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STARTING SYSTEM

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HOW TO USE THIS MANUAL

APPLICATION NOTICE

Information

INFOID:0000000006514125

In this manual, “Idling Stop System” is referred to as “Stop / Start System”.

PRECAUTION

PRECAUTIONS
FOR EUROPE

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

INFOID:0000000006843039

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. Information necessary to service the system safely is included in the “SRS AIR BAG” and “SEAT BELT” of this Service Manual.

The vehicle may be equipped with a passenger air bag deactivation switch. Because no rear seat exists where a rear-facing child restraint can be placed, the switch is designed to turn off the passenger air bag so that a rear-facing child restraint can be used in the front passenger seat. The switch is located in the center of the instrument panel, near the ashtray. When the switch is turned to the ON position, the passenger air bag is enabled and could inflate for certain types of collision. When the switch is turned to the OFF position, the passenger air bag is disabled and will not inflate. A passenger air bag OFF indicator on the instrument panel lights up when the passenger air bag is switched OFF. The driver air bag always remains enabled and is not affected by the passenger air bag deactivation switch.

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 the “SRS AIR BAG”.**
- **Do not 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.**
- **The vehicle may be equipped with a passenger air bag deactivation switch which can be operated by the customer. When the passenger air bag is switched OFF, the passenger air bag is disabled and will not inflate. When the passenger air bag is switched ON, the passenger air bag is enabled and could inflate for certain types of collision. After SRS maintenance or repair, make sure the passenger air bag deactivation switch is in the same position (ON or OFF) as when the vehicle arrived for service.**

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, DO NOT 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.**

FOR EUROPE : Precautions Necessary for Steering Wheel Rotation After Battery Disconnection

INFOID:0000000006843040

CAUTION:

Comply with the following cautions to prevent any error and malfunction.

- **Before removing and installing any control units, first turn the ignition switch to the LOCK position, then disconnect both battery cables.**
- **After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.**

- **Always use CONSULT to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.**

For vehicle with steering lock unit, if the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.
If turning the steering wheel is required with the battery disconnected or discharged, follow the operation procedure below before starting the repair operation.

OPERATION PROCEDURE

1. Connect both battery cables.
   NOTE:
   Supply power using jumper cables if battery is discharged.
2. Turn the ignition switch to ACC position.
   (At this time, the steering lock will be released.)
3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
4. Perform the necessary repair operation.
5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the ignition switch is turned to LOCK position.)
6. Perform self-diagnosis check of all control units using CONSULT.

EXCEPT FOR EUROPE

EXCEPT FOR EUROPE : Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

INFOID:0000000006057595

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. 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.**

EXCEPT FOR EUROPE : Precautions Necessary for Steering Wheel Rotation After Battery Disconnection

INFOID:0000000006057596

CAUTION:
Comply with the following cautions to prevent any error and malfunction.
- **Before removing and installing any control units, first turn the ignition switch to the LOCK position, then disconnect both battery cables.**

- **After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.**
- **Always use CONSULT to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.**

For vehicle with steering lock unit, if the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.
If turning the steering wheel is required with the battery disconnected or discharged, follow the operation procedure below before starting the repair operation.

OPERATION PROCEDURE

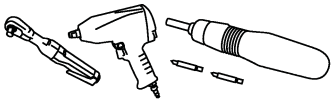
1. Connect both battery cables.
   NOTE:
   Supply power using jumper cables if battery is discharged.
2. Turn the ignition switch to ACC position.
   (At this time, the steering lock will be released.)
3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
4. Perform the necessary repair operation.
5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the ignition switch is turned to LOCK position.)
6. Perform self-diagnosis check of all control units using CONSULT.

PREPARATION

PREPARATION

Commercial Service Tools

INFOID:0000000006057504

Tool name	Description
Power tool  PIIB1407E	Loosening bolts, nuts and screws

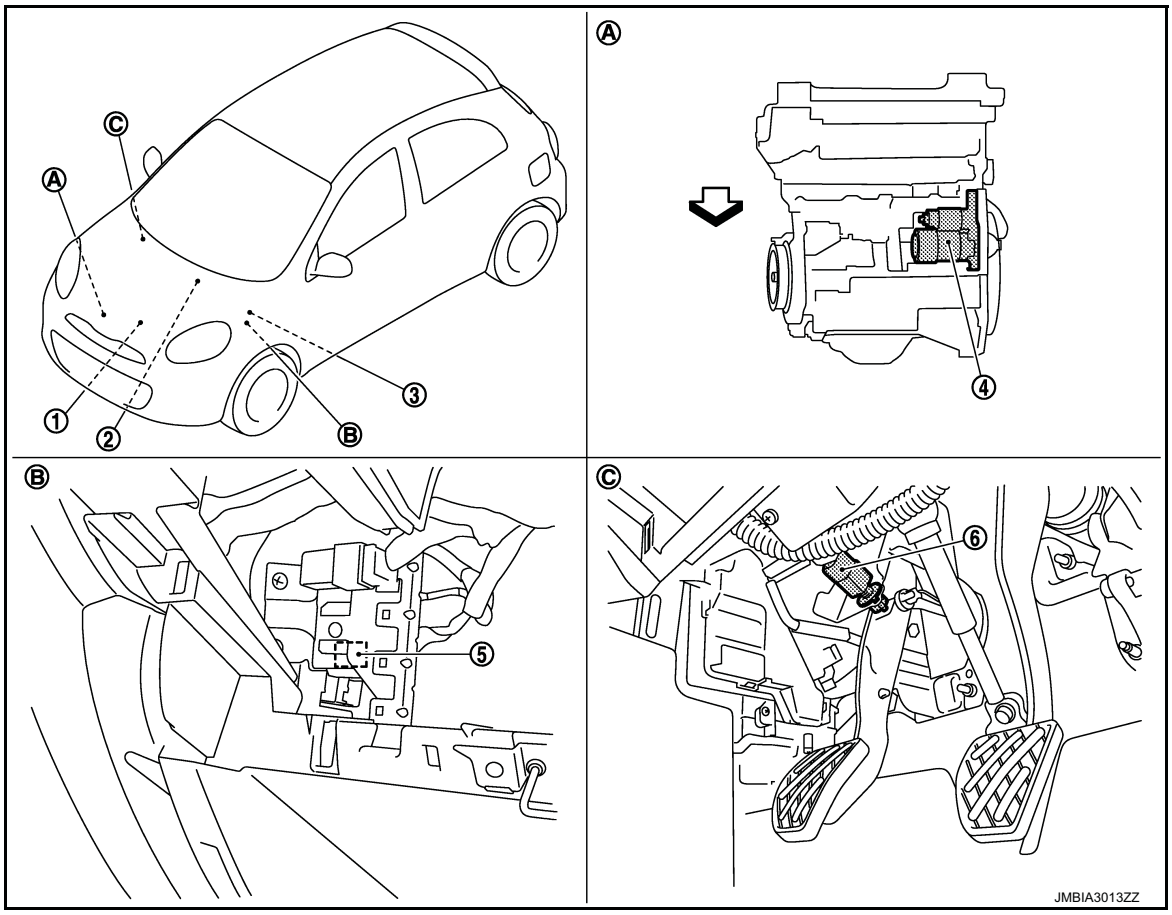
SYSTEM DESCRIPTION

COMPONENT PARTS

STARTING SYSTEM (WITH INTELLIGENT KEY)

STARTING SYSTEM (WITH INTELLIGENT KEY) : Component Parts Location

INFOID:0000000006057516



1. Transmission range switch (A/T and CVT models) Refer to TM-113, "A/T CONTROL SYSTEM : Component Parts Location" (A/T), TM-331, "CVT CONTROL SYSTEM : Component Parts Location" (CVT).
2. IPDM E/R Refer to PCS-8, "Component Parts Location".
3. BCM Refer to BCS-9, "BODY CONTROL SYSTEM : Component Parts Location".
4. Starter motor
5. Starter relay
6. Clutch interlock switch (M/T models)

A. Engine
B. Glove box removed condition
C. Clutch pedal (M/T models)

⇦ :Vehicle front

STARTING SYSTEM (WITH INTELLIGENT KEY) : Component Description

INFOID:0000000006057517

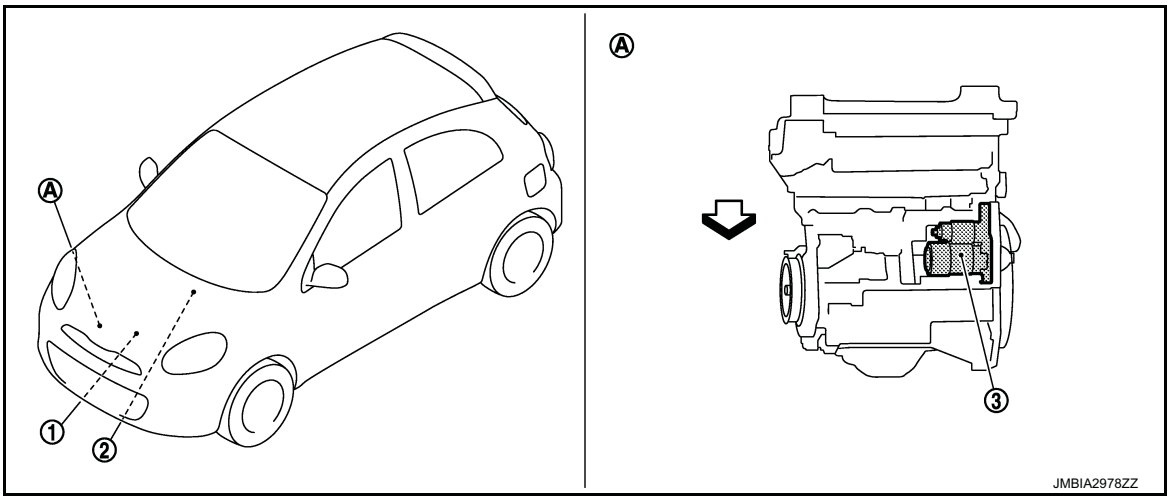
Component part	Description
BCM	BCM controls the starter relay.
IPDM E/R	CPU inside IPDM E/R controls the starter control relay.

Component part	Description
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.
Starter relay	Power is supplied to the starter control relay with BCM control.
Clutch interlock switch (M/T models)	The switch turns ON and electric power is supplied to the starter control relay inside IPDM E/R when the clutch pedal is depressed.
Transmission range switch (A/T and CVT models)	Transmission range switch 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.

STARTING SYSTEM (WITHOUT INTELLIGENT KEY)

STARTING SYSTEM (WITHOUT INTELLIGENT KEY) : Component Parts Location

INFOID:0000000006066881



1. Transmission range switch (A/T and CVT models) Refer to TM-113, "A/T CONTROL SYSTEM : Component Parts Location" (A/T), TM-331, "CVT CONTROL SYSTEM : Component Parts Location" (CVT).
2. IPDM E/R (A/T and CVT models) Refer to PCS-76, "Component Parts Location".
3. Starter motor

A. Engine

⇦ :Vehicle front

STARTING SYSTEM (WITHOUT INTELLIGENT KEY) : Component Description

INFOID:0000000006066882

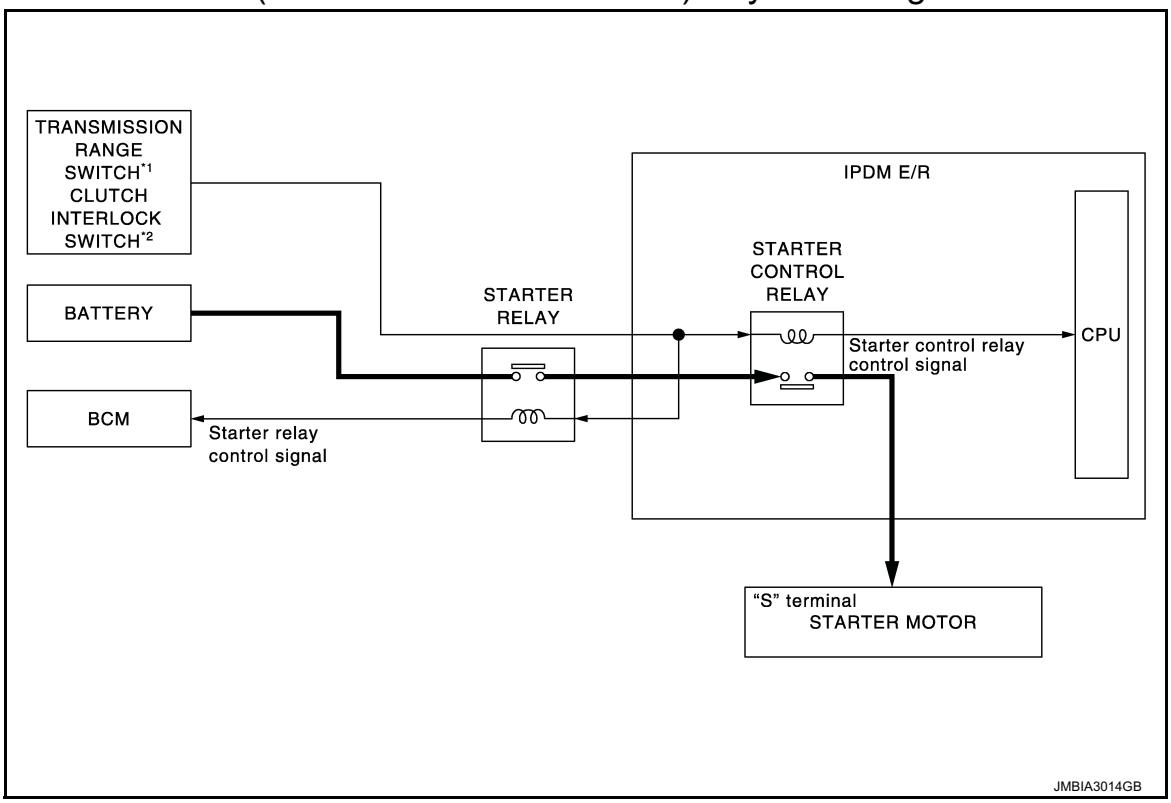
Component part	Description
IPDM E/R (A/T and CVT models)	CPU inside IPDM E/R controls the starter control relay.
Starter motor	The starter motor plunger closes and the motor is supplied with battery power, which in turn cranks the engine, when the “S” terminal is supplied with electric power.
Transmission range switch (A/T and CVT models)	Transmission range switch supplies power to the starter control relay inside IPDM E/R when the selector lever is shifted to the P or N position.

SYSTEM

STARTING SYSTEM (WITH INTELLIGENT KEY)

STARTING SYSTEM (WITH INTELLIGENT KEY) : System Diagram

INFOID:0000000006057512



*1: A/T and CVT models

*2: M/T models

STARTING SYSTEM (WITH INTELLIGENT KEY) : System Description

INFOID:0000000006057514

A/T AND CVT MODELS

- When selector lever is P or N, power is supplied to starter relay and starter control relay by transmission range switch. And BCM and IPDM E/R (CPU) detect selector lever P/N condition by the inputted signal.
- When starter operating condition is satisfied, IPDM E/R turns starter control relay ON by starter control relay control signal.
- When engine cranking condition is satisfied, BCM turns starter relay ON by starter control relay control signal.
- Then battery power is supplied to starter motor ("S" terminal) through starter control relay and starter relay.

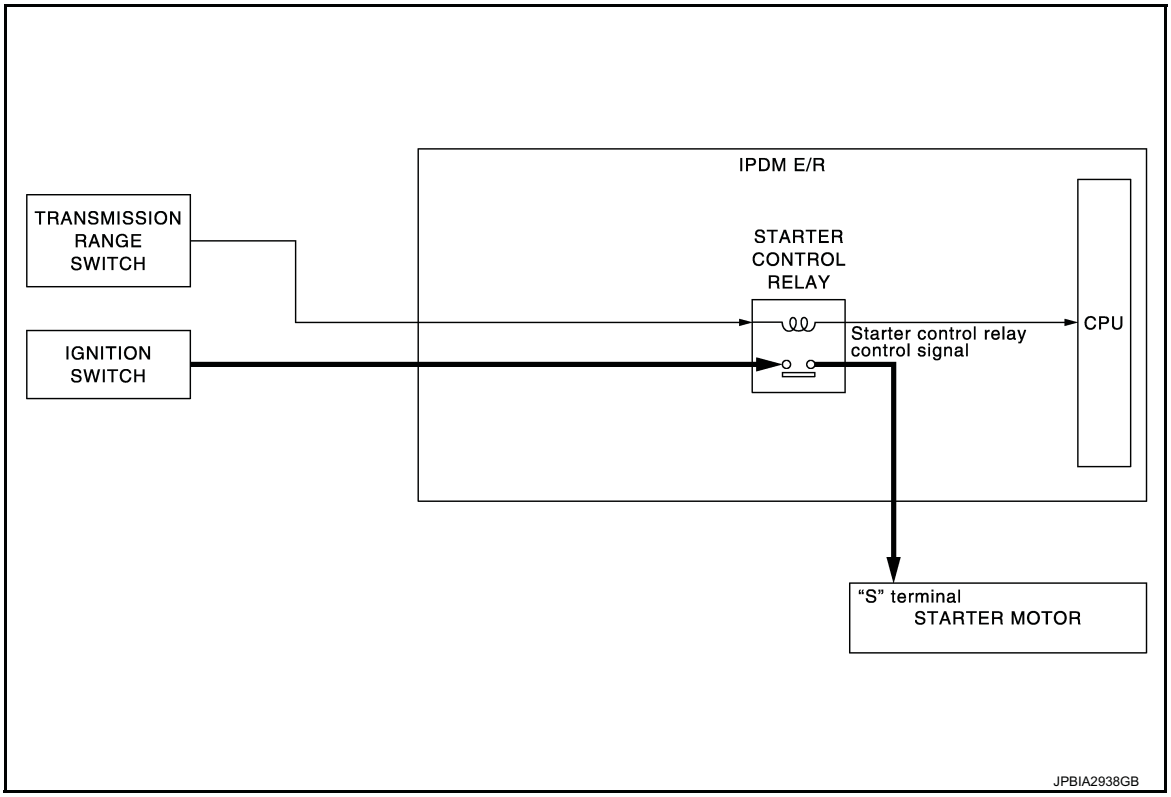
M/T MODELS

- When the clutch interlock switch is turned ON, power is supplied to starter control relay and starter control relay. And BCM and IPDM E/R (CPU) detect clutch interlock switch condition by the inputted signal.
- When starter operating condition is satisfied, IPDM E/R turns starter control relay ON by starter control relay control signal.
- When engine cranking condition is satisfied, BCM turns starter relay ON by starter control relay control signal.
- Then battery power is supplied to starter motor ("S" terminal) through starter control relay and starter relay.

STARTING SYSTEM (WITHOUT INTELLIGENT KEY)

STARTING SYSTEM (WITHOUT INTELLIGENT KEY) : System Diagram

INFOID:0000000006066883



STARTING SYSTEM (WITHOUT INTELLIGENT KEY) : System Description

INFOID:0000000006066884

A/T AND CVT MODELS

- When selector lever is P or N, power is supplied to starter control relay by transmission range switch. And IPDM E/R (CPU) detect selector lever P/N condition by the inputted signal.
- When engine cranking condition is satisfied, then battery power is supplied to starter motor ("S" terminal) through starter control relay.

M/T MODELS

When ignition switch is START position, battery power is supplied to starter motor ("S" terminal).

WIRING DIAGRAM

STARTING SYSTEM (WITH INTELLIGENT KEY)

Application Notice

INFOID:0000000006881809

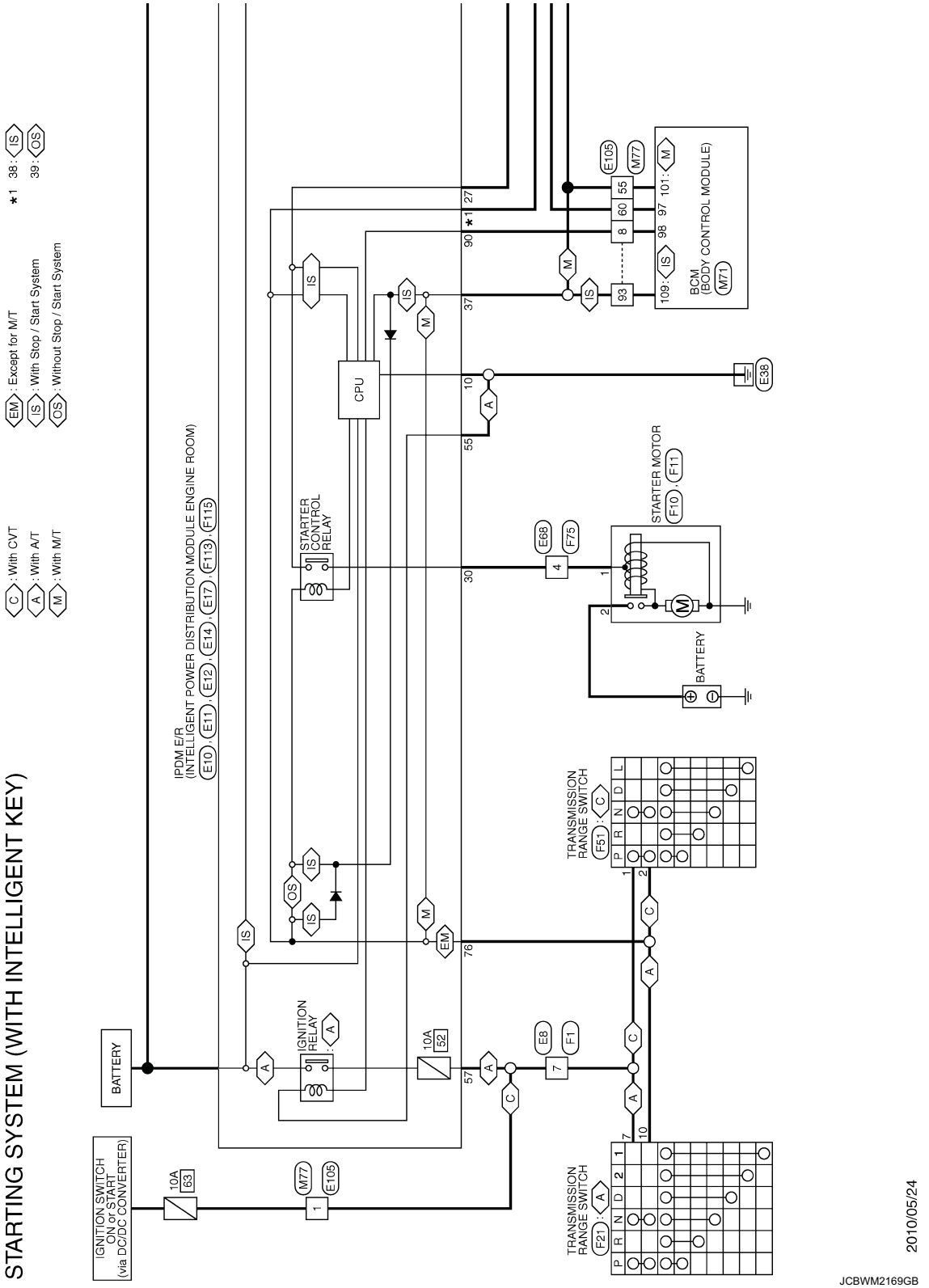
Wiring diagram type	Destination
TYPE A	• Models for Thailand • Models for general area from Thailand plant* • Models for China • Models for India (HR12DE engine models): Vehicle production: From May 2010 to April 2011
TYPE B	• Models for Australia • Models for New Zealand • Models for Hong Kong • Models for India (K9K engine models): Vehicle production: From October 2010 to April 2011 • Models for Europe (Without stop/start system): Vehicle production: From July 2010 to June 2011 • Models for general area from India plant*
TYPE C	• Models for Europe (With stop/start system): Vehicle production: From April 2011 to June 2011 • Models for South Africa
TYPE D	• Models for India: Vehicle production: From May 2011 • Models for Lebanon and Jordan • Models for Europe: Vehicle production: From July 2011

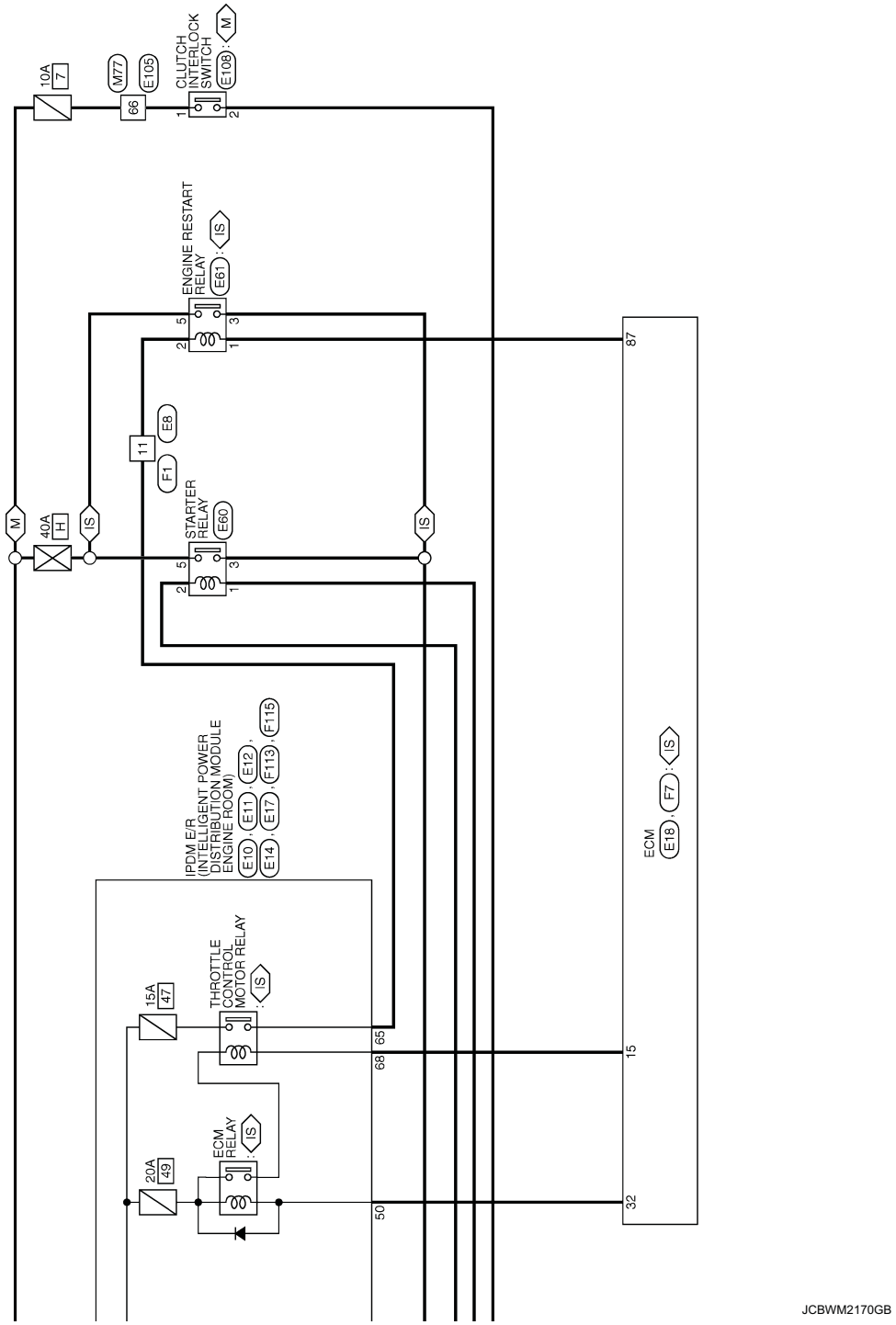
*: Refer to GI-26, "Information About Identification or Model Code" to identify a production plant.

TYPE A

TYPE A : Wiring Diagram

INFOID:0000000006881505




10A
7
M77
E105
66
CLUTCH INTERLOCK SWITCH
M
E108
1
2
ENGINE RESTART RELAY
IS
E61
5
2
3
1
87
E8
11
F1
M
40A
H1
IS
STARTER RELAY
E60
IS
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E10, E11, E12, E14, E17, F113, F115
15A
47
THROTTLE CONTROL MOTOR RELAY
65
68
15
ECM RELAY
20A
49
50
32
ECM
E18, F7
JCBWM2170GB

STARTING SYSTEM (WITH INTELLIGENT KEY)

Connector No.	E8
Connector Name	WIRE TO WIRE
Connector Type	NS12MGY-CS

Terminal No.	Color of Wire	Signal Name [Specification]
1	P	–
2	G	–
3	V	–
4	G	–
5	BG	– [For China]
5	L	– [Except for China]
6	GR	–
7	R	–
8	B	–
9	BR	– [For China]
9	P	– [For India]
9	G	– [Except for India and China]
10	SB	–
11	L	–
12	V	–

Connector No.	E10
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	TH24FW-NH

Terminal No.	Color of Wire	Signal Name [Specification]
9	Y	–
10	B	–
11	P	–
12	L	–
14	LG	–
15	BR	–
16	SB	–

21	P	–
23	SB	–
24	V	–

Connector No.	E11
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	M06FB-LC

Terminal No.	Color of Wire	Signal Name [Specification]
27	SB	– [With Intelligent Key]
27	W	– [Without Intelligent Key]
29	Y	–
30	R	–
31	P	–
32	G	–

Connector No.	E12
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS08FBR-CS

Terminal No.	Color of Wire	Signal Name [Specification]
33	BR	– [Without stop / start system]
34	L	– [Without Intelligent Key]
35	G	–
36	L	–
37	BR	– [For India]
37	L	– [With Intelligent Key except for India]
37	Y	– [Without Intelligent Key except for India]
38	LG	– [With stop / start system]
38	L	– [Without stop / start system]
39	L	– [With stop / start system]
39	LG	– [Without stop / start system]

40	P	–

Connector No.	E14
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS12FBR-CS

Terminal No.	Color of Wire	Signal Name [Specification]
53	BG	– [For China]
53	LG	– [Except for China]
54	GR	–
55	B	–
56	BR	–
57	R	–
58	P	–
59	R	–
61	G	–
63	Y	–
64	V	–

Connector No.	E17
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	TH16FW-NH

Terminal No.	Color of Wire	Signal Name [Specification]
80	R	– [With Intelligent Key]
81	SB	– [With Intelligent Key]
82	SB	– [With Intelligent Key]
87	O	– [For India with Intelligent Key]
87	BG	– [Except for India with Intelligent Key]
88	GR	– [With Intelligent Key]
89	P	– [With Intelligent Key]
90	L	– [With Intelligent Key]

Connector No.	E18
Connector Name	ECM
Connector Type	RH24FB-RZ8-L-LH

Terminal No.	Color of Wire	Signal Name [Specification]
81	V	POWER SUPPLY FOR ECM (BACKUP)
82	SB	CRANKING ENABLE SIGNAL
83	P	CAN–L
84	L	CAN–H
85	GR	REFRIGERANT PRESSURE SENSOR
87	LG	ENGINE RESTART RELAY CONTROL
88	GR	DATA LINK CONNECTOR
93	BG	IGNITION SWITCH [HR15DE]
93	L	IGNITION SWITCH [HR12DE]
98	LG	SENSOR GROUND (REFRIGERANT PRESSURE SENSOR)
99	P	STOP LAMP SWITCH
100	G	BRAKE PEDAL POSITION SWITCH
101	W	SENSOR POWER SUPPLY (REFRIGERANT PRESSURE SENSOR)
102	BR	SENSOR POWER SUPPLY (ACCELERATOR PEDAL POSITION SENSOR 2)
103	GR	ACCELERATOR PEDAL POSITION SENSOR 2
104	Y	SENSOR GROUND (ACCELERATOR PEDAL POSITION SENSOR 2)
105	G	POWER SUPPLY FOR ECM
106	V	SENSOR POWER SUPPLY (ACCELERATOR PEDAL POSITION SENSOR 1)
107	B	ECM GROUND
108	B	ECM GROUND
110	SB	ACCELERATOR PEDAL POSITION SENSOR 1
111	R	SENSOR GROUND (ACCELERATOR PEDAL POSITION SENSOR 1)

JCBWM2171GB

STARTING SYSTEM (WITH INTELLIGENT KEY)

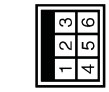
Connector No.	E60
Connector Name	STARTER RELAY
Connector Type	MS02FL-M2-LC

Terminal No.	Color of Wire	Signal Name [Specification]
1	G	–
2	LG	–
3	SB	–
5	L	–

Connector No.	E61
Connector Name	ENGINE RESTART RELAY
Connector Type	MS02FL-M2-LC

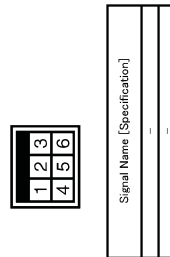
Terminal No.	Color of Wire	Signal Name [Specification]
1	LG	–
2	L	–
3	SB	– [With Intelligent Key]
3	R	– [Without Intelligent Key]
5	L	– [With Intelligent Key]
5	P	– [Without Intelligent Key]

Connector No.	E68
Connector Name	WIRE TO WIRE
Connector Type	M06MW-LC



Terminal No.	Color of Wire	Signal Name [Specification]
1	GR	–
2	L	–
4	W	– [With M/T without Intelligent Key]
4	R	– [Except for M/T without Intelligent Key]
5	B	–
6	R	–

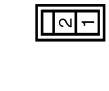
Connector No.	E105
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS16-TM4



Terminal No.	Color of Wire	Signal Name [Specification]
1	R	–
2	R	–
3	W	–
4	BR	– [For China]
4	P	– [For India]
4	G	– [Except for India and China]
5	R	–
6	LG	–
7	P	–
8	L	–
9	O	– [For India]
9	BG	– [Except for India]
10	Y	–
18	SB	–
28	BR	–
35	SB	–

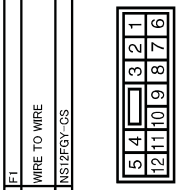
36	LG	–
42	BG	–
43	P	–
51	V	–
52	P	–
53	GR	–
54	SB	–
55	LG	–
56	R	– [For China]
56	L	– [Except for China]
58	R	–
59	P	–
60	G	–
61	O	– [For India]
61	BG	– [Except for India]
62	G	–
63	R	–
64	W	–
65	L	–
66	Y	–
68	R	–
69	Y	–
70	G	–
71	SB	–
72	LG	–
75	L	–
76	B	–
80	L	–
81	P	–
82	GR	–
83	LG	–
84	V	–
85	Y	–
86	W	–
88	L	–
89	P	–
90	SHIELD	–
91	L	–
92	Y	–
93	L	– [With Intelligent Key]
93	Y	– [Without Intelligent Key]
94	V	–
95	W	–
96	W	–
97	SB	–
98	SB	–
99	P	–
100	GR	–

Connector No.	E108
Connector Name	CLUTCH INTERLOCK SWITCH
Connector Type	M02FBR-LC



Terminal No.	Color of Wire	Signal Name [Specification]
1	Y	–
2	V	–

Connector No.	F1
Connector Name	WIRE TO WIRE
Connector Type	NS12FGY-CS



Terminal No.	Color of Wire	Signal Name [Specification]
1	LG	–
2	G	–
3	BR	–
4	G/W	–
5	R/W	–
6	R	–
7	R	–
8	B	–
9	BR	–
10	O	–
11	L/W	–
12	V	– [For China]
12	W	– [Except for China]

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STARTING SYSTEM (WITH INTELLIGENT KEY)

Connector No.	F7
Connector Name	ECM
Connector Type	RH24FGY-RZ8-R-LH

Terminal No.	Color of Wire	Signal Name [Specification]
1	L	THROTTLE CONTROL MOTOR (OPEN)
2	L/W	THROTTLE CONTROL MOTOR POWER SUPPLY
3	G	A/F SENSOR 1 HEATER
4	P	THROTTLE CONTROL MOTOR (CLOSE)
5	BR/W	HEATED OXYGEN SENSOR 2 HEATER
6	SB	VOLTAGE STABILIZER SIGNAL
9	SB	EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE
10	B	ECM GROUND
11	B	ECM GROUND
12	R	EGR VOLUME CONTROL VALVE NO. 1
15	G/W	THROTTLE CONTROL MOTOR RELAY
16	O	EGR VOLUME CONTROL VALVE NO. 3
17	V	IGNITION SIGNAL NO. 1
18	Y/B	IGNITION SIGNAL NO. 2
20	W	EGR VOLUME CONTROL VALVE NO. 2
21	W	IGNITION SIGNAL NO. 4
22	BR	IGNITION SIGNAL NO. 3
23	GR	FUEL PUMP RELAY
24	BR	EGR VOLUME CONTROL VALVE NO. 4
25	R	FUEL INJECTOR NO. 4
27	BR	FUEL PUMP CONTROL MODULE (FPCM) CHECK
28	SB	FUEL PUMP CONTROL MODULE (FPCM)
29	G	FUEL INJECTOR NO. 3
30	O	FUEL INJECTOR NO. 2
31	L	FUEL INJECTOR NO. 1
32	P	ECM RELAY (SELF SHUT-OFF)

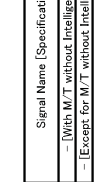
Connector No.	F10
Connector Name	STARTER MOTOR
Connector Type	–

Terminal No.	Color of Wire	Signal Name [Specification]
1	W	– [With M/T without Intelligent Key]
1	R	– [Except for M/T without Intelligent Key]

Connector No.	F11
Connector Name	STARTER MOTOR
Connector Type	–

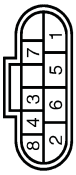
Terminal No.	Color of Wire	Signal Name [Specification]
2	B/R	–

Connector No.	F21
Connector Name	TRANSMISSION RANGE SWITCH
Connector Type	YDX06FB-HS4



Terminal No.	Color of Wire	Signal Name [Specification]
2	R/B	–
3	W	–
4	W/B	–
5	O	–
6	R	–
7	R	–
8	L/B	–
9	Y	–
10	BR	–

Connector No.	F51
Connector Name	TRANSMISSION RANGE SWITCH
Connector Type	YDX06FB-HS4



Terminal No.	Color of Wire	Signal Name [Specification]
1	R	–
2	BR	–
3	R	–
4	Y	–
5	O	–
6	L/B	–
7	W/B	–
8	R/B	–

Connector No.	F75
Connector Name	WIRE TO WIRE
Connector Type	M06FW-LC

Terminal No.	Color of Wire	Signal Name [Specification]
1	GR	–
2	G	–
4	W	– [With M/T without Intelligent Key]
4	R	– [Except for M/T without Intelligent Key]
5	B	–
6	R	–

Connector No.	F113
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	TH12FW-NH

Terminal No.	Color of Wire	Signal Name [Specification]
42	LG	–
43	GR	– [Without stop / start system]
47	R/W	–
48	O	–
50	P	–

Connector No.	F115
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS12FW-CS

Terminal No.	Color of Wire	Signal Name [Specification]
65	L/W	–
68	G/W	–
70	Y	–
71	BR	–
72	SB	–
75	R	– [With D–Jetronic engine]
75	L	– [With L–Jetronic engine]
76	BR	–

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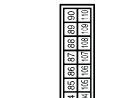
STARTING SYSTEM (WITH INTELLIGENT KEY)

Connector No.	M71
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	TH40FW-NH

Terminal No.	Color of Wire	Signal Name [Specification]
74	V	AUTO RETR DOOR MIR OPER
75	GR	DRIVER DOOR REQ SW
76	L	PASSENGER DOOR REQ SW
77	W	BACK DOOR REQ SW
78	P	DRIVER DOOR ANT+
79	V	DRIVER DOOR ANT−
80	LG	PASSENGER DOOR ANT+
81	Y	PASSENGER DOOR ANT−
82	W	BACK DOOR ANT +
83	B	BACK DOOR ANT −
84	P	ROOM ANT 1 +
85	L	ROOM ANT 1 −
86	G	ROOM ANT 2 +
87	R	ROOM ANT 2 −
88	V	LUGGAGE ROOM ANT+
89	LG	LUGGAGE ROOM ANT−
90	W	PUSH-BTN IGN SW ILL PWR
91	V	ACC/ON IND
93	R	I-KEY WARN BUZZER
94	G	S/L UNIT COMM
95	W	S/L UNIT PWR SPLY
96	SB	ACC RELAY CONT
97	LG	STARTER RELAY CONT [For China]
97	R	STARTER RELAY CONT [Except for China]
98	O	IGN RELAY (IPDM E/R) CONT [For India]
98	BG	IGN RELAY (IPDM E/R) CONT [Except for India]
99	GR	IGN RELAY (F/B) CONT
100	L	PUSH SW
101	V	CLUTCH INTERLOCK SW
102	BR	SHIFT N/P
104	P	A/T SHIFT SELECT PWR SPLY [With A/T]
104	P	CVT SHIFT SELECT PWR SPLY [With CVT]
105	SB	STOP LAMP SW 2
106	Y	BLWR FAN MTR RELAY CONT
107	GR	S/L CONDITION 1
108	P	S/L CONDITION 2
109	L	INHIBIT RELAY OUTPUT

Connector No.	M77
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4



Terminal No.	Color of Wire	Signal Name [Specification]
1	R	−
2	R	−
3	W	−
4	BR	−
5	R	−
6	LG	−
7	GR	−
8	O	− [For India]
8	BG	− [Except for India]
9	R	−
10	G	−
18	SB	− [With Intelligent Key]
18	P	− [Without Intelligent Key]
28	BR	−
35	R	−
36	Y	−
42	GR	−
43	LG	−
51	BR	−
52	P	−
53	GR	−
54	L	−
55	V	−
56	BR	− [For China]
56	L	− [Except for China]
58	BR	−
59	LG	−
60	LG	− [For China]
60	R	− [Except for China]
61	BG	− [For China]
61	Y	− [Except for China]
62	SB	−
63	R	−
64	V	−
65	R	−
66	G	−
68	R	−
69	Y	−
70	W	−
71	R	−
72	P	− [With auto A/C]
72	Y	− [With manual A/C]
75	L	−
76	B	−
80	L	−
81	P	−
82	GR	−
83	LG	−
84	Y	−
85	BR	− [For China]
85	W	− [For India]
85	Y	− [Except for India and China]
86	R	−
88	L	−
89	P	−
90	SHIELD	−
91	P	−
92	BG	− [For China]
92	L	− [Except for China]
93	L	− [With Intelligent Key]
93	Y	− [Without Intelligent Key]
94	L	−
95	G	−
96	W	−
97	SB	−
98	R	−
99	P	−
100	R	−

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TYPE B

TYPE B : Wiring Diagram

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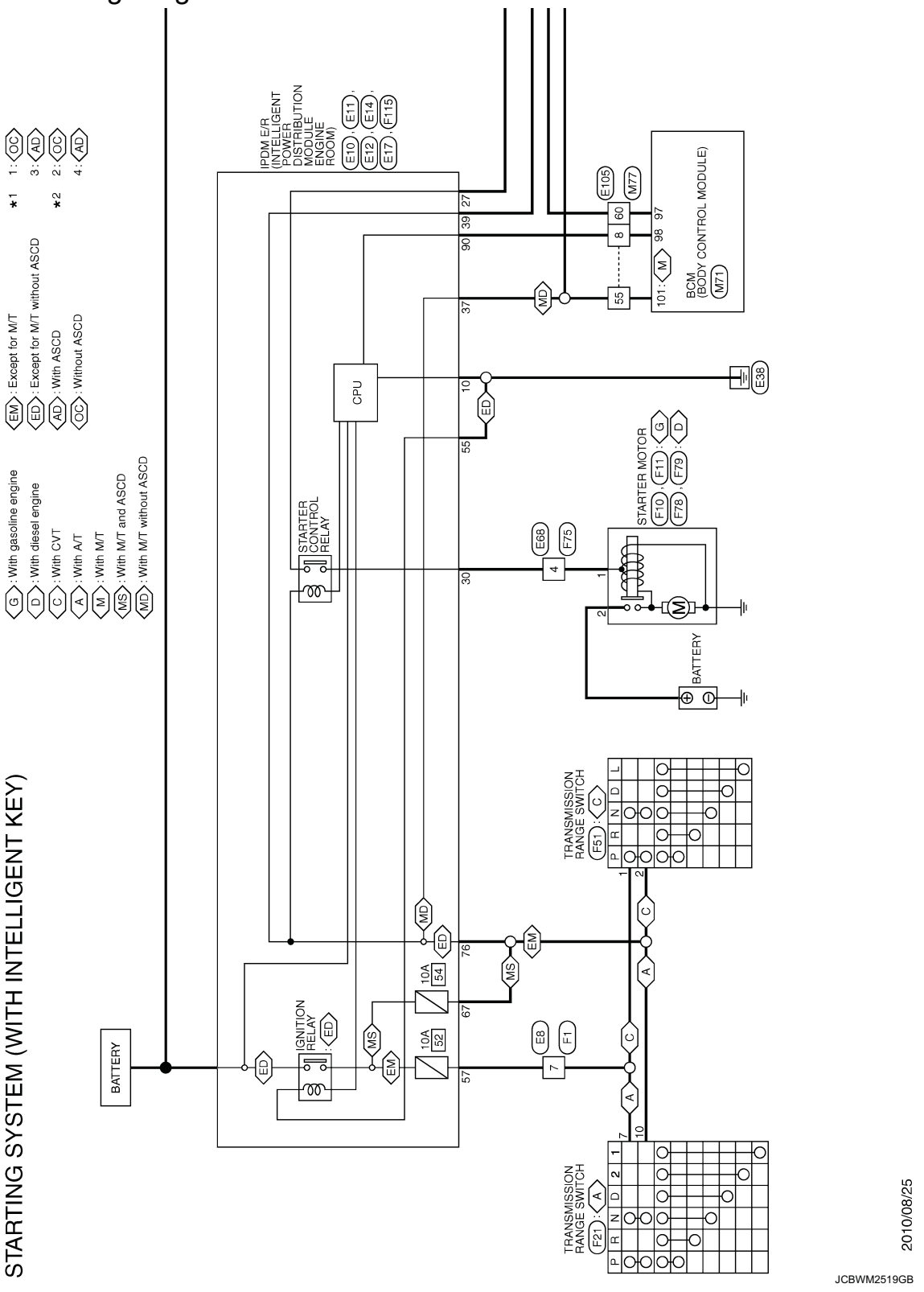
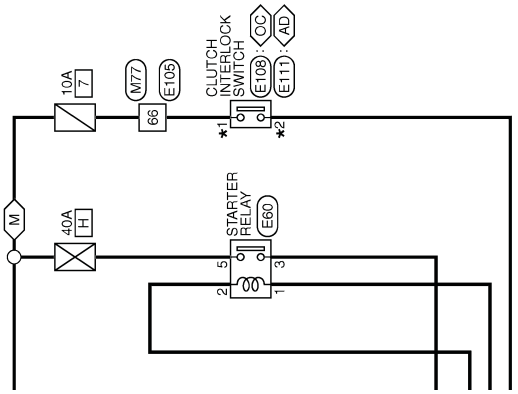




JCBWM2520GB

STARTING SYSTEM (WITH INTELLIGENT KEY)

Connector No.	E8
Connector Name	WIRE TO WIRE
Connector Type	NS12MGY-CS

Terminal No.	Color of Wire	Signal Name [Specification]
1	P	–
2	G	–
3	V	–
4	G	–
5	L	–
6	GR	–
7	R	–
8	B	–
9	G	– [For Australia, New Zealand and Hong Kong]
9	P	– [Except for Australia, New Zealand and Hong Kong]
10	SB	–
11	B	–
12	V	–

Connector No.	E10
Connector Name	IPDM E.R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	TH24FW-NH

Terminal No.	Color of Wire	Signal Name [Specification]
9	Y	–
10	B	–
11	P	–
12	L	–
15	BR	–
19	GR	–
21	P	–
23	SB	–
24	V	–

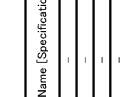
Connector No.	E11
Connector Name	IPDM E.R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	M06FB-LC

Terminal No.	Color of Wire	Signal Name [Specification]
27	SB	– [With Intelligent Key]
27	W	– [Without Intelligent Key]
29	Y	–
30	R	–
31	P	–
32	G	–

Connector No.	E12
Connector Name	IPDM E.R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS06FBR-CS

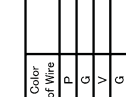
Terminal No.	Color of Wire	Signal Name [Specification]
33	BR	–
34	L	– [Without Intelligent Key]
35	G	–
37	GR	– [With Intelligent Key for Australia, New Zealand and Hong Kong]
37	BR	– [With Intelligent Key except for Australia, New Zealand and Hong Kong]
38	L	–
39	LG	– [With Intelligent Key]
40	P	–

Connector No.	E14
Connector Name	IPDM E.R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS12FBR-CS



Terminal No.	Color of Wire	Signal Name [Specification]
53	LG	–
54	GR	–
55	B	–
56	BR	–
57	R	– [With gasoline engine]
57	O	– [With diesel engine]
58	P	– [For Australia, New Zealand, Hong Kong and diesel engine with daytime running light system]
58	BR	– [Without daytime running light system except for Australia, New Zealand, Hong Kong and diesel engine]
59	R	– [For Australia, New Zealand, Hong Kong and diesel engine]
59	W	– [Except for Australia, New Zealand, Hong Kong and diesel engine]
60	W	–
61	G	–
63	Y	–
64	V	–

Connector No.	E17
Connector Name	IPDM E.R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	TH16FW-NH



Terminal No.	Color of Wire	Signal Name [Specification]
80	R	– [With Intelligent Key]
81	SB	– [With Intelligent Key]
82	SB	– [With Intelligent Key]
87	BG	– [With Intelligent Key for Australia, New Zealand and Hong Kong]
87	O	– [With Intelligent Key except for Australia, New Zealand and Hong Kong]
88	GR	– [With Intelligent Key]
89	P	– [With Intelligent Key]
90	L	– [With Intelligent Key]

Connector No.	E60
Connector Name	STARTER RELAY
Connector Type	MS02FL-M2-LC

Terminal No.	Color of Wire	Signal Name [Specification]
1	G	–
2	LG	–
3	SB	–
5	L	–

Connector No.	E68
Connector Name	WIRE TO WIRE
Connector Type	M06MW-LC

Terminal No.	Color of Wire	Signal Name [Specification]
1	G	–
2	L	–
4	W	– [With M/T without Intelligent Key]
4	R	– [Except for M/T without Intelligent Key]

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STARTING SYSTEM (WITH INTELLIGENT KEY)

Connector No.	E105
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS16-TM4

Terminal No.	Color of Wire	Signal Name [Specification]
4	G	– [For Australia, New Zealand and Hong Kong]
4	P	– [Except for Australia, New Zealand and Hong Kong]
6	LG	–
8	L	–
9	BG	– [For Australia, New Zealand and Hong Kong]
9	O	– [Except for Australia, New Zealand and Hong Kong]
10	Y	–
31	SHIELD	–
32	L	–
38	W	–
39	O	–
40	G	–
41	W	–
42	R	–
45	Y	–
46	B	–
51	V	–
52	P	–
53	GR	–
54	SB	–
55	LG	–
56	L	–
58	R	–
59	P	–
60	G	–
61	BG	– [For Australia, New Zealand and Hong Kong]
61	O	– [Except for Australia, New Zealand and Hong Kong]
62	G	–
63	R	–
64	W	–
65	L	–
66	Y	–
68	R	–
69	Y	–
70	G	–
71	SB	–
72	LG	–
73	R	–
74	BR	–
75	L	–
76	B	–
80	L	–
81	P	–
82	GR	–
83	LG	–
84	V	–
85	Y	–
86	W	–
88	L	–
89	P	–
90	SHIELD	–
91	L	–
92	Y	–
94	V	–
95	W	–
96	W	–
97	SB	–
98	SB	–
99	P	–
100	GR	–

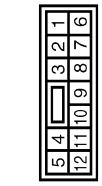
Connector No.	E108
Connector Name	CLUTCH INTERLOCK SWITCH
Connector Type	M02FBR-LC

Terminal No.	Color of Wire	Signal Name [Specification]
1	Y	–
2	V	–

Connector No.	E111
Connector Name	CLUTCH INTERLOCK SWITCH
Connector Type	M04FW-LC

Terminal No.	Color of Wire	Signal Name [Specification]
3	Y	–
4	LG	–

Connector No.	F1
Connector Name	WIRE TO WIRE
Connector Type	NS12FGY-CS



Terminal No.	Color of Wire	Signal Name [Specification]
1	LG	–
2	G	–
3	BR	–
4	G/W	–
5	R/W	–
6	R	–
7	R	–
8	B	–
9	BR	–
10	O	–
11	B	–
12	W	– [With gasoline engine]
12	V	– [With diesel engine]

Connector No.	F10
Connector Name	STARTER MOTOR
Connector Type	–

Terminal No.	Color of Wire	Signal Name [Specification]
1	W	– [With M/T without Intelligent Key]
1	R	– [Except for M/T without Intelligent Key]

Connector No.	F11
Connector Name	STARTER MOTOR
Connector Type	–

Terminal No.	Color of Wire	Signal Name [Specification]
2	B/R	–

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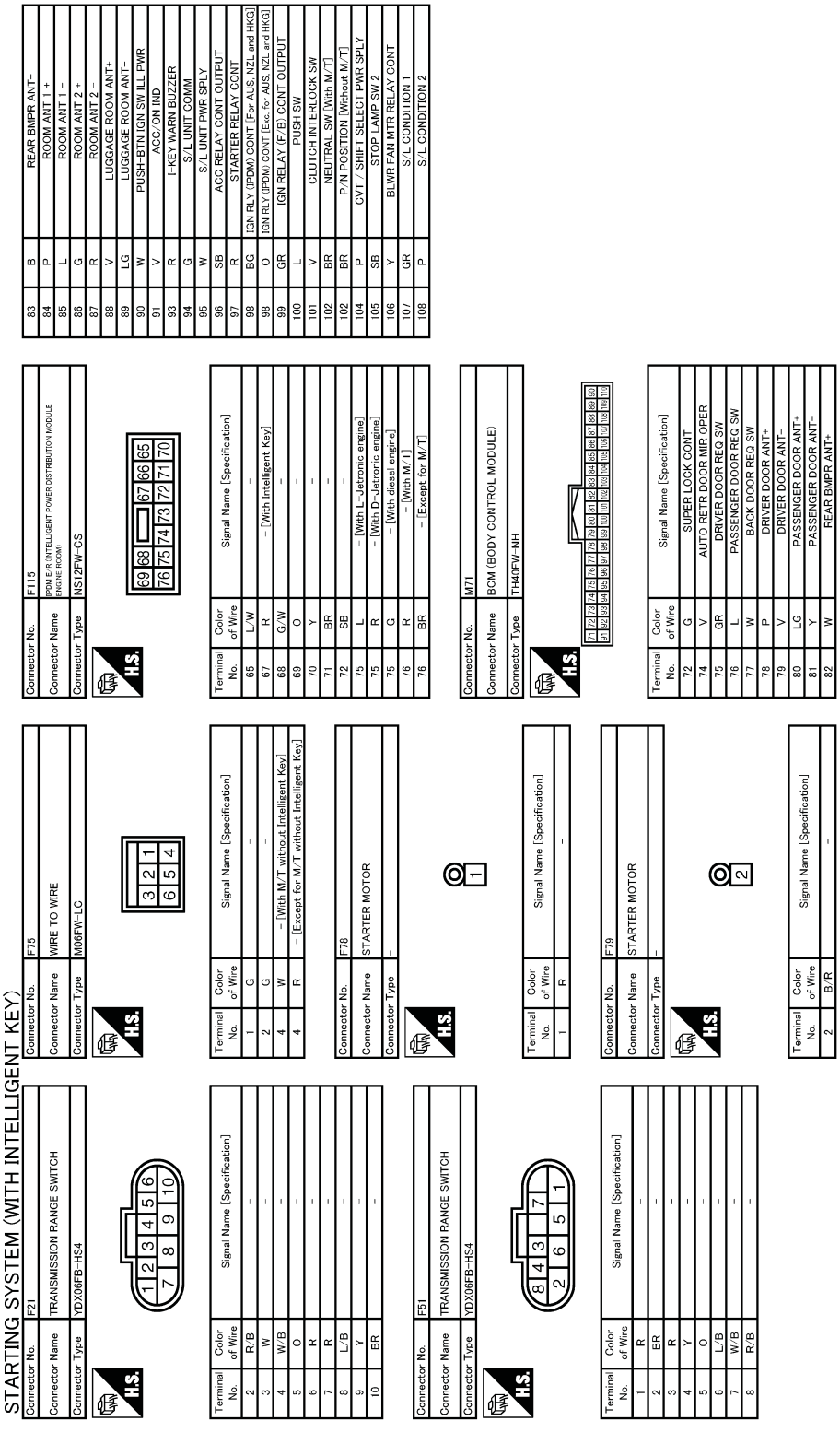
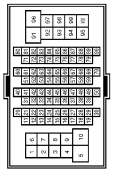


JCBWM2523GB

STARTING SYSTEM (WITH INTELLIGENT KEY)

Connector No.	M77
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4



Terminal No.	Color of Wire	Signal Name [Specification]
4	BR	–
6	LG	–
8	BG	– [For Australia, New Zealand and Hong Kong]
8	O	– [Except for Australia, New Zealand and Hong Kong]
9	R	–
10	G	–
31	SHIELD	–
32	L	–
38	BR	–
39	L	–
40	G	–
41	W	–
42	R	–
45	Y	–
46	B	–
51	BR	–
52	P	–
53	GR	–
54	L	–
55	V	–
56	L	–
58	BR	–
59	LG	–
60	R	–
61	Y	–
62	SB	–
63	R	–
64	V	–
65	R	–
66	G	–
68	R	–
69	Y	–
70	W	–
71	R	–
72	P	– [With auto A/C]
72	Y	– [With manual A/C]
73	SB	–
74	GR	–
75	L	–
76	B	–
80	L	–
81	P	–
82	GR	–
83	LG	–
84	Y	–
85	W	–
86	R	–
88	L	–
89	P	–
90	SHIELD	–
91	P	–
92	L	–
94	L	–
95	G	–
96	W	–
97	SB	–
98	R	–
99	P	–
100	R	–

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TYPE C

TYPE C : Wiring Diagram

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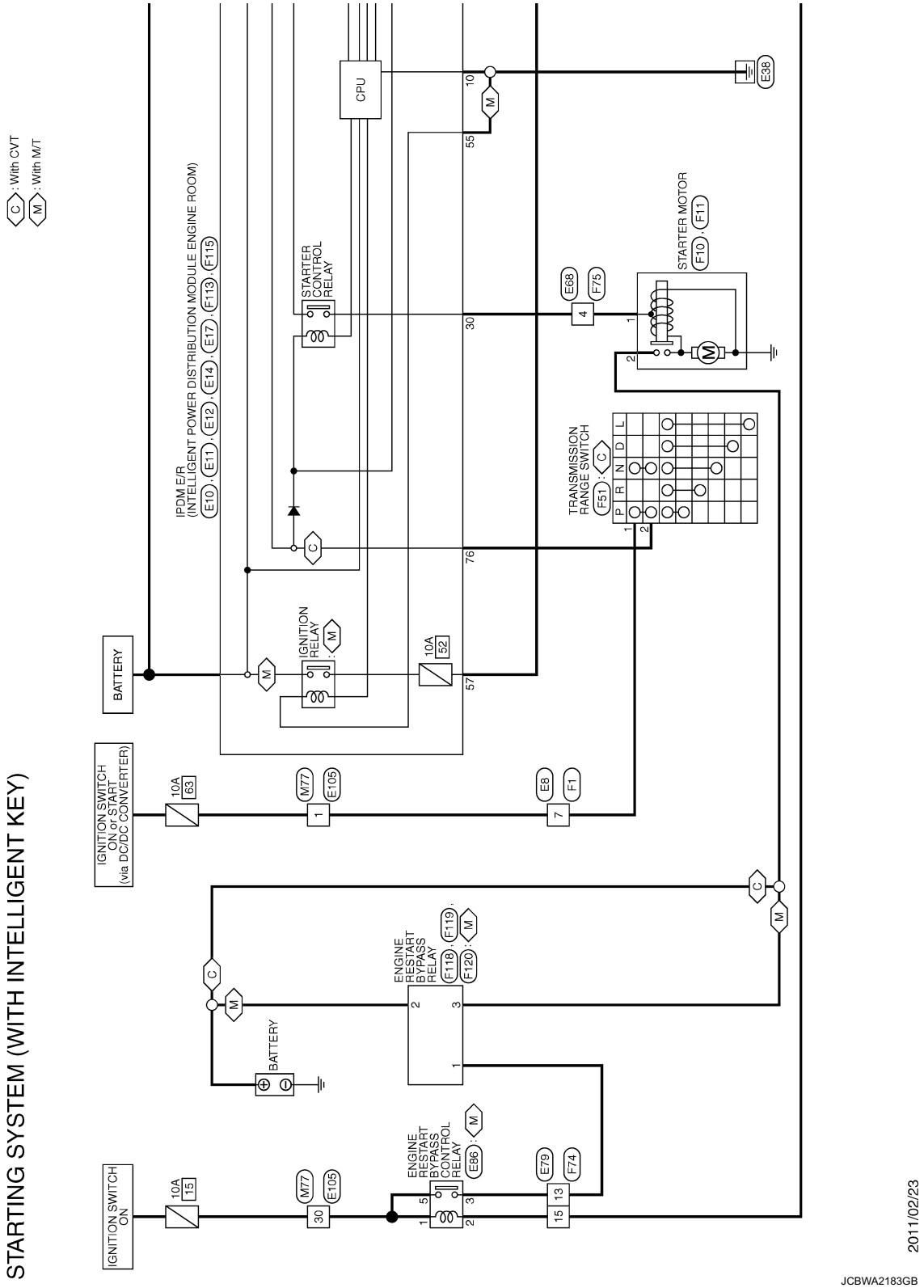
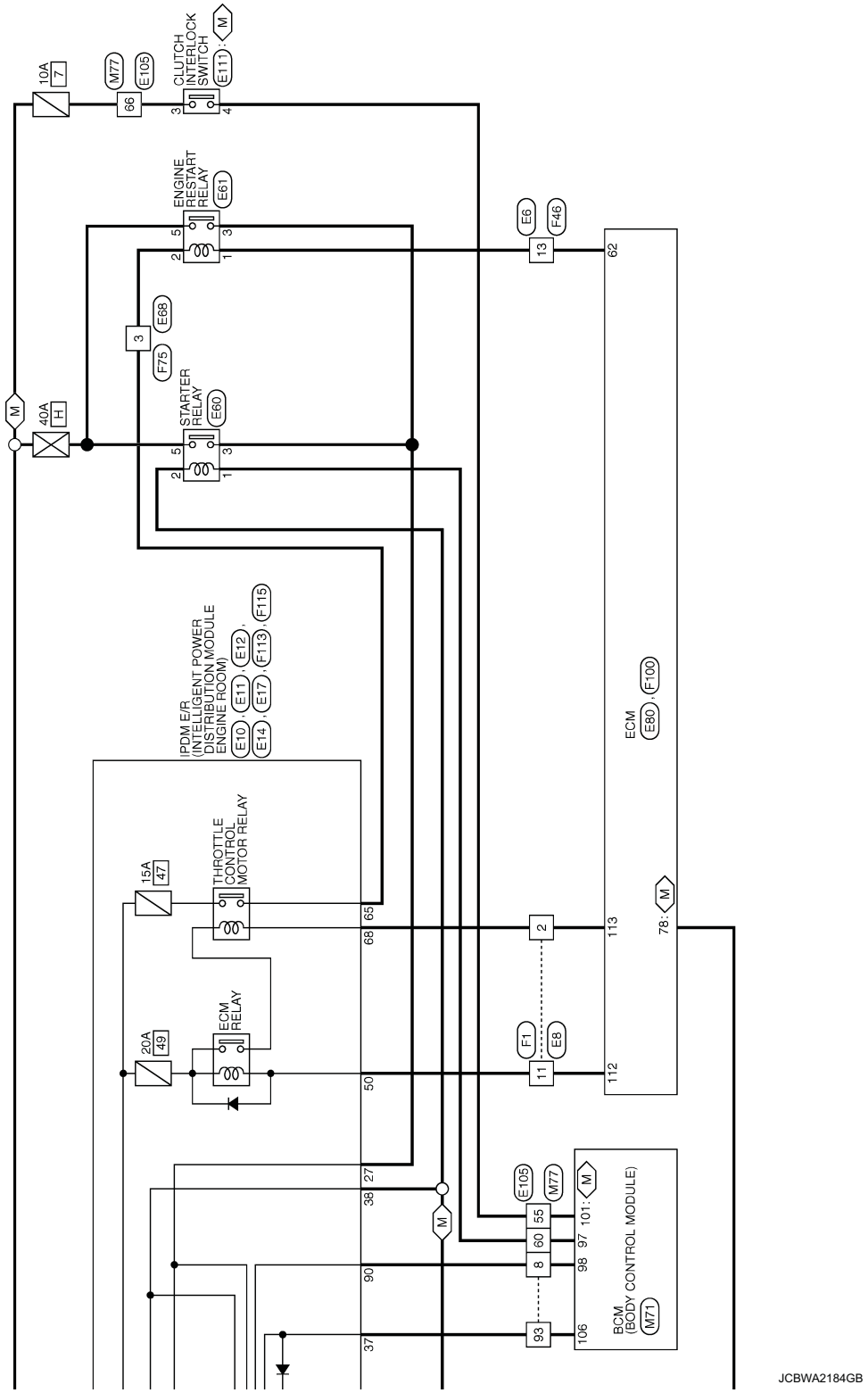
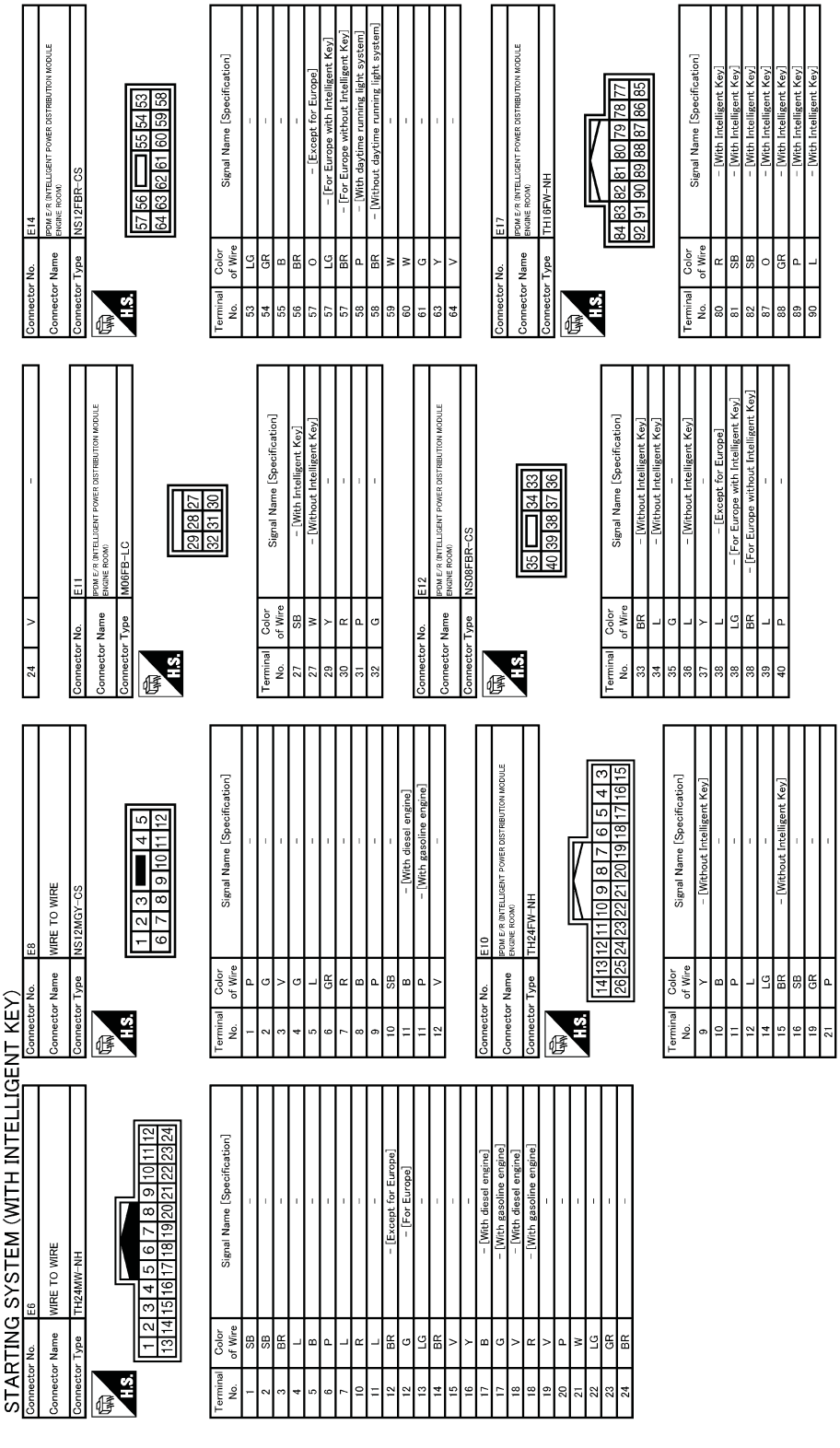



10A 7
M77
E105
66
3
CLUTCH INTERLOCK SWITCH
E111
M
4
ENGINE RESTART RELAY
E61
5
2
3
1
E6
F46
13
62
E68
3
F75
STARTER RELAY
E60
M
40A H
5
2
3
1
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E10, E11, E12, E14, E17, F113, F115
15A 47
THROTTLE CONTROL MOTOR RELAY
65
68
20A 49
ECM RELAY
50
ECM
E80, F100
2
113
78: M
F1
E8
11
112
27
38
M
E105
M77
55
60
8
101: M
97
98
90
93
37
106
BCM (BODY CONTROL MODULE)
M71
JCBWA2184GB

STARTING SYSTEM (WITH INTELLIGENT KEY)



JCBWA2185GB

STARTING SYSTEM (WITH INTELLIGENT KEY)

Connector No.	E60
Connector Name	STARTER RELAY
Connector Type	MS02FL-M2-LC

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	G	–
2	LG	–
3	SB	–
5	L	–

Connector No.	E61
Connector Name	ENGINE RESTART RELAY
Connector Type	MS02FL-M2-LC

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	LG	–
2	L	–
3	SB	– [With Intelligent Key]
3	R	– [Without Intelligent Key]
5	L	– [With Intelligent Key]
5	P	– [Without Intelligent Key]

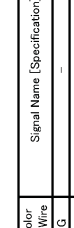
Connector No.	E68
Connector Name	WIRE TO WIRE
Connector Type	M06MW-LC

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	G	–
2	L	–
3	L	–
4	R	– [Except for South Africa with gasoline engine]
4	W	– [For South Africa with gasoline engine]
5	B	–
6	LG	–

Connector No.	E79
Connector Name	WIRE TO WIRE
Connector Type	NS16MW-CS

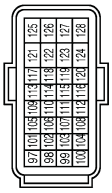
H.S.



Terminal No.	Color of Wire	Signal Name [Specification]
1	L	–
3	SB	–
5	Y	–
6	BR	–
7	SB	–
8	B	–
9	SB	–
10	R	–
11	LG	–
13	R	–
15	P	–
16	B	–

Connector No.	E80
Connector Name	ECM
Connector Type	RH24FGY-R28-L-LH

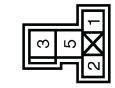
H.S.



Terminal No.	Color of Wire	Signal Name [Specification]
98	W	ASCD MAIN SWITCH
99	P	CAN–L
100	L	CAN–H
101	V	SENSOR POWER SUPPLY (ACCELERATOR PEDAL POSITION SENSOR 1)
102	SB	ACCELERATOR PEDAL POSITION SENSOR 1
103	BR	PARK / NEUTRAL POSITION SIGNAL
104	GR	DATA LINK CONNECTOR
105	R	SUPERCHARGER BYPASS VALVE CONTROL MOTOR RELAY
106	V	POWER SUPPLY FOR ECM (BACKUP)
107	O	SPEED LIMITER MAIN SWITCH
108	R	CLUTCH PEDAL POSITION SWITCH
109	L	IGNITION SWITCH
110	Y	ASCD STEERING SWITCH
111	B	SENSOR GROUND (ASCD STEERING SWITCH)
112	P	ECM RELAY (SELF SHUT–OFF)
113	G	THROTTLE CONTROL MOTOR RELAY
114	R	SENSOR GROUND (ACCELERATOR PEDAL POSITION SENSOR 1)
115	P	STOP LAMP SWITCH
116	G	BRAKE PEDAL POSITION SWITCH
117	GR	FUEL PUMP RELAY
118	BR	SENSOR POWER SUPPLY (ACCELERATOR PEDAL POSITION SENSOR 2)
119	GR	ACCELERATOR PEDAL POSITION SENSOR 2
120	Y	SENSOR GROUND (ACCELERATOR PEDAL POSITION SENSOR 2)
121	G	POWER SUPPLY FOR ECM
122	L	THROTTLE CONTROL MOTOR POWER SUPPLY
123	V	SUPERCHARGER BYPASS VALVE CONTROL MOTOR POWER SUPPLY
124	B	ECM GROUND
125	G	A/F SENSOR 1 HEATER
126	BR	HEATED OXYGEN SENSOR 2 HEATER
127	B	ECM GROUND
128	B	ECM GROUND

Connector No.	E86
Connector Name	ENGINE RESTART BYPASS CONTROL RELAY
Connector Type	MS02FL-M2-LC

H.S.



Terminal No.	Color of Wire	Signal Name [Specification]
1	G	–
2	P	–
3	R	–
5	G	–

JCBWA2186GB

STARTING SYSTEM (WITH INTELLIGENT KEY)

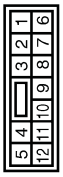
Connector No.	E105
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS16-TM4

Terminal No.	Color of Wire	Signal Name [Specification]
1	R	–
2	R	–
3	W	–
4	P	–
5	R	–
6	LG	–
7	P	–
8	L	–
9	O	–
10	Y	–
16	L	–
17	W	–
18	SB	–
26	LG	–
27	BR	–
28	BR	–
30	G	–
31	SHIELD	–
32	L	–
38	W	–
39	O	–
40	G	–
41	W	–
42	R	–
45	Y	–
46	B	–
51	V	– [With CVT]
51	BR	– [With M/T]
52	P	–
53	GR	–
54	SB	–
55	LG	–
56	L	–
58	R	–
59	P	–
60	G	–
61	O	–
62	G	–
63	R	–
64	W	–
66	Y	–
68	R	–
69	Y	–
70	G	–
71	SB	–
72	LG	–
73	R	–
80	L	–
81	P	–
82	GR	–
83	LG	–
84	V	–
85	Y	–
86	W	–
88	L	–
89	P	–
90	SHIELD	–
91	L	–
92	Y	–
93	Y	–
94	V	–
95	W	–
96	R	– [With diesel engine]
96	W	– [With gasoline engine]
97	SB	–
98	SB	–
99	P	–
100	GR	–

Connector No.	E111
Connector Name	CLUTCH INTERLOCK SWITCH
Connector Type	M04FW-LC

Terminal No.	Color of Wire	Signal Name [Specification]
3	Y	– [With Intelligent Key]
3	GR	– [Without Intelligent Key]
4	LG	–

Connector No.	F1
Connector Name	WIRE TO WIRE
Connector Type	NS12FGY-CS



Terminal No.	Color of Wire	Signal Name [Specification]
1	LG	–
2	G	– [Except for Europe]
2	G/W	– [For Europe]
3	BR	–
4	G/W	–
5	R/W	– [Except for Europe]
5	Y	– [For Europe]
6	R	–
7	R	–
8	B	–
9	BR	–
10	O	–
11	B	– [With diesel engine]
11	P	– [With gasoline engine]
12	V	– [With diesel engine]
12	W	– [With gasoline engine]

Connector No.	F10
Connector Name	STARTER MOTOR
Connector Type	–

Terminal No.	Color of Wire	Signal Name [Specification]
1	W	– [Except for Europe]
1	R	– [For Europe]

Connector No.	F11
Connector Name	STARTER MOTOR
Connector Type	–

Terminal No.	Color of Wire	Signal Name [Specification]
2	B/R	–

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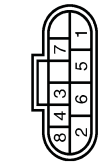
STARTING SYSTEM (WITH INTELLIGENT KEY)

Connector No.	F46
Connector Name	WIRE TO WIRE
Connector Type	TH24FW-NH

Terminal No.	Color of Wire	Signal Name [Specification]
1	SB	–
2	SB	–
3	BR	–
4	L	–
5	B	–
6	P	–
7	L	–
10	R/W	–
11	L/R	–
12	BR/W	– [Except for Europe]
12	G	– [For Europe]
13	LG	–
14	BR	–
15	BR	–
16	G/R	–
17	B	– [With diesel engine]
17	O	– [With gasoline engine]
18	V	– [With diesel engine]
18	LG	– [With gasoline engine]
19	L/W	–
20	G	–
21	W	–
22	R/B	–
23	GR	–
24	BR	–

Connector No.	F51
Connector Name	TRANSMISSION RANGE SWITCH
Connector Type	YDX06FB-HS4



Terminal No.	Color of Wire	Signal Name [Specification]
1	R	–
2	BR	–
3	R	–
4	Y	–
5	O	–
6	L/B	–
7	W/B	–
8	R/B	–

Connector No.	F74
Connector Name	WIRE TO WIRE
Connector Type	NS16FW-CS

Terminal No.	Color of Wire	Signal Name [Specification]
1	L	–
3	L	–
5	Y	–
6	L	–
7	R	–
8	B	–
9	SB	–
10	R	–
11	Y	–
13	R	–
15	P	–
16	B	–

Connector No.	F75
Connector Name	WIRE TO WIRE
Connector Type	M06FW-LC

Terminal No.	Color of Wire	Signal Name [Specification]
1	G	–
2	G	–
3	L/W	–
4	R	– [Except for South Africa with gasoline engine]
4	W	– [For South Africa with gasoline engine]
5	B	–
6	LG	–

Connector No.	F100
Connector Name	ECM
Connector Type	RH40FBR-RZ8-R-LH

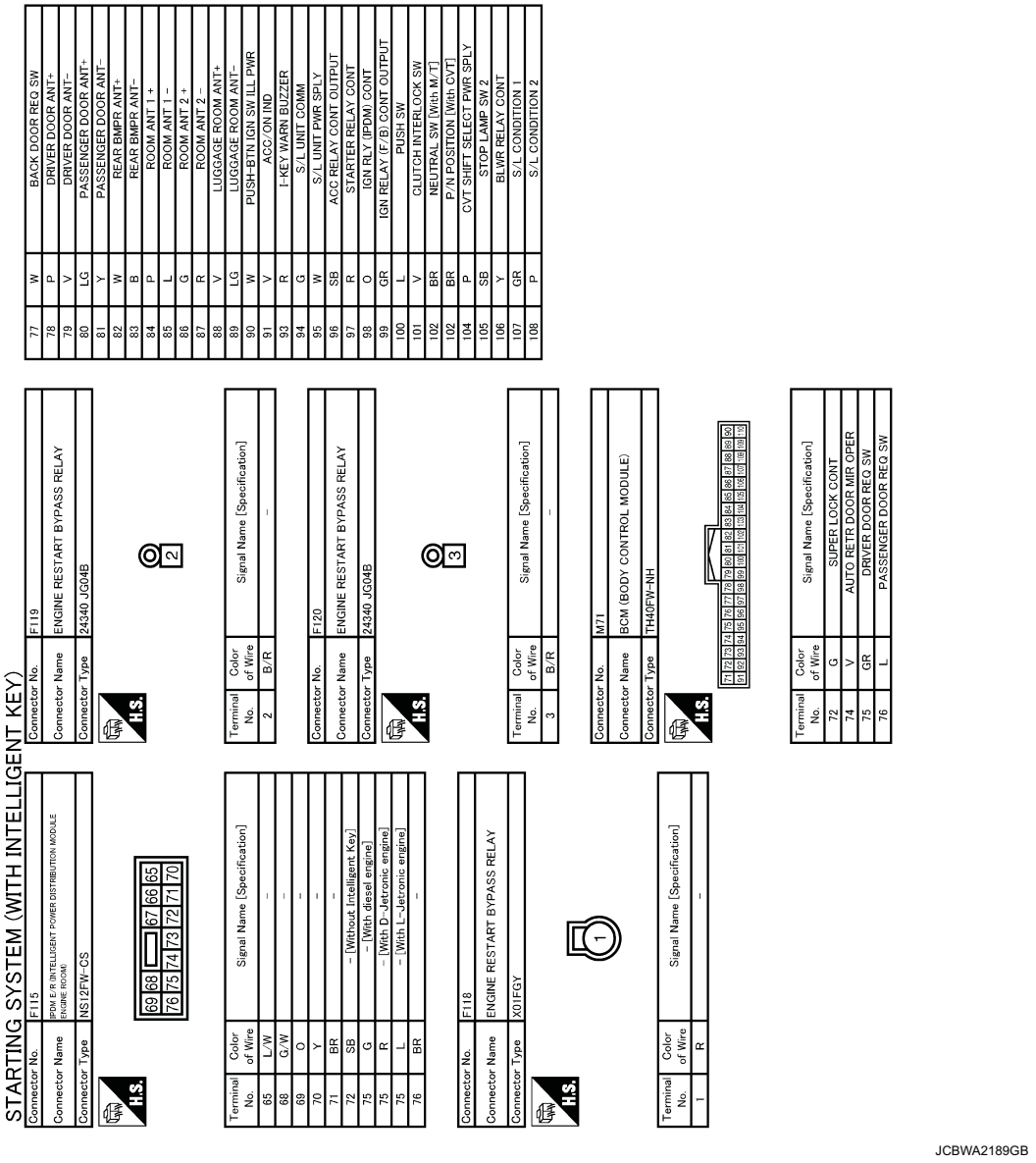
Terminal No.	Color of Wire	Signal Name [Specification]
49	R	FUEL INJECTOR DRIVER POWER SUPPLY 1
50	L	SUPERCHARGER BYPASS VALVE CONTROL MOTOR (OPEN)
51	L	THROTTLE CONTROL MOTOR (OPEN)
52	P	THROTTLE CONTROL MOTOR (CLOSE)
53	L	FUEL INJECTOR DRIVER POWER SUPPLY 2
54	P	SUPERCHARGER BYPASS VALVE CONTROL MOTOR (CLOSE)
55	R	HIGH PRESSURE FUEL PUMP (HI)
56	L	HIGH PRESSURE FUEL PUMP (LO)
57	L	SWIRL CONTROL VALVE MOTOR (OPEN)
58	L	SWIRL CONTROL VALVE POWER SUPPLY
59	Y	HIGH PRESSURE FUEL PUMP POWER SUPPLY
60	B	ECM GROUND [HIGH PRESSURE FUEL PUMP]
61	G	SWIRL CONTROL VALVE MOTOR (CLOSE)
62	LG	ENGINE RESTART RELAY CONTROL SIGNAL
63	W/R	CAMSHAFT POSITION SENSOR (PHASE)
66	W	SENSOR POWER SUPPLY (THROTTLE POSITION SENSOR)
67	W/R	EXHAUST CAMSHAFT POSITION SENSOR (PHASE)
68	Y	SENSOR POWER SUPPLY (BATTERY CURRENT SENSOR)
69	GR	SENSOR GROUND (CAMSHAFT POSITION SENSOR (PHASE))
72	L/W	CAMSHAFT POSITION SENSOR (PHASE) POWER SUPPLY
73	R	SENSOR GROUND (BATTERY CURRENT SENSOR, G-SENSOR)
74	R	SENSOR GROUND (THROTTLE POSITION SENSOR)
75	G	THROTTLE POSITION SENSOR 1
76	L	THROTTLE POSITION SENSOR 2
77	Y	SUPERCHARGER MAGNETIC CLUTCH RELAY
78	P	SR DRIVE RELAY
79	L	BATTERY TEMPERATURE SENSOR
80	O	BATTERY CURRENT SENSOR
81	W	INTAKE VALVE TIMING CONTROL SOLENOID VALVE
82	V	IGNITION SIGNAL No. 1
83	SB	VOLTAGE STABILIZER SIGNAL
84	B	ECM GROUND
85	Y	EXHAUST VALVE TIMING CONTROL SOLENOID VALVE
86	Y/B	IGNITION SIGNAL No. 2
88	R	EGR VOLUME CONTROL VALVE (STEP 1)
89	W	EGR VOLUME CONTROL VALVE (STEP 2)
90	BR	IGNITION SIGNAL No. 3
92	SB	CRANKING ENABLE SIGNAL
93	O	EGR VOLUME CONTROL VALVE (STEP 3)
94	BR	EGR VOLUME CONTROL VALVE (STEP 4)
95	SB	EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Connector No.	F113
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	TH12FW-NH

Terminal No.	Color of Wire	Signal Name [Specification]
42	LG	– [Without Intelligent Key]
43	GR	– [Without Intelligent Key]
47	R/W	– [Without Intelligent Key]
48	O	–
50	BR	– [With diesel engine]
50	P	– [With gasoline engine]

JCBWA2188GB

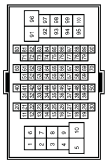
STARTING SYSTEM (WITH INTELLIGENT KEY)



JCBWA2189GB

STARTING SYSTEM (WITH INTELLIGENT KEY)

Connector No.	M77
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4



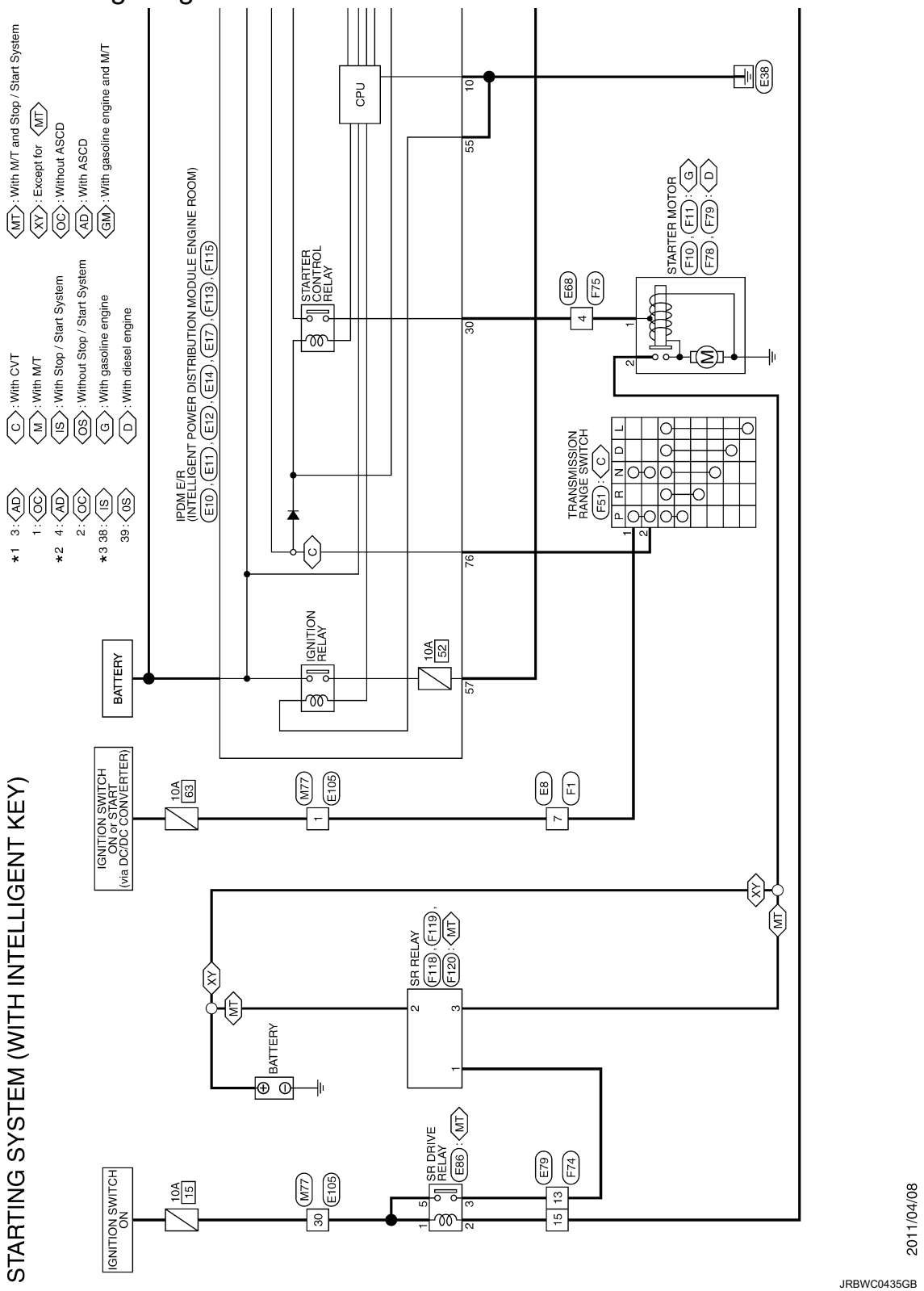
Terminal No.	Color of Wire	Signal Name [Specification]
1	R	–
2	R	–
3	W	–
4	BR	–
5	R	–
6	LG	–
7	GR	–
8	O	–
9	R	–
10	G	–
16	L	–
17	W	–
18	P	–
26	R	–
27	BR	–
28	BR	–
30	Y	–
31	SHIELD	–
32	L	–
38	BR	–
39	L	–
40	G	–
41	W	–
42	R	–
45	Y	–
46	B	–
51	BR	–
52	P	–
53	GR	–
54	L	–
55	V	–
56	L	–
58	BR	–
59	LG	–
60	R	–
61	Y	–
62	SB	–
63	R	–
64	V	–
66	G	–
68	R	–
69	Y	–
70	W	–
71	R	–
72	P	– [With auto A/C]
72	Y	– [With manual A/C]
73	SB	–
80	L	–
81	P	–
82	GR	–
83	LG	–
84	Y	–
85	W	–
86	R	–
88	L	–
89	P	–
90	SHIELD	–
91	P	–
92	L	–
93	Y	–
94	L	–
95	G	–
96	R	– [With diesel engine]
96	W	– [With gasoline engine]
97	SB	–
98	R	–
99	P	–
100	R	–

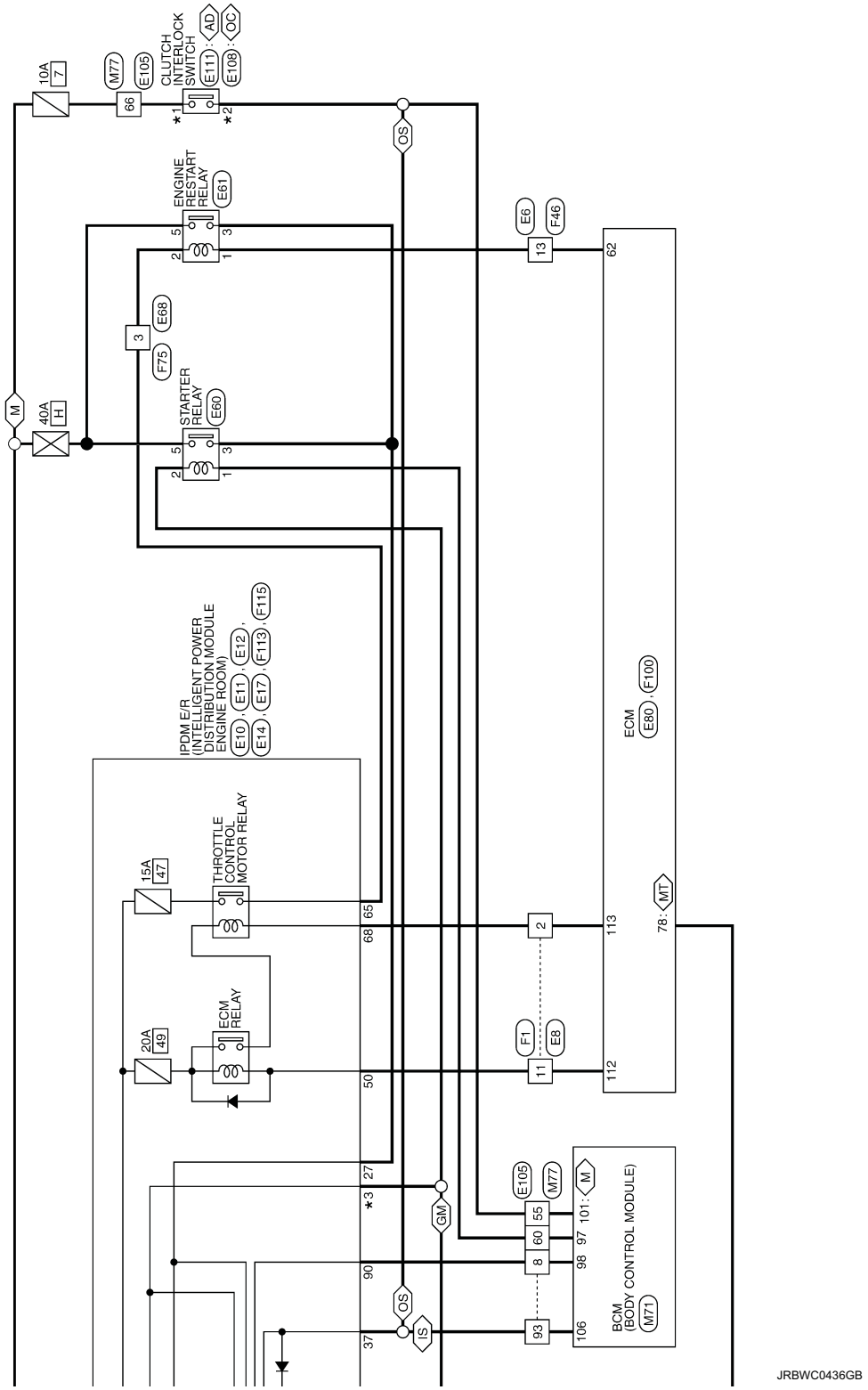
JCBWA2190GB

TYPE D

TYPE D : Wiring Diagram

INFOID:0000000007605533




10A 7
M77
E105
66
CLUTCH INTERLOCK SWITCH
E111 : AD
E108 : OC
*1
*2
OS
ENGINE RESTART RELAY
E61
E6
F46
13
62
E68
3
F75
STARTER RELAY
E60
M
40A H
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E10, E11, E12, E14, E17, F113, F115
THROTTLE CONTROL MOTOR RELAY
15A 47
ECM RELAY
20A 49
ECM
E80, F100
MT
78 :
113
112
F1
E8
11
2
65
68
50
27
*3
GM
90
37
IS
E105
M77
M
101 :
55
60
97
8
98
93
106
BCM (BODY CONTROL MODULE)
M71
JRBWC0436GB

STARTING SYSTEM (WITHOUT INTELLIGENT KEY)

Application Notice

INFOID:0000000007230345

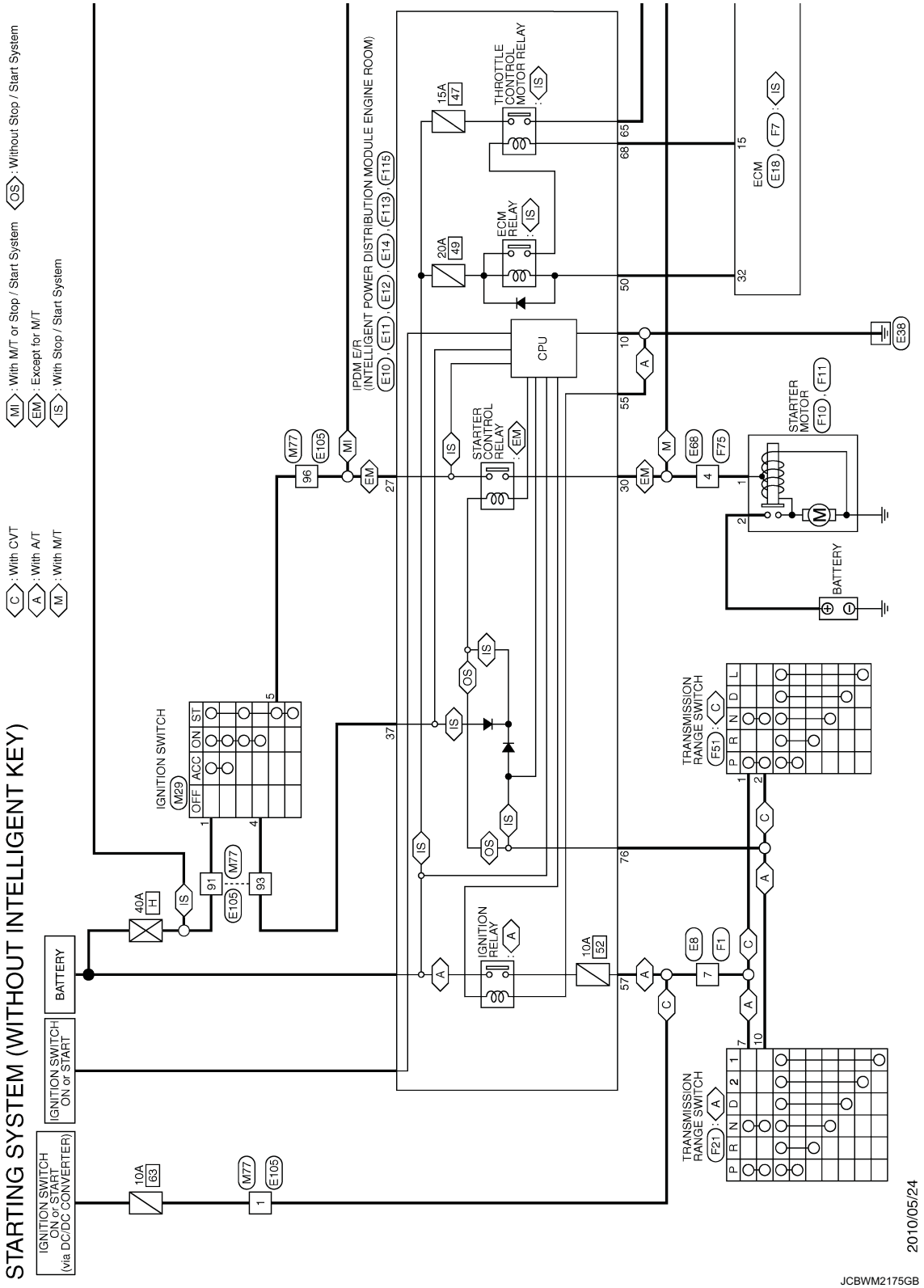
Wiring diagram type	Destination
TYPE A	• Models for Thailand • Models for general area from Thailand plant* • Models for China • Models for India (HR12DE engine models): Vehicle production: From May 2010 to April 2011
TYPE B	• Models for Australia • Models for New Zealand • Models for Hong Kong • Models for India (K9K engine models): Vehicle production: From October 2010 to April 2011 • Models for Europe (Without stop/start system): Vehicle production: From July 2010 to June 2011 • Models for general area from India plant*
TYPE C	• Models for Europe (With stop/start system): Vehicle production: From April 2011 to June 2011 • Models for South Africa
TYPE D	• Models for India: Vehicle production: From May 2011 • Models for Lebanon and Jordan • Models for Europe: Vehicle production: From July 2011

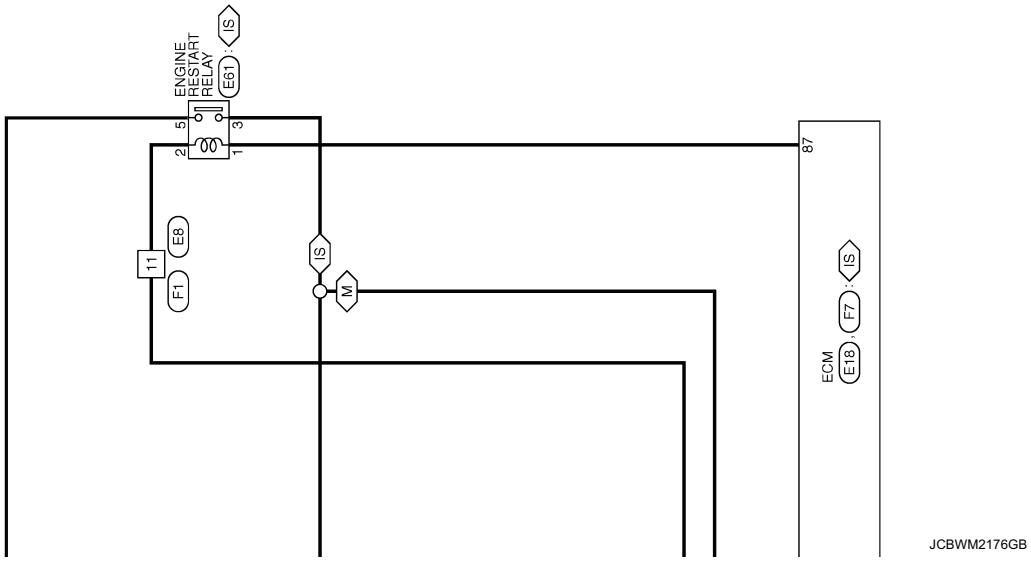
*: Refer to GI-26, "Information About Identification or Model Code" to identify a production plant.

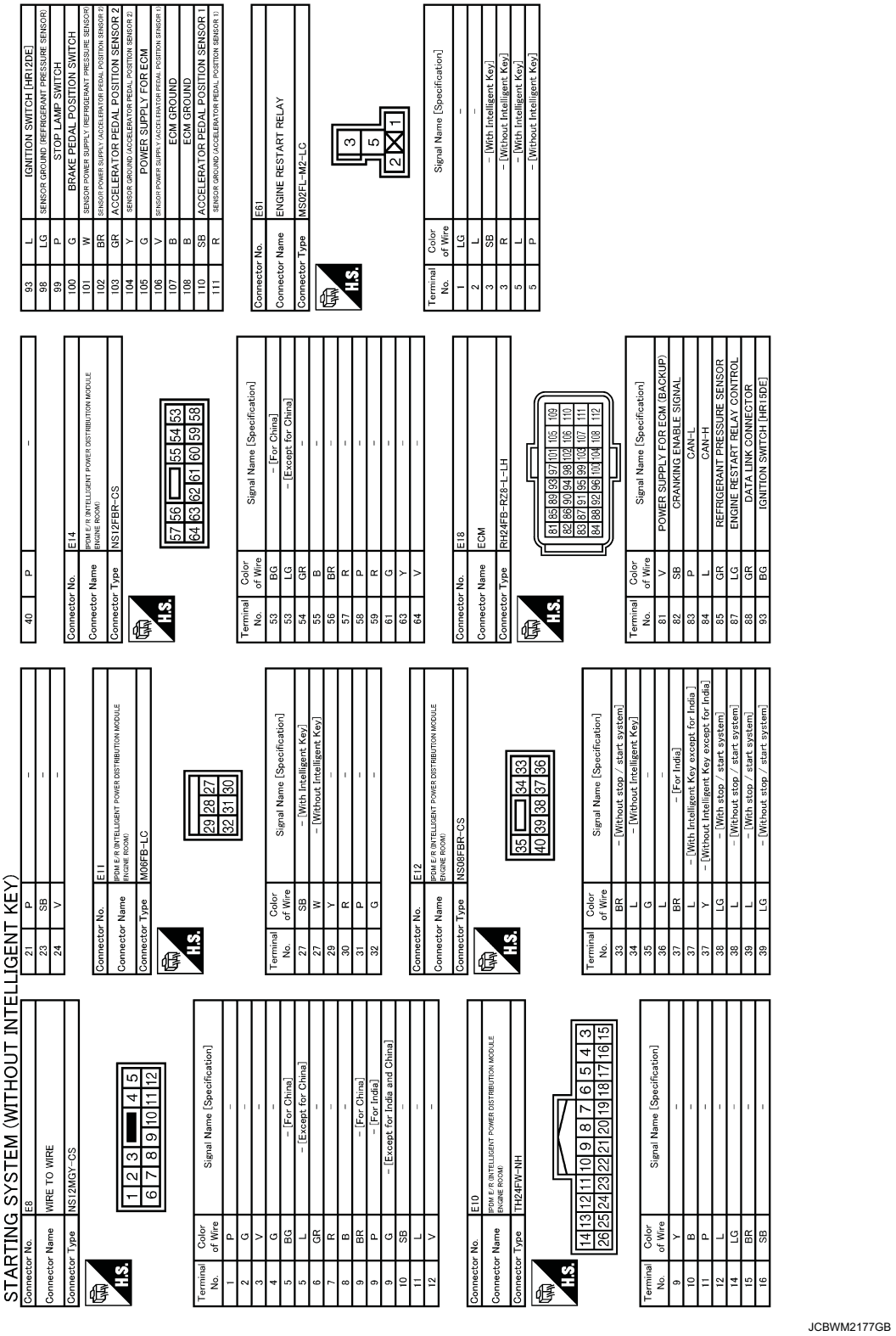
TYPE A

TYPE A : Wiring Diagram

INFOID:0000000006881507




ENGINE RESTART RELAY
E61
IS
5
3
2
1
87
11
E8
F1
IS
M
ECM
E18
F7
IS
JCBWM2176GB



JCBWM2177GB

STARTING SYSTEM (WITHOUT INTELLIGENT KEY)

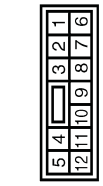
Connector No.	E68
Connector Name	WIRE TO WIRE
Connector Type	M08MW-LC

Terminal No.	Color of Wire	Signal Name [Specification]
1	GR	–
2	L	–
4	W	– [With M/T without Intelligent Key]
4	R	– [Except for M/T without Intelligent Key]
5	B	–
6	R	–

Connector No.	E105
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS16-TM4

Terminal No.	Color of Wire	Signal Name [Specification]
1	R	–
2	R	–
3	W	–
4	BR	– [For China]
4	P	– [For India]
4	G	– [Except for India and China]
5	R	–
6	LG	–
7	P	–
8	L	–
9	O	– [For India]
9	BG	– [Except for India]
10	Y	–
18	SB	–
28	BR	–
35	SB	–
36	LG	–
42	BG	–
43	P	–
51	V	–
52	P	–
53	GR	–
54	SB	–
55	LG	–
56	R	– [For China]
56	L	– [Except for China]
58	R	–
59	P	–
60	G	–
61	O	– [For India]
61	BG	– [Except for India]
62	G	–
63	R	–
64	W	–
65	L	–
66	Y	–
68	R	–
69	Y	–
70	G	–
71	SB	–
72	LG	–
75	L	–
76	B	–
80	L	–
81	P	–
82	GR	–
83	LG	–
84	V	–
85	Y	–
86	W	–
88	L	–
89	P	–
90	SHIELD	–
91	L	–
92	Y	–
93	L	– [With Intelligent Key]
93	Y	– [Without Intelligent Key]
94	V	–
95	W	–
96	W	–
97	SB	–
98	SB	–
99	P	–
100	GR	–

Connector No.	F1
Connector Name	WIRE TO WIRE
Connector Type	NS12FGY-GS



Terminal No.	Color of Wire	Signal Name [Specification]
1	LG	–
2	G	–
3	BR	–
4	G/W	–
5	R/W	–
6	R	–
7	R	–
8	B	–
9	BR	–
10	O	–
11	L/W	– [For China]
12	V	– [Except for China]
12	W	

Connector No.	F7
Connector Name	ECM
Connector Type	RH24FGY-RZ8-R-LH

Terminal No.	Color of Wire	Signal Name [Specification]
1	L	THROTTLE CONTROL MOTOR (OPEN)
2	L/W	THROTTLE CONTROL MOTOR POWER SUPPLY
3	G	A/F SENSOR 1 HEATER
4	P	THROTTLE CONTROL MOTOR (CLOSE)
5	BR/W	HEATED OXYGEN SENSOR 2 HEATER
6	SB	VOLTAGE STABILIZER SIGNAL
9	SB	EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE
10	B	ECM GROUND
11	B	ECM GROUND
12	R	EGR VOLUME CONTROL VALVE NO. 1
15	G/W	THROTTLE CONTROL MOTOR RELAY
16	O	EGR VOLUME CONTROL VALVE NO. 3
17	V	IGNITION SIGNAL NO. 1
18	Y/B	IGNITION SIGNAL NO. 2
20	W	EGR VOLUME CONTROL VALVE NO. 2
21	W	IGNITION SIGNAL NO. 4
22	BR	IGNITION SIGNAL NO. 3
23	GR	FUEL PUMP RELAY
24	BR	EGR VOLUME CONTROL VALVE NO. 4
25	R	FUEL INJECTOR NO. 4
27	BR	FUEL PUMP CONTROL MODULE (FPCM) CHECK
28	SB	FUEL PUMP CONTROL MODULE (FPCM)
29	G	FUEL INJECTOR NO. 3
30	O	FUEL INJECTOR NO. 2
31	L	FUEL INJECTOR NO. 1
32	P	ECM RELAY (SELF SHUT-OFF)

Connector No.	F10
Connector Name	STARTER MOTOR
Connector Type	–

Terminal No.	Color of Wire	Signal Name [Specification]
1	W	– [With M/T without Intelligent Key]
1	R	– [Except for M/T without Intelligent Key]

Connector No.	F11
Connector Name	STARTER MOTOR
Connector Type	–

Terminal No.	Color of Wire	Signal Name [Specification]
2	B/R	–

JCBWM2178GB

STARTING SYSTEM (WITHOUT INTELLIGENT KEY)

Connector No.	F21
Connector Name	TRANSMISSION RANGE SWITCH
Connector Type	YDX06FB-HS4

H.S.

1 2 3 4 5 6
7 8 9 10

Terminal No.	Color of Wire	Signal Name [Specification]
2	R/B	–
3	W	–
4	W/B	–
5	O	–
6	R	–
7	R	–
8	L/B	–
9	Y	–
10	BR	–

Connector No.	F51
Connector Name	TRANSMISSION RANGE SWITCH
Connector Type	YDX06FB-HS4

H.S.

8 4 3 7
2 6 5 1

Terminal No.	Color of Wire	Signal Name [Specification]
1	R	–
2	BR	–
3	R	–
4	Y	–
5	O	–
6	L/B	–
7	W/B	–
8	R/B	–

Connector No.	F75
Connector Name	WIRE TO WIRE
Connector Type	M06FW-LC

H.S.

3 2 1
6 5 4

Terminal No.	Color of Wire	Signal Name [Specification]
1	GR	–
2	G	–
4	W	– [With M/T without Intelligent Key]
4	R	– [Except for M/T without Intelligent Key]
5	B	–
6	R	–

Connector No.	F113
Connector Name	IPDM E. R. (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	TH12FW-NH

H.S.

46 45 44 43 42 41
52 51 50 49 48 47

Terminal No.	Color of Wire	Signal Name [Specification]
42	LG	–
43	GR	– [Without stop / start system]
47	R/W	–
48	O	–
50	P	–

Connector No.	F115
Connector Name	IPDM E.R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS12FW-CS

H.S.

69 68 67 66 65
76 75 74 73 72 71 70

Terminal No.	Color of Wire	Signal Name [Specification]
65	L/W	–
68	G/W	–
70	Y	–
71	BR	–
72	SB	–
75	R	– [With D–Jetronic engine]
75	L	– [With L–Jetronic engine]
76	BR	–

Connector No.	M29
Connector Name	IGNITION SWITCH
Connector Type	M06FW-LC

H.S.

1 5 3
2 4

Terminal No.	Color of Wire	Signal Name [Specification]
1	P	–
2	SB	–
3	GR	–
4	Y	–
5	W	–

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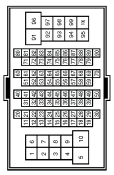
STARTING SYSTEM (WITHOUT INTELLIGENT KEY)

Connector No.	M77
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4



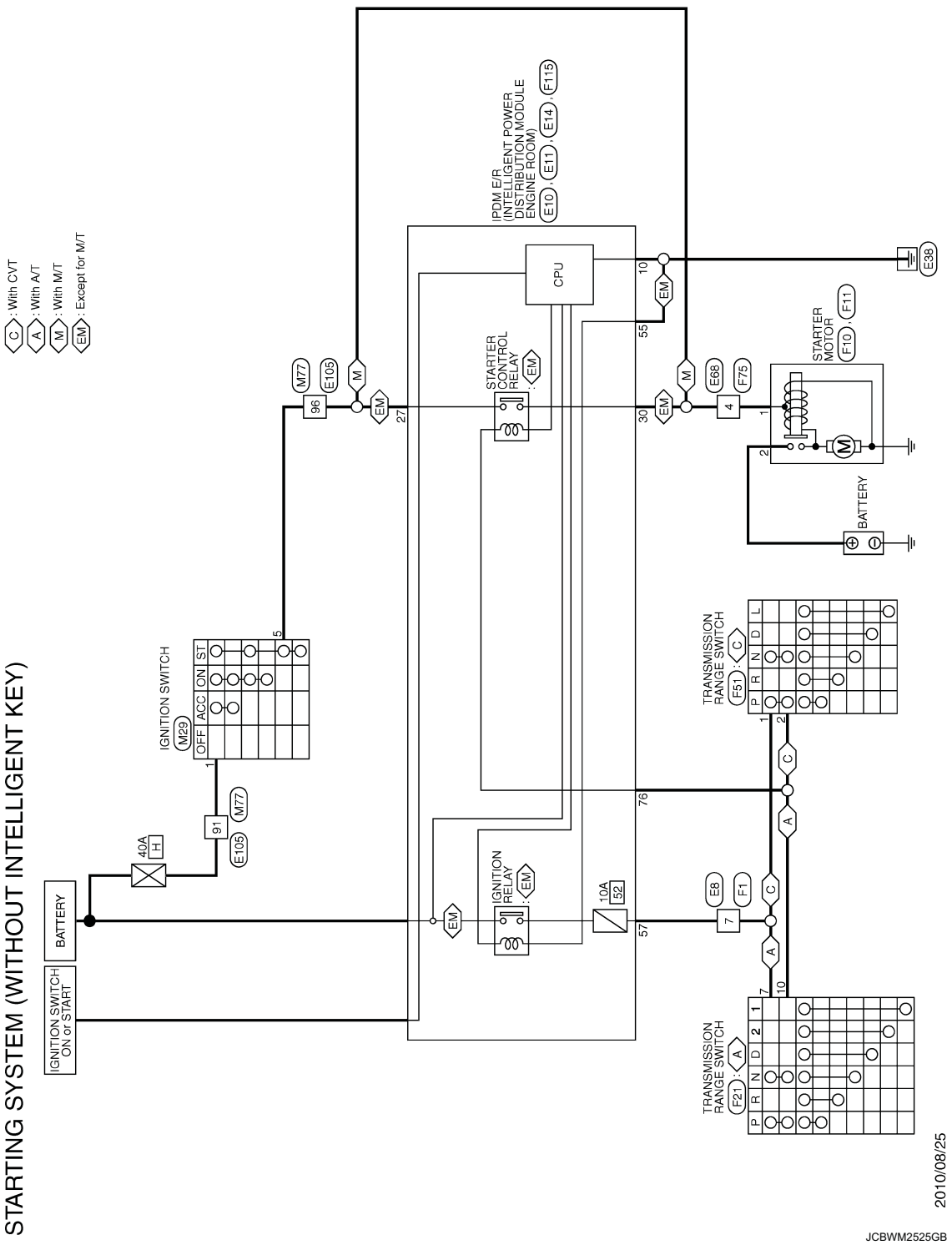
Terminal No.	Color of Wire	Signal Name [Specification]
1	R	–
2	R	–
3	W	–
4	BR	–
5	R	–
6	LG	–
7	GR	–
8	O	– [For India]
8	BG	– [Except for India]
9	R	–
10	G	–
18	SB	– [With Intelligent Key]
18	P	– [Without Intelligent Key]
28	BR	–
35	R	–
36	Y	–
42	GR	–
43	LG	–
51	BR	–
52	P	–
53	GR	–
54	L	–
55	V	–
56	BR	– [For China]
56	L	– [Except for China]
58	BR	–
59	LG	–
60	LG	– [For China]
60	R	– [Except for China]
61	BG	– [For China]
61	Y	– [Except for China]
62	SB	–
63	R	–
64	V	–
65	R	–
66	G	–
68	R	–
69	Y	–
70	W	–
71	R	–
72	P	– [With auto A/C]
72	Y	– [With manual A/C]
75	L	–
76	B	–
80	L	–
81	P	–
82	GR	–
83	LG	–
84	Y	–
85	BR	– [For China]
85	W	– [For India]
85	Y	– [Except for India and China]
86	R	–
88	L	–
89	P	–
90	SHIELD	–
91	P	–
92	BG	– [For China]
92	L	– [Except for China]
93	L	– [With Intelligent Key]
93	Y	– [Without Intelligent Key]
94	L	–
95	G	–
96	W	–
97	SB	–
98	R	–
99	P	–
100	R	–

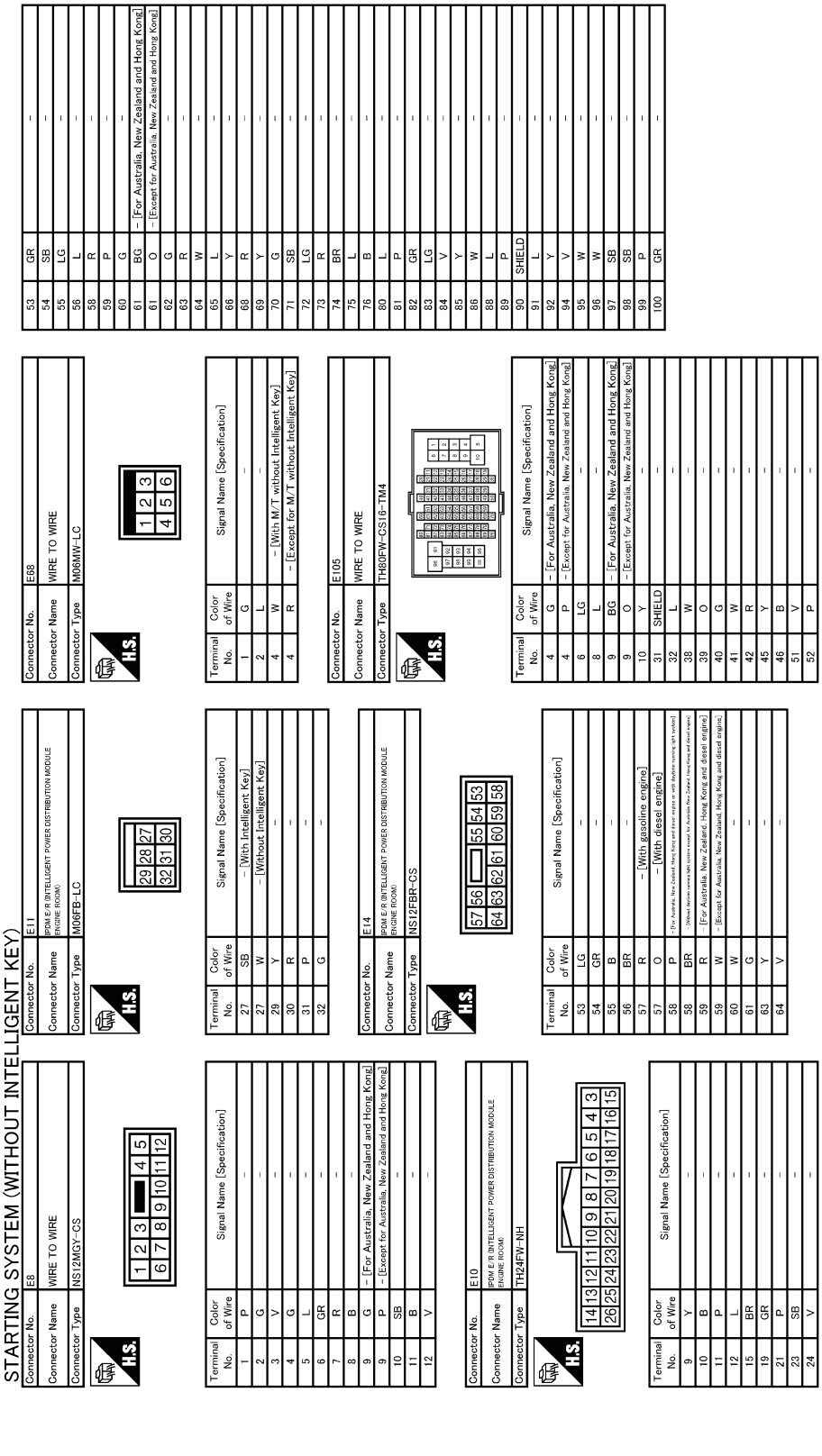
JCBWM2180GB

TYPE B

TYPE B : Wiring Diagram

INFOID:0000000006066886




STARTING SYSTEM (WITHOUT INTELLIGENT KEY)
Connector No. E8
Connector Name WIRE TO WIRE
Connector Type NS12MGY-CS
H.S.
1 2 3 4 5
6 7 8 9 10 11 12
Terminal No. | Color of Wire | Signal Name [Specification]
1 P –
2 G –
3 V –
4 G –
5 L –
6 GR –
7 R –
8 B –
9 G – [For Australia, New Zealand and Hong Kong]
9 P – [Except for Australia, New Zealand and Hong Kong]
10 SB –
11 B –
12 V –
Connector No. E11
Connector Name IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type M06FB-LC
H.S.
29 28 27
32 31 30
Terminal No. | Color of Wire | Signal Name [Specification]
27 SB – [With Intelligent Key]
27 W – [Without Intelligent Key]
29 Y –
30 R –
31 P –
32 G –
Connector No. E14
Connector Name IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type NS12FBR-CS
H.S.
57 56 55 54 53
64 63 62 61 60 59 58
Terminal No. | Color of Wire | Signal Name [Specification]
53 LG –
54 GR –
55 B –
56 BR –
57 R – [With gasoline engine]
57 O – [With diesel engine]
58 P [For Australia, New Zealand, Hong Kong and Brunei models with keyless access with system] / [Without keyless access with system except for Australia, New Zealand and Brunei models]
58 BR – [For Australia, New Zealand, Hong Kong and diesel engine] / – [Except for Australia, New Zealand, Hong Kong and diesel engine]
59 R –
59 W –
60 W –
61 G –
63 Y –
64 V –
Connector No. E68
Connector Name WIRE TO WIRE
Connector Type M06MW-LC
H.S.
1 2 3
4 5 6
Terminal No. | Color of Wire | Signal Name [Specification]
1 G –
2 L –
4 W – [With M/T without Intelligent Key]
4 R – [Except for M/T without Intelligent Key]
Connector No. E105
Connector Name WIRE TO WIRE
Connector Type TH80FW-CS16-TM4
H.S.
Terminal No. | Color of Wire | Signal Name [Specification]
4 G – [For Australia, New Zealand and Hong Kong]
4 P – [Except for Australia, New Zealand and Hong Kong]
6 LG –
8 L –
9 BG – [For Australia, New Zealand and Hong Kong]
9 O – [Except for Australia, New Zealand and Hong Kong]
10 Y –
31 SHIELD –
32 L –
38 W –
39 O –
40 G –
41 W –
42 R –
45 Y –
46 B –
51 V –
52 P –
53 GR –
54 SB –
55 LG –
56 L –
58 R –
59 P –
60 G –
61 BG – [For Australia, New Zealand and Hong Kong]
61 O – [Except for Australia, New Zealand and Hong Kong]
62 G –
63 R –
64 W –
65 L –
66 Y –
68 R –
69 Y –
70 G –
71 SB –
72 LG –
73 R –
74 BR –
75 L –
76 B –
80 L –
81 P –
82 GR –
83 LG –
84 V –
85 Y –
86 W –
88 L –
89 P –
90 SHIELD –
91 L –
92 Y –
94 V –
95 W –
96 W –
97 SB –
98 SB –
99 P –
100 GR –
Connector No. E10
Connector Name IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type TH24FW-NH
H.S.
14 13 12 11 10 9 8 7 6 5 4 3
26 25 24 23 22 21 20 19 18 17 16 15
Terminal No. | Color of Wire | Signal Name [Specification]
9 Y –
10 B –
11 P –
12 L –
15 BR –
19 GR –
21 P –
23 SB –
24 V –
JCBWM2526GB

STARTING SYSTEM (WITHOUT INTELLIGENT KEY)

Connector No.	F1
Connector Name	WIRE TO WIRE
Connector Type	NS12FGY-CS

Terminal No.	Color of Wire	Signal Name [Specification]
1	LG	–
2	G	–
3	BR	–
4	G/W	–
5	R/W	–
6	R	–
7	R	–
8	B	–
9	BR	–
10	O	–
11	B	–
12	W	– [With gasoline engine]
12	V	– [With diesel engine]

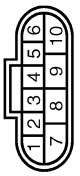
Connector No.	F11
Connector Name	STARTER MOTOR
Connector Type	–

Terminal No.	Color of Wire	Signal Name [Specification]
2	B/R	–

Connector No.	F10
Connector Name	STARTER MOTOR
Connector Type	–

Terminal No.	Color of Wire	Signal Name [Specification]
1	W	– [With M/T without Intelligent Key]
1	R	– [Except for M/T without Intelligent Key]

Connector No.	F21
Connector Name	TRANSMISSION RANGE SWITCH
Connector Type	YDX06FB-HS4



Terminal No.	Color of Wire	Signal Name [Specification]
2	R/B	–
3	W	–
4	W/B	–
5	O	–
6	R	–
7	R	–
8	L/B	–
9	Y	–
10	BR	–

Connector No.	F51
Connector Name	TRANSMISSION RANGE SWITCH
Connector Type	YDX06FB-HS4

Terminal No.	Color of Wire	Signal Name [Specification]
1	R	–
2	BR	–
3	R	–
4	Y	–
5	O	–
6	L/B	–
7	W/B	–
8	R/B	–

Connector No.	F75
Connector Name	WIRE TO WIRE
Connector Type	M06FW-LC

Terminal No.	Color of Wire	Signal Name [Specification]
1	G	–
2	G	–
4	W	– [With M/T without Intelligent Key]
4	R	– [Except for M/T without Intelligent Key]

Connector No.	F115
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS12FW-CS

Terminal No.	Color of Wire	Signal Name [Specification]
65	L/W	–
67	R	– [With Intelligent Key]
68	G/W	–
69	O	–
70	Y	–
71	BR	–
72	SB	–
75	L	– [With L–Jetronic engine]
75	R	– [With D–Jetronic engine]
75	G	– [With diesel engine]
76	R	– [With M/T]
76	BR	– [Except for M/T]

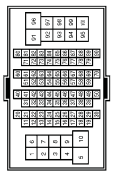
Connector No.	M29
Connector Name	IGNITION SWITCH
Connector Type	M06FW-LC

Terminal No.	Color of Wire	Signal Name [Specification]
1	P	–
2	SB	–
3	GR	–
4	Y	–
5	W	–

JCBWM2527GB

STARTING SYSTEM (WITHOUT INTELLIGENT KEY)

Connector No.	M77
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4



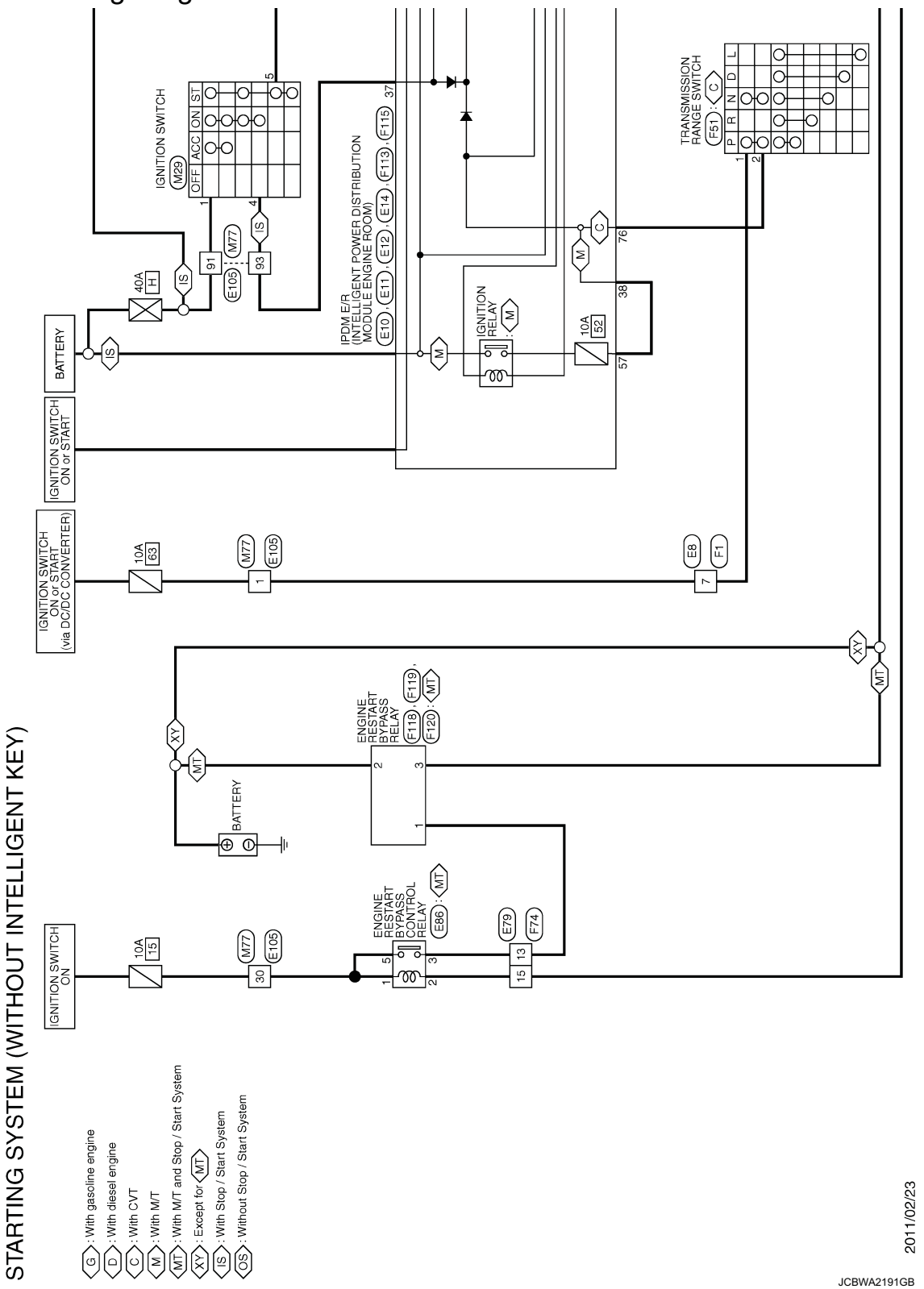
Terminal No.	Color of Wire	Signal Name [Specification]
4	BR	–
6	LG	–
8	BG	– [For Australia, New Zealand and Hong Kong]
8	O	– [Except for Australia, New Zealand and Hong Kong]
9	R	–
10	G	–
31	SHIELD	–
32	L	–
38	BR	–
39	L	–
40	G	–
41	W	–
42	R	–
45	Y	–
46	B	–
51	BR	–
52	P	–
53	GR	–
54	L	–
55	V	–
56	L	–
58	BR	–
59	LG	–
60	R	–
61	Y	–
62	SB	–
63	R	–
64	V	–
65	R	–
66	G	–
68	R	–
69	Y	–
70	W	–
71	R	–
72	P	– [With auto A/C]
72	Y	– [With manual A/C]
73	SB	–
74	GR	–
75	L	–
76	B	–
80	L	–
81	P	–
82	GR	–
83	LG	–
84	Y	–
85	W	–
86	R	–
88	L	–
89	P	–
90	SHIELD	–
91	P	–
92	L	–
94	L	–
95	G	–
96	W	–
97	SB	–
98	R	–
99	P	–
100	R	–

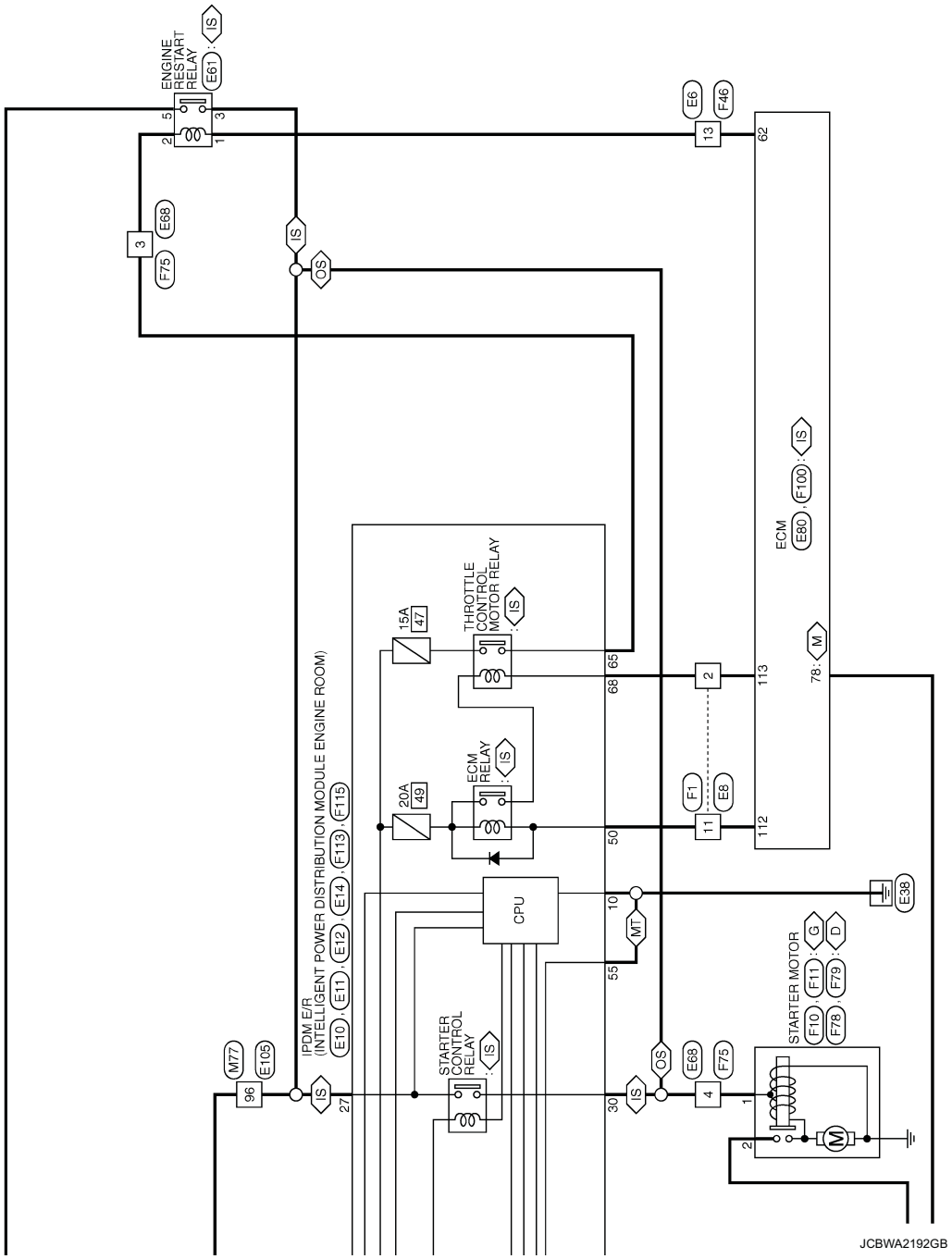
JCBWM2528GB

TYPE C

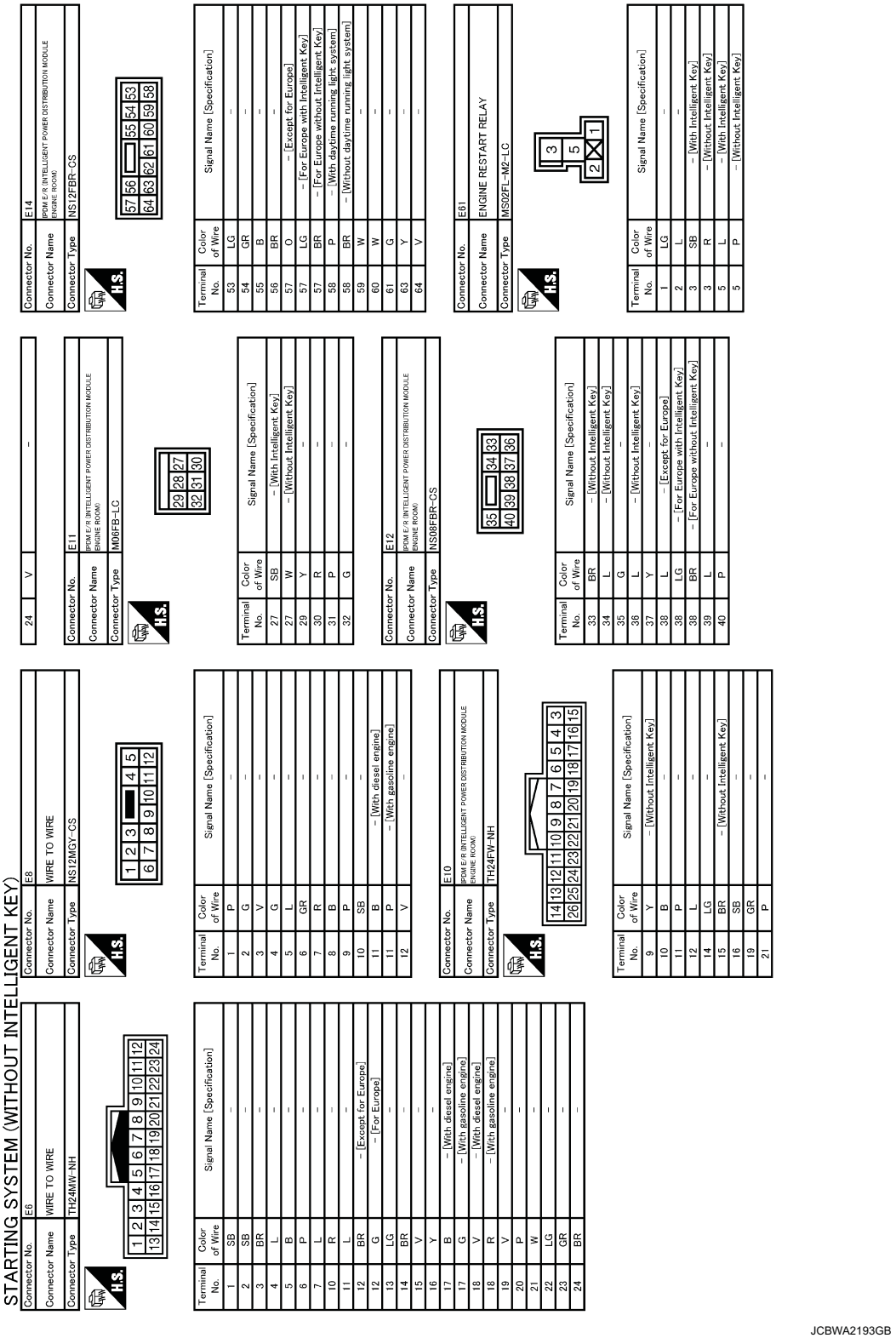
TYPE C : Wiring Diagram

INFOID:0000000007230270




ENGINE RESTART RELAY
E61
IS
OS
E68
F75
E6
F46
62
ECM
E80
F100
78
113
112
THROTTLE CONTROL MOTOR RELAY
15A
47
65
68
ECM RELAY
20A
49
50
F1
E8
11
IPDM E/R
(INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E10
E11
E12
E14
F113
F115
CPU
10
55
MT
E38
STARTER CONTROL RELAY
M77
E105
96
27
30
4
STARTER MOTOR
F10
F11
F78
F79
G
D
JCBWA2192GB

STARTING SYSTEM (WITHOUT INTELLIGENT KEY)



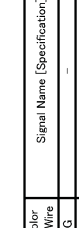
JCBWA2193GB

STARTING SYSTEM (WITHOUT INTELLIGENT KEY)

Connector No.	E68
Connector Name	WIRE TO WIRE
Connector Type	M08MW-LC

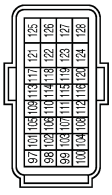
Terminal No.	Color of Wire	Signal Name [Specification]
1	G	–
2	L	–
3	L	–
4	R	– [Except for South Africa with gasoline engine]
4	W	– [For South Africa with gasoline engine]
5	B	–
6	LG	–

Connector No.	E79
Connector Name	WIRE TO WIRE
Connector Type	NS16MW-CS



Terminal No.	Color of Wire	Signal Name [Specification]
1	L	–
3	SB	–
5	Y	–
6	BR	–
7	SB	–
8	B	–
9	SB	–
10	R	–
11	LG	–
13	R	–
15	P	–
16	B	–

Connector No.	E80
Connector Name	ECM
Connector Type	RH24FGY-RZ8-L-LH

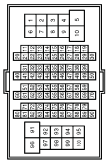


Terminal No.	Color of Wire	Signal Name [Specification]
98	W	ASCD MAIN SWITCH
99	P	CAN–L
100	L	CAN–H
101	V	SENSOR POWER SUPPLY (ACCELERATOR PEDAL POSITION SENSOR 1)
102	SB	ACCELERATOR PEDAL POSITION SENSOR 1
103	BR	PARK / NEUTRAL POSITION SIGNAL
104	GR	DATA LINK CONNECTOR
105	R	SUPERCHARGER BYPASS VALVE CONTROL MOTOR RELAY
106	V	POWER SUPPLY FOR ECM (BACKUP)
107	O	SPEED LIMITER MAIN SWITCH
108	R	CLUTCH PEDAL POSITION SWITCH
109	L	IGNITION SWITCH
110	Y	ASCD STEERING SWITCH
111	B	SENSOR GROUND (ASCD STEERING SWITCH)
112	P	ECM RELAY (SELF SHUT–OFF)
113	G	THROTTLE CONTROL MOTOR RELAY
114	R	SENSOR GROUND (ACCELERATOR PEDAL POSITION SENSOR 1)
115	P	STOP LAMP SWITCH
116	G	BRAKE PEDAL POSITION SWITCH
117	GR	FUEL PUMP RELAY
118	BR	SENSOR POWER SUPPLY (ACCELERATOR PEDAL POSITION SENSOR 2)
119	GR	ACCELERATOR PEDAL POSITION SENSOR 2
120	Y	SENSOR GROUND (ACCELERATOR PEDAL POSITION SENSOR 2)
121	G	POWER SUPPLY FOR ECM
122	L	THROTTLE CONTROL MOTOR POWER SUPPLY
123	V	SUPERCHARGER BYPASS VALVE CONTROL MOTOR POWER SUPPLY
124	B	ECM GROUND
125	G	A/F SENSOR 1 HEATER
126	BR	HEATED OXYGEN SENSOR 2 HEATER
127	B	ECM GROUND
128	B	ECM GROUND

Connector No.	E86
Connector Name	ENGINE RESTART BYPASS CONTROL RELAY
Connector Type	MS02FL-MZ-LC

Terminal No.	Color of Wire	Signal Name [Specification]
1	G	–
2	P	–
3	R	–
5	G	–

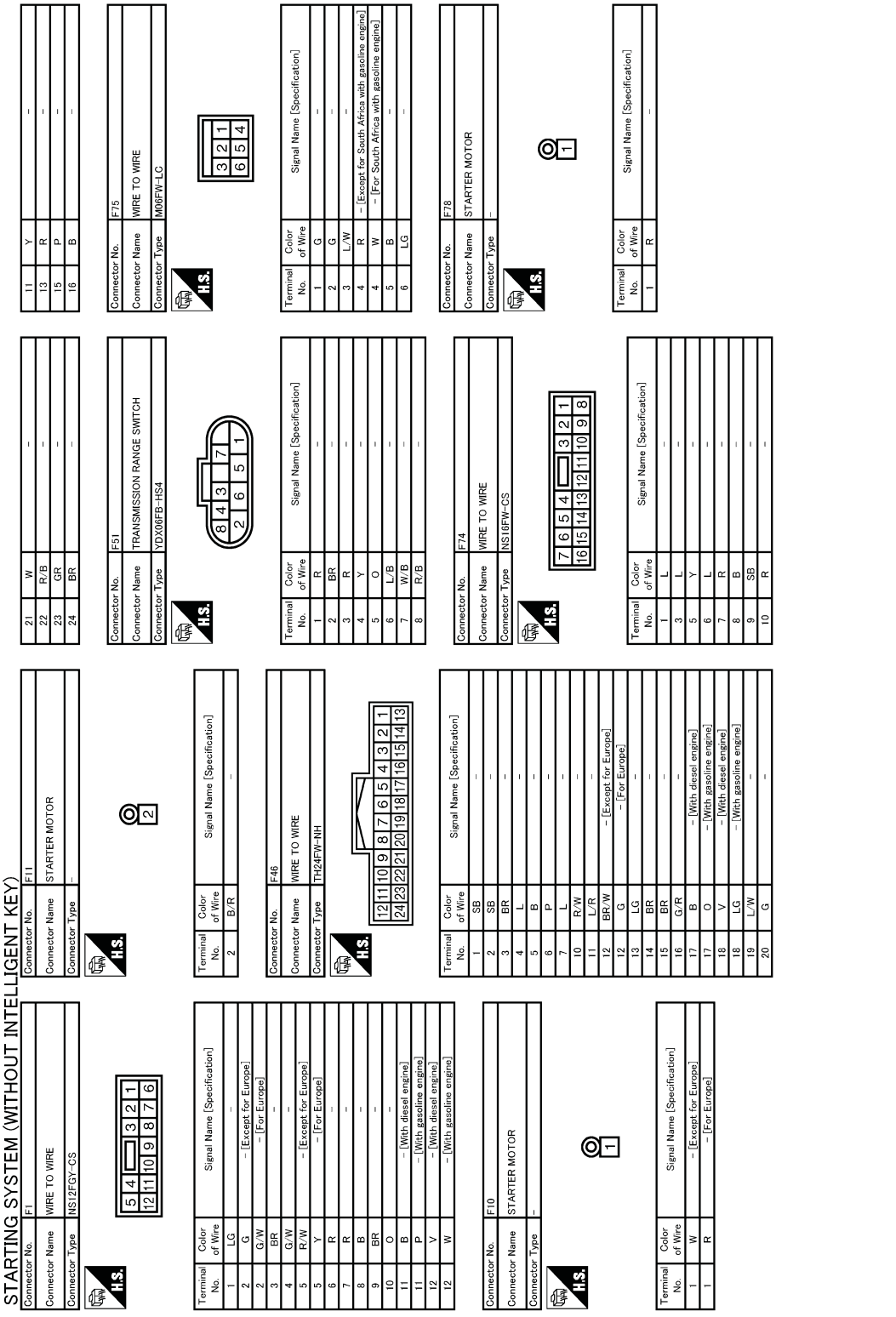
Connector No.	E105
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS16-TM4



Terminal No.	Color of Wire	Signal Name [Specification]
1	R	–
2	R	–
3	W	–
4	P	–
5	R	–
6	LG	–
7	P	–
8	L	–
9	O	–
10	Y	–
16	L	–
17	W	–
18	SB	–
26	LG	–
27	BR	–
28	BR	–
30	G	–
31	SHIELD	–
32	L	–
38	W	–
39	O	–
40	G	–
41	W	–
42	R	–
45	Y	–
46	B	–
51	V	– [With CVT]
51	BR	– [With M/T]
52	P	–
53	GR	–
54	SB	–
55	LG	–
56	L	–
58	R	–
59	P	–
60	G	–
61	O	–
62	G	–
63	R	–
64	W	–
66	Y	–
68	R	–
69	Y	–
70	G	–
71	SB	–
72	LG	–
73	R	–
80	L	–
81	P	–
82	GR	–
83	LG	–
84	V	–
85	Y	–
86	W	–
88	L	–
89	P	–
90	SHIELD	–
91	L	–
92	Y	–
93	Y	–
94	V	–
95	W	–
96	R	– [With diesel engine]
96	W	– [With gasoline engine]
97	SB	–
98	SB	–
99	P	–
100	GR	–

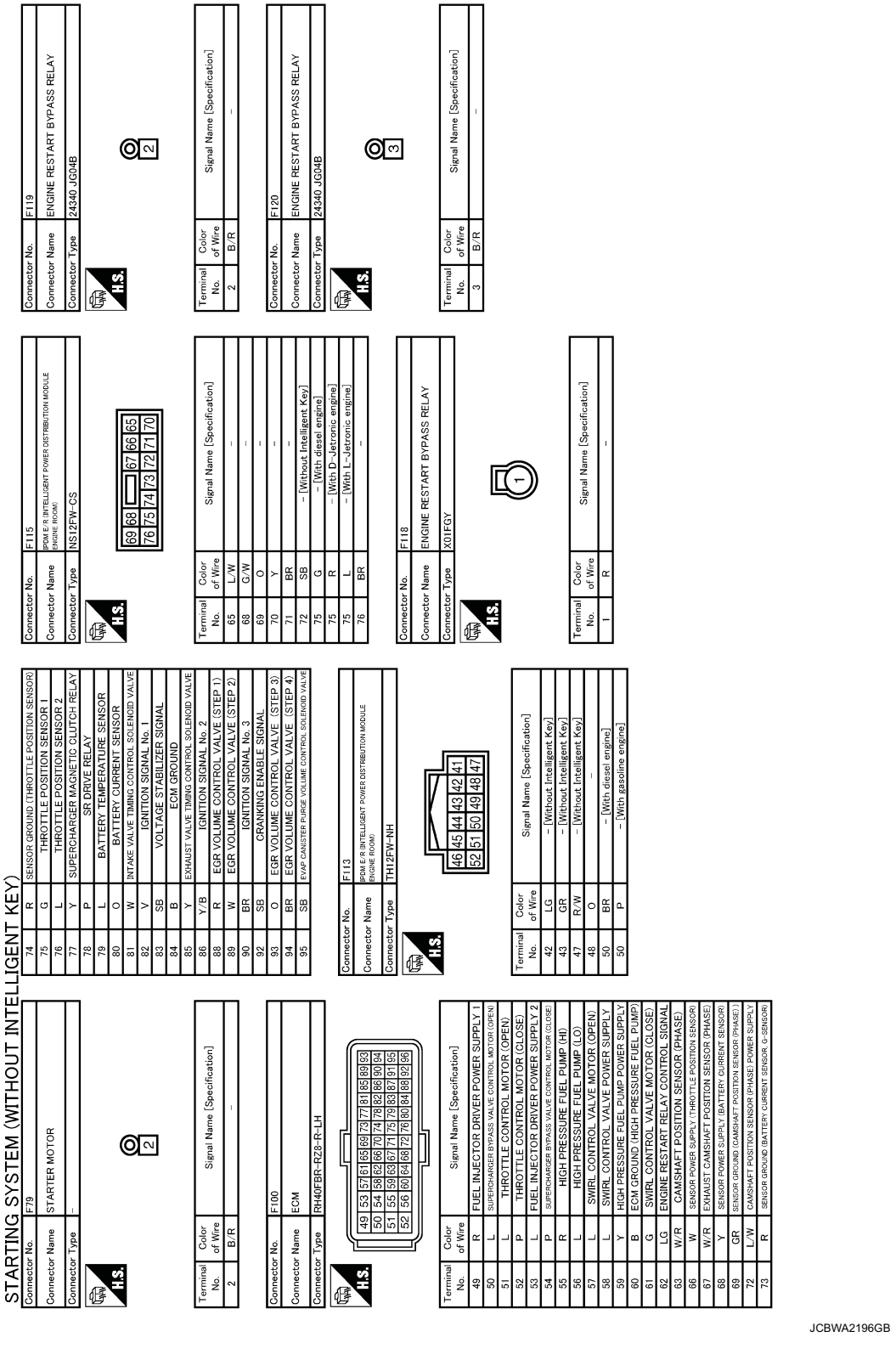
JCBWA2194GB

STARTING SYSTEM (WITHOUT INTELLIGENT KEY)



JCBWA2195GB

STARTING SYSTEM (WITHOUT INTELLIGENT KEY)



JCBWA2196GB

STARTING SYSTEM (WITHOUT INTELLIGENT KEY)

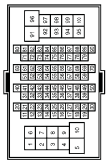
Connector No.	M29
Connector Name	IGNITION SWITCH
Connector Type	M06FW-LC

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	P	–
2	SB	–
3	GR	–
4	Y	–
5	R	– [With diesel engine]
5	W	– [With gasoline engine]

Connector No.	M77
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4

H.S.



