

# ENGINE CONTROL SYSTEM

## SECTION EC

### MODIFICATION NOTICE:

#### Gasoline engine

- Wiring Diagrams for KA24DE engine models have been changed.

#### Diesel engine

- YD25DDTi engine models have been added for Middle East. For specifications other than those described here, refer to YD25DDTi engine of Supplement-VI 1st Revision Volume 1 (SM1E-1D22FG1).
- Wiring Diagrams for YD25DDTi (except for Middle East), ZD30DDT, TD27 and QD32 engine models have been changed.

## CONTENTS

<input type="checkbox"/> KA24DE <input type="checkbox"/>	<b>DTC 0402 P9-FUEL TEMP SEN</b> .....45
	Wiring Diagram .....45
<b>TR Trouble Diagnosis for Non-Detectable Items</b> .....3	<b>DTC 0403 ACCEL POS SENSOR</b> .....46
Vehicle Speed Sensor (VSS) .....3	Wiring Diagram .....46
MIL & Data Link Connectors .....5	<b>DTC 0701 P1-CAM POS SEN</b> .....48
	Wiring Diagram .....48
<input type="checkbox"/> QD & TD <input type="checkbox"/>	<b>DTC 0702 P2-TDC PULSE SIG</b> .....49
<b>QUICK-GLOW SYSTEM</b> .....9	Wiring Diagram .....49
Wiring Diagram .....9	<b>DTC 0703 P3-PUMP COMM LINE</b> .....50
	Wiring Diagram .....50
<input type="checkbox"/> YD25DDTi <input type="checkbox"/>	<b>DTC 0704 P4-SPILL/V CIRC, DTC 0706 P6-SPILL VALVE</b> .....51
<b>ENGINE AND EMISSION CONTROL OVERALL SYSTEM</b> .....20	Wiring Diagram .....51
Circuit Diagram .....20	<b>DTC 0707 P7-F/INJ TIMG FB</b> .....52
<b>TR Trouble Diagnosis for Power Supply</b> .....21	Wiring Diagram .....52
Main Power Supply and Ground Circuit.....21	<b>DTC 0902 ECM RLY</b> .....53
<b>DTC 0104 VEHICLE SPEED SEN</b> .....28	Wiring Diagram .....53
Wiring Diagram .....28	Diagnostic Procedure .....54
<b>DTC 0208 OVER HEAT (FOR MIDDLE EAST)</b> .....30	<b>DTC 1004 FUEL CUT SYSTEM1</b> .....56
Description .....30	Wiring Diagram .....56
CONSULT-II Reference Value in Data Monitor Mode .....30	<b>GLOW CONTROL SYSTEM</b> .....57
ECM Terminals and Reference Value .....31	Wiring Diagram .....57
On Board Diagnosis Logic.....31	<b>PARK/NEUTRAL POSITION (PNP) SWITCH</b> .....58
Overall Function Check .....32	Wiring Diagram .....58
Wiring Diagram .....33	Diagnostic Procedure .....59
Diagnostic Procedure .....34	<b>HEAT UP SWITCH</b> .....62
Main 12 Causes of Overheating.....44	Wiring Diagram .....62
	<b>MIL &amp; DATA LINK CONNECTORS</b> .....63
	Wiring Diagram .....63

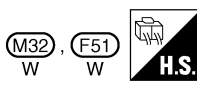
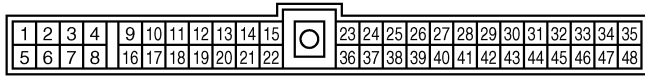
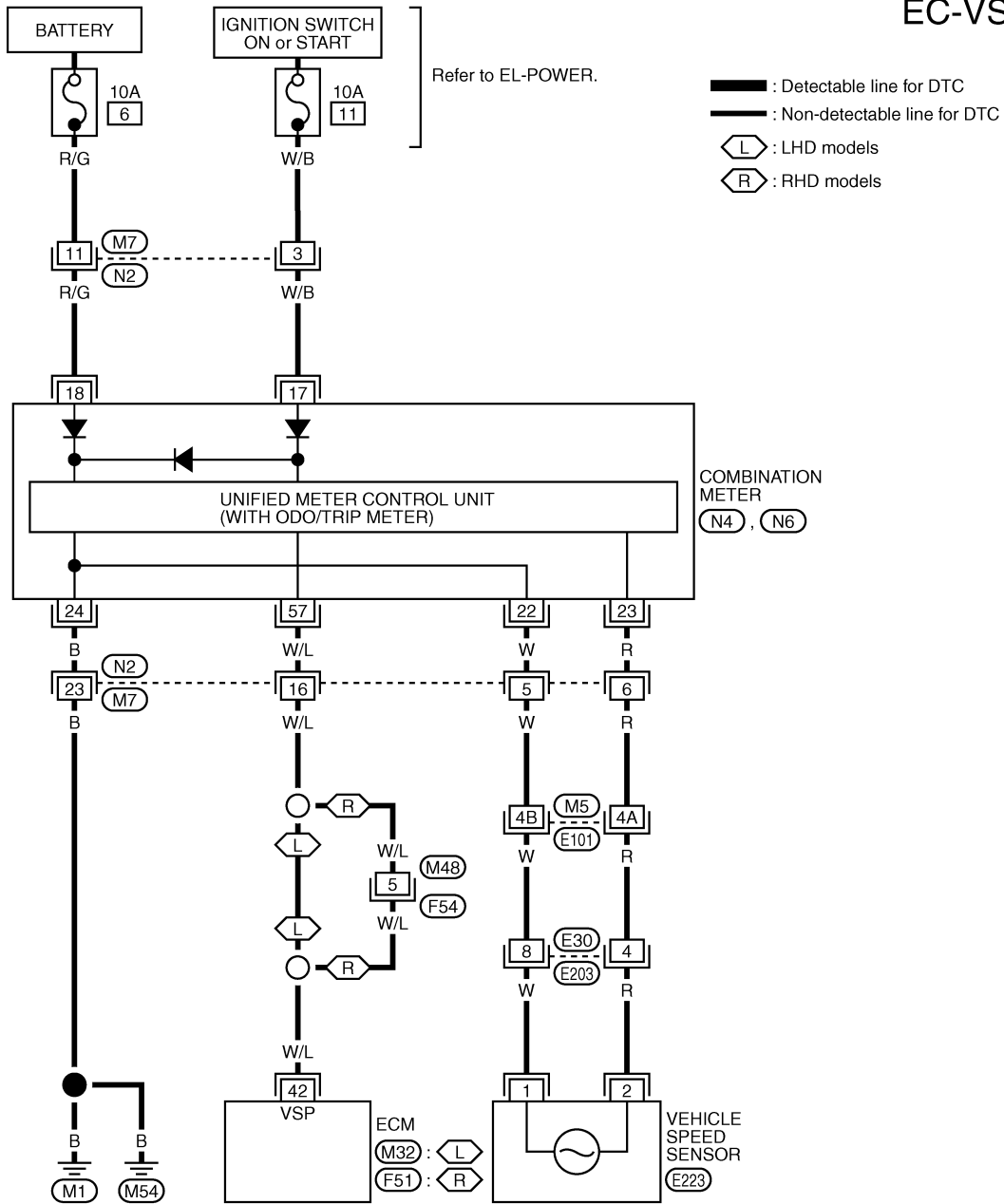
# CONTENTS (Cont'd)

<input type="text"/>	ZD30DDT	<input type="text"/>	<b>GLOW CONTROL SYSTEM</b> .....	70
			Wiring Diagram .....	70
<b>ENGINE AND EMISSION CONTROL OVERALL</b>			<b>HEAT UP SWITCH</b> .....	71
<b>SYSTEM</b> .....			Wiring Diagram .....	71
Circuit Diagram .....			<b>MIL &amp; DATA LINK CONNECTORS</b> .....	72
<b>DTC 0104 VEHICLE SPEED SEN</b> .....			Wiring Diagram .....	72
Wiring Diagram .....				

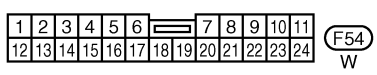
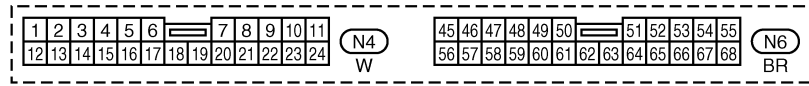
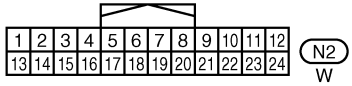
Vehicle Speed Sensor (VSS)

MODELS WITH TACHOMETER

EC-VSS-01



Refer to last page (Foldout page).

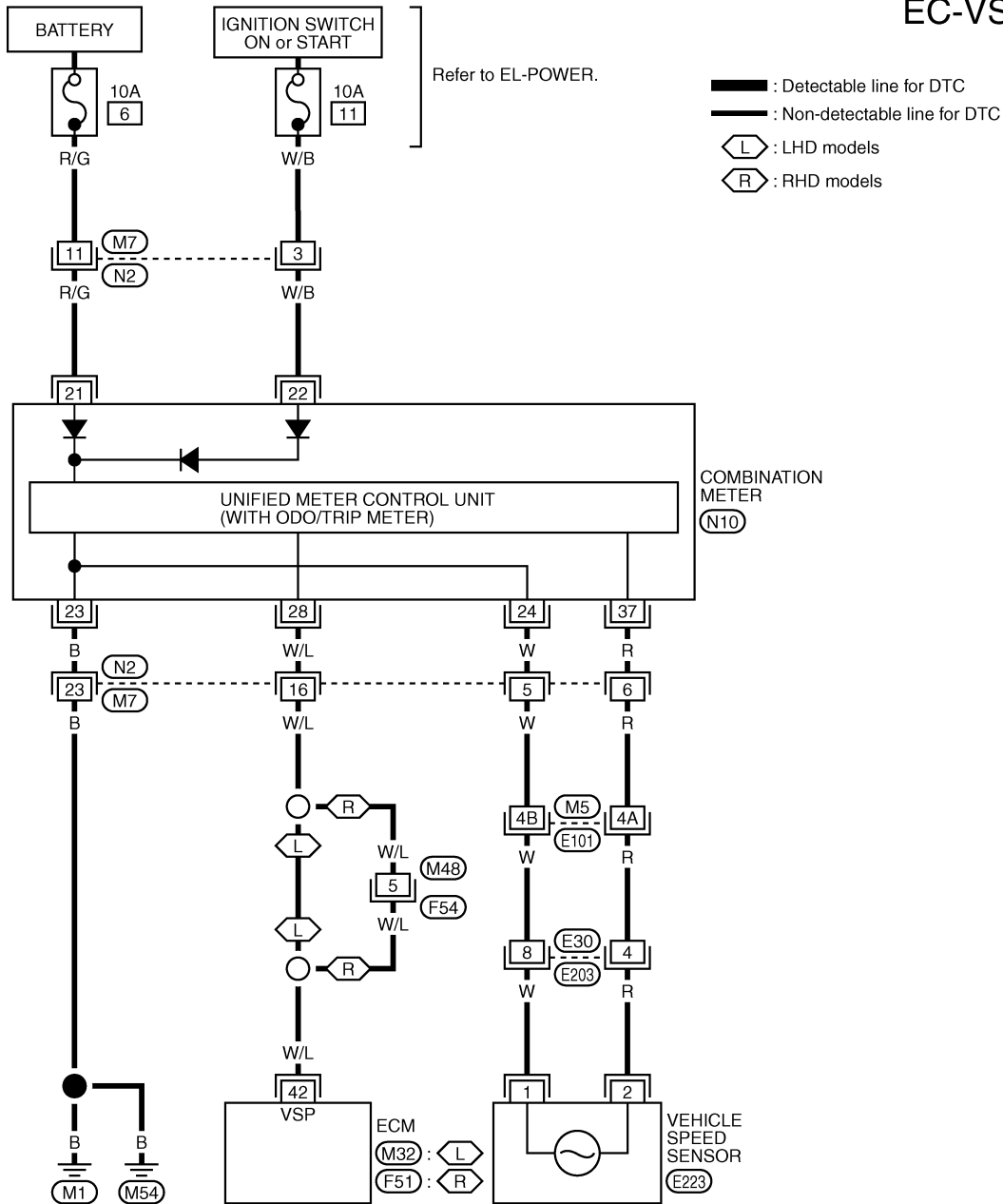


GI  
MA  
EM  
LC  
**EC**  
FE  
CL  
MT  
AT  
TF  
PD  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX

Vehicle Speed Sensor (VSS) (Cont'd)

MODELS WITHOUT TACHOMETER

EC-VSS-02



1	2	3	4	9	10	11	12	13	14	15	23	24	25	26	27	28	29	30	31	32	33	34	35
5	6	7	8	16	17	18	19	20	21	22	36	37	38	39	40	41	42	43	44	45	46	47	48



Refer to last page (Foldout page).

