECU (Multiplex network body ECU)	<ul style="list-style-type: none"> ECM Power management control ECU Airbag ECU assembly Combination meter assembly 	<ul style="list-style-type: none"> Speed sensitive automatic lock control does not occur. Shift linked automatic lock control does not occur. Shift linked automatic unlock control does not occur. Automatic lock/unlock cannot be changed. 	-	U0100 U0101 U0151 U0155 (Main body ECU (Multiplex network body ECU))
Display Automatic Dimming <ul style="list-style-type: none"> Display dimming control. 	Main body ECU (Multiplex network body ECU)	Combination meter assembly	Automatic dimming control for displays does not operate when taillights are turned on.	-	U0155 (Main body ECU (Multiplex network body ECU))
Luggage Compartment Door Opener/Luggage Compartment Door Open Control <ul style="list-style-type: none"> Accepts luggage compartment door opener request. 	Main body ECU (Multiplex network body ECU)	<ul style="list-style-type: none"> Combination meter assembly ECM Power management control ECU 	Luggage compartment door does not open.	-	U0100 U0101 U0155 (Main body ECU (Multiplex network body ECU))
Illumination Control	Main body ECU (Multiplex network body ECU)	<ul style="list-style-type: none"> Certification ECU (Smart key ECU assembly) Power management control ECU 	Interior lights turn off.	When communication with smart key ECU is interrupted: <ul style="list-style-type: none"> Interior lights do not turn off right after getting out of the vehicle. 	U0293 U0327 (Main body ECU (Multiplex network body ECU))
Seat and Mirror Control	Main body ECU (Multiplex network body ECU)	<ul style="list-style-type: none"> Front power seat switch LH Outer mirror control ECU assembly 	<ul style="list-style-type: none"> Memory function does not operate. Mirrors cannot be adjusted. 	-	U0120 U0155 U0199 U0200 U0208

FUNCTION	CONTROL MASTER	SYSTEM (Relative side)	FAIL-SAFE OPERATION	DRIVER DETECTABLE	U0327 DTC (Detection ECU THAT STORED network DTC body ECU))
		<ul style="list-style-type: none"> Outer mirror control ECU assembly (for Front passenger side) Power management control ECU Certification ECU (Smart key ECU assembly) Combination meter assembly 			
Entry Function/Wireless Control	Certification ECU (Smart key ECU assembly)	Main body ECU (Multiplex network body ECU)	Entry lock/unlock control is not possible.	-	U0327 (Main body ECU (Multiplex network body ECU))
Daytime Running Light Control	Main body ECU (Multiplex network body ECU)	<ul style="list-style-type: none"> ECM Power management control ECU 	Daytime running light control is not possible.	-	U0100 U0293 (Main body ECU (Multiplex network body ECU))
Engine Start/Stop Switch (Power Source Mode Change) <ul style="list-style-type: none"> Using start/stop switch signal as trigger, changes power source mode automatically and requests starter operation when conditions are met. 	Power management control ECU	<ul style="list-style-type: none"> ECM Main body ECU (Multiplex network body ECU) Combination meter assembly Skid control ECU (Brake booster with master cylinder assembly) 	None	A message is displayed on the multi-information display for 15 seconds when the power switch is turned from on (IG) to off.	U0293 Power management control ECU
Seat Position Memory System <ul style="list-style-type: none"> Controls the seat position based on 	Front power seat switch LH	<ul style="list-style-type: none"> Main body ECU (Multiplex network body ECU) ECM 	<ul style="list-style-type: none"> Driving position memory function is prohibited. Auto away/return function is 	-	-

FUNCTION operation conditions.	CONTROL MASTER	SYSTEMS RELATED management control ECU • Combination meter assembly	FAIL-SAFE OPERATION prohibited	DRIVER DETECTABLE	DTC DETECTION (ECU THAT STORED DTC)
Outer Mirror Surface Adjustment Control	<ul style="list-style-type: none"> Outer mirror control ECU assembly (for Driver side) Outer mirror control ECU assembly (for Front passenger side) 	Main body ECU (Multiplex network body ECU)	Manual adjustment does not operate.	-	U0142 (Outer mirror control ECU assembly (for Driver side)) (Outer mirror control ECU assembly (for Front passenger side))
Outer Mirror Surface Heater Control	<ul style="list-style-type: none"> Outer mirror control ECU assembly (for Driver side) Outer mirror control ECU assembly (for Front passenger side) 	<ul style="list-style-type: none"> Air conditioning amplifier assembly Main body ECU (Multiplex network body ECU) 	Heater does not operate.	-	U0142 (Outer mirror control ECU assembly (for Driver side)) (Outer mirror control ECU assembly (for Front passenger side))
Reverse-shift Linked Door Mirror Operation	<ul style="list-style-type: none"> Outer mirror control ECU assembly (for Driver side) Outer mirror control ECU assembly (for Front passenger side) 	Main body ECU (Multiplex network body ECU)	Reverse-shift linked door mirror function does not operate.	-	-
Mirror Surface Position Memory and Recall	<ul style="list-style-type: none"> Outer mirror control ECU assembly (for Driver side) 	Main body ECU (Multiplex network body ECU)	Mirror surface position cannot be memorized or recalled.	-	-

