

# STR

SECTION

STARTING SYSTEM

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## HOW TO USE THIS MANUAL

< HOW TO USE THIS MANUAL >

## HOW TO USE THIS MANUAL

### HOW TO USE THIS MANUAL

#### Application Notice

INFOID:000000007093990

Check vehicle identification number to use the corresponding service information in this manual.

Service information	Vehicle identification number
TYPE A	Up to VIN: JN8AS1MU*BM710003 JN8AS1MW*BM730002 JN8BS1MW*BM760006
TYPE B	From VIN: JN8AS1MU*BM710004 JN8AS1MW*BM730003 JN8BS1MW*BM760007

\*: Refer to [GI-24, "Information About Identification or Model Code"](#) to vehicle identification number

# DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

## BASIC INSPECTION

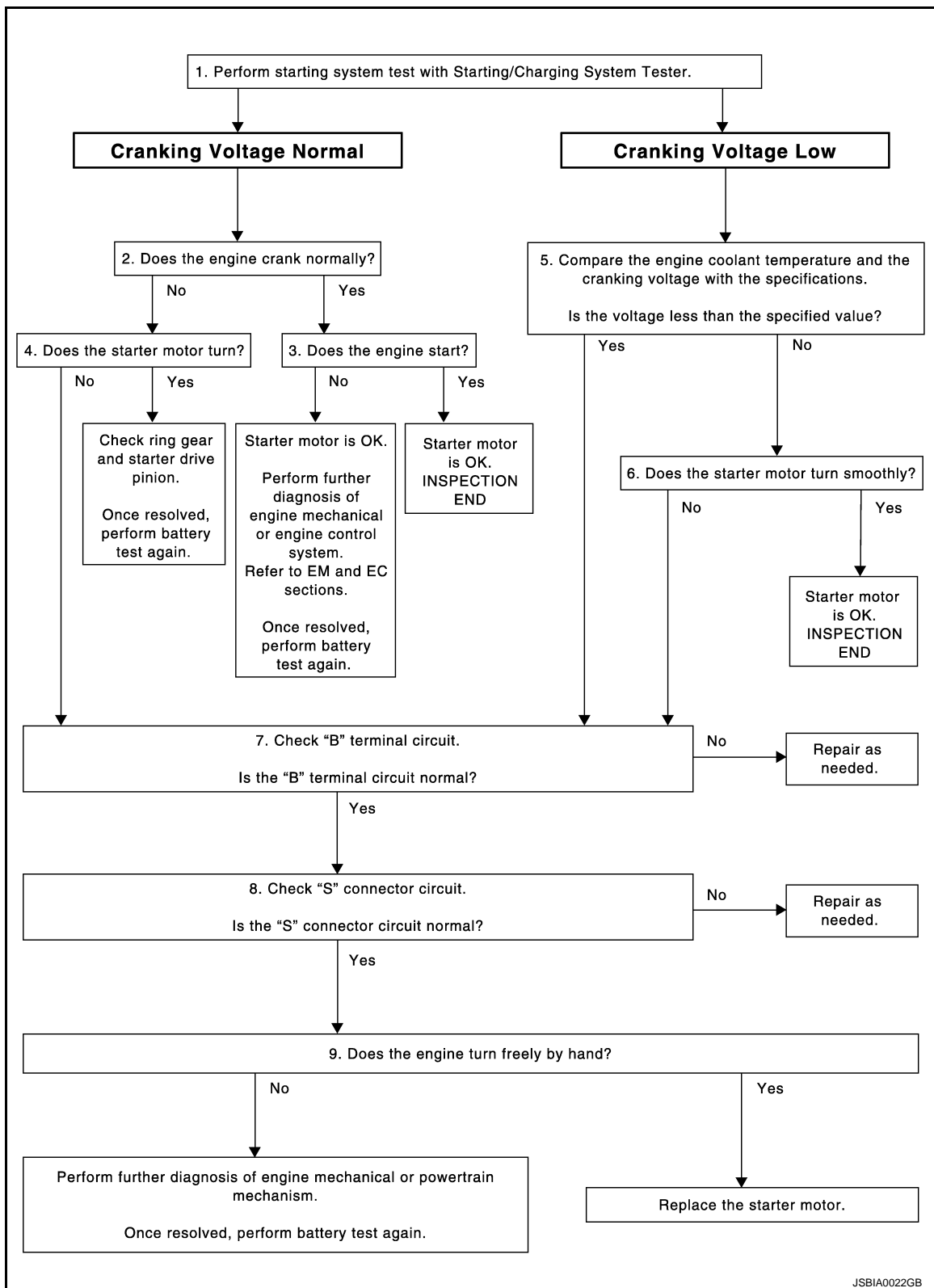
### DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000006564803

STR

#### OVERALL SEQUENCE



#### DETAILED FLOW

# DIAGNOSIS AND REPAIR WORKFLOW

## < BASIC INSPECTION >

### NOTE:

To ensure a complete and thorough diagnosis, the battery, starter motor and alternator test segments must be done as a set from start to finish.

## 1. DIAGNOSIS WITH STARTING/CHARGING SYSTEM TESTER

Perform the starting system test with Starting/Charging System Tester (SST: J-44373). For details and operating instructions, refer to Technical Service Bulletin.

### Test result

CRANKING VOLTAGE NORMAL>>GO TO 2.

CRANKING VOLTAGE LOW>>GO TO 5.

CHARGE BATTERY>>Perform the slow battery charging procedure. (Initial rate of charge is 10A for 12 hours.) Perform battery test again. Refer to Technical Service Bulletin.

REPLACE BATTERY>>Before replacing battery, clean the battery cable clamps and battery posts. Perform battery test again. Refer to Technical Service Bulletin. If second test result is "REPLACE BATTERY", then do so. Perform battery test again to confirm repair.

## 2. CRANKING CHECK

Check that the starter motor operates correctly.

### Does the engine crank normally?

YES >> GO TO 3.

NO >> GO TO 4.

## 3. ENGINE START CHECK

Check that the engine starts.

### Does the engine start?

YES >> Starter motor is OK. INSPECTION END

NO >> Perform further diagnosis of engine mechanical or engine control system. Refer EM and EC sections. Once resolved, perform battery test again.

## 4. STARTER MOTOR ACTIVATION

Check that the starter motor operates.

### Does the starter motor turn?

YES >> Check ring gear and starter motor drive pinion. Once resolved, perform battery test again.

NO >> GO TO 7.

## 5. COMPARISON BETWEEN ENGINE COOLANT AND CRANKING VOLTAGE

Compare the engine coolant temperature and the cranking voltage with the specifications.

### Minimum Specification of Cranking Voltage Referencing Coolant Temperature

Engine coolant temperature [°C (°F)]	Voltage [V]
-30 to -20 (-22 to -4)	8.6
-19 to -10 (-2 to 14)	9.1
-9 to 0 (16 to 32)	9.5
More than 1 (More than 34)	9.9

### Is the voltage less than the specified value?

YES >> GO TO 7.

NO >> GO TO 6.

## 6. STARTER OPERATION

Check the starter operation status.

### Does the starter motor turn smoothly?

YES >> Starter motor is OK. INSPECTION END

NO >> GO TO 7.

## 7. "B" TERMINAL CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to [STR-9, "Diagnosis Procedure"](#).

### Is "B" terminal circuit normal?

## DIAGNOSIS AND REPAIR WORKFLOW

### < BASIC INSPECTION >

---

- YES >> GO TO 8.  
NO >> Repair as needed.

A

### 8. "S" CONNECTOR CIRCUIT INSPECTION

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Check "S" connector circuit. Refer to [STR-10. "Diagnosis Procedure"](#).

STR

Is "S" connector circuit normal?

- YES >> GO TO 9.  
NO >> Repair as needed.

C

### 9. ENGINE ROTATION STATUS

---

Check that the engine can be rotated by hand.

Does the engine turn freely by hand?

D

- YES >> Replace starter motor.  
NO >> Perform further diagnosis of engine mechanical or powertrain mechanism. Once resolved, perform battery test again. Refer to Technical Service Bulletin.

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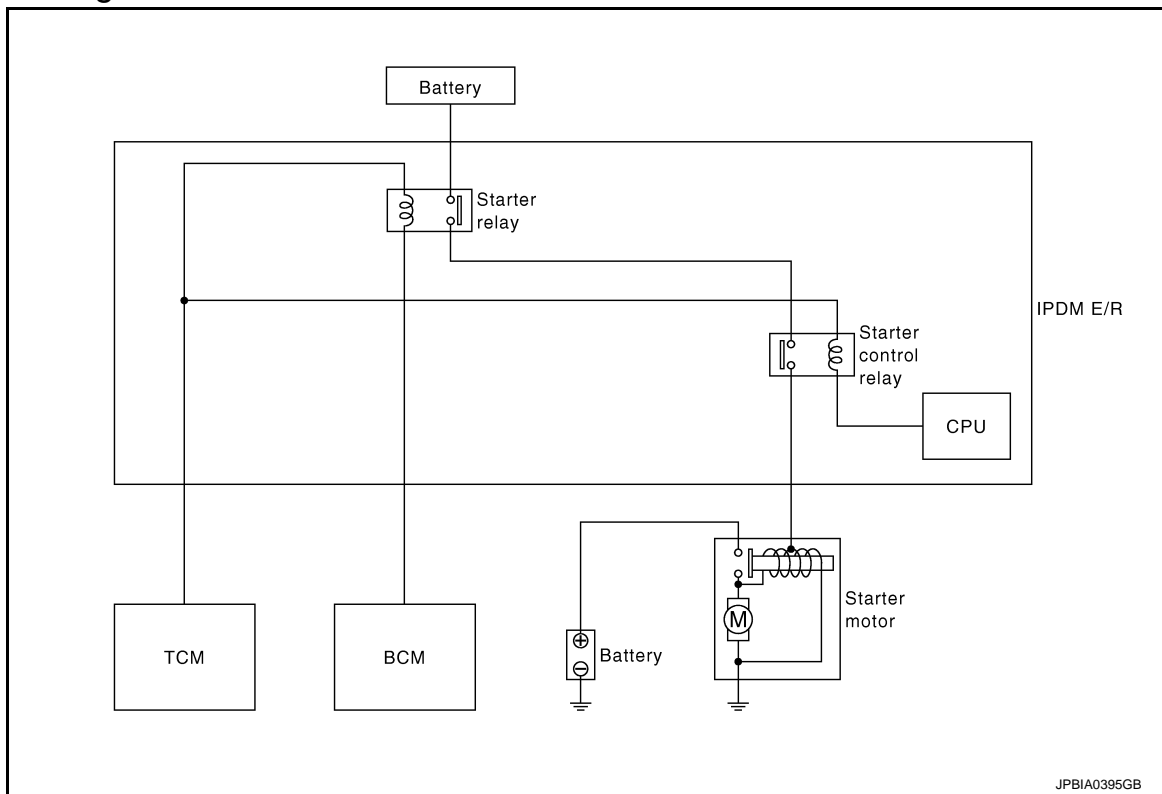
# STARTING SYSTEM

< SYSTEM DESCRIPTION >

## SYSTEM DESCRIPTION

### STARTING SYSTEM

#### System Diagram



#### System Description

The starter motor plunger closes and provides a closed circuit between the battery and starter motor. The starter motor is grounded to the engine block. With power and ground supplied, cranking occurs and the engine starts.

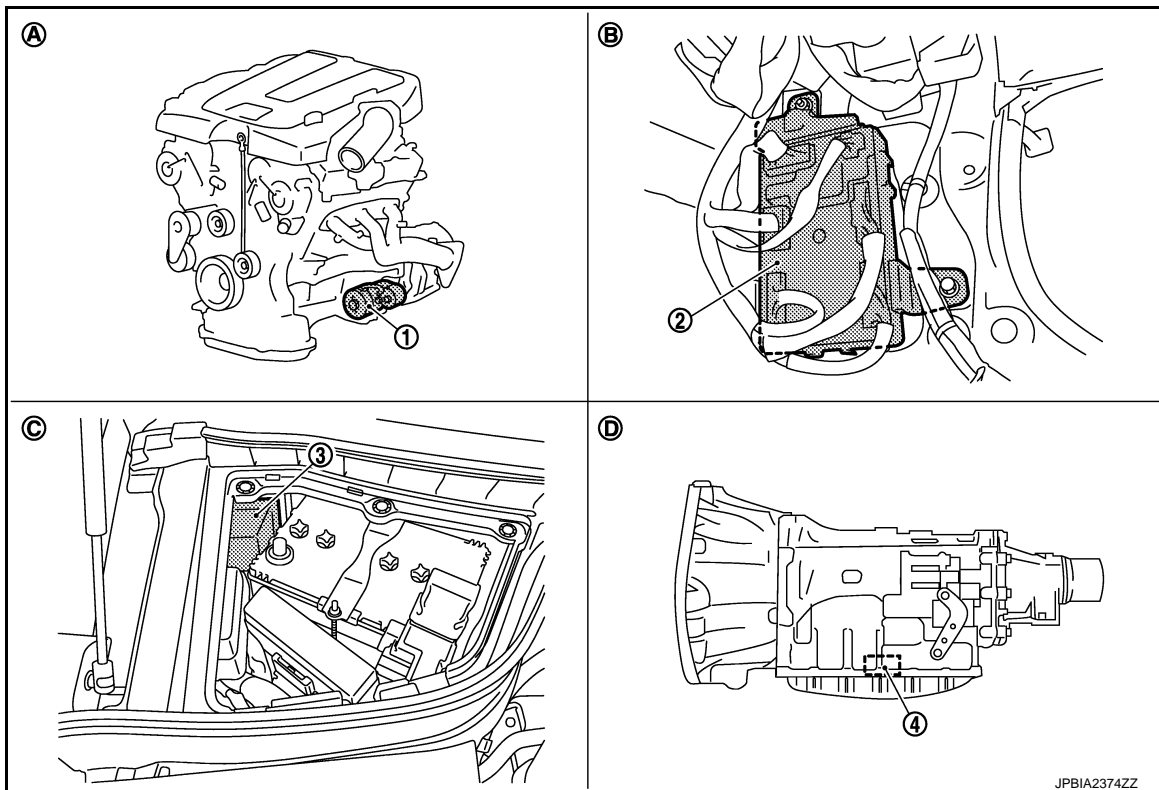
VQ35HR

# STARTING SYSTEM

< SYSTEM DESCRIPTION >

## VQ35HR : Component Parts Location

INFOID:0000000006564806



1. Starter motor

2. BCM

3. IPDM E/R

4. TCM

A. Cylinder block (bank 2) side

B. Dash side lower (Passenger side)

C. Engine room dash panel (RH)

D. Inside of A/T (built into A/T)

VK50VE

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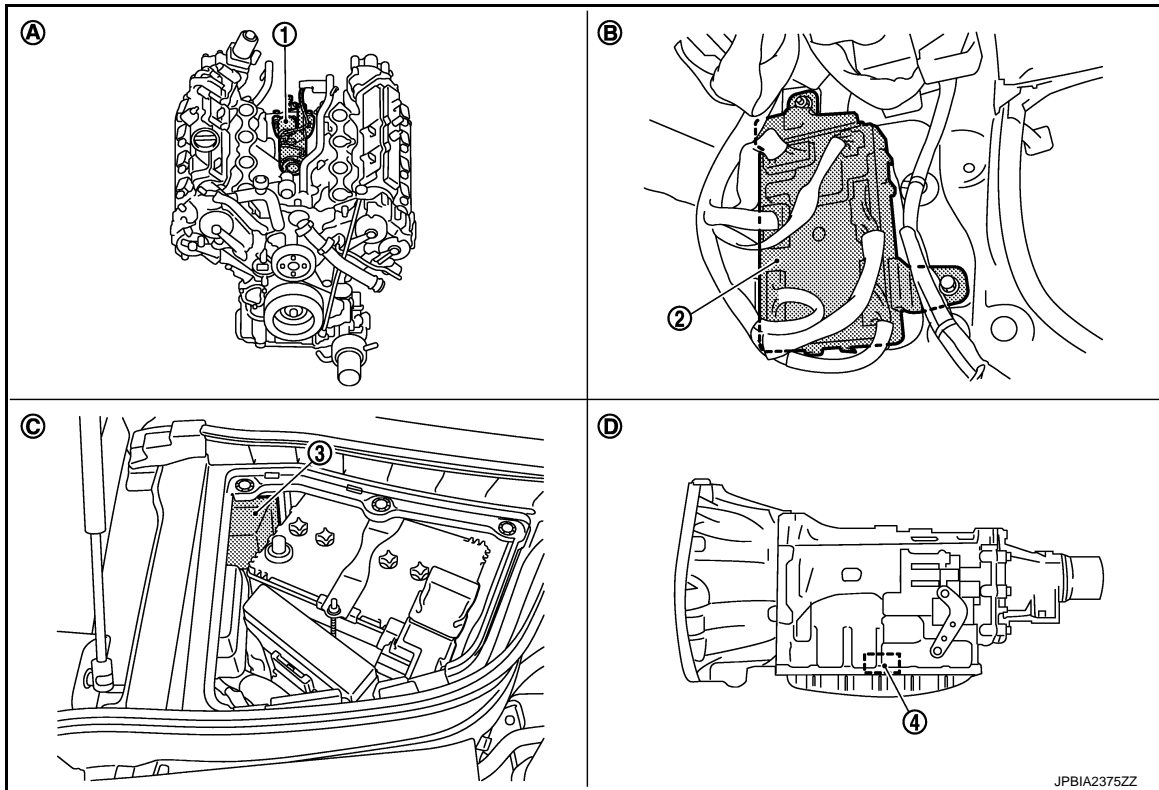
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# STARTING SYSTEM

## < SYSTEM DESCRIPTION >

### VK50VE : Component Parts Location

INFOID:000000006564807



1. Starter motor

2. BCM

3. IPDM E/R

4. TCM

A. Engine

B. Dash side lower (Passenger side)

C. Engine room dash panel (RH)

D. Inside of A/T (built into A/T)

## Component Description

INFOID:000000006564808

Component part	Description
TCM	TCM supplies power to the starter relay and starter control relay inside IPDM E/R when the selector lever is shifted to the P or N position.
BCM	BCM controls the starter relay inside IPDM E/R.
IPDM E/R	CPU inside IPDM E/R controls the starter control relay.
Starter motor	The starter motor plunger closes and the motor is supplied with battery power, which in turn cranks the engine, when the "S" terminal is supplied with electric power.



## B TERMINAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

### DTC/CIRCUIT DIAGNOSIS

#### B TERMINAL CIRCUIT

##### Description

INFOID:0000000006564809

STR

The "B" terminal is constantly supplied with battery power.

##### Diagnosis Procedure

INFOID:0000000006564810

##### CAUTION:

Perform diagnosis under the condition that engine cannot start by the following procedure.

1. Remove fuel pump fuse.
2. Crank or start the engine (where possible) until the fuel pressure is released.

##### 1. CHECK "B" TERMINAL CIRCUIT

1. Turn ignition switch OFF.
2. Check that starter motor "B" terminal connection is clean and tight.
3. Check voltage between starter motor "B" terminal and ground.