M5, E101

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24

N2  
W

21	22	23	24	25	26	27	28	29		
30	31	32	33	34	35	36	37	38	39	40

N10  
BR



1	2	3	4	5	6	7	8	9	10	11		
12	13	14	15	16	17	18	19	20	21	22	23	24

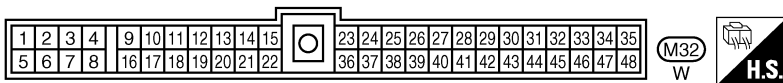
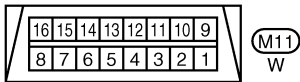
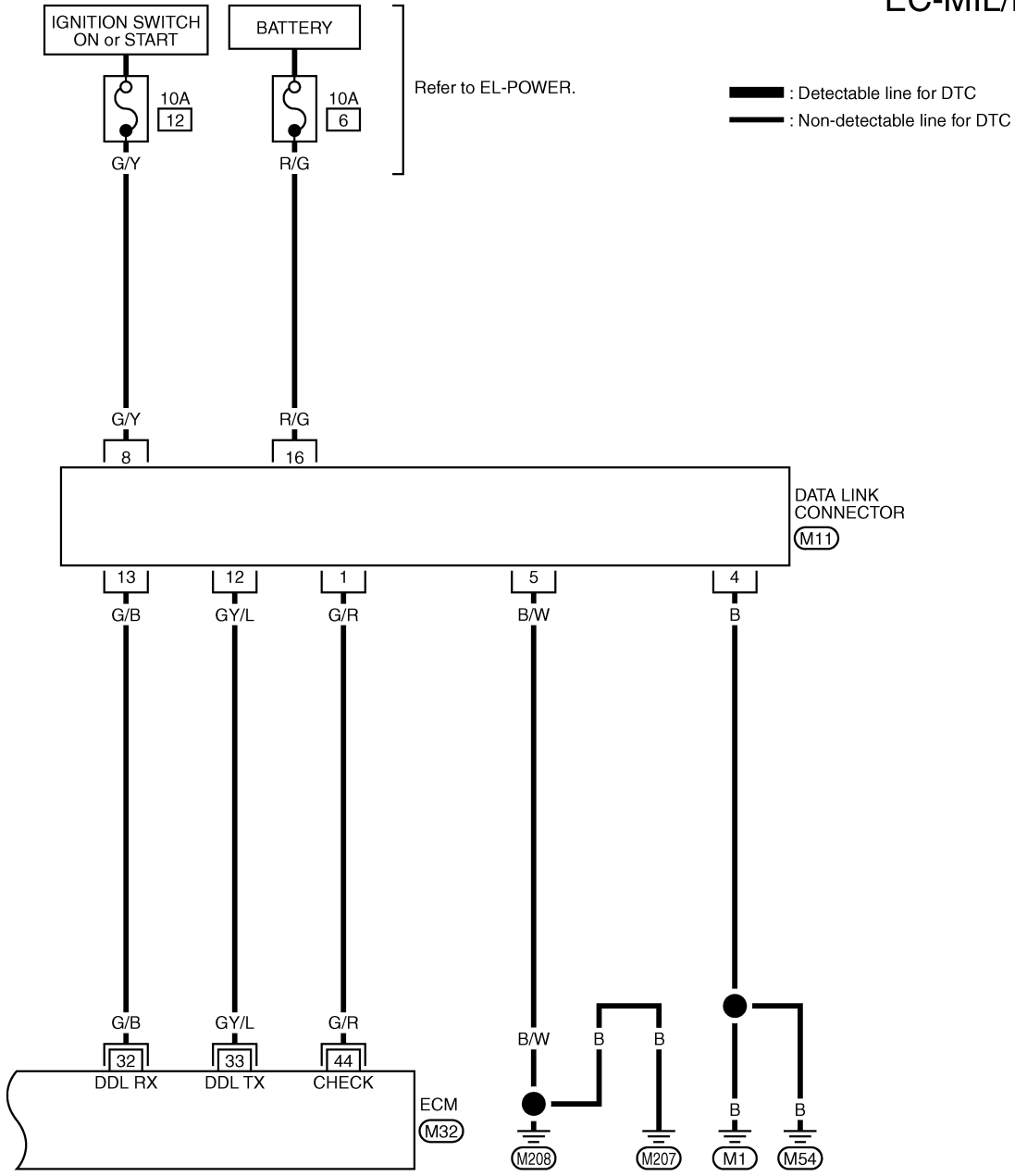
F54  
W



MIL & Data Link Connectors (Cont'd)

LHD MODELS

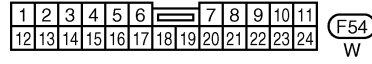
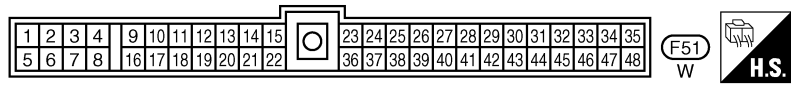
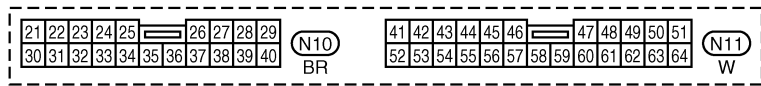
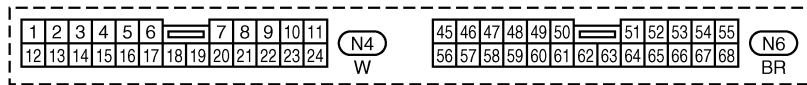
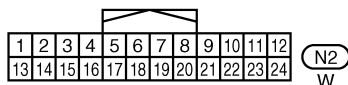
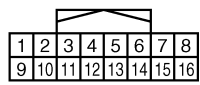
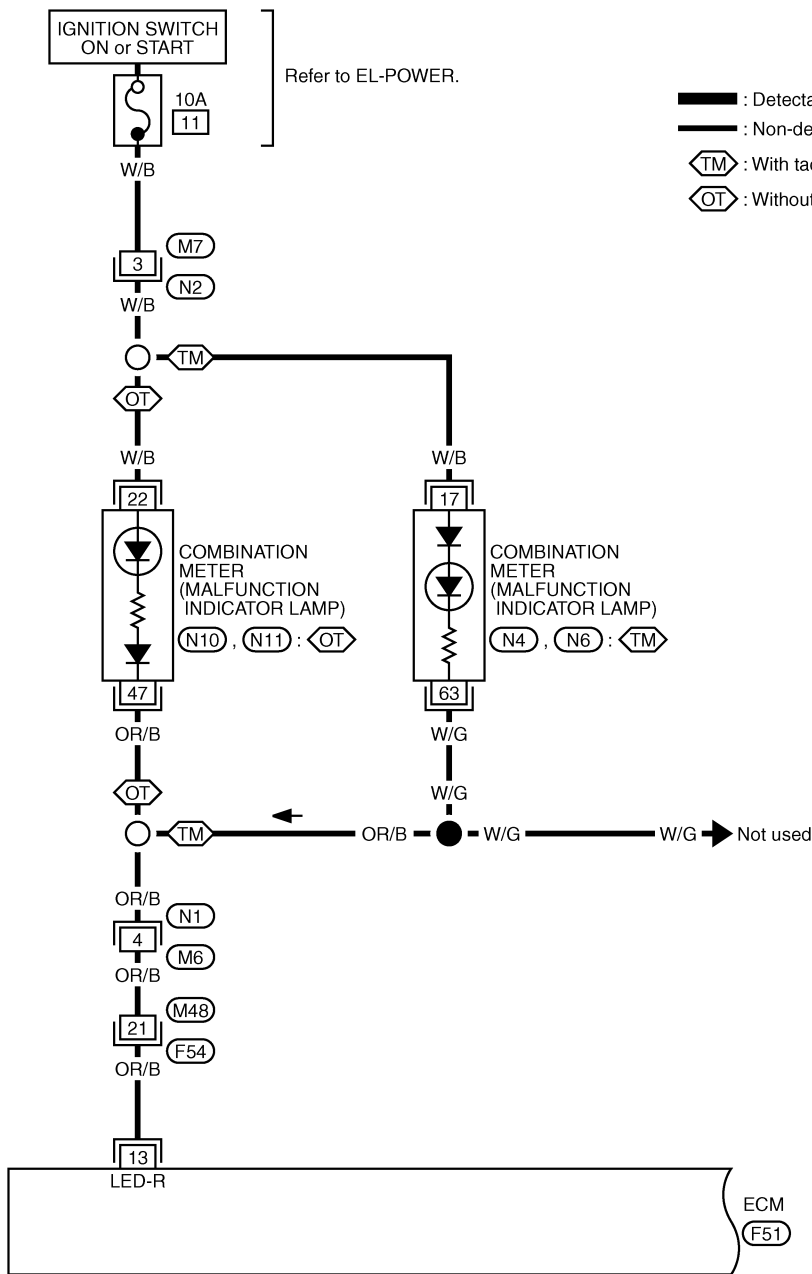
EC-MIL/DL-02



MIL & Data Link Connectors (Cont'd)