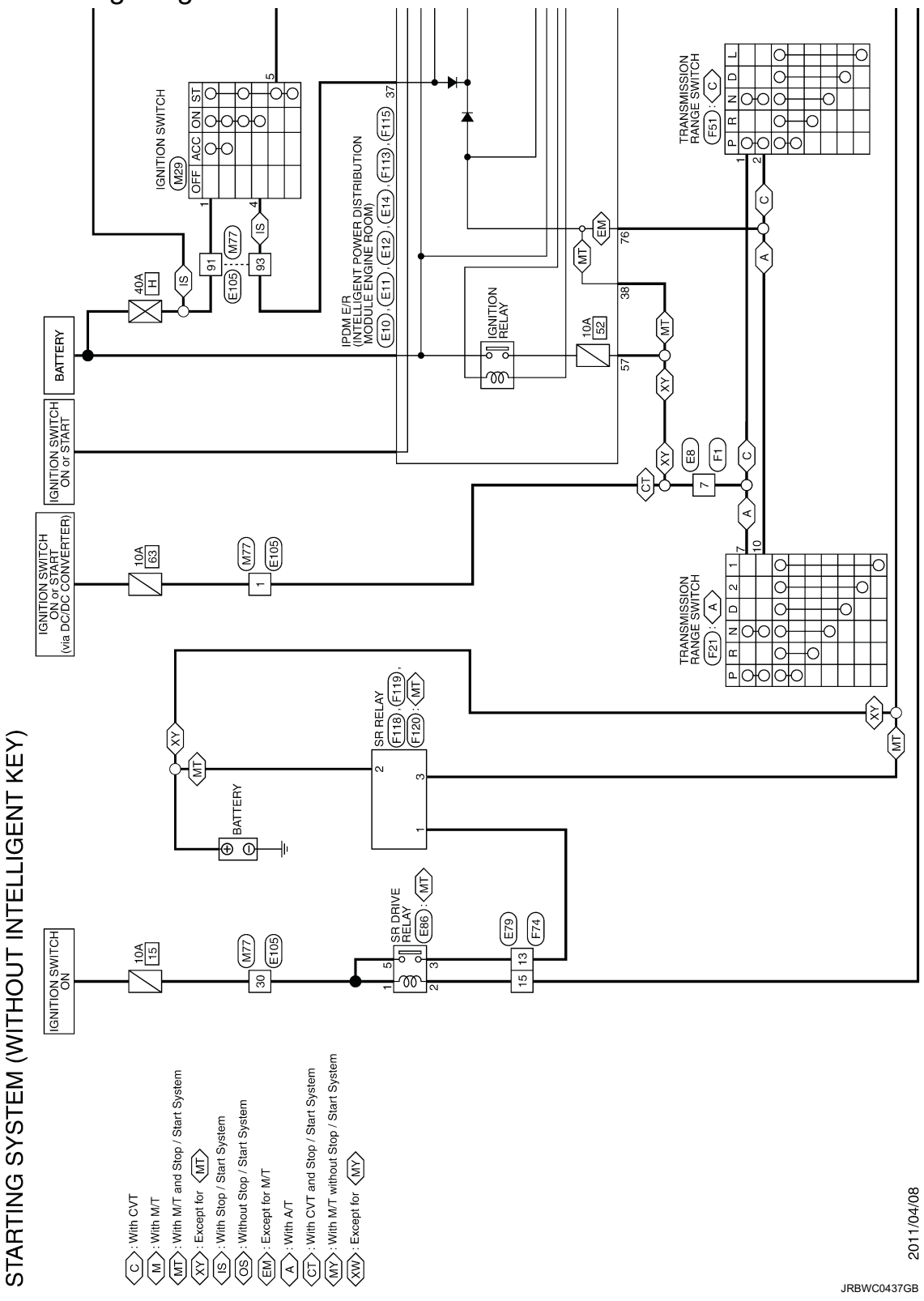
Terminal No.	Color of Wire	Signal Name [Specification]
1	R	–
2	R	–
3	W	–
4	BR	–
5	R	–
6	LG	–
7	GR	–
8	O	–
9	R	–
10	G	–
16	L	–
17	W	–
18	P	–
26	R	–
27	BR	–
28	BR	–
30	Y	–
31	SHIELD	–
32	L	–
38	BR	–
39	L	–
40	G	–
41	W	–
42	R	–
45	Y	–
46	B	–
51	BR	–
52	P	–
53	GR	–
54	L	–
55	V	–
56	L	–
58	BR	–
59	LG	–
60	R	–
61	Y	–
62	SB	–
63	R	–
64	V	–
66	G	–
68	R	–
69	Y	–
70	W	–
71	R	–
72	P	– [With auto A/C]
72	Y	– [With manual A/C]
73	SB	–
80	L	–
81	P	–
82	GR	–
83	LG	–
84	Y	–
85	W	–
86	R	–
88	L	–
89	P	–
90	SHIELD	–
91	P	–
92	L	–
93	Y	–
94	L	–
95	G	–
96	R	– [With diesel engine]
96	W	– [With gasoline engine]
97	SB	–
98	R	–
99	P	–
100	R	–

JCBWA2197GB

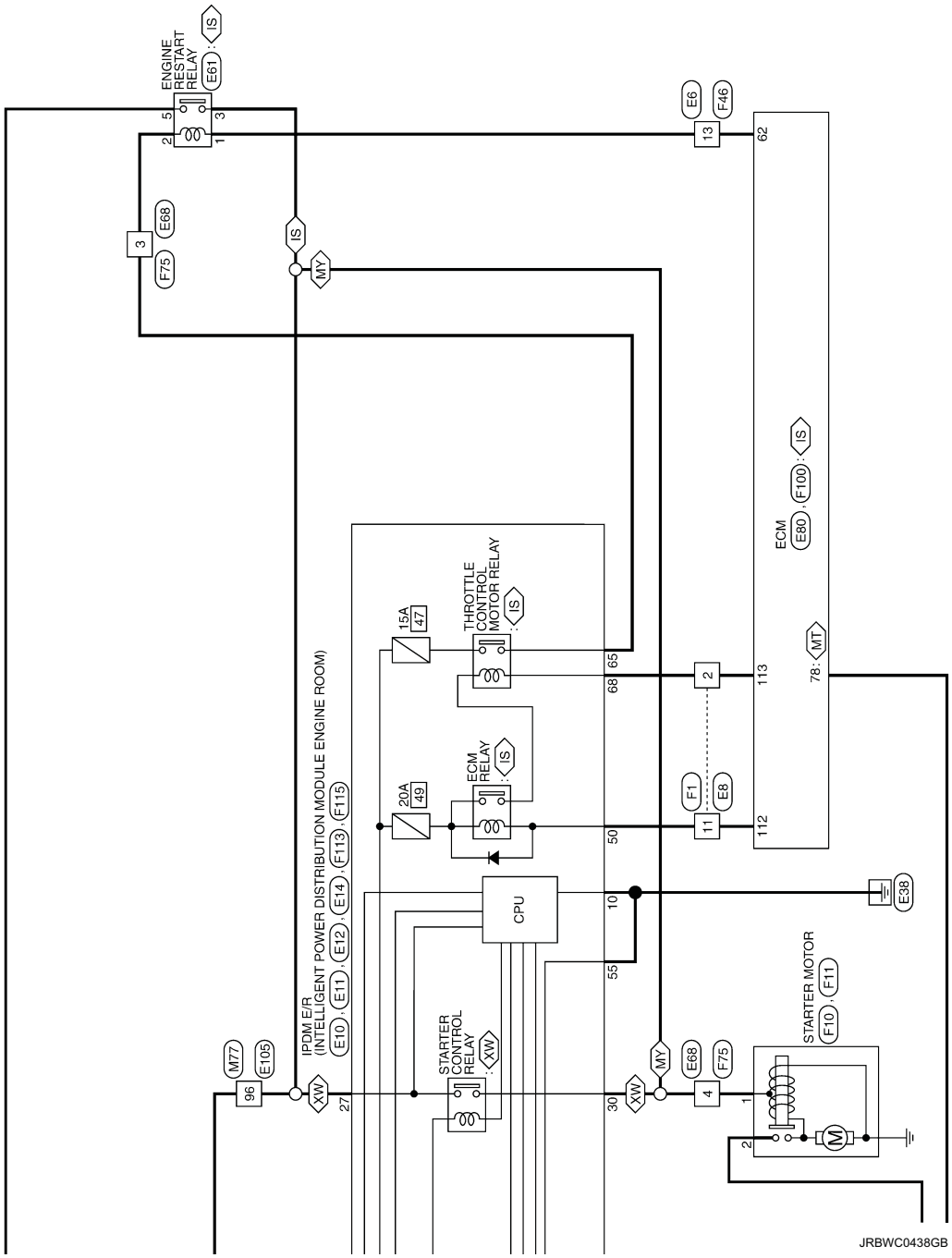
TYPE D

TYPE D : Wiring Diagram

INFOID:0000000007605534



C : With CVT
M : With M/T
MT : With M/T and Stop / Start System
XY : Except for MT
IS : With Stop / Start System
OS : Without Stop / Start System
EM : Except for M/T
A : With A/T
CT : With CVT and Stop / Start System
MY : With M/T without Stop / Start System
XW : Except for MY


ENGINE RESTART RELAY
E61
IS
E6
F46
13
62
E68
F75
3
IS
MY
ECM
E80
F100
IS
MT
78:
THROTTLE CONTROL MOTOR RELAY
15A
47
65
68
2
113
ECM RELAY
20A
49
F1
E8
11
112
50
CPU
10
55
E38
IPDM E/R
(INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E10
E11
E12
E14
F113
F115
STARTER CONTROL RELAY
XW
M77
E105
96
27
30
4
STARTER MOTOR
F10
F11
JRBWC0438GB

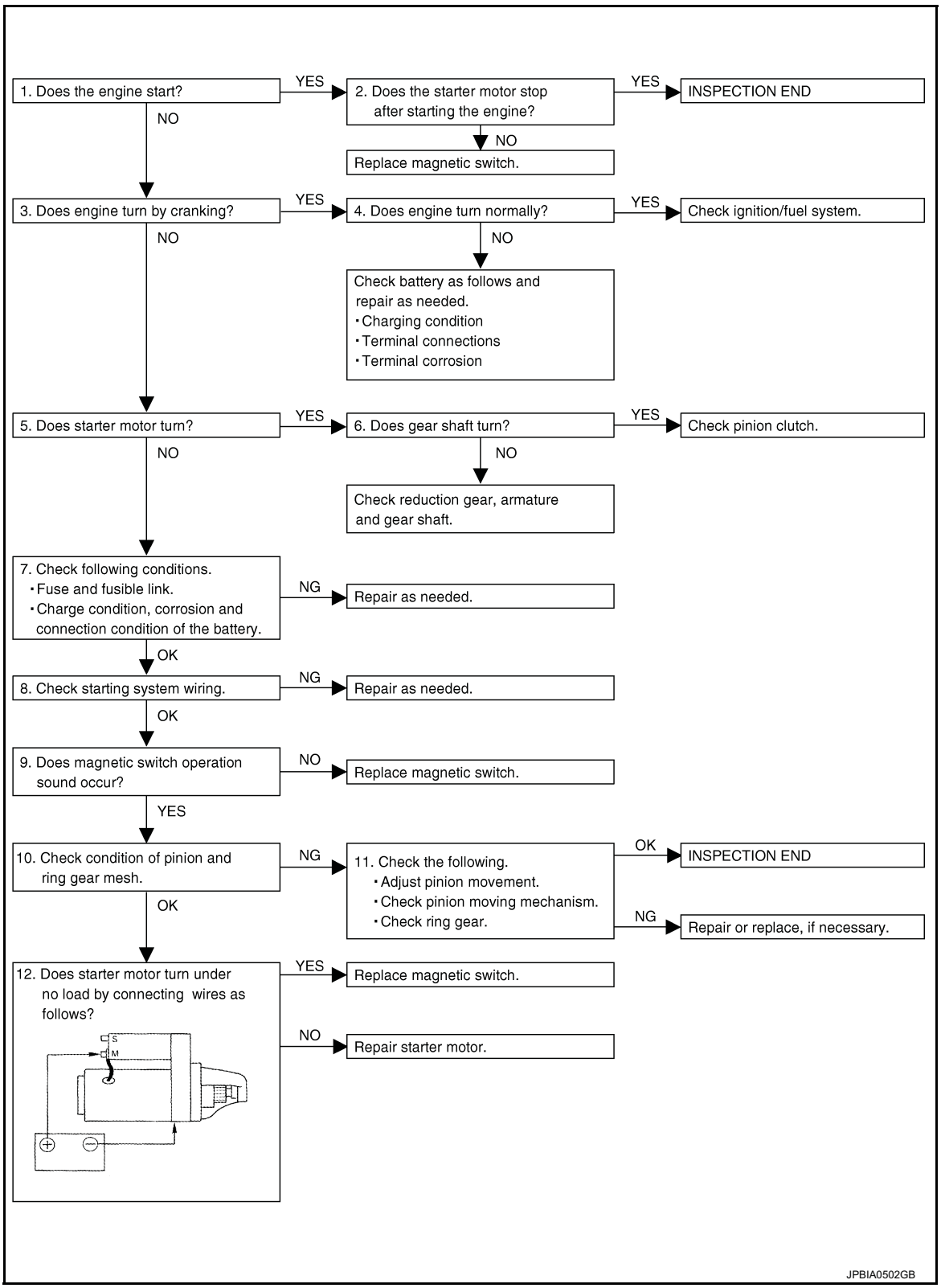
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000006057521

OVERALL SEQUENCE



DETAILED FLOW

NOTE:
If any malfunction is found, immediately disconnect the battery cable from the negative terminal.

1.CHECK ENGINE START

Crank the engine and check that the engine starts.

Does the engine start?

YES >> GO TO 2.
NO >> GO TO 3.

2.CHECK THAT THE STARTER MOTOR STOPS

Check that the starter motor stops after starting the engine.

Does the starter motor stop?

YES >> INSPECTION END
NO >> Replace magnetic switch.

3.CHECK THE ENGINE SPEED WITH CRANKING

Check that the engine runs at cranking.

Does engine turn by cranking?

YES >> GO TO 4.
NO >> GO TO 5.

4.CHECK THE ENGINE SPEED WITH CRANKING

Check that the engine speed is not low at cranking.

Does engine turn normally?

YES >> Check ignition/fuel system.
NO >> Check charge condition, corrosion and connection condition of the battery. Refer to PG-511, "FOR MAINTENANCE REQUIRED BATTERY MODELS : Work Procedure (Without Stop/Start System)" or PG-516, "FOR MAINTENANCE REQUIRED BATTERY MODELS : Work Procedure (With Stop/Start System)".

5.CHECK STARTER MOTOR ACTIVATION

Check that the starter motor runs at cranking.

Does starter motor turn?

YES >> GO TO 6.
NO >> GO TO 7.

6.CHECK STARTER MOTOR UNIT

1. Remove starter motor.
2. Check that the gear shaft of starter motor rotates.

Does gear shaft turn?

YES >> Check pinion clutch. Refer to STR-64, "HR12DE : Inspection and Adjustment" (HR12DE), STR-71, "HR15DE : Inspection and Adjustment" (HR15DE) or STR-76, "K9K : Inspection and Adjustment" (K9K).
NO >> Check reduction gear, armature and gear shaft.

7.CHECK POWER SUPPLY CIRCUIT

Check the following conditions.

- Fuse and fusible link
- Charge condition, corrosion and connection condition of the battery. Refer to PG-511, "FOR MAINTENANCE REQUIRED BATTERY MODELS : Work Procedure (Without Stop/Start System)" or PG-516, "FOR MAINTENANCE REQUIRED BATTERY MODELS : Work Procedure (With Stop/Start System)".

Are these inspection results normal?

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

8.CHECK STARTING SYSTEM WIRING

Check the following.

- “B” terminal circuit. Refer to STR-58, "Diagnosis Procedure".

• “S” terminal circuit. Refer to STR-59, "Diagnosis Procedure".

Are these inspection results normal?

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

9.CHECK MAGNETIC SWITCH OPERATION SOUND

Check that a magnetic switch operation sound can be heard when the ignition switch is set at the starting position.

Does magnetic switch operation sound occur?

YES >> GO TO 10.
NO >> Replace magnetic switch.

10.PINION AND RING GEAR ENGAGEMENT CHECK

Check condition of pinion and ring gear mesh.

Is the inspection result normal?

YES >> GO TO 12.
NO >> GO TO 11.

11.CHECK STARTER MOTOR UNIT

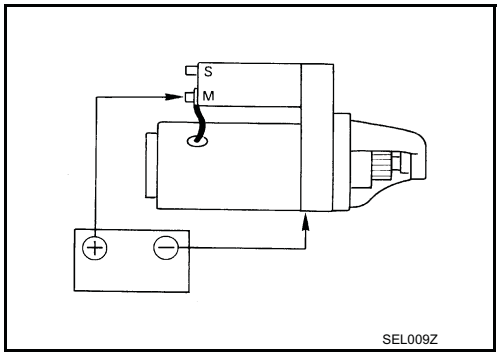
Check the following.
• Adjust pinion movement. Refer to STR-64, "HR12DE : Inspection and Adjustment" (HR12DE), STR-71, "HR15DE : Inspection and Adjustment" (HR15DE) or STR-76, "K9K : Inspection and Adjustment" (K9K).
• Check pinion moving mechanism.
• Check ring gear.

Are these inspection results normal?

YES >> INSPECTION END
NO >> Repair or replace, if necessary.

12.CHECK STARTER MOTOR UNIT

Check that the starter motor runs when connecting the positive terminal (12 V) to starter motor terminal M and the negative terminal (ground) to starter motor body.



Does the starter motor run?

YES >> Replace magnetic switch.
NO >> Repair starter motor.

DTC/CIRCUIT DIAGNOSIS

B TERMINAL CIRCUIT

Description

INFOID:0000000006057523

The “B” terminal is constantly supplied with battery power.

Diagnosis Procedure

INFOID:0000000006057524

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		
F11 (Gasoline engine) F79 (Diesel engine)	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 selector lever to “P” or “N” position. (A/T and CVT models)
   Keep depressing clutch pedal fully. (M/T models)
2. Check voltage between battery positive terminal and starter motor “B” terminal.

Terminals			Condition	Voltage (Approx.)
(+)	(–)			
	Starter motor “B” terminal	Terminal		
Battery positive terminal	F11 (Gasoline engine) F79 (Diesel engine)	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 selector lever to “P” or “N” position. (A/T and CVT models)
   Keep depressing clutch pedal fully. (M/T models)
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-55, "Work Flow".
NO >> Check the starter motor case and ground for poor continuity.

S TERMINAL CIRCUIT

Description

INFOID:0000000006057525

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 for A/T and CVT models or the clutch pedal is depressed for M/T models.

Diagnosis Procedure

INFOID:0000000006057526

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.INSPECTION START

Check which type of transmission the vehicle is equipped with.

Which type of transmission?

M/T models without Intelligent Key system>>GO TO 4.
Except M/T models without Intelligent Key system>>GO TO 2.

2.CHECK “S” TERMINAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect starter motor connector.
3. Shift selector lever to “P” or “N” position. (A/T and CVT models)
   Keep depressing clutch pedal fully. (M/T models)
4. Check voltage between starter motor harness connector and ground.

Terminals			Condition	Voltage (Approx.)
(+)		(–)		
Starter motor harness connector	Terminal			
F10 (Gasoline engine) F78 (Diesel engine)	1	Ground	When the ignition switch is in START position	Battery voltage

Is the inspection result normal?

YES >> “S” terminal circuit is OK. Further inspection is necessary. Refer to STR-55, "Work Flow".
NO >> GO TO 3.

3.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.	
F10 (Gasoline engine) F78 (Diesel engine)	1	E10	30	Existed

Is the inspection result normal?

YES >> Further inspection is necessary. Refer to STR-55, "Work Flow".
NO >> Repair the harness.

4.CHECK “S” TERMINAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect starter motor connector.
3. Check voltage between starter motor harness connector and ground.

Terminals			Condition	Voltage (Approx.)
(+)		(–)		
Starter motor harness connector	Terminal			
F10 (Gasoline engine) F78 (Diesel engine)	1	Ground	When the ignition switch is in START position	Battery voltage

Is the inspection result normal?

YES >> “S” terminal circuit is OK. Further inspection is necessary. Refer to STR-55, "Work Flow".
NO >> GO TO 5.

5. CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

1. Disconnect ignition switch connector.
2. Check continuity between starter motor harness connector and ignition switch harness connector.

Starter motor harness connector		Ignition switch harness connector		Continuity
Connector No.	Terminal No.	Connector No.	Terminal No.	
F10 (Gasoline engine) F78 (Diesel engine)	1	M29	5	Existed

Is the inspection result normal?

YES >> Further inspection is necessary. Refer to STR-55, "Work Flow".
NO >> Repair the harness.

SYMPTOM DIAGNOSIS

STARTING SYSTEM

Symptom Table

INFOID:0000000006057527

Symptom	Reference
No normal cranking	Refer to STR-55, "Work Flow".
Starter motor does not rotate	

REMOVAL AND INSTALLATION

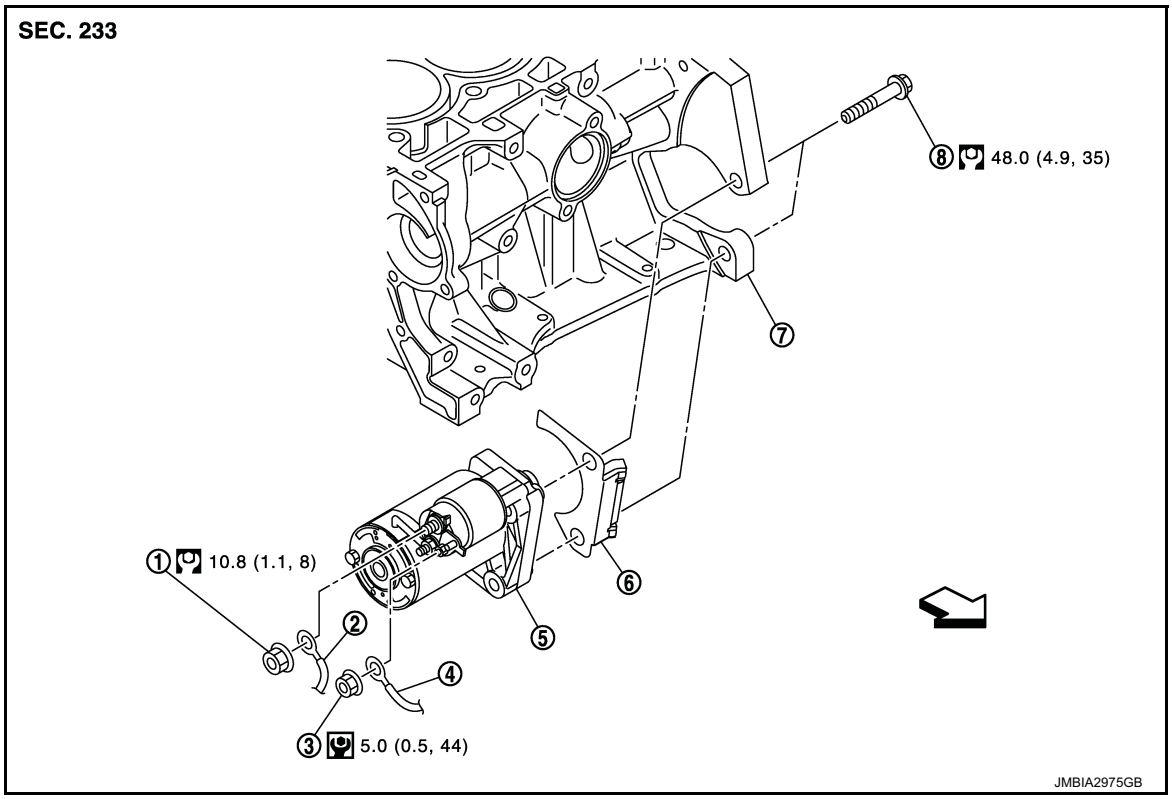
STARTER MOTOR

HR12DE

HR12DE : Exploded View

INFOID:0000000006057535

REMOVAL



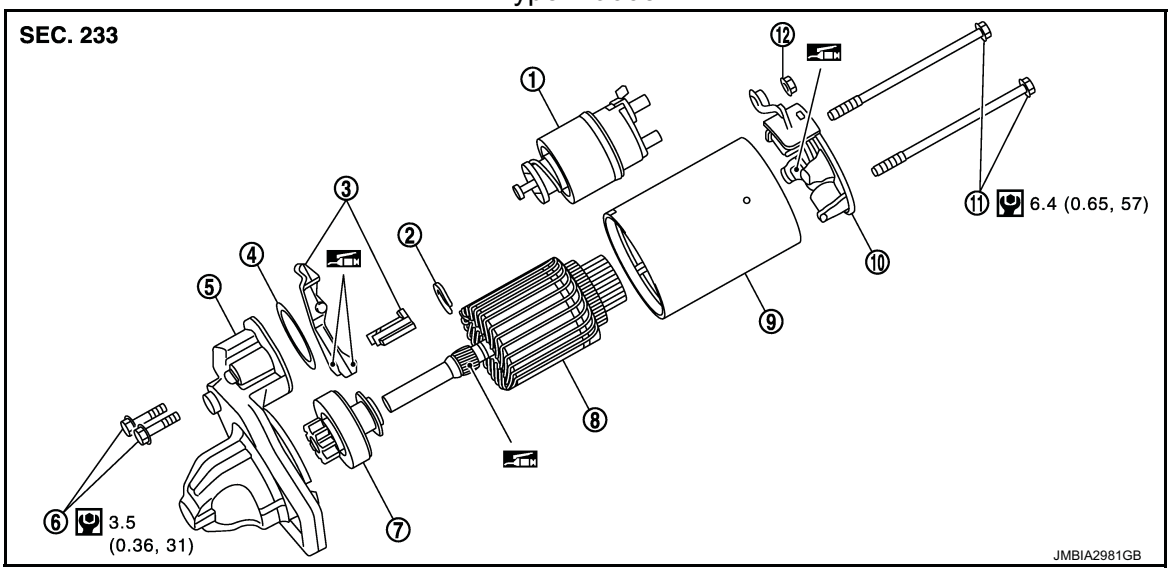
1. “B” terminal nut
2. “B” terminal harness
3. “S” terminal nut
4. “S” terminal harness
5. Starter motor
6. Rear plate cover
7. Cylinder block
8. Starter motor mounting bolt

⇦ : Vehicle front

Refer to GI-4, "Components" for symbols not described on the above.

DISASSEMBLY

Type: 196052

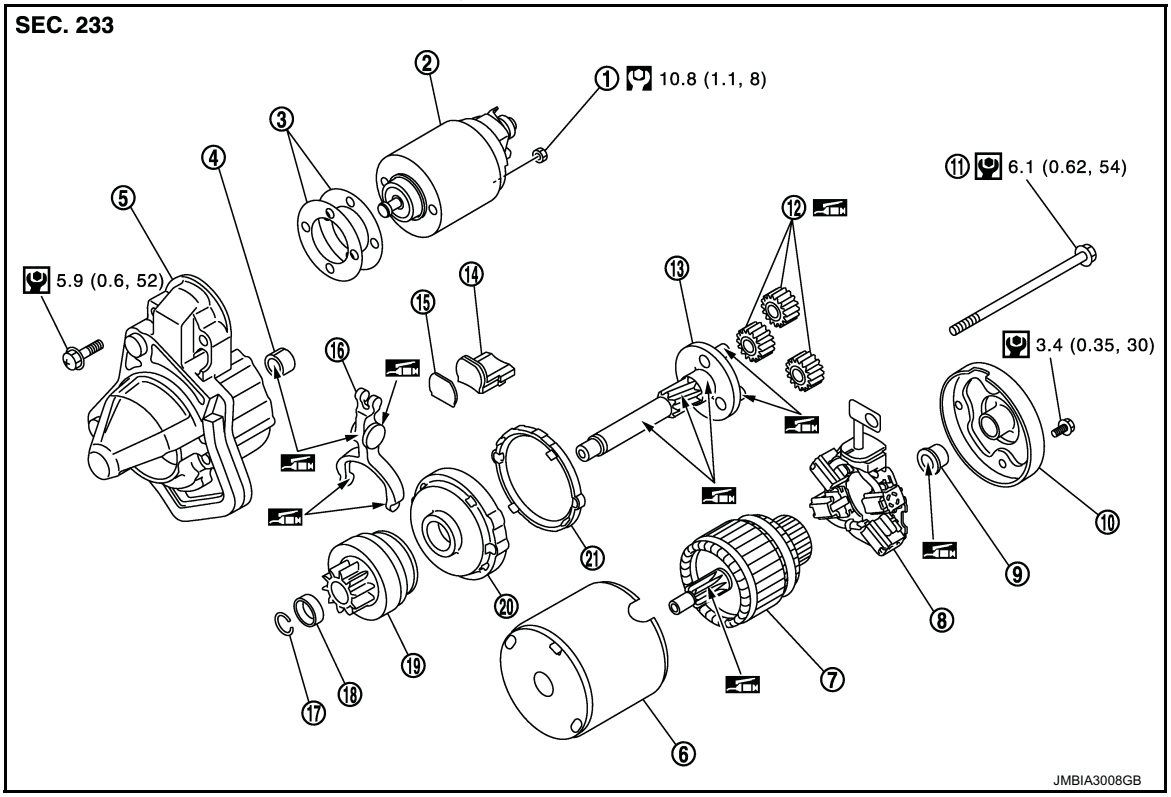


1. Magnetic switch assembly
2. Circlip
3. Shift lever and lever rest
4. Paper sealant
5. Gear case assembly
6. Solenoid bolt
7. Pinion assembly
8. Armature assembly
9. Yoke assembly
10. Brush holder assembly
11. Through bolt
12. Nut

: High-temperature grease point

Refer to GI-4, "Components" for symbols not described on the above.

Type: M000T33671ZT



1. “M” terminal nut
2. Magnetic switch assembly
3. Adjusting plate
4. Metal FR
5. Gear case
6. Yoke
7. Armature
8. Brush holder assembly
9. Metal RR
10. Rear cover
11. Through bolt
12. Planetary gear
13. Gear shaft
14. Packing
15. Plate

16. Shift lever
17. Stopper ring
18. Stopper
19. Pinion assembly
20. Internal gear
21. Packing

: High-temperature grease point

Refer to GI-4, "Components" for symbols not described on the above.

CAUTION:
Never disassemble starter motor of models with STOP/START SYSTEM.
NOTE:
Apply high-temperature grease to lubricate the bearing, gears and frictional surface when assembling the starter.

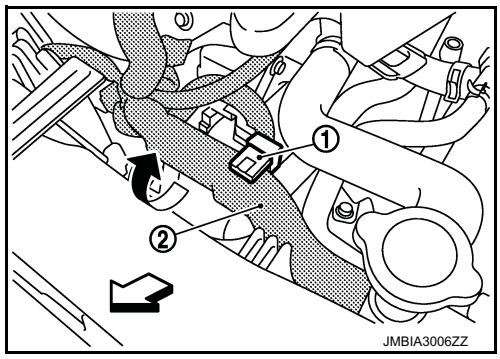
HR12DE : Removal and Installation

INFOID:0000000006057536

REMOVAL

1. Disconnect the battery cable from the negative terminal. Refer to PG-529, "FOR MAINTENANCE REQUIRED BATTERY MODELS : Removal and Installation" (Maintenance required battery models) or PG-530, "FOR MAINTENANCE FREE BATTERY MODELS : Removal and Installation" (Maintenance free battery models).
2. Remove air duct (inlet) and air cleaner body assembly. Refer to EM-33, "TYPE 1 : Removal and Installation" (For the vehicle type 1) or EM-34, "TYPE 2 : Removal and Installation" (For the vehicle type 2). Regarding to the vehicle type, refer to EM-8, "How to Check Vehicle Type".
3. Remove “B” terminal nut and “B” terminal harness.
4. Remove “S” terminal nut and “S” terminal harness.
5. Remove harness clamp (1), and then move engine control harness (2) and secure work space.

   ⇦ : Vehicle front



6. Remove starter motor mounting bolts.
7. Remove starter motor upward from the vehicle.
   CAUTION:
   For models with STOP/START SYSTEM, never erase the starter operation counter except when replacing starter motor.

INSTALLATION

Note the following items, and then install in the reverse order of removal.
CAUTION:
- **Be careful to tighten “B” terminal nut to the specified torque.**
- **Erase the starter operation counter when the starter motor for models with STOP/START SYSTEM is replaced. Refer to EC3-178, "Work Procedure".**

HR12DE : Inspection and Adjustment

INFOID:0000000006057538

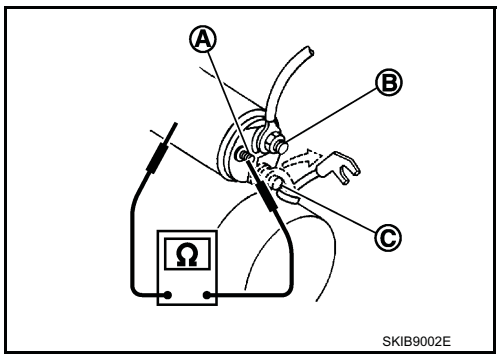
INSPECTION

Magnetic Switch Check
- Before starting to check, disconnect the battery cable from the negative terminal.
- Disconnect “M” terminal of starter motor.

1. Continuity test [between “S” terminal (A) and switch body]

B : “B” terminal
C : “M” terminal

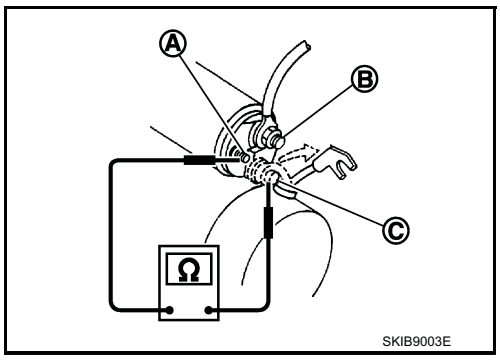
- Replace magnetic switch if continuity does not exist.



2. Continuity test [between “S” terminal (A) and “M” terminal (C)]

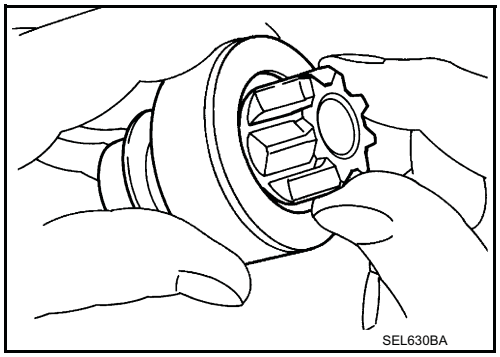
B : “B” terminal

- Replace magnetic switch if continuity does not exist.



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 (If equipped).
   - 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.
   - Replace pinion assembly if it is locked or rotated in both directions or unusual resistance is evident.

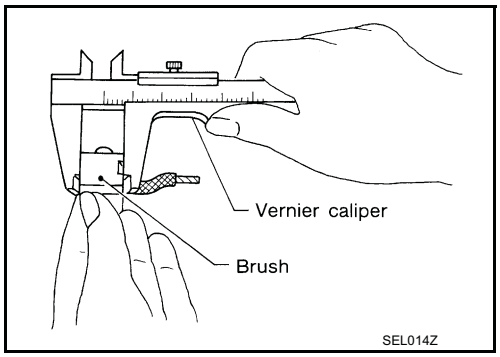


Brush Check

- Check wear of brush.

Minimum length of brush : **Refer to SDS STR-81, "Starter Motor".**

- Replace brush if the measurement value is less than the specified value.

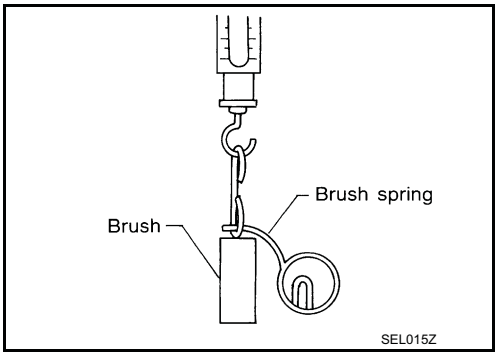


Brush Spring Check

- Check brush spring tension with brush spring detached from brush.

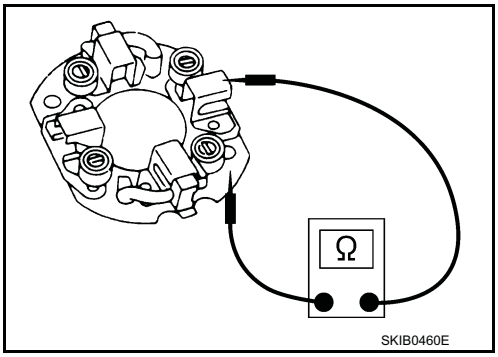
Spring tension (with new brush) : **Refer to SDS STR-81, "Starter Motor".**

- Replace brush spring if the measurement value is less than the specified value.



Brush Holder Check

1. Perform insulation test between brush holder (positive side) and its base (negative side).
   - Replace brush holder assembly if continuity does not exist.
2. Check brush to see if it moves smoothly.
   - If brush holder is bent, replace it; if sliding surface is dirty, clean.

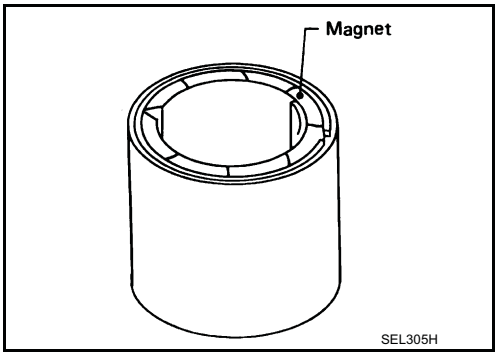


Yoke Check

Magnet is secured to yoke by bonding agent. Check magnet to see that it is secured to yoke and for any cracks. Replace malfunctioning parts as an assembly.

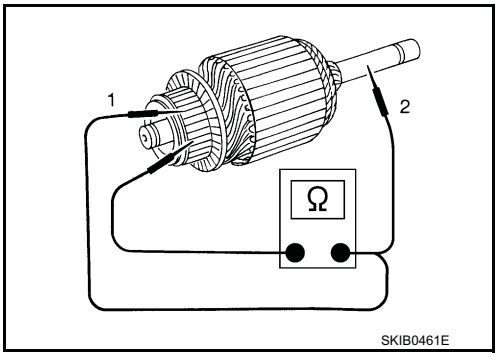
CAUTION:

Never clamp yoke in a vise or strike it with a hammer.

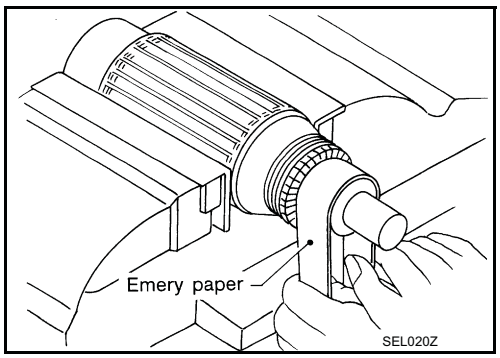


Armature Check

1. Continuity test (between two segments side by side)
   - Replace armature assembly if continuity does not exist.
2. Insulation test (between each commutator bar and shaft)
   - Replace armature assembly if continuity exists.



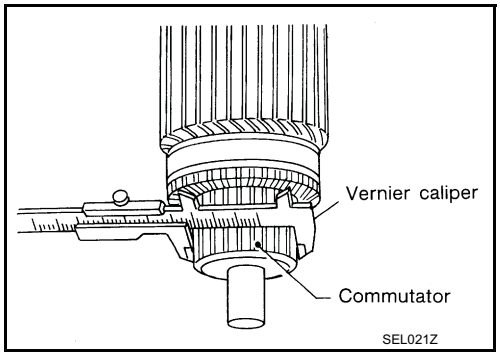
3. Check commutator surface.
   - Grind with No. 500 - 600 emery paper if it has a rough surface.



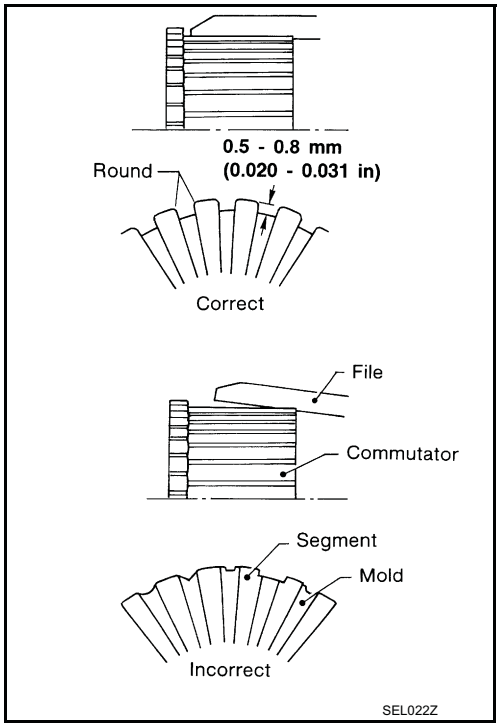
4. Check diameter of commutator.

   Commutator minimum diameter : **Refer to SDS STR-81, "Starter Motor".**

   - Replace armature assembly if the measurement value is less than the specified value.



5. Check depth of insulating mold from commutator surface.
   - Undercut to 0.5 to 0.8 mm (0.020 to 0.031 in) if the depth is 0.2 mm (0.008 in) or less.



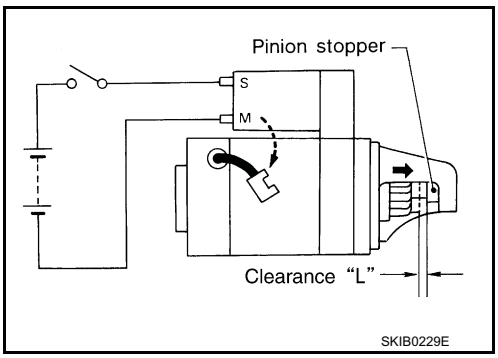
ADJUSTMENT

Pinion Protrusion Length Adjustment

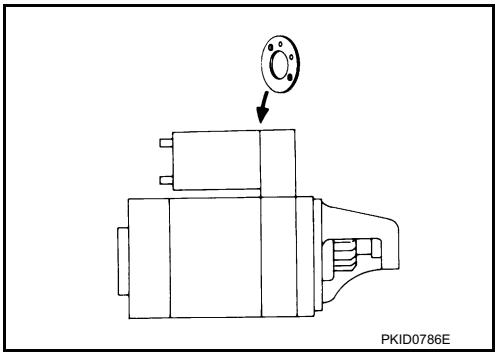
CLEARANCE

- With pinion driven out by magnetic switch, push pinion back to remove slack and measure clearance “L” between the front edge of the pinion and the pinion stopper.

Clearance “L” : Refer to SDS STR-81, "Starter Motor".



- Adjust with the adjusting plate if the measurement value is not in the specified area.

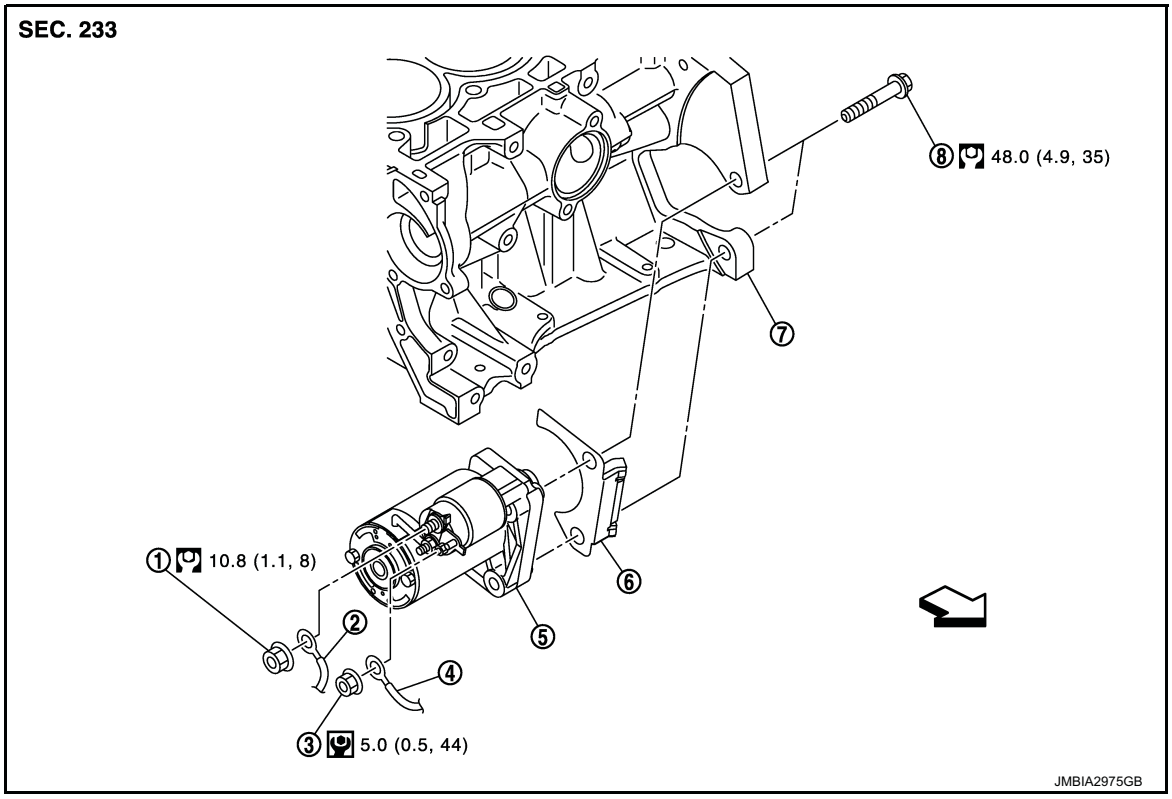


HR12DDR

HR12DDR : Exploded View

INFOID:0000000007315630

REMOVAL



1. “B” terminal nut
2. “B” terminal harness
3. “S” terminal nut
4. “S” terminal harness
5. Starter motor
6. Rear plate cover
7. Cylinder block
8. Starter motor mounting bolt

⇦ : Vehicle front

Refer to GI-4, "Components" for symbols not described on the above.

HR12DDR : Removal and Installation

INFOID:0000000007315631

REMOVAL

1. Disconnect the battery cable from the negative terminal. Refer to PG-529, "FOR MAINTENANCE REQUIRED BATTERY MODELS : Removal and Installation" (Maintenance required battery models) or PG-530, "FOR MAINTENANCE FREE BATTERY MODELS : Removal and Installation" (Maintenance free battery models).
2. Remove radiator core support upper.
   - For the vehicle type 3: Refer to DLK-537, "HR12DDR : Removal and Installation".
   - For the vehicle type 4: Refer to DLK-745, "HR12DDR : Removal and Installation".
   - For the vehicle type 5: Refer to DLK-892, "HR12DDR : Removal and Installation".
   - For the vehicle type 6: Refer to DLK-1022, "HR12DDR : Removal and Installation".

   Regarding to the vehicle type, refer to DLK-382, "Information".
3. Remove cooling fan assembly. Refer to CO-49, "Removal and Installation".
4. Remove radiator hose (lower) on water inlet side. Refer to CO-45, "Exploded View".
5. Remove “B” terminal nut and “B” terminal harness.
6. Remove “S” terminal nut and “S” terminal harness.
7. Remove starter motor mounting bolts.
8. Remove starter motor upward from the vehicle.

   CAUTION:
   For models with STOP/START SYSTEM, never erase the starter operation counter except when replacing starter motor.

INSTALLATION

Note the following items, and then install in the reverse order of removal.

CAUTION:

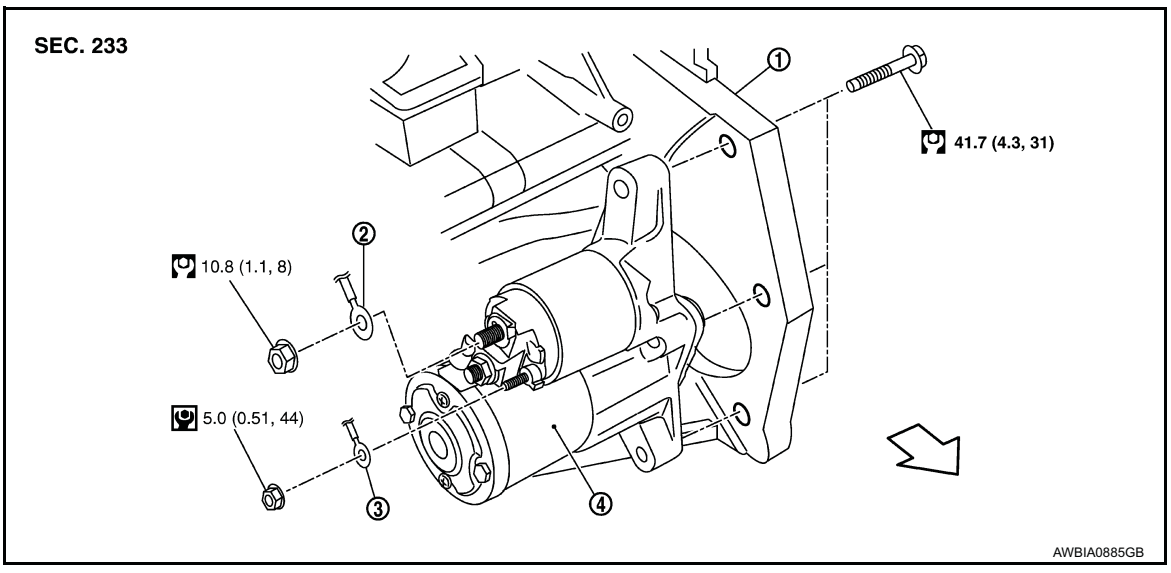
- **Be careful to tighten “B” terminal nut to the specified torque.**
- **Erase the starter operation counter when the starter motor for models with STOP/START SYSTEM is replaced. Refer to EC3-990, "Work Procedure".**
- **Replace the engine restart relay and the fuel pump relay when the starter motor models with STOP/START SYSTEM is replaced.**

HR15DE

HR15DE : Exploded View

INFOID:0000000006365141

REMOVAL



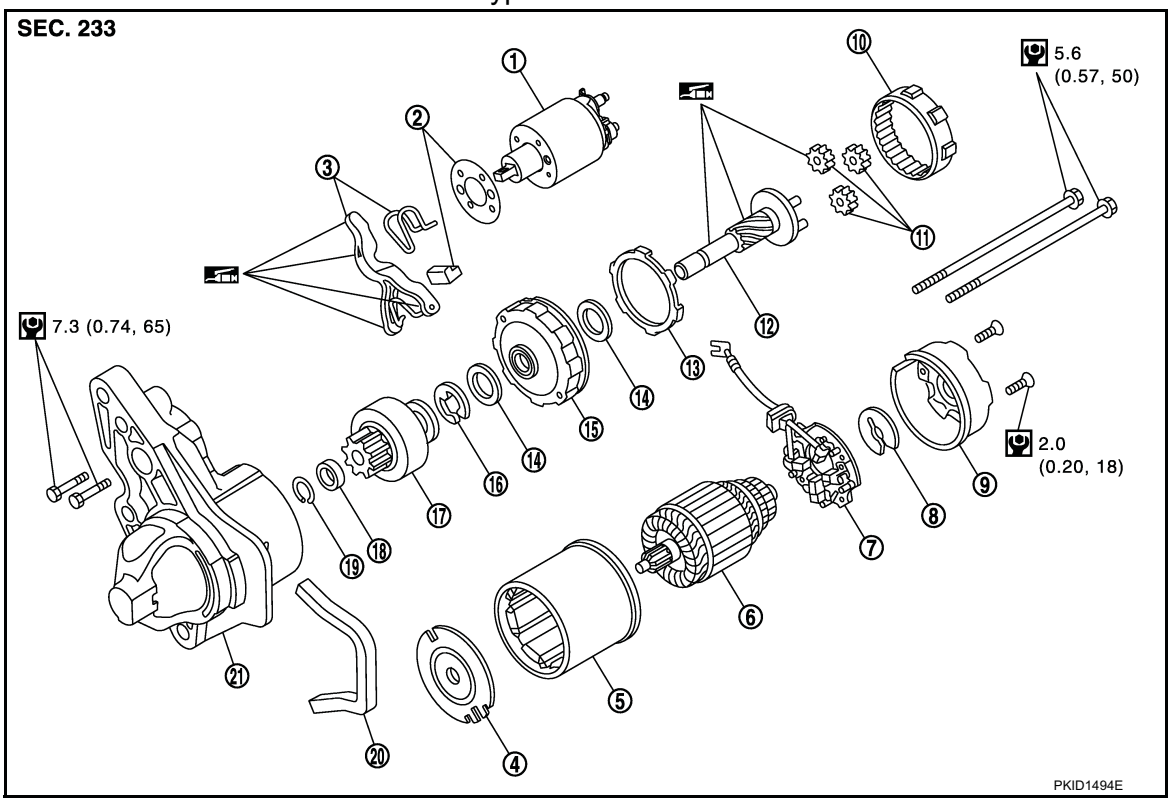
1. Cylinder block
2. “B” terminal harness
3. “S” terminal harness
4. Starter motor

⇦ : Vehicle front

Refer to GI-4, "Components" for symbols in the figure.

DISASSEMBLY

Type: S114-901B



1. Magnetic switch assembly
2. Adjusting plate
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. Internal gear
11. Planetary gear
12. Pinion shaft
13. Packing
14. Thrust washer
15. Center bracket (C)
16. E-ring
17. Pinion assembly
18. Pinion stopper
19. Pinion stopper clip
20. Seal rubber
21. Gear case assembly

: High-temperature grease point

Refer to GI-4, "Components" for symbols not described on the above.

HR15DE : Removal and Installation

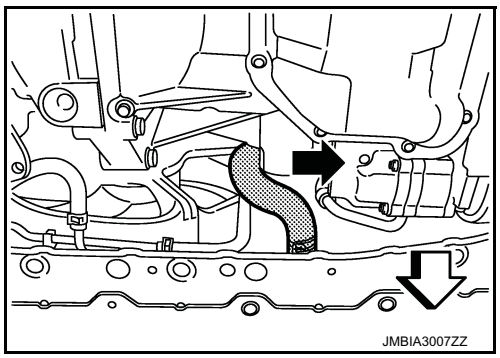
INFOID:0000000006363660

REMOVAL

1. Disconnect the battery cable from the negative terminal. Refer to PG-529, "FOR MAINTENANCE REQUIRED BATTERY MODELS : Removal and Installation" (Maintenance required battery models) or PG-530, "FOR MAINTENANCE FREE BATTERY MODELS : Removal and Installation" (Maintenance free battery models).
2. Remove air duct (inlet). Refer to EM-337, "Removal and Installation".
3. Remove “S” terminal nut and “S” terminal harness.
4. Remove “B” terminal nut and “B” terminal harness.
5. Remove starter motor mounting bolts.

6. Move radiator hose (lower) and secure work space.
CAUTION:
Perform this step when engine is cold.

⇦ : Vehicle front



7. Remove starter motor from underneath the vehicle.

INSTALLATION

Note the following item, and then install in the reverse order of removal.
CAUTION:
Be careful to tighten "B" terminal nut to the specified torque.

HR15DE : Inspection and Adjustment

INFOID:0000000006363661

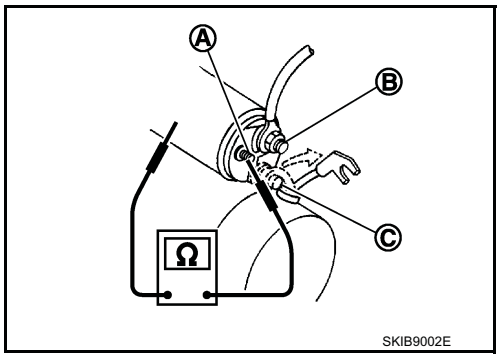
INSPECTION

Magnetic Switch Check
- Before starting to check, disconnect the battery cable from the negative terminal.
- Disconnect "M" terminal of starter motor.

1. Continuity test [between "S" terminal (A) and switch body]

B : "B" terminal
C : "M" terminal

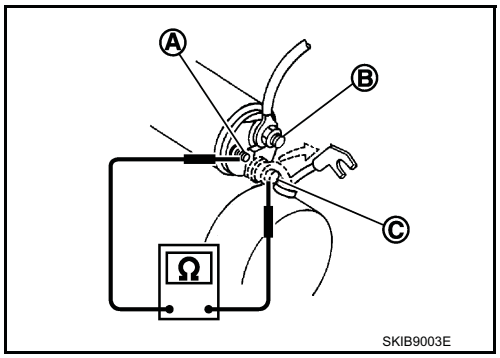
- Replace magnetic switch if continuity does not exist.



2. Continuity test [between "S" terminal (A) and "M" terminal (C)]

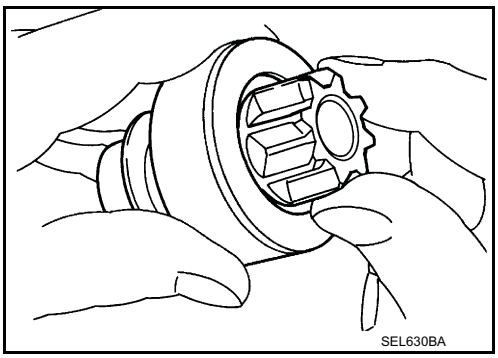
B : "B" terminal

- Replace magnetic switch if continuity does not exist.



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 (If equipped).
   - 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.
   - Replace pinion assembly if it is locked or rotated in both directions or unusual resistance is evident.

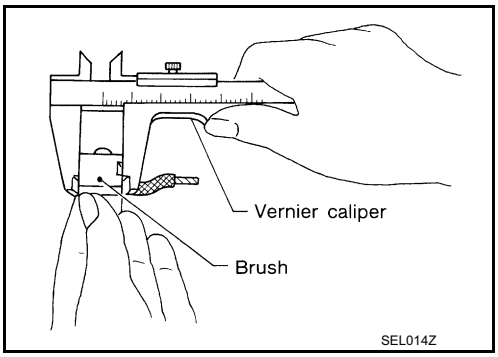


Brush Check

- Check wear of brush.

Minimum length of brush : **Refer to SDS STR-81, "Starter Motor".**

- Replace brush if the measurement value is less than the specified value.

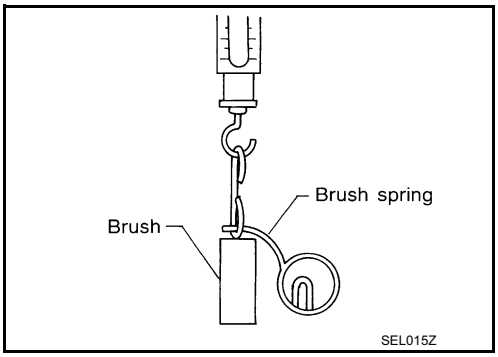


Brush Spring Check

- Check brush spring tension with brush spring detached from brush.

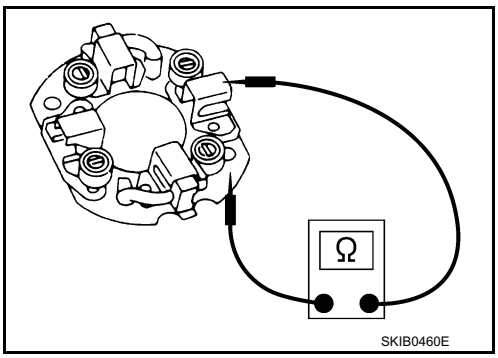
Spring tension (with new brush) : **Refer to SDS STR-81, "Starter Motor".**

- Replace brush spring if the measurement value is less than the specified value.



Brush Holder Check

1. Perform insulation test between brush holder (positive side) and its base (negative side).
   - Replace brush holder assembly if continuity does not exist.
2. Check brush to see if it moves smoothly.
   - If brush holder is bent, replace it; if sliding surface is dirty, clean.

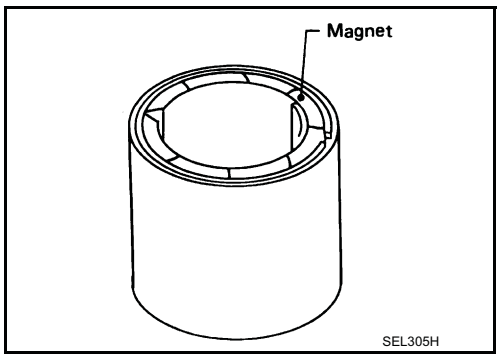


Yoke Check

Magnet is secured to yoke by bonding agent. Check magnet to see that it is secured to yoke and for any cracks. Replace malfunctioning parts as an assembly.

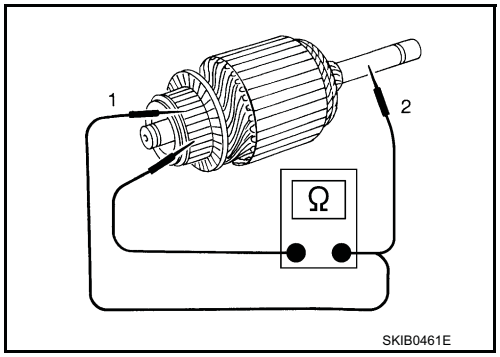
CAUTION:

Never clamp yoke in a vise or strike it with a hammer.

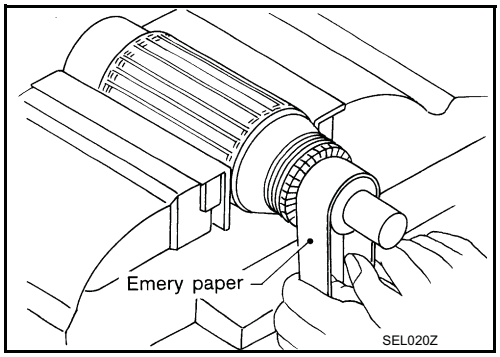


Armature Check

1. Continuity test (between two segments side by side)
   - Replace armature assembly if continuity does not exist.
2. Insulation test (between each commutator bar and shaft)
   - Replace armature assembly if continuity exists.



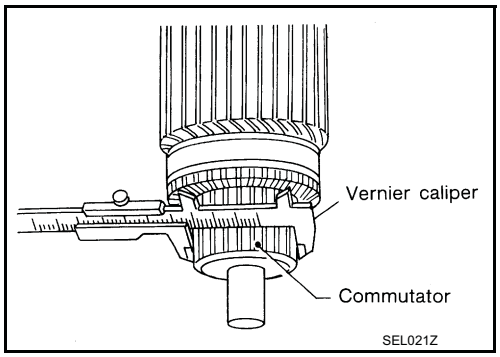
3. Check commutator surface.
   - Grind with No. 500 - 600 emery paper if it has a rough surface.



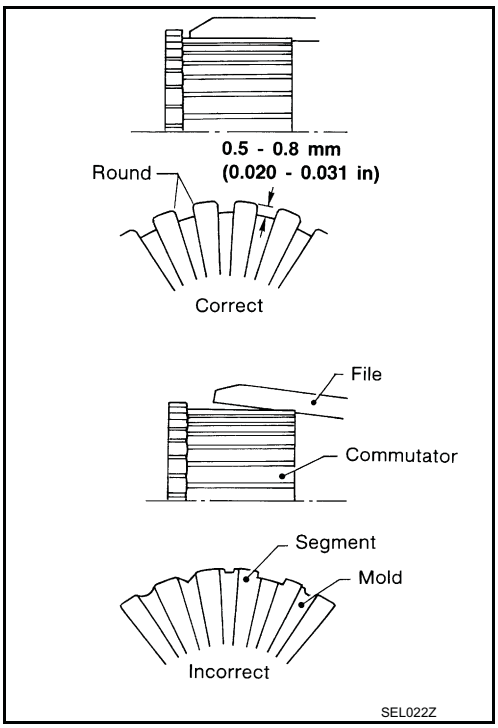
4. Check diameter of commutator.

Commutator minimum diameter	**: Refer to SDS STR-81, "Starter Motor".**

   - Replace armature assembly if the measurement value is less than the specified value.



5. Check depth of insulating mold from commutator surface.
   - Undercut to 0.5 to 0.8 mm (0.020 to 0.031 in) if the depth is 0.2 mm (0.008 in) or less.



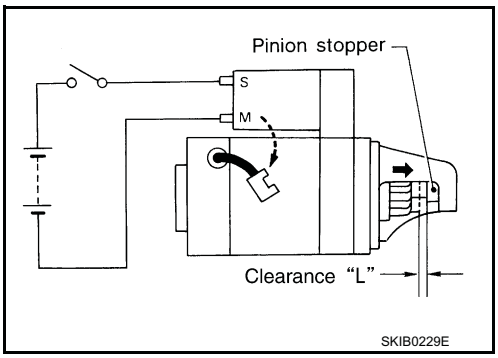
ADJUSTMENT

Pinion Protrusion Length Adjustment

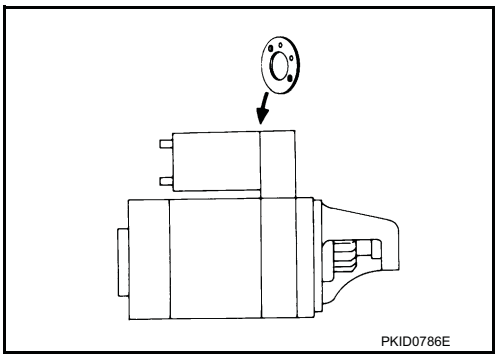
CLEARANCE

- With pinion driven out by magnetic switch, push pinion back to remove slack and measure clearance “L” between the front edge of the pinion and the pinion stopper.

Clearance “L” : Refer to SDS STR-81, "Starter Motor".



- Adjust with the adjusting plate if the measurement value is not in the specified area.

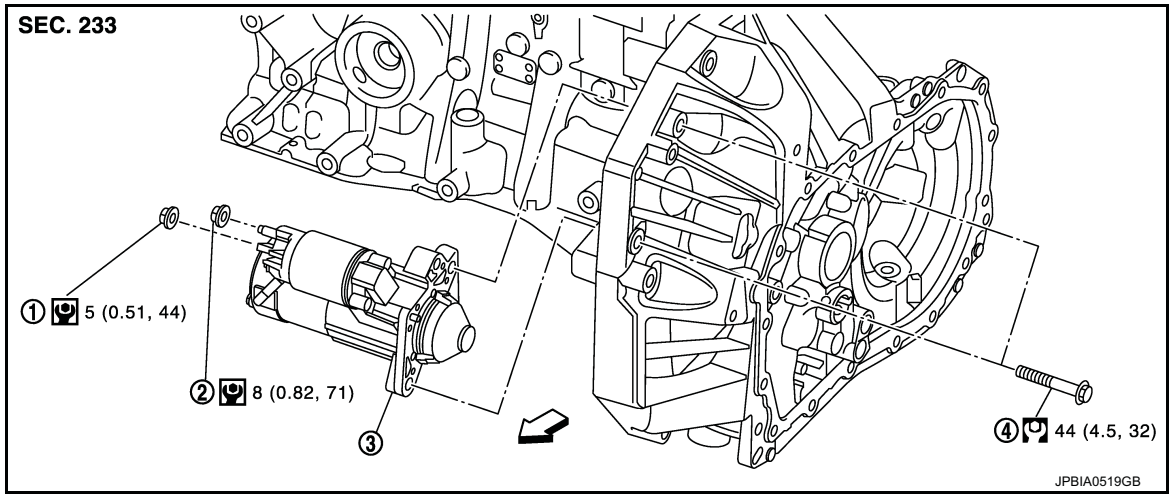


K9K

K9K : Exploded View

INFOID:0000000006833314

REMOVAL



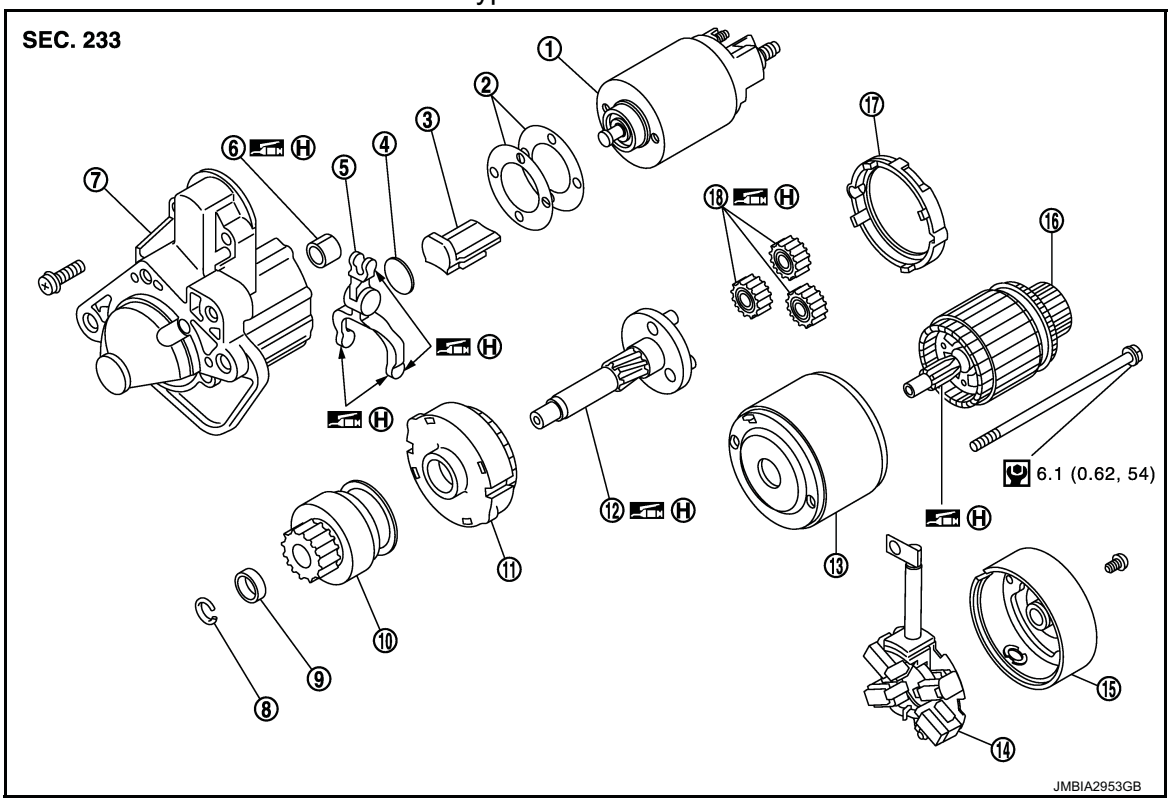
1. “S” terminal nut
2. “B” terminal nut
3. Starter motor
4. Starter motor mounting bolt

⇦ : Vehicle front

Refer to GI-4, "Components" for symbols in the figure.

DISASSEMBLY

Type: M000T87881



1. Magnetic switch assembly
2. Adjusting plate
3. Packing
4. Plate
5. Shift lever
6. Metal FR
7. Gear case
8. Stopper ring
9. Stopper
10. Pinion assembly
11. Internal gear
12. Gear shaft
13. Yoke
14. Brush holder assembly
15. Rear cover
16. Armature
17. Packing
18. Planetary gear

(H): High-temperature grease point

Refer to GI-4, "Components" for symbols not described on the above.

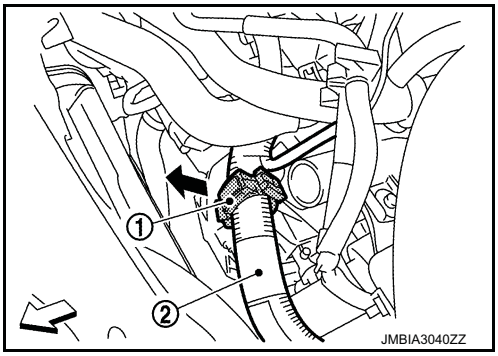
K9K : Removal and Installation

INFOID:0000000006833315

REMOVAL

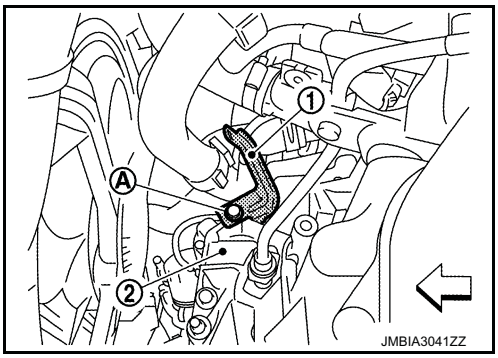
1. Disconnect the battery cable from the negative terminal. Refer to PG-529, "FOR MAINTENANCE REQUIRED BATTERY MODELS : Removal and Installation" (Maintenance required battery models) or PG-530, "FOR MAINTENANCE FREE BATTERY MODELS : Removal and Installation" (Maintenance free battery models).
2. Remove air duct (inlet). Refer to EM-461, "Removal and Installation".
3. Remove harness clamp (1), and then move engine control harness (2) and secure work space.

   ⇦ : Vehicle front



4. Remove mounting bolt (A), and then remove harness bracket (1) from transaxle (2).

   ⇦ : Vehicle front



5. Remove “S” terminal nut and “S” terminal harness.
6. Remove “B” terminal nut and “B” terminal harness.
7. Remove starter motor mounting bolts.
8. Remove starter motor from underneath the vehicle.

INSTALLATION

Note the following item, and then install in the reverse order of removal.

CAUTION:

Be careful to tighten “B” terminal nut to the specified torque.

K9K : Inspection and Adjustment

INFOID:0000000006834802

INSPECTION

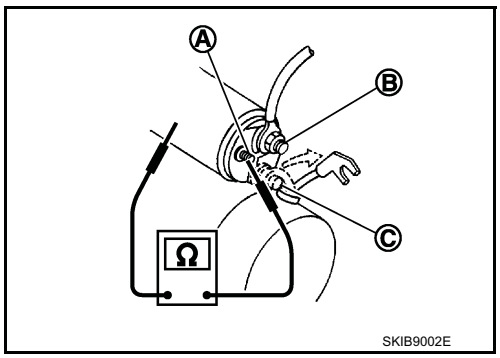
Magnetic Switch Check

- Before starting to check, disconnect the battery cable from the negative terminal.
- Disconnect “M” terminal of starter motor.

1. Continuity test [between “S” terminal (A) and switch body]

B : “B” terminal
C : “M” terminal

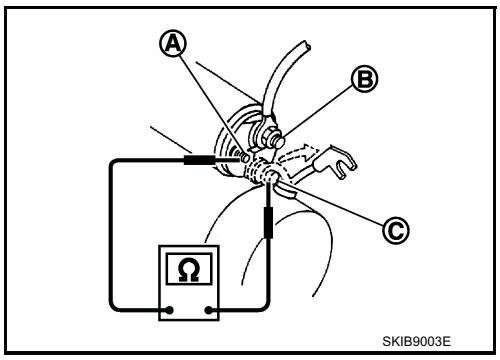
- Replace magnetic switch if continuity does not exist.



2. Continuity test [between “S” terminal (A) and “M” terminal (C)]

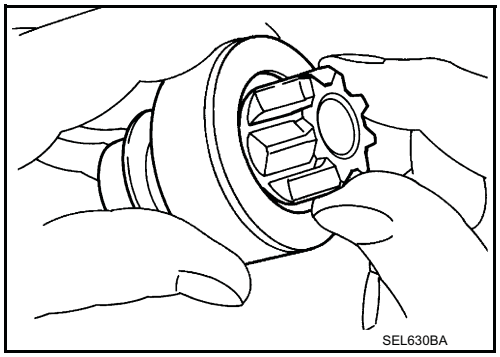
B : “B” terminal

- Replace magnetic switch if continuity does not exist.



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 (If equipped).
   - 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.
   - Replace pinion assembly if it is locked or rotated in both directions or unusual resistance is evident.

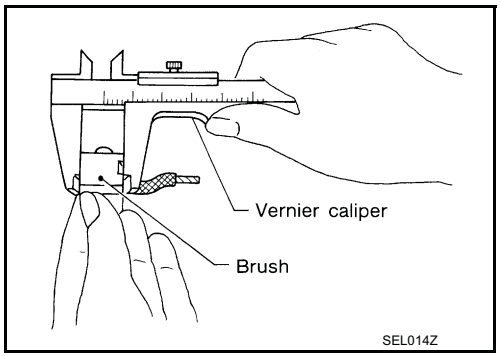


Brush Check

- Check wear of brush.

Minimum length of brush : **Refer to SDS STR-81, "Starter Motor".**

- Replace brush if the measurement value is less than the specified value.

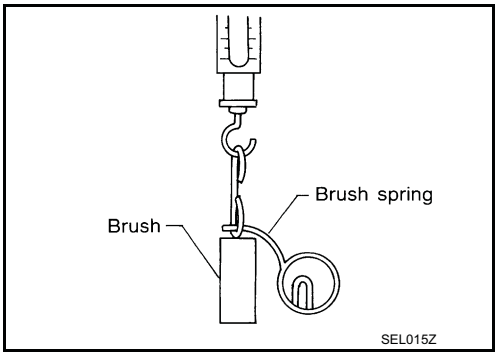


Brush Spring Check

- Check brush spring tension with brush spring detached from brush.

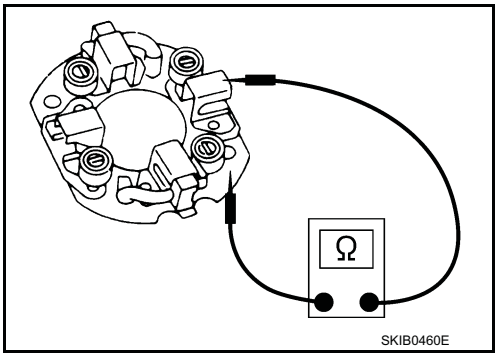
Spring tension (with new brush) : **Refer to SDS STR-81, "Starter Motor".**

- Replace brush spring if the measurement value is less than the specified value.



Brush Holder Check

1. Perform insulation test between brush holder (positive side) and its base (negative side).
   - Replace brush holder assembly if continuity does not exist.
2. Check brush to see if it moves smoothly.
   - If brush holder is bent, replace it; if sliding surface is dirty, clean.

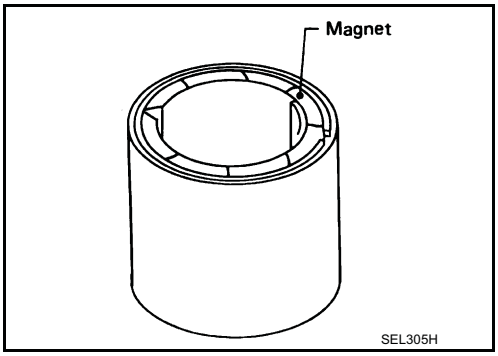


Yoke Check

Magnet is secured to yoke by bonding agent. Check magnet to see that it is secured to yoke and for any cracks. Replace malfunctioning parts as an assembly.

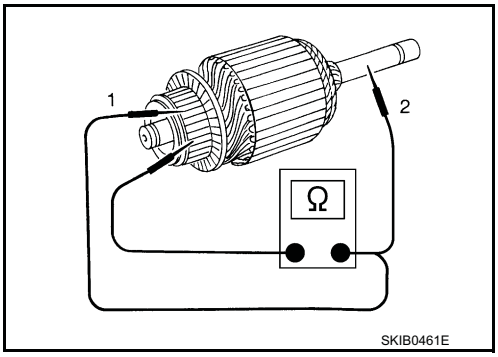
CAUTION:

Never clamp yoke in a vise or strike it with a hammer.

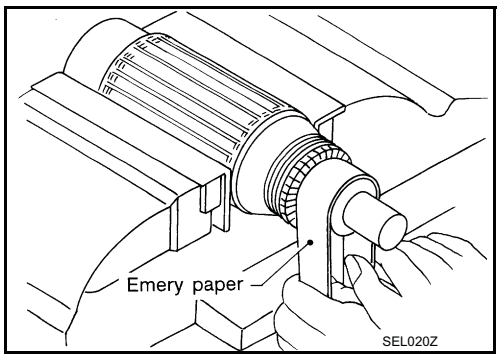


Armature Check

1. Continuity test (between two segments side by side)
   - Replace armature assembly if continuity does not exist.
2. Insulation test (between each commutator bar and shaft)
   - Replace armature assembly if continuity exists.



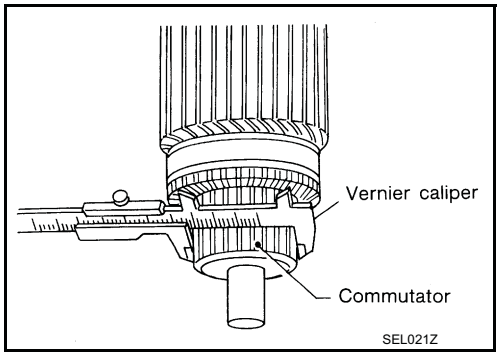
3. Check commutator surface.
   - Grind with No. 500 - 600 emery paper if it has a rough surface.



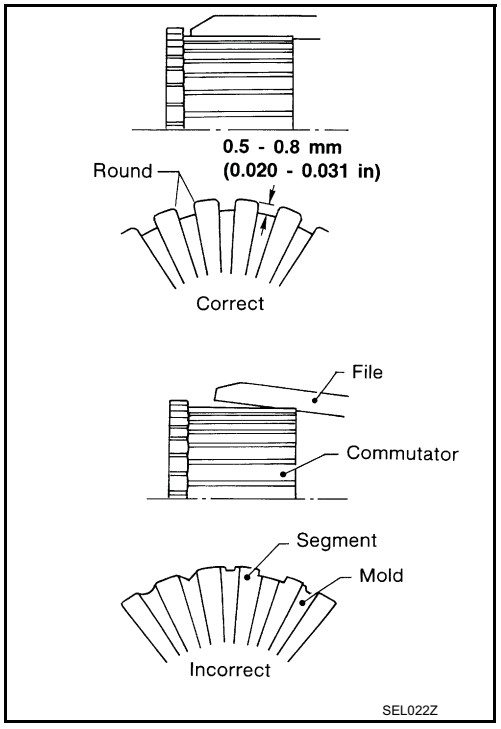
4. Check diameter of commutator.

Commutator minimum diameter	**: Refer to SDS STR-81, "Starter Motor".**

   - Replace armature assembly if the measurement value is less than the specified value.



5. Check depth of insulating mold from commutator surface.
   - Undercut to 0.5 to 0.8 mm (0.020 to 0.031 in) if the depth is 0.2 mm (0.008 in) or less.



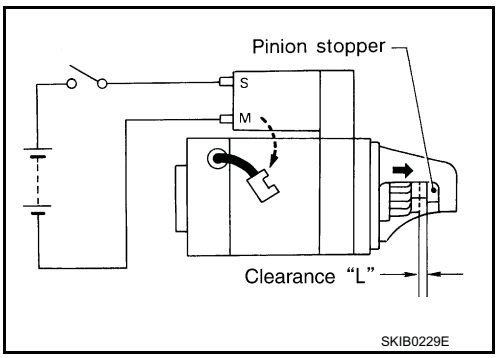
ADJUSTMENT

Pinion Protrusion Length Adjustment

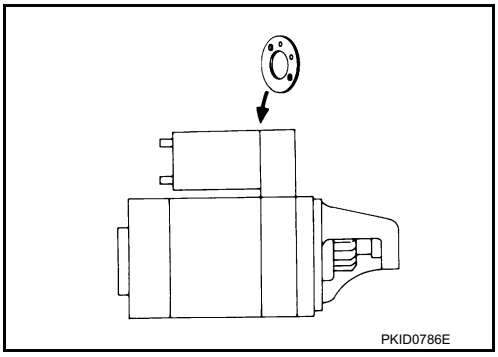
CLEARANCE

- With pinion driven out by magnetic switch, push pinion back to remove slack and measure clearance “L” between the front edge of the pinion and the pinion stopper.

Clearance “L” : Refer to SDS STR-81, "Starter Motor".



- Adjust with the adjusting plate if the measurement value is not in the specified area.



SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Starter Motor

INFOID:0000000006057534

Engine			HR12DE		HR12DDR	HR15DE	K9K
Type			1196052	M000T33671ZT	M000T37871	S114 - 901	M000T87881
			VALEO make	MITSUBISHI make		HITACHI make	MITSUBISHI mak
			Direct drive type	Reduction gear type			
System voltage		[V]	12				
No-load	Terminal voltage	[V]	11		—	11	11.5
	Current	[A]	Less than 70	Less than 95	—	Less than 110	Less than 90
	Revolution	[rpm]	More than 6,000	More than 3,000	—	More than 3,000	More than 2,500
Minimum diameter of commutator		[mm (in)]	29.3 (1.153)	28.8 (1.134)	—	28.0 (1.102)	28.8 (1.134)
Minimum length of brush		[mm (in)]	7.5 (0.295)	5.5 (0.217)	—	10.5 (0.413)	5.5 (0.217)
Brush spring tension		[N (kg, lb)]	18.5 (1.88, 4.11)	15.0 - 20.4 (1.53 - 2.08, 3.37 - 4.59)	—	16.2 (1.65, 3.6)	15.0 - 20.4 (1.53 - 2.08, 3.37 - 4.59)
Clearance between bearing metal and armature shaft		[mm (in)]	Less than 0.08 (0.003)	Less than 0.2 (0.008)	—	Less than 0.2 (0.008)	
Clearance “L” between pinion front edge and pinion stopper		[mm (in)]	0 (0)	0.5 - 2.0 (0.020 - 0.0787)	—	0.3 - 2.5 (0.012 - 0.095)	Less than 0.2 (0.008)