FUNCTION	CONTROLLER	SYSTEM RELATED	FAIL-SAFE OPERATION	DRIVER DETECTABLE	DTC DETECTION (ECU THAT STORED DTC)
Seat Memory Switch Signal Forwarding <ul style="list-style-type: none"> Transmits memory switch signal via the CAN bus. 	Outer mirror control ECU assembly (for Driver side)	<ul style="list-style-type: none"> Main body ECU (Multiplex network body ECU) Outer mirror control ECU assembly (for Front passenger side) 	Seat position memory settings cannot be memorized or recalled.	-	-
Dynamic Radar Cruise Control System <ul style="list-style-type: none"> Accelerates or decelerates the vehicle to maintain the distance to the vehicle ahead. 	Driving support ECU assembly	<ul style="list-style-type: none"> Airbag ECU assembly Steering sensor Skid control ECU (Brake booster with master cylinder assembly) Power management control ECU Combination meter assembly Main body ECU (Multiplex network body ECU) 	Control stops.	Displays messages on the multi-information display.	U0125 U0126 U0129 U0293 (Driving support ECU assembly)
Pre-collision System <ul style="list-style-type: none"> Controls the seat belts and brakes immediately 	Driving support ECU assembly	<ul style="list-style-type: none"> Airbag ECU assembly Steering sensor Skid control ECU (Brake 	Control stops.	<ul style="list-style-type: none"> Displays messages on the multi-information display. 	U0125 U0126 U0129 U0142 U0293

<p>FUNCTION before a crash.</p>	<p>CONTROL MASTER</p>	<p>SYSTEMS (with master cylinder assembly)</p> <ul style="list-style-type: none"> Power 	<p>FAIL-SAFE OPERATION</p>	<p>DRIVER DETECTABLE PCS indicator light flashes.</p>	<p>U1100 DTC (Detection support ECU assembly stored DTC)</p>
		<p>management control ECU</p> <ul style="list-style-type: none"> Seat belt control ECU Main body ECU (Multiplex network body ECU) 			
<p>Pre-collision System (Operation Condition 1)</p> <ul style="list-style-type: none"> When the VSC system suddenly brakes or the vehicle is unable to be controlled while spinning or drifting, the seat belt control ECU receives buckle switch information from the airbag ECU assembly and operates the pre-collision seat belts that retracts the seat belts to enhance the effect of the pretensioner. 	<p>Seat belt control ECU</p>	<ul style="list-style-type: none"> Airbag ECU assembly Skid control ECU (Brake booster with master cylinder assembly) Main body ECU (Multiplex network body ECU) 	<p>Control stops.</p>	<p>PCS indicator light flashes.</p>	<p>U0129 U0140 U0151 (Seat belt control ECU)</p>
<p>Pre-collision System (Operation Condition 2)</p> <ul style="list-style-type: none"> When the driving support ECU assembly has 	<p>Seat belt control ECU</p>	<ul style="list-style-type: none"> Airbag ECU assembly Skid control ECU (Brake booster with 	<p>Control stops.</p>	<p>PCS indicator light flashes.</p>	<p>U0129 U0140 U0151 U1104</p>

FUNCTION	CONTROL MASTER	SYSTEM RELATED	FAIL-SAFE OPERATION	DRIVER DETECTABLE	DTC (ECU THAT STORED DTC)
<p>Function that a collision is unavoidable based on information from the millimeter wave radar sensor assembly, the seat belt control ECU operates the pre-collision seat belts to enhance the effect of the pretensioner.</p>		<p>master cylinder assembly</p> <ul style="list-style-type: none"> Main body ECU (Multiplex network body ECU) Driving support ECU assembly 			<p>(Seat belt control ECU)</p>
<p>Blind Spot Monitor System Control</p> <ul style="list-style-type: none"> Detects vehicles in blind spot of adjacent lane and informs driver. 	<p>Blind spot monitor sensor LH</p>	<ul style="list-style-type: none"> Steering sensor Skid control ECU (Brake booster with master cylinder assembly) Main body ECU (Multiplex network body ECU) Power management control ECU 	<p>Blind spot monitor control is prohibited.</p>	<p>Displays messages on the multi-information display.</p>	<p>U0126 U0129 U0142 U0232 U0293 (Blind spot monitor sensor LH)</p>
<p>Gateway System (Between V bus and sub bus 11)</p> <ul style="list-style-type: none"> Relays data between V bus and sub bus 11, and monitors ECUs connected to sub bus 11. 	<p>Power management control ECU</p>	<ul style="list-style-type: none"> Driving support ECU assembly Blind spot monitor sensor LH Seat belt control ECU 	<p>-</p>	<p>-</p>	<p>U0104 U0233 U1002 U1100 (Power management control ECU)</p>