RHD MODELS

EC-MIL/DL-03

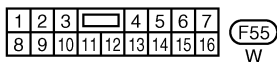
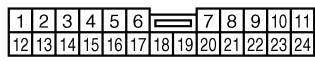
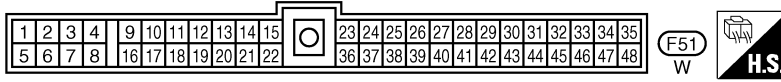
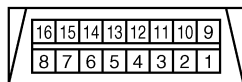
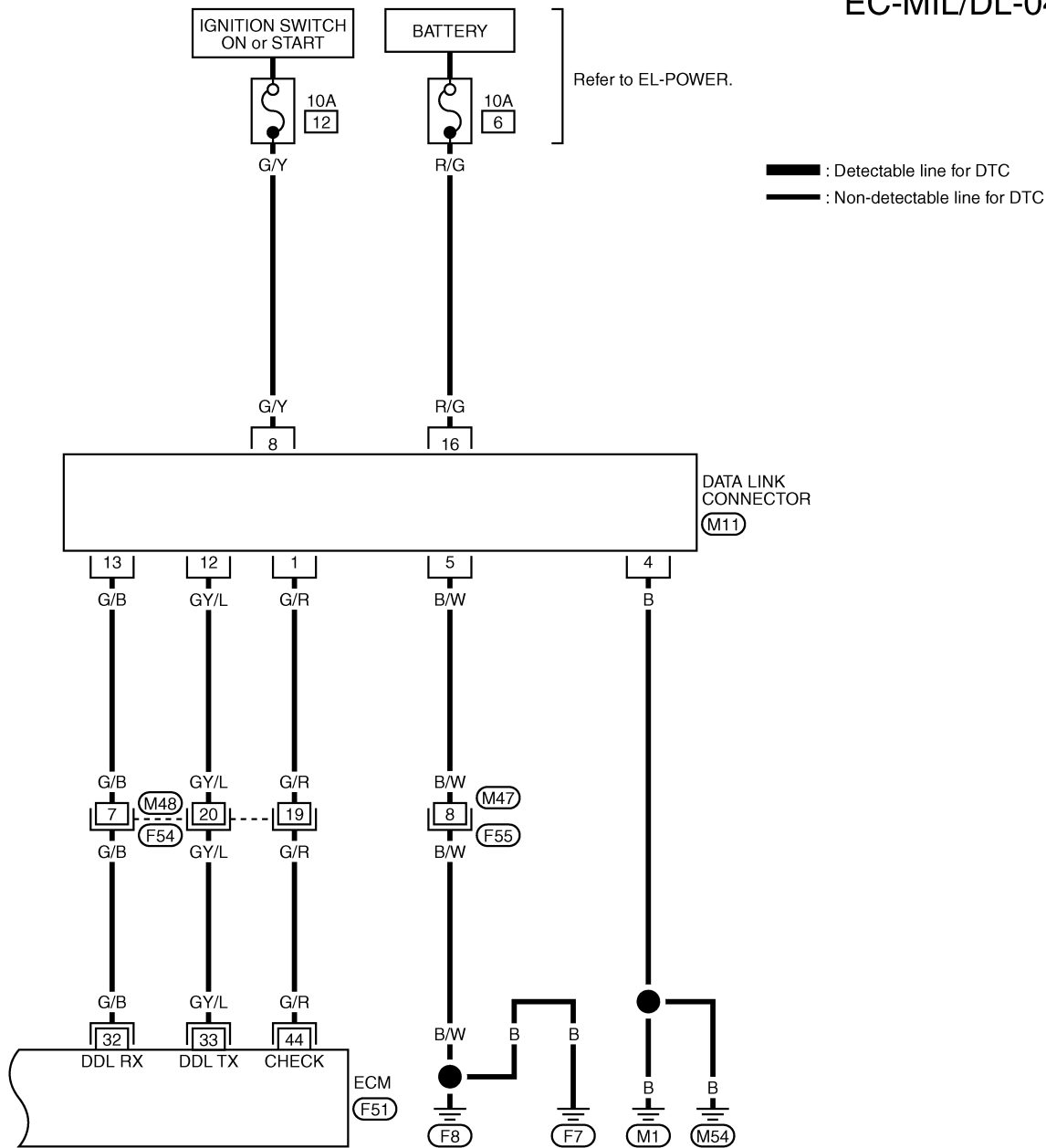


GI  
MA  
EM  
LC  
EC  
FE  
CL  
MT  
AT  
TF  
PD  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX

MIL & Data Link Connectors (Cont'd)

RHD MODELS

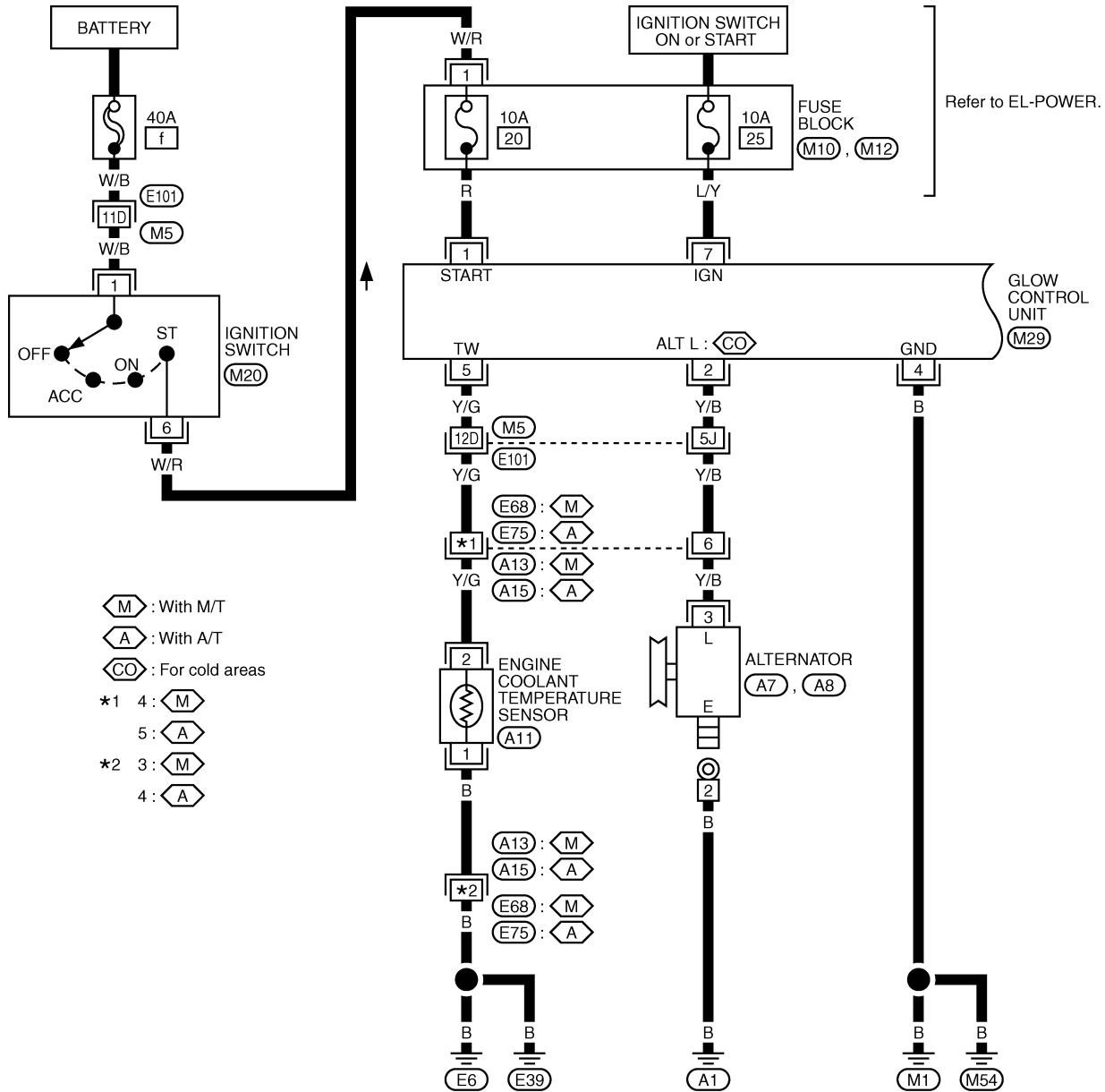
EC-MIL/DL-04



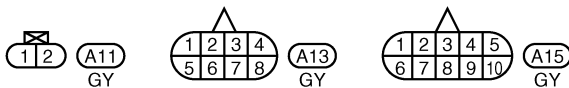
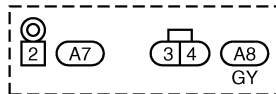
Wiring Diagram

LHD MODELS WITH TD27 ENGINE (EXCEPT COLD AREAS) AND QD32 ENGINE

EC-GLOW-01



- M : With M/T
- A : With A/T
- CO : For cold areas
- \*1 4: M
- 5: A
- \*2 3: M
- 4: A



Refer to last page (Foldout page).

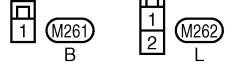
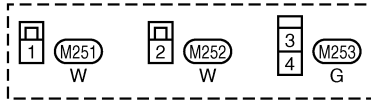
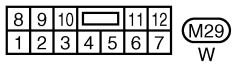
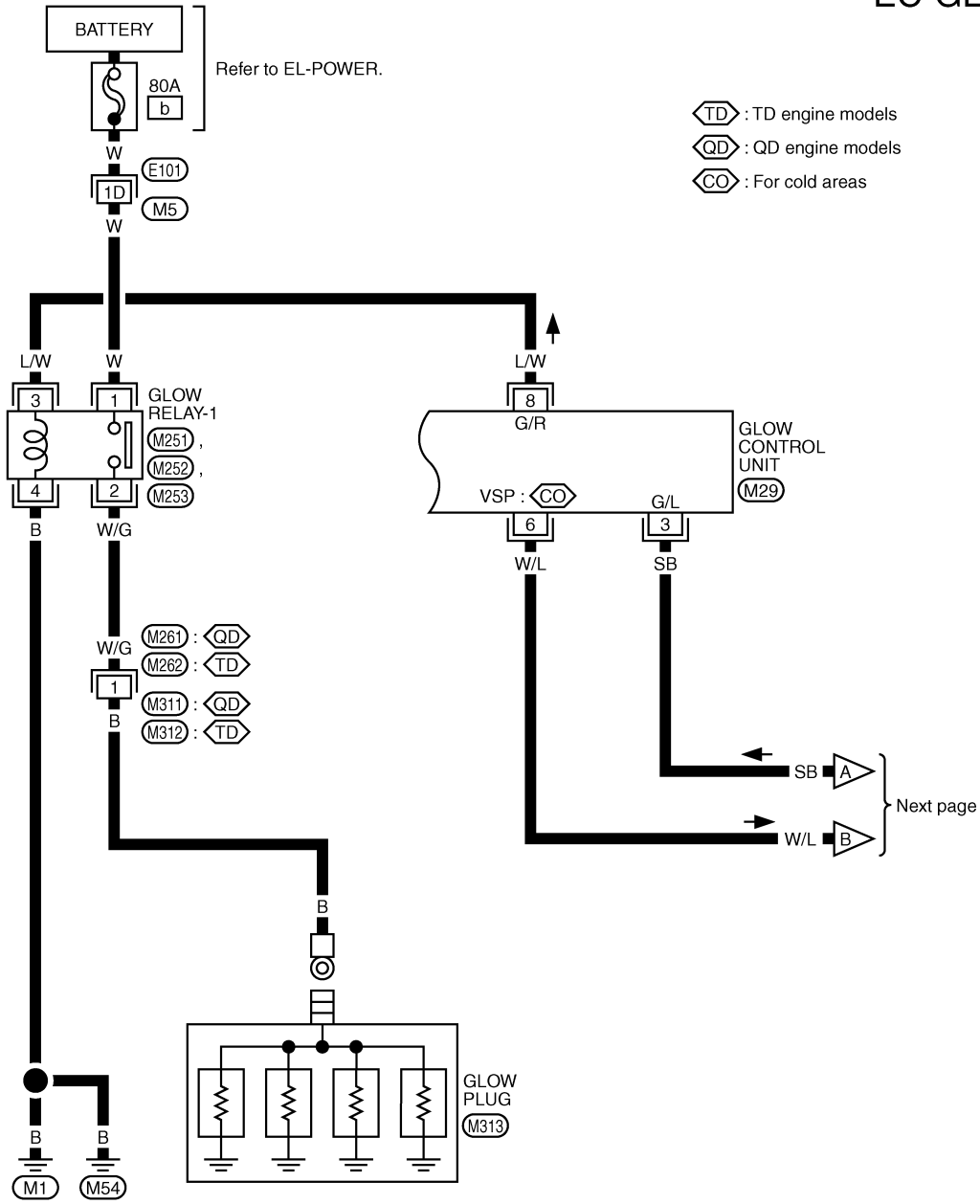
- M5, E101
- M10

GI  
MA  
EM  
LC  
EC  
FE  
CL  
MT  
AT  
TF  
PD  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX

# QUICK-GLOW SYSTEM

## Wiring Diagram (Cont'd)

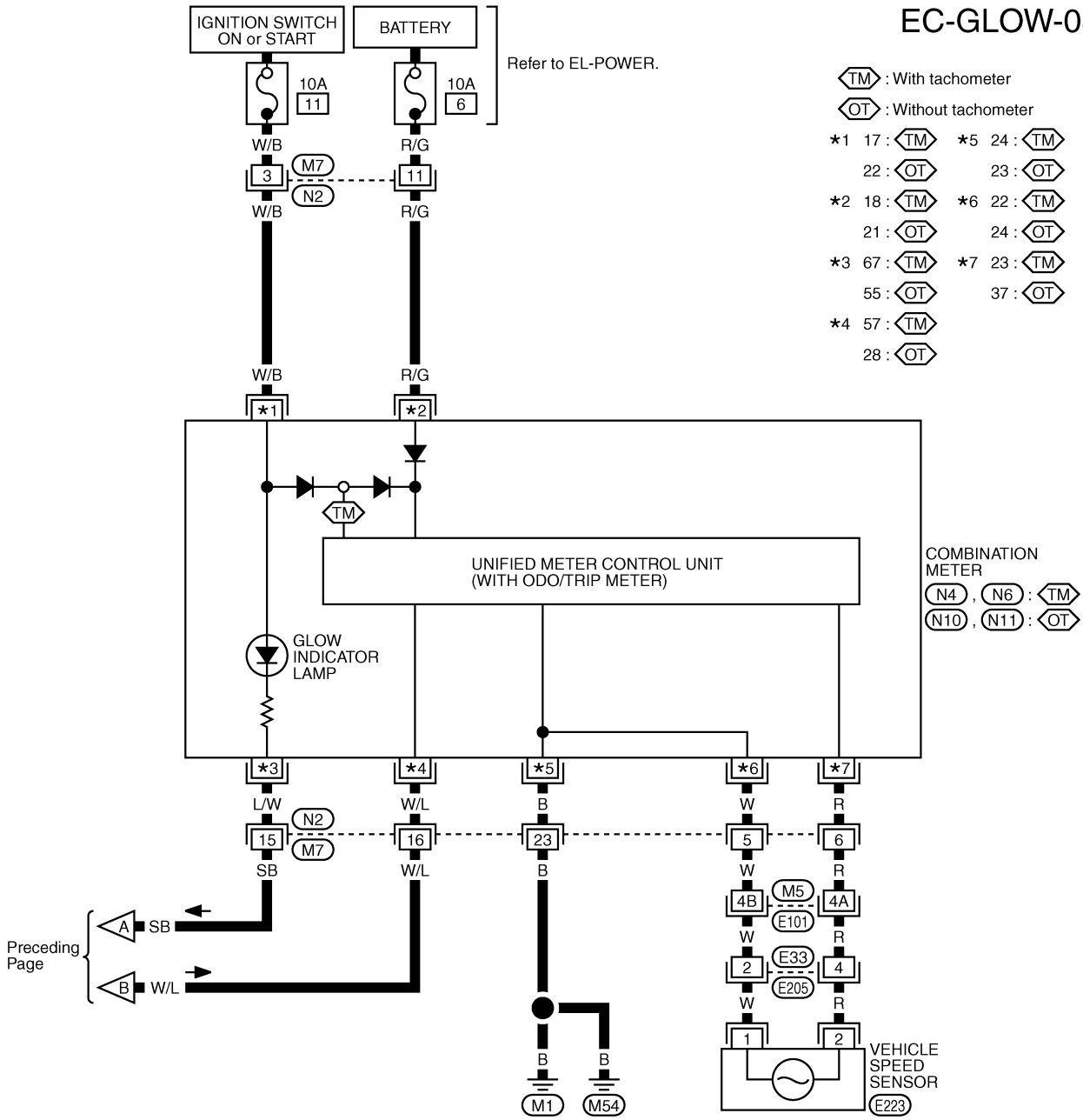
EC-GLOW-02



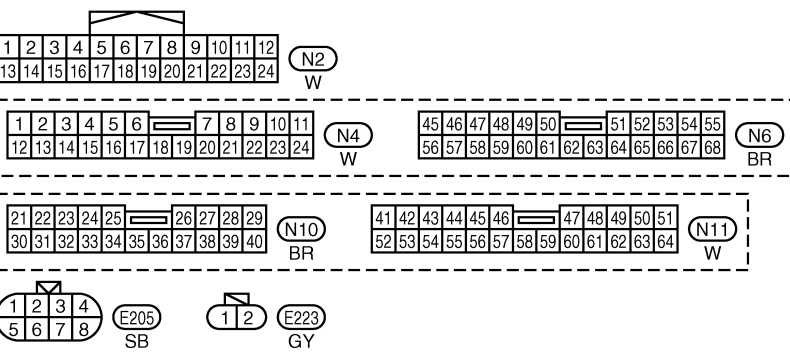
Refer to last page (Foldout page).  
M5, E101

Wiring Diagram (Cont'd)

EC-GLOW-03



GI  
MA  
EM  
LC  
EC  
FE  
CL  
MT  
AT  
TF  
PD  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX

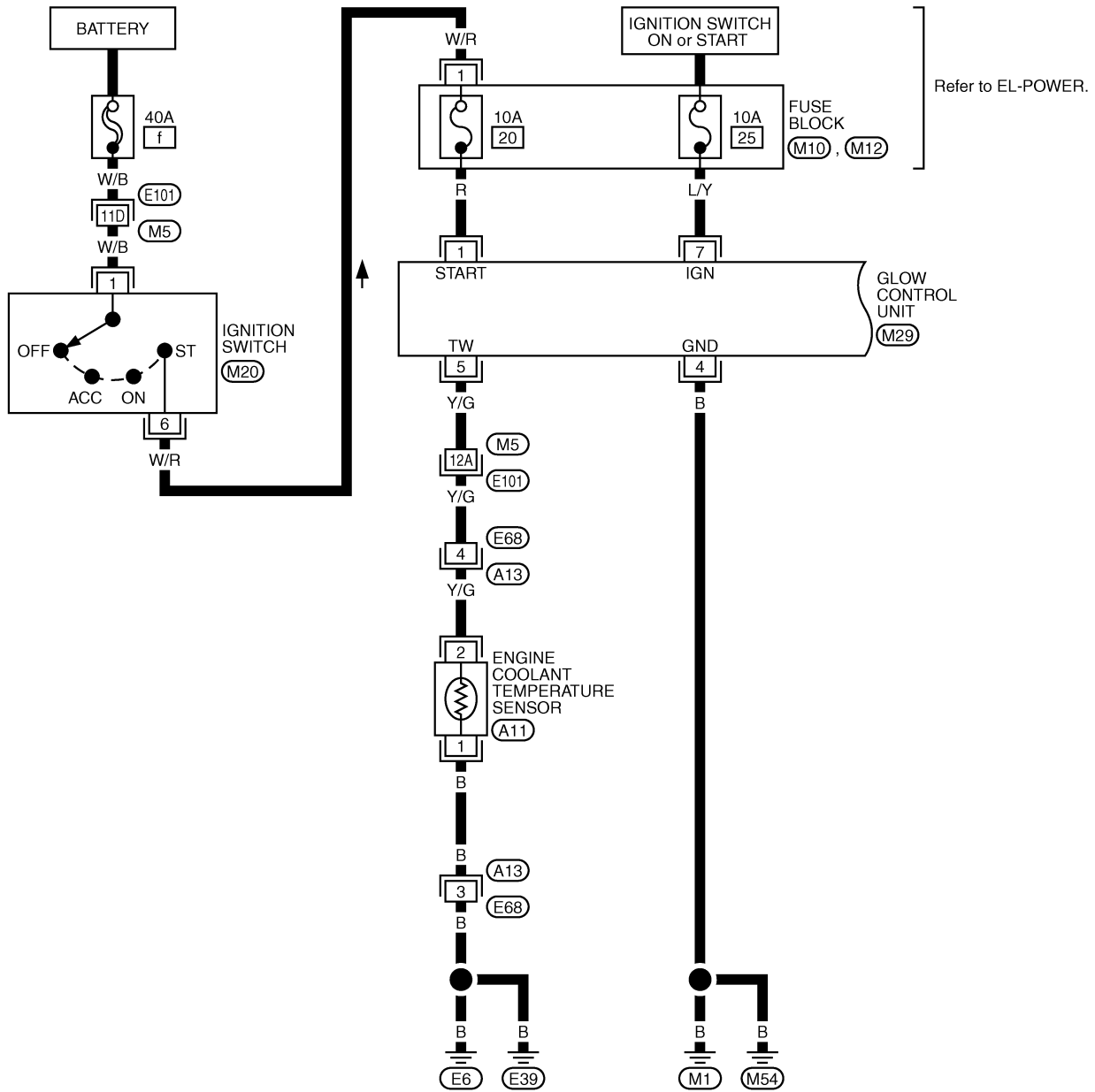


Refer to last page (Foldout page).  
M5, E101

Wiring Diagram (Cont'd)

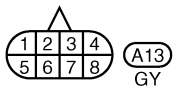
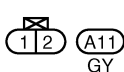
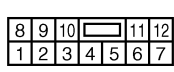
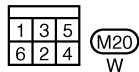
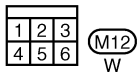
RHD MODELS WITH TD27 ENGINE (WITHOUT EGR) AND QD32 ENGINE

EC-GLOW-04

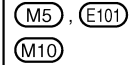


Refer to EL-POWER.

GLOW CONTROL UNIT (M29)

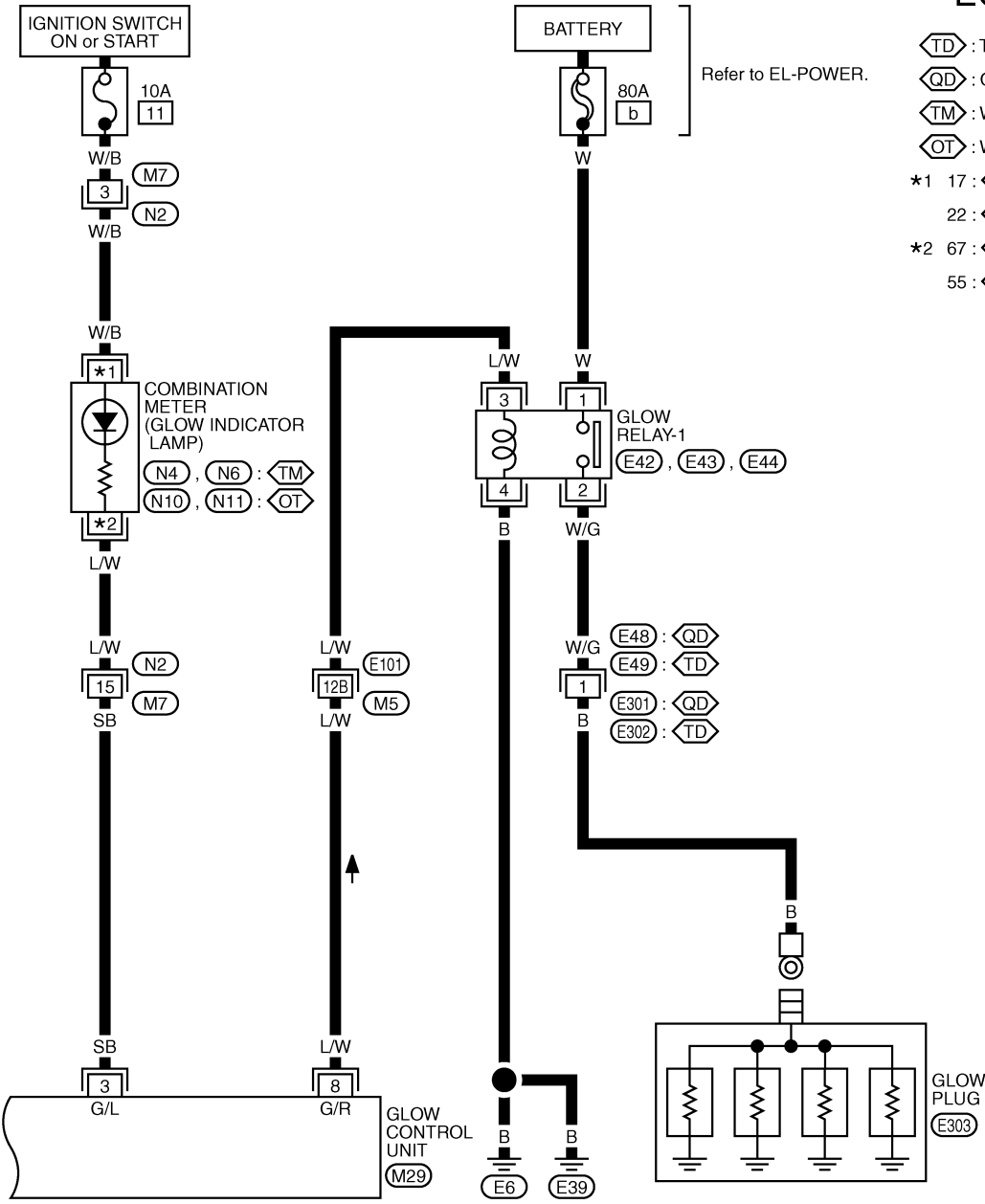


Refer to last page (Foldout page).



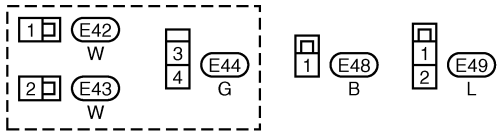
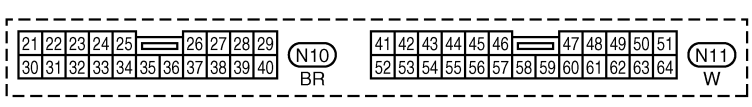
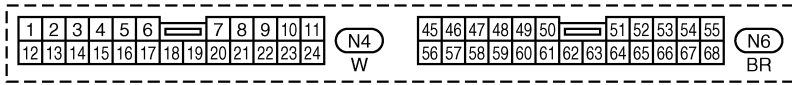
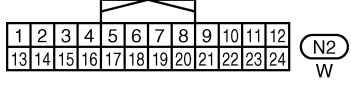
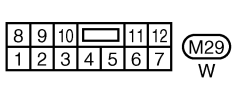
Wiring Diagram (Cont'd)

EC-GLOW-05



- TD : TD27 engine models
- QD : QD32 engine models
- TM : With tachometer
- OT : Without tachometer
- \*1 17: TM
- 22: OT
- \*2 67: TM
- 55: OT

GI  
MA  
EM  
LC  
**EC**  
FE  
CL  
MT  
AT  
TF  
PD  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX

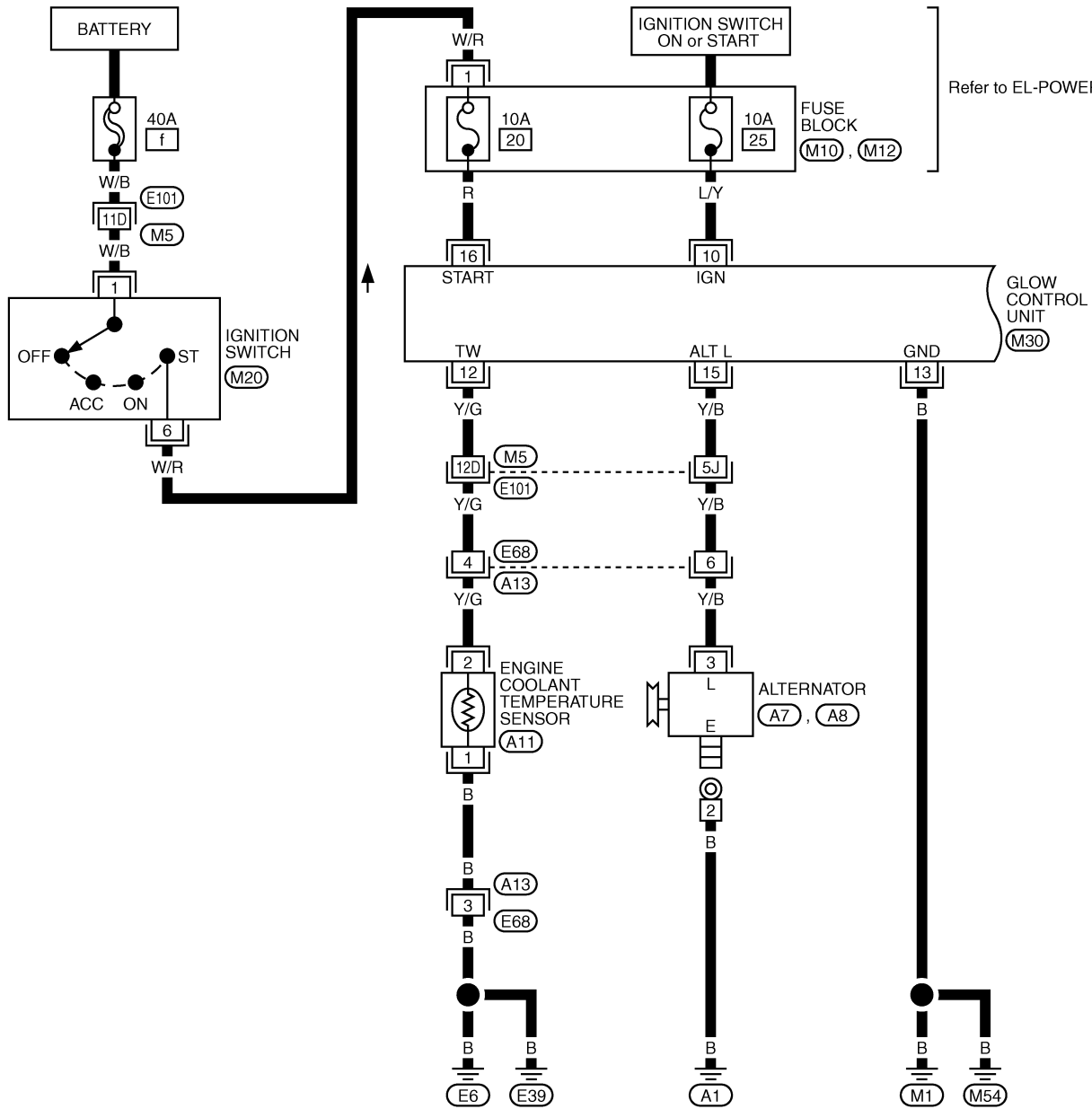


Refer to last page (Foldout page).  
M5, E101

Wiring Diagram (Cont'd)

LHD MODELS WITH TD27 ENGINE FOR COLD AREAS

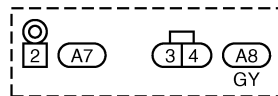
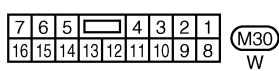
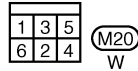
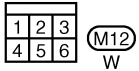
EC-GLOW-06



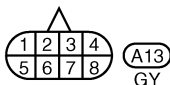
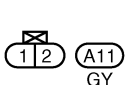
Refer to EL-POWER.

GLOW CONTROL UNIT (M30)

Refer to last page (Foldout page).



(M5), (E101)  
(M10)

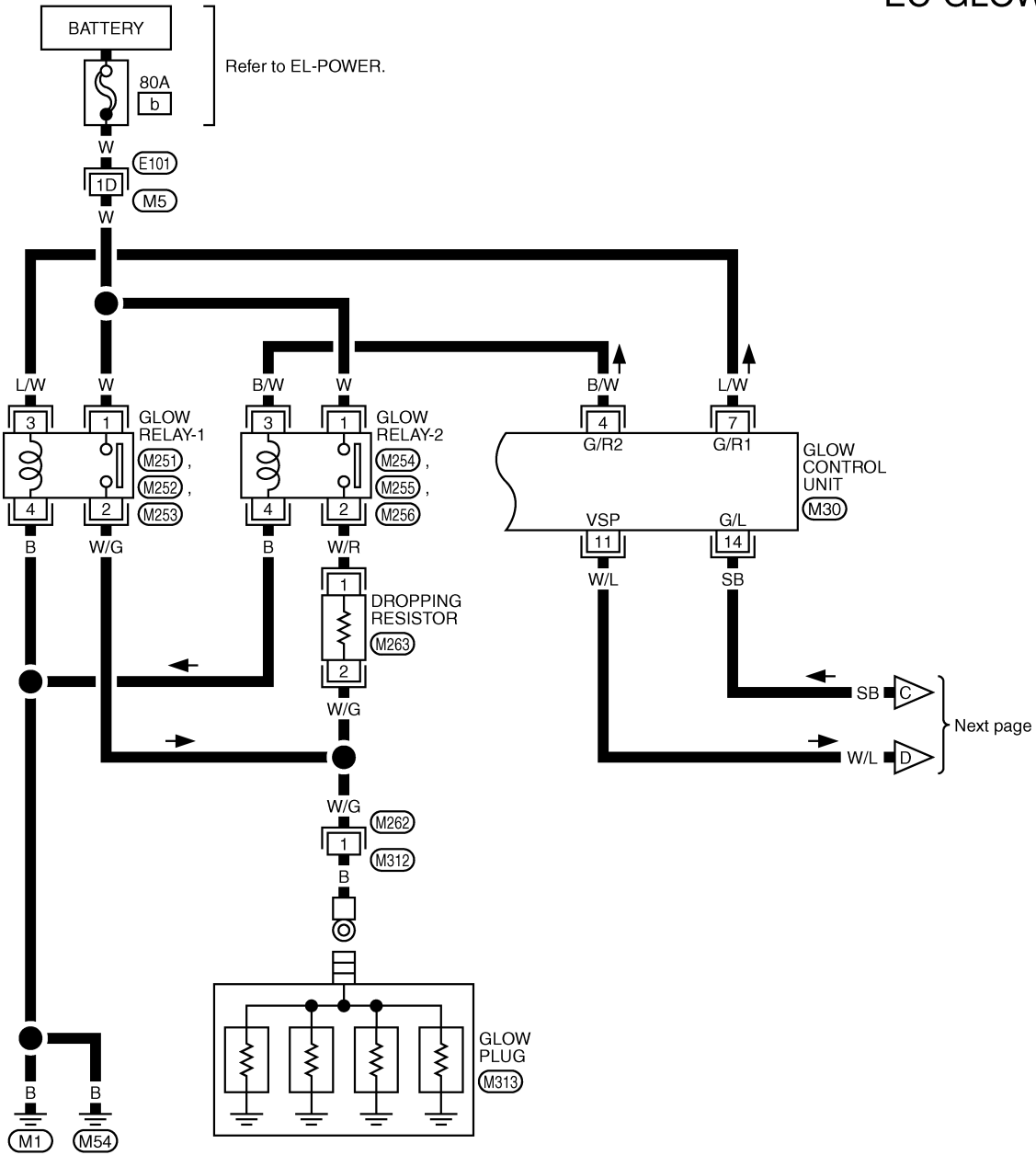


# QUICK-GLOW SYSTEM

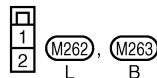
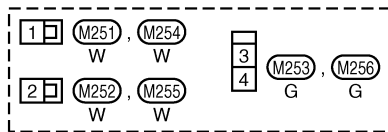
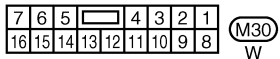
## Wiring Diagram (Cont'd)

QD & TD

EC-GLOW-07



GI  
MA  
EM  
LC  
**EC**  
FE  
CL  
MT  
AT  
TF  
PD  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX

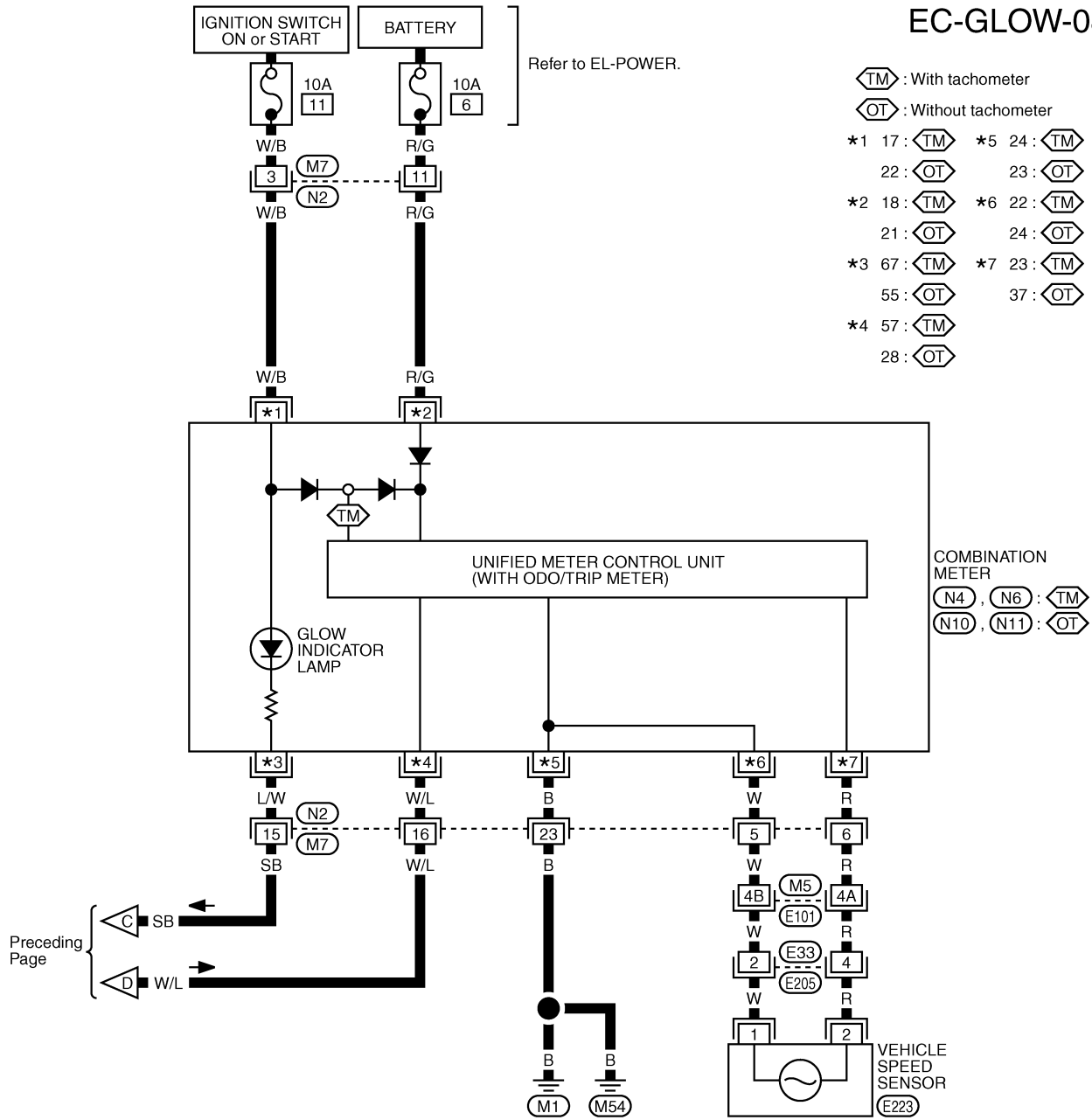


Refer to last page (Foldout page).  
(M5), (E101)

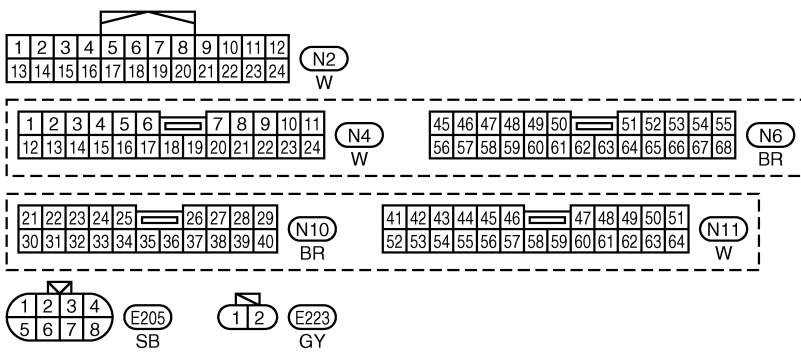
GEC214A

Wiring Diagram (Cont'd)

EC-GLOW-08



Preceding Page

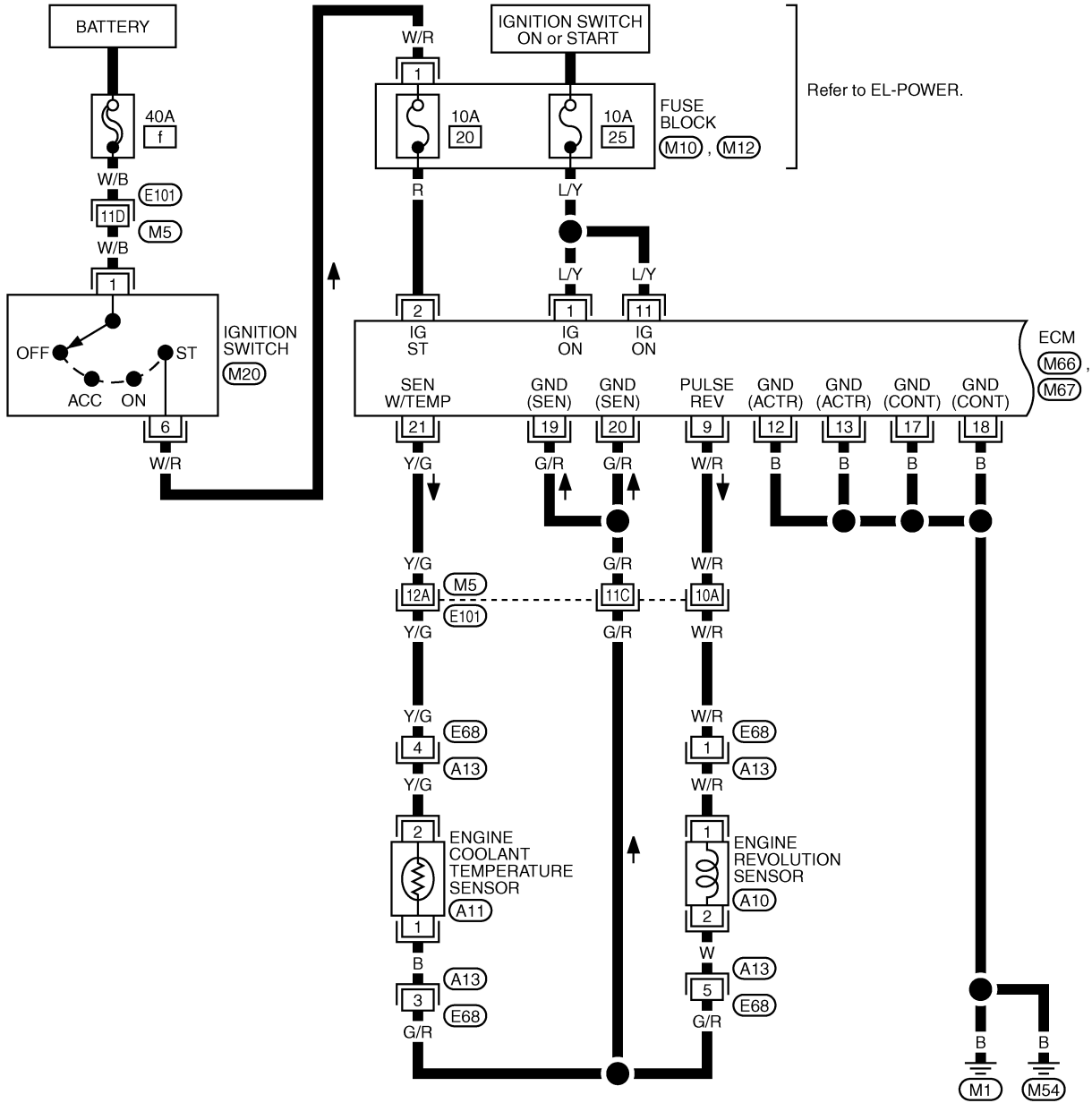


Refer to last page (Foldout page).  
M5, E101

Wiring Diagram (Cont'd)

TD27 ENGINE MODELS WITH EGR

EC-GLOW-09



Refer to EL-POWER.

GI

MA

EM

LC

EC

FE

CL

MT

AT

TF

PD

FA

RA

BR

ST

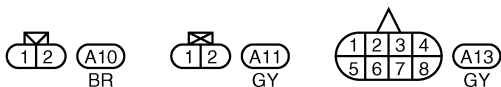
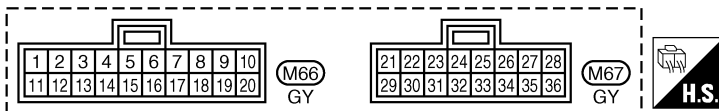
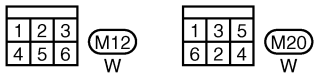
RS

BT

HA

EL

IDX



Refer to last page (Foldout page).

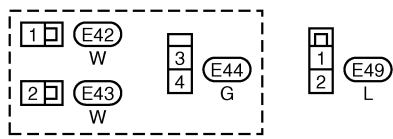
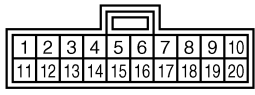
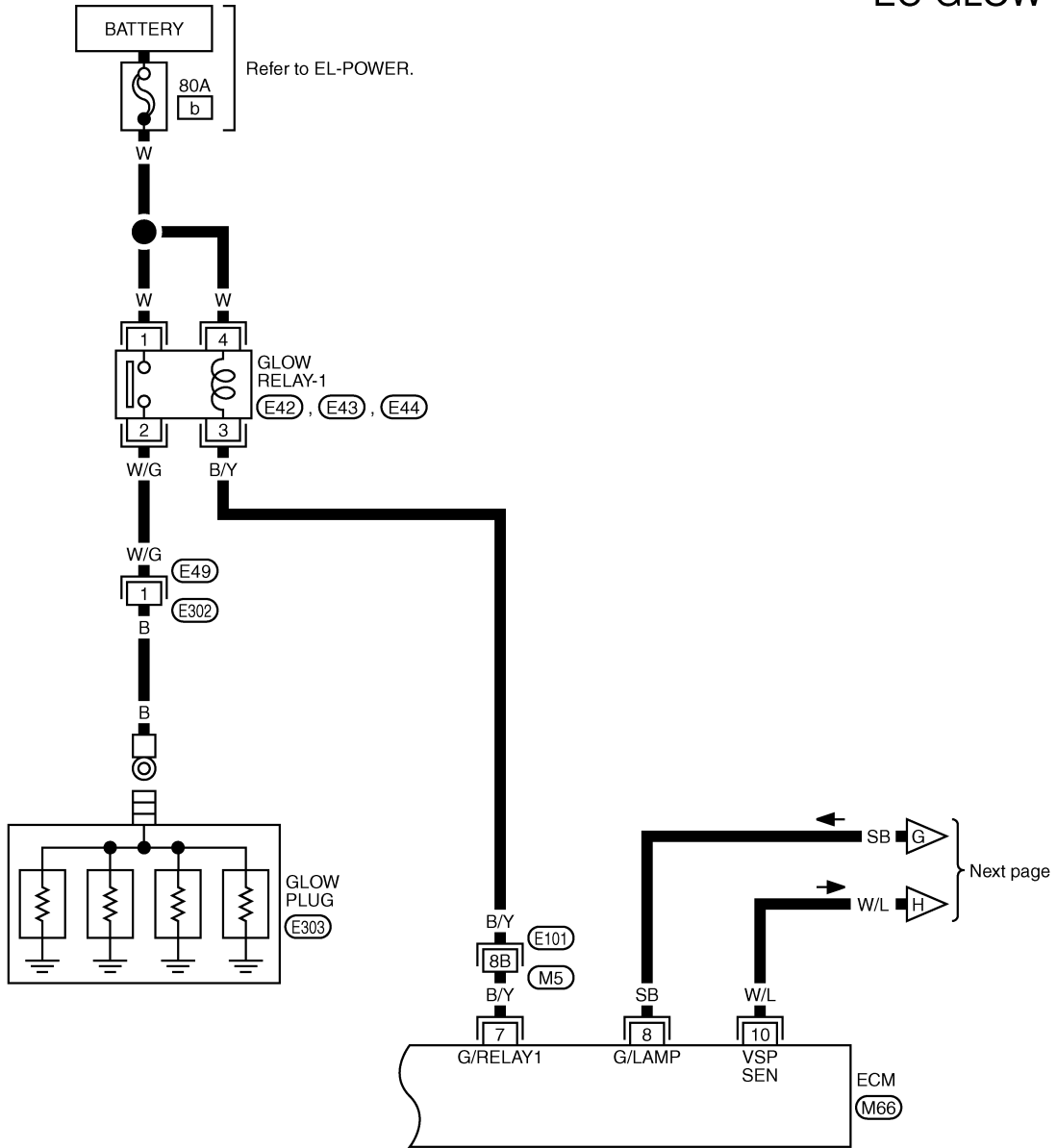
M5, E101

M10

# QUICK-GLOW SYSTEM

## Wiring Diagram (Cont'd)

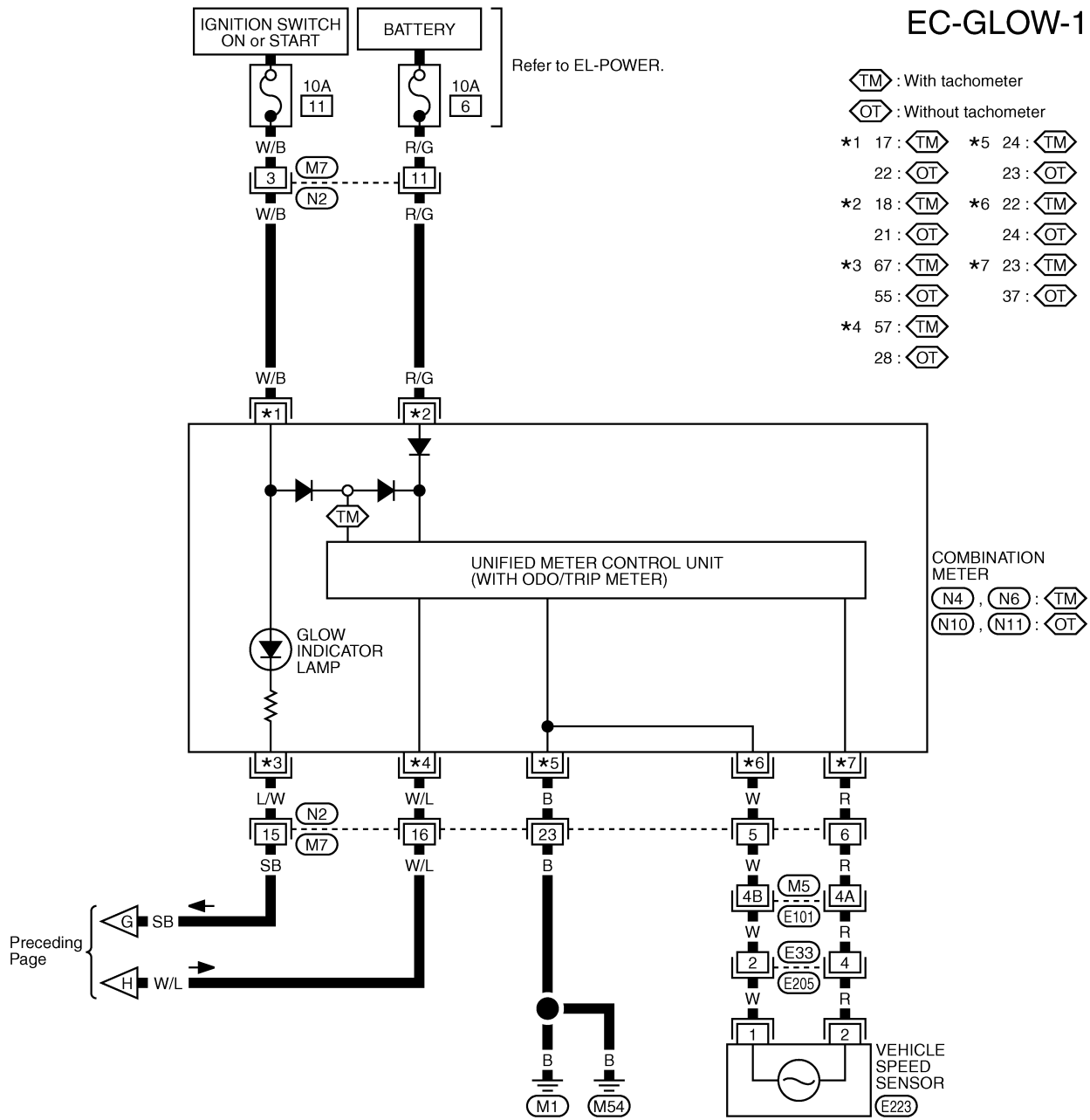
EC-GLOW-10



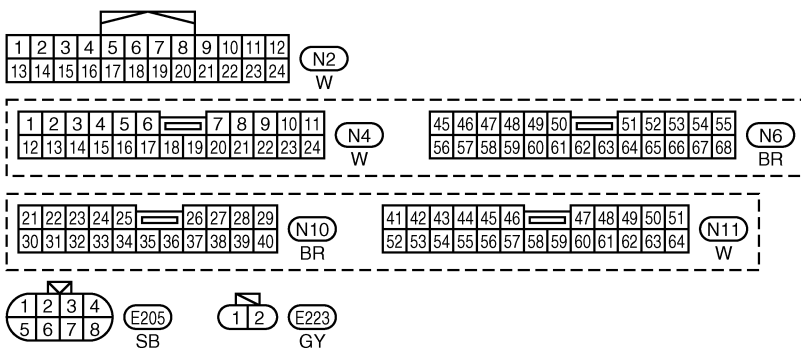
Refer to last page (Foldout page).  
 (M5), (E101)

Wiring Diagram (Cont'd)

EC-GLOW-11

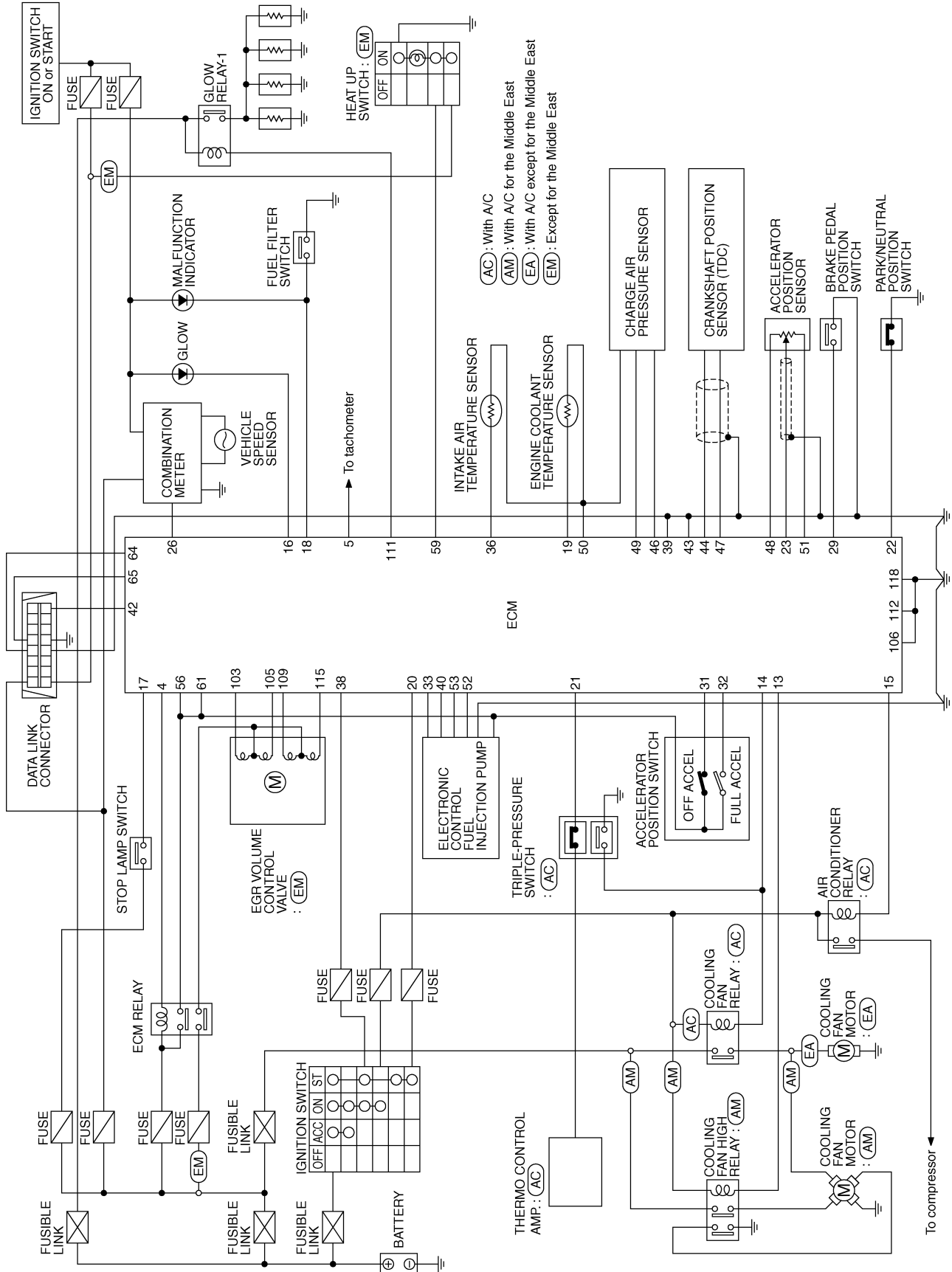


GI  
MA  
EM  
LC  
EC  
FE  
CL  
MT  
AT  
TF  
PD  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX



Refer to last page (Foldout page).  
M5, E101

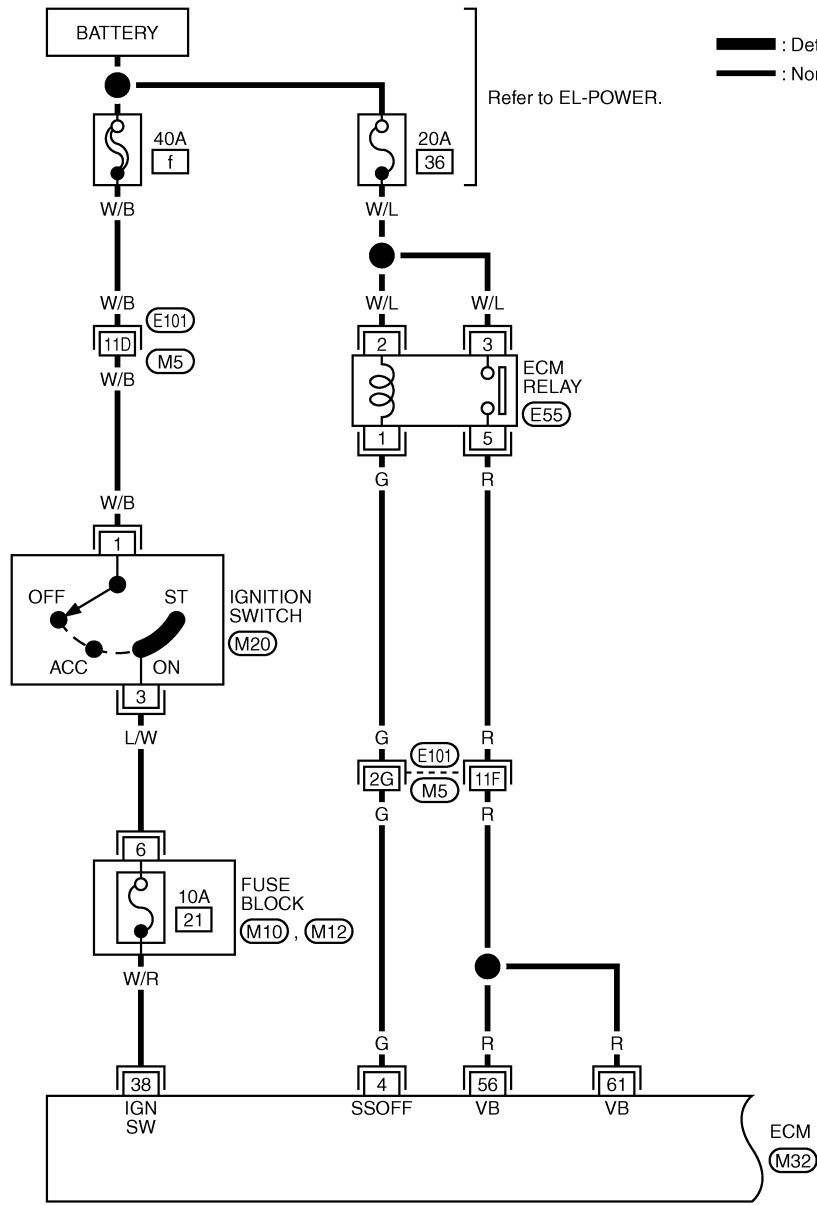
Circuit Diagram



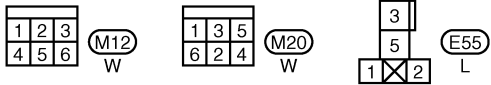
Main Power Supply and Ground Circuit

WIRING DIAGRAM - MODELS FOR MIDDLE EAST

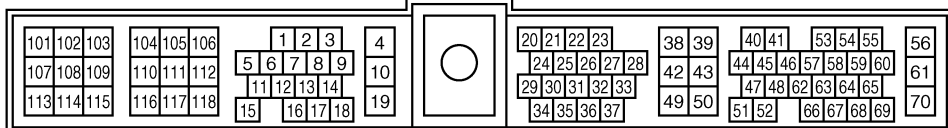
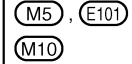
EC-MAIN-01



GI  
 MA  
 EM  
 LC  
**EC**  
 FE  
 CL  
 MT  
 AT  
 TF  
 PD  
 FA  
 RA  
 BR  
 ST  
 RS  
 BT  
 HA  
 EL  
 IDX



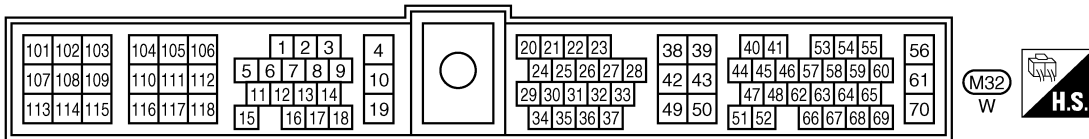
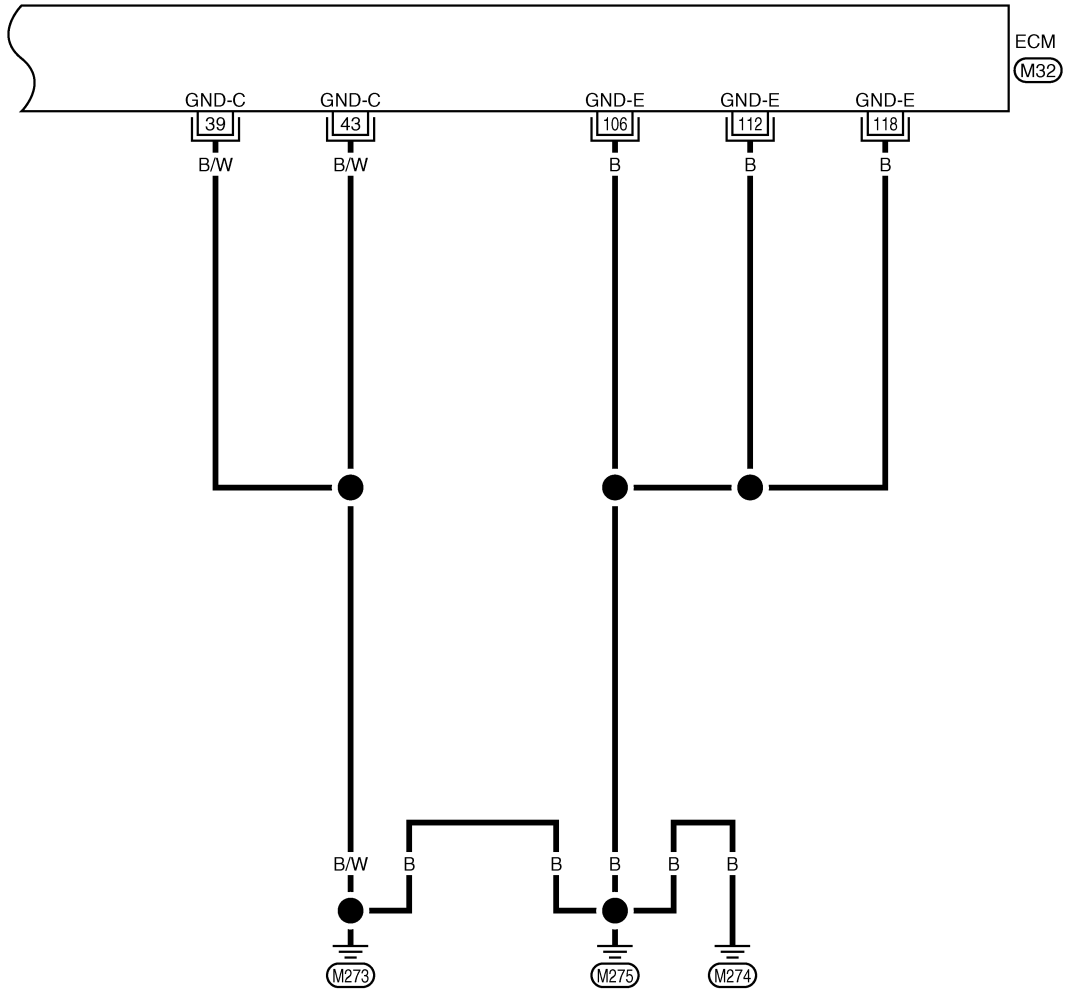
Refer to last page (Foldout page).



Main Power Supply and Ground Circuit  
(Cont'd)

EC-MAIN-02

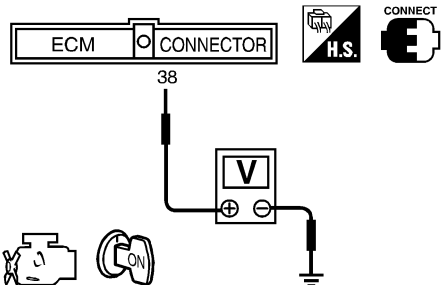
— : Detectable line for DTC  
 — : Non-detectable line for DTC



## Main Power Supply and Ground Circuit (Cont'd)

### DIAGNOSTIC PROCEDURE - MODELS FOR MIDDLE EAST

<b>1</b>	<b>INSPECTION START</b>	
Start engine. Is engine running?		
Yes or No		
Yes	▶	GO TO 7.
No	▶	GO TO 2.

<b>2</b>	<b>CHECK ECM POWER SUPPLY CIRCUIT-I</b>	
1. Turn ignition switch "ON". 2. Check voltage between ECM terminal 38 and ground with CONSULT-II or tester.		
		
Voltage: Battery voltage		
OK or NG		
OK	▶	GO TO 4.
NG	▶	GO TO 3.

<b>3</b>	<b>DETECT MALFUNCTIONING PART</b>	
Check the following.		
<ul style="list-style-type: none"> <li>● Fuse block (J/B) connector M10, M12</li> <li>● 10A fuse</li> <li>● Harness for open or short between ECM and fuse</li> </ul>		
		▶ Repair open circuit or short to ground or short to power in harness or connectors.

<b>4</b>	<b>CHECK ECM GROUND CIRCUIT FOR OPEN AND SHORT</b>	
1. Turn ignition switch "OFF". 2. Disconnect ECM harness connector. 3. Check harness continuity between ECM terminals 39, 43, 106, 112, 118 and engine ground. Refer to Wiring Diagram. <b>Continuity should exist.</b> 4. Also check harness for short to ground and short to power.		
OK or NG		
OK	▶	GO TO 6.
NG	▶	GO TO 5.

GI

MA

EM

LC

EC

FE

CL

MT

AT

TF

PD

FA

RA

BR

ST

RS

BT

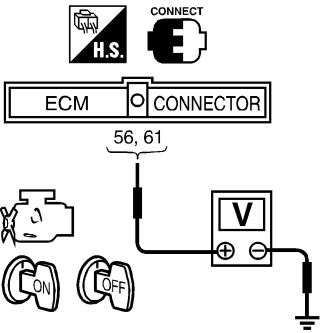
HA

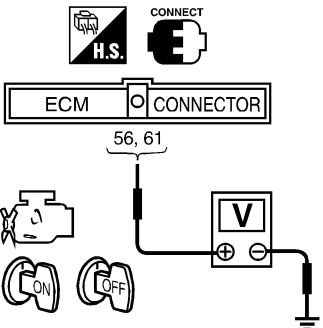
EL

IDX

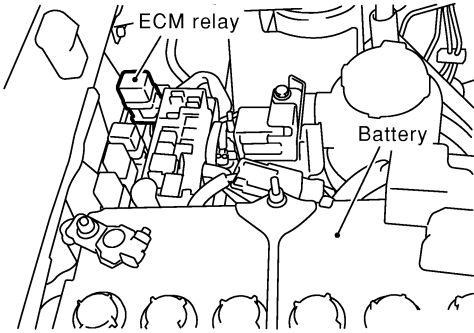
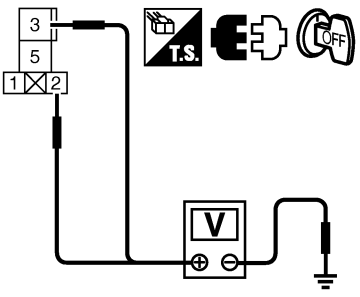
Main Power Supply and Ground Circuit  
(Cont'd)

<b>5</b>	<b>DETECT MALFUNCTIONING PART</b>
Check harness for open or short between ECM and engine ground	
▶ Repair open circuit or short to power in harness or connectors.	

<b>6</b>	<b>CHECK ECM POWER SUPPLY CIRCUIT-II</b>
<p>1. Reconnect ECM harness connector.                  2. Turn ignition switch "ON" and then "OFF".                  3. Check voltage between ECM terminals 56, 61 and ground with CONSULT-II or tester.</p>	
	
<p><b>Voltage:</b>                  After turning ignition switch "OFF", battery voltage will exist for a few seconds, then drop to approximately 0V.</p>	
SEC949C	
<b>OK or NG</b>	
OK	▶ Check electronic control fuel injection pump power supply circuit. Refer to "Diagnostic Procedure", EC-653 in Service Manual (Publication No. SM1E-1D22FG1).
NG (Battery voltage does not exist.)	▶ GO TO 8.
NG (Battery voltage exists for more than a few seconds.)	▶ GO TO 10.

<b>7</b>	<b>CHECK ECM POWER SUPPLY CIRCUIT-II</b>
<p>1. Reconnect ECM harness connector.                  2. Turn ignition switch "ON" and then "OFF".                  3. Check voltage between ECM terminals 56, 61 and ground with CONSULT-II or tester.</p>	
	
<p><b>Voltage:</b>                  After turning ignition switch "OFF", battery voltage will exist for a few seconds, then drop to approximately 0V.</p>	
SEC949C	
<b>OK or NG</b>	
OK	▶ GO TO 15.
NG (Battery voltage does not exist.)	▶ GO TO 8.
NG (Battery voltage exists for more than a few seconds.)	▶ GO TO 10.

Main Power Supply and Ground Circuit  
(Cont'd)

<b>8</b>	<b>CHECK ECM POWER SUPPