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CONTENTS

VDC/TCS/ABS	Component Parts Location	22
	Component Description	24
BASIC INSPECTION5	EDD	0.5
DIAGNOSIS AND REPAIR WORK FLOW 5	EBD	
Work Flow5	System Description	
Diagnostic Work Sheet6	System Description	26
Diagnostic work Sneet	Component Parts Location	
INSPECTION AND ADJUSTMENT8	·	29
ADDITIONAL SERVICE WHEN REPLACING	DIAGNOSIS SYSTEM [ABS ACTUATOR	
CONTROL UNIT8	AND ELECTRIC UNIT (CONTROL UNIT)]	
ADDITIONAL SERVICE WHEN REPLACING	CONSULT Function	30
CONTROL UNIT : Description8	DTC/CIDCUIT DIA CNICCIC	
ADDITIONAL SERVICE WHEN REPLACING	DTC/CIRCUIT DIAGNOSIS	36
CONTROL UNIT : Special Repair Requirement8	C1101, C1102, C1103, C1104 WHEEL SEN-	
	SOR	36
ADJUSTMENT OF STEERING ANGLE SENSOR	Description	
NEUTRAL POSITION8	DTC Logic	
ADJUSTMENT OF STEERING ANGLE SENSOR	Diagnosis Procedure	
NEUTRAL POSITION : Description8	•	
ADJUSTMENT OF STEERING ANGLE SENSOR	C1105, C1106, C1107, C1108 WHEEL SEN-	
NEUTRAL POSITION : Special Repair Require-	SOR	
ment8	Description	
SYSTEM DESCRIPTION10	DTC Logic	
OTOTEM DECOME TION	Diagnosis Procedure	42
VDC10	C1109 POWER AND GROUND SYSTEM	40
System Diagram10	Description	
System Description11	DTC Logic	
Component Parts Location12	Diagnosis Procedure	
Component Description14	Diagnosis Procedure	40
TCS15	C1110, C1153 ABS ACTUATOR AND ELEC-	
System Diagram	TRIC UNIT (CONTROL UNIT)	50
System Description	DTC Logic	50
Component Parts Location17	Diagnosis Procedure	51
Component Description	C4444 ARC MOTOR MOTOR RELAY OVO	
Component Description19	C1111 ABS MOTOR, MOTOR RELAY SYS-	5 0
ABS20	TEM	
System Diagram20	Description	
System Description21	DTC Logic	
•	Diagnosis Procedure	53

C1115 WHEEL SENSOR	55	C1164, C1165 CV SYSTEM	94
Description		Description	
DTC Logic	55	DTC Logic	
Diagnosis Procedure	56	Diagnosis Procedure	94
C1116 STOP LAMP SWITCH	62	C1166, C1167 SV SYSTEM	96
Description	62	Description	96
DTC Logic	62	DTC Logic	96
Diagnosis Procedure	63	Diagnosis Procedure	96
Component Inspection	66	CAATO VA DIANT CODINO	
04400 04400 04404 04400 IN ABO 001		C1170 VARIANT CODING	
C1120, C1122, C1124, C1126 IN ABS SOL .		DTC Logic	
Description		Diagnosis Procedure	98
DTC Logic		C1185 ICC UNIT	00
Diagnosis Procedure	68	Description	
C1121, C1123, C1125, C1127 OUT ABS SOL	60	DTC Logic	
Description		Diagnosis Procedure	
•		Diagnosis Procedure	98
DTC Logic		C1197 VACUUM SENSOR	101
Diagnosis Procedure	/0	Description	
C1130 ENGINE SIGNAL	71	DTC Logic	
Description		Diagnosis Procedure	
DTC Logic		Blaghoole i roodane	
Diagnosis Procedure		C1198 VACUUM SENSOR	104
Diagnosis i roccare	/ !	Description	104
C1140 ACTUATOR RELAY SYSTEM	73	DTC Logic	104
Description	73	Diagnosis Procedure	
DTC Logic		•	
Diagnosis Procedure		C1199 VACUUM SENSOR	
•		Description	107
C1142 PRESS SENSOR	75	DTC Logic	107
Description	75	Diagnosis Procedure	107
DTC Logic	75	04404 V4 011114 0511000	
Diagnosis Procedure	75	C119A VACUUM SENSOR	
04440.077777110.41101.7.07110.07		Description	
C1143 STEERING ANGLE SENSOR		DTC Logic	
Description		Diagnosis Procedure	110
DTC Logic		U1000 CAN COMM CIRCUIT	112
Diagnosis Procedure	79		
C1144 INCOMPLETE STEERING ANGLE		Description DTC Logic	
SENSOR ADJUSTMENT	00	Diagnosis Procedure	
		Diagnosis Procedure	113
DTC Logic		U1002 SYSTEM COMM (CAN)	114
Diagnosis Procedure	82	Description	
C1145, C1146 YAW RATE/SIDE G SENSOR	84	DTC Logic	
Description		Diagnosis Procedure	
DTC Logic		Blaghtone i recount i i i i i i i i i i i i i i i i i i i	
Diagnosis Procedure		U1100 CAN COMM CIRCUIT (ICC UNIT)	116
Diagnosis i roccare	07	Description	116
C1154 TRANSMISSION RANGE SWITCH	87	DTC Logic	116
Description	87	Diagnosis Procedure	
DTC Logic		-	
Diagnosis Procedure		POWER SUPPLY AND GROUND CIRCUIT .	
•		Description	
C1155 BRAKE FLUID LEVEL SWITCH	89	Diagnosis Procedure	118
Description	89	DADVING DDAVE CWITCH	
DTC Logic	89	PARKING BRAKE SWITCH	
Diagnosis Procedure		Component Function Check	
Component Inspection		Diagnosis Procedure	
•		Component Inspection	121

VDC OFF SWITCH123	PRECAUTIONS 152
Description	Precaution for Supplemental Restraint System A
Component Function Check	
Diagnosis Procedure123	· ·
Component Inspection124	Precaution for Procedure without Cowl Top Cover. 152
	Precautions for Removing Battery Terminal 152
ABS WARNING LAMP125	riecaution for brake System
Description125	
Component Function Check125	Precautions for Harness Repair154
Diagnosis Procedure125	·
BRAKE WARNING LAMP126	PREPARATION155
Description	
Diagnosis Procedure	·
Diagnosis Frocedure120	Commercial Service 1001155
VDC OFF INDICATOR LAMP127	REMOVAL AND INSTALLATION156
Description127	
Component Function Check127	
Diagnosis Procedure127	
	FRUNT WHEEL SENSUR156
VDC WARNING LAMP128	FRONT WHEEL SENSOR : Exploded View156
Description128	
Component Function Check128	
Diagnosis Procedure128	REAR WHEEL SENSOR157
ECU DIA CNOCIC INFORMATION (CO.	
ECU DIAGNOSIS INFORMATION 129	REAR WHEEL SENSOR : Removal and Installa-
ABS ACTUATOR AND ELECTRIC UNIT	tion157
(CONTROL UNIT)129	
Reference Value129	
Wiring Diagram - BRAKE CONTROL SYSTEM 134 Fail-Safe	
DTC No. Index	TROIT OF TOK : Exploded view 100
DTC NO. IIIdex143	TROTT GENOOT TOTOR. Removal and instal-
SYMPTOM DIAGNOSIS145	lation158
	REAR SENSOR ROTOR158
EXCESSIVE ABS FUNCTION OPERATION	REAR SENSOR ROTOR : Exploded View158
FREQUENCY145	REAR SENSOR ROTOR : Removal and Installa-
Diagnosis Procedure145	
UNEXPECTED PEDAL REACTION146	ADO AO IOA ION AND ELECTRIC CITI
Diagnosis Procedure146	(CONTROL UNIT)159
THE BRAKING DISTANCE IS LONG147	E . I. I. IV.
Diagnosis Procedure147	Pemoval and Installation 150
Diagnosis i Tocedure147	
ABS FUNCTION DOES NOT OPERATE 148	YAW RATE/SIDE G SENSOR161
Diagnosis Procedure148	Exploded View161
-	Removal and Installation161
PEDAL VIBRATION OR ABS OPERATION	STEERING ANGLE SENSOR162
SOUND OCCURS149	Exploded View162
Diagnosis Procedure149	Removal and Installation162
VELUCI E JEDICO DUDINO VIDO/TOO/A DO	
VEHICLE JERKS DURING VDC/TCS/ABS	BRANE ASSIST (WITH PREVIEW FUNC-
CONTROL150	•
Diagnosis Procedure150	SVSTEM DESCRIPTION
NORMAL OPERATING CONDITION151	SYSTEM DESCRIPTION163
	DDEVIEW FUNCTION
Description151	System Description163
PRECAUTION152	Component Parts Location164
=>/\o \o	Oumpunem rans Lucation104

Revision: July 2016 BRC-3 2016 QX50

Component Description165	DTC/CIRCUIT DIAGNOSIS	172
DTC/CIRCUIT DIAGNOSIS166	INTELLIGENT BRAKE ASSIST	
PREVIEW FUNCTION 166 Diagnosis Procedure	Diagnosis Procedure SYMPTOM DIAGNOSIS	
SYMPTOM DIAGNOSIS167	SWITCH DOES NOT TURN ON / SWITCH	
NORMAL OPERATING CONDITION 167 Description	Symptom Table Description	173
PRECAUTION168	Diagnosis Procedure	
PRECAUTIONS	NORMAL OPERATING CONDITION Description PRECAUTION	175
SYSTEM DESCRIPTION169 INTELLIGENT BRAKE ASSIST	PRECAUTIONS Precautions for Removing Battery Terminal Precautions for IBA System Service	176
System Description169	REMOVAL AND INSTALLATION	177
Component Parts Location	IBA OFF SWITCH	

DIAGNOSIS AND REPAIR WORK FLOW [VDC/TCS/ABS] < BASIC INSPECTION > **BASIC INSPECTION** Α DIAGNOSIS AND REPAIR WORK FLOW Work Flow INFOID:0000000012168359 DETAILED FLOW 1.INTERVIEW FROM THE CUSTOMER Clarify customer complaints before inspection. First of all, perform an interview utilizing BRC-6, "Diagnostic Work Sheet" and reproduce the symptom as well as fully understand it. Ask customer about his/her complaints D carefully. Check symptoms by driving vehicle with customer, if necessary. CAUTION: Customers are not professional. Never guess easily like "maybe the customer means that...," or " maybe the customer mentions this symptom". Е >> GO TO 2. BRC 2.CHECK SYMPTOM Reproduce the symptom that is indicated by the customer, based on the information from the customer obtained by interview. Also check that the symptom is not caused by fail-safe mode. Refer to BRC-142, "Fail-Safe". **CAUTION:** When the symptom is caused by normal operation, fully inspect each portion and obtain the understanding of customer that the symptom is not caused by a malfunction. Н >> GO TO 3. 3.perform the self-diagnosis With CONSULT Turn the ignition switch OFF \rightarrow ON. CAUTION: Be sure to wait of 10 seconds after turning ignition switch OFF or ON. Perform self-diagnosis for "ABS". Is DTC detected? YES >> Record or print self-diagnosis results and freeze frame data (FFD). GO TO 4. NO >> GO TO 6. 4. RECHECK THE SYMPTOM (P)With CONSULT Erase self-diagnostic results for "ABS". Turn the ignition switch OFF \rightarrow ON \rightarrow OFF. **CAUTION:** Be sure to wait of 10 seconds after turning ignition switch OFF or ON. N 3. Perform DTC confirmation procedures for the error-detected system.

Is DTC detected?

YES >> GO TO 5.

NO >> Check harness and connectors based on the information obtained by interview. Refer to <u>GI-42</u>, "Intermittent Incident".

REPAIR OR REPLACE ERROR-DETECTED PART

(II) With CONSULT

- Repair or replace error-detected parts.
- 2. Reconnect part or connector after repairing or replacing.
- 3. When DTC is detected, erase self-diagnostic result for "ABS".

CAUTION:

- Turn the ignition switch OFF \rightarrow ON \rightarrow OFF after erase self-diagnosis result.
- Be sure to wait of 10 seconds after turning ignition switch OFF or ON.

Revision: July 2016 BRC-5 2016 QX50

DIAGNOSIS AND REPAIR WORK FLOW

[VDC/TCS/ABS] < BASIC INSPECTION >

>> GO TO 7.

6. IDENTIFY ERROR-DETECTED SYSTEM BY SYMPTOM DIAGNOSIS

Estimate error-detected system based on symptom diagnosis and perform inspection.

Can the error-detected system be identified?

YES >> GO TO 7.

NO >> Check harness and connectors based on the information obtained by interview. Refer to GI-42. "Intermittent Incident".

7. FINAL CHECK

(P)With CONSULT

- Check the reference value for "ABS".
- Recheck the symptom and check that the symptom is not reproduced on the same conditions.

Is the symptom reproduced?

YES >> GO TO 3.

NO >> INSPECTION END

Diagnostic Work Sheet

INFOID:0000000012168360

DESCRIPTION

- · In general, customers have their own criteria for a problem. Therefore, it is important to understand the symptom and status well enough by asking the customer about his/her concerns carefully. To systemize all the information for the diagnosis, prepare the interview sheet referring to the interview points.
- In some cases, multiple conditions that appear simultaneously may cause a DTC to be detected.

INTERVIEW SHEET SAMPLE

	Interview sheet						
Customer MR/MS		Registration number	า			al year stration	
name		Vehicle type	е		VIN		
Storage date		Engine/traction Motor	;-		Mile	age	km (Mile)
		□ Does not	t operate (·) function
		☐ Warning	lamp turns C	ON.			
Symptom		ABS	or ((ABS))	BRA □	KE or		
		□ Noise (Location:) □ Vibration (Location:)					
		□ Other ()					
First occurren	ce	☐ Recently	□ Othe	r ()
Frequency of	occurrence	☐ Always	☐ Unde	r a certain co	onditions of	☐ Sometimes (time(s)/day)
		☐ Irrelevan	t				
Climate con-	Weather	□ Fine	☐ Cloud	☐ Rain	□Snow	☐ Others ()
ditions	Temperature	□ Hot	□Warm	□ Cool	□ Cold	☐ Temperature [App	rox. °C (°F)]
	Relative humidity	☐ High	□Мо	oderate	□ Lov	V	
Road conditio	ns	☐ Ordinary	road □ Hiç	ghway 🗆 N	lountainous ro	oad (uphill or downhill)	☐ Rough road

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION > [VDC/TCS/ABS]

	DI LOTIOIT.				
			Interview sheet		
Customer	MR/MS	Registration number		Initial year registration	
name		Vehicle type		VIN	
Storage date		Engine/trac- tion Motor		Mileage	km (Mile)
Operating con	dition, etc.	☐ During drivi☐ During dec☐ Immediate☐☐ During corr	ng 🔲 During accelera	Approx.	At constant speed driving km/h (MPH)]
	VDC OFF switch operation	□ Yes □] No		
	Use of other functions (ex. ICC)	□ Yes □	1 No ()
Other conditions	Presence of non-genuine parts installation	□ Yes □	1 No ()
Memo					

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION > [VDC/TCS/ABS]

INSPECTION AND ADJUSTMENT ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT: Description

INFOID:0000000012168361

After replacing the ABS actuator and electric unit (control unit), perform the neutral position adjustment for the steering angle sensor. Refer to BRC-8, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT: Special Repair Requirement

1.perform the neutral position adjustment for the steering angle sensor

Perform the neutral position adjustment for the steering angle sensor.

>> Refer to <u>BRC-8</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : <u>Description</u>".

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description

INFOID:0000000012168363

When doing work that applies to the list below, make sure to adjust neutral position of steering angle sensor before running vehicle. Refer to <u>BRC-8</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

x: Required -: Not required

Situation	Adjustment of steering angle sensor neutral position
Removing/Installing ABS actuator and electric unit (control unit)	-
Replacing ABS actuator and electric unit (control unit)	×
Removing/Installing steering angle sensor	×
Replacing steering angle sensor	×
Removing/Installing steering components	×
Replacing steering components	×
Removing/Installing suspension components	×
Replacing suspension components	×
Change tires to new ones	-
Tire rotation	-
Adjusting wheel alignment	×

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION CAUTION:

To adjust neutral position of steering angle sensor, make sure to use CONSULT. (Adjustment cannot be done without CONSULT.)

ALIGN THE VEHICLE STATUS

Stop the vehicle with front wheels in straight-ahead position.

>> GO TO 2.

2.PERFORM THE NEUTRAL POSITION ADJUSTMENT FOR THE STEERING ANGLE SENSOR

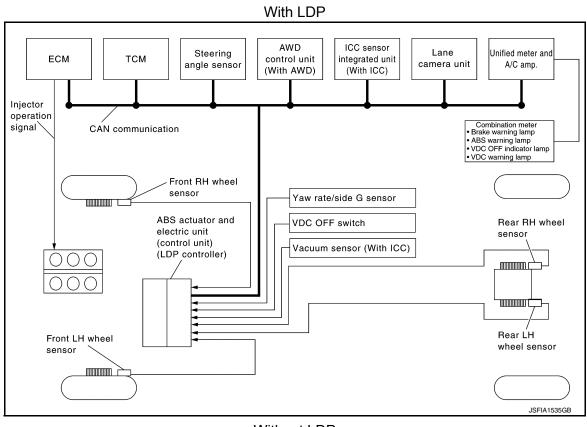
INSPECTION AND ADJUSTMENT

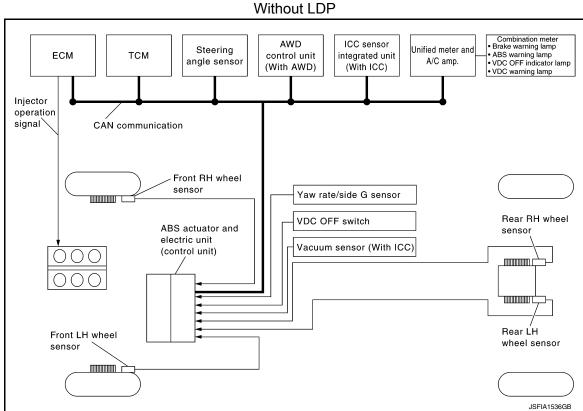
[VDC/TCS/ABS] < BASIC INSPECTION > Select "ABS", "WORK SUPPORT" and "ST ANGLE SENSOR ADJUSTMENT" in order with CONSULT. Select "START". Α **CAUTION:** Do not touch steering wheel while adjusting steering angle sensor. 3. After approximately 10 seconds, select "END". В NOTE: After approximately 60 seconds, it ends automatically. 4. Turn ignition switch OFF, then turn it ON again. **CAUTION:** Be sure to perform above operation. >> GO TO 3. D 3. CHECK DATA MONITOR Run the vehicle with front wheels in straight-ahead position, then stop. Е Select "ABS", "DATA MONITOR" and "STR ANGLE SIG" in order with CONSULT, and check steering angle sensor signal. **BRC** STR ANGLE SIG : 0±2.5° Is the steering angle within the specified range? YES >> GO TO 4. NO >> Perform the neutral position adjustment for the steering angle sensor again, GO TO 1. f 4.ERASE THE SELF-DIAGNOSIS MEMORY Erase the self-diagnosis memories for "ABS", "ENGINE" and "ICC/ADAS" with CONSULT. Н "ABS": Refer to <u>BRC-30</u>, "CONSULT Function". • "ENGINE": Refer to EC-146, "CONSULT Function". "ICC/ADAS": Refer to CCS-39, "CONSULT Function (ICC/ADAS)". Are the memories erased? YES >> INSPECTION END NO >> Check the items indicated by the self-diagnosis. K L Ν 0 Р

SYSTEM DESCRIPTION

VDC

System Diagram





System Description

INFOID:0000000012168366

 Vehicle Dynamics Control system detects driver's steering operation amount and brake pedal travel from steering angle sensor and pressure sensor. Using information from yaw rate/side G sensor and wheel sensor, VDC judges driving condition (conditions of under steer and over steer) to improve vehicle driving stability by controlling brake application to 4 wheels and engine output.

• During VDC operation, it informs driver of system operation by flashing VDC warning lamp.

Electrical system diagnosis by CONSULT is available.

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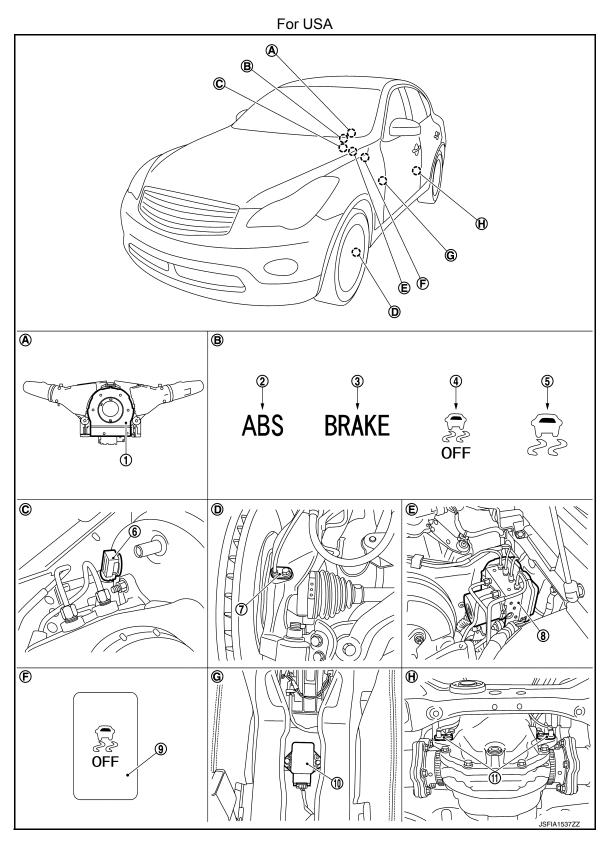
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Component Parts Location



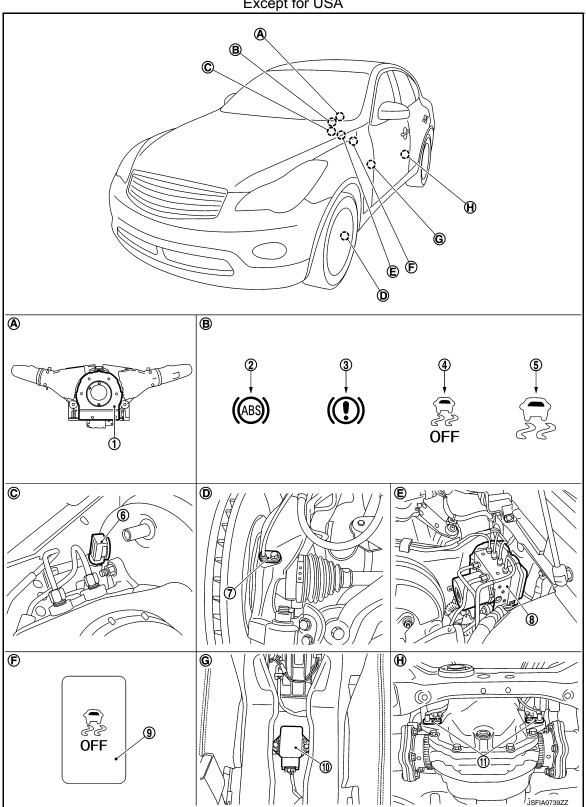
- 1. Steering angle sensor
- 4. VDC OFF indicator lamp
- 2. ABS warning lamp
- 5. VDC warning lamp
- 3. Brake warning lamp
- 6. Vacuum sensor (with ICC)

- Front wheel sensor
- 10. Yaw rate/side G sensor
- Back of spiral cable assembly
- D. Steering knuckle
- G. Under center console
- ABS actuator and electric unit (con- 9. 8. trol unit)
- 11. Rear wheel sensor
- B. Combination meter
- E. Inside brake master cylinder cover
- Rear final drive assembly H.
- C. Brake booster

VDC OFF switch

F. Instrument driver lower panel

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1.	Steering angle sensor	2.	ABS warning lamp	3.	Brake warning lamp
4.	VDC OFF indicator lamp	5.	VDC warning lamp	6.	Vacuum sensor (with ICC)
7.	Front wheel sensor	8.	ABS actuator and electric unit (control unit)	9.	VDC OFF switch
10.	Yaw rate/side G sensor	11.	Rear wheel sensor		
A.	Back of spiral cable assembly	B.	Combination meter	C.	Brake booster
D.	Steering knuckle	E.	Inside brake master cylinder cover	F.	Instrument driver lower panel
G.	Under center console	H.	Rear final drive assembly		

Component Description

Compo	Reference	
	Pump Motor	BRC-52, "Description"
	Actuator relay (main relay)	BRC-73, "Description"
ABS actuator and electric unit (control unit)	Solenoid valve	BRC-67, "Description", BRC-69, "Description"
	Pressure sensor	BRC-75, "Description"
	VDC switch-over valve (CV1, CV2, SV1, SV2)	BRC-94, "Description", BRC-96, "Description"
Wheel sensor	BRC-36, "Description"	
Yaw rate/side G sensor	BRC-84, "Description"	
Steering angle sensor	BRC-78, "Description"	
VDC OFF switch		BRC-123, "Description"
ABS warning lamp		BRC-125, "Description"
Brake warning lamp	BRC-126, "Description"	
VDC OFF indicator lamp	BRC-127, "Description"	
VDC warning lamp	BRC-128, "Description"	
Vacuum sensor (with ICC)	BRC-101, "Description"	

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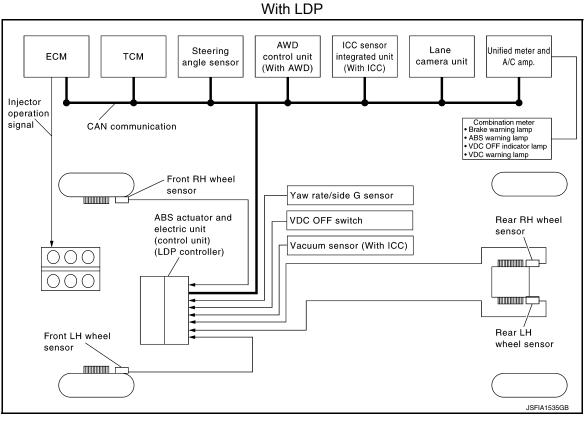
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TCS

System Diagram



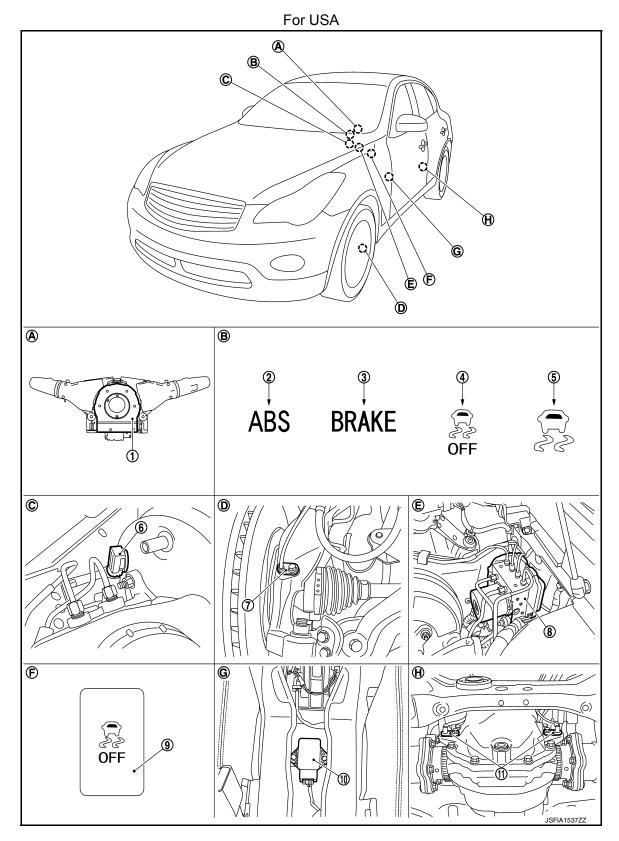
Without LDP Combination meter Brake warning lamp ABS warning lamp VDC OFF indicator lamp ICC sensor AWD Steering Unified meter and ECM TCM control unit integrated unit A/C amp. angle sensor (With AWD) (With ICC) VDC warning lamp Injector operation signal` CAN communication Front BH wheel sensor Yaw rate/side G sensor Rear RH wheel VDC OFF switch ABS actuator and sensor electric unit Vacuum sensor (With ICC) (control unit) Rear LH Front LH wheel wheel sensor sensor JSFIA1536GB

System Description

- Traction Control System is a function that electronically controls engine torque, brake fluid pressure and A/T gear position to ensure the optimum slippage ratio at drive wheels by computing wheel speed signals from 4 wheel sensors. When ABS actuator and electric unit (control unit) detects a spin at drive wheels (rear wheels), it compares wheel speed signals from all 4 wheels. At this time, LH and RH rear brake fluid pressure are controlled, while fuel being cut to engine and throttle valve being closed to reduce engine torque by the control unit. Further more, throttle position is continuously controlled to ensure the optimum engine torque at all times.
- During TCS operation, TCS informs driver of system operation by flashing VDC warning lamp.
- Electrical system diagnosis by CONSULT is available.

Component Parts Location

INFOID:0000000012168371



- Steering angle sensor
- 4. VDC OFF indicator lamp
- 2. ABS warning lamp
- 5. VDC warning lamp
- 3. Brake warning lamp
- 6. Vacuum sensor (with ICC)

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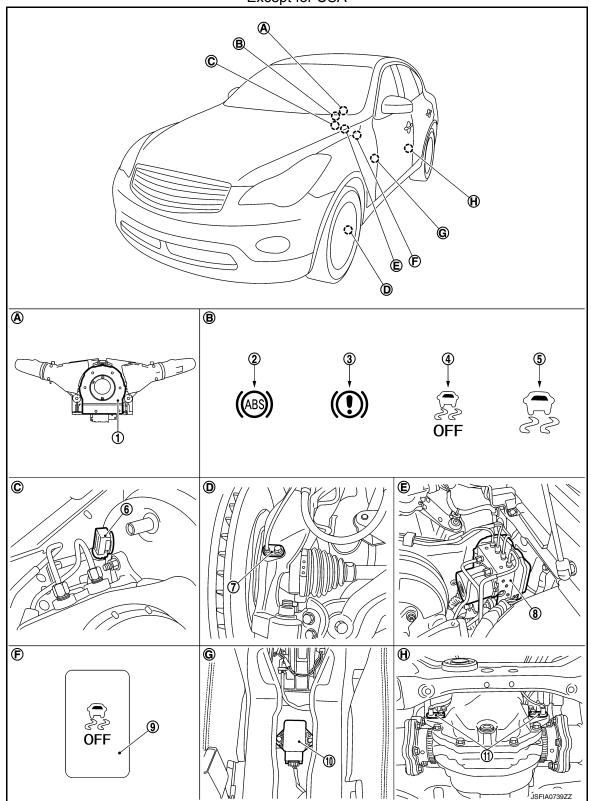
- 7. Front wheel sensor
- 10. Yaw rate/side G sensor
- A. Back of spiral cable assembly
- D. Steering knuckle
- G. Under center console

- 8. ABS actuator and electric unit (con- 9. trol unit)
- 11. Rear wheel sensor
- B. Combination meter
- E. Inside brake master cylinder cover
- H. Rear final drive assembly
- C. Brake booster

VDC OFF switch

F. Instrument driver lower panel

Except for USA



INFOID:0000000012168372

1. Steering angle sensor 2. ABS warning lamp 3. Brake warning lamp VDC OFF indicator lamp 5. VDC warning lamp 6. Vacuum sensor (with ICC) 4. 7. Front wheel sensor ABS actuator and electric unit (con-9. VDC OFF switch trol unit) 11. Rear wheel sensor 10. Yaw rate/side G sensor A. Back of spiral cable assembly В. Combination meter C. Brake booster F. Steering knuckle E. Inside brake master cylinder cover D. Instrument driver lower panel Under center console Rear final drive assembly

Component Description

Compo	Reference	
	Pump Motor	BRC-52, "Description"
	Actuator relay (main relay)	BRC-73, "Description"
ABS actuator and electric unit (control unit)	Solenoid valve	BRC-67, "Description", BRC-69, "Description"
	Pressure sensor	BRC-75, "Description"
	VDC switch-over valve (CV1, CV2, SV1, SV2)	BRC-94, "Description", BRC-96, "Description"
Wheel sensor	BRC-36, "Description"	
Yaw rate/side G sensor	BRC-84, "Description"	
Steering angle sensor	BRC-78, "Description"	
VDC OFF switch		BRC-123, "Description"
ABS warning lamp		BRC-125, "Description"
Brake warning lamp	BRC-126, "Description"	
VDC OFF indicator lamp	BRC-127, "Description"	
VDC warning lamp	BRC-128, "Description"	
Vacuum sensor (with ICC)	BRC-101, "Description"	

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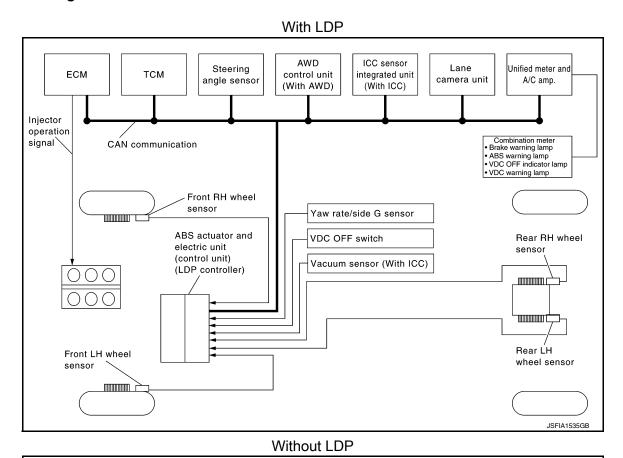
sensor

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ABS

System Diagram

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Combination meter Brake warning lamp ICC sensor AWD Steering Unified meter and ABS warning lamp VDC OFF indicator lamp ECM TCM control unit integrated unit A/C amp. angle sensor (With AWD) (With ICC) VDC warning lamp Injector operation signal` CAN communication Front RH wheel sensor Yaw rate/side G sensor Rear RH wheel VDC OFF switch ABS actuator and sensor electric unit Vacuum sensor (With ICC) (control unit) Rear LH Front LH wheel wheel sensor

System Description

INFOID:0000000012168374

Anti-Lock Braking System detects wheel revolution while braking, electronically controls braking force, and
prevents wheel locking during sudden braking. It improves handling stability and maneuverability for avoiding obstacles.

• Electrical system diagnosis by CONSULT is available.

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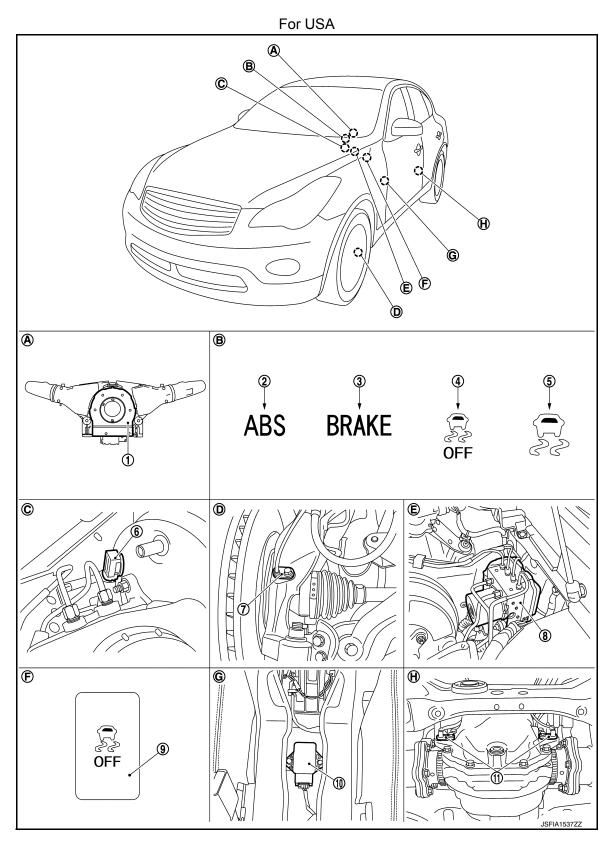
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Component Parts Location



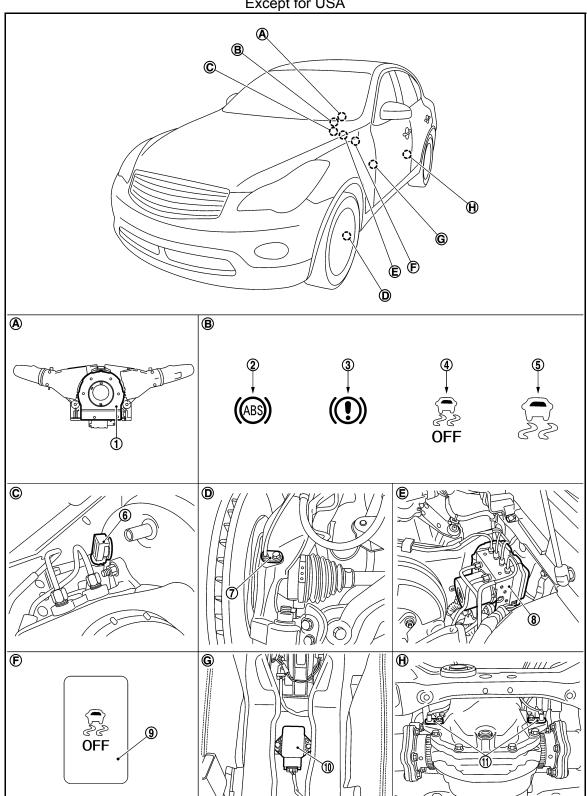
- 1. Steering angle sensor
- 4. VDC OFF indicator lamp
- 2. ABS warning lamp
- 5. VDC warning lamp
- 3. Brake warning lamp
- 6. Vacuum sensor (with ICC)

- Front wheel sensor
- 10. Yaw rate/side G sensor
- Back of spiral cable assembly
- D. Steering knuckle
- G. Under center console
- ABS actuator and electric unit (con- 9. 8. trol unit)
- 11. Rear wheel sensor
- B. Combination meter
- E. Inside brake master cylinder cover
- Rear final drive assembly H.
- C. Brake booster

VDC OFF switch

F. Instrument driver lower panel

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1.	Steering angle sensor	2.	ABS warning lamp	3.	Brake warning lamp
4.	VDC OFF indicator lamp	5.	VDC warning lamp	6.	Vacuum sensor (with ICC)
7.	Front wheel sensor	8.	ABS actuator and electric unit (control unit)	9.	VDC OFF switch
10.	Yaw rate/side G sensor	11.	Rear wheel sensor		
A.	Back of spiral cable assembly	B.	Combination meter	C.	Brake booster
D.	Steering knuckle	E.	Inside brake master cylinder cover	F.	Instrument driver lower panel
G.	Under center console	H.	Rear final drive assembly		

Component Description

Compo	Reference	
	Pump Motor	BRC-52, "Description"
	Actuator relay (main relay)	BRC-73, "Description"
ABS actuator and electric unit (control unit)	Solenoid valve	BRC-67, "Description", BRC-69, "Description"
	Pressure sensor	BRC-75, "Description"
	VDC switch-over valve (CV1, CV2, SV1, SV2)	BRC-94, "Description", BRC-96, "Description"
Wheel sensor	BRC-36, "Description"	
Yaw rate/side G sensor	BRC-84, "Description"	
Steering angle sensor	BRC-78, "Description"	
VDC OFF switch		BRC-123, "Description"
ABS warning lamp		BRC-125, "Description"
Brake warning lamp	BRC-126, "Description"	
VDC OFF indicator lamp	BRC-127, "Description"	
VDC warning lamp	BRC-128, "Description"	
Vacuum sensor (with ICC)	BRC-101, "Description"	

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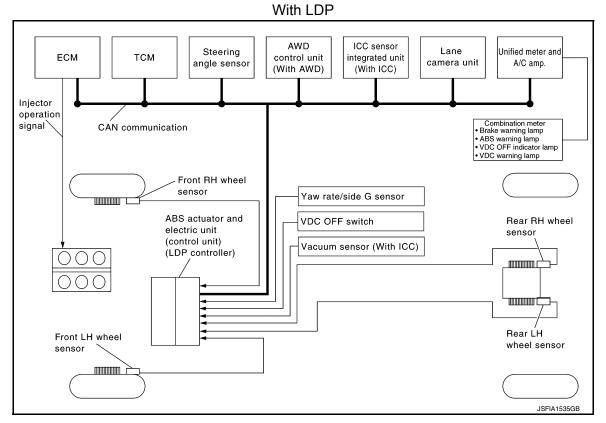
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System Diagram



Without LDP Combination meter Brake warning lamp ABS warning lamp VDC OFF indicator lamp ICC sensor AWD Steering Unified meter and ECM TCM control unit integrated unit A/C amp. angle sensor (With AWD) (With ICC) VDC warning lamp Injector operation signal` CAN communication Front BH wheel sensor Yaw rate/side G sensor Rear RH wheel VDC OFF switch ABS actuator and sensor electric unit Vacuum sensor (With ICC) (control unit) Rear LH Front LH wheel wheel sensor sensor JSFIA1536GB

System Description

- Electric Brake force Distribution is a following function. ABS actuator and electric unit (control unit) detects subtle slippages between the front and rear wheels during braking. Then is electronically controls the rear braking force (brake fluid pressure) to reducing and reduces rear wheel slippage. Accordingly it improves vehicle stability.
- Electrical system diagnosis by CONSULT is available.

Component Parts Location

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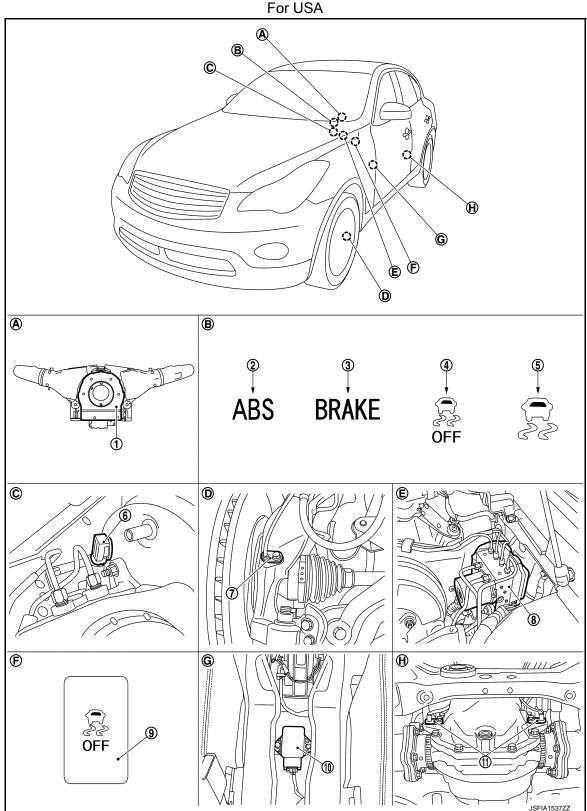
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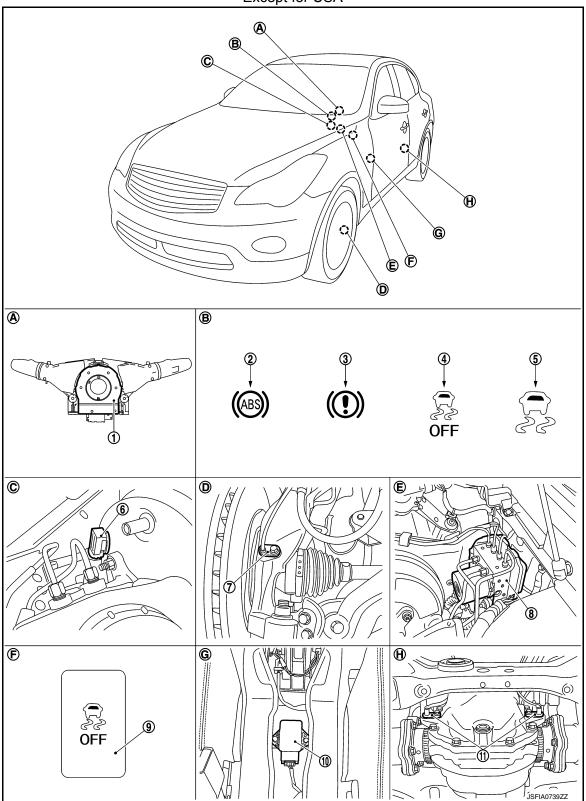
- Steering angle sensor
- VDC OFF indicator lamp
- 2. ABS warning lamp
- 5. VDC warning lamp
- 3. Brake warning lamp
- 6. Vacuum sensor (with ICC)

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- 7. Front wheel sensor
- 10. Yaw rate/side G sensor
- A. Back of spiral cable assembly
- D. Steering knuckle
- G. Under center console
- 8. ABS actuator and electric unit (con- 9. VDC OFF switch trol unit)
- 11. Rear wheel sensor
- B. Combination meter
- E. Inside brake master cylinder cover
- H. Rear final drive assembly
- C. Brake booster
- F. Instrument driver lower panel

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1. Steering angle sensor 2. ABS warning lamp 3. Brake warning lamp VDC OFF indicator lamp 5. VDC warning lamp 6. Vacuum sensor (with ICC) 4. 7. Front wheel sensor ABS actuator and electric unit (con-9. VDC OFF switch trol unit) 11. Rear wheel sensor 10. Yaw rate/side G sensor A. Back of spiral cable assembly В. Combination meter C. Brake booster F. Steering knuckle E. Inside brake master cylinder cover D. Instrument driver lower panel Under center console Rear final drive assembly

Component Description

Compo	Reference	
	Pump	DDC 52 "Description"
	Motor	BRC-52, "Description"
	Actuator relay (main relay)	BRC-73, "Description"
ABS actuator and electric unit (control unit)	Solenoid valve	BRC-67, "Description", BRC-69, "Description"
	Pressure sensor	BRC-75, "Description"
	VDC switch-over valve (CV1, CV2, SV1, SV2)	BRC-94, "Description", BRC-96, "Description"
Wheel sensor		BRC-36, "Description"
Yaw rate/side G sensor		BRC-84, "Description"
Steering angle sensor		BRC-78, "Description"
VDC OFF switch		BRC-123, "Description"
ABS warning lamp		BRC-125, "Description"
Brake warning lamp		BRC-126, "Description"
VDC OFF indicator lamp		BRC-127, "Description"
VDC warning lamp		BRC-128, "Description"
Vacuum sensor (with ICC)	BRC-101, "Description"	

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< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

DIAGNOSIS SYSTEM [ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)]

CONSULT Function

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FUNCTION

CONSULT can display each diagnostic item using the diagnostic test modes shown following.

Diagnostic test mode	Function		
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on CONSULT.		
Self diagnostic result	Self-diagnostic results can be read and erased quickly.		
Data monitor	Input/Output data in the ABS actuator and electric unit (control unit) can be read.		
Active test	CONSULT drives some actuators apart from ABS actuator and electric unit (control unit) a also shifts some parameters in a specified range.		
ECU identification	ABS actuator and electric unit (control unit) part number can be read.		
Specific data monitor	Specific LDP data in the ABS actuator and electric unit (control unit) can be read.		

WORK SUPPORT

CAUTION:

Erase DTC memory of the lane camera unit after implementing work support. Refer to <u>DAS-280, "CON-SULT Function (LANE CAMERA)".</u>

Item	Description
ST ANGLE SENSOR ADJUSTMENT	Adjusts the neutral position of the steering angle sensor.

SELF DIAGNOSTIC RESULT

Operation Procedure

Before performing the self-diagnosis for "ABS" with CONSULT, start engine and drive vehicle at 50 km/h (31 MPH) or more for approximately 2 minutes.

Display Item List

Refer to BRC-143, "DTC No. Index".

How to Erase Self-diagnosis Results

After erasing DTC memory for "ABS" with CONSULT, start the engine and drive the vehicle at 50 km/h (31 MPH) or more for approximately 2 minutes as the final inspection, and make sure that the ABS warning lamp, VDC warning lamp and brake warning lamp turn OFF.

CAUTION:

If memory cannot be erased, perform applicable diagnosis.

NOTE: • When the wheel sensor malfunctions, after inspecting the w

- When the wheel sensor malfunctions, after inspecting the wheel sensor system, ABS warning lamp, VDC warning lamp and brake warning lamp will not turn OFF even when the system is normal unless the vehicle is driven at approximately 50 km/h (31 MPH) or more for approximately 2 minutes.
- Brake warning lamp will turn ON in case of parking brake operation (when switch is ON) or in case of brake fluid level switch operation (when brake fluid is insufficient).
- VDC OFF switch should not stay in "ON" position.

DATA MONITOR

Display Item List

NOTE:

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

	SELECT MO	ONITOR ITEM	×: Applicable ▼: Optional item	
Monitor item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	Remarks	
FR LH SENSOR [km/h (MPH)]	×	×		
FR RH SENSOR [km/h (MPH)]	×	×	Wheel speed	
RR LH SENSOR [km/h (MPH)]	×	×	White speed	
RR RH SENSOR [km/h (MPH)]	×	×		
STOP LAMP SW (On/Off)	×	×	Stop lamp switch signal status	
BATTERY VOLT (V)	×	×	Battery voltage supplied to the ABS actuator and electric unit (control unit)	
GEAR	×	×	Gear position determined by TCM	E
SLCT LVR POSI	×	×	A/T selector lever position	
YAW RATE SEN (d/s)	×	×	Yaw rate detected by yaw rate/side G sensor	
ACCEL POS SIG (%)	×	•	Throttle actuator opening/closing is displayed (Linked with accelerator pedal)	
SIDE G-SENSOR (m/s ²)	×	•	Transverse G detected by yaw rate/side G sensor	
STR ANGLE SIG (°)	×	•	Steering angle detected by steering angle sensor	
PRESS SENSOR (bar)	×	▼	Brake fluid pressure detected by pressure sensor	
ENGINE RPM [tr/min (rpm)]	×	▼	Engine speed	
FLUID LEV SW (On/Off)	×	•	Brake fluid level switch signal status	
PARK BRAKE SW (On/Off)	×	•	Parking brake switch signal status	
FR RH IN SOL (On/Off) (Note)	•	×		
FR RH OUT SOL (On/Off) (Note)	•	×		
FR LH IN SOL (On/Off) (Note)	•	×		
FR LH OUT SOL (On/Off) (Note)	•	×	Operation status of each solenoid valve	
RR RH IN SOL (On/Off) (Note)	•	×	Spanish salas at auti odianola valvo	
RR RH OUT SOL (On/Off) (Note)	▼	×		
RR LH IN SOL (On/Off) (Note)	▼	×		
RR LH OUT SOL (On/Off) (Note)	▼	×		
MOTOR RELAY (On/Off)	•	×	Motor and motor relay operation	
ACTUATOR RLY (On/Off) (Note)	•	×	Actuator relay operation	

Revision: July 2016 BRC-31 2016 QX50

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

	SELECT MONITOR ITEM			
Monitor item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	Remarks	
ABS WARN LAMP (On/Off)	▼	×	ABS warning lamp	
OFF LAMP (On/Off)	▼	×	VDC OFF indicator lamp	
SLIP/VDC LAMP (On/Off)	▼	×	VDC warning lamp	
EBD SIGNAL (On/Off)	▼	•	EBD operation	
ABS SIGNAL (On/Off)	▼	•	ABS operation	
TCS SIGNAL (On/Off)	▼	•	TCS operation	
VDC SIGNAL (On/Off)	▼	•	VDC operation	
EBD FAIL SIG (On/Off)	▼	•	EBD fail-safe signal	
ABS FAIL SIG (On/Off)	▼	•	ABS fail-safe signal	
TCS FAIL SIG (On/Off)	▼	•	TCS fail-safe signal	
VDC FAIL SIG (On/Off)	▼	•	VDC fail-safe signal	
CRANKING SIG (On/Off)	▼	•	Crank operation	
CV1 (On/Off) (Note)	▼	•	VDC switch-over valve	
CV2 (On/Off) (Note)	▼	•		
SV1 (On/Off) (Note)	▼	•	VDC Switch-over valve	
SV2 (On/Off) (Note)	▼	•		
V/R OUTPUT (On/Off)	▼	•	Solenoid valve relay activated	
M/R OUTPUT (On/Off)	▼	•	Actuator motor and motor relay activated	
LDP) APP SEN (%)	×	×	Accelerator pedal position sensor status received from ECM via CAN communication	
LDP) ICC MAIN SW (On/Off)	×	×	ICC MAIN switch status received from ECM via CAN con munication	
LDP) LDP ON SW (On/Off)	×	×	Dynamic driver assistance switch status received from ECM via CAN communication	
LDP) WIPER SIGNAL (Stop/PRTCT/1low/1high/Low/High)	×	×	Front wiper operating condition received from BCM via CAN communication	
LDP) BRAKE SW (On/Off)	×	×	Brake switch signal status	
LDP) STOP LMP SW (On/Off)	×	×	Stop lamp switch signal status	
LDP) LDW SW (On/Off)	×	×	Warning systems switch status received from lane camera unit via CAN communication	

< SYSTEM DESCRIPTION >

[VDC/TCS/ABS]

	SELECT MONITOR ITEM			
Monitor item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	Remarks	
LDP) SHIFT POSITION (OFF/P/R/N/D/MM 1st – MM 5th)	×	×	Shift position received from TCM via CAN communication	
LDP) TURN SIGNAL (Off/LH/RH/LH&RH)	×	×	Turn signal operating condition received from BCM via CAN communication	

NOTE:

A brief moment of On/Off condition occurs every 20 seconds after ignition switch turned ON. This is not malfunction because it is an operation for checking.

ACTIVE TEST

CAUTION:

- · Do not perform active test while driving vehicle.
- Make sure to completely bleed air from brake system.
- The active test cannot be started when ABS warning lamp, VDC warning lamp and brake warning lamp are ON.
- ABS warning lamp, VDC warning lamp and brake warning lamp are ON during active test.
- Erase memory of ICC system after implementing active test. Refer to CCS-39, "CONSULT Function (ICC/ADAS)".
- Erase memory of the lane camera unit after implementing active test. Refer to <u>DAS-280</u>, "<u>CONSULT</u> <u>Function</u> (<u>LANE CAMERA</u>)".

NOTE:

- "TEST IS STOPPED" in "ABS" with CONSULT is displayed 10 seconds after operation start.
- After "TEST IS STOPPED" in "ABS" with CONSULT is displayed, to perform test again.

Test Item

ABS SOLENOID VALVE

• Select "Up", "Keep" and "Down" of "ACTIVE TEST" in "ABS" with CONSULT. Then use screen monitor to check that solenoid valve operates as shown in the table below.

Test item	Diaglassitass	Display (Note)		
	Display item —	Up	Keep	Down
	FR RH IN SOL	Off	On	On
- D DU 601	FR RH OUT SOL	Off	Off	On*
R RH SOL	CV2	Off	Off	Off
	SV2	Off	Off	Off
	FR LH IN SOL	Off	On	On
D I I I COI	FR LH OUT SOL	Off	Off	On*
FR LH SOL	CV1	Off	Off	Off
	SV1	Off	Off	Off
	RR RH IN SOL	Off	On	On
R RH SOL	RR RH OUT SOL	Off	Off	On*
R RH SUL	CV1	Off	Off	Off
	SV1	Off	Off	Off
	RR LH IN SOL	Off	On	On
RR LH SOL	RR LH OUT SOL	Off	Off	On*
	CV2	Off	Off	Off
	SV2	Off	Off	Off

^{*:} On for 1 to 2 seconds after the select, and then Off.

NOTE:

A brief moment of On/Off condition occurs every 20 seconds after ignition switch turned ON. This is not malfunction because it is an operation for checking.

Revision: July 2016 BRC-33 2016 QX50

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[VDC/TCS/ABS]

ABS SOLENOID VALVE (ACT)

• Select "Up", "ACT UP" and "ACT KEEP" of "ACTIVE TEST" in "ABS" with CONSULT. Then use screen monitor to check that solenoid valve operates as shown in the table below.

Test item	Diaplay item	Display (Note)		
rest item	Display item	Up	ACT UP	ACT KEEP
	FR RH IN SOL	Off	Off	Off
FR RH ABS SOLENOID	FR RH OUT SOL	Off	Off	Off
(ACT)	CV2	Off	On	On
	SV2	Off	On*	Off
	FR LH IN SOL	Off	Off	Off
FR LH ABS SOLENOID	FR LH OUT SOL	Off	Off	Off
(ACT)	CV1	Off	On	On
	SV1	Off	On*	Off
	RR RH IN SOL	Off	Off	Off
RR RH ABS SOLENOID	RR RH OUT SOL	Off	Off	Off
(ACT)	CV1	Off	On	On
	SV1	Off	On*	Off
	RR LH IN SOL	Off	Off	Off
RR LH ABS SOLENOID	RR LH OUT SOL	Off	Off	Off
(ACT)	CV2	Off	On	On
	SV2	Off	On*	Off

^{*:} On for 1 to 2 seconds after the select, and then Off.

NOTE:

A brief moment of On/Off condition occurs every 20 seconds after ignition switch turned ON. This is not malfunction because it is an operation for checking.

ABS MOTOR

• Select "On" and "Off" of "ACTIVE TEST" in "ABS" with CONSULT on screen. Make sure motor relay and actuator relay operates as shown in table below.

Test item	Display item	Dis	play
	Display item	On	Off
ABS MOTOR	MOTOR RELAY	On	Off
ABS WOTOR	ACTUATOR RLY (Note)	On	On

NOTE:

A brief moment of On/Off condition occurs every 20 seconds after ignition switch turned ON. This is not malfunction because it is an operation for checking.

ECU IDENTIFICATION

ABS actuator and electric unit (control unit) part number can be read.

SPECIFIC DATA MONITOR

Specific data monitor displays specific LDP operating conditions.

Monitor item (Unit)	Remarks	
YAW RATE SEN (d/s)	Yaw rate detected by yaw rate/side G sensor	
LDP) YAW ORDER (×100Nm)	Calculated target yaw moment	
LDP) WARN REQ (On/Off)	Status of warning request that transmits to lane camera unit via CAN communication	

< SYSTEM DESCRIPTION >

[VD	C/T	CS	ΆB	S]
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Monitor item (Unit)	Remarks			
LDP) WARN CONTROL (On/Off)	Status of warning main controller for LDP			
LDP) REDY SIGNAL (On/Off)	Status of internal judgment by LDP controller [ABS actuator and electric unit (control unit)]			
LDP) STATUS SIGNAL (STANDBY/WARN/MASK/Off)	Status of internal judgment by LDP controller [ABS actuator and electric unit (control unit)]			
LDP) CAMERA LOST (Detect/Deviate/Both)	Lane marker detected condition received from lane camera unit via CAN communication			
LDP) LANE UNCLEAR (On/Off)	Lane marker condition received from lane camera unit via CAN communication			

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DTC/CIRCUIT DIAGNOSIS

C1101, C1102, C1103, C1104 WHEEL SENSOR

Description INFOID:000000012168382

When the sensor rotor rotates, the magnetic field changes. It converts the magnetic field changes to current signals (rectangular wave) and transmits them to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1101	RR RH SENSOR-1 (Rear RH wheel sensor-1)	When an open circuit is detected in rear RH wheel sensor circuit.
C1102	RR LH SENSOR-1 (Rear LH wheel sensor-1)	When an open circuit is detected in rear LH wheel sensor circuit.
C1103	FR RH SENSOR-1 (Front RH wheel sensor-1)	When an open circuit is detected in front RH wheel sensor circuit.
C1104	FR LH SENSOR-1 (Front LH wheel sensor-1)	When an open circuit is detected in front LH wheel sensor circuit.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
 Harness or connector ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery 	Harness or connector Wheel sensor ABS actuator and electric unit (control unit) ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery Vehicle was not driven after previous repair

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

(II) With CONSULT

- 1. Start the engine.
- 2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
- 3. Stop the vehicle.
- 4. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

5. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

6. Perform self-diagnosis for "ABS".

<pre></pre>	
Is DTC "C1101", "C1102", "C1104" detected?	•
YES-1 >> "C1101", "C1102", "C1103" or "C1104" is displayed by "CRNT": Proceed to BRC-37, "Diagnosis Procedure".	Α
YES-2 >> "C1101", "C1102", "C1103" and "C1104" are displayed by "PAST": INSPECTION END (Erase the	
memory of self-diagnosis results.) NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermittent Incident". NO-2 >> Confirmation after repair: INSPECTION END	В
Diagnosis Procedure	С
CAUTION:	
Never check between wheel sensor harness connector terminals. 1.CHECK WHEEL SENSOR	D
Turn the ignition switch OFF.	
2. Check the wheel sensor for damage.	Е
Is the inspection result normal?	
YES >> GO TO 3. NO >> GO TO 2.	BRO
2.REPLACE WHEEL SENSOR (1)	
With CONSULT	G
T. Replace the wheel sensor.Front: Refer to BRC-156, "FRONT WHEEL SENSOR: Removal and Installation".	
- Rear: Refer to BRC-157, "REAR WHEEL SENSOR: Removal and Installation".	
2. Erase self-diagnosis result for "ABS".	Н
 Turn the ignition switch OFF → ON → OFF. NOTE: 	
Wait at least 10 seconds after turning ignition switch OFF or ON.	
 Start the engine. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes. 	
NOTE:	J
Vehicle must be driven after repair or replacement to erase the previous DTCs. 6. Stop the vehicle.	J
Stop the vehicle. Turn the ignition switch OFF.	
NOTE:	K
Wait at least 10 seconds after turning ignition switch OFF. 8. Start the engine.	
NOTE:	1
Wait at least 10 seconds after start the engine.	_
9. Perform self-diagnosis for "ABS". <u>Is DTC "C1101", "C1102", "C1103" or "C1104" detected?</u>	
YES >> GO TO 3.	\mathbb{M}
NO >> INSPECTION END	
3. CHECK CONNECTOR	N
1. Turn the ignition switch OFF.	
2. Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.3. Check the wheel sensor harness connector for disconnection or looseness.	
Is the inspection result normal?	0
YES >> GO TO 5.	
NO >> Repair / replace harness or connector, securely lock the connector, and GO TO 4.	Р
4.PERFORM SELF-DIAGNOSIS (1)	
With CONSULT Frage self diagnosis result for "ARS"	
 Erase self-diagnosis result for "ABS". Turn the ignition switch OFF → ON → OFF. 	
NOTE:	
Wait at least 10 seconds after turning ignition switch OFF or ON.	

Revision: July 2016 BRC-37 2016 QX50

3. Start the engine.

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

4. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

- 5. Stop the vehicle.
- Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

7. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

8. Perform self-diagnosis for "ABS".

Is DTC "C1101", "C1102", "C1103" or "C1104" detected?

YES >> GO TO 5.

NO >> INSPECTION END

5. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUND CIR-CUIT

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to BRC-118, <a href="Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair / replace harness, connector, fuse, or fusible link.

6.CHECK TERMINAL

- 1. Turn the ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) harness connector and then check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
- 3. Disconnect wheel sensor harness connector and check each wheel sensor pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair / replace harness, connector, or terminal, and GO TO 7.

7.PERFORM SELF-DIAGNOSIS (2)

(P)With CONSULT

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect wheel sensor harness connector.
- 3. Erase self-diagnosis result for "ABS".
- 4. Turn the ignition switch OFF \rightarrow ON \rightarrow OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

- Start the engine.
- 6. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

- 7. Stop the vehicle.
- 8. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

9. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

Perform self-diagnosis for "ABS".

Is DTC "C1101", "C1102", "C1103" or "C1104" detected?

YES >> GO TO 8.

NO >> INSPECTION END

8.CHECK WHEEL SENSOR HARNESS

1. Turn the ignition switch OFF.

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

- Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Disconnect wheel sensor harness connector.
- 4. Check the continuity between ABS actuator and electric unit (control unit) harness connector and wheel sensor harness connector. (Check the continuity while turning steering wheel left and right, or while moving center harness in wheel housing.)
- Measurement connector and terminal for power supply circuit

ABS actuator and ele	ectric unit (control unit)		Wheel se	nsor	Continuity
Connector	Terminal		Connector	Terminal	Continuity
	26	E60	(Front LH wheel)		
E41	9	E27	(Front RH wheel)	1	Existed
	6	B34	(Rear LH wheel)	'	LAISIGU
	7	B33	(Rear RH wheel)		

Measurement connector and terminal for signal circuit

ABS actuator and ele	ectric unit (control unit)		Wheel se	nsor	Continuity		
Connector	Terminal	Connector Terminal		Connector		Continuity	
	5	E60	(Front LH wheel)				
E41	10	E27	(Front RH wheel)	2	Existed		
	27	B34	(Rear LH wheel)	2	Existed		
	29	B33	(Rear RH wheel)				

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair / replace harness or connector, and GO TO 9.

9. PERFORM SELF-DIAGNOSIS (3)

(P)With CONSULT

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- Connect wheel sensor harness connector.
- 3. Erase self-diagnosis result for "ABS".
- 4. Turn the ignition switch OFF \rightarrow ON \rightarrow OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

- Start the engine.
- 6. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

- 7. Stop the vehicle.
- 8. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

Perform self-diagnosis for "ABS".

Is DTC "C1101", "C1102", "C1103" or "C1104" detected?

YES >> GO TO 10.

NO >> INSPECTION END

10.check wheel sensor output signal

- 1. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 2. Disconnect wheel sensor harness connector.
- 3. Connect ABS active wheel sensor tester (SST: J-45741-A) to wheel sensor using appropriate adapter.

4. Turn the ABS active wheel sensor tester power switch ON.

NOTE:

BRC-39 Revision: July 2016 2016 QX50 **BRC**

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< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

The green POWER indicator should illuminate. If the POWER indicator does not illuminate, replace the battery in the ABS active wheel sensor tester before proceeding.

5. Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheel sensor tester. The red SENSOR indicator should flash ON and OFF to indicate an output signal.

NOTE:

If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads and retest.

Does the ABS active wheel sensor tester detect a signal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".

NO >> GO TO 11.

11.REPLACE WHEEL SENSOR

(P)With CONSULT

- 1. Replace the wheel sensor.
- Front: Refer to BRC-156, "FRONT WHEEL SENSOR: Removal and Installation"
- Rear: Refer to BRC-157, "REAR WHEEL SENSOR: Removal and Installation"
- Connect ABS actuator and electric unit (control unit) harness connector.
- 3. Erase self-diagnosis result for "ABS".
- Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

- 5. Start the engine.
- Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

- 7. Stop the vehicle.
- 8. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

9. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

10. Perform self-diagnosis for "ABS".

Is DTC "C1101", "C1102", "C1103" or "C1104" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".