Terminals			Voltage (Approx.)
(+)		(-)	
Starter motor "B" terminal	Terminal		
E204 (VQ35HR) E206 (VK50VE)	2	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check harness between battery and starter motor for open circuit.

##### 2. CHECK BATTERY CABLE CONNECTION STATUS (VOLTAGE DROP TEST)

1. Shift A/T selector lever to "P" or "N" position.
2. Check voltage between battery positive terminal and starter motor "B" terminal.

Terminals			Condition	Voltage (Approx.)
(+)	(-)			
	Starter motor "B" terminal	Terminal		
Battery positive terminal	E204 (VQ35HR) E206 (VK50VE)	2	When the ignition switch is in START position	Less than 0.5 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> Check harness between the battery and the starter motor for poor continuity.

##### 3. CHECK GROUND CIRCUIT STATUS (VOLTAGE DROP TEST)

1. Shift A/T selector lever to "P" or "N" position.
2. Check voltage between starter motor case and battery negative terminal.

Terminals		Condition	Voltage (Approx.)
(+)	(-)		
Starter motor case	Battery negative terminal	When the ignition switch is in START position	Less than 0.2 V

Is the inspection result normal?

YES >> "B" terminal circuit is OK. Further inspection is necessary. Refer to [STR-3, "Work Flow"](#).

NO >> Check the starter motor case and ground for poor continuity.

# S CONNECTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

## S CONNECTOR CIRCUIT

### Description

INFOID:000000006564811

The starter motor magnetic switch is supplied with power when the ignition switch is turned to the START position while the selector lever is in the P or N position.

### Diagnosis Procedure

INFOID:000000006564812

#### CAUTION:

Perform diagnosis under the condition that engine cannot start by the following procedure.

1. Remove fuel pump fuse.
2. Crank or start the engine (where possible) until the fuel pressure is released.

#### 1.CHECK "S" CONNECTOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect starter motor connector.
3. Shift A/T selector lever to "P" or "N" position.
4. Check voltage between starter motor harness connector and ground.

Terminals			Condition	Voltage (Approx.)
(+)		(−)		
Starter motor har- ness connector	Terminal			
F52 (VQ35HR) F55 (VK50VE)	1	Ground	When the ignition switch is in START position	Battery voltage

Is the inspection result normal?

- YES >> "S" connector circuit is OK. Further inspection is necessary. Refer to [STR-3, "Work Flow"](#).  
NO >> GO TO 2.

#### 2.CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

1. Disconnect IPDM E/R connector.
2. Check continuity between starter motor harness connector and IPDM E/R harness connector.

Starter motor harness connector		IPDM E/R harness connector		Continuity
Connector No.	Terminal No.	Connector No.	Terminal No.	
F52 (VQ35HR) F55 (VK50VE)	1	E7	80	Existed

Is the inspection result normal?

- YES >> Further inspection is necessary. Refer to [STR-3, "Work Flow"](#).  
NO >> Repair the harness.

## < DTC/CIRCUIT DIAGNOSIS >

## STARTING SYSTEM

## TYPE A

### TYPE A : Wiring Diagram - STARTING SYSTEM -

INFOID:000000006564813

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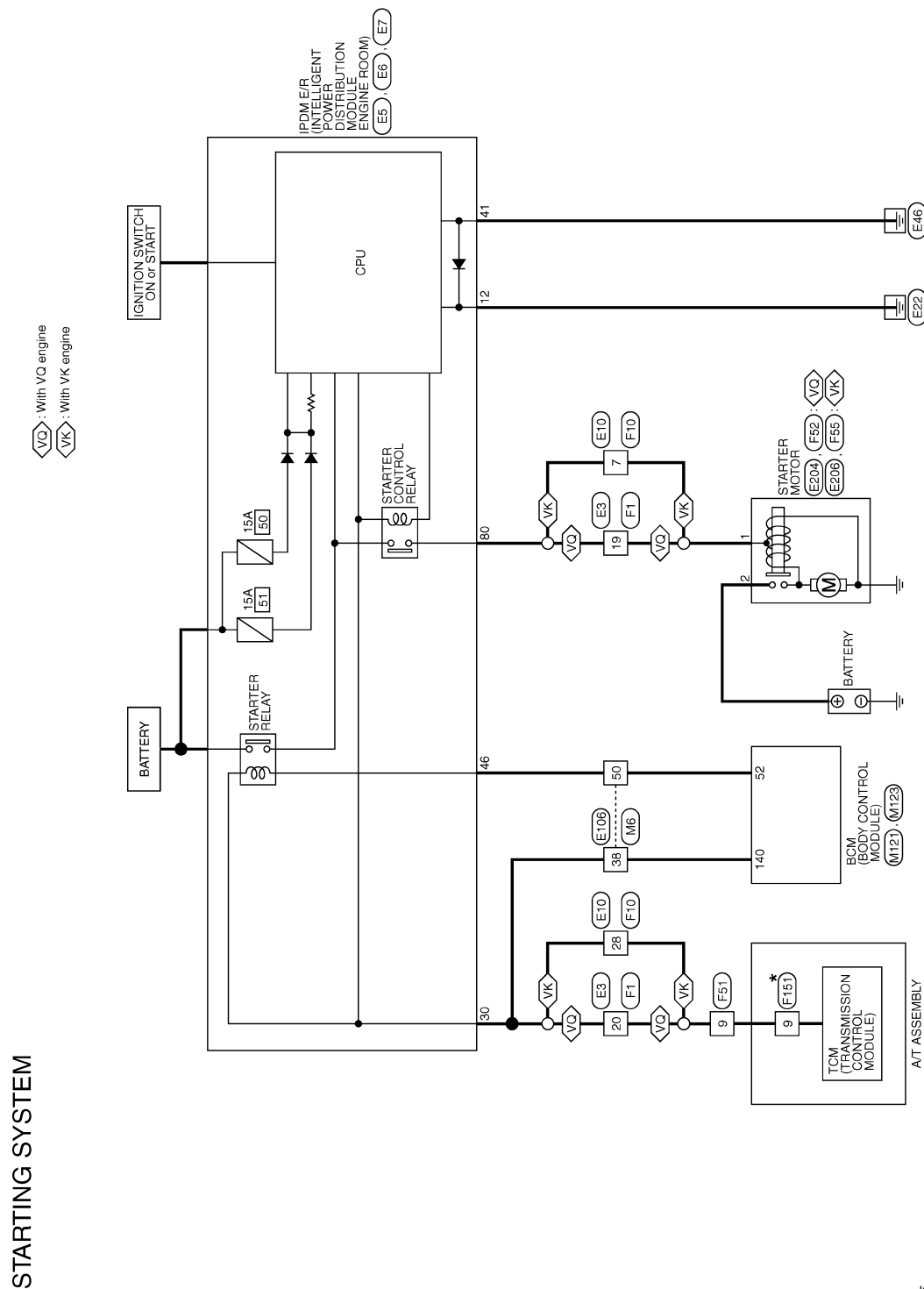
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★: This connector is not shown in "Harness Layout".

2008/03/04

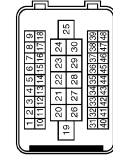
JCBWM0710GB

# STARTING SYSTEM

## < DTC/CIRCUIT DIAGNOSIS >

### STARTING SYSTEM

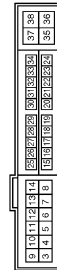
Connector No.	E3
Connector Name	WIRE TO WIRE
Connector Type	SAA38MB-RS10-SJZ2



Terminal No.	Color of Wire	Signal Name [Specification]
19	W	-
20	GR	-
21	G	-
22	LG	-
23	W	-
25	BR	-
26	BR	-
27	R	-
28	R	-
29	L	-
30	V	-
31	LG	-
32	L	-
33	P	-
34	G	-
35	Y	-
40	O	-
41	W	-
42	V	-
43	W	-



Connector No.	E5
Connector Name	IPDM E/R INTELLIGENT POWER DISTRIBUTION MODULE (ENGINE ROOM)
Connector Type	TH20FW-CS12-M4-1V



Terminal No.	Color of Wire	Signal Name [Specification]
4	V	-
5	L	-

7	R	-
10	SB	-
11	BR	-
12	B	-
13	Y	-
16	LG	-
18	W	-
19	W	-
25	G	-
26	R	-
27	Y	-
28	O	-
30	GR	-
32	SB	-
33	P	-
36	G	-

Connector No.	E6
Connector Name	IPDM E/R INTELLIGENT POWER DISTRIBUTION MODULE (ENGINE ROOM)
Connector Type	TH08FW-NH



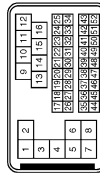
Terminal No.	Color of Wire	Signal Name [Specification]
39	P	-
40	L	-
41	B	-
42	Y	-
43	SB	-
44	W	-
45	G	-
46	BR	-

Connector No.	E7
Connector Name	IPDM E/R INTELLIGENT POWER DISTRIBUTION MODULE (ENGINE ROOM)
Connector Type	TH20FW-CS12-M4



Terminal No.	Color of Wire	Signal Name [Specification]
48	L	-
49	W	- [With VK engine]
49	SB	- [With VQ engine]
51	G	-
52	W	-
53	W	-
54	R	-
55	BR	-
56	O	- [With VK engine]
56	V	- [With VQ engine]
57	LG	-
58	Y	-
69	W	-
70	O	-
74	G	-
75	Y	-
76	P	- [With VK engine]
76	V	- [With VQ engine]
77	B	- [With VK engine]
77	L	- [With VQ engine]
80	W	-