Last Modified: 6-26-2019	6.8:8.0.48	Doc ID: [REDACTED]
Model Year Start: 2013	Model: Avalon HV	Prod Date Range: [11/2012 -]
Title: PRE-COLLISION: PRE-COLLISION SYSTEM: C1A50; Brake System; 2013 MY Avalon HV [11/2012 -]		

DTC	C1A50	Brake System
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DESCRIPTION

When the driving support ECU receives an electronically controlled brake system malfunction signal from the skid control ECU via the CAN communication line, DTC C1A50 is stored.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1A50	While the power switch is on (IG). When the skid control ECU (brake booster with master cylinder assembly) detects a malfunction in the brake system, it sends a malfunction signal to the driving support ECU assembly via CAN communication and the driving support ECU assembly stores this DTC.	<ul style="list-style-type: none"> • CAN communication system • Electronically controlled brake system • Driving support ECU assembly • Brake booster with master cylinder assembly (skid control ECU)

INSPECTION PROCEDURE

HINT:

This circuit uses CAN communication. Therefore, be sure to check that the CAN communication system is normal before performing inspection.

PROCEDURE

1.	CHECK DTC OUTPUT (ELECTRONICALLY CONTROLLED BRAKE SYSTEM)
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(a) Check for electronically controlled brake system DTCs **WED**.


OK:

Electronically controlled brake system DTCs are not output.


NG  **GO TO ELECTRONICALLY CONTROLLED BRAKE SYSTEM**

OK

**2. REPLACE BRAKE BOOSTER WITH MASTER CYLINDER ASSEMBLY**

(a) Replace the brake booster with master cylinder assembly (skid control ECU) .

NEXT**3. CHECK DTC OUTPUT (PRE-COLLISION SYSTEM)**

- (a) Connect the Techstream to the DLC3.
- (b) Turn the power switch on (IG).
- (c) Turn the Techstream on.
- (d) Enter the following menus: Body Electrical / Pre-Collision 2 / Trouble Codes.
- (e) Clear the DTCs .
- (f) Drive the vehicle.
- (g) Recheck for DTCs.
 - OK:
 - DTC C1A50 is not output.

NG  **REPLACE DRIVING SUPPORT ECU ASSEMBLY**

OK  **END (BRAKE BOOSTER WITH MASTER CYLINDER ASSEMBLY WAS DEFECTIVE)**



Last Modified: 6-26-2019	6.8:8.0.48	Doc ID [REDACTED]
Model Year Start: 2013	Model: Avalon HV	Prod Date Range: [11/2012 -]
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: ELECTRONICALLY CONTROLLED BRAKE SYSTEM: C1252/52,C1253/53; Brake Booster Pump Motor on Time Abnormally Long; 2013 MY Avalon HV [11/2012 -]		