NO >> INSPECTION END

[VDC/TCS/ABS]

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C1105, C1106, C1107, C1108 WHEEL SENSOR

Description INFOID:0000000012168385

When the sensor rotor rotates, the magnetic field changes. It converts the magnetic field changes to current signals (rectangular wave) and transmits them to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1105	RR RH SENSOR-2 (Rear RH wheel sensor-2)	 When power supply voltage of rear RH wheel sensor is low. When distance between rear RH wheel sensor and rear RH wheel sensor rotor is large. When installation of rear RH wheel sensor or rear RH wheel sensor rotor is not normal. When there is contamination on or damage to the rear RH wheel sensor or rear RH sensor rotor.
C1106	RR LH SENSOR-2 (Rear LH wheel sensor-2)	 When power supply voltage of rear LH wheel sensor is low. When distance between rear LH wheel sensor and rear LH wheel sensor rotor is large. When installation of rear LH wheel sensor or rear LH wheel sensor rotor is not normal. When there is contamination on or damage to the rear LH wheel sensor or rear LH sensor rotor.
C1107	FR RH SENSOR-2 (Front RH wheel sensor-2)	 When power supply voltage of front RH wheel sensor is low. When distance between front RH wheel sensor and front RH wheel sensor rotor is large. When installation of front RH wheel sensor or front RH wheel sensor rotor is not normal. When there is contamination on or damage to the front RH wheel sensor or front RH sensor rotor.
C1108	FR LH SENSOR-2 (Front LH wheel sensor-2)	 When power supply voltage of front LH wheel sensor is low. When distance between front LH wheel sensor and front LH wheel sensor rotor is large. When installation of front LH wheel sensor or front LH wheel sensor rotor is not normal. When there is contamination on or damage to the front LH wheel sensor or front LH sensor rotor.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC	
 Harness or connector Wheel sensor Sensor rotor Tire size ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery 	Harness or connector Wheel sensor Sensor rotor ABS actuator and electric unit (control unit) Tire size ABS actuator and electric unit (control unit) power supply system Fuse Fuse Fusible link Battery Vehicle was not driven after previous repair	1

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

Revision: July 2016 BRC-41 2016 QX50

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

(P)With CONSULT

- 1. Start the engine.
- 2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
- 3. Stop the vehicle.
- Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

5. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

6. Perform self-diagnosis for "ABS".

Is DTC "C1105", "C1106", "C1107" or "C1108" detected?

YES-1 >> "C1105", "C1106", "C1107" or "C1108" is displayed by "CRNT": Proceed to <u>BRC-42, "Diagnosis Procedure"</u>.

YES-2 >> "C1105", "C1106", "C1107" and "C1108" are displayed by "PAST": INSPECTION END (Erase the memory of self-diagnosis results.)

NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermittent Incident".

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012168387

CAUTION:

Never check between wheel sensor harness connector terminals.

1. CHECK WHEEL HUB ASSEMBLY

Check that there is no excessive looseness in wheel hub assembly.

- Front
- 2WD: Refer to FAX-7, "Inspection".
- AWD: Refer to FAX-16, "Inspection".
- Rear: Refer to RAX-5, "Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace the wheel hub assembly, and GO TO 2.

- Front
- 2WD: Refer to FAX-8, "Removal and Installation".
- AWD: Refer to FAX-18, "Removal and Installation".
- Rear: Refer to RAX-7, "Removal and Installation".

2. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUND CIRCUIT

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to BRC-118. <a href="Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair / replace harness, connector, fuse, or fusible link.

3. CHECK TIRE

- 1. Turn the ignition switch OFF.
- Check the tire air pressure, wear and size. Refer to WT-54, "Tire Air Pressure".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Adjust air pressure or replace tire, and GO TO 4.

4.CHECK DATA MONITOR (1)

(I) With CONSULT

- 1. Erase self-diagnosis result for "ABS".
- Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

< D	TC/CIRCUIT DIAGNOSIS > [VDC/TCS/ABS)]
3. 4.	Start the engine. Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSO and "RR RH SENSOR". NOTE:	٦"
5.	Set the "DATA MONITOR" recording speed to "10 msec". Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor. NOTE:	
	Vehicle must be driven after repair or replacement to erase the previous DTCs.	
Not	e the difference at 50 km/h (31 MPH) between the wheel speed detected by the error detecting wheel se	<u>n-</u>
sor	and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference with	
	respectively?	
YE N(ES >> GO TO 5. D >> GO TO 6.	
_		
J.	PERFORM SELF-DIAGNOSIS (1)	_
_	Vith CONSULT	
1.	Stop the vehicle.	
۷.	Turn the ignition switch OFF. NOTE:	
	Wait at least 10 seconds after turning ignition switch OFF.	
3.	Start the engine.	
	NOTE:	
1	Wait at least 10 seconds after start the engine. Perform self-diagnosis for "ABS".	
	· · · · · · · · · · · · · · · · · · ·	
	TC "C1105", "C1106", "C1107" or "C1108" detected?	
YE No		
_		
<u>U.</u>	CHECK WHEEL SENSOR AND SENSOR ROTOR	
1. 2. 3.	Turn the ignition switch OFF. Disconnect wheel sensor harness connector. Remove dust and foreign matter adhered to the wheel sensor and sensor rotor with a vacuum dust colle tor through the wheel sensor mounting hole. CAUTION:	C-
	Install wheel sensor with no backlash and float, and tighten the mounting bolt to the specific	d
	torque. • Front: Refer to <u>BRC-156, "FRONT WHEEL SENSOR: Exploded View"</u> .	
	• Rear: Refer to BRC-157, "REAR WHEEL SENSOR: Exploded View".	
7	>> GO TO 7.	
1.0	CHECK WHEEL SENSOR	
Che	eck the wheel sensor for damage.	_
	ne inspection result normal?	
	S >> GO TO 8.	
NO		
8.0	CHECK WHEEL SENSOR OUTPUT SIGNAL	
1.		—
1. 2.	Disconnect ABS actuator and electric unit (control unit) harness connector. Connect ABS active wheel sensor tester (SST: J-45741-A) to wheel sensor using appropriate adapter.	
3.	Turn the ABS active wheel sensor tester power switch ON.	
	NOTE:	
4.	The green POWER indicator should illuminate. If the POWER indicator does not illuminate, replace the battery in the ABS active wheel sensor tester before proceeding. Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheels are the sensor tester before proceeding.	
	sensor tester. The red SENSOR indicator should flash ON and OFF to indicate an output signal.	

retest.

If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads and

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 12. NO >> GO TO 9.

9.replace wheel sensor (1)

With CONSULT

- Replace the wheel sensor.
- Front: Refer to BRC-156, "FRONT WHEEL SENSOR: Removal and Installation".
- Rear: Refer to <u>BRC-157</u>, "<u>REAR WHEEL SENSOR</u>: Removal and Installation".
- Connect ABS actuator and electric unit (control unit) harness connector.
- 3. Erase self-diagnosis result for "ABS".
- 4. Turn the ignition switch OFF \rightarrow ON \rightarrow OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

- 5. Start the engine.
- Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 10. NO >> GO TO 20.

10. PERFORM SELF-DIAGNOSIS (2)

(P)With CONSULT

- 1. Stop the vehicle.
- Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

4. Perform self-diagnosis for "ABS".

Is DTC "C1105", "C1106", "C1107" or "C1108" detected?

YES >> GO TO 11.

NO >> INSPECTION END

11. CHECK CONNECTOR

- Turn the ignition switch OFF.
- Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.
- 3. Check the wheel sensor harness connector for disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 14.

NO >> Repair / replace harness or connector, securely lock the connector, and GO TO 12.

12. CHECK DATA MONITOR (2)

(P)With CONSULT

- Erase self-diagnosis result for "ABS".
- Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

- Start the engine.
- Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

C1105, C1106, C1107, C1108 WHEEL SENSOR < DTC/CIRCUIT DIAGNOSIS > [VDC/TCS/ABS]	
NOTE: Set the "DATA MONITOR" recording speed to "10 msec". 5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor. NOTE:	
Vehicle must be driven after repair or replacement to erase the previous DTCs.	
Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within	
5%, respectively?	
YES >> GO TO 13.	
NO >> GO TO 14.	
13. PERFORM SELF-DIAGNOSIS (3)	
With CONSULT	
1. Stop the vehicle.	
 Turn the ignition switch OFF. NOTE: 	
Wait at least 10 seconds after turning ignition switch OFF.	
3. Start the engine.	В
NOTE:	P
Wait at least 10 seconds after start the engine. 4. Perform self-diagnosis for "ABS".	
<u>Is DTC "C1105", "C1106", "C1107" or "C1108" detected?</u>	
YES >> GO TO 14.	
NO >> INSPECTION END	
14. CHECK TERMINAL	
1. Turn the ignition switch OFF.	
 Disconnect ABS actuator and electric unit (control unit) harness connector and then check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector. Disconnect wheel sensor harness connector and check each wheel sensor pin terminals for damage or 	
loose connection with harness connector.	
Is the inspection result normal?	
YES >> GO TO 17.	
NO >> Repair / replace harness, connector, or terminal, and GO TO 15.	
15. CHECK DATA MONITOR (3)	
With CONSULT	
 Connect ABS actuator and electric unit (control unit) harness connector. Connect wheel sensor harness connector. 	
3. Erase self-diagnosis result for "ABS".	
4. Turn the ignition switch OFF \rightarrow ON \rightarrow OFF.	
NOTE:	
Wait at least 10 seconds after turning ignition switch OFF or ON. 5. Start the engine.	
 Start the engine. Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR". NOTE: 	

Set the "DATA MONITOR" recording speed to "10 msec".

7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

NOIE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

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YES >> GO TO 16. NO >> GO TO 17.

16. PERFORM SELF-DIAGNOSIS (4)

(E)With CONSULT

Revision: July 2016 BRC-45 2016 QX50

< DTC/CIRCUIT DIAGNOSIS > [VDC/TCS/ABS]

- 1. Stop the vehicle.
- Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

Perform self-diagnosis for "ABS".

Is DTC "C1105", "C1106", "C1107" or "C1108" detected?

YES >> GO TO 17.

NO >> INSPECTION END

17. CHECK WHEEL SENSOR HARNESS

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Disconnect wheel sensor harness connector.
- 4. Check the continuity between ABS actuator and electric unit (control unit) harness connector and the ground.

ABS actuator and ele	ectric unit (control unit)		Continuity		
Connector	Terminal	_	Continuity		
	26, 5				
⊑ 41	9, 10	Ground	Not existed		
E41	6, 27	Ground	Not existed		
	7, 29				

Is the inspection result normal?

YES >> GO TO 18.

NO >> Repair / replace harness or connector, and GO TO 18.

18. CHECK DATA MONITOR (4)

(P)With CONSULT

- Connect ABS actuator and electric unit (control unit) harness connector.
- Connect wheel sensor harness connector.
- 3. Erase self-diagnosis result for "ABS".
- 4. Turn the ignition switch OFF \rightarrow ON \rightarrow OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

- 5. Start the engine.
- Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 19.

NO >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".

19. PERFORM SELF-DIAGNOSIS (5)

(P)With CONSULT

- 1. Stop the vehicle.
- 2. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF. Start the engine. NOTE: Wait at least 10 seconds after start the engine. Perform self-diagnosis for "ABS". DTC "C1105". "C1105". "C1107" or "C1108" detected? YES → Replace the ABS actuator and electric unit (control unit). Refer to BRC-159. "Removal and Instaliation". NO → INSPECTION END 20. REPLACE SENSOR ROTOR Whith CONSULT. Replace the sensor rotor. Front. Refer to BRC-158. "FRONT SENSOR ROTOR: Removal and Instaliation". Rear: Refer to BRC-158. "REAR SENSOR ROTOR: Removal and Instaliation". Rear: Refer to BRC-158. "REAR SENSOR ROTOR: Removal and Instaliation". Iturn the ignition switch OFF → ON → OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF or ON. Start the engine. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes. NOTE: Vehicle must be driven after repair or replacement to erase the previous DTCs. Stort the vehicle. Turn the ignition switch OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF. Soltant the engine. NOTE: Wait at least 10 seconds after start the engine. Perform self-diagnosis for "ABS". Start the engine. DTC "C1106". "C1106". "C1107" or "C1108" detected? YES → Replace the ABS actuator and electric unit (control unit). Refer to BRC-159. "Removal and Instaliation". NO → INSPECTION END	C1105, C1106, C1107, C1108 WHEEL SENSOR	
3. Start the engine. NOTE: Wait at least 10 seconds after start the engine. 4. Perform self-diagnosis for "ABS". 5 DTC "C1105". "C1106". "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159. "Removal and Installation". NO >> INSPECTION END 20.REPLACE SENSOR ROTOR With CONSULT 1. Replace the sensor rotor. Front: Refer to BRC-158. "FRONT SENSOR ROTOR: Removal and Installation". Rear: Refer to BRC-158. "REAR SENSOR ROTOR: Removal and Installation". Rear: Refer to BRC-158. "REAR SENSOR ROTOR: Removal and Installation". 3. Turn the ignition switch OFF → ON → OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF or ON. 4. Start the engine. 5. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes. NOTE: Vehicle must be driven after repair or replacement to erase the previous DTCs. 5. Stop the vehicle. 7. Turn the ignition switch OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF. NOTE: Wait at least 10 seconds after start the engine. 9. Perform self-diagnosis for "ABS". 5 DTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".	D. D. O. T. O. C. A. D.	3]
NOTE: Wait at least 10 seconds after start the engine. Perform self-diagnosis for "ABS". DTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation". NO >> INSPECTION END OREPLACE SENSOR ROTOR With CONSULT Replace the sensor rotor. Front: Refer to BRC-158, "FRONT SENSOR ROTOR: Removal and Installation". Rear: Refer to BRC-158, "REAN SENSOR ROTOR: Removal and Installation". Rear: Refer to BRC-158, "REAN SENSOR ROTOR REmoval and Installation". Turn the ignition switch OFF → ON → OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF or ON. Start the engine. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes. NOTE: Vehicle must be driven after repair or replacement to erase the previous DTCs. Stop the vehicle. Turn the ignition switch OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF. NOTE: Wait at least 10 seconds after start the engine. Perform self-diagnosis for "ABS". B DTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".	Wait at least 10 seconds after turning ignition switch OFF.	_
Wait at least 10 seconds after start the engine. Perform self-diagnosis for "ABS". DTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation". NO >> INSPECTION END OREPLACE SENSOR ROTOR With CONSULT Replace the sensor rotor. Front: Refer to BRC-158, "FRONT SENSOR ROTOR: Removal and Installation". Rear: Refer to BRC-158, "FRONT SENSOR ROTOR: Removal and Installation". Rear: Refer to BRC-158, "REAR SENSOR ROTOR: Removal and Installation". Pront: Refer to BRC-158, "REAR SENSOR ROTOR: Removal and Installation". Pront: Refer to BRC-158, "REAR SENSOR ROTOR: Removal and Installation". Pront: Rear: Refer to BRC-158, "REAR SENSOR ROTOR: Removal and Installation". Rear: Refer to BRC-158, "REAR SENSOR ROTOR: Removal and Installation". Pront: Removal and Installation and Installation". Wait at least 10 seconds after start the engine. Perform self-diagnosis for "ABS". Bott "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".		
A. Perform self-diagnosis for "ABS". S DTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation". NO >> INSPECTION END OREPLACE SENSOR ROTOR With CONSULT Replace the sensor rotor. Front: Refer to BRC-158, "FRONT SENSOR ROTOR: Removal and Installation". Rear: Refer to BRC-158, "REAR SENSOR ROTOR: Removal and Installation". Erase self-diagnosis result for "ABS". Turn the ignition switch OFF → ON → OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF or ON. Start the engine. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes. NOTE: Vehicle must be driven after repair or replacement to erase the previous DTCs. Stop the vehicle. Turn the ignition switch OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF. Start the engine. NOTE: Wait at least 10 seconds after start the engine. Perform self-diagnosis for "ABS". Start the engine. NOTE: Wait at least 10 seconds after start the engine. Perform self-diagnosis for "ABS". S DTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".		
S DTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation". NO >> INSPECTION END 20. REPLACE SENSOR ROTOR BWith CONSULT 1. Replace the sensor rotor. Front: Refer to BRC-158, "FRONT SENSOR ROTOR: Removal and Installation". Rear: Refer to BRC-158, "REAR SENSOR ROTOR: Removal and Installation". 2. Erase self-diagnosis result for "ABS". 3. Turn the ignition switch OFF → ON → OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF or ON. 4. Start the engine. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes. NOTE: Vehicle must be driven after repair or replacement to erase the previous DTCs. 5. Stop the vehicle. 7. Turn the ignition switch OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF. Soptime vehicle at least 10 seconds after turning ignition switch OFF. NOTE: Wait at least 10 seconds after start the engine. NOTE: Wait at least 10 seconds after start the engine. Perform self-diagnosis for "ABS". S DTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".		
YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation". NO >> INSPECTION END 20. REPLACE SENSOR ROTOR With CONSULT	•	
NO >> INSPECTION END 20.REPLACE SENSOR ROTOR BWith CONSULT 1. Replace the sensor rotor. Front: Refer to BRC-158, "FRONT SENSOR ROTOR: Removal and Installation". Rear: Refer to BRC-158, "REAR SENSOR ROTOR: Removal and Installation". 2. Erase self-diagnosis result for "ABS". 3. Turn the ignition switch OFF → ON → OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF or ON. 4. Start the engine. 5. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes. NOTE: Vehicle must be driven after repair or replacement to erase the previous DTCs. 3. Stop the vehicle. 7. Turn the ignition switch OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF. 3. Start the engine. NOTE: Wait at least 10 seconds after start the engine. 9. Perform self-diagnosis for "ABS". 5. DTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".		al.
NO >> INSPECTION END 20. REPLACE SENSOR ROTOR BWith CONSULT 1. Replace the sensor rotor. Front: Refer to BRC-158, "FRONT SENSOR ROTOR: Removal and Installation". Rear: Refer to BRC-158, "REAR SENSOR ROTOR: Removal and Installation". 2. Erase self-diagnosis result for "ABS". 3. Turn the ignition switch OFF → ON → OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF or ON. 4. Start the engine. 5. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes. NOTE: Vehicle must be driven after repair or replacement to erase the previous DTCs. 5. Stop the vehicle. 7. Turn the ignition switch OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF. 8. Start the engine. NOTE: Wait at least 10 seconds after start the engine. 9. Perform self-diagnosis for "ABS". s DTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".		<u> 11-</u>
i. Replace the sensor rotor. Front: Refer to BRC-158, "FRONT SENSOR ROTOR: Removal and Installation". Rear: Refer to BRC-158, "REAR SENSOR ROTOR: Removal and Installation". Erase self-diagnosis result for "ABS". Turn the ignition switch OFF → ON → OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF or ON. Start the engine. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes. NOTE: Vehicle must be driven after repair or replacement to erase the previous DTCs. Stop the vehicle. Turn the ignition switch OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF. Start the engine. NOTE: Wait at least 10 seconds after start the engine. Perform self-diagnosis for "ABS". DTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".		
i. Replace the sensor rotor. Front: Refer to BRC-158, "FRONT SENSOR ROTOR: Removal and Installation". Rear: Refer to BRC-158, "REAR SENSOR ROTOR: Removal and Installation". Erase self-diagnosis result for "ABS". Turn the ignition switch OFF → ON → OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF or ON. Start the engine. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes. NOTE: Vehicle must be driven after repair or replacement to erase the previous DTCs. Stop the vehicle. Turn the ignition switch OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF. Start the engine. NOTE: Wait at least 10 seconds after start the engine. Perform self-diagnosis for "ABS". DTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".	20. REPLACE SENSOR ROTOR	
 Replace the sensor rotor. Front: Refer to BRC-158, "FRONT SENSOR ROTOR: Removal and Installation". Rear: Refer to BRC-158, "REAR SENSOR ROTOR: Removal and Installation". Erase self-diagnosis result for "ABS". Turn the ignition switch OFF → ON → OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF or ON. Start the engine. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes. NOTE: Vehicle must be driven after repair or replacement to erase the previous DTCs. Stop the vehicle. Turn the ignition switch OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF. Start the engine. NOTE: Wait at least 10 seconds after start the engine. Perform self-diagnosis for "ABS". DTC "C1105", "C1106", "C1107" or "C1108" detected? YES > Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation". 		—
Rear: Refer to BRC-158, "REAR SENSOR ROTOR: Removal and Installation". Erase self-diagnosis result for "ABS". Turn the ignition switch OFF → ON → OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF or ON. Start the engine. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes. NOTE: Vehicle must be driven after repair or replacement to erase the previous DTCs. Stop the vehicle. Turn the ignition switch OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF. Start the engine. NOTE: Wait at least 10 seconds after start the engine. Perform self-diagnosis for "ABS". DTC "C1105", "C1106", "C1107" or "C1108" detected? YES > Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".		
 2. Erase self-diagnosis result for "ABS". 3. Turn the ignition switch OFF → ON → OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF or ON. 4. Start the engine. 5. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes. NOTE: Vehicle must be driven after repair or replacement to erase the previous DTCs. 3. Stop the vehicle. 7. Turn the ignition switch OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF. 3. Start the engine. NOTE: Wait at least 10 seconds after start the engine. 9. Perform self-diagnosis for "ABS". s DTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation". 		
 3. Turn the ignition switch OFF → ON → OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF or ON. 4. Start the engine. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes. NOTE: Vehicle must be driven after repair or replacement to erase the previous DTCs. 5. Stop the vehicle. Turn the ignition switch OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF. 3. Start the engine. NOTE: Wait at least 10 seconds after start the engine. Perform self-diagnosis for "ABS". s DTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159. "Removal and Installation". 		
NOTE: Wait at least 10 seconds after turning ignition switch OFF or ON. Start the engine. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes. NOTE: Vehicle must be driven after repair or replacement to erase the previous DTCs. Stop the vehicle. Turn the ignition switch OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF. Start the engine. NOTE: Wait at least 10 seconds after start the engine. Perform self-diagnosis for "ABS". DTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".		
Wait at least 10 seconds after turning ignition switch OFF or ON. Start the engine. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes. NOTE: Vehicle must be driven after repair or replacement to erase the previous DTCs. Stop the vehicle. Turn the ignition switch OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF. Start the engine. NOTE: Wait at least 10 seconds after start the engine. Perform self-diagnosis for "ABS". S DTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".		
 Start the engine. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes. NOTE: Vehicle must be driven after repair or replacement to erase the previous DTCs. Stop the vehicle. Turn the ignition switch OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF. Start the engine. NOTE: Wait at least 10 seconds after start the engine. Perform self-diagnosis for "ABS". DTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation". 		
Vehicle must be driven after repair or replacement to erase the previous DTCs. Stop the vehicle. Turn the ignition switch OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF. Start the engine. NOTE: Wait at least 10 seconds after start the engine. Perform self-diagnosis for "ABS". DTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".		
Vehicle must be driven after repair or replacement to erase the previous DTCs. Stop the vehicle. Turn the ignition switch OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF. Start the engine. NOTE: Wait at least 10 seconds after start the engine. Perform self-diagnosis for "ABS". SDTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".		
 Stop the vehicle. Turn the ignition switch OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF. Start the engine. NOTE: Wait at least 10 seconds after start the engine. Perform self-diagnosis for "ABS". DTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159 , "Removal and Installation".		
 7. Turn the ignition switch OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF. 3. Start the engine. NOTE: Wait at least 10 seconds after start the engine. 9. Perform self-diagnosis for "ABS". s DTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation". 		
NOTE: Wait at least 10 seconds after turning ignition switch OFF. Start the engine. NOTE: Wait at least 10 seconds after start the engine. Perform self-diagnosis for "ABS". SDTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".		
 Start the engine. NOTE: Wait at least 10 seconds after start the engine. Perform self-diagnosis for "ABS". SDTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation". 		
NOTE: Wait at least 10 seconds after start the engine. Perform self-diagnosis for "ABS". S DTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".		
Wait at least 10 seconds after start the engine. 9. Perform self-diagnosis for "ABS". <u>s DTC "C1105", "C1106", "C1107" or "C1108" detected?</u> YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-159, "Removal and Installation"</u> .		
9. Perform self-diagnosis for "ABS". <u>s DTC "C1105", "C1106", "C1107" or "C1108" detected?</u> YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-159, "Removal and Installation"</u> .		
s DTC "C1105", "C1106", "C1107" or "C1108" detected? YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".		
YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-159</u> , "Removal and Installation".	s DTC "C1105", "C1106", "C1107" or "C1108" detected?	
<u>lation"</u> .		al-
NO >> INSPECTION END	'	
	NO >> INSPECTION END	

[VDC/TCS/ABS]

C1109 POWER AND GROUND SYSTEM

Description INFOID:0000000012168388

Supplies electric power to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1109	BATTERY VOLTAGE [ABNORMAL] (Battery voltage [abnormal])	 When ignition power supply voltage is in following state. Ignition power supply voltage: 10 V ≥ ignition power supply voltage. Ignition power supply voltage: 16 V ≤ ignition power supply voltage.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
 Harness or connector ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery Charge system 	Harness or connector ABS actuator and electric unit (control unit) IPDM E/R ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery Charge system

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

(I) With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

3. Perform self-diagnosis for "ABS".

Is DTC "C1109" detected?

YES-1 >> "CRNT" is displayed: Proceed to BRC-48, "Diagnosis Procedure".

YES-2 >> "PAST" is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)

NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermittent Incident".

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012168390

1. CHECK CONNECTOR

- Turn the ignition switch OFF.
- Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.

C1109 POWER AND GROUND SYSTEM	
< DTC/CIRCUIT DIAGNOSIS > [VDC/TCS/ABS]	
Is the inspection result normal?	
YES >> GO TO 3. NO >> Repair / replace harness or connector, securely lock the connector, and GO TO 2.	
2.PERFORM SELF-DIAGNOSIS	
R)With CONSULT	
1. Turn the ignition switch OFF.	
NOTE: Wait at least 10 seconds after turning ignition switch OFF.	
2. Start the engine.	
NOTE: Wait at least 10 seconds after start the engine.	
Perform self-diagnosis for "ABS".	
s DTC "C1109" detected?	
YES >> GO TO 3.	
NO >> INSPECTION END	_
3. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUND CIRCUIT	
Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to <u>BRC-118.</u>	
Diagnosis Procedure".	
s the inspection result normal?	
YES >> GO TO 4. NO >> Repair / replace harness, connector, fuse, or fusible link.	
4.CHECK TERMINAL	
Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with	
harness connector.	
2. Check the IPDM E/R pin terminals for damage or loose connection with harness connector.	
Is the inspection result normal?	
YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-159</u> , "Removal and Installation".	
NO >> Repair / replace harness, connector, or terminal.	

C1110, C1153 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

C1110, C1153 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

DTC Logic

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1110	CONTROLLER FAILURE (Controller failure)	When there is an internal malfunction in the ABS actuator and electric unit (control unit).
C1153	EMERGENCY BRAKE (Emergency brake)	When ABS actuator and electric unit (control unit) is malfunctioning. (Pressure increase is too much or too little)

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

DTC	PAST DTC	CRNT DTC	
C1110	The vehicle travels near high-voltage electrical power lines. Motor built-in the ABS actuator and electric unit (control unit) operates temporarily without a break. Harness or connector ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery	 Harness or connector ABS actuator and electric unit (control unit) ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery 	
C1153	 The vehicle travels near high-voltage electrical power lines. ABS operates for a long time (e.g. travel under a tire hydroplaning condition). 	ABS actuator and electric unit (control unit)	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

(P)With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

Perform self-diagnosis for "ABS".

Is DTC "C1110" or "C1153" detected?

- YES-1 >> "C1110" or "C1153" is displayed by "CRNT": Proceed to BRC-51, "Diagnosis Procedure".
- YES-2 >> "C1110" and "C1153" are displayed by "PAST": INSPECTION END (Erase the memory of self-diagnosis results.)
- NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

C1110, C1153 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< DTC/CIRCUIT DIAGNOSIS > [VDC/TCS/ABS]

1. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUND CIRCUIT

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to <u>BRC-118</u>, "Diagnosis Procedure".

Is the inspection result normal?

Diagnosis Procedure

YES >> GO TO 2.

NO >> Repair / replace harness, connector, fuse, or fusible link.

2. PERFORM SELF-DIAGNOSIS

(P)With CONSULT

Perform self-diagnosis for "ABS".

NOTE:

Replace the ABS actuator and electric unit (control unit) even if other DTCs are displayed along with "C1110" or "C1153" in self-diagnosis for "ABS".

Is DTC "C1110" or "C1153" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-159</u>, "Removal and Installation".

NO >> INSPECTION END (Although motor built-in the ABS actuator and electric unit (control unit) operates temporarily without a break, this is not a malfunction. Erase the memory of self-diagnosis results.)

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C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

Description INFOID.000000012168393

PUMP

The pump returns the brake fluid stored in the reservoir to the master cylinder by reducing the pressure.

MOTOR

The motor drives the pump according to the signals transmitted by the ABS actuator and electric unit (control unit).

MOTOR RELAY

Activates or deactivates motor according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic INFOID:000000012168394

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1111	PUMP MOTOR (Pump motor and motor relay)	When a malfunction is detected in motor or motor relay.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
 Harness or connector ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery 	Harness or connector ABS actuator and electric unit (control unit) ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.check dtc detection

(P)With CONSULT

- 1. Turn the ignition switch OFF \rightarrow ON, and wait 30 seconds.
- 2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
- 3. Stop the vehicle.
- 4. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

5. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

6. Perform self-diagnosis for "ABS".

Is DTC "C1111" detected?

YES-1 >> "CRNT" is displayed: Proceed to BRC-53, "Diagnosis Procedure".

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

<pre>< DTC/CIRCUIT DIAGNOSIS ></pre>	[VDC/TCS/ABS]
YES-2 >> "PAST" is displayed: INSPECTION END (Erase the memory of self-dia NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermitted NO-2 >> Confirmation after repair: INSPECTION END	
Diagnosis Procedure	INFOID:000000012168395
1.check connector	
 Turn the ignition switch OFF. Check the ABS actuator and electric unit (control unit) harness connector for distance of the increasing result parents. 	isconnection or looseness.
Is the inspection result normal? YES >> GO TO 3.	
NO >> Repair / replace harness or connector, securely lock the connector, and	d GO TO 2.
2.PERFORM SELF-DIAGNOSIS	
	
 Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes. NOTE: 	
Vehicle must be driven after repair or replacement to erase the previous DTCs.	
 Stop the vehicle. Turn the ignition switch OFF. 	
NOTE: Wait at least 10 seconds after turning ignition switch OFF.	
5. Start the engine.	
NOTE: Wait at least 10 seconds after start the engine. Perform self-diagnosis for "ABS".	
Is DTC "C1111" detected?	
YES >> GO TO 3. NO >> INSPECTION END	
3.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SU	PPLY AND GROUND CIR-
CUIT Check the ABS actuator and electric unit (control unit) power supply and ground	circuit Refer to BRC-118
"Diagnosis Procedure".	circuit. Neier to <u>bixo-110.</u>
Is the inspection result normal?	
YES >> GO TO 5. NO >> Repair / replace harness, connector, or fuse, and GO TO 4.	
4.ERASE SELF-DIAGNOSIS RESULT (1)	
®With CONSULT	
 Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes. NOTE: 	
Vehicle must be driven after repair or replacement to erase the previous DTCs. Stop the vehicle.	
3. Erase self-diagnosis result for "ABS".	
 Turn the ignition switch OFF → ON → OFF. NOTE: 	
Wait at least 10 seconds after turning ignition switch OFF or ON.	
>> INSPECTION END	
5.CHECK TERMINAL	

Revision: July 2016 BRC-53 2016 QX50

harness connector.

<u>Is the inspection result normal?</u>

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

- YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-159</u>, "Removal and Installation".
- NO >> Repair / replace harness or connector, and GO TO 6.

6. ERASE SELF-DIAGNOSIS RESULT (2)

With CONSULT

1. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

- 2. Stop the vehicle.
- 3. Erase self-diagnosis result for "ABS".
- 4. Turn the ignition switch OFF \rightarrow ON \rightarrow OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

>> INSPECTION END

C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

C1115 WHEEL SENSOR

Description INFOID:0000000012168396

When the sensor rotor rotates, the magnetic field changes. It converts the magnetic field changes to current signals (rectangular wave) and transmits them to the ABS actuator and electric unit (control unit).

DTC Logic INFOID:0000000012168397

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1115	ABS SENSOR [ABNORMAL SIGNAL] (Wheel sensor [abnormal signal])	When difference in wheel speed between any wheel and others is detected the vehicle is driven, because of installation of other tires than specified.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
 Harness or connector Wheel sensor Sensor rotor ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery 	 Harness or connector Wheel sensor Sensor rotor ABS actuator and electric unit (control unit) ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery Tire size

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.check dtc detection

(P)With CONSULT

- 1. Start the engine.
- 2. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.
- Stop the vehicle.
- Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

5. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

6. Perform self-diagnosis for "ABS".

Is DTC "C1115" detected?

YES-1 >> "CRNT" is displayed: Proceed to BRC-56, "Diagnosis Procedure".

YES-2 >> "PAST" is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)

NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermittent Incident".

NO-2 >> Confirmation after repair: INSPECTION END

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BRC-55 Revision: July 2016 2016 QX50

< DTC/CIRCUIT DIAGNOSIS >

Diagnosis Procedure

INFOID:0000000012168398

CAUTION:

Never check between wheel sensor harness connector terminals.

1. CHECK TIRE

Check the tire air pressure, wear and size. Refer to WT-54, "Tire Air Pressure".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Adjust air pressure or replace tire and GO TO 2.

2.CHECK DATA MONITOR (1)

(P)With CONSULT

- 1. Erase self-diagnosis result for "ABS".
- 2. Turn the ignition switch OFF \rightarrow ON \rightarrow OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

- 3. Start the engine.
- Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

5. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 3. NO >> GO TO 4.

3.perform self-diagnosis (1)

(P)With CONSULT

- 1. Stop the vehicle.
- Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

4. Perform self-diagnosis for "ABS".

Is DTC "C1115" detected?

YES >> GO TO 4.

NO >> INSPECTION END

 ${f 4.}$ CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUND CIRCUIT

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to <u>BRC-118</u>, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair / replace harness, connector, fuse, or fusible link.

5. CHECK WHEEL SENSOR AND SENSOR ROTOR

- 1. Turn the ignition switch OFF.
- Disconnect wheel sensor harness connector.
- Remove dust and foreign matter adhered to the wheel sensor and sensor rotor with a vacuum dust collector through the wheel sensor mounting hole.
 CAUTION:

Revision: July 2016 BRC-56 2016 QX50

Install wheel sensor with no backlash and float, and tighten the mounting bolt to the specified torque.

- Front: Refer to BRC-156, "FRONT WHEEL SENSOR: Exploded View".
- Rear: Refer to BRC-157, "REAR WHEEL SENSOR: Exploded View".

>> GO TO 6.

6.CHECK WHEEL SENSOR

Check the wheel sensor for damage.

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 8.

7 . CHECK WHEEL SENSOR OUTPUT SIGNAL

- Disconnect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect ABS active wheel sensor tester (SST: J-45741-A) to wheel sensor using appropriate adapter.
- Turn the ABS active wheel sensor tester power switch ON.

NOTE:

The green POWER indicator should illuminate. If the POWER indicator does not illuminate, replace the battery in the ABS active wheel sensor tester before proceeding.

4. Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheel sensor tester. The red SENSOR indicator should flash ON and OFF to indicate an output signal.

NOTE:

If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads and retest.

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 11. NO >> GO TO 8.

8. REPLACE WHEEL SENSOR (1)

(P)With CONSULT

- 1. Replace the wheel sensor.
- Front: Refer to BRC-156, "FRONT WHEEL SENSOR: Removal and Installation".
- Rear: Refer to BRC-157, "REAR WHEEL SENSOR: Removal and Installation".
- Connect ABS actuator and electric unit (control unit) harness connector.
- Erase self-diagnosis result for "ABS".
- 4. Turn the ignition switch OFF \rightarrow ON \rightarrow OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

- 5. Start the engine.
- 6. Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 9.

NO >> GO TO 19.

$\mathbf{9}.$ PERFORM SELF-DIAGNOSIS (2)

With CONSULT

- 1. Stop the vehicle.
- Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

BRC-57 Revision: July 2016 2016 QX50 **BRC**

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< DTC/CIRCUIT DIAGNOSIS >

Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

Perform self-diagnosis for "ABS".

Is DTC "C1115" detected?

YES >> GO TO 10.

NO >> INSPECTION END

10. CHECK CONNECTOR

- 1. Turn the ignition switch OFF.
- 2. Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.
- Check the wheel sensor harness connector for disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 12.

NO >> Repair / replace harness or connector, securely lock the connector, and GO TO 11.

11. CHECK DATA MONITOR (2)

(P)With CONSULT

- 1. Erase self-diagnosis result for "ABS".
- Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

- 3. Start the engine.
- Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 12. NO >> GO TO 13.

12. PERFORM SELF-DIAGNOSIS (3)

(P)With CONSULT

- 1. Stop the vehicle.
- 2. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

Perform self-diagnosis for "ABS".

Is DTC "C1115" detected?

YES >> GO TO 13.

NO >> INSPECTION END

13. CHECK TERMINAL

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector and then check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
- 3. Disconnect wheel sensor harness connector and check each wheel sensor pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 16.

C1115 WHEEL SENSOR

< DTC/CIRCUIT DIAGNOSIS > [VDC/TCS/ABS]

NO >> Repair / replace harness, connector, or terminal, and GO TO 14.

14. CHECK DATA MONITOR (3)

With CONSULT

- Connect ABS actuator and electric unit (control unit) harness connector.
- Connect wheel sensor harness connector.
- 3. Erase self-diagnosis result for "ABS".
- 4. Turn the ignition switch OFF \rightarrow ON \rightarrow OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

- 5. Start the engine.
- Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 15. NO >> GO TO 16.

15. PERFORM SELF-DIAGNOSIS (4)

(P)With CONSULT

- 1. Stop the vehicle.
- 2. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

4. Perform self-diagnosis for "ABS".

Is DTC "C1115" detected?

YES >> GO TO 16.

NO >> INSPECTION END

16.check wheel sensor harness

- Turn the ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Disconnect wheel sensor harness connector.
- 4. Check the continuity between ABS actuator and electric unit (control unit) harness connector and wheel sensor harness connector. (Check continuity while turning steering wheel left and right, or while moving center harness in wheel housing.)
- Measurement connector and terminal for power supply circuit

ABS actuator and electric unit (control unit)		Wheel sensor			Continuity
Connector	Terminal	Connector		Terminal	Continuity
	26	E60	(Front LH wheel)		
E41	9	E27	(Front RH wheel)	1	Existed
	6	B34	(Rear LH wheel)	!	LXISIEU
	7	B33	(Rear RH wheel)		

Measurement connector and terminal for signal circuit

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ABS actuator and electric unit (control unit)		Wheel sensor			Continuity
Connector	Terminal	Connector		Terminal	Continuity
E41	5	E60	(Front LH wheel)		
	10	E27	(Front RH wheel)	2	Existed
	27	B34	(Rear LH wheel)	2	LXISIEU
	29	B33	(Rear RH wheel)		

Check the continuity between ABS actuator and electric unit (control unit) harness connector and the ground.

ABS actuator and ele	ectric unit (control unit)		Continuity	
Connector Terminal		_	Continuity	
	26, 5			
E41	9, 10	Ground	Not existed	
L41	6, 27			
	7, 29			

Is the inspection result normal?

YES >> GO TO 17.

NO >> Repair / replace harness or connector, and GO TO 17.

17. CHECK DATA MONITOR (4)

(P)With CONSULT

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect wheel sensor harness connector.
- 3. Erase self-diagnosis result for "ABS".
- 4. Turn the ignition switch OFF \rightarrow ON \rightarrow OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

- Start the engine.
- Select "ABS" and "DATA MONITOR", check "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR" and "RR RH SENSOR".

NOTE:

Set the "DATA MONITOR" recording speed to "10 msec".

7. Read a value (wheel speed) of both normal wheel sensors and error-detecting wheel sensor.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

Note the difference at 50 km/h (31 MPH) between the wheel speed detected by the error detecting wheel sensor and the maximum/minimum wheel speed detected by the normal wheel sensors, is the difference within 5%, respectively?

YES >> GO TO 18.

NO >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-159</u>, "Removal and Installation".

18. PERFORM SELF-DIAGNOSIS (5)

(P)With CONSULT

- 1. Stop the vehicle.
- Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

Perform self-diagnosis for "ABS".

Is DTC "C1115" detected?

C1115 WHEEL SENSOR

[VDC/TCS/ABS] < DTC/CIRCUIT DIAGNOSIS > YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation". NO >> INSPECTION END 19. REPLACE SENSOR ROTOR (P)With CONSULT Replace the sensor rotor. Front: Refer to <u>BRC-158</u>, "FRONT SENSOR ROTOR: Removal and Installation". Rear: Refer to <u>BRC-158</u>, "REAR SENSOR ROTOR: Removal and Installation".

- 2. Erase self-diagnosis result for "ABS". 3. Turn the ignition switch OFF \rightarrow ON \rightarrow OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

- Start the engine.
- 5. Drive the vehicle at approx. 50 km/h (31 MPH) or more for approx. 2 minutes.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

- Stop the vehicle.
- Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

8. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

9. Perform self-diagnosis for "ABS".

Is DTC "C1115" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".

NO >> INSPECTION END BRC

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[VDC/TCS/ABS]

C1116 STOP LAMP SWITCH

Description INFOID.000000012168399

The stop lamp switch transmits the stop lamp switch signal (ON/OFF) to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1116	STOP LAMP SW (Stop lamp switch)	When stop lamp switch signal is not input when brake pedal operates.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
Harness or connector Stop lamp switch signal circuit	Harness or connector Stop lamp switch ABS actuator and electric unit (control unit) ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

(I) With CONSULT

- 1. Turn the ignition switch OFF, and wait 10 seconds or more.
- 2. Start the engine.

NOTE:

Stop the vehicle.

3. Wait 1 minute or more.

NOTE:

Never depress brake pedal.

- 4. Depress brake pedal by 100 mm (3.94 in) or more, and maintain at that position for a minimum of 1 minute or more.
- 5. Release brake pedal, and wait 1 minute or more.
- 6. Repeat step 4 to 5 ten or more times.
- Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

8. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

9. Perform self-diagnosis for "ABS".

Is DTC "C1116" detected?

C1116 STOP LAMP SWITCH

CTITESTOP LAWP SWITCH	
< DTC/CIRCUIT DIAGNOSIS > [VDC/TCS/ABS]	
YES-1 >> "CRNT" is displayed: Proceed to <u>BRC-63, "Diagnosis Procedure"</u> . YES-2 >> "PAST" is displayed: INSPECTION END (Erase the memory of self-diagnosis results.) NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-42, "Intermittent Incident"</u> . NO-2 >> Confirmation after repair: INSPECTION END	•
Diagnosis Procedure	1
NOTE: DTC "C1116" may be detected when the brake pedal and the accelerator pedal are simultaneously depressed for 1 minute or more while driving the vehicle. This is not a malfunction. 1.INTERVIEW FROM THE CUSTOMER	l
Check if the brake pedal and the accelerator pedal are simultaneously depressed for 1 minute or more while driving the vehicle.	- ;
Is there such a history? YES >> GO TO 2. NO >> GO TO 3.	
2.PERFORM SELF-DIAGNOSIS	
 	
NOTE: Wait at least 10 seconds after turning ignition switch OFF or ON. Start the engine. NOTE:	
Stop the vehicle. 4. Depress the brake pedal several times. 5. Turn the ignition switch OFF. NOTE:	
Wait at least 10 seconds after turning ignition switch OFF. 6. Start the engine. NOTE:	
Wait at least 10 seconds after start the engine. 7. Perform self-diagnosis for "ABS".	
<u>Is DTC "C1116" detected?</u> YES >> GO TO 3.	
NO >> INSPECTION END	
3.STOP LAMP FOR ILLUMINATION Depress brake nodel and sheek that step lamp turns ON	-
Depress brake pedal and check that stop lamp turns ON. Does stop lamp turn ON? YES >> GO TO 5.	
NO >> Check the stop lamp system circuit. GO TO 4.	
4.CHECK DATA MONITOR (1)	_
 With CONSULT 1. Erase self-diagnosis result for "ABS". 2. Turn the ignition switch OFF → ON → OFF. 	
NOTE: Wait at least 10 seconds after turning ignition switch OFF or ON.	
3. Start the engine.NOTE:Stop the vehicle.	
 Select "ABS", "DATA MONITOR" and "STOP LAMP SW" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depressed or released. Refer to <u>BRC-129</u>, "Reference Value". Select "ABS" "DATA MONITOR" and "PRESS SENSOR" according to this order. Check that data monitor. 	

Revision: July 2016 BRC-63

Is the inspection result normal?

5. Select "ABS", "DATA MONITOR" and "PRESS SENSOR" according to this order. Check that data monitor displays "5 bar" or less when brake pedal is depressed. Refer to <u>BRC-129</u>, "Reference Value".

2016 QX50

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< DTC/CIRCUIT DIAGNOSIS >

YES >> INSPECTION END

NO >> GO TO 5.

5. CHECK CONNECTOR

- Turn the ignition switch OFF.
- 2. Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.
- Check the stop lamp switch harness connector for disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair / replace harness or connector, and GO TO 6.

6.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUND CIRCUIT

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to <u>BRC-118</u>, <u>"Diagnosis Procedure"</u>.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair / replace harness, connector, fuse, or fusible link.

.CHECK STOP LAMP SWITCH CLEARANCE

- 1. Turn the ignition switch OFF.
- Check the stop lamp switch clearance. Refer to <u>BR-10, "Inspection and Adjustment"</u>.

Is the inspection result normal?

YES >> GO TO 9.

NO >> Adjust stop lamp switch clearance. Refer to <u>BR-10</u>, "<u>Inspection and Adjustment</u>". GO TO 8.

8.CHECK DATA MONITOR (2)

(P)With CONSULT

- Erase self-diagnosis result for "ABS".
- Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

Start the engine.

NOTE:

Stop the vehicle.

- 4. Select "ABS", "DATA MONITOR" and "STOP LAMP SW" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depressed or released. Refer to BRC-129, "Reference Value".
- 5. Select "ABS", "DATA MONITOR" and "PRESS SENSOR" according to this order. Check that data monitor displays "5 bar" or less when brake pedal is depressed. Refer to BRC-129, "Reference Value".

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 9.

9. CHECK STOP LAMP SWITCH

Check the stop lamp switch. Refer to BRC-66, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 10.

NO >> Replace the stop lamp switch. Refer to <u>BR-21, "Removal and Installation"</u>. GO TO 10.

10. CHECK DATA MONITOR (3)

(P)With CONSULT

- Erase self-diagnosis result for "ABS".
- 2. Turn the ignition switch OFF \rightarrow ON \rightarrow OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

Start the engine.

NOTE:

Start the vehicle.

Revision: July 2016 BRC-64 2016 QX50

C1116 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

- Select "ABS", "DATA MONITOR" and "STOP LAMP SW" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depressed or released. Refer to BRC-129, "Reference Value".
- Select "ABS", "DATA MONITOR" and "PRESS SENSOR" according to this order. Check that data monitor displays "5 bar" or less when brake pedal is depressed. Refer to BRC-129. "Reference Value".

Is the inspection result normal?

YFS >> INSPECTION END

NO >> GO TO 11.

11. CHECK CONNECTOR AND TERMINAL

- Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.
- Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
- Disconnect stop lamp switch harness connector.
- Check the stop lamp switch harness connector for disconnection or looseness.
- Check the stop lamp switch pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 13.

NO >> Repair / replace harness, connector, or terminal, and GO TO 12.

12.check data monitor (4)

(P)With CONSULT

- Connect ABS actuator and electric unit (control unit) harness connector.
- Connect stop lamp switch harness connector.
- Erase self-diagnosis result for "ABS".
- Turn the ignition switch OFF \rightarrow ON \rightarrow OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

Start the engine.

NOTE:

Stop the vehicle.

- Select "ABS", "DATA MONITOR" and "STOP LAMP SW" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depressed or released. Refer to BRC-129, "Reference Value".
- Select "ABS", "DATA MONITOR" and "PRESS SENSOR" according to this order. Check that data monitor displays "5 bar" or less when brake pedal is depressed. Refer to BRC-129, "Reference Value".

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 13.

13. CHECK STOP LAMP SWITCH CIRCUIT (1)

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

	+			
ABS actuator and ele	ectric unit (control unit)	_	Condition	Voltage
Connector	Terminal			
E41	30	Ground	Brake pedal depressed	Battery voltage
Ľ41	30	Giouria	Brake pedal not depressed	Approx. 0 V

Is the inspection result normal?

>> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Instal-YES

NO >> Repair / replace harness or connector, and GO TO 14.

14.CHECK STOP LAMP SWITCH CIRCUIT (2)

Turn the ignition switch OFF.

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BRC-65 Revision: July 2016 2016 QX50

< DTC/CIRCUIT DIAGNOSIS >

- Disconnect stop lamp switch harness connector.
- 3. Check the continuity between ABS actuator and electric unit (control unit) harness connector and stop lamp switch harness connector.

ABS actuator and ele	ectric unit (control unit)	Stop lan	np switch	Continuity
Connector	Terminal	Connector	Terminal	Continuity
E41	30	E110	2	Existed

4. Check the continuity between ABS actuator and electric unit (control unit) harness connector and the ground.

ABS actuator and electric unit (control unit)		_	Continuity
Connector	Terminal		
E41	30	Ground	Not existed

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-159</u>, "Removal and Installation".

NO >> Repair / replace harness or connector, and GO TO 15.

15. CHECK DATA MONITOR (5)

(II) With CONSULT

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- 2. Connect stop lamp switch harness connector.
- 3. Erase self-diagnosis result for "ABS".
- Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start the engine.

NOTE:

Stop the vehicle.

- 6. Select "ABS", "DATA MONITOR" and "STOP LAMP SW" according to this order. Check that data monitor displays "On" or "Off" when brake pedal is depressed or released. Refer to BRC-129, "Reference Value".
- Select "ABS", "DATA MONITOR" and "PRESS SENSOR" according to this order. Depress the brake pedal
 and check if "PRESSURE SENSOR" indicates "5 bar" or less when "STOP LAMP SW" of "DATA MONITOR" turns from "Off" to "On". Refer to <u>BRC-129</u>, "<u>Reference Value</u>".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-159</u>, "Removal and Installation".

Component Inspection

INFOID:0000000012168402

1. CHECK STOP LAMP SWITCH

- 1. Turn the ignition switch OFF.
- 2. Disconnect stop lamp switch connector.
- Check the continuity between stop lamp switch connector terminals.

Stop lamp switch	Condition	Continuity	
Terminal	Condition	Continuity	
1 – 2	Release stop lamp switch (When brake pedal is depressed.)	Existed	
1 – 2	Push stop lamp switch (When brake pedal is released.)	Not existed	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace the stop lamp switch. Refer to BR-21, "Removal and Installation".

[VDC/TCS/ABS]

C1120, C1122, C1124, C1126 IN ABS SOL

Description INFOID:0000000012168403

The solenoid valve increases, holds or decreases the fluid pressure of each brake caliper according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic INFOID:0000000012168404

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1120	FR LH IN ABS SOL (Front LH ABS IN solenoid valve)	When a malfunction is detected in front LH ABS IN valve.
C1122	FR RH IN ABS SOL (Front RH ABS IN solenoid valve)	When a malfunction is detected in front RH ABS IN valve.
C1124	RR LH IN ABS SOL (Rear LH ABS IN solenoid valve)	When a malfunction is detected in rear LH ABS IN valve.
C1126	RR RH IN ABS SOL (Rear RH ABS IN solenoid valve)	When a malfunction is detected in rear RH ABS IN valve.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
 Harness or connector ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery 	 Harness or connector ABS actuator and electric unit (control unit) ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

(P)With CONSULT

Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

3. Perform self-diagnosis for "ABS".

Is DTC "C1120", "C1122", "C1124" or "C1126" detected?

YES-1 >> "C1120", "C1122", "C1124" or "C1126" is displayed by "CRNT": Proceed to BRC-68, "Diagnosis Procedure".

YES-2 >> "C1120", "C1122", "C1124" or "C1126" is displayed by "PAST": INSPECTION END (Erase the memory of self-diagnosis results.)

NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermittent Incident".

BRC-67 Revision: July 2016 2016 QX50 **BRC**

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C1120, C1122, C1124, C1126 IN ABS SOL

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012168405

1. CHECK CONNECTOR

- 1. Turn the ignition switch OFF.
- 2. Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair / replace harness or connector, securely lock the connector, and GO TO 2.

2.PERFORM SELF-DIAGNOSIS

(P)With CONSULT

Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

3. Perform self-diagnosis for "ABS".

Is DTC "C1120", "C1122", "C1124" or "C1126" detected?

YES >> GO TO 3.

NO >> INSPECTION END

${f 3.}$ CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUND CIRCUIT

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to BRC-118, <a href="Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, fuse, or fusible link.

4. CHECK TERMINAL

Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".
- NO >> Repair / replace harness, connector, or terminal.

C1121, C1123, C1125, C1127 OUT ABS SOL

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

C1121, C1123, C1125, C1127 OUT ABS SOL

Description INFOID:0000000012168406

The solenoid valve increases, holds or decreases the fluid pressure of each brake caliper according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic INFOID:0000000012168407

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1121	FR LH OUT ABS SOL (Front LH ABS OUT solenoid valve)	When a malfunction is detected in front LH ABS OUT valve.
C1123	FR RH OUT ABS SOL (Front RH ABS OUT solenoid valve)	When a malfunction is detected in front RH ABS OUT valve.
C1125	RR LH OUT ABS SOL (Rear LH ABS OUT solenoid valve)	When a malfunction is detected in rear LH ABS OUT valve.
C1127	RR RH OUT ABS SOL (Rear RH ABS OUT solenoid valve)	When a malfunction is detected in rear RH ABS OUT valve.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
 Harness or connector ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery 	Harness or connector ABS actuator and electric unit (control unit) ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

(P)With CONSULT

Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

3. Perform self-diagnosis for "ABS".

Is DTC "C1121", "C1123", "C1125" or "C1127" detected?

YES-1 >> "C1121", "C1123", "C1125" or "C1127" is displayed by "CRNT": Proceed to BRC-70, "Diagnosis Procedure".

YES-2 >> "C1121", "C1123", "C1125" and "C1127" are displayed by "PAST": INSPECTION END (Erase the memory of self-diagnosis results.)

NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermittent Incident".

BRC-69 Revision: July 2016 2016 QX50 **BRC**

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C1121, C1123, C1125, C1127 OUT ABS SOL

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012168408

1. CHECK CONNECTOR

- 1. Turn the ignition switch OFF.
- 2. Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair / replace harness or connector, securely lock the connector, and GO TO 2.

2.PERFORM SELF-DIAGNOSIS

(P)With CONSULT

Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

3. Perform self-diagnosis for "ABS".

Is DTC "C1121", "C1123", "C1125" or "C1127" detected?

YES >> GO TO 3.

NO >> INSPECTION END

${f 3.}$ CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUND CIRCUIT

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to <u>BRC-118</u>, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, fuse, or fusible link.

4. CHECK TERMINAL

Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".
- NO >> Repair / replace harness, connector, or terminal.

[VDC/TCS/ABS]

C1130 ENGINE SIGNAL

Description INFOID:0000000012168409

ABS actuator and electric unit (control unit) and ECM exchange the engine signal with CAN communication line.

DTC Logic INFOID:0000000012168410

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1130	ENGINE SIGNAL 1 (Engine system signal)	When a malfunction is detected in ECM system.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC	
 Harness or connector ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery CAN communication line 	Harness or connector ECM ABS actuator and electric unit (control unit) ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery CAN communication line	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.check dtc detection

(P)With CONSULT

Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

3. Perform self-diagnosis for "ABS".

Is DTC "C1130" detected?

YES-1 >> "CRNT" is displayed: Proceed to BRC-71, "Diagnosis Procedure".

YES-2 >> "PAST" is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)

NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermittent Incident".

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

1. CHECK ENGINE SYSTEM

(P)With CONSULT

BRC-71 Revision: July 2016 2016 QX50 **BRC**

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INFOID:0000000012168411

C1130 ENGINE SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Perform self-diagnosis for "ENGINE". Refer to EC-146, "CONSULT Function".

Is DTC detected?

YES >> Check the DTC. Refer to EC-580, "DTC Index".

NO >> GO TO 2.

2.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUND CIRCUIT

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to <u>BRC-118</u>, <u>"Diagnosis Procedure"</u>.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair / replace harness, connector, fuse, or fusible link.

3.CHECK CONNECTOR AND TERMINAL

- Turn the ignition switch OFF.
- 2. Disconnect ECM harness connector.
- 3. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 4. Check the connector for disconnection or looseness.
- Check the pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, or terminal, securely lock the connector, and GO TO 4.

4. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

(P)With CONSULT

- 1. Connect ECM harness connector.
- 2. Connect ABS actuator and electric unit (control unit) harness connector.
- 3. Erase self-diagnosis result for "ABS".
- 4. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

5. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

6. Perform self-diagnosis for "ABS".

Is DTC "C1130" or "U1000"detected?

YES ("C1130")>>Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-159</u>, "Removal and <u>Installation"</u>.

YES ("U1000")>>Refer to LAN-18, "Trouble Diagnosis Flow Chart".

NO >> INSPECTION END

C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

C1140 ACTUATOR RELAY SYSTEM

Description INFOID:0000000012168412

Activates or deactivates each solenoid valve according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic INFOID:0000000012168413

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1140	ACTUATOR RLY (Actuator relay)	When a malfunction is detected in actuator relay.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC **CRNT DTC** Harness or connector Harness or connector · ABS actuator and electric unit (control unit) · ABS actuator and electric unit (control unit) power supply sys-· ABS actuator and electric unit (control unit) power supply system Fuse Fuse · Fusible link · Fusible link Battery Battery

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.check DTC DETECTION

(II) With CONSULT

Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

Perform self-diagnosis for "ABS".

Is DTC "C1140" detected?

YES-1 >> "CRNT" is displayed: Proceed to BRC-73, "Diagnosis Procedure"

YES-2 >> "PAST" is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)

NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermittent Incident".

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

1. CHECK CONNECTOR

Turn the ignition switch OFF.

Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness. Is the inspection result normal?

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INFOID:0000000012168414

C1140 ACTUATOR RELAY SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

YES >> GO TO 3.

NO >> Repair / replace harness or connector, securely lock the connector, and GO TO 2.

2. PERFORM SELF-DIAGNOSIS

(P)With CONSULT

Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

3. Perform self-diagnosis for "ABS".

Is DTC "C1140" detected?

YES >> GO TO 3.

NO >> INSPECTION END

 ${f 3.}$ CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUND CIRCUIT

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to <u>BRC-118.</u> "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness, connector, fuse, or fusible link.

4. CHECK TERMINAL

Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-159</u>, "Removal and Installation".

NO >> Repair / replace harness, connector, or terminal.

C1142 PRESS SENSOR

Description INFOID:0000000012168415

The pressure sensor converts the brake fluid pressure to an electric signal and transmits it to the ABS actuator and electric unit (control unit). [The pressure sensor is integrated in the ABS actuator and electric unit (control unit).]

DTC Logic INFOID:0000000012168416

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1142	PRESS SEN CIRCUIT (Pressure sensor circuit)	When a malfunction is detected in pressure sensor.

POSSIBLE CAUSE

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC	`
 Harness or connector Air inclusion in the brake piping Stop lamp switch system ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery 	 Stop lamp switch system ABS actuator and electric unit (control unit) Brake system ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery Air inclusion in the brake piping 	l

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

(E)With CONSULT

Turn the ignition switch OFF.

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

Wait at least 10 seconds after start the engine.

Perform self-diagnosis for "ABS".

Is DTC "C1142" detected?

YES-1 >> "CRNT" is displayed: Proceed to BRC-75, "Diagnosis Procedure"

YES-2 >> "PAST" is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)

NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermittent Incident".

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

1.STOP LAMP SWITCH SYSTEM

Check the stop lamp switch system. Refer to BRC-62, "DTC Logic".

BRC-75 Revision: July 2016 2016 QX50 **BRC**

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INFOID:0000000012168417

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace stop lamp switch system.

2.CHECK BRAKE FLUID LEAKAGE

Check the brake fluid leakage. Refer to BR-13, "Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace brake fluid leakage part.

3.CHECK BRAKE PIPING

Check the brake piping.

- Front: Refer to BR-25, "FRONT: Inspection".
- Rear: Refer to BR-27, "REAR: Inspection".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace brake piping.

- Front: Refer to BR-24, "FRONT: Removal and Installation".
- Rear: Refer to BR-27, "REAR: Removal and Installation".

4. CHECK BRAKE PEDAL

Check the brake pedal.

- Brake pedal height: Refer to BR-10, "Inspection and Adjustment".
- Brake pedal assembly: Refer to BR-22, "Inspection and Adjustment".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Adjust the brake pedal height or replace brake pedal assembly.

- Adjust the brake pedal: Refer to <u>BR-10</u>, "Inspection and Adjustment".
- Replace the brake pedal: Refer to BR-21, "Removal and Installation".

CHECK BRAKE MASTER CYLINDER

Check the brake master cylinder. Refer to BR-15, "Inspection".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace brake master cylinder. Refer to <u>BR-29</u>, "Removal and Installation".

O.CHECK BRAKE BOOSTER

Check the brake booster. Refer to BR-16, "Inspection".

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace brake booster. Refer to BR-32, "Removal and installation".

7 . CHECK BRAKE BOOSTER PRESSURE SENSOR

Check the brake booster pressure sensor. Refer to BR-35, "Inspection".

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace brake booster pressure sensor. Refer to <u>BR-35</u>, "Removal and Installation".

$oldsymbol{8}.$ CHECK VACUUM PIPING

Check the vacuum piping. Refer to BR-36, "Inspection".

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace vacuum piping. Refer to BR-36, "Removal and Installation".

9. CHECK FRONT DISC BRAKE

Check the front disc brake. Refer to BR-44, "BRAKE CALIPER ASSEMBLY: Inspection".

<u>Is the inspection result normal?</u>

C1142 PRESS SENSOR	
< DTC/CIRCUIT DIAGNOSIS > [VDC/TCS/ABS]	
YES >> GO TO 10. NO >> Repair or replace front disc brake. Refer to <u>BR-41, "BRAKE CALIPER ASSEMBLY : Removal and Installation"</u> .	Α
10.check rear disc brake	
Check the rear disc brake. Refer to BR-51, "BRAKE CALIPER ASSEMBLY: Inspection".	В
Is the inspection result normal?	
YES >> GO TO 11. NO >> Repair or replace rear disc brake. Refer to <u>BR-48</u> , " <u>BRAKE CALIPER ASSEMBLY</u> : <u>Removal and Installation</u> ".	С
11. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUND CIRCUIT	D
Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to BRC-118 , "Diagnosis Procedure" . Is the inspection result normal? YES >> GO TO 12.	Е
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12. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)	
 With CONSULT 1. Erase self-diagnosis result for "ABS". 2. Turn the ignition switch OFF. NOTE: 	G
Wait at least 10 seconds after turning ignition switch OFF. 3. Start the engine. NOTE:	Н
Wait at least 10 seconds after start the engine. 4. Start the engine and drive the vehicle for a short period of time. NOTE:	I
Vehicle must be driven after repair or replacement to erase the previous DTCs. 5. Stop the vehicle. 6. Perform self-diagnosis for "ABS".	J
<u>Is DTC "C1142" detected?</u> YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-159</u> , "Removal and Instal-	K
<u>lation"</u> .	
NO >> Check the ABS actuator and electric unit (control unit) harness connector and terminal for damage, looseness and disconnection. Repair / replace harness, connector, or terminal.	L
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Revision: July 2016 BRC-77 2016 QX50

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C1143 STEERING ANGLE SENSOR

Description INFOID:000000012168418

The steering angle sensor detects the rotation amount, angular velocity and direction of the steering wheel, and transmits the data to the ABS actuator and electric unit (control unit) via CAN communication.

DTC Logic

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1143	ST ANG SEN CIRCUIT (Steering angle sensor circuit)	When a malfunction is detected in steering angle sensor.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
 Harness or connector ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery CAN communication line Incomplete neutral position adjustment of steering angle sensor Improper installation of steering angle sensor 	Harness or connector Steering angle sensor ABS actuator and electric unit (control unit) IPDM E/R CAN communication line Wheel alignment Incomplete neutral position adjustment of steering angle sensor ABS actuator and electric unit (control unit) power supply system Fuse Fuse Fusible link Battery

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.check dtc detection

(II) With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

3. Perform self-diagnosis for "ABS".

Is DTC "C1143" detected?

YES-1 >> "CRNT" is displayed: Proceed to BRC-79, "Diagnosis Procedure".

YES-2 >> "PAST" is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)

NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermittent Incident".

NO-2 >> Confirmation after repair: INSPECTION END

C1143 STEERING ANGLE SENSOR [VDC/TCS/ABS] < DTC/CIRCUIT DIAGNOSIS > Diagnosis Procedure INFOID:0000000012168420 Α ${f 1.}$ ADJUST THE NEUTRAL POSITION OF STEERING ANGLE SENSOR With CONSULT Perform neutral position adjustment of steering angle sensor. Refer to BRC-8, "ADJUSTMENT OF STEER-ING ANGLE SENSOR NEUTRAL POSITION: Description". >> GO TO 2. 2.PERFORM SELF-DIAGNOSIS (1) D (P)With CONSULT Turn the ignition switch OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF. Е Start the engine. NOTE: Wait at least 10 seconds after start the engine. **BRC** Perform self-diagnosis for "ABS". Is DTC "C1143" detected? YES-1 >> "CRNT" is displayed: GO TO 3. YES-2 >> "PAST" is displayed: INSPECTION END (Erase the memory of self-diagnosis results.) >> INSPECTION END 3. CHECK CONNECTOR Turn the ignition switch OFF. Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness. Check the steering angle sensor harness connector for disconnection or looseness. Is the inspection result normal? YES >> GO TO 5. NO >> Repair / replace harness or connector, securely lock the connector, and GO TO 4. 4.PERFORM SELF-DIAGNOSIS (2) (P)With CONSULT Turn the ignition switch OFF. Wait at least 10 seconds after turning ignition switch OFF. 2. Start the engine. NOTE:

Wait at least 10 seconds after start the engine.

Perform self-diagnosis for "ABS".

Is DTC "C1143" detected?

YES >> GO TO 5.

NO >> INSPECTION END

${f 5}.$ CHECK STEERING ANGLE SENSOR POWER SUPPLY

- 1. Turn the ignition switch OFF.
- Disconnect steering angle sensor harness connector.
- Check the voltage between steering angle sensor harness connector and ground.

	+		
Steering a	ngle sensor	_	Voltage
Connector Terminal			
M37 8		Ground	Approx. 0 V

4. Turn the ignition switch ON.

NOTE:

Start the engine.

Revision: July 2016 BRC-79 2016 QX50

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C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Check the voltage between steering angle sensor harness connector and ground.

	+		
Steering a	ngle sensor	_	Voltage
Connector	Connector Terminal		
M37	M37 8		Battery voltage

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

6.CHECK STEERING ANGLE SENSOR POWER SUPPLY CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Check the 10A fuse (#45).
- 3. Disconnect IPDM E/R harness connector.
- 4. Check the continuity between steering angle sensor harness connector and IPDM E/R harness connector.

Steering angle sensor		IPDI	Continuity	
Connector Terminal		Connector	Terminal	Continuity
M37	8	E5	25	Existed

5. Check the continuity between steering angle sensor harness connector and ground.

Steering a	ngle sensor		Continuity
Connector Terminal		_	Continuity
M37 8		Ground	Not existed

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply.

NO >> Repair / replace harness, connector, or fuse.

7.check steering angle sensor ground circuit

- 1. Turn the ignition switch OFF.
- 2. Check the continuity between steering angle sensor harness connector and ground.

Steering a	ngle sensor		Continuity	
Connector Terminal			Continuity	
M37 7		Ground	Existed	

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair / replace harness or connector.

8. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUND CIRCUIT

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to <u>BRC-118</u>. "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair / replace harness, connector, fuse, or fusible link.

9. CHECK TERMINAL

- Check the steering angle sensor pin terminals for damage or loose connection with harness connector.
- 2. Check the IPDM E/R pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair / replace harness, connector, or terminal.

C1143 STEERING ANGLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

1	\sim						
1	()	.CHECK	CAN	COMM	UNICAT	IONI	INF

- 1. Connect steering angle sensor harness connector.
- 2. Connect IPDM E/R harness connector.
- Check the CAN communication line. Refer to <u>LAN-18</u>, "Trouble <u>Diagnosis Flow Chart"</u>.

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair / replace harness or connector. Refer to LAN-8, "Precautions for Harness Repair".

11. CHECK DATA MONITOR

(P)With CONSULT

- 1. "ABS", "DATA MONITOR" and "STR ANGLE SIG" according to this order.
- 2. Check that the indication changes with the steering angle when the steering wheel is turned left/right from the neutral position. Refer to BRC-129, "Reference Value".

Is the inspection result normal?

- YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-159</u>, "Removal and Installation".
- NO >> Replace the steering angle sensor. Refer to BRC-162, "Removal and Installation".

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C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT

DTC Logic

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1144	ST ANG SEN SIGNAL (Steering angle sensor not complete)	When neutral position adjustment of steering angle sensor is not complete.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
Incomplete neutral position adjustment of steering angle sensor	Harness or connector Steering angle sensor ABS actuator and electric unit (control unit) Incomplete neutral position adjustment of steering angle sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

(II) With CONSULT

Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

3. Perform self-diagnosis for "ABS".

Is DTC "C1144" detected?

YES-1 >> "CRNT" is displayed: Proceed to BRC-82, "Diagnosis Procedure".

YES-2 >> "PAST" is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)

NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermittent Incident".

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012168422

$1.\mathsf{adjust}$ the neutral position of steering angle sensor

Perform neutral position adjustment of steering angle sensor. Refer to <u>BRC-8</u>, "<u>ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT</u>: <u>Description</u>".

>> GO TO 2.

2.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

(I) With CONSULT

1. Turn the ignition switch OFF.

NOTE:

C1144 INCOMPLETE STEERING ANGLE SENSOR ADJUSTMENT	
< DTC/CIRCUIT DIAGNOSIS > [VDC/TCS/ABS]	
Wait at least 10 seconds after turning ignition switch OFF. 2. Start the engine. NOTE:	Α
Wait at least 10 seconds after start the engine. 3. Perform self-diagnosis for "ABS".	В
Is DTC "C1144" detected?	
YES >> GO TO 3. NO >> INSPECTION END	С
3.CHECK STEERING ANGLE SENSOR SYSTEM	
 Turn the ignition switch OFF. Check the steering angle sensor system. Refer to <u>BRC-78</u>. "<u>DTC Logic</u>". Is the inspection result normal? 	D
YES >> GO TO 4.	
NO >> Repair / replace harness, connector, or terminal.	Е
4.CHECK DATA MONITOR	
(a) With CONSULT	BR
 "ABS", "DATA MONITOR" and "STR ANGLE SIG" according to this order. Check that the indication changes with the steering angle when the steering wheel is turned left/right from 	
the neutral position. Refer to <u>BRC-129, "Reference Value"</u> .	G
Is the inspection result normal?	
 YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-159</u>, "Removal and Installation". NO >> Replace the steering angle sensor. Refer to <u>BRC-162</u>, "Removal and Installation". 	Н
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BRC-83 2016 QX50 Revision: July 2016

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C1145, C1146 YAW RATE/SIDE G SENSOR

Description INFOID:000000012168423

The yaw rate/side G sensor detects the yaw rate/side G affecting the vehicle, and transmits the data to the ABS actuator and electric unit (control unit) as an analog voltage signal.

DTC Logic

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1145	YAW RATE SENSOR (Yaw rate sensor circuit)	 When a malfunction is detected in yaw rate signal. When a signal line of yaw rate/side G sensor is open or shorted.
C1146	SIDE G SEN CIRCUIT (Side G sensor circuit)	 When a malfunction is detected in side G signal. When a signal line of yaw rate/side G sensor is open or shorted.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
Harness or connector ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery	Harness or connector Yaw rate/side G sensor ABS actuator and electric unit (control unit) ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.check dtc detection

(II) With CONSULT

Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

3. Perform self-diagnosis for "ABS".

Is DTC "C1145" or "C1146" detected?

- YES-1 >> "C1145" or "C1146" is displayed by "CRNT": Proceed to BRC-84, "Diagnosis Procedure".
- YES-2 >> "C1145" and "C1146" are displayed by "PAST": INSPECTION END (Erase the memory of self-diagnosis results.)
- NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012168425

CAUTION:

C1145, C1146 YAW RATE/SIDE G SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

- A malfunction in yaw rate/side G sensor system may be detected when the vehicle sharply turns during a spin turn, acceleration turn or drift driving while VDC function is OFF (VDC OFF indicator lamp is in ON status). This is not a malfunction if the status returns to normal after engine is started again. In that case, erase self-diagnosis result memory using CONSULT.
- When the engine is in running status and the vehicle is on a turntable at the entrance of parking lot or on a moving unit, VDC warning lamp may turn ON and "ABS" self-diagnosis may display "YAW RATE SENSOR". In this case, yaw rate sensor is not malfunctioning. The status returns to normal when the vehicle is left from the turntable or moving unit and the engine is started again. In that case, erase self-diagnosis result memory using CONSULT.

${f 1}$.CHECK YAW RATE/SIDE G SENSOR POWER SUPPLY

- Turn the ignition switch OFF.
- 2. Disconnect yaw rate/side G sensor harness connector.
- Check the voltage between yaw rate/side G sensor harness connector and ground.

	+			
Yaw rate/si	de G sensor	_	Voltage	
Connector Terminal				
M143	4	Ground	Approx. 0 V	

Turn the ignition switch ON.

NOTE:

Never start engine.

Check the voltage between yaw rate/side G sensor harness connector and ground.

	+			
Yaw rate/si	de G sensor	_	Voltage	
Connector Terminal				
M143	4	Ground	Battery Voltage	

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK YAW RATE/SIDE G SENSOR POWER SUPPLY CIRCUIT

- Turn the ignition switch OFF.
- Check the 10A fuse (#45).
- Disconnect IPDM E/R harness connector.
- Check the continuity between yaw rate/side G sensor harness connector and IPDM E/R harness connector.

Yaw rate/si	Yaw rate/side G sensor		IPDM E/R	
Connector Terminal		Connector	Terminal	Continuity
M143	4	E5	25	Existed

Check the continuity between yaw rate/side G sensor harness connector and ground.

Yaw rate/si	de G sensor	_	Continuity	
Connector Terminal			Continuity	
M143	4	Ground	Not existed	

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply.

NO >> Repair / replace harness, connector, or fuse.

3.check yaw rate/side g sensor ground circuit

- Turn the ignition switch OFF.
- Check the continuity between yaw rate/side G sensor harness connector and ground.

BRC-85 2016 QX50 Revision: July 2016

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< DTC/CIRCUIT DIAGNOSIS >

Yaw rate/si	de G sensor		Continuity
Connector Terminal		_	Continuity
M143	1	Ground	Existed

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness or connector.

4. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUND CIRCUIT

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to <u>BRC-118</u>, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair / replace harness, connector, fuse, or fusible link.

5. CHECK COMMUNICATION LINE

Check the continuity between yaw rate/side G sensor harness connector and ABS actuator and electric unit (control unit) harness connector.

Yaw rate/si	Yaw rate/side G sensor		ABS actuator and electric unit (control unit)	
Connector	Terminal	Connector	Terminal	Continuity
M143	2	E41	25	Existed
IVI 143	3	L41	45	LAISIEU

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair / replace harness or connector. Refer to LAN-8, "Precautions for Harness Repair".

6.CHECK TERMINAL

- Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector
- 2. Check the yaw rate/side G sensor pin terminals for damage or loose connection with harness connector.
- 3. Check the IPDM E/R pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair / replace harness, connector, or terminal.

7. REPLACE YAW RATE/SIDE G SENSOR

(P)With CONSULT.

- Connect ABS actuator and electric unit (control unit) harness connector.
- Replace the yaw rate/side G sensor. Refer to BRC-161, "Removal and Installation".
- 3. Erase self-diagnosis result for "ABS".
- 4. Turn the ignition switch OFF.
- 5. Turn the ignition switch ON.

NOTE:

Never start engine.

Perform self-diagnosis for "ABS".

Is DTC "C1145" or "C1146" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".

NO >> INSPECTION END

C1154 TRANSMISSION RANGE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

C1154 TRANSMISSION RANGE SWITCH

Description INFOID:0000000012168429

The ABS actuator and electric unit (control unit) and TCM exchange signals via the CAN communication line.

DTC Logic

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1154	PNP POSI SIG (PNP position signal)	When a malfunction is detected in TCM system.

POSSIBLE CAUSE

NOTE

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC

• Harness or connector
• Transmission range switch

• Transmission range switch

• CRNT DTC

• Harness or connector
• ABS actuator and electric unit (control unit)
• TCM
• Transmission range switch

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

(P)With CONSULT

Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

3. Perform self-diagnosis for "ABS".

Is DTC "C1154" detected?

YES-1 >> "CRNT" is displayed: Proceed to BRC-87, "Diagnosis Procedure".

YES-2 >> "PAST" is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)

NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermittent Incident".

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

CAUTION:

"C1154" may be detected when going up a slope, being towed with ignition switch ON and the shift selector in a position other than R position. This is not a shift position error. The system returns to normal once the vehicle is stopped, parked on level ground and the engine is started.

1. CHECK TRANSMISSION SYSTEM

(P)With CONSULT

Perform self-diagnosis for "TRANSMISSION". Refer to TM-63, "CONSULT Function".

Is DTC detected?

YES >> Check the DTC. Refer to TM-157, "DTC Index".

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2016 QX50

C1154 TRANSMISSION RANGE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

NO >> GO TO 2.

2.PERFORM SELF-DIAGNOSIS

(II) With CONSULT

- 1. Erase Self-diagnosis result for "ABS".
- 2. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

3. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

4. Drive the vehicle for a short period of time.

NOTE:

Vehicle must be driven after repair or replacement to erase the previous DTCs.

- 5. Stop the vehicle.
- 6. Perform self-diagnosis for "ABS".

Is DTC "C1154" detected?

- YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-159</u>, "Removal and Installation".
- NO >> Check pin terminals and connection of each harness connector for abnormal conditions. Repair / replace harness, connector, or terminal.

C1155 BRAKE FLUID LEVEL SWITCH

Description INFOID:0000000012168432

The brake fluid level switch converts the brake fluid level to an electric signal and transmits it to the ABS actuator and electric unit (control unit).

DTC Logic INFOID:0000000012168433

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1155	BR FLUID LEVEL LOW (Brake fluid level low)	When brake fluid level low signal is detected.When an open circuit is detected in brake fluid level switch circuit.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC **CRNT DTC** Harness or connector · ABS actuator and electric unit (control unit) · Harness or connector · Brake fluid level switch · Brake fluid level is low · Combination meter · Unified meter and A/C amp. · Brake fluid level is low

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

(P)With CONSULT

Turn the ignition switch OFF. NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

3. Perform self-diagnosis for "ABS".

Is DTC "C1155" detected?

YES-1 >> "CRNT" is displayed: Proceed to BRC-89, "Diagnosis Procedure".

YES-2 >> "PAST" is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)

NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermittent Incident".

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

1.CHECK BRAKE FLUID LEVEL Turn the ignition switch OFF.

Check the brake fluid level. Refer to BR-13, "Inspection".

Is the inspection result normal?

>> GO TO 3. YES

BRC-89 Revision: July 2016 2016 QX50 **BRC**

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INFOID:0000000012168434

C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

NO >> Refill brake fluid. Refer to BR-13, "Refilling" GO TO 2.

2.perform self-diagnosis (1)

(II) With CONSULT

- 1. Erase self-diagnosis result for "ABS".
- Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

4. Perform self-diagnosis for "ABS".

Is DTC "C1155" detected?

YES >> GO TO 3.

NO >> INSPECTION END

3. CHECK CONNECTOR

- 1. Turn the ignition switch OFF.
- 2. Check the brake fluid level switch harness connector for disconnection or looseness.
- 3. Check the combination meter harness connector for disconnection or looseness.
- 4. Check the unified meter and A/C amp. harness connector for disconnection or looseness.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair / replace harness or connector, and GO TO 4.

4.PERFORM SELF-DIAGNOSIS (2)

(P)With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

Perform self-diagnosis for "ABS".

Is DTC "C1155" detected?

YES >> GO TO 5.

NO >> INSPECTION END

5. CHECK BRAKE FLUID LEVEL SWITCH

Check the brake fluids level switch. Refer to BRC-92, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace the reservoir tank. Refer to <u>BR-30, "Disassembly and Assembly"</u>. GO TO 6.

6.PERFORM SELF-DIAGNOSIS (3)

(P)With CONSULT

- Erase self-diagnosis result for "ABS".
- 2. Turn the ignition switch OFF \rightarrow ON \rightarrow OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

3. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

4. Perform self-diagnosis for "ABS".

Is DTC "C1155" detected?

YES >> GO TO 7.

NO >> INSPECTION END

C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

$\overline{7}$. CHECK CONNECTOR AND TERMINAL

- 1. Turn the ignition switch OFF.
- Disconnect brake fluid level switch harness connector.
- Check the brake fluid level switch harness connector for disconnection or looseness.
- Check the brake fluid level switch pin terminals for damage or loose connection with harness connector.
- Disconnect combination meter harness connector.
- Check the combination meter harness connector for disconnection or looseness.
- Check the combination meter pin terminals for damage or loose connection with harness connector.
- 8. Disconnect unified meter and A/C amp. harness connector.
- 9. Check the unified meter and A/C amp. harness connector for disconnection or looseness.
- 10. Check the unified meter and A/C amp. pin terminals for damage or loose connection with harness connec-

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair / replace harness, connector, or terminal, and GO TO 8.

8. PERFORM SELF-DIAGNOSIS (4)

(P)With CONSULT

1. Connect brake fluid level switch harness connector.

- 2. Connect combination meter harness connector
- Connect unified meter and A/C amp. harness connector.
- Erase self-diagnosis result for "ABS".
- Turn the ignition switch OFF \rightarrow ON \rightarrow OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

7. Perform self-diagnosis for "ABS".

Is DTC "C1155" detected?

YES >> GO TO 9.

NO >> INSPECTION END

9. CHECK BRAKE FLUID LEVEL SWITCH CIRCUIT (1)

- Turn the ignition switch OFF.
- 2. Disconnect brake fluid level switch harness connector.
- Disconnect combination meter harness connector.
- Check the continuity between brake fluid level switch harness connector and combination meter harness connector.

Brake fluid level switch		Combination meter		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E47	1	M53	28	Existed

Check the continuity between brake fluid level switch harness connector and ground.

1	Brake fluid level switch		_	Continuity
•	Connector Terminal			Continuity
	E47	1	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair / replace harness or connector, and GO TO 10.

10.CHECK BRAKE FLUID LEVEL SWITCH CIRCUIT (2)

- Disconnect unified meter and A/C amp. harness connector.
- Check the continuity between brake fluid level switch harness connector and unified meter and A/C amp. harness connector.

BRC-91 Revision: July 2016 2016 QX50 **BRC**

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Brake fluid level switch		Unified meter and A/C amp.		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E47	1	M67	57	Existed

3. Check the continuity between brake fluid level switch harness connector and ground.

Brake fluid	level switch	_	Continuity
Connector Terminal			Continuity
E47	1	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair / replace harness or connector, and GO TO 11.

11. CHECK BRAKE FLUID LEVEL SWITCH GROUND CIRCUIT

Check the continuity between brake fluid level switch harness connector and ground.

Brake fluid level switch			Continuity
Connector	Terminal	_	Continuity
E47	2	Ground	Existed

Is the inspection result normal?

YES >> GO TO 12.

NO >> Repair / replace harness or connector, and GO TO 12.

12. CHECK COMBINATION METER

- Connect brake fluid level switch harness connector.
- 2. Connect combination meter harness connector
- 3. Connect unified meter and A/C amp. harness connector.
- 4. Check the combination meter. Refer to MWI-37, "Diagnosis Description".

Is the inspection result normal?

YES >> GO TO 13.

NO >> Repair or replace combination meter. Refer to MWI-136, "Removal and Installation".

13. CHECK UNIFIED METER AND A/C AMP.

Check the unified meter A/C amp. Refer to MWI-39, "CONSULT Function (METER/M&A)".

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-159</u>, "Removal and Installation".

NO >> Repair or replace unified meter A/C amp. Refer to MWI-137, "Removal and Installation".

Component Inspection

INFOID:0000000012168435

1. CHECK BRAKE FLUID LEVEL SWITCH

- 1. Turn the ignition switch OFF.
- 2. Disconnect brake fluid level switch harness connector.
- 3. Check the continuity between terminals of brake fluid level switch.

Brake fluid level switch	Condition	Continuity	
Terminal	Condition		
	When brake fluid level in reservoir tank is within the specified level.	Not existed	
1 – 2	When brake fluid level in reservoir tank is less than the specified level.	Existed	

Is the inspection result normal?

YES >> INSPECTION END

C1155 BRAKE FLUID LEVEL SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

NO >> Replace the reservoir tank. Refer to <u>BR-30. "Disassembly and Assembly"</u>.

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C1164, C1165 CV SYSTEM

Description INFOID.000000012242309

CV1, CV2 (CUT VALVE)

The cut valve shuts off the normal brake fluid path from the master cylinder, when VDC/TCS is activated.

DTC Logic

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1164	CV 1 (Cut valve 1)	When a malfunction is detected in cut valve 1.
C1165	CV 2 (Cut valve 2)	When a malfunction is detected in cut valve 2.

POSSIBLE CAUSE

NOTE

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
 Harness or connector ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery 	Harness or connector ABS actuator and electric unit (control unit) ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

(P)With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

3. Perform self-diagnosis for "ABS".

Is DTC "C1164" or "C1165" detected?

YES-1 >> "C1164" or "C1165" is displayed by "CRNT": Proceed to BRC-94, "Diagnosis Procedure".

YES-2 >> "C1164" and "C1165" are displayed by "PAST": INSPECTION END (Erase the memory of self-diagnosis results.)

NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermittent Incident".

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012242311

C1164, C1165 CV SYSTEM	
< DTC/CIRCUIT DIAGNOSIS > [VDC/TCS/ABS]	
 Turn the ignition switch OFF. Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness. Is the inspection result normal? 	Α
YES >> GO TO 3. NO >> Repair / replace harness or connector, securely lock the connector, and GO TO 2. 2.PERFORM SELF-DIAGNOSIS	В
With CONSULT Perform self-diagnosis for "ABS" again. Is DTC "C1164" or "C1165" detected?	С
YES >> GO TO 3. NO >> INSPECTION END	D
3. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUND CIRCUIT	Е
Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to <u>BRC-118</u> . " <u>Diagnosis Procedure</u> ".	
Is the inspection result normal? YES >> GO TO 4.	BR
NO >> Repair / replace harness, connector, fuse, or fusible link.	
4.CHECK TERMINAL	G
Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness.	Н
Is the inspection result normal?	
YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159 , "Removal and Installation".	1
NO >> Repair / replace harness, connector, or terminal.	
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Revision: July 2016 BRC-95 2016 QX50

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C1166, C1167 SV SYSTEM

Description INFOID:000000012242312

SV1, SV2 (SUCTION VALVE)

The suction valve supplies the brake fluid from the master cylinder to the pump, when VDC/TCS is activated.

DTC Logic

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1166	SV 1 (Suction valve 1)	When a malfunction is detected in suction valve 1.
C1167	SV 2 (Suction valve 2)	When a malfunction is detected in suction valve 2.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
 Harness or connector ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery 	Harness or connector ABS actuator and electric unit (control unit) ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

(P)With CONSULT

1. Turn the ignition switch OFF.

NOTF:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

3. Perform self-diagnosis for "ABS".

Is DTC "C1166" or "C1167" detected?

- YES-1 >> "C1166" or "C1167" is displayed by "CRNT": Proceed to BRC-96, "Diagnosis Procedure".
- YES-2 >> "C1166" and "C1167" is displayed by "PAST": INSPECTION END (Erase the memory of self-diagnosis results.)
- NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012242314

1. CHECK CONNECTOR

C1166, C1167 SV SYSTEM

C1166, C1167 SV SYSTEM	
< DTC/CIRCUIT DIAGNOSIS > [VDC/TCS/ABS]	
 Turn the ignition switch OFF. Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness. 	А
Is the inspection result normal?	
YES >> GO TO 3. NO >> Repair / replace harness or connector, securely lock the connector, and GO TO 2.	В
2.PERFORM SELF-DIAGNOSIS	
With CONSULT Perform self-diagnosis for "ABS" again.	С
Is DTC "C1166" or "C1167" detected?	
YES >> GO TO 3. NO >> INSPECTION END	D
3.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUND CIR-	_
CUIT	Е
Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to <u>BRC-118.</u> " <u>Diagnosis Procedure</u> ".	
Is the inspection result normal?	BR
YES >> GO TO 4.	
NO >> Repair / replace harness, connector, fuse, or fusible link.	
4.CHECK TERMINAL	G
Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness.	Н
Is the inspection result normal?	- ' '
YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Instal-	
<u>lation"</u> . NO >> Repair / replace harness, connector, or terminal.	
NO >> Repair / replace harness, connector, or terminal.	
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Revision: July 2016 BRC-97 2016 QX50

C1170 VARIANT CODING

DTC Logic

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1170	VARIANT CODING (Variant coding)	When the information in ABS actuator and electric unit (control unit) is not the same.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC	
_	ABS actuator and electric unit (control unit)	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

(E)With CONSULT

Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

3. Perform self-diagnosis for "ABS".

Is DTC "C1170" detected?

YES-1 >> "CRNT" is displayed: Proceed to BRC-98, "Diagnosis Procedure".

YES-2 >> "PAST" is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)

NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermittent Incident".

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012168437

1. CHECK SELF-DIAGNOSIS RESULTS

With CONSULT

Replace the ABS actuator and electric unit (control unit) even if other DTC are displayed along with "C1170" in self-diagnosis for "ABS".

>> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".

C1185 ICC UNIT

Description INFOID:0000000012168438

The ABS actuator and electric unit (control unit) and the ICC sensor integrated unit exchange signals via the CAN communication line.

DTC Logic INFOID:0000000012168439

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
C1185	ACC CONT (ACC controller)	ICC sensor integrated unit internal malfunction.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
 Harness or connector ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery CAN communication line 	Harness or connector ICC sensor integrated unit ABS actuator and electric unit (control unit) CAN communication line

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

(P)With CONSULT

Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

3. Perform self-diagnosis for "ABS".

Is DTC "C1185" detected?

YES-1 >> "CRNT" is displayed: Proceed to BRC-99, "Diagnosis Procedure".

YES-2 >> "PAST" is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)

NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermittent Incident".

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

CHECK ICC SENSOR INTEGRATED UNIT SYSTEM

With CONSULT

Perform self-diagnosis for "ICC/ADAS". Refer to CCS-39, "CONSULT Function (ICC/ADAS)".

Is DTC detected?

BRC-99 Revision: July 2016 2016 QX50 **BRC**

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INFOID:0000000012168440

C1185 ICC UNIT

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

YES >> Check the DTC. Refer to CCS-155, "DTC Index".

NO >> GO TO 2.

2. CHECK CONNECTOR AND TERMINAL

- Turn the ignition switch OFF.
- 2. Disconnect ICC sensor integrated unit harness connector.
- 3. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 4. Check the connector for disconnection or looseness.
- 5. Check the pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair / replace harness, connector, or terminal, securely lock the connector, and GO TO 3.

3.check abs actuator and electric unit (control unit)

(P)With CONSULT

- 1. Connect ICC sensor integrated unit harness connector.
- 2. Connect ABS actuator and electric unit (control unit) harness connector.
- 3. Erase self-diagnosis result for "ABS".
- 4. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

5. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

Perform self-diagnosis for "ABS".

Is DTC "C1185" or "U1000" detected?

YES ("C1185")>>Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".

YES ("U1000")>>Refer to LAN-18, "Trouble Diagnosis Flow Chart".

NO >> INSPECTION END

C1197 VACUUM SENSOR

Description INFOID:0000000012168441

The vacuum sensor converts the vacuum pressure to an electric signal and transmits it to the ABS actuator and electric unit (control unit).

DTC Logic INFOID:0000000012168442

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1197	VACUUM SENSOR (Vacuum sensor)	When a malfunction is detected in vacuum sensor.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC **CRNT DTC** Harness or connector ABS actuator and electric unit (control unit) power supply sys- Harness or connector tem · Vacuum sensor (brake booster) Fuse Vacuum piping · Fusible link · ABS actuator and electric unit (control unit) Battery

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT

Turn the ignition switch OFF. NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

Perform self-diagnosis for "ABS".

Is DTC "C1197" detected?

YES-1 >> "CRNT" is displayed: Proceed to BRC-101, "Diagnosis Procedure".

YES-2 >> "PAST" is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)

NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermittent Incident".

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

CHECK CONNECTOR

- Turn the ignition switch OFF.
- 2. Check the vacuum sensor harness connector for disconnection or looseness.
- Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.

Is the inspection result normal?

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INFOID:0000000012168443

BRC-101 Revision: July 2016 2016 QX50

< DTC/CIRCUIT DIAGNOSIS >

YES >> GO TO 2.

NO >> Repair / replace harness or connector, and GO TO 2.

2. CHECK BRAKE BOOSTER

- Turn the ignition switch OFF.
- Check the brake booster. Refer to <u>BR-16</u>, "Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace the brake booster. Refer to <u>BR-32</u>, "Removal and installation".

3.CHECK VACUUM PIPING

Check the vacuum piping. Refer to BR-36, "Inspection".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace the vacuum piping. Refer to BR-36, "Removal and Installation".

4.CHECK TERMINAL

- 1. Turn the ignition switch OFF.
- Disconnect vacuum sensor harness connector.
- 3. Check the vacuum sensor pin terminals for damage or loose connection with harness connector.
- 4. Disconnect ABS actuator and electric unit (control unit) harness connector.
- Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair / replace harness, connector, or terminal.

5. CHECK VACUUM SENSOR CIRCUIT

- Turn the ignition switch OFF.
- Disconnect vacuum sensor harness connector.
- 3. Disconnect ABS actuator and electric unit (control unit) harness connector.
- Check the continuity between vacuum sensor harness connector and ABS actuator and electric unit (control unit) harness connector.

Vacuum sensor		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector Terminal		Continuity
	1		12	
E82	2	E41	15	Existed
	3		19	

Check the continuity between vacuum sensor harness connector and ground.

Vacuum sensor Connector Terminal			Continuity
		_	Continuity
	1	Ground	Not existed
E82	2		
	3		

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair / replace harness or connector.

6. REPLACE VACUUM SENSOR

(P)With CONSULT

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- Replace the vacuum sensor.

CAUTION:

C1197 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Always replace brake booster because vacuum sensor cannot be disassembled. Refer to BR-32, "Removal and installation".

3. Erase self-diagnosis result for "ABS".

Turn the impition quitteb OFF - ON - OFF

4. Turn the ignition switch OFF \rightarrow ON \rightarrow OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

5. Start engine.

NOTE:

Wait at least 10 seconds after start the engine.

6. Perform self-diagnosis for "ABS".

Is DTC "C1197" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-159</u>, "Removal and Installation".

NO >> INSPECTION END

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C1198 VACUUM SENSOR

Description INFOID.000000012168444

The vacuum sensor converts the vacuum pressure to an electric signal and transmits it to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1198	VACUUM SEN CIR (Vacuum sensor circuit)	 When an open circuit is detected in vacuum sensor circuit. When a short circuit is detected in vacuum sensor circuit. When a malfunction is detected in vacuum sensor noise.

POSSIBLE CAUSE

NOTE

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
 Harness or connector ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery 	Harness or connector Vacuum sensor (brake booster) ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.check dtc detection

(P)With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

3. Perform self-diagnosis for "ABS".

Is DTC "C1198" detected?

YES-1 >> "CRNT" is displayed: Proceed to <u>BRC-104</u>, "<u>Diagnosis Procedure</u>".

YES-2 >> "PAST" is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)

NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermittent Incident".

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012168446

1. CHECK CONNECTOR

- Turn the ignition switch OFF.
- Check the vacuum sensor harness connector for disconnection or looseness.
- Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.

C1198 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair / replace harness or connector, and GO TO 2.

2.CHECK TERMINAL

- Turn the ignition switch OFF.
- 2. Disconnect vacuum sensor harness connector.
- 3. Check the vacuum sensor pin terminals for damage or loose connection with harness connector.
- Disconnect ABS actuator and electric unit (control unit) harness connector.
- 5. Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YFS >> GO TO 3.

NO >> Repair / replace harness, connector, or terminal.

3. CHECK VACUUM SENSOR CIRCUIT

- Turn the ignition switch OFF.
- 2. Disconnect vacuum sensor harness connector.
- 3. Disconnect ABS actuator and electric unit (control unit) harness connector.
- Check the continuity between vacuum sensor harness connector and ABS actuator and electric unit (control unit) harness connector.

Vacuum sensor		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector Terminal		Continuity
	1		12	
E82	2	E41	15	Existed
	3		19	

Check the continuity between vacuum sensor harness connector and ground.

Vacuun	n sensor		Continuity	
Connector Terminal		_	Continuity	
	1		Not existed	
E82	2	Ground		
	3			

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness or connector.

4.REPLACE VACUUM SENSOR

(P)With CONSULT

- Connect ABS actuator and electric unit (control unit) harness connector.
- Replace the vacuum sensor.

CAUTION:

Always replace brake booster because vacuum sensor cannot be disassembled. Refer to BR-32, "Removal and installation".

- 3. Erase self-diagnosis result for "ABS".
- Turn the ignition switch OFF → ON → OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF or ON.

Start engine.

NOTE:

Wait at least 10 seconds after start the engine.

6. Perform self-diagnosis for "ABS".

Is DTC "C1198" detected?

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BRC-105 Revision: July 2016 2016 QX50

C1198 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-159</u>, "Removal and Installation".

NO >> INSPECTION END

C1199 VACUUM SENSOR

Description INFOID:0000000012168447

The vacuum sensor converts the vacuum pressure to an electric signal and transmits it to the ABS actuator and electric unit (control unit).

DTC Logic INFOID:0000000012168448

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C1199	BRAKE BOOSTER (Brake booster)	When brake booster vacuum is approx. 0 kPa (0 mmHg) during engine running.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
Harness or connector ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery	Harness or connector Vacuum sensor (brake booster) Vacuum piping ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.check DTC DETECTION

(P)With CONSULT

Turn the ignition switch OFF. NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

3. Perform self-diagnosis for "ABS".

Is DTC "C1199" detected?

YES-1 >> "CRNT" is displayed: Proceed to BRC-107, "Diagnosis Procedure".

YES-2 >> "PAST" is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)

NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermittent Incident".

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

1. CHECK CONNECTOR

- Check the vacuum sensor harness connector for disconnection or looseness.
- Check the ABS actuator and electric unit (control unit) harness connector for disconnection or looseness.

Is the inspection result normal?

Turn the ignition switch OFF.

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INFOID:0000000012168449

< DTC/CIRCUIT DIAGNOSIS >

YES >> GO TO 2.

NO >> Repair / replace harness or connector, and GO TO 2.

2. CHECK BRAKE BOOSTER

- Turn the ignition switch OFF.
- Check the brake booster. Refer to <u>BR-16</u>, "Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace the brake booster. Refer to <u>BR-32</u>, "Removal and installation".

3.check vacuum piping

Check the vacuum piping. Refer to BR-36, "Inspection".

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace the vacuum piping. Refer to BR-36, "Removal and Installation".

4.CHECK TERMINAL

- 1. Turn the ignition switch OFF.
- Disconnect vacuum sensor harness connector.
- 3. Check the vacuum sensor pin terminals for damage or loose connection with harness connector.
- 4. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 5. Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair / replace harness, connector, or terminal.

5. CHECK VACUUM SENSOR CIRCUIT

- Turn the ignition switch OFF.
- Disconnect vacuum sensor harness connector.
- 3. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 4. Check the continuity between vacuum sensor harness connector and ABS actuator and electric unit (control unit) harness connector.

Vacuun	n sensor	ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	Continuity
	1	E41	12	
E82	2		15	Existed
	3		19	

Check the continuity between vacuum sensor harness connector and ground.

Vacuun	n sensor		Continuity
Connector	Terminal	_	
	1	Ground	Not existed
E82	2		
	3		

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair / replace harness or connector.

6. REPLACE VACUUM SENSOR

(P)With CONSULT

- 1. Connect ABS actuator and electric unit (control unit) harness connector.
- Replace the vacuum sensor.

CAUTION:

C1199 VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Always replace brake booster because vacuum sensor cannot be disassembled. Refer to BR-32. "Removal and installation". 3. Erase self-diagnosis result for "ABS". 4. Turn the ignition switch OFF \rightarrow ON \rightarrow OFF. NOTE: Wait at least 10 seconds after turning ignition switch OFF or ON. 5. Start engine. NOTE: Wait at least 10 seconds after start the engine. 6. Perform self-diagnosis for "ABS".

Is DTC "C1199" detected?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".

NO >> INSPECTION END

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[VDC/TCS/ABS]

C119A VACUUM SENSOR

Description INFOID:000000012168450

The vacuum sensor converts the vacuum pressure to an electric signal and transmits it to the ABS actuator and electric unit (control unit).

DTC Logic INFOID:000000012168451

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
C119A	VACUUM SEN VOLT (Vacuum sensor voltage)	When a malfunction is detected in supply power voltage of vacuum sensor.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
 Harness or connector ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery 	Harness or connector Vacuum sensor (brake booster) ABS actuator and electric unit (control unit) ABS actuator and electric unit (control unit) power supply system Fuse Fusible link Battery

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

(P)With CONSULT

Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

3. Perform self-diagnosis for "ABS".

Is DTC "C119A" detected?

YES-1 >> "CRNT" is displayed: Proceed to BRC-110, "Diagnosis Procedure".

YES-2 >> "PAST" is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)

NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermittent Incident".

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012168452

1. CHECK CONNECTOR

- Turn the ignition switch OFF.
- Check the vacuum sensor harness connector for disconnection or looseness.

C119A VACUUM SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

3.	Check the ABS actuator and electric unit (control unit) harness connector for disconnection or loosenes	s.
Is th	e inspection result normal?	

YES >> GO TO 3.

NO >> Repair / replace harness or connector, and GO TO 2.

2.CHECK VACUUM SENSOR POWER SUPPLY

- 1. Turn the ignition switch OFF.
- 2. Disconnect vacuum sensor harness connector.
- 3. Check the voltage between vacuum sensor harness connector and ground.

	+		
Vacuun	n sensor	_	Voltage
Connector	Terminal		
E82	3	Ground	Approx. 0 V

4. Turn the ignition switch ON.

NOTE:

Start the engine.

5. Check the voltage between vacuum sensor harness connector and ground.

	+		
Vacuun	n sensor	_	Voltage
Connector	Terminal		
E82	3	Ground	4.75 – 5.25 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.check vacuum sensor power supply circuit

- Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Check the continuity between vacuum sensor harness connector and ABS actuator and electric unit (control unit) harness connector.

Vacuum sensor		ABS actuator and electric unit (control unit)		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E82	3	E41	19	Existed

Check the continuity between vacuum sensor harness connector and ground.

Vacuun	n sensor	_	Continuity
Connector Terminal			Continuity
E82	3	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair / replace harness or connector.

4. CHECK VACUUM SENSOR GROUND CIRCUIT

- 1. Turn the ignition switch OFF.
- Check the continuity between vacuum sensor harness connector and ground.

Vacuun	n sensor		Continuity
Connector Terminal		_	Continuity
E82	2	Ground	Not existed

Revision: July 2016 BRC-111 2016 QX50

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C119A VACUUM SENSOR

[VDC/TCS/ABS]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair / replace harness or connector.

5. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY AND GROUND CIRCUIT

Check the ABS actuator and electric unit (control unit) power supply and ground circuit. Refer to <u>BRC-118</u>. "<u>Diagnosis Procedure</u>".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair / replace harness, connector, fuse, or fusible link.

6. CHECK TERMINAL

- 1. Check the vacuum sensor pin terminals for damage or loose connection with harness connector.
- 2. Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".
- NO >> Repair / replace harness, connector, or terminal.

U1000 CAN COMM CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

U1000 CAN COMM CIRCUIT

Description INFOID:0000000012168453

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

DTC DETECTION LOGIC

DTC	Display Item (Trouble diagnosis content)	Malfunction detected condition
U1000	CAN COMM CIRCUIT (CAN communication circuit)	When CAN communication signal is not continuously transmitted or received for 2 seconds or more.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
Harness or connectorCAN communication line	CAN communication system malfunction

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.check dtc detection

(P)With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

3. Perform self-diagnosis for "ABS".

Is DTC "U1000" detected?

YES-1 >> "CRNT" is displayed: Proceed to BRC-113, "Diagnosis Procedure".

YES-2 >> "PAST" is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)

NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermittent Incident".

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

Proceed to LAN-18, "Trouble Diagnosis Flow Chart".

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INFOID:0000000012168455

[VDC/TCS/ABS]

U1002 SYSTEM COMM (CAN)

Description INFOID:000000012168456

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
U1002	SYSTEM COMM (CAN) (CAN system communication)	When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal for 2 seconds or less.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
CAN communication line Harness or connector	CAN communication line ABS actuator and electric unit (control unit) Steering angle sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

(P)With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

3. Perform self-diagnosis for "ABS".

Is DTC "U1002" detected?

YES-1 >> "CRNT" is displayed: Proceed to BRC-114, "Diagnosis Procedure".

YES-2 >> "PAST" is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)

NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermittent Incident".

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012168458

CAUTION:

- Never apply 7.0 V or more to the measurement terminal.
- Use a tester with open terminal voltage of 7.0 V or less.

U1002 SYSTEM COMM (CAN)

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Р

 Turn the ignition switch OFF and disconnect the battery cable from the negative terminal when checking the harness. Α ${f 1}$.CHECK CAN DIAGNOSIS SUPPORT MONITOR With CONSULT В Select "ABS" and "CAN Diagnosis Support Monitor" in order. Check the malfunction history between each control unit connected to ABS actuator and electric unit (control unit). Check the result of "PAST"? All items are "OK">>Check the intermittent incident. Refer to GI-42, "Intermittent Incident". "TRANSMIT DIAG" is other than "OK">>GO TO 2. D A control unit other than ABS actuator and electric unit (control unit) is anything other than "OK">>GO TO 3. 2.CHECK TRANSMITTING SIDE UNIT Check the ABS actuator and electric unit (control unit) harness connector terminals No. 14 and 35 for damage or loose connection. Is the inspection result normal? YES >> Erase self-diagnosis results. Then perform self-diagnosis for "ABS" with CONSULT. **BRC** NO >> Recheck the terminals for damage or loose connection. Refer to LAN-8, "Precautions for Harness Repair". 3.CHECK APPLICABLE CONTROL UNIT Check the terminals of each harness connector for damage or loose connection. Is the inspection result normal? YES >> Erase self-diagnosis results. Then perform self-diagnosis for applicable control unit with CON-NO >> Recheck the terminals for damage or loose connection. Refer to LAN-8, "Precautions for Harness Repair". Ν

Revision: July 2016 BRC-115 2016 QX50

[VDC/TCS/ABS]

U1100 CAN COMM CIRCUIT (ICC UNIT)

Description INFOID.000000012168459

The ABS actuator and electric unit (control unit) and the ICC sensor integrated unit exchange signals via the CAN communication line.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item (Trouble diagnosis content)	Malfunction detected condition
U1100	ACC COMM CIRCUIT (ACC communication circuit)	When there is a malfunction in the CAN communication circuit or ICC sensor integrated unit.

POSSIBLE CAUSE

NOTE:

Confirm if DTC is PAST or CRNT. If DTC is CRNT, proceed with Diagnosis Procedure. If DTC is PAST, clear DTC. Do not replace the ABS actuator and electric unit (control unit) for a PAST DTC.

PAST DTC	CRNT DTC
CAN communication lineICC integrated unitHarness or connector	CAN communication line ABS actuator and electric unit (control unit) ICC integrated unit

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn the ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

(P)With CONSULT

1. Turn the ignition switch OFF.

NOTE:

Wait at least 10 seconds after turning ignition switch OFF.

2. Start the engine.

NOTE:

Wait at least 10 seconds after start the engine.

3. Perform self-diagnosis for "ABS".

Is DTC "U1100" detected?

YES-1 >> "CRNT" is displayed: Proceed to BRC-116, "Diagnosis Procedure".

YES-2 >> "PAST" is displayed: INSPECTION END (Erase the memory of self-diagnosis results.)

NO-1 >> To check malfunction symptom before repair: Refer to GI-42, "Intermittent Incident".

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000012168461

1. CHECK CAN COMMUNICATION LINE

Check the CAN communication line. Refer to LAN-18, "Trouble Diagnosis Flow Chart".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair / replace harness, connector, or terminal.

2. PERFORM SELF-DIAGNOSIS

U1100 CAN COMM CIRCUIT (ICC UNIT)

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

(P)With CONSULT

Perform self-diagnosis for "ICC/ADAS". Refer to CCS-39, "CONSULT Function (ICC/ADAS)".

Is DTC detected?

YES >> Check the DTC. Refer to CCS-155, "DTC Index".

NO >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".

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POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

POWER SUPPLY AND GROUND CIRCUIT

Description INFOID.000000012168462

Supplies power to ABS actuator and electric unit (control unit).

Diagnosis Procedure

INFOID:0000000012168463

$1.\mathsf{check}$ abs actuator and electric unit (control unit) ignition power supply (1)

- 1. Turn the ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) harness connector.
- 3. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

+			
ABS actuator and electric unit (control unit)		_	Voltage
Connector Terminal			
E41	28	Ground	Approx. 0 V

Turn the ignition switch ON

NOTE:

Start the engine.

5. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

+			
ABS actuator and electric unit (control unit)		_	Voltage
Connector Terminal			
E41	28	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.check abs actuator and electric unit (control unit) ignition power supply circuit

- Turn the ignition switch OFF.
- Check the 10A fuse (#45).
- 3. Disconnect IPDM E/R harness connector.
- Check the continuity between ABS actuator and electric unit (control unit) harness connector and IPDM E/ R harness connector.

ABS actuator and ele	ectric unit (control unit)	IPDM	Continuity	
Connector Terminal		Connector	Terminal	Continuity
E41	28	E5	25	Existed

5. Check the continuity between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and ele	ectric unit (control unit)		Continuity
Connector Terminal		_	Continuity
E41	28	Ground	No existed

Is the inspection result normal?

YES >> Perform trouble diagnosis for ignition power supply.

NO >> Repair / replace harness, connector, or fuse.

3.CHECK MOTOR AND MOTOR RELAY POWER SUPPLY

- Turn the ignition switch OFF.
- 2. Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

	+		
ABS actuator and ele	ectric unit (control unit)	_	Voltage
Connector Terminal			
E41	2	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

f 4.CHECK MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

- Turn the ignition switch OFF.
- Check the 50A fusible link (#M).
- Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (2) and 50A fusible link (#M).

Is the inspection result normal?

YES >> Perform trouble diagnosis for battery power supply.

>> Repair / replace harness, connector, or fusible link. NO

${f 5.}$ CHECK ACTUATOR RELAY, ABS IN VALVE, ABS OUT VALVE POWER SUPPLY

Turn the ignition switch OFF.

Check the voltage between ABS actuator and electric unit (control unit) harness connector and ground.

+			
ABS actuator and ele	ectric unit (control unit)	_	Voltage
Connector Terminal			
E41	3	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

$oldsymbol{6}$.CHECK ACTUATOR RELAY, ABS IN VALVE, ABS OUT VALVE POWER SUPPLY CIRCUIT

- Turn the ignition switch OFF.
- Check the 30A fusible link (#L).
- Check the continuity and short circuit between ABS actuator and electric unit (control unit) harness connector terminal (3) and 30A fusible link (#L).

Is the inspection result normal?

YES >> Perform trouble diagnosis for battery power supply.

NO >> Repair / replace harness, connector, or fusible link.

.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT

Check the continuity between ABS actuator and electric unit (control unit) harness connector and the ground.

	ABS actuator and ele	ectric unit (control unit)	_	Continuity
_	Connector	Terminal		
_	F41	1	Ground	Existed
	LTI	4	Ground	LAISTEG

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair / replace harness, connector, or terminal.

8.CHECK TERMINAL

- Check the ABS actuator and electric unit (control unit) pin terminals for damage or loose connection with harness connector.
- Check the IPDM E/R pin terminals for damage or loose connection with harness connector.

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BRC-119 Revision: July 2016 2016 QX50

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Is the inspection result normal?

- YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-159</u>, "Removal and Installation".
- NO >> Repair / replace harness, connector, or terminal.

PARKING BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

PARKING BRAKE SWITCH

Component Function Check

INFOID:0000000012168464

1. CHECK PARKING BRAKE SWITCH OPERATION

Operate the parking brake pedal. Then check that the brake warning lamp in the combination meter turns ON/ OFF correctly.

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Condition	Brake warning lamp illumination status
When the parking brake pedal is operation	ON
When the parking brake pedal is not operation.	OFF

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Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to BRC-121, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000012168465

1. CHECK PARKING BRAKE SWITCH

Check the parking brake switch. Refer to BRC-121, "Component Inspection".

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Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace the parking brake switch.

Н

2. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to <u>MWI-37</u>, "<u>Diagnosis Description</u>".

Is the inspection result normal?

YES >> GO TO 3.

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NO >> Repair or replace combination meter. Refer to MWI-136, "Removal and Installation".

3. CHECK DATA MONITOR

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With CONSULT

Select "ABS", "DATA MONITOR" and "PARK BRAKE SW" in order, and perform the parking brake switch inspection.

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Condition	PARK BRAKE SW (DATA MONITOR)
Parking brake switch is active	ON
Parking brake switch is inactive	OFF

N

Is the inspection result normal?

YES >> INSPECTION END

<u>vicia)</u>.

INFOID:0000000012168466

NO >> Check the unified meter and A/C amp. Refer to MWI-39, "CONSULT Function (METER/M&A)".

Component Inspection

1. CHECK PARKING BRAKE SWITCH

1. Turn the ignition switch OFF.

Р

2. Disconnect parking brake switch connector.

Check the continuity between parking brake switch connector and ground.

PARKING BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

Parking brake switch		_	Condition	Continuity	
Connector	Terminal		Condition	Continuity	
E107	1 Ground	When the parking brake switch is operated.	Existed		
E107	ı	Ground	When the parking brake switch is not operated.	Not existed	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace the parking brake switch.

INFOID:0000000012168468

INFOID:0000000012168469

VDC OFF SWITCH

Description INFOID:0000000012168467

VDC OFF switch can deactivate (turn OFF) the VDC/TCS function by pressing the VDC OFF switch.

Component Function Check

CHECK VDC OFF SWITCH OPERATION

Turn ON/OFF the VDC OFF switch and check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly.

Condition	VDC OFF indicator lamp illumination status
Press the VDC OFF switch when VDC OFF indicator lamp is OFF.	ON
Press the VDC OFF switch when VDC OFF indicator lamp is ON.	OFF

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to BRC-123, "Diagnosis Procedure".

Diagnosis Procedure

1. CHECK VDC OFF SWITCH

Check the VDC OFF switch. Refer to BRC-124, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> VDC OFF switch is malfunctioning. Replace the VDC OFF switch.

2.CHECK VDC OFF SWITCH HARNESS

- Disconnect ABS actuator and electric unit (control unit) connector.
- Disconnect VDC OFF switch connector.
- 3. Check the continuity between VDC OFF switch connector and ABS actuator and electric unit (control unit) connector.

	and electric unit ol unit)	VDC OFF switch		Continuity
Connector	Terminal	Connector	Terminal	
E41	31	M19	1	Existed

Check the continuity between ABS actuator and electric unit (control unit) harness connector and ground.

ABS actuator and electric unit (control unit)			Continuity
Connector Terminal			Continuity
E41	31	Ground	Not existed

Check the continuity between VDC OFF switch harness connector and ground.

VDC OFF switch		_	Continuity
Connector	Terminal	Continuity	
M19	2	Ground	Existed

Is the inspection result normal?

YES >> GO TO 3.

>> If the open or short in harness, repair or replace harness. NO

BRC-123 Revision: July 2016 2016 QX50 **BRC**

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VDC OFF SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

3. CHECK COMBINATION METER

- 1. Connect ABS actuator and electric unit (control unit) connector.
- 2. Connect VDC OFF switch connector.
- 3. Check the indication and operation of combination meter are normal. Refer to <u>MWI-37</u>, "<u>Diagnosis</u> <u>Description</u>".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace combination meter. Refer to <u>MWI-136</u>, "Removal and Installation".

Component Inspection

INFOID:0000000012168470

1. CHECK VDC OFF SWITCH

- 1. Turn the ignition switch OFF.
- 2. Disconnect VDC OFF switch connector.
- 3. Check the continuity between VDC OFF switch connector terminals.

VDC OFF switch	Condition	Continuity
Terminal	Condition	Continuity
1 – 2	When VDC OFF switch is hold pressed.	Existed
1 – 2	When releasing VDC OFF switch.	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace the VDC OFF switch.

ABS WARNING LAMP

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

ABS WARNING LAMP

Description INFOID:000000012168471

×: ON –: OFF

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Condition	ABS warning lamp
Ignition switch OFF	-
For 1 second after turning ignition switch ON	×
1 second later after turning ignition switch ON	-
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

INFOID:0000000012168472

1. CHECK ABS WARNING LAMP OPERATION

Check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to BRC-125, "Diagnosis Procedure".

INFOID:0000000012168473

Diagnosis Procedure

INFOID:00000000121684/3

1. CHECK SELF-DIAGNOSIS

With CONST

Perform self-diagnosis for "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to BRC-143, "DTC No. Index".

NO >> GO TO 2.

2. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-37, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-159</u>, "Removal and Installation".

NO >> Repair or replace combination meter. Refer to MWI-136, "Removal and Installation".

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[VDC/TCS/ABS]

BRAKE WARNING LAMP

Description INFOID:000000012168474

 \times : ON -: OFF

Condition	Brake warning lamp (Note 1)
Ignition switch OFF	-
For 1 second after turning ignition switch ON	× (Note 2)
1 second later after turning ignition switch ON	× (Note 2)
EBD function is malfunctioning.	×

NOTE:

- 1: Brake warning lamp will turn on in case of parking brake operation (when switch is ON) or of brake fluid level switch operation (when brake fluid is insufficient).
- · 2: After starting the engine, brake warning lamp is turned off.

Component Function Check

INFOID:0000000012168475

1.BRAKE WARNING LAMP OPERATION CHECK 1

Check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to diagnosis procedure. Refer to BRC-126, "Diagnosis Procedure".

2.BRAKE WARNING LAMP OPERATION CHECK 2

Check that the brake warning lamp in the combination meter turns ON/OFF correctly when operating the parking brake pedal.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Check the parking brake switch. Refer to BRC-121, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000012168476

1. CHECK PARKING BRAKE SWITCH

Check that the brake warning lamp in the combination meter turns ON/OFF correctly when operating the parking brake pedal.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check the parking brake switch. Refer to BRC-121, "Diagnosis Procedure".

2.check self-diagnosis

(With CONST

Perform self-diagnosis for "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to BRC-143, "DTC No. Index".

NO >> GO TO 3.

3.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-37, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-159</u>, "Removal and Installation".

NO >> Repair or replace combination meter. Refer to <u>MWI-136</u>, "Removal and Installation".

VDC OFF INDICATOR LAMP

< DTC/CIRCUIT DIAGNOSIS >

[VDC/TCS/ABS]

VDC OFF INDICATOR LAMP

Description INFOID:0000000012168477

×: ON -: OFF

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Condition	VDC OFF indicator lamp
Ignition switch OFF	-
For 1 second after turning ignition switch ON	×
1 second later after turning ignition switch ON	-
VDC OFF switch turned ON. (VDC function is OFF.)	×

Component Function Check

INFOID:0000000012168478

${f 1}$.VDC OFF INDICATOR LAMP OPERATION CHECK 1

Check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to diagnosis procedure. Refer to BRC-127, "Diagnosis Procedure".

2.VDC OFF INDICATOR LAMP OPERATION CHECK 2

Check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly when operating the VDC OFF switch.

Is the inspection result normal?

YES >> INSPECTION END

>> Check the VDC OFF switch. Refer to BRC-123, "Diagnosis Procedure". NO

Diagnosis Procedure

INFOID:0000000012168479

1. CHECK VDC OFF SWITCH

Perform the trouble diagnosis for VDC OFF switch. Refer to BRC-123, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check the VDC OFF switch. Refer to BRC-123, "Diagnosis Procedure".

2.CHECK SELF-DIAGNOSIS

(With CONST

Perform self-diagnosis for "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to BRC-143, "DTC No. Index".

NO >> GO TO 3.

3.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-37, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-159, "Removal and Installation".

NO >> Repair or replace combination meter. Refer to MWI-136, "Removal and Installation". **BRC**

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[VDC/TCS/ABS]

VDC WARNING LAMP

Description INFOID:000000012168480

×: ON ∆: Blink -: OFF

Condition	VDC warning lamp
Ignition switch OFF	-
For 1 second after turning ignition switch ON	×
1 second later after turning ignition switch ON	-
VDC/TCS is activated while driving	Δ
VDC/TCS function is malfunctioning.	×
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

INFOID:0000000012168481

1. CHECK VDC WARNING LAMP OPERATION

Check that the lamp illuminates for approximately 1 second after the ignition switch is turned ON.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to diagnosis procedure. Refer to BRC-128, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000012168482

1. CHECK SELF-DIAGNOSIS

With CONST

Perform self-diagnosis for "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to BRC-143, "DTC No. Index".

NO >> GO TO 2.

2. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to <u>MWI-37</u>, "<u>Diagnosis Description</u>".

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-159</u>, "Removal and Installation".

NO >> Repair or replace combination meter. Refer to MWI-136, "Removal and Installation".

< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

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ECU DIAGNOSIS INFORMATION

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value INFOID:0000000012168483

VALUES ON THE DIAGNOSIS TOOL

CAUTION:

The display shows the control unit calculation data, so a normal value might be displayed even in the event the output circuit (harness) is open or short-circuited.

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

		Data monitor		
Monitor item Display content		Condition	Reference value in normal operation	
		Vehicle stopped	0 [km/h (MPH)]	
FR LH SENSOR	Wheel speed	Vehicle running (Note 1)	Nearly matches the speedometer display (± 10% or less)	
		Vehicle stopped	0 [km/h (MPH)]	
FR RH SENSOR	Wheel speed	Vehicle running (Note 1)	Nearly matches the speedometer display (± 10% or less)	
		Vehicle stopped	0 [km/h (MPH)]	
RR LH SENSOR	Wheel speed	Vehicle running (Note 1)	Nearly matches the speedometer display (± 10% or less)	
		Vehicle stopped	0 [km/h (MPH)]	
RR RH SENSOR	Wheel speed	Vehicle running (Note 1)	Nearly matches the speedometer display (± 10% or less)	
STOP LAMP SW	Stop lamp switch signal status	When brake pedal is depressed	On	
STOP LAWIF SW	Stop lamp switch signal status	When brake pedal is not depressed	Off	
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V	
GEAR	Gear position determined by TCM	First gear (1GR) Second gear (2GR) Third gear (3GR) Forth gear (4GR) Fifth gear (5GR)	1 2 3 4 5	
SLCT LVR POSI	A/T selector lever position	P position R position N position D position	P R N D	
		Vehicle stopped	Approx. 0 d/s	
YAW RATE SEN	Yaw rate detected by yaw rate/side G sensor	Vehicle turning right	Negative value	
	33,1301	Vehicle turning left	Positive value	
ACCEL POS SIG	Throttle actuator opening/closing is	Accelerator pedal not depressed (ignition switch is ON)	0 %	
al)	displayed (linked with accelerator ped- al)	Depress accelerator pedal (ignition switch is ON)	0 - 100 %	

BRC-129 Revision: July 2016 2016 QX50

< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

< ECU DIAGNOSIS I	THE STANDARD P	Dete were the	[VDC/1C3/AB3]
Monitor item	Display content	Data monitor	Defense servelue in
Worldon dem	Display Content	Condition	Reference value in normal operation
	Transcript O detected by side O and	Vehicle stopped	Approx. 0 m/s ²
SIDE G-SENSOR	Transverse G detected by side G sensor	Vehicle turning right	Negative value
		Vehicle turning left	Positive value
		Driving straight	±2.5°
STR ANGLE SIG	Steering angle detected by steering angle sensor	Turn 90° to right	Approx. +90°
	gradient	Turn 90° to left	Approx. –90°
		With ignition switch turned ON and brake pedal released	Approx. 0 bar
PRESS SENSOR	Brake fluid pressure detected by pressure sensor	With ignition switch turned ON and brake pedal depressed	-40 to 300 bar (Pressure increases according to pedal effort.)
		With engine stopped	0 rpm
ENGINE RPM	With engine running	Engine running	Almost in accordance with tachometer display
FLUID LEV CW	Drake fluid level switch signal status	When brake fluid level switch ON	On
FLUID LEV SW	Brake fluid level switch signal status	When brake fluid level switch OFF	Off
DADK DDAKE SW	Darking broke quitab signal status	Parking brake switch is active	On
PARK BRAKE SW	Parking brake switch signal status	Parking brake switch is inactive	Off
	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" in "ABS" with CONSULT)	On
FR RH IN SOL		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" in "ABS" with CONSULT)	On
FR RH OUT SOL		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
	Operation status of each solenoid	Actuator (solenoid valve) is active ("AC-TIVE TEST" in "ABS" with CONSULT)	On
FR LH IN SOL	valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
	Operation status of cook and and	Actuator (solenoid valve) is active ("AC-TIVE TEST" in "ABS" with CONSULT)	On
FR LH OUT SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
	Operation status of cook and and	Actuator (solenoid valve) is active ("AC-TIVE TEST" in "ABS" with CONSULT)	On
RR RH IN SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
	Operation status of each calcasid	Actuator (solenoid valve) is active ("AC-TIVE TEST" in "ABS" with CONSULT)	On
RR RH OUT SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off

< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

		Data monitor	
Monitor item	Display content	Condition	Reference value in normal operation
RR LH IN SOL Operation status of each solenoid valve	Operation status of each solenoid	Actuator (solenoid valve) is active ("AC-TIVE TEST" in "ABS" with CONSULT)	On
	1 .	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
	Operation status of each solenoid	Actuator (solenoid valve) is active ("AC-TIVE TEST" in "ABS" with CONSULT)	On
RR LH OUT SOL	valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	Off
MOTOR RELAY	Mater and mater relay apprehing	When the motor relay and motor are operating	On
MOTOR RELAY	Motor and motor relay operation	When the motor relay and motor are not operating	Off
CTUATOR RLY	Actuator relay energies	When the actuator relay is operating	On
Note 2)	Actuator relay operation	When the actuator relay is not operating	Off
DC MADNI ANAD	ABS warning lamp	When ABS warning lamp is ON	On
BS WARN LAMP	(Note 3)	When ABS warning lamp is OFF	Off
PFF LAMP	VDC OFF indicator lamp	When VDC OFF indicator lamp is ON	On
'FF LAIVIP	(Note 3)	When VDC OFF indicator lamp is OFF	Off
LIDA/DC LAMB	VDC warning lamp	When VDC warning lamp is ON	On
LIP/VDC LAMP	(Note 3)	When VDC warning lamp is OFF	Off
DD CICNAL	EDD or cretice	EBD is active	On
BD SIGNAL	EBD operation	EBD is inactive	Off
BS SIGNAL	ABS operation	ABS is active	On
DO SIGNAL	ABS operation	ABS is inactive	Off
CS SIGNAL	TCS operation	TCS is active	On
CO SIGNAL	103 operation	TCS is inactive	Off
DC SIGNAL	VDC operation	VDC is active	On
DO SIGNAL	VDC operation	VDC is inactive	Off
BD FAIL SIG	EBD fail-safe signal	In EBD fail-safe	On
BD I AIL SIG	LDD Iali-Sale Signal	EBD is normal	Off
BS FAIL SIG	ABS fail safe signal	In ABS fail-safe	On
DO I AIL OIG	ABS fail-safe signal	ABS is normal	Off
CS FAIL SIG	TCS fail eafe signal	In TCS fail-safe	On
OO I AIL OIG	TCS fail-safe signal	TCS is normal	Off
/DC FAIL SIG	VDC fail safe signal	In VDC fail-safe	On
DO FAIL SIG	VDC fail-safe signal	VDC is normal	Off
RANKING SIG	Crank appration	Crank is active	On
DIC DINIMINA	Crank operation	Crank is inactive	Off
CV1	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" in "ABS" with CONSULT)	On
(Note 2)	VDC SWILGH-OVEL VAIVE	When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	Off

Revision: July 2016 BRC-131 2016 QX50

< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

		Data monitor	
Monitor item	Display content	Condition	Reference value in normal operation
CV2	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" in "ABS" with CONSULT)	On
(Note 2)	VDC SWILCH-OVER VAIVE	When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	Off
SV1	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" in "ABS" with CONSULT)	On
(Note 2)	VDC SWICH-OVEL VAIVE	When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	Off
SV2	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" in "ABS" with CONSULT)	On
(Note 2)	VDC SWICH-OVEL VAIVE	When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	Off
V/R OUTPUT	Salanaid valva ralay activated	When the solenoid valve relay is active (When ignition switch OFF)	On
(Note 2)	Solenoid valve relay activated	When the solenoid valve relay is not active (in the fail-safe mode)	Off
M/R OUTPUT	Actuator motor and motor relay activated	When the actuator motor and motor relay are active ("ACTIVE TEST" in "ABS" with CONSULT)	On
		When the actuator motor and motor relay are inactive	Off
LDD) ADD OFN	Accelerator pedal position sensor sta-	Accelerator pedal is not depressed (Ignition switch ON)	0 %
LDP) APP SEN	tus	Depress accelerator pedal (Ignition switch ON)	0 - 100 %
		ICC MAIN switch is ON	On
LDP) ICC MAIN SW	ICC MAIN switch	ICC MAIN switch is OFF	Off
I DD) I DD ON CW	Donoronia delinorono antista della constata	Dynamic driver assistance switch is ON	On
LDP) LDP ON SW	Dynamic driver assistance switch	Dynamic driver assistance switch is OFF	Off
		Front wiper is OFF	Stop
		Front wiper stops at fail-safe operation	PRTCT
LDP) WIPER SIGNAL	Front wiper operation	Front wiper INT is operating	1low
		Front wiper LO is operating	Low
		Front wiper HI is operating	High
LDP) BRAKE SW	Brake switch signal status	When brake pedal is not depressed	On
	Diano switch signal status	When brake pedal is depressed	Off
LDP) STOP LMP SW	Stop lamp switch signal status	When brake pedal is depressed	On
	Stop lattip switch digital status	When brake pedal is not depressed	Off
	Warning eyetame ewitch condition	Warning systems switch is ON (Warning systems ON indicator is ON)	On
LDP) LDW SW	Warning systems switch condition	Warning systems switch is OFF (Warning systems ON indicator is OFF)	Off

< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

Monitor item Display content		Data monitor		
		Condition	Reference value in normal operation	
5		Shift position is not received	Off	
LDP) SHIFT POSITION	Shift position	Selector lever position	P/R/N/D	
		When using manual mode	MM 1st – MM 5th	
		Turn signal is OFF.	Off	
LDD) TUDN SICNAL	Turn simple promotion	Turn signal lamp RH is blinking	LH	
LDP) TURN SIGNAL	Turn signal operation	Turn signal lamp LH is blinking	RH	
		Turn signal lamp LH and RH are blinking.	LH&RH	
LDP) YAW ORDER	Calculated toward value and atotics	LDP is controlling to right side deviation	Negative value	
(Note 4)	Calculated target yaw moment status	LDP is controlling to left side deviation	Positive value	
LDP) WARN REQ	Lane departure warning request status	Lane departure warning is operating. (When using LDP)	On	
(Note 4)		Lane departure warning is not operating.	Off	
LDP) WARN CONTROL	Marries resis controller status	When using LDP	On	
(Note 4)	Warning main controller status	When using LDW	Off	
LDP) REDY SIGNAL	I DD was divisited in	LDP control is ready	On	
(Note 4) LDP ready status		LDP control is not ready	Off	
	LDP control status	LDP control is standby	STANDBY	
LDP) STATUS SIGNAL		Lane departure warning is operating (When using LDP)	WARN	
(Note 4)		LDP control is stopped	MASK	
		LDP control is OFF	Off	
	Lane marker detected condition	Both side lane markers are detected	Detect	
LDP) CAMERA LOST (Note 4)		Deviate side lane marker is lost	Deviate	
(Both side lane markers are lost	Both	
LDP) LANE UNCLEAR	Long marker condition	Lane marker is unclear	On	
(Note 4)	Lane marker condition	Lane marker is clear	Off	

NOTE:

- 1: Confirm tire pressure is normal.
- 2: A brief moment of On/Off condition occurs every 20 seconds after ignition switch turned ON. This is not malfunction because it is an operation for checking.
- 3: On and off timing for warning lamp and indicator lamp.
- ABS warning lamp: Refer to $\underline{\sf BRC-125}$, "Description".
- Brake warning lamp: Refer to BRC-126, "Description".
- VDC OFF indicator lamp: Refer to BRC-127, "Description".
- VDC warning lamp: Refer to BRC-128, "Description".
- 4: The item displayed on "SPECIFIC DATA MONITOR".

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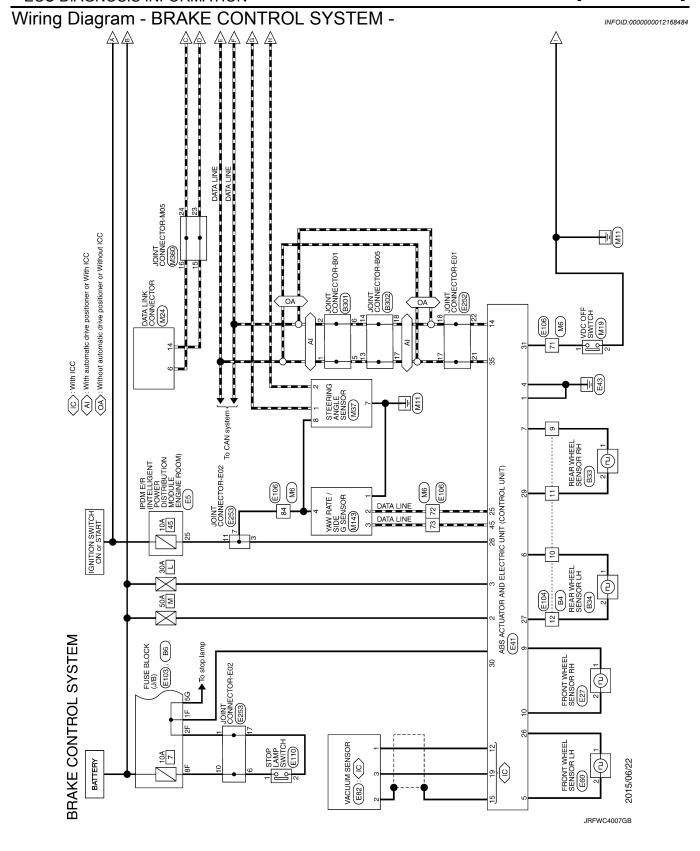
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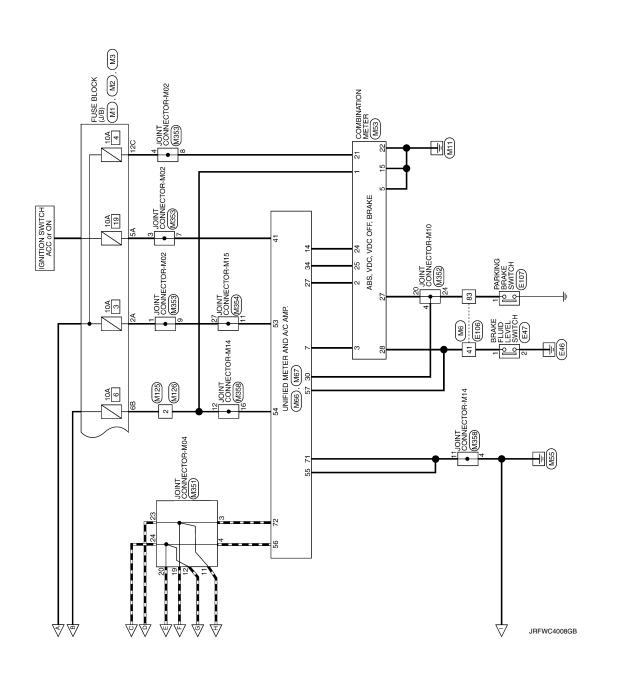
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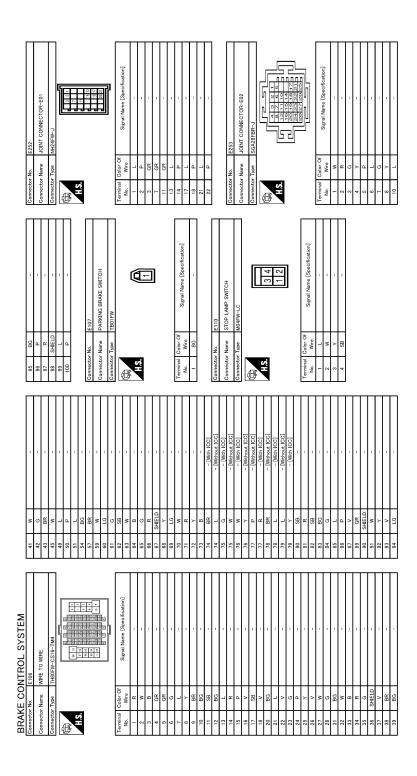
< ECU DIAGNOSIS INFORMATION > [VDC/TCS/ABS]

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< ECU DIAGNOSIS INFORMATION > [VDC/TCS/ABS]

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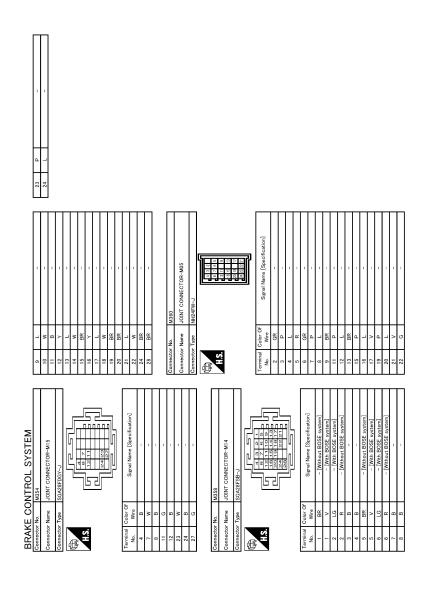
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+	+	- 88	7.1	98	IGNITION SIGNAL	Connector No	Ī	M6/
\dashv	4		22	8	GROUND	Connector Name		UNITIED METER AND A/C AMP
95 GR -	16		24	BR	COMMUNICATION SIGNAL (LCD->AMP.)			
- M 96			25	>	COMMUNICATION SIGNAL (AMP>LCD)	Connector Type		TH32FW-NH
- T 1 26			26	œ	VEHICLE SPEED SIGNAL (8-PULSE)			
98 SHIELD -	Connector No.	M37	27	>	PARKING BRAKE SWITCH SIGNAL	E		
^ 66		Г	28	3	BRAKE FLUID LEVEL SWITCH SIGNAL			<u> </u>
- do 001	Connector Name	ne STEERING ANGLE SENSOR	20	do	SEAT BELT BLICKLE SWITCH SIGNAL (DBN/ED SIDE)	Ý	_	
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	181	ı	90	Ť	MACHINE MILES SHOW (PASSENGER SIDE)			57 58 59 60 61 62 63 65 69 70 71 72
ı	Q		9	1	WASHER LEVEL SWITCH SIGNAL		_	
Connector No. M19	至	K	33		ILLUMINATION CONTROL SIGNAL			
Connector Name VDC OFF SWITCH	Ę	1	36	FG	SELECT SWITCH SIGNAL			
		7 2 8	37	SB	ENTER SWITCH SIGNAL	Terminal	Color Of	Clanel Mane [Canadidanian]
Connector Type TK06FGY		0 7 /	38	_	TRIP A/B RESET SWITCH SIGNAL	No.	Wire	olgnai Name [opecification]
		•	39	۵	ILLUMINATION CONTROL SWITCH SIGNAL (-)	41	>	ACC POWER SUPPLY
			40	B.C.	ILLIMINATION CONTROL SWITCH SIGNAL (+)	42	>	FIJEL LEVEL SENSOR SIGNAL
				1		43	0	INTAVE CONSO STORY
	F	201-0				;		IN VEHICLE SENSON SIGNAL
, ,	_	Signal Name [Specification]		1		t	3	IN-VEHICLE SENSOR SIGNAL
1 2 2 1	NO.		Connector No.	1	M66	45	-	AMBIENT SENSOR SIGNAL
	-	L CAN-H	Connector Name		UNIFIED METER AND A/C AMP	46	BG	SUNLOAD SENSOR SIGNAL
	2	P CAN-L				47	9	EXHAUST GAS / OUTSIDE ODOR DETECTING SENSOR SIGNAL
	7	B GROUND	Connector Type		TH40FW-NH	53	9	IGNITION POWER SUPPLY
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2 B -	Connector No.	M53		_	5 7 8 9 10 11	57	>	BRAKE FLUID LEVEL SWITCH SIGNAL
3 R	Connector Name	COMBINATION METER		_	23 25 27 28 30 34	58	BR	FUEL LEVEL SENSOR GROUND
				-1		59	g	INTAKE SENSOR GROUND
	Connector Type	re TH40FW-NH				09	_	IN-VEHICLE SENSOR GROUND
		1				61	BB	AMBIENT SENSOR GROUND
Connector No Mod	Œ		Terminal	Color Of		63	g	CHILDED GOSDAS CALCUMIS
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Т		1 2 3 5 6 7 10 15 16 19 20	,	4	MANUAL MODE STILL OF SIGNAL	20	2	ECV SIGNAL
Connector Type BD16FW		27 22 24 25 28 27 28 29 39 31 33 88 37 38 39 40	7	HS GR	COMMUNICATION SIGNAL (AMP>METER)	69	_	A/C LAN SIGNAL
			8		VEHICLE SPEED SIGNAL (2-PULSE)	70	æ	EACH DOOR MOTOR POWER SUPPLY
			6	SB	SEAT BELT BUCKLE SWITCH SIGNAL (DRIVER SIDE)	7.1	8	GROUND
			10	Α	MANUAL MODE SIGNAL	72	а	CAN-L
	Terminal Col	Color Of	=	9	NON-MANUAL MODE SIGNAL			
1	No.	Wire Signal Name [Specification]	14	æ	COMMINICATION SIGNAL (LCD=>AMP.)			
3 4 3 6 7 8	-	SP RATTERY POWER SUBDLY	20	-	TON ON OPE SIGNAL			
		t	2	,	TOTAL CONTROL DE			
	\dagger	+	53	_	AT SNOW SWITCH SIGNAL			
	8	GR COMMUNICATION SIGNAL (AMP>METER)	25	>	MANUAL MODE SHIFT DOWN SIGNAL			
Terminal Color Of	S	B GROUND	27	PC	COMMUNICATION SIGNAL (METER->AMP.)			
	9	P ALTERNATOR SIGNAL	28	œ	VEHICLE SPEED SIGNAL (8-PULSE)			
	_	BB AIP BAG SIGNAI	30	>	DARKING RRAKE SWITCH SIGNAL			
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+	+	SEC	34	>	COMMUNICATION SIGNAL (AMP>LCD)			
5 B -	15	B GROUND	38	۵	BLOWER MOTOR CONTROL SIGNAL			
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Revision: July 2016 BRC-141 2016 QX50



JRFWC4015GB

Fail-Safe

ABS, EBD SYSTEM

If ABS malfunction electrically, ABS warning lamp, VDC warning lamp will turn on. If EBD malfunction electrically, brake warning lamp, ABS warning lamp and VDC warning lamp will turn on. Simultaneously, the VDC/TCS/ABS become one of the following conditions of the fail-safe function.

< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

• For malfunction of ABS, only the EBD is activated and the condition of vehicle is the same condition of vehicles without TCS/ABS system.

NOTE:

ABS self-diagnosis sound may be heard. That is a normal condition because a self-diagnosis for "Ignition switch ON" and "The first starting" are being performed.

 For malfunction of EBD, EBD and ABS become inoperative, and the condition of vehicle is the same as the condition of vehicles without TCS/ABS, EBD system.

VDC / TCS

If VDC/TCS/ABS system malfunction electrically, VDC warning lamp are turned on, and the condition of vehicle is the same as the condition of vehicles without VDC/TCS control.

CAUTION:

If the Fail-Safe function is activated, then perform self-diagnosis for "ABS" with CONSULT.

LDW/LDP SYSTEM

- In case of malfunction in the LDW/LDP system, lane departure warning lamp is turned ON, and the condition of vehicle is the same as the condition of vehicles without LDW/LDP control.
- In case of malfunction in the VDC/TCS/ABS system, lane departure warning lamp is turned ON, and the condition of vehicle is the same as the condition of vehicles without LDW/LDP control.

DTC No. Index

DTC	Items (CONSULT screen terms)	Reference
C1101	RR RH SENSOR-1	
C1102	RR LH SENSOR-1	BRC-36, "DTC Logic"
C1103	FR RH SENSOR-1	BRC-36, DTC LOGIC
C1104	FR LH SENSOR-1	
C1105	RR RH SENSOR-2	
C1106	RR LH SENSOR-2	BRC-41, "DTC Logic"
C1107	FR RH SENSOR-2	BRO-41, DTC LOGIC
C1108	FR LH SENSOR-2	
C1109	BATTERY VOLTAGE [ABNORMAL]	BRC-48, "DTC Logic"
C1110	CONTROLLER FAILURE	BRC-50, "DTC Logic"
C1111	PUMP MOTOR	BRC-52, "DTC Logic"
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-55, "DTC Logic"
C1116	STOP LAMP SW	BRC-62, "DTC Logic"
C1120	FR LH IN ABS SOL	BRC-67, "DTC Logic"
C1121	FR LH OUT ABS SOL	BRC-69, "DTC Logic"
C1122	FR RH IN ABS SOL	BRC-67, "DTC Logic"
C1123	FR RH OUT ABS SOL	BRC-69, "DTC Logic"
C1124	RR LH IN ABS SOL	BRC-67, "DTC Logic"
C1125	RR LH OUT ABS SOL	BRC-69, "DTC Logic"
C1126	RR RH IN ABS SOL	BRC-67, "DTC Logic"
C1127	RR RH OUT ABS SOL	BRC-69, "DTC Logic"
C1130	ENGINE SIGNAL 1	BRC-71, "DTC Logic"
C1140	ACTUATOR RLY	BRC-73, "DTC Logic"
C1142	PRESS SEN CIRCUIT	BRC-75, "DTC Logic"
C1143	ST ANG SEN CIRCUIT	BRC-78, "DTC Logic"
C1144	ST ANG SEN SIGNAL	BRC-82, "DTC Logic"
C1145	YAW RATE SENSOR	PDC 94 "DTC Logie"
C1146	SIDE G-SEN CIRCUIT	BRC-84, "DTC Logic"

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< ECU DIAGNOSIS INFORMATION >

[VDC/TCS/ABS]

DTC	Items (CONSULT screen terms)	Reference
C1153	EMERGENCY BRAKE	BRC-50, "DTC Logic"
C1154	PNP POSI SIG	BRC-87, "DTC Logic"
C1155	BR FLUID LEVEL LOW	BRC-89, "DTC Logic"
C1164	CV 1	BRC-94, "DTC Logic"
C1165	CV 2	BRC-94, DTC Logic
C1166	SV 1	BRC-96, "DTC Logic"
C1167	SV 2	BICE-90, DTC Logic
C1170	VARIANT CORDING	BRC-98, "DTC Logic"
C1185	ACC CONT (Note 1)	BRC-99, "DTC Logic"
C1197	VACUUM SENSOR (Note 1)	BRC-101, "DTC Logic"
C1198	VACUUM SEN CIR (Note 1)	BRC-104, "DTC Logic"
C1199	BRAKE BOOSTER (Note 1)	BRC-107, "DTC Logic"
C119A	VACUUM SEN VOLT (Note 1)	BRC-110, "DTC Logic"
C1B00	LDP) CAMERA MALF (Note 2)	DAS-300, "DTC Logic"
C1B04	LDP) ICC STG SW MALF (Note 2)	DAS-301, "DTC Logic"
C1B05	LDP) APP SEN MALF (Note 2)	DAS-302, "DTC Logic"
C1B06	LDP) TCM MALF (Note 2)	DAS-303, "DTC Logic"
U0100	LDP) ECM CAN CIR2 (Note 2)	DAS-304, "DTC Logic"
U0101	LDP) TCM CAM CAN CIR2 (Note 2)	DAS-305, "DTC Logic"
U0104	LDP) ICC CAM CAN CIR2 (Note 2)	DAS-306, "DTC Logic"
U0405	LDP) ICC CAM CAN CIR1 (Note 2)	DAS-307, "DTC Logic"
U1000	CAN COMM CIRCUIT	BRC-113, "DTC Logic"
U1002	SYSTEM COMM (CAN)	BRC-114, "DTC Logic"
U1100	ACC COMM CIRCUIT (Note 1)	BRC-116, "DTC Logic"
U1500	LDP) CAM CAN CIR1 (Note 2)	DAS-308, "DTC Logic"
U1501	LDP) CAM CAN CIR2 (Note 2)	DAS-309, "DTC Logic"

NOTE:

^{1:} With ICC models.

^{2:} With LDP models.

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

[VDC/TCS/ABS] < SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

Diagnosis Procedure

1.CHECK START

Check front and rear brake force distribution using a brake tester. Refer to BR-53, "General Specifications". Is the inspection result normal?

YES >> GO TO 2.

NO >> Check brake system.

2.CHECK FRONT AND REAR AXLE

Make sure that there is no excessive play in the front and rear axles.

- Front
- 2WD models: Refer to FAX-7, "Inspection".
- AWD models: Refer to FAX-16, "Inspection".
- Rear: Refer to RAX-5, "Inspection".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning components.

3.check wheel sensor and sensor rotor

Check the following.

- · Wheel sensor installation for damage.
- Sensor rotor installation for damage.
- Wheel sensor connector connection.
- Wheel sensor harness inspection.

Is the inspection result normal?

YES >> GO TO 4.

NO >> • Replace wheel sensor or sensor rotor.

· Repair harness.

4.CHECK ABS WARNING LAMP DISPLAY

Make sure that the ABS warning lamp is turned off after the ignition switch is turned ON or when driving.

Is the ABS warning lamp illuminated?

>> Perform self-diagnosis for "ABS" with CONSULT. YES

NO >> Normal BRC

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UNEXPECTED PEDAL REACTION

< SYMPTOM DIAGNOSIS >

[VDC/TCS/ABS]

UNEXPECTED PEDAL REACTION

Diagnosis Procedure

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1. CHECK BRAKE PEDAL STROKE

Check brake pedal stroke. Refer to BR-10, "Inspection and Adjustment".

Is the stroke too large?

YES

- >> Bleed air from brake tube and hose. Refer to BR-14, "Bleeding Brake System".
 - Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc.
 - Brake pedal: Refer to BR-10, "Inspection and Adjustment".
 - Brake booster: Refer to BR-16, "Inspection".
 - Master cylinder: Refer to BR-15, "Inspection".

NO >> GO TO 2.

2. CHECK FUNCTION

Disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS. Check if braking force is normal in this condition. Connect connector after inspection.

Is the inspection result normal?

YES >> Normal

NO >> Check brake system.

THE BRAKING DISTANCE IS LONG

< SYMPTOM DIAGNOSIS >

[VDC/TCS/ABS]

THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

INFOID:0000000012168489

CAUTION:

The stopping distance on slippery road surfaces might be longer when the ABS is operating than when the ABS is not operating.

1. CHECK FUNCTION

Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS. In this condition, check stopping distance. After inspection, connect connector.

Is the inspection result normal?

YES >> Normal

NO >> Check brake system.

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ABS FUNCTION DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

[VDC/TCS/ABS]

ABS FUNCTION DOES NOT OPERATE

Diagnosis Procedure

INFOID:0000000012168490

CAUTION:

ABS does not operate when speed is 10 km/h (6 MPH) or lower.

1. CHECK ABS WARNING LAMP DISPLAY

Make sure that the ABS warning lamp turns OFF after ignition switch is turned ON or when driving. <u>Is the inspection result normal?</u>

YES >> Normal

NO >> Perform self-diagnosis for "ABS" with CONSULT.

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS [VDC/TCS/ABS] < SYMPTOM DIAGNOSIS > PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS Α Diagnosis Procedure INFOID:0000000012168491 **CAUTION:** Under the following conditions, ABS is activated and vibration is felt when brake pedal is lightly depressed (just place a foot on it). However, this is normal. · When shifting gears When driving on slippery road During cornering at high speed When passing over bumps or grooves [at approximately 50 mm (1.97 in) or more] When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher] D 1.SYMPTOM CHECK 1 Check that there are pedal vibrations when the engine is started. Е Do vibrations occur? YES >> GO TO 2. NO >> Inspect the brake pedal. BRC 2.SYMPTOM CHECK 2 Check that there are ABS operation noises when the engine is started. Do the operation noises occur? YES >> GO TO 3. NO >> Perform self-diagnosis for "ABS" with CONSULT. 3. SYMPTOM CHECK 3 Н Check symptoms when electrical component (headlamps, etc.) switches are operated. Do symptoms occur? YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit. If there is, move it farther away. NO >> Normal J K L M

Revision: July 2016 BRC-149 2016 QX50

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VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

< SYMPTOM DIAGNOSIS >

[VDC/TCS/ABS]

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

Diagnosis Procedure

INFOID:0000000012168492

1.SYMPTOM CHECK

Check if the vehicle jerks during VDC/TCS/ABS control.

Is the inspection result normal?

YES >> Normal.

NO >> GO TO 2.

2.CHECK SELF-DIAGNOSIS RESULTS

Perform self-diagnosis for "ABS" with CONSULT.

Are self-diagnosis results indicated?

YES >> Check corresponding items, make repairs, and perform self-diagnosis for "ABS" with CONSULT.

NO >> GO TO 3.

3.CHECK CONNECTOR

- Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector and check terminal for deformation, disconnection, looseness, etc.
- · Securely connect connectors and perform self-diagnosis for "ABS" with CONSULT.

Are self-diagnosis results indicated?

YES >> If poor contact, damage, open or short circuit of connector terminal is found, repair or replace.

NO >> GO TO 4.

4. CHECK ECM AND A/T SELF-DIAGNOSIS RESULTS

Perform self-diagnosis for "ENGINE" and "TRANSMISSION" with CONSULT.

Are self-diagnosis results indicated?

YES >> Check the corresponding items.

NO >> Replace ABS actuator and electric unit (control unit).

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

[VDC/TCS/ABS]

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NORMAL OPERATING CONDITION

Description INFOID:0000000012168493

Symptom	Result		
Slight vibrations are felt on the brake pedal and the operation noises occur, when VDC, TCS or ABS is activated.			
Stopping distance is longer than that of vehicles without ABS when the vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.	This is a normal condition due to the VDC, TCS or ABS activation.		
The brake pedal moves and generates noises, when TCS or VDC is activated due to rapid acceleration or sharp turn.			
The brake pedal vibrates and motor operation noises occur from the engine room, after the engine starts and ust after the vehicle starts.	This is a normal, and it is caused by the ABS operation check.		
Depending on the road conditions, the driver may experience a sluggish feel.	This is normal, because		
TCS may activate momentarily if wheel speed changes when driving over location where friction coefficient varies, when downshifting, or when fully depressing accelerator pedal.	TCS places the highest priority on the optimum traction (stability).		
The ABS warning lamp and VDC warning lamp may turn ON when the vehicle is subject to strong shaking or large vibration, such as when the vehicle is rotating on a turntable or located on a ship while the engine s running.	In this case, restart the engine on a normal road. If the normal con-		
VDC may not operate normally or the ABS warning lamp and VDC warning lamp may illuminate, when run- ning on a special road that is extremely slanted (e.g. bank in a circuit course).	dition is restored, there is no malfunction. At		
A malfunction may occur in the yaw rate/side G sensor system, when the vehicle turns sharply, such as durng a spin turn, axle turn, or drift driving, while the VDC function is off (VDC warning lamp illuminated).	that time, erase the self-diagnosis memory.		
The vehicle speed will not increase even though the accelerator pedal is depressed, when inspecting the speedometer on a 2-wheel chassis dynamometer.	Normal (Deactivate the VDC/TCS function before performing an inspection on a chassis dynamometer.)		
/DC warning lamp may simultaneously turn on when low tire pressure warning lamp turns on.	This is not a VDC system error but results from characteristic change of tire.		

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< PRECAUTION > [VDC/TCS/ABS]

PRECAUTION

PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the "SRS AIR BAG" and "SEAT BELT" of this Service Manual.

WARNING:

Always observe the following items for preventing accidental activation.

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that would result in air bag inflation, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.
- Improper repair, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see "SRS AIR BAG".
- Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

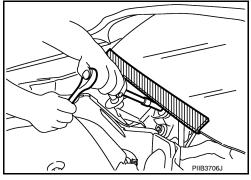
windshield.

Always observe the following items for preventing accidental activation.

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery or batteries, and wait at least 3 minutes before performing any service.

Precaution for Procedure without Cowl Top Cover

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc to prevent damage to



Precautions for Removing Battery Terminal

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When disconnecting the battery terminal, pay attention to the following.

- Always use a 12V battery as power source.
- Never disconnect battery terminal while engine is running.

Revision: July 2016 BRC-152 2016 QX50

PRECAUTIONS

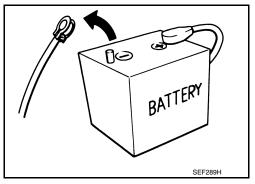
< PRECAUTION > [VDC/TCS/ABS]

 When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.

 For vehicles with the engine listed below, remove the battery terminal after a lapse of the specified time:

> BR08DE : 4 minutes YD25DDTi : 2 minutes YS23DDT D4D engine : 20 minutes : 4 minutes HRA2DDT : 12 minutes YS23DDTT : 4 minutes ZD30DDTi K9K engine : 4 minutes : 60 seconds : 4 minutes ZD30DDTT : 60 seconds M9R engine

R9M engine : 4 minutes V9X engine : 4 minutes



NOTE:

ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.

 After high-load driving, if the vehicle is equipped with the V9X engine, turn the ignition switch OFF and wait for at least 15 minutes to remove the battery terminal.

NOTE:

- Turbocharger cooling pump may operate in a few minutes after the ignition switch is turned OFF.
- · Example of high-load driving
- Driving for 30 minutes or more at 140 km/h (86 MPH) or more.
- Driving for 30 minutes or more on a steep slope.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.

NOTE:

If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.

After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.

NOTE:

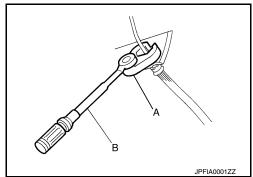
The removal of 12V battery may cause a DTC detection error.

Precaution for Brake System

WARNING:

Since dust covering the front and rear brakes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.

- Brake fluid use refer to MA-10, "Fluids and Lubricants".
- Never reuse drained brake fluid.
- Never spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.
- Never use mineral oils such as gasoline or light oil. They may damage rubber parts and cause improper operation.
- Always loosen the brake tube flare nut with a flare nut wrench.
- Tighten the brake tube flare nut to the specified torque with a crowfoot (A) and torque wrench (B).
- Always conform the specified tightening torque when installing the brake pipes.
- Brake system is an important safety part. If a brake fluid leak is detected, always disassemble the affected part. If a malfunction is detected, replace part with a new one.
- Turn the ignition switch OFF and disconnect the ABS actuator and electric unit (control unit) connector or the battery negative terminal before performing the work.



Precaution for Brake Control

 When starting engine or when starting vehicle just after starting engine, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is normal condition.

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Revision: July 2016 BRC-153 2016 QX50

PRECAUTIONS

[VDC/TCS/ABS] < PRECAUTION >

· When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for estimate causes before starting diagnostic servicing. Besides electrical system inspection, check brake booster operation, brake fluid level, and oil leaks.

- If tire size and type are used in an improper combination, or brake pads are not Genuine NISSAN parts. stopping distance or steering stability may deteriorate.
- ABS might be out of order or malfunctions by putting a radio (wiring inclusive), an antenna and a lead-in wire near the control unit.
- · If aftermarket parts (car stereo, CD player, etc.) have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.
- VDC system may not operate normally or a VDC OFF indicator lamp or VDC warning lamp may light.
- When replacing the following parts with parts other than genuine parts or making modifications: Suspension related parts (shock absorber, spring, bushing, etc.), tires, wheels (other than specified sizes), brake-related parts (pad, rotor, caliper, etc.), engine-related parts (muffler, ECM, etc.) and body reinforcement-related parts (roll bar, tower bar, etc.).
- When driving with worn or deteriorated suspension, tires and brake-related parts.

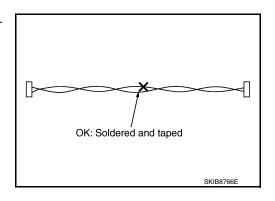
Precautions for Harness Repair

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COMMUNICATION LINE

 Solder the repaired area and wrap tape around the soldered area. NOTE:

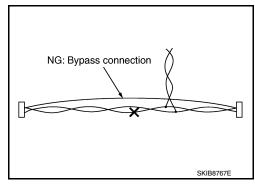
A fray of twisted lines must be within 110 mm (4.33 in).



• Bypass connection is never allowed at the repaired area. NOTE:

Bypass connection may cause communication error as spliced wires that are separate from the main line or twisted lines lose noise immunity.

Replace the applicable harness as an assembly if error is detected on the shield lines of communication line.



[VDC/TCS/ABS] < PREPARATION >

PREPARATION

PREPARATION

Special Service Tool

The actual shapes of TechMate tools may differ from those illustrated here.

Tool number (TechMate No.) Tool name		Description	
ST30720000 (J-25405) Drift a: 77 mm (3.03 in) dia. b: 55.5 mm (2.185 in) dia.	a b ZZA0701D		E BRC
ST27863000 (—) Drift a: 74.5 mm (2.933 in) dia. b: 62.5 mm (2.461 in) dia.	a b b zzA0832D	Installing rear sensor rotor	G
KV40104710 (—) a: 76.3 mm (3.004 in) dia. b: 67.9 mm (2.673 in) dia.	a b b zzA0832D		I Ј — К
KV991J0080 (J-45741-A) ABS active wheel sensor taster	J-45741-BOX POWER UNKERN WFIA0101E	Checking operation of wheel sensors	L

Commercial Service Tool

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Tool name		Description	
1. Flare nut crowfoot a: 10 mm (0.39 in) /12 mm (0.47 in) 2. Torque wrench		Installing brake tube	O P
	S-NT360		

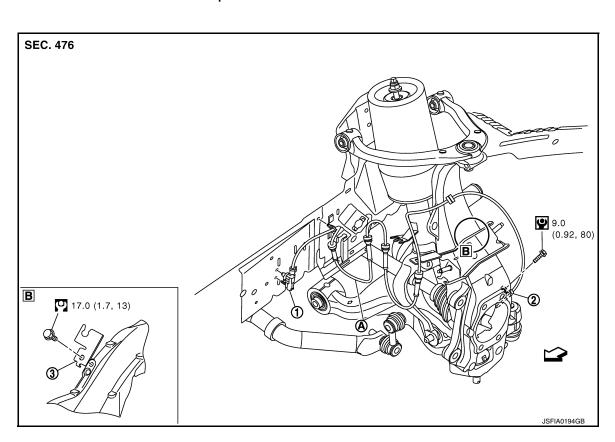
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REMOVAL AND INSTALLATION

WHEEL SENSOR FRONT WHEEL SENSOR

FRONT WHEEL SENSOR: Exploded View



- 1. Front LH wheel sensor connector
- 2. Front LH wheel sensor
- 3. Bracket

- A. White line (slant line)
- <□: Vehicle front

Refer to GI section GI-4, "Components" for symbol marks in the figure.

NOTE:

The above figure shows left side. Right side is the mirror image.

FRONT WHEEL SENSOR: Removal and Installation

REMOVAL

Be careful with the following when removing sensor.

- Do not twist sensor harness as much as possible, when removing it. Pull sensors out without pulling sensor harness.
- Be careful to avoid damaging sensor edges or rotor teeth. Remove wheel sensor first before removing front or rear wheel hub. This is to avoid damage to sensor wiring and loss of sensor function.

INSTALLATION

Be careful with the following when installing wheel sensor. Tighten installation bolts to the specified torques. Refer to BRC-156, "FRONT WHEEL SENSOR: Exploded View".

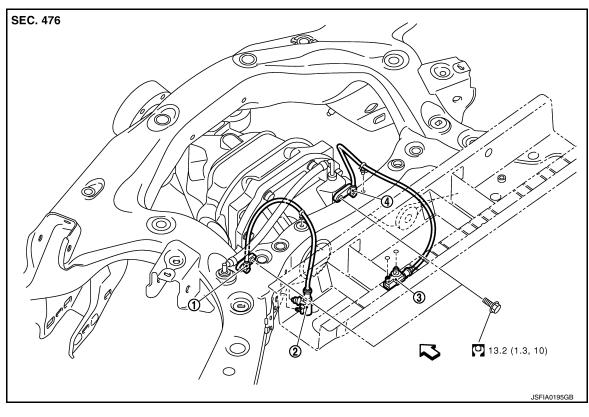
- When installing, make sure there is no foreign material such as iron chips on and in the mounting hole of the wheel sensor. Make sure no foreign material has been caught in the sensor rotor. Remove any foreign material and clean the mount.
- When installing wheel sensor, be sure to press rubber grommets in until they lock at locations shown above in the figure. When installed, harness must not be twisted.

INFOID:0000000012168504

 When you see the harness of the wheel sensor from the front side of the vehicle ensure that the white lines (A) are not twisted.

REAR WHEEL SENSOR

REAR WHEEL SENSOR: Exploded View



- 1. Rear LH wheel sensor
- 2. Rear LH wheel sensor connector
- 3. Rear RH wheel sensor connector

Rear RH wheel sensor

<□: Vehicle front

Refer to GI section GI-4, "Components" for symbol marks in the figure.

REAR WHEEL SENSOR: Removal and Installation

REMOVAL

Be careful with the following when removing sensor.

- · Do not twist sensor harness as much as possible, when removing it. Pull sensors out without pulling sensor
- Be careful to avoid damaging sensor edges or rotor teeth. Remove wheel sensor first before removing front or rear wheel hub. This is to avoid damage to sensor wiring and loss of sensor function.

INSTALLATION

Be careful with the following when installing wheel sensor. Tighten installation bolts to the specified torques. Refer to BRC-157, "REAR WHEEL SENSOR: Exploded View".

- · When installing, make sure there is no foreign material such as iron chips on and in the mounting hole of the wheel sensor. Make sure no foreign material has been caught in the sensor rotor. Remove any foreign material and clean the mount.
- When installing a rear LH wheel sensor, be sure to pass the wheel sensor harness under the breather hose.

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SENSOR ROTOR

FRONT SENSOR ROTOR

FRONT SENSOR ROTOR: Exploded View

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Refer to FAX-8, "Exploded View" (2WD models), FAX-18, "Exploded View" (AWD models).

FRONT SENSOR ROTOR: Removal and Installation

INFOID:0000000012168507

REMOVAL

Sensor rotor cannot be disassembled. Remove the sensor rotor together with hub bearing assembly. Refer to <u>FAX-8</u>, "<u>Exploded View</u>" (2WD models), <u>FAX-18</u>, "<u>Exploded View</u>" (AWD models).

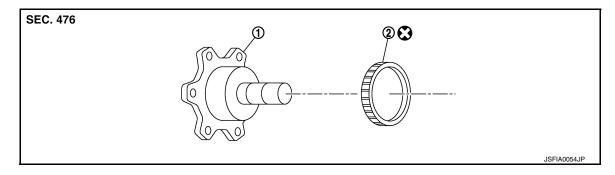
INSTALLATION

Sensor rotor cannot be disassembled. Install the sensor rotor together with hub bearing assembly. Refer to <u>FAX-8</u>, "<u>Exploded View</u>" (2WD models), <u>FAX-18</u>, "<u>Exploded View</u>" (AWD models).

REAR SENSOR ROTOR

REAR SENSOR ROTOR: Exploded View





1. Side flange

2. Rear wheel sensor rotor

Refer to GI section GI-4, "Components" for symbol marks in the figure.

REAR SENSOR ROTOR: Removal and Installation

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REMOVAL

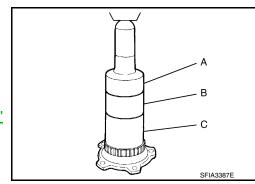
- Follow the procedure below to remove rear sensor rotor.
- Remove side flange. Refer to <u>DLN-183, "2WD : Exploded View"</u> (2WD), <u>DLN-195, "AWD : Exploded View"</u> (AWD).
- Using a bearing replacer (suitable tool) and puller (suitable tool), remove sensor rotor from side flange.

INSTALLATION

CAUTION:

Do not reuse sensor rotor.

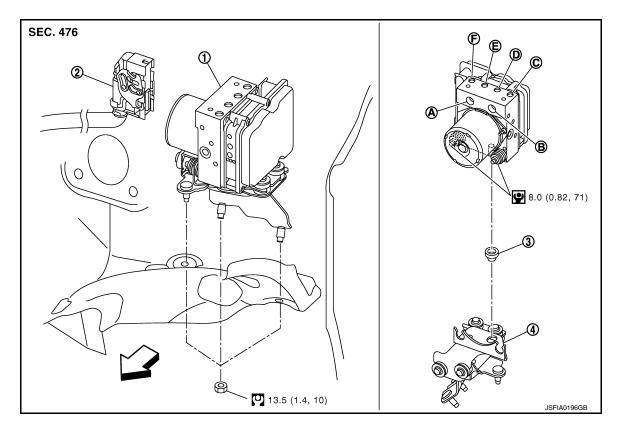
- Follow the procedure below to install rear sensor rotor.
- Using a drifts, press rear sensor rotor onto side flange.
 - A: Drift [SST: ST30720000 (J-25405)]
 - B: Drift [SST: ST27863000 ()]
 - C: Drift [SST: KV40104710 ()]
- Install side flange. Refer to <u>DLN-183, "2WD : Exploded View"</u> (2WD), <u>DLN-195, "AWD : Exploded View"</u> (AWD).



[VDC/TCS/ABS]

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Exploded View INFOID:0000000012168510



- ABS actuator and electric unit (control 2. 1. unit)
- Connector

Bushing

- 4. Bracket
- From master cylinder secondary side B.
 - From master cylinder primary side
- C. To front LH brake caliper

- To rear RH brake caliper
- To Rear LH brake caliper
- To front RH brake caliper

< : Vehicle front

Refer to GI section GI-4, "Components" for symbol marks in the figure.

Removal and Installation

INFOID:0000000012168511

REMOVAL

CAUTION:

- Before servicing, disconnect the battery cable from negative terminal.
- To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut crowfoot and torque wrench.
- Do not apply excessive impact to ABS actuator and electric unit (control unit), such as dropping it.
- Do not remove and install actuator by holding harness.
- After work is completed, bleed air from brake tube. Refer to BR-14, "Bleeding Brake System".
- 1. Remove hoodledge cover LH. Refer to EXT-22, "Exploded View".
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Loosen brake tube flare nuts, then remove brake tubes from ABS actuator and electric unit (control unit).
- Remove tire (front LH side).
- Remove fender protector (rear): (front LH side). Refer to EXT-25, "FENDER PROTECTOR: Exploded 5.
- 6. Remove ABS actuator and electric unit (control unit) bracket mounting nuts.
- 7. Remove ABS actuator and electric unit (control unit) from vehicle.

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

[VDC/TCS/ABS]

< REMOVAL AND INSTALLATION >

INSTALLATION

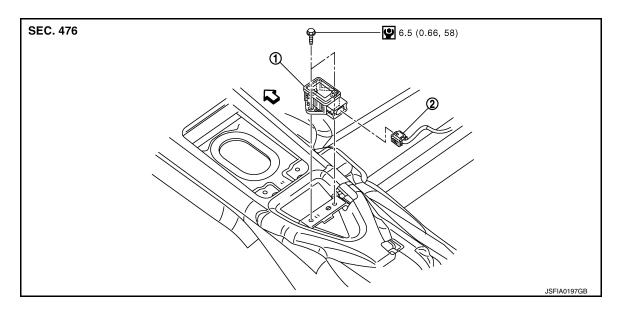
Note the following, and install in the reverse order of removal.

- Before servicing, disconnect the battery cable from negative terminal.
- To remove brake tube, use a flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut crowfoot and torque wrench.
- Do not apply excessive impact to ABS actuator and electric unit (control unit), such as dropping it.
- · Do not remove and install actuator by holding harness.
- After work is completed, bleed air from brake tube. Refer to BR-14, "Bleeding Brake System".
- After installing harness connector in the ABS actuator and electric unit (control unit), make sure connector is securely locked.
- When replacing ABS actuator and electric unit (control unit), make sure to adjust neutral position of steering angle sensor. Refer to <u>BRC-8</u>, "<u>ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION</u>: <u>Description</u>".

[VDC/TCS/ABS]

YAW RATE/SIDE G SENSOR

Exploded View INFOID:0000000012168512



Yaw rate/side G sensor

Connector 2.

: Vehicle front

Refer to GI section GI-4, "Components" for symbol makes in the figure.

Removal and Installation

REMOVAL

CAUTION:

Do not drop or strike yaw rate/side G sensor, or do not use power tool etc., because yaw rate/side G sensor is sensitive to the impact.

- Remove center console. Refer to IP-23, "Exploded View".
- 2. Disconnect yaw rate/side G sensor harness connector.
- Remove mounting bolts. Remove yaw rate/side G sensor.

INSTALLATION

Note the following, and install in the reverse order of removal.

 Do not drop or strike yaw rate/side G sensor, or do not use power tool etc., because yaw rate/side G sensor is sensitive to the impact.

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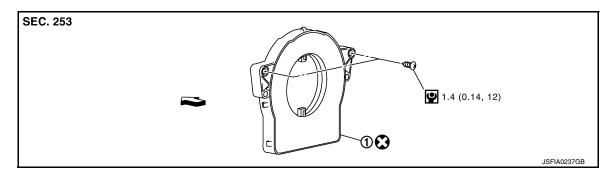
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STEERING ANGLE SENSOR

Exploded View



Steering angle sensor

<□: Vehicle front

Refer to GI section GI-4. "Components" for symbol marks in the figure.

Removal and Installation

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REMOVAL

- 1. Remove spiral cable assembly. Refer to SR-14, "Exploded View".
- Remove steering angle sensor from spiral cable assembly.

INSTALLATION

Note the following, and install in the reverse order of removal.

- · Never reuse steering angle sensor.
- When installing steering angle sensor, tighten it to the specified torque with an electric screwdriver. Be sure
 to tighten it completely with no floating and tilting.
- After work, make sure to adjust neutral position of steering angle sensor. Refer to <u>BRC-8</u>. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

PREVIEW FUNCTION

< SYSTEM DESCRIPTION >

[BRAKE ASSIST (WITH PREVIEW FUNCTION)]

SYSTEM DESCRIPTION

PREVIEW FUNCTION

System Description

INFOID:0000000012168516

FUNCTION DESCRIPTION

When the Preview Function identifies the need to apply emergency braking by sensing a vehicle ahead in the same lane and the distance and relative speed from it, it applies the brake pre-pressure before the driver depress the brake pedal and helps improve brake response by reducing pedal free play.

The Preview Function shares component parts and diagnosis with the ICC (Intelligent Cruise Control) system. **CAUTION:**

This system is only an aid to assist braking operation and is not a collision warning or avoidance device. It is the driver's responsibility to stay alert, drive safely and be in control of the vehicle at all times.

OPERATION DESCRIPTION

Operation

- The system detects the distance to the vehicle in front with the ICC sensor integrated unit of ICC (Full Speed Range) and judges the necessity of emergency braking.
- The system detects the accelerator pedal release operation of the driver by the accelerator pedal position sensor and estimates the driver's brake operation intention.
- If the system is judged that the emergency braking is necessary or that the driver has the intention to operate the brake it supplies the power supply to the brake booster to apply pre-pressure and adjusts the brake play.

NOTE:

This system will not operate when the vehicle is moving at approximately 32 km/h (20 MPH) or less.

End of Operation

The pre-pressure function ceases when the following conditions are met:

- When the driver depresses the accelerator pedal or the brake pedal.
- 2. If the driver does not operate the accelerator pedal or brake pedal within approximately 1 second.

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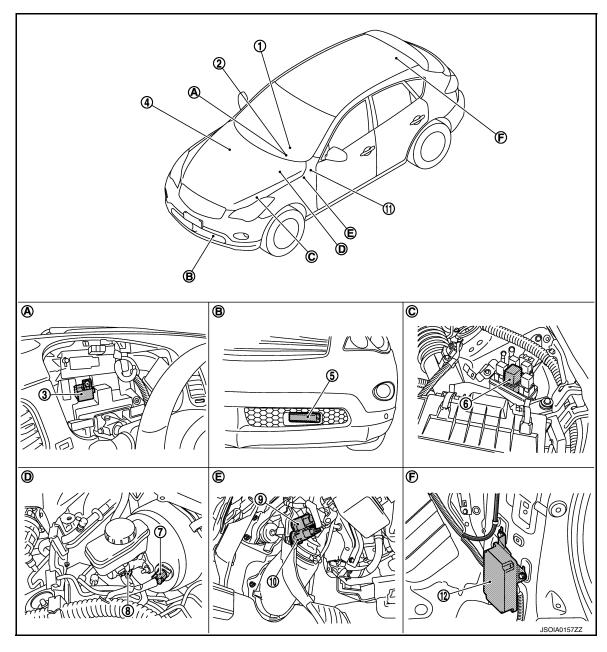
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Component Parts Location

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- 1. ICC steering switch
- 4. ECM
 Refer to EC-39, "Component Parts
 Location".
- 7. Booster solenoid/Release switch
- 10. ICC brake switch
- A. Behind the combination meter
- D. Inside brake master cylinder cover

- Information display, ICC system warning lamp (On the combination meter)
- 5. ICC sensor integrated unit
- 8. Brake pressure sensor
- 11. IBA OFF switch
- B. Front bumper (LH)
- E. Upper side of brake pedal

- ICC warning chime
- 6. ICC brake hold relay
- 9. Stop lamp switch
- 12. Brake booster control unit
- C. Engine room (LH)
- F. Luggage room (RH)

PREVIEW FUNCTION

< SYSTEM DESCRIPTION >

[BRAKE ASSIST (WITH PREVIEW FUNCTION)]

Component Description

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Component	Function Description			Description	
Component	*1	*2	*3	Description	
ICC sensor integrated unit	×	×	×	Refer to CCS-47, "Description".	
ECM	×	×	×	Refer to CCS-82, "Description".	
ABS actuator and electric unit (control unit)	×	×	×	Refer to CCS-53, "Description".	
всм	×			Transmits the front wiper request signal to ICC sensor integrated unit via CAN communication.	
TCM	×	×		Refer to CCS-123, "Description".	
Unified meter and A/C amp.	×	×	×	Receives the meter display signal, ICC warning lamp signal, and IBA OFF indicator lamp signal from ICC sensor integrat ed unit via CAN communication and transmits them to the combination meter via the communication line.	
Combination meter	×	×	×	Performs the following operations using the signals received from the unified meter and A/C amp. via the communication line. • Displays the ICC system operation status using the meter display signal. • Illuminates the ICC system warning lamp using the ICC warning lamp signal. • Illuminates the IBA OFF indicator lamp using the IBA OFF indicator lamp signal.	
ICC brake switch	×	×	×	Refer to CCS-55. "Description".	
Stop lamp switch	×	×	×	TREIGH TO GOO-SS. Description.	
ICC brake hold relay	×		×	Refer to CCS-75, "Description".	
Brake booster control unit	×	×	×	Refer to CCS-93, "Description".	
Brake booster	×		×	Refer to CCS-93. "Description".	
Brake pressure sensor	×		×	Refer to CCS-63, "Description".	
Booster solenoid/Release switch	×		×	Refer to CCS-65, "Description" for booster solenoid. Refer to CCS-68, "Description" for release switch.	
ICC warning chime	×	×	×	Refer to CCS-136, "Description".	
Steering angle sensor	×			Refer to CCS-117, "Description".	
IBA OFF switch			×NOTE	Refer to CCS-112, "Description".	

^{*1:} Vehicle-to-vehicle distance control mode

NOTE:

Only IBA system uses

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^{*2:} Conventional (fixed speed) cruise control mode

^{*3:} IBA system and Brake Assist (With Preview Function)

PREVIEW FUNCTION

[BRAKE ASSIST (WITH PREVIEW FUNCTION)]

< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS

PREVIEW FUNCTION

Diagnosis Procedure

INFOID:0000000012168519

1.BRAKE ASSIST (PREVIEW FUNCTION) DIAGNOSIS

When the preview function is not operating properly, the buzzer sounds and the preview function warning lamp will come on.

NOTE:

The preview function warning lamp shares the ICC system warning lamp.

>> Go to ICC (Full Speed Range). Refer to CCS-5, "Work Flow".

NORMAL OPERATING CONDITION

[BRAKE ASSIST (WITH PREVIEW FUNCTION)]

< SYMPTOM DIAGNOSIS >

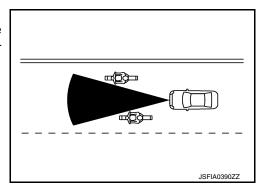
SYMPTOM DIAGNOSIS

NORMAL OPERATING CONDITION

Description

PRECAUTIONS FOR PREVIEW FUNCTION

- This system is only an aid to assist braking operation and is not a collision warning or avoidance device. It is the driver's responsibility to stay alert, drive safely and be in control of the vehicle at all times.
- As there is a performance limit to the Preview Function, never rely solely on this system. This system does
 not correct careless inattentive or absent-minded driving, or overcome poor visibility in rain, fog, or other bad
 weather. Reduce vehicle speed by depressing the brake, in order to maintain a safe distance between vehicles.
- The system may not detect a vehicle ahead, depending on road or weather conditions. While the vehicle still
 travels and the Brake Assist System operates under normal conditions, the Preview Function may operate
 improperly under the following conditions:
- When rain, snow or dirt adhere to the system sensor
- When strong light (for example, at sunrise or sunset) is directly shining on the front of the vehicle
- Winding or hilly roads may cause the sensor to temporarily not detect a vehicle in the same lane or may detect objects or vehicles in other lanes.
- Vehicle position in the lane may cause the sensor to temporarily not detect a vehicle in the same lane or may detect objects or vehicles in other lanes.
- · The system will not detect:
- Pedestrians or objects in the roadway
- Oncoming vehicles in the same lane
- Motorcycles traveling offset in the travel lane as illustrated
- When the Preview Function operates, the brake pedal may move slightly and may make a small noise. This is not a system malfunction.



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Revision: July 2016 BRC-167 2016 QX50

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PRECAUTION

PRECAUTIONS

Precautions for Removing Battery Terminal

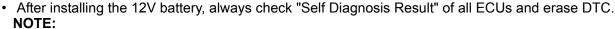
 When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.

NOTE:

ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.

For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.
 NOTE:

If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.



The removal of 12V battery may cause a DTC detection error.

Precautions for Preview Function Service

INFOID:0000000012168522

INFOID:0000000012168521

BATTERY

- Never look straight into the laser beam discharger when adjusting laser beam aiming.
- Never use the ICC sensor integrated unit removed from vehicle. Never disassemble or remodel.

[INTELLIGENT BRAKE ASSIST]

SYSTEM DESCRIPTION

INTELLIGENT BRAKE ASSIST

System Description

FUNCTION DESCRIPTION

Intelligent Brake Assist (IBA) system warns the driver by a warning lamp and chime when there is a risk of a collision with the vehicle ahead in the traveling lane and the driver must take avoidance action immediately. The system helps reduce the rear-end collision speed by applying the brakes when it judges a collision can not be avoided.

CAUTION:

The IBA system is a not collision avoidance system. It is the driver's responsibility to stay alert, drive safely and be in control of the vehicle at all times. As there is a performance limit, it may not provide a warning or brake in certain conditions.

NOTE:

- The IBA system shares component parts and diagnosis with the ICC (Intelligent Cruise Control) system.
 New parts added to the IBA system is the IBA OFF indicator lamp in the combination meter and the IBA OFF switch on the inside instrument driver lower panel.
- The ICC sensor integrated unit shares the parts with the ICC, but the IBA system will operate even when the ICC system is turned to OFF.

OPERATION DESCRIPTION

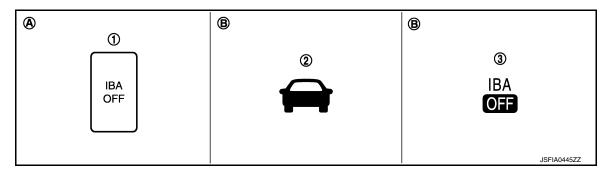
The IBA system uses a distance sensor located below the front bumper to measure the distance to a vehicle ahead. When the system judges that the distance gets shorter, the vehicle ahead detection indicator lamp on the combination meter blinks and the warning chime sounds.

To turn the system OFF/ON, push and hold the IBA OFF switch after starting the engine for more than 1 second.

NOTE:

- The system ON/OFF condition will be memorized even if the ignition switch turns OFF.
- The IBA system operates under the following conditions.
- The IBA system will function when the vehicle is driven at speeds of approximately 15 km/h (10 MPH) and above, and when the vehicle's speed is approximately 15 km/h (10 MPH) faster than that of the vehicle ahead.

Switch and Indicators



1. IBA OFF switch

- Vehicle ahead detection indicator lamp
- On the instrument lower panel LH B. On the combination meter

Fail-safe Indication

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IBA OFF indicator lamp

< SYSTEM DESCRIPTION >

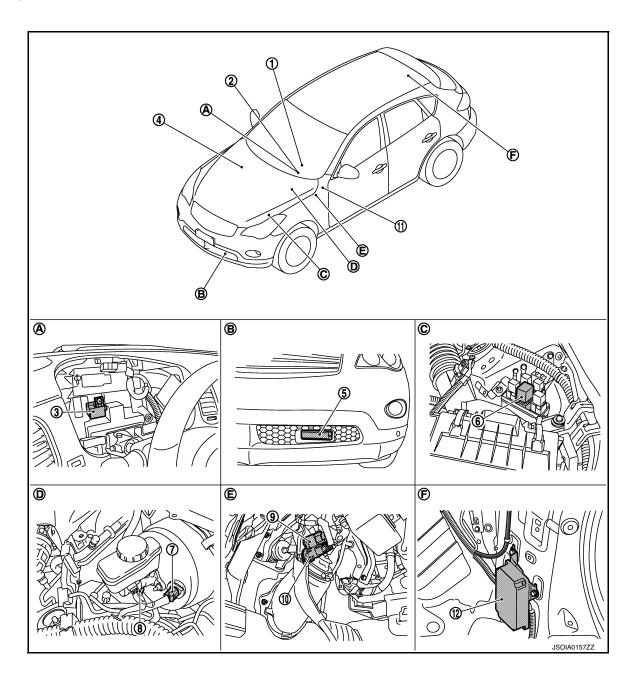
Condition	Description	Indication on the combination meter
When the sensor window is dirtyWhen the system malfunction	The system will be cancelled automatically with a beep sound.	
When driving into a strong light (i.e. sunlight)	The system is temporary unavailable. (Without the warning chime)	IBA OFF
		JSFIA0392ZZ

NOTE:

When the IBA turns OFF, the IBA OFF indicator lamp will illuminate.

Component Parts Location

INFOID:0000000012168524



INTELLIGENT BRAKE ASSIST

< SYSTEM DESCRIPTION >

[INTELLIGENT BRAKE ASSIST]

1.	ICC steering switch	2.	Information display, ICC system warning lamp (On the combination meter)	3.	ICC warning chime	Α
4.	ECM Refer to EC-39, "Component Parts Location".	5.	ICC sensor integrated unit	6.	ICC brake hold relay	В
7.	Booster solenoid/Release switch	8.	Brake pressure sensor	9.	Stop lamp switch	
10.	ICC brake switch	11.	IBA OFF switch	12.	Brake booster control unit	С
A.	Behind the combination meter	B.	Front bumper (LH)	C.	Engine room (LH)	
D.	Inside brake master cylinder cover	E.	Upper side of brake pedal	F.	Luggage room (RH)	
Comi	nonent Description					D

Component Description

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Component	Func	tion Desc	cription	Description	
Component	*1	*2	*3	Description	
ICC sensor integrated unit	×	×	×	Refer to CCS-47, "Description".	
ECM	×	×	×	Refer to CCS-82, "Description".	
ABS actuator and electric unit (control unit)	×	×	×	Refer to CCS-53, "Description".	
ВСМ	×			Transmits the front wiper request signal to ICC sensor integrated unit via CAN communication.	
TCM	×	×		Refer to CCS-123, "Description".	
Unified meter and A/C amp.	×	×	×	Receives the meter display signal, ICC warning lamp signal, and IBA OFF indicator lamp signal from ICC sensor integrat ed unit via CAN communication and transmits them to the combination meter via the communication line.	
Combination meter	×	×	×	Performs the following operations using the signals received from the unified meter and A/C amp. via the communication line. Displays the ICC system operation status using the meter display signal. Illuminates the ICC system warning lamp using the ICC warning lamp signal. Illuminates the IBA OFF indicator lamp using the IBA OFF indicator lamp signal.	
ICC brake switch	×	×	×	Defeate CCC 55 "Deceription"	
Stop lamp switch	×	×	×	Refer to CCS-55, "Description".	
ICC brake hold relay	×		×	Refer to CCS-75, "Description".	
Brake booster control unit	×	×	×	Refer to CCS-93, "Description".	
Brake booster	×		×	Refer to CCS-93. "Description".	
Brake pressure sensor	×		×	Refer to CCS-63, "Description".	
Booster solenoid/Release switch	×		×	Refer to CCS-65, "Description" for booster solenoid. Refer to CCS-68, "Description" for release switch.	
ICC warning chime	×	×	×	Refer to CCS-136, "Description".	
Steering angle sensor	×			Refer to CCS-117, "Description".	
IBA OFF switch			×NOTE	Refer to CCS-112, "Description".	

^{*1:} Vehicle-to-vehicle distance control mode

NOTE:

Only IBA system uses

Revision: July 2016 BRC-171 2016 QX50

^{*2:} Conventional (fixed speed) cruise control mode

^{*3:} IBA system and Brake Assist (With Preview Function)

INTELLIGENT BRAKE ASSIST

< DTC/CIRCUIT DIAGNOSIS >

[INTELLIGENT BRAKE ASSIST]

DTC/CIRCUIT DIAGNOSIS

INTELLIGENT BRAKE ASSIST

Diagnosis Procedure

INFOID:0000000012168526

1.INTELLIGENT BRAKE ASSIST DIAGNOSIS

- The system will be cancelled automatically with a beep sound and IBA OFF indicator lamp on the combination meter will illuminate, when the system will not operate properly.
- When the IBA OFF indicator lamp continues to illuminate even if the IBA system is turned ON after the engine restarts, perform the trouble-diagnosis.

NOTE:

IBA system automatically returns to ON, when erasing self-diagnosis result for "ICC/ADAS" with CONSULT.

>> Go to ICC (Full Speed Range). Refer to CCS-5, "Work Flow".

SWITCH DOES NOT TURN ON / SWITCH DOES NOT TURN OFF

< SYMPTOM DIAGNOSIS >

[INTELLIGENT BRAKE ASSIST]

SYMPTOM DIAGNOSIS

SWITCH DOES NOT TURN ON / SWITCH DOES NOT TURN OFF

Symptom Table

CAUTION:

Perform the self-diagnosis with CONSULT before the symptom diagnosis. Perform the trouble diagnosis if any DTC is detected.

Sym	Inspection item/Reference page	
IBA system does not turn ON/OFF	IBA OFF indicator lamp is not turned ON⇔OFF when operating IBA OFF switch	BRC-173, "Diagnosis Procedure"

Description INFOID:0000000012168528

IBA system does not turn ON/OFF.

- IBA OFF indicator lamp does not illuminate even if the IBA OFF switch is depressed when IBA OFF indicator lamp is not illuminated.
- IBA OFF indicator lamp does not turn OFF even if the IBA OFF switch is depressed when IBA OFF indicator lamp is illuminated.

NOTE:

- To turn the system OFF⇔ON, push and hold the IBA OFF switch after starting the engine for more than 1 second.
- The system ON/OFF condition will be memorized even if the ignition switch turns OFF.

Diagnosis Procedure

1. PERFORM THE SELF-DIAGNOSIS

- 1. Perform "All DTC Reading" with CONSULT.
- Check if the DTC is detected in self-diagnosis results for "ICC/ADAS" with CONSULT. Refer to <u>CCS-155</u>.
 "DTC Index".

Is any DTC detected?

YES >> GO TO 6.

NO >> GO TO 2.

2.IBA OFF SWITCH INSPECTION

- 1. Start the engine.
- 2. Check that "IBA SW" operates normally in "DATA MONITOR" for "ICC/ADAS" with CONSULT.

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 5.

3.CHECK IBA OFF INDICATOR CIRCUIT

- 1. Start the engine.
- 2. Select the active test item "METER LAMP" for "ICC/ADAS" with CONSULT.
- Check if the IBA OFF indicator lamp illuminates when the test item is operated.

Is the inspection result normal?

YES >> Refer to GI-38, "Work Flow".

NO >> GO TO 4.

4.CHECK DATA MONITOR OF "UNIFIED METER AND A/C AMP."

Check that "BA W/L" operates normally in "DATA MONITOR" for "METER/M&A" with CONSULT, when the IBA OFF switch is pushed and hold for more than 1 second.

Is the inspection result normal?

- YES >> Replace the combination meter. Refer to MWI-136, "Exploded View".
- NO >> Replace the unified meter and A/C amp. Refer to MWI-137, "Exploded View".

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SWITCH DOES NOT TURN ON / SWITCH DOES NOT TURN OFF

< SYMPTOM DIAGNOSIS >

[INTELLIGENT BRAKE ASSIST]

5. CHECK IBA OFF SWITCH

Check IBA OFF switch. Refer to CCS-113, "Component Inspection (IBA OFF Switch)".

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

6. REPAIR OR REPLACE MALFUNCTIONING PARTS

Repair or replace malfunctioning parts.

>> GO TO 7.

7. CHECK IBA SYSTEM

Check that IBA OFF indicator lamp turned ON⇔OFF, when operating IBA OFF switch.

>> INSPECTION END

NORMAL OPERATING CONDITION

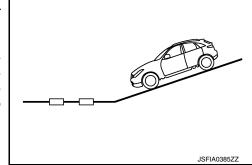
[INTELLIGENT BRAKE ASSIST]

NORMAL OPERATING CONDITION

Description INFOID:000000012168530

PRECAUTIONS FOR INTELLIGENT BRAKE ASSIST

- The IBA system is a not collision avoidance system. It is the driver's responsibility to stay alert, drive safely and be in control of the vehicle at all times.
- As there is a performance limit, it may not provide a warning or brake in certain conditions.
- The system will not detect the following objects:
- Pedestrians, animals, or obstacles in the roadway
- Oncoming vehicles in the same lane
- The system will not detect under the following conditions:
- When the sensor gets dirty and it is impossible to detect the distance from the vehicle ahead.
- When driving into a strong light (i.e. sunlight)
- The sensor generally detects the signals returned from the reflectors on a vehicle ahead. Therefore, the system may not function properly under the following conditions:
- When the reflectors of the vehicle ahead are positioned high or close each other (including a small vehicle such as motorcycles).
- When the sensor gets dirty or and it is impossible to detect the distance from the vehicle ahead.
- When the reflectors on the vehicle ahead is missing, damaged or covered.
- When the reflector of the vehicle ahead is covered with dirt, snow and road spray.
- When visibility is low (such as rain, fog, snow, etc.).
- When snow or road spray from traveling vehicles are raised up.
- When dense exhaust or other smoke (black smoke) from vehicles reduces the sensor visibility.
- When excessively heavy baggage is loaded in the rear seat or the luggage room of vehicle.
- When abruptly accelerating or decelerating.
- On steep downhill or roads with sharp curves.
- When there is a highly reflective object near the vehicle ahead (ie,) very close to other vehicle, signboard, etc.
- While towing a trailer.
- Depending on certain road conditions (curved, beginning of a curve), vehicle conditions (steering position, vehicle position), or preceding vehicle's conditions (position in lane, etc.), the system may not function properly.
- The system may not function in offset conditions.
- The system may not function when the distance to the vehicle ahead is extremely close.
- The system detect highly reflective objects such as reflectors, signs, white markers, and other stationary objects on the road or near the traveling lane, and when in extreme conditions, detection of these objects may cause the system to function.
- The system is designed to automatically check the sensor's functionality. If the sensor is covered with ice, a transparent or translucent plastic bag, etc., the system may not detect them. In these instances the system may not be able to warn properly. Be sure to check and clean the sensor regularly.
- Excessive noise will interfere with the warning chime sound, and the chime may not be heard.
- Never step in under the brake pedal to avoid an accident when IBA system turns on.
- Sudden appearance of the vehicle in front (ie, it abruptly cuts in) may not be detected and the system may not warn soon enough.
- The system will be cancelled automatically with a beep sound and the IBA OFF indicator lamp will illuminate under the following conditions:
- When the sensor window is dirty
- When the system malfunctions



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PRECAUTION

PRECAUTIONS

Precautions for Removing Battery Terminal

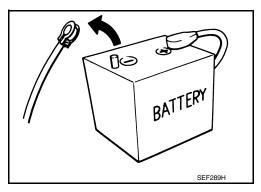
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When disconnecting the battery terminal, pay attention to the following.

- Always use a 12V battery as power source.
- · Never disconnect battery terminal while engine is running.
- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.
- For vehicles with the engine listed below, remove the battery terminal after a lapse of the specified time:

BR08DE : 4 minutes YD25DDTi : 2 minutes : 20 minutes YS23DDT D4D engine : 4 minutes HRA2DDT : 12 minutes YS23DDTT : 4 minutes : 60 seconds : 4 minutes ZD30DDTi K9K engine ZD30DDTT M9R engine : 4 minutes : 60 seconds

R9M engine : 4 minutes V9X engine : 4 minutes



NOTE:

ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.

• After high-load driving, if the vehicle is equipped with the V9X engine, turn the ignition switch OFF and wait for at least 15 minutes to remove the battery terminal.

NOTE:

- Turbocharger cooling pump may operate in a few minutes after the ignition switch is turned OFF.
- Example of high-load driving
- Driving for 30 minutes or more at 140 km/h (86 MPH) or more.
- Driving for 30 minutes or more on a steep slope.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.

NOTE:

If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.

After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.

NOTE:

The removal of 12V battery may cause a DTC detection error.

Precautions for IBA System Service

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- Never look straight into the laser beam discharger when adjusting laser beam aiming.
- Turn the IBA system OFF in conditions similar to driving, such as free rollers or a chassis dynamometer.
- Never use the ICC sensor integrated unit removed from vehicle. Never disassemble or remodel.
- Erase DTC when replacing parts of ICC system. Then check the operation of ICC system after adjusting laser beam aiming if necessary.
- Never change IBA system state ON/OFF without the consent of the customer.

NOTE

IBA system automatically returns to ON, when erasing self-diagnosis result for "ICC/ADAS" with CONSULT.

IBA OFF SWITCH

< REMOVAL AND INSTALLATION >

[INTELLIGENT BRAKE ASSIST]

REMOVAL AND INSTALLATION

IBA OFF SWITCH

Removal and Installation

REMOVAL

- 1. Remove instrument lower panel LH. Refer to IP-13, "Removal and Installation".
- 2. Disengage the pawl. Then remove IBA OFF switch.

INSTALLATION

Install in the reverse order of removal.

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