Connector No.	E10
Connector Name	WIRE TO WIRE
Connector Type	SAA38MB-RS9-SHZ8



Terminal No.	Color of Wire	Signal Name [Specification]
1	SHIELD	-

2	L	-
3	G	-
4	BR	-
5	G	-
6	BR	-
7	W	-
8	SHIELD	-
9	W	-
10	W	-
11	W	-
12	W	-
13	R	-
14	LG	-
15	O	-
16	W	-
17	P	-
18	W	-
19	W	-
20	BR	-
21	SB	-
22	W	-
23	V	-
24	Y	-
26	LG	-
27	G	-
28	GR	-
29	P	-
30	W	-
31	G	-
32	L	-
33	O	-
35	R	-
36	SHIELD	-
37	Y	-
38	SHIELD	-
39	W	-
40	SHIELD	-
41	Y	-
42	SHIELD	-
43	W	-
44	G	-
45	L	-
46	G	-
47	B	-
48	R	-
49	L	-
50	G	-
51	B	-
52	R	-

# STARTING SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

## STARTING SYSTEM

Connector No.	E106
Connector Name	WIRE TO WIRE
Connector Type	TH00FW-CS16-TM4



Terminal No.	Color of Wire	Signal Name [Specification]
1	G	-
2	O	-
3	SB	-
4	LG	-
5	Y	-
6	W	-
7	G	-
8	V	-
9	R	-
10	BR	-
11	B	-
12	G	-
13	R	-
14	W	-
15	SHIELD	-
16	SB	-
17	L	-
18	P	-
19	G	-
20	W	- [With ICC]
20	Y	- [Without ICC]
21	BR	-
22	R	- [With ICC]
22	V	- [Without ICC]
23	G	-
24	L	- [With ICC]
24	P	- [Without ICC]
25	Y	- [With ICC]
25	L	- [Without ICC]
26	SHIELD	-
28	G	-
29	LG	-
30	O	-
31	BR	-
32	W	-
33	Y	-
34	O	-
35	SB	-

36	P	-
37	Y	-
38	GR	-
39	LG	-
41	LG	-
42	V	-
43	R	-
44	G	-
45	GR	-
46	W	-
47	L	-
48	P	-
49	SB	-
50	BR	-
51	B	-
52	Y	-
53	O	-
54	R	-
55	SB	-
56	P	-
59	P	-
60	SB	-
61	V	-
62	P	-
63	LG	-
64	L	-
65	O	-
66	L	-
69	L	-
70	SHIELD	-
71	G	-
72	G	-
73	R	-
74	BR	-
76	L	-
77	W	-
78	Y	-
80	SB	-
81	L	-
82	W	-
83	LG	-
84	GR	-
85	G	-
86	P	-
87	W	-
88	O	-
89	LG	-
90	BR	-
91	GR	-
92	BR	-
93	SB	-
94	W	-

95	Y	-
96	W	-
100	Y	-

Connector No.	E204
Connector Name	STARTER MOTOR
Connector Type	-



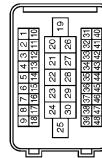
Terminal No.	Color of Wire	Signal Name [Specification]
2	B/Y	-

Connector No.	E206
Connector Name	STARTER MOTOR
Connector Type	-



Terminal No.	Color of Wire	Signal Name [Specification]
2	B/Y	-

Connector No.	F1
Connector Name	WIRE TO WIRE
Connector Type	SA43FB-RS10-SJ22



JCBWA1543GB

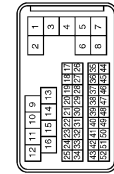
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# STARTING SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

## STARTING SYSTEM

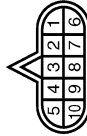
Connector No.	F10
Connector Name	WIRE TO WIRE
Connector Type	SAA38FB-RS8-SH28



Terminal No.	Color of Wire	Signal Name [Specification]
1	SHIELD	-
2	Y	-
3	G	-
4	BR	-
5	B	-
6	W	-
7	R	-
8	SHIELD	-
9	W	-
10	G	-
11	Y	-
12	V	-
13	P	-
14	L	-
15	O	-
16	R	-
17	GR	-
18	G	-
19	O	-
20	R	-
21	V	-
22	B	-
23	LG	-
24	Y	-
26	O	-
27	SB	-
28	LG	-
29	P	-
30	GR	-
31	BR	-
32	G	-
33	L	-
35	P	-
36	SHIELD	-
37	Y	-
38	SHIELD	-
39	W	-
40	SHIELD	-

41	Y	-
42	SHIELD	-
43	W	-
44	LG	-
45	L	-
46	G	-
47	B	-
48	R	-
49	L	-
50	G	-
51	B	-
52	R	-

Connector No.	F51
Connector Name	A/T ASSEMBLY
Connector Type	RK10FG-DGY



Terminal No.	Color of Wire	Signal Name [Specification]
1	Y	-
2	R	- [With VK engine]
3	BR	- [With VQ engine]
4	L	-
5	B	-
6	Y	-
7	R	-
8	P	-
9	LG	- [With VK engine]
9	GR	- [With VQ engine]
10	B	-

Connector No.	F52
Connector Name	STARTER MOTOR
Connector Type	X01MGY



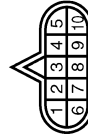
Terminal No.	Color of Wire	Signal Name [Specification]
1	W	-

Connector No.	F55
Connector Name	STARTER MOTOR
Connector Type	X01FGY



Terminal No.	Color of Wire	Signal Name [Specification]
1	R	-

Connector No.	F151
Connector Name	TOM (TRANSMISSION CONTROL MODULE)
Connector Type	SP10FG



Terminal No.	Color of Wire	Signal Name [Specification]
1	W	VIGN
2	B	BATT
3	R	CAN-H
4	O	K LINE

JCBWA1544GB

# STARTING SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

TYPE B

## STARTING SYSTEM

Connector No.	M6
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4

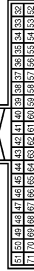


Terminal No.	Color of Wire	Signal Name [Specification]
1	G	-
2	O	-
3	SB	-
4	LG	-
5	GR	-
6	W	-
7	G	-
8	W	-
9	P	-
10	BR	-
11	B	-
12	G	-
13	R	-
14	W	-
15	SHIELD	-
16	BR	-
17	L	-
18	P	-
19	G	-
20	W	- [With ICC]
20	GR	- [Without ICC]
21	BR	- [With ICC]
21	R	- [Without ICC]
22	R	- [With ICC]
22	L	- [Without ICC]
23	G	-
24	L	- [With ICC]
24	P	- [Without ICC]
25	Y	- [With ICC]
25	W	- [Without ICC]
26	SHIELD	-
28	GR	-
28	V	-
29	O	-
30	O	-
31	BR	-
32	W	-
33	Y	-
34	L	-

35	L	-
36	P	-
37	G	-
38	R	-
39	L	-
41	L	-
42	W	-
43	R	-
44	LG	-
45	GR	-
46	W	-
47	L	-
48	P	-
49	O	-
50	LG	-
51	SB	-
52	Y	-
53	O	-
54	BR	-
55	SB	-
56	P	-
59	SB	-
60	SB	-
61	V	-
62	P	-
63	R	-
64	L	-
65	O	-
66	L	-
69	V	-
70	SHIELD	-
71	O	-
72	GR	-
73	W	-
74	SB	-
76	V	-
77	V	-
78	Y	-
80	O	-
81	L	-
82	W	-
83	Y	-
84	L	-
85	P	-
86	BR	-
87	P	-
88	V	-
88	G	-
89	G	-
90	P	-
91	R	-
92	R	-
93	GR	-

94	L	-
95	G	-
96	W	-
100	Y	-

Connector No.	M121
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	TH40FG-NH



Terminal No.	Color of Wire	Signal Name [Specification]
34	SB	LUGGAGE ROOM ANT-
35	V	LUGGAGE ROOM ANT+
38	B	BACK DOOR ANT-
39	W	BACK DOOR ANT+
47	Y	IGN RELAY (IPDM E/R) CONT
48	W	BK DOOR OPENER SW OPERATION
52	LG	STARTER RELAY CONT
61	W	BACK DOOR OPENER REQUEST SW
84	L	TRAILER WARM BUZZER (ENG ROOM)
85	O	REAR WIPER STOP POSITION
86	LG	BACK DOOR SW
87	P	BACK DOOR OPENER SW
88	BR	REAR RH DOOR SW
89	R	REAR LH DOOR SW

Connector No.	M123
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	TH40FG-NH



Terminal No.	Color of Wire	Signal Name [Specification]
112	GR	RAIN SENSOR SERIAL LINK
113	P	OPTICAL SENSOR

116	BR	STOP LAMP SW 1
118	P	STOP LAMP SW 2
119	SB	DR DOOR UNLOCK SENSOR
121	BR	KEYSLOT SW
123	W	IGN F/B
124	LG	PASSENGER DOOR SW
132	O	POWER WINDOW SW COMM
134	GR	LOCK IND
137	B	RECEIVER/SENSOR GND
138	Y	SENSOR POWER SUPPLY
140	R	SHIFT N/P
141	G	SECURITY INDICATOR OUTPUT
142	O	COMBI SW OUTPUT 5
143	P	COMBI SW OUTPUT 1
144	G	COMBI SW OUTPUT 2
145	L	COMBI SW OUTPUT 3
146	SB	COMBI SW OUTPUT 4
150	GR	DRIVER DOOR SW
151	G	REAR WINDOW DEFOGGER RELAY CONT

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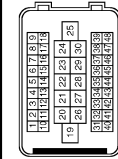


# STARTING SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

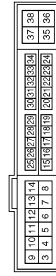
## STARTING SYSTEM

Connector No.	E3
Connector Name	WIRE TO WIRE
Connector Type	SAA38MB-RS10-SJ22



Terminal No.	Color of Wire	Signal Name [Specification]
19	W	-
20	GR	-
21	G	-
22	LG	-
23	W	-
25	BR	-
26	BR	-
27	R	-
28	R	-
29	L	-
30	V	-
31	LG	-
32	L	-
33	P	-
34	G	-
35	Y	-
40	BG	-
41	W	-
42	V	-
43	W	-

Connector No.	E5
Connector Name	FROM E-POWER INTELLIGENT POWER DISTRIBUTION MODULE
Connector Type	TH20FW-CS12-M4-1V



Terminal No.	Color of Wire	Signal Name [Specification]
4	V	-
5	L	-

7	R	-
10	SB	-
11	BR	-
12	B	-
13	Y	-
16	LG	-
19	W	-
25	G	-
26	R	-
27	Y	-
28	BG	-
30	GR	-
32	SB	-
33	P	-
36	G	-

Connector No.	E6
Connector Name	FROM E-POWER INTELLIGENT POWER DISTRIBUTION MODULE
Connector Type	TH20FW-4H



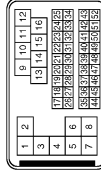
Terminal No.	Color of Wire	Signal Name [Specification]
39	P	-
40	L	-
41	B	-
42	Y	-
43	SB	-
44	W	-
45	G	-
46	BR	-

Connector No.	E7
Connector Name	FROM E-POWER INTELLIGENT POWER DISTRIBUTION MODULE
Connector Type	TH20FW-CS12-M4



Terminal No.	Color of Wire	Signal Name [Specification]
48	L	-
49	W	- [With VK engine]
51	G	- [With VK engine]
52	W	-
53	W	-
54	R	-
55	BR	-
56	BG	- [With VK engine]
57	LG	-
58	V	- [With VK engine]
59	Y	-
69	W	-
70	BG	-
74	G	-
75	Y	-
76	P	- [With VK engine]
76	V	- [With VK engine]
77	B	- [With VK engine]
77	L	- [With VK engine]
80	W	-

Connector No.	E10
Connector Name	WIRE TO WIRE
Connector Type	SAA38MB-RS8-SH28



Terminal No.	Color of Wire	Signal Name [Specification]
1	SHIELD	-

2	L	-
3	G	-
4	BR	-
5	G	-
6	BR	-
7	W	-
8	SHIELD	-
9	W	-
10	W	-
11	W	-
12	W	-
13	R	-
14	LG	-
15	BG	-
16	W	-
17	P	-
18	W	-
19	W	-
20	BR	-
21	SB	-
22	W	-
23	V	-
24	Y	-
26	LG	-
27	G	-
28	GR	-
29	P	-
30	W	-
31	G	-
32	L	-
33	BG	-
35	R	-
36	SHIELD	-
37	Y	-
38	SHIELD	-
39	W	-
40	SHIELD	-
41	Y	-
42	SHIELD	-
43	W	-
44	G	-
45	L	-
46	G	-
47	B	-
48	R	-
49	L	-
50	G	-
51	B	-
52	R	-

# STARTING SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

## STARTING SYSTEM

Connector No.	E106
Connector Name	WIRE TO WIRE
Connector Type	TH80PW-CS16-TM4



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35

Terminal No.	Color of Wire	Signal Name [Specification]
1	G	-
2	B	-
3	SB	-
4	LG	-
5	Y	-
6	W	-
7	G	-
8	V	-
9	R	-
10	BR	-
11	B	-
12	G	-
13	R	-
14	W	-
15	SHIELD	-
16	SB	-
17	L	-
18	P	-
19	G	-
20	W	- [With ICC]
21	Y	- [Without ICC]
22	BR	-
23	R	- [With ICC]
24	V	- [Without ICC]
25	G	-
26	L	- [With ICC]
27	P	- [Without ICC]
28	Y	- [With ICC]
29	L	- [Without ICC]
30	SB	-
31	BR	-
32	W	-
33	Y	-
34	B	-
35	SB	-

97	W	-
98	SHIELD	-
100	Y	-

Connector No.	E204
Connector Name	STARTER MOTOR
Connector Type	-



Terminal No.	2	Color of Wire	Signal Name [Specification]
2	B/Y	-	-

Connector No.	E206
Connector Name	STARTER MOTOR
Connector Type	-



Terminal No.	2	Color of Wire	Signal Name [Specification]
2	B/Y	-	-

Connector No.	F1
Connector Name	WIRE TO WIRE
Connector Type	SAA38FB-RS1D-SJ22



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35

Terminal No.	Color of Wire	Signal Name [Specification]
19	W	-
20	GR	-
21	P	-
22	G	-
23	W	-
25	P	-
26	BR	-
27	R	-
28	R	-
29	L	-
30	Y	-
31	V	-
32	LG	-
33	GR	-
34	G	-
35	Y	-
40	O	-
41	SB	-
42	P	-
43	BR	-

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# STARTING SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

## STARTING SYSTEM

Connector No.	F10
Connector Name	WIRE TO WIRE
Connector Type	SAA3PFB-RS8-S1Z3

1	2	1	9
12	11	10	8
16	15	14	13
20	19	18	17
24	23	22	21
28	27	26	25
32	31	30	29
36	35	34	33
40	39	38	37
44	43	42	41
48	47	46	45
52	51	50	49
56	55	54	53
60	59	58	57
64	63	62	61
68	67	66	65
72	71	70	69
76	75	74	73
80	79	78	77
84	83	82	81
88	87	86	85
92	91	90	89
96	95	94	93
100	99	98	97
104	103	102	101
108	107	106	105
112	111	110	109
116	115	114	113
120	119	118	117
124	123	122	121
128	127	126	125
132	131	130	129
136	135	134	133
140	139	138	137
144	143	142	141
148	147	146	145
152	151	150	149
156	155	154	153
160	159	158	157
164	163	162	161
168	167	166	165
172	171	170	169
176	175	174	173
180	179	178	177
184	183	182	181
188	187	186	185
192	191	190	189
196	195	194	193
200	199	198	197
204	203	202	201
208	207	206	205
212	211	210	209
216	215	214	213
220	219	218	217
224	223	222	221
228	227	226	225
232	231	230	229
236	235	234	233
240	239	238	237
244	243	242	241
248	247	246	245
252	251	250	249
256	255	254	253
260	259	258	257
264	263	262	261
268	267	266	265
272	271	270	269
276	275	274	273
280	279	278	277
284	283	282	281
288	287	286	285
292	291	290	289
296	295	294	293
300	299	298	297
304	303	302	301
308	307	306	305
312	311	310	309
316	315	314	313
320	319	318	317
324	323	322	321
328	327	326	325
332	331	330	329
336	335	334	333
340	339	338	337
344	343	342	341
348	347	346	345
352	351	350	349
356	355	354	353
360	359	358	357
364	363	362	361
368	367	366	365
372	371	370	369
376	375	374	373
380	379	378	377
384	383	382	381
388	387	386	385
392	391	390	389
396	395	394	393
400	399	398	397
404	403	402	401
408	407	406	405
412	411	410	409
416	415	414	413
420	419	418	417
424	423	422	421
428	427	426	425
432	431	430	429
436	435	434	433
440	439	438	437
444	443	442	441
448	447	446	445
452	451	450	449
456	455	454	453
460	459	458	457
464	463	462	461
468	467	466	465
472	471	470	469
476	475	474	473
480	479	478	477
484	483	482	481
488	487	486	485
492	491	490	489
496	495	494	493
500	499	498	497
504	503	502	501
508	507	506	505
512	511	510	509
516	515	514	513
520	519	518	517
524	523	522	521
528	527	526	525
532	531	530	529
536	535	534	533
540	539	538	537
544	543	542	541
548	547	546	545
552	551	550	549
556	555	554	553
560	559	558	557
564	563	562	561
568	567	566	565
572	571	570	569
576	575	574	573
580	579	578	577
584	583	582	581
588	587	586	585
592	591	590	589
596	595	594	593
600	599	598	597
604	603	602	601
608	607	606	605
612	611	610	609
616	615	614	613
620	619	618	617
624	623	622	621
628	627	626	625
632	631	630	629
636	635	634	633
640	639	638	637
644	643	642	641
648	647	646	645
652	651	650	649
656	655	654	653
660	659	658	657
664	663	662	661
668	667	666	665
672	671	670	669
676	675	674	673
680	679	678	677
684	683	682	681
688	687	686	685
692	691	690	689
696	695	694	693
700	699	698	697
704	703	702	701
708	707	706	705
712	711	710	709
716	715	714	713
720	719	718	717
724	723	722	721
728	727	726	725
732	731	730	729
736	735	734	733
740	739	738	737
744	743	742	741
748	747	746	745
752	751	750	749
756	755	754	753
760	759	758	757
764	763	762	761
768	767	766	765
772	771	770	769
776	775	774	773
780	779	778	777
784	783	782	781
788	787	786	785
792	791	790	789
796	795	794	793
800	799	798	797
804	803	802	801
808	807	806	805
812	811	810	809
816	815	814	813
820	819	818	817
824	823	822	821
828	827	826	825
832	831	830	829
836	835	834	833
840	839	838	837
844	843	842	841
848	847	846	845
852	851	850	849
856	855	854	853
860	859	858	857
864	863	862	861
868	867	866	865
872	871	870	869
876	875	874	873
880	879	878	877
884	883	882	881
888	887	886	885
892	891	890	889
896	895	894	893
900	899	898	897
904	903	902	901
908	907	906	905
912	911	910	909
916	915	914	913
920	919	918	917
924	923	922	921
928	927	926	925
932	931	930	929
936	935	934	933
940	939	938	937
944	943	942	941
948	947	946	945
952	951	950	949
956	955	954	953
960	959	958	957
964	963	962	961
968	967	966	965
972	971	970	969
976	975	974	973
980	979	978	977
984	983	982	981
988	987	986	985
992	991	990	989
996	995	994	993
1000	999	998	997



Terminal No.	Color of Wire	Signal Name [Specification]
1	SHIELD	-
2	Y	-
3	G	-
4	BR	-
5	B	-
6	W	-
7	R	-
8	SHIELD	-
9	W	-
10	G	-
11	Y	-
12	V	-
13	P	-
14	L	-
15	O	-
16	R	-
17	GR	-
18	G	-
19	O	-
20	R	-
21	V	-
22	B	-
23	LG	-
24	Y	-
26	O	-
27	SB	-
28	LG	-
29	P	-
30	GR	-
31	BR	-
32	G	-
33	L	-
35	P	-
36	SHIELD	-
37	Y	-
38	SHIELD	-
39	W	-
40	SHIELD	-

41	Y	-
42	SHIELD	-
43	W	-
44	LG	-
45	L	-
46	G	-
47	B	-
48	R	-
49	L	-
50	G	-
51	B	-
52	R	-

Connector No.	F51
Connector Name	A/T ASSEMBLY
Connector Type	RK10FG-DGY



5	4	3	2	1
10	9	8	7	6

Terminal No.	Color of Wire	Signal Name [Specification]
1	Y	-
2	R	- [With VK engine]
3	BR	- [With VQ engine]
4	L	-
5	V	-
6	B	-
7	R	-
8	P	-
9	LG	- [With VK engine]
10	GR	- [With VQ engine]
10	B	-

Connector No.	F52
Connector Name	STARTER MOTOR
Connector Type	X01MGY



Terminal No.	Color of Wire	Signal Name [Specification]
1	W	-

Connector No.	F55
Connector Name	STARTER MOTOR
Connector Type	X01FGY



Terminal No.	Color of Wire	Signal Name [Specification]
1	R	-

Connector No.	F151
Connector Name	TCM (TRANSMISSION CONTROL MODULE)
Connector Type	SPT0FG



1	2	3	4	5
6	7	8	9	10

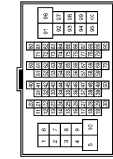
Terminal No.	Color of Wire
--------------	---------------

# STARTING SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

## STARTING SYSTEM

Connector No.	M6
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4



Terminal No.	Color of Wire	Signal Name [Specification]
1	G	-
2	BG	-
3	SB	-
4	LG	-
5	GR	-
6	W	-
7	G	-
8	W	-
9	P	-
10	BR	-
11	B	-
12	G	-
13	R	-
14	W	-
15	SHIELD	-
16	BR	-
17	L	-
18	P	-
19	G	- [With ICC]
20	W	- [Without ICC]
20	GR	- [With ICC]
21	BR	- [Without ICC]
21	R	- [With ICC]
22	R	- [Without ICC]
22	L	- [With ICC]
23	G	-
24	L	- [With ICC]
24	P	- [Without ICC]
25	Y	- [With ICC]
25	W	- [Without ICC]
26	SHIELD	-
28	GR	-
29	V	-
30	BG	-
31	BR	-
32	W	-
33	Y	-
34	L	-

35	L	-
36	P	-
37	G	-
38	R	-
39	G	-
41	L	-
42	W	-
43	R	-
44	LG	-
45	GR	-
46	W	-
47	L	-
48	P	-
49	BG	-
50	LG	-
51	SB	-
52	Y	-
53	BG	-
54	BR	-
55	SB	-
56	SB	-
60	SB	-
61	V	-
62	P	-
63	R	-
64	L	-
65	BG	-
69	V	-
70	SHIELD	-
71	BG	-
72	GR	-
73	W	-
74	SB	-
76	V	-
77	V	-
78	Y	-
80	BG	-
81	L	-
82	W	-
83	Y	-
84	L	-
85	P	-
86	BR	-
87	P	-
88	V	-
89	G	-
90	P	-
91	R	-
92	R	-
93	GR	-
94	L	-
95	G	-

96	W	-
97	W	-
98	SHIELD	-
100	Y	-

Connector No.	M121
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	TH40FGY-NH



Terminal No.	Color of Wire	Signal Name [Specification]
34	SB	LUGGAGE ROOM ANT-
35	V	LUGGAGE ROOM ANT+
38	B	BACK DOOR ANT-
39	W	BACK DOOR ANT+
47	Y	IGN RELAY (IPDM E/R) CONT
52	LG	STARTER RELAY CONT
61	W	BACK DOOR OPENER REQUEST SW
64	L	I-KEY WARN BUZZER (ENG ROOM)
65	BG	REAR WIPER STOP POSITION
66	LG	BACK DOOR SW
67	P	BACK DOOR OPENER SW
68	BR	REAR RH DOOR SW
69	R	REAR LH DOOR SW

Connector No.	M123
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	TH40FG-NH



Terminal No.	Color of Wire	Signal Name [Specification]
112	GR	RAIN SENSOR SERIAL LINK
113	P	OPTICAL SENSOR
116	BR	STOP LAMP SW 1

118	P	STOP LAMP SW 2
119	SB	DR DOOR UNLOCK SENSOR
121	BR	KEY SLOT SW
123	WR	IGN F/B
124	LG	PASSENGER DOOR SW
132	BG	POWER WINDOW SW COMM
134	GR	LOCK IND
137	B	RECEIVER/SENSOR GND
138	Y	SENSOR POWER SUPPLY
140	R	SHIFT N/P
141	G	SECURITY INDICATOR OUTPUT
142	BG	COMBI SW OUTPUT 5
143	P	COMBI SW OUTPUT 1
144	G	COMBI SW OUTPUT 2
145	L	COMBI SW OUTPUT 3
146	SB	COMBI SW OUTPUT 4
150	GR	DRIVER DOOR SW
151	G	REAR WINDOW DEFOGGER RELAY CONT

## STARTING SYSTEM

< SYMPTOM DIAGNOSIS >

### SYMPTOM DIAGNOSIS

#### STARTING SYSTEM

##### Symptom Table

INFOID:0000000006564814

STR

Symptom	Reference
No normal cranking	Refer to <a href="#">STR-3, "Work Flow"</a> .
Starter motor does not rotate	

A

C

D

E

F

G

H

I

J

K

L

M

N

O

P

## PRECAUTIONS

< PRECAUTION >

### PRECAUTION

#### PRECAUTIONS

##### Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

INFOID:000000006564815

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, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, 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:**

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, and wait at least 3 minutes before performing any service.

# PREPARATION

< PREPARATION >

## PREPARATION


### PREPARATION

#### Special Service Tools

INFOID:0000000006564816

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Tool number (Kent-Moore No.) Tool name	Description
<p>— (J-44373 Model MCR620) Starting/Charging System Tester</p>  <p>SEL403X</p>	<p>Tests starting and charging systems. For operating instructions, refer to Technical Service Bulletin.</p>


C

D

E

#### Commercial Service Tools

INFOID:0000000006564817

Tool name	Description
<p>Power tool</p>  <p>PIIB1407E</p>	<p>Loosening bolts, nuts and screws</p>

F

G

H

I

J

K

L

M

N

O

P

# STARTER MOTOR

< REMOVAL AND INSTALLATION >

## REMOVAL AND INSTALLATION

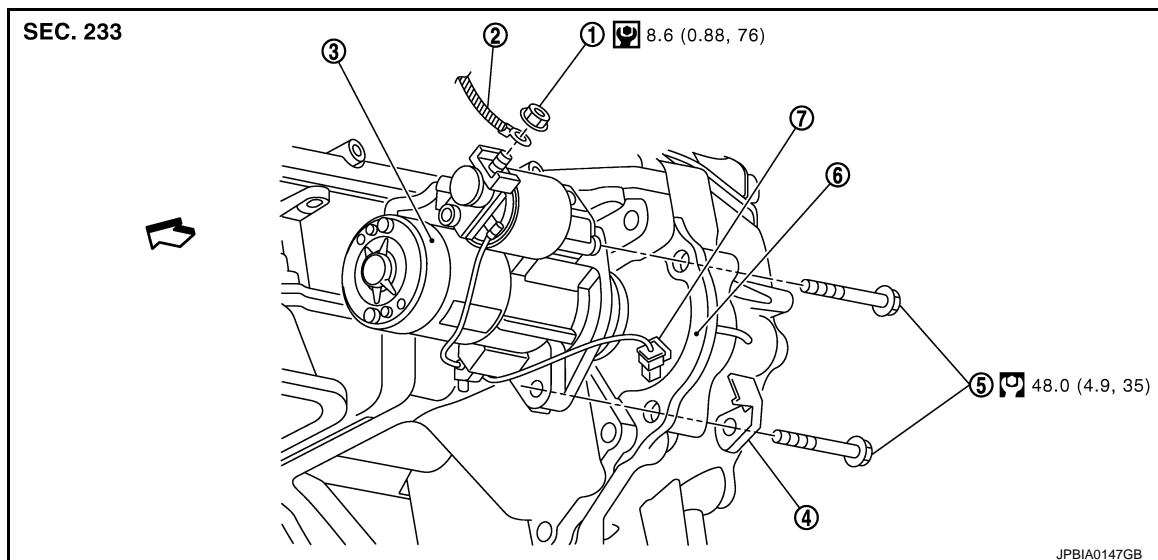
### STARTER MOTOR

VQ35HR

VQ35HR : Exploded View

INFOID:000000006564818

#### REMOVAL



- |                         |                                |                      |
|-------------------------|--------------------------------|----------------------|
| 1. "B" terminal nut     | 2. "B" terminal harness        | 3. Starter motor     |
| 4. Harness clip bracket | 5. Starter motor mounting bolt | 6. Converter housing |
| 7. "S" connector        |                                |                      |

↙: Engine front

Refer to [GI-4, "Components"](#) for symbols in the figure.