DTC	C1252/52	Brake Booster Pump Motor on Time Abnormally Long
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DTC	C1253/53	Pump Motor Relay Malfunction
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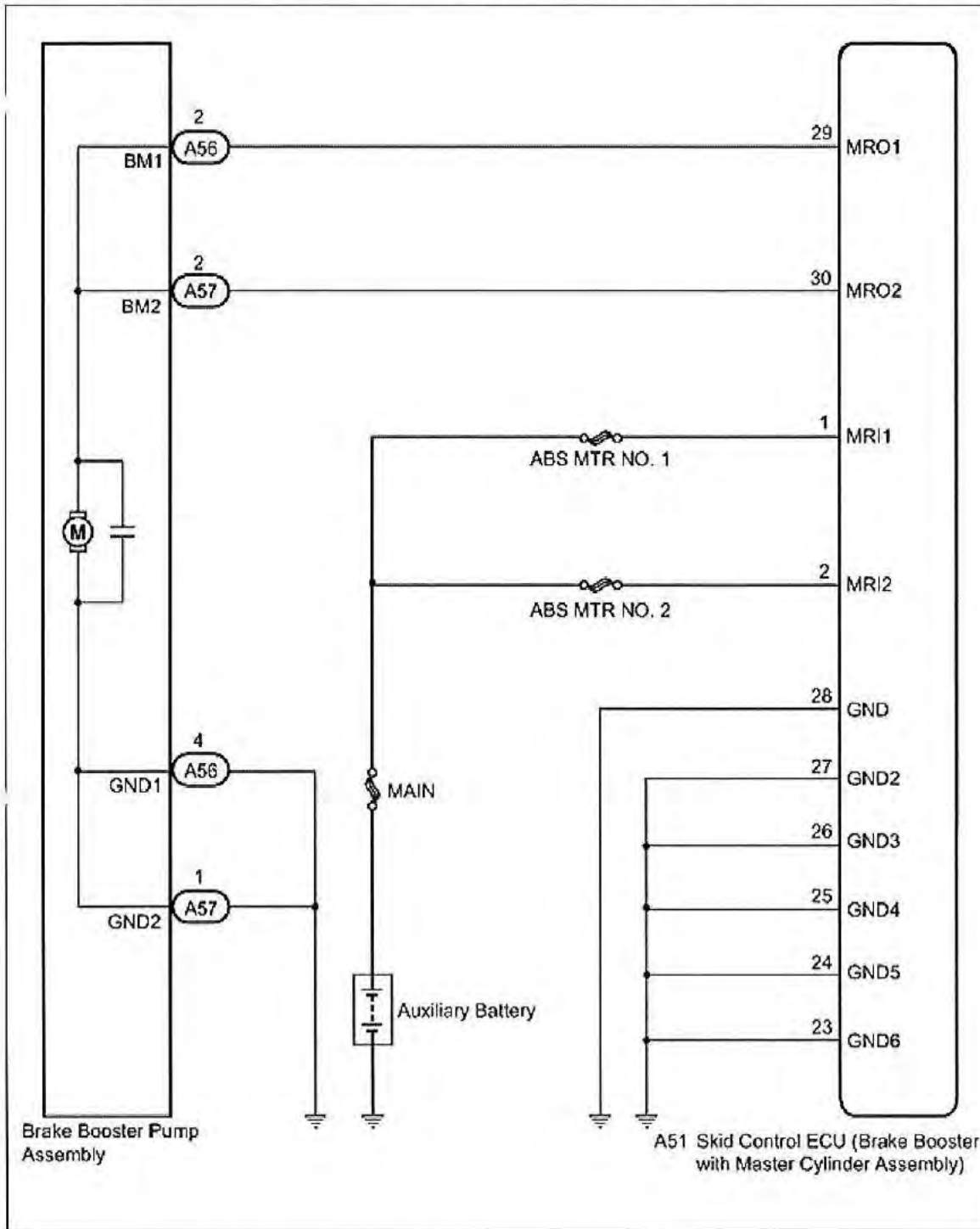
DESCRIPTION

The skid control ECU (brake booster with master cylinder assembly) detects decreases in the accumulator pressure according to the data from the accumulator pressure sensor, and then starts and stops the pump motor by operating the motor relay.

DTC NO.	INF CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1252/52	311	The pump motor is operating continuously for 178 seconds or more. (When the relay is malfunctioning for 98 seconds or more.)	<ul style="list-style-type: none"> • Short in motor circuit or motor monitor circuit • Motor relay stuck • Accumulator pressure sensor malfunction in brake actuator (Brake booster with master cylinder assembly) • Skid control ECU (Brake booster with master cylinder assembly)
C1253/53	321	With IG1 terminal voltage 9.5 V or more, the motor drive monitor remains off for 0.2 seconds or more after a motor drive on request.	<ul style="list-style-type: none"> • Open in motor circuit or motor monitor circuit • Skid control ECU (Brake booster with master cylinder assembly)
↑	322	The motor drive monitor remains on for 2 seconds or more after a motor drive off request.	<ul style="list-style-type: none"> • Short in motor circuit or motor monitor circuit • Skid control ECU (Brake booster with master cylinder assembly)
↑	323	The skid control ECU (brake booster with master cylinder assembly) internal motor drive logical inconsistency continues for 2 seconds or more.	Skid control ECU (Brake booster with master cylinder assembly)
↑	324	An open circuit is detected in the skid control ECU (brake booster with master cylinder assembly) internal motor relays 1 and 2.	<ul style="list-style-type: none"> • Open in motor circuit or motor monitor circuit • Skid control ECU (Brake booster with master cylinder assembly)

DTC NO.	INF CODE	DTC DETECTION CONDITION	TROUBLE AREA
↑	325	An open circuit is detected in the skid control ECU (brake booster with master cylinder assembly) internal motor relays 1 and 3.	↑
↑	326	An open circuit is detected in the skid control ECU (brake booster with master cylinder assembly) internal motor relays 2 and 3.	↑
↑	327	An open circuit is detected in the skid control ECU (brake booster with master cylinder assembly) internal motor relay 1.	↑
↑	328	An open circuit is detected in the skid control ECU (brake booster with master cylinder assembly) internal motor relay 2.	↑
↑	329	An open circuit is detected in the skid control ECU (brake booster with master cylinder assembly) internal motor relay 3.	↑

WIRING DIAGRAM




INSPECTION PROCEDURE

NOTICE:

- When replacing the skid control ECU (brake booster with master cylinder assembly) or brake actuator (brake booster with master cylinder assembly), perform initialization and calibration of the linear solenoid valve NFO
- Inspect the fuses for circuits related to this system before performing the following inspection procedure.

PROCEDURE


1. PERFORM ACTIVE TEST USING TECHSTREAM (ABS MOTOR RELAY)

- (a) Connect the Techstream to the DLC3.
- (b) Turn the power switch on (IG).
- (c) Select the Active Test on the Techstream  .

ABS/VSC/TRAC

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
ECB* Motor Relay	ABS motor relay	Relay ON/OFF	-

*: Electronically Controlled Brake System

- (d) Select the Data List on the Techstream  .

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
ECB* Motor Relay	ABS motor relay / ON or OFF	ON: Relay on OFF: Relay off	-

*: Electronically Controlled Brake System

- (e) Check the operating condition of the ABS motor relay when operating it using the Techstream.

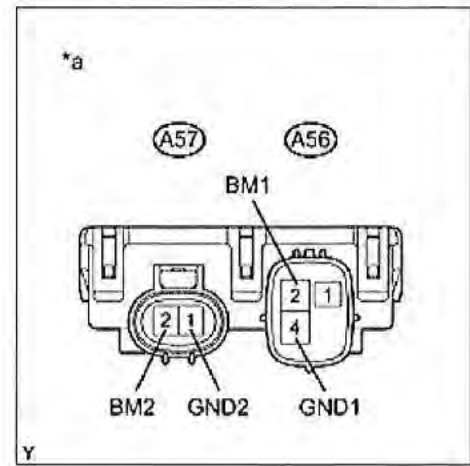
RESULT	PROCEED TO
ABS motor relay in the Data List turns ON/OFF using the Active Test.	A
ABS motor relay in the Data List does not change using the Active Test.	B

B  **GO TO STEP 6**

A


2. INSPECT BRAKE BOOSTER PUMP ASSEMBLY

- (a) Turn the power switch off.



(b) Make sure that there is no looseness at the locking part and the connecting part of the connectors.

(c) Disconnect the A56 and A57 brake booster pump assembly connectors.

(d) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A56-2 (BM1) - A56-4 (GND1)	Always	Below 10 Ω
A57-2 (BM2) - A57-1 (GND2)	Always	Below 10 Ω
A56-2 (BM1) - A57-2 (BM2)	Always	Below 1 Ω
A56-4 (GND1) - A57-1 (GND2)	Always	Below 1 Ω

Text in Illustration

*a	Component without harness connected (Brake Booster Pump Assembly)
----	--

NG ▶ REPLACE BRAKE BOOSTER PUMP ASSEMBLY

OK



3. CHECK HARNESS AND CONNECTOR (GND TERMINAL)

(a) Measure the resistance according to the value(s) in the table below.

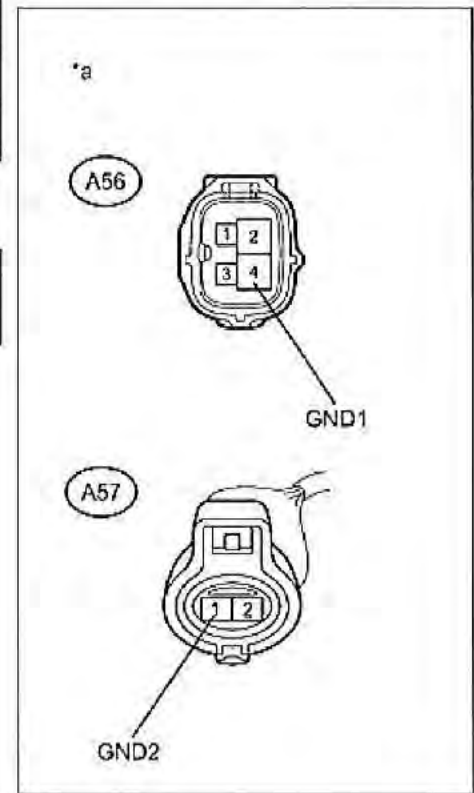
Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A56-4 (GND1) - Body ground	Always	Below 1 Ω
A57-1 (GND2) - Body ground	Always	Below 1 Ω

Text in Illustration

*a	Front view of wire harness connector (to Brake Booster Pump Assembly)
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NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (GND CIRCUIT)

OK
▼

4.	READ VALUE USING TECHSTREAM (ACCUMULATOR PRESSURE SENSOR)
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- (a) Reconnect the A56 and A57 brake booster pump assembly connectors.
- (b) Connect the Techstream to the DLC3.
- (c) Turn the power switch on (IG).
- (d) Select the Data List on the Techstream **RPD**.

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Accumulator Sensor	Accumulator pressure sensor / Min.: 0.00 V, Max.: 5.00 V	Specified value: 2.90 to 4.20 V	When brake fluid is stored in the accumulator: Accumulator pressure changes in accordance with volume of fluid stored in the accumulator

(e) Wait for 30 seconds without depressing the brake pedal.

(f) Check that the accumulator pressure sensor output value change is within the specified range.

OK:

Accumulator pressure sensor output value change is less than 0.55 V.

NG ► GO TO STEP 8

OK



5.	RECONFIRM DTC
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(a) Turn the power switch off.

(b) Clear the DTCs **MPO**.

(c) Turn the power switch on (IG).

(d) Check if the same DTC is output **MPO**.

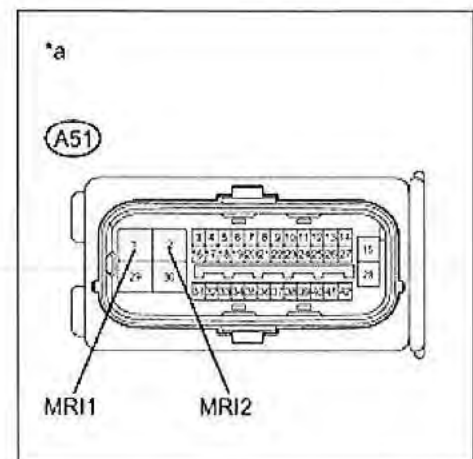
RESULT	PROCEED TO
DTCs C1252/52 and C1253/53 are not output.	A
DTCs C1252/52 and/or C1253/53 are output.	B

B ► REPLACE BRAKE BOOSTER WITH MASTER CYLINDER ASSEMBLY

A ► USE SIMULATION METHOD TO CHECK

6.	CHECK HARNESS AND CONNECTOR (MRI TERMINAL)
-----------	---

(a) Turn the power switch off.



- (b) Make sure that there is no looseness at the locking part and the connecting part of the connector.
- (c) Disconnect the A51 skid control ECU (brake booster with master cylinder assembly) connector.
- (d) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A51-1 (MRI1) - Body ground	Always	11 to 14 V
A51-2 (MRI2) - Body ground	Always	11 to 14 V

Text in Illustration

*a	Front view of wire harness connector (to Skid Control ECU (Brake Booster with Master Cylinder Assembly))
----	---

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (MRI CIRCUIT)

OK

7.	CHECK HARNESS AND CONNECTOR (BRAKE BOOSTER WITH MASTER CYLINDER ASSEMBLY - BRAKE BOOSTER PUMP ASSEMBLY)
----	--

- (a) Make sure that there is no looseness at the locking part and the connecting part of the connectors.
- (b) Disconnect the A56 and A57 brake booster pump assembly connectors.
- (c) Measure the resistance according to the value(s) in the table below.


Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A51-29 (MRO1) - A56-2 (BM1)	Always	Below 1 Ω
A51-29 (MRO1) - Body ground	Always	10 k Ω or higher
A56-2 (BM1) - Body ground	Always	10 k Ω or higher
A51-30 (MRO2) - A57-2 (BM2)	Always	Below 1 Ω
A51-30 (MRO2) - Body ground	Always	10 k Ω or higher
A57-2 (BM2) - Body ground	Always	10 k Ω or higher

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK ▶ REPLACE BRAKE BOOSTER WITH MASTER CYLINDER

ASSEMBLY**8. PERFORM ACTIVE TEST USING TECHSTREAM (SOLENOID VALVE)**

(a) Select the Active Test on the Techstream .

HINT:

The Active Test can be performed when the following conditions are met.


- ABS main relay is on.
- Shift lever is in P.
- Parking brake is applied.
- Vehicle speed is 0 km/h (0 mph).

ABS/VSC/TRAC

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
ECB* Solenoid (SMC/SRC/SCC)	Switching solenoid valve (SMC/SRC/SCC)	Solenoid ON/OFF	Operation sound of solenoid (clicking sound) can be heard

*: Electronically Controlled Brake System

(b) Perform the Active Test of the solenoid using the Techstream.

(c) Select the Data List on the Techstream .

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Wheel Cylinder Pressure Sensor	Wheel cylinder pressure sensor / Min.: 0.00 V, Max.: 5.00 V	Brake pedal released: 0.10 to 0.90 V	Reading increases when brake pedal is depressed

(d) Check that the output value of the wheel cylinder pressure sensor does not increase.

OK:

The output value of the wheel cylinder pressure sensor does not increase.

HINT:

If the output value increases, there may be brake fluid leaks in the brake actuator.

NG ► REPLACE BRAKE BOOSTER WITH MASTER CYLINDER ASSEMBLY

OK ► REPLACE BRAKE BOOSTER PUMP ASSEMBLY



Last Modified: 6-26-2019	6.8:8.0.48	Doc ID: [REDACTED]
Model Year Start: 2013	Model: Avalon HV	Prod Date Range: [11/2012 -]
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: ELECTRONICALLY CONTROLLED BRAKE SYSTEM: C1256/56; Accumulator Low Pressure; 2013 MY Avalon HV [11/2012 -]		

DTC	C1256/56	Accumulator Low Pressure
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DESCRIPTION

The accumulator pressure sensor is built into the brake actuator (brake booster with master cylinder assembly) and detects the accumulator pressure.

The skid control ECU (brake booster with master cylinder assembly) turns on the brake warning light / red (malfunction) and brake warning light / yellow (minor malfunction), and sounds the meter buzzer if it senses a decrease in the accumulator pressure.

DTC C1256/56 may be stored if the accumulator pressure drops due to frequent braking (this is not a malfunction).

DTC NO.	INF CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1256/56	341	Significant drop in accumulator pressure continues. (DTCs will be stored and the buzzer will operate when either condition is met.)	<ul style="list-style-type: none"> Accumulator pressure dropped due to frequent brake pedal operation (not a malfunction) Pump motor malfunction Accumulator deterioration Accumulator pressure sensor (Brake booster with master cylinder assembly) Supply voltage reduced

WIRING DIAGRAM

Refer to DTCs C1252/52 and C1253/53 [INFO](#) .

INSPECTION PROCEDURE

NOTICE:

- When replacing the brake actuator (brake booster with master cylinder assembly), perform initialization and calibration of the linear solenoid valve [INFO](#) .
- Inspect the fuses for circuits related to this system before performing the following inspection procedure.

HINT:

When C1202/68, C1241/41, C1252/52, C1253/53 and/or C1391/69 are output together with C1256/56, inspect and repair the trouble areas indicated by C1202/68, C1241/41, C1252/52, C1253/53 and/or C1391/69 first [INFO](#) , [INFO](#) , [INFO](#) , or [INFO](#)).

PROCEDURE

1.	BRAKE PROBLEM CHECK
-----------	----------------------------

(a) Ask the customer if frequent braking was performed while the brake warning light / yellow (minor malfunction) was on.

OK:

RESULT	PROCEED TO
Frequent braking was not performed.	A
Frequent braking was performed.	B

HINT:

This DTC may be stored even if the accumulator pressure drops only temporarily due to frequent braking.

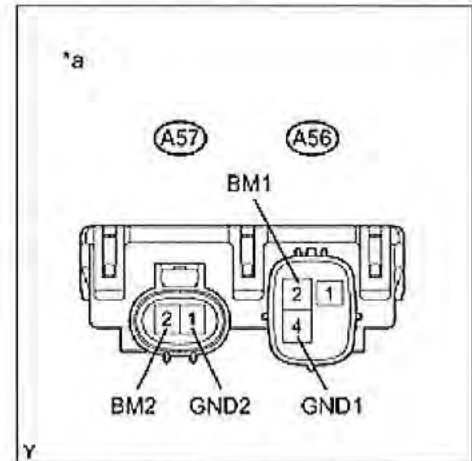
B ▶ END

A



2. INSPECT BRAKE BOOSTER PUMP ASSEMBLY

(a) Make sure that there is no looseness at the locking part and the connecting part of the connectors.



(b) Disconnect the A56 and A57 brake booster pump assembly connectors.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A56-2 (BM1) - A56-4 (GND1)	Always	Below 10 Ω
A57-2 (BM2) - A57-1 (GND2)	Always	Below 10 Ω
A56-2 (BM1) - A57-2 (BM2)	Always	Below 1 Ω
A56-4 (GND1) - A57-1 (GND2)	Always	Below 1 Ω

Text in Illustration

*a	Component without harness connected (Brake Booster Pump Assembly)
----	--

NG **REPLACE BRAKE BOOSTER PUMP ASSEMBLY**

OK

3.	READ VALUE USING TECHSTREAM (ACCUMULATOR PRESSURE SENSOR)
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- (a) Reconnect the A56 and A57 brake booster pump assembly connectors.
- (b) Connect the Techstream to the DLC3.
- (c) Turn the power switch on (IG).
- (d) Select the Data List on the Techstream .

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Accumulator Sensor	Accumulator pressure sensor / Min.: 0.00 V, Max.: 5.00 V	Specified value: 2.90 to 4.20 V	When brake fluid is stored in the accumulator: Accumulator pressure changes in accordance with volume of fluid stored in the accumulator

- (e) Wait for 30 seconds without depressing the brake pedal.
- (f) Check that the accumulator pressure sensor output value change is within the specified range.
OK:
Accumulator pressure sensor output value change is less than 0.55 V.

NG **GO TO STEP 4**

OK **USE SIMULATION METHOD TO CHECK**

4.	PERFORM ACTIVE TEST USING TECHSTREAM (SOLENOID VALVE)
-----------	--

- (a) Select the Active Test on the Techstream .

HINT:

The Active Test can be performed when the following conditions are met.

- ABS main relay is on.
- Shift lever is in P.
- Parking brake is applied.


- Vehicle speed is 0 km/h (0 mph).

ABS/VSC/TRAC

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
ECB* Solenoid (SMC/SRC/SCC)	Switching solenoid valve (SMC/SRC/SCC)	Solenoid ON/OFF	Operation sound of solenoid (clicking sound) can be heard

*: Electronically Controlled Brake System

(b) Perform the Active Test of the solenoid using the Techstream.

(c) Select the Data List on the Techstream .

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Wheel Cylinder Pressure Sensor	Wheel cylinder pressure sensor / Min.: 0.00 V, Max.: 5.00 V	Brake pedal released: 0.10 to 0.90 V	Reading increases when brake pedal is depressed

(d) Check that the output value of the wheel cylinder pressure sensor does not increase.

OK:

The output value of the wheel cylinder pressure sensor does not increase.

HINT:

If the output value increases, there may be brake fluid leaks in the brake actuator.

NG ► **REPLACE BRAKE BOOSTER WITH MASTER CYLINDER ASSEMBLY**

OK ► **REPLACE BRAKE BOOSTER PUMP ASSEMBLY**



Last Modified: 6-26-2019	6.8:8.0.48	Doc ID [REDACTED]
Model Year Start: 2013	Model: Avalon HV	Prod Date Range: [11/2012 -]
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: ELECTRONICALLY CONTROLLED BRAKE SYSTEM: C1391/69; Accumulator Leak Malfunction; 2013 MY Avalon HV [11/2012 -]		

DTC	C1391/69	Accumulator Leak Malfunction
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DESCRIPTION

This DTC is stored if internal or external brake fluid leaks are detected due to improper sealing in the brake actuator (brake booster with master cylinder assembly) or brake booster pump assembly. Internal leaks are suspected if the pump motor operates frequently without braking.

DTC NO.	INF CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1391/69	351	Either of the following is detected: <ol style="list-style-type: none"> 1. Accumulator pressure sensor input does not increase before braking or while the pump motor is operating. 2. Accumulator pressure sensor input reduction rate exceeds the specification before braking and while the pump motor is not operating. 	<ul style="list-style-type: none"> • Brake fluid leaks • Brake actuator (Brake booster with master cylinder assembly) (Malfunctioning internal seal, low gas pressure in accumulator, etc.)

INSPECTION PROCEDURE

NOTICE:

When replacing the brake actuator (brake booster with master cylinder assembly), perform initialization and calibration of the linear solenoid valve .

PROCEDURE

1.	CHECK FOR FLUID LEAK
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(a) Check that there are no fluid leaks in the brake lines between the brake actuator (brake booster with master cylinder assembly) and the wheel cylinders.

(b) Check that the brakes are not dragging.

OK:



There are no fluid leaks or dragging.

NG  **REPAIR OR REPLACE APPLICABLE PART**

OK



2. RECONFIRM DTC


- (a) Clear the DTCs .
- (b) Turn the power switch on (READY).
- (c) Check if the same DTC is output .

RESULT	PROCEED TO
DTC C1391/69 is output.	A
DTC C1391/69 is not output.	B

B ▶ REPLACE BRAKE BOOSTER WITH MASTER CYLINDER ASSEMBLY

A ▼

3. PERFORM ACTIVE TEST USING TECHSTREAM (SOLENOID VALVE)

- (a) Turn the power switch off.
- (b) Connect the Techstream to the DLC3.
- (c) Turn the power switch on (IG).
- (d) Select the Active Test on the Techstream .

HINT:


The Active Test can be performed when the following conditions are met.

- ABS main relay is on.
- Shift lever is in P.
- Parking brake is applied.
- Vehicle speed is 0 km/h (0 mph).

ABS/VSC/TRAC

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
ECB* Solenoid (SMC/SRC/SCC)	Switching solenoid valve (SMC/SRC/SCC)	Solenoid ON/OFF	Operation sound of solenoid (clicking sound) can be heard

*: Electronically Controlled Brake System

- (e) Perform the Active Test of the solenoid using the Techstream.
- (f) Select the Data List on the Techstream .

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Wheel Cylinder Pressure Sensor	Wheel cylinder pressure sensor / Min.: 0.00 V, Max.: 5.00 V	Brake pedal released: 0.10 to 0.90 V	Reading increases when brake pedal is depressed

(g) Check that the output value of the wheel cylinder pressure sensor does not increase.

OK:

The output value of the wheel cylinder pressure sensor does not increase.

HINT:

If the output value increases, there may be brake fluid leaks in the brake actuator (brake booster with master cylinder assembly).


RESULT	PROCEED TO
The output value of the wheel cylinder pressure sensor increases.	A
The output values of the wheel cylinder pressure sensor does not increase.	B

B ▶ REPLACE BRAKE BOOSTER PUMP ASSEMBLY

A



4.	REPLACE BRAKE BOOSTER WITH MASTER CYLINDER ASSEMBLY
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(a) Replace the brake actuator (brake booster with master cylinder assembly)  .

NEXT ▶ REPLACE BRAKE BOOSTER PUMP ASSEMBLY