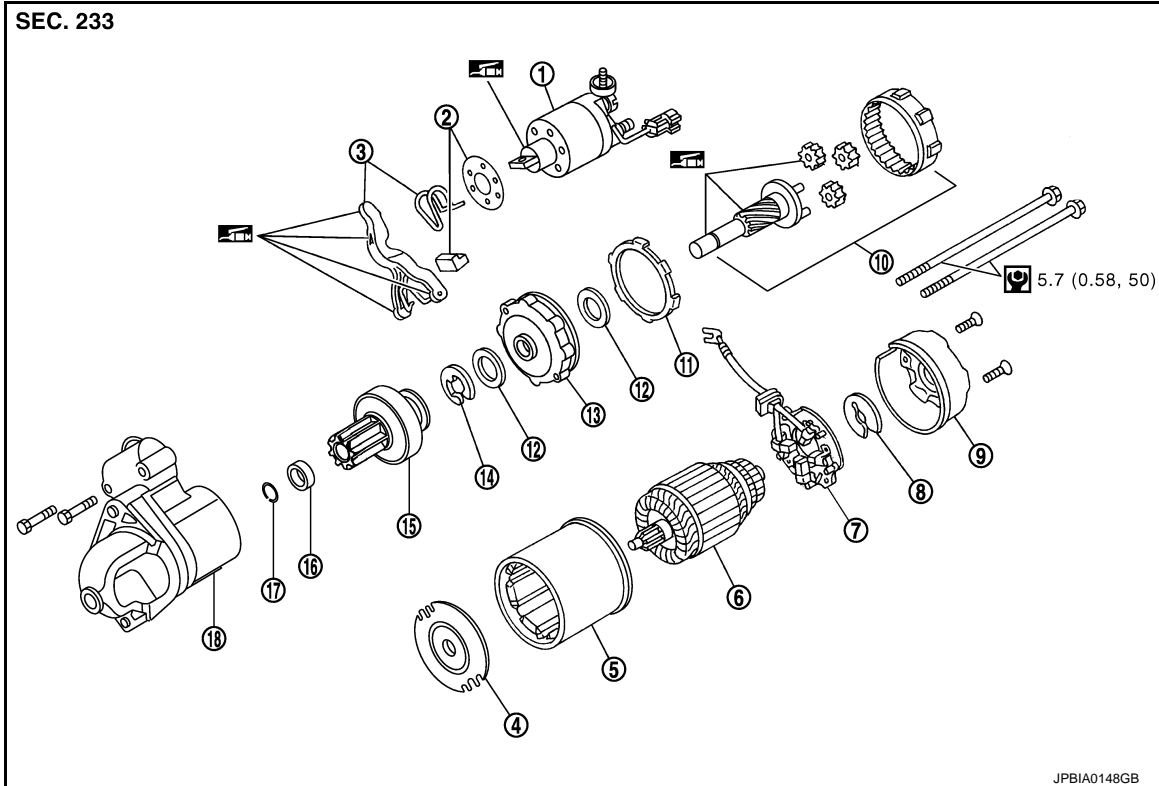
#### DISASSEMBLY



# STARTER MOTOR

## < REMOVAL AND INSTALLATION >

Type: S114-927



- |                             |                         |                        |
|-----------------------------|-------------------------|------------------------|
| 1. Magnetic switch assembly | 2. Dust cover kit       | 3. Shift lever set     |
| 4. Center bracket (A)       | 5. Yoke assembly        | 6. Armature assembly   |
| 7. Brush holder assembly    | 8. Thrust washer        | 9. Rear cover assembly |
| 10. Shaft gear assembly     | 11. Packing             | 12. Thrust washer      |
| 13. Center bracket (P)      | 14. E-ring              | 15. Pinion assembly    |
| 16. Pinion stopper          | 17. Pinion stopper clip | 18. Gear case assembly |

: High-temperature grease point

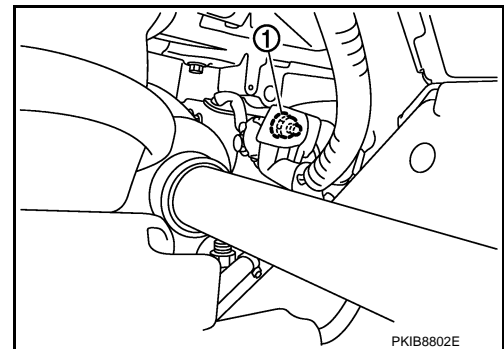
Refer to [GI-4, "Components"](#) for symbols not described on the above.

## VQ35HR : Removal and Installation (2WD)

INFOID:0000000006564819

### Removal

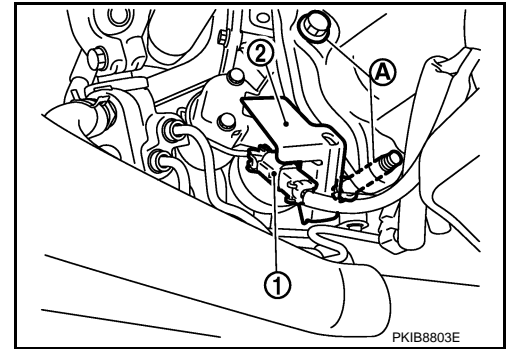
1. Disconnect the battery cable from the negative terminal.
2. Remove engine undercover using power tools.
3. Remove "B" terminal nut (1).



# STARTER MOTOR

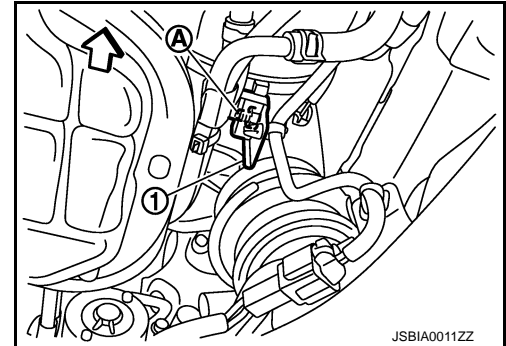
## < REMOVAL AND INSTALLATION >

4. Disconnect "S" connector (1).
5. Remove starter motor mounting bolts (A) and harness bracket (2), using power tools.



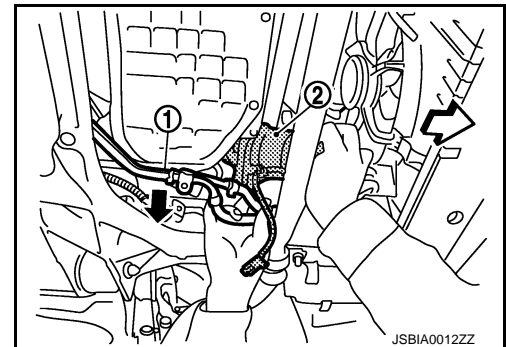
6. Remove compressor bracket bolts (A).
7. Remove compressor bracket (1).

⇐ : Vehicle front



8. Remove A/T fluid cooler tube clip bolts and bracket. Refer to [TM-216, "2WD : Exploded View"](#).
9. Move A/T fluid cooler tube (1) downward.
10. Remove starter motor (2) forward from the vehicle.

⇐ : Vehicle front



## INSTALLATION

Install in the reverse order of removal.

### **CAUTION:**

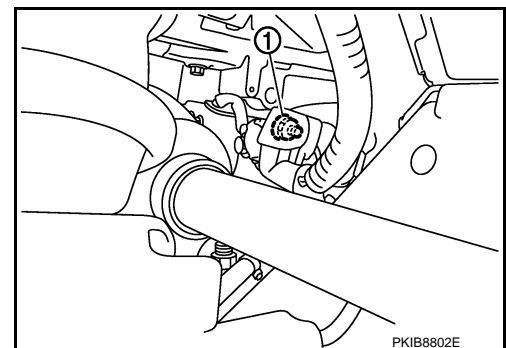
**Be sure to tighten "B" terminal nut carefully.**

## VQ35HR : Removal and Installation (AWD)

INFOID:000000006564820

### Removal

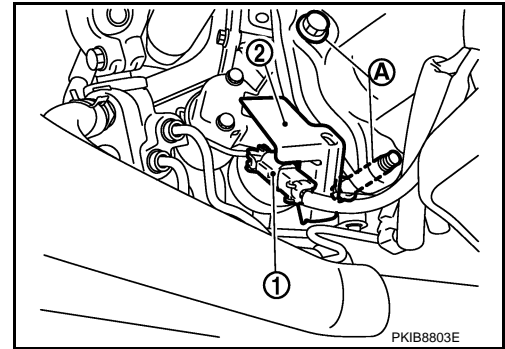
1. Disconnect the battery cable from the negative terminal.
2. Remove engine undercover, using power tools.
3. Remove "B" terminal nut (1).



# STARTER MOTOR

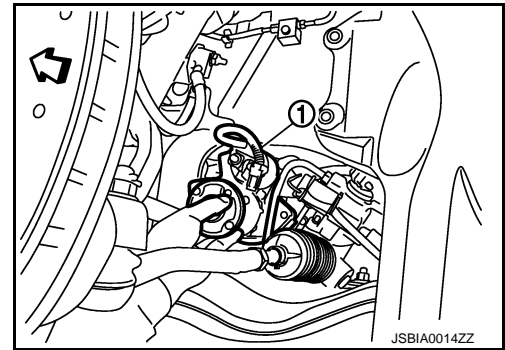
## < REMOVAL AND INSTALLATION >

4. Disconnect "S" connector (1).
5. Remove starter motor mounting bolts (A) and harness bracket (2), using power tools.



6. Remove front drive shaft left side housing bolts. Refer to [FAX-26. "Exploded View"](#).
7. Move a front drive shaft left side forward.
8. Remove stater motor (1) to left side from the vehicle.

↶ : Vehicle front



## INSTALLATION

Install in the reverse order of removal.

### **CAUTION:**

**Be sure to tighten "B" terminal nut carefully.**

VQ35HR : Inspection

INFOID:0000000006564821

## INSPECTION AFTER DISASSEMBLY

### Pinion/Clutch Check

1. Inspect pinion teeth.
  - Replace pinion if teeth are worn or damaged. (Also check condition of ring gear teeth.)
2. Inspect reduction gear teeth.
  - Replace reduction gear if teeth are worn or damaged. (Also check condition of armature shaft gear teeth.)
3. Check to see if pinion locks in one direction and rotates smoothly in the opposite direction.
  - If it locks or rotates in both directions, or unusual resistance is evident, replace.

VK50VE

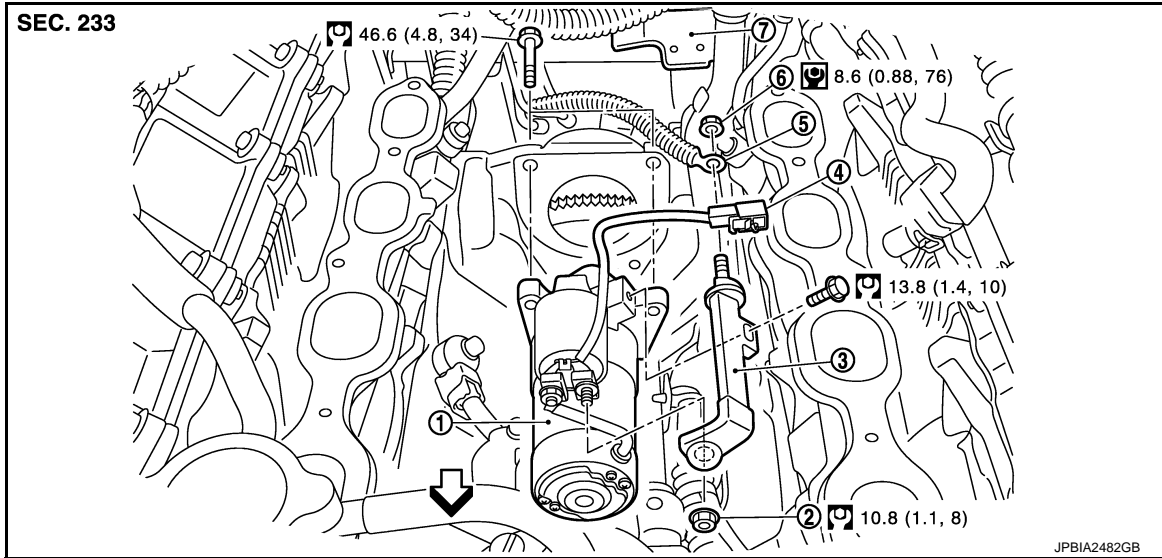
VK50VE : Exploded View

INFOID:0000000006564822

## REMOVAL

# STARTER MOTOR

## < REMOVAL AND INSTALLATION >



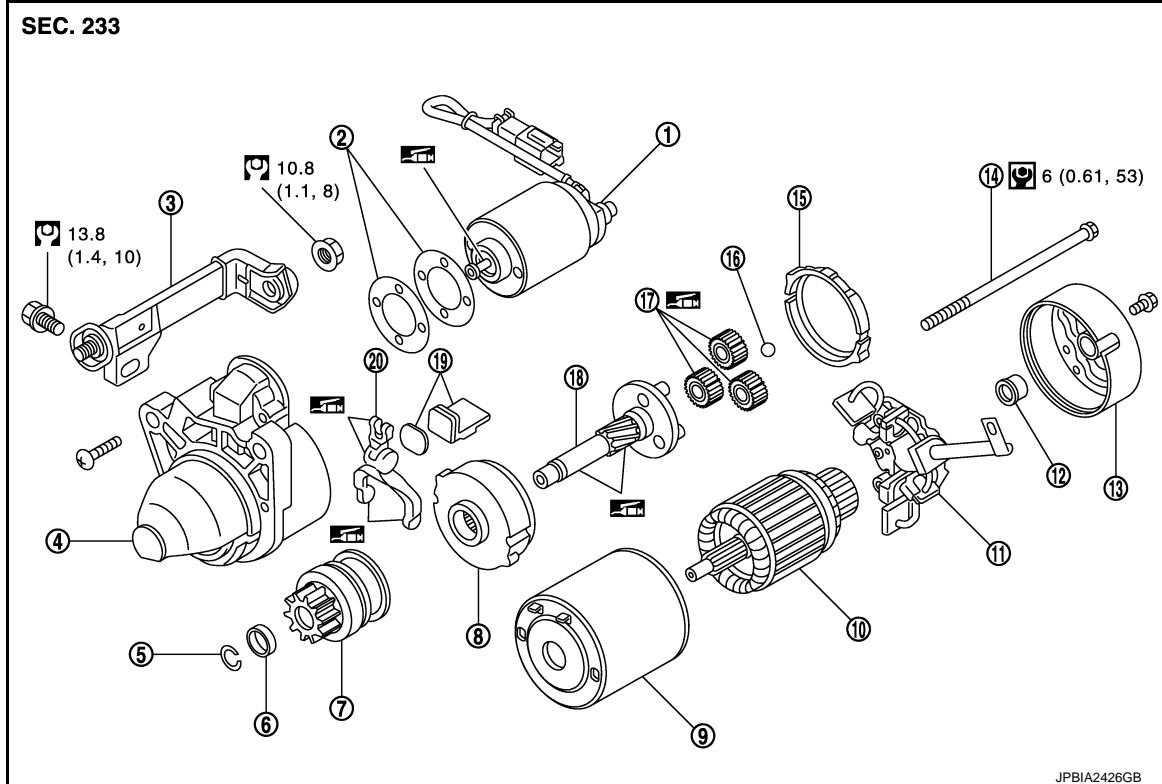
- |                          |                               |                           |
|--------------------------|-------------------------------|---------------------------|
| 1. Starter motor         | 2. "B" terminal extension nut | 3. "B" terminal extension |
| 4. "S" connector         | 5. "B" terminal harness       | 6. "B" terminal nut       |
| 7. "S" connector bracket |                               |                           |

⇐ Engine front

Refer to [GI-4, "Components"](#) for symbols in the figure.

## DISASSEMBLY

Type: M001T30671



- |                             |                           |                           |
|-----------------------------|---------------------------|---------------------------|
| 1. Magnetic switch assembly | 2. Adjusting plate        | 3. "B" terminal extension |
| 4. Gear case assembly       | 5. Stopper ring           | 6. Stopper                |
| 7. Pinion assembly          | 8. Internal gear          | 9. Yoke assembly          |
| 10. Armature assembly       | 11. Brush holder assembly | 12. Metal RR              |

# STARTER MOTOR

## < REMOVAL AND INSTALLATION >

- |                    |                    |                |
|--------------------|--------------------|----------------|
| 13. Rear cover     | 14. Through bolt   | 15. Packing    |
| 16. Ball           | 17. Planetary gear | 18. Gear shaft |
| 19. Dust cover kit | 20. Shift lever    |                |



High-temperature grease point

Refer to [GI-4, "Components"](#) for symbols not described on the above.

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## VK50VE : Removal and Installation

INFOID:0000000006564823

### REMOVAL

1. Disconnect the battery cable from the negative terminal.
2. Remove engine cover, using power tools. Refer to [EM-177, "Exploded View"](#).
3. Remove intake manifold. Refer to [EM-182, "Exploded View"](#).
4. Remove "B" terminal nut.
5. Disconnect "S" connector.
6. Remove starter motor mounting bolts using power tools.
7. Remove starter motor upward from the vehicle.

### INSTALLATION

Install in the reverse order of removal.

#### **CAUTION:**

**Be sure to tighten "B" terminal nut carefully.**

## VK50VE : Inspection

INFOID:0000000006564824

### INSPECTION AFTER DISASSEMBLY

#### Pinion/Clutch Check

1. Inspect pinion teeth.
  - Replace pinion if teeth are worn or damaged. (Also check condition of ring gear teeth.)
2. Inspect reduction gear teeth.
  - Replace reduction gear if teeth are worn or damaged. (Also check condition of armature shaft gear teeth.)
3. Check to see if pinion locks in one direction and rotates smoothly in the opposite direction.
  - If it locks or rotates in both directions, or unusual resistance is evident, replace.

## SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

## SERVICE DATA AND SPECIFICATIONS (SDS)

### SERVICE DATA AND SPECIFICATIONS (SDS)

#### Starter Motor

INFOID:000000006564825

Applied model		VQ35HR	VK50VE
Type		S114-927	M001T30671
		HITACHI make	mitsubishi make
		Reduction gear type	
System voltage		[V]	12
No-load	Terminal voltage	[V]	11
	Current	[A]	Less than 110
	Revolution	[rpm]	More than 2,700
Minimum diameter of commutator		[mm. (in.)]	28.0 (1.102)
Minimum length of brush		[mm. (in.)]	10.5 (0.413)
Brush spring tension		[N (kg, lb.)]	16.2 (1.65, 3.6)
Clearance between bearing metal and armature shaft		[mm. (in.)]	Less than 0.2 (0.008)
Clearance between pinion front edge and pinion stopper		[mm. (in.)]	0.3 - 2.5 (0.012 – 0.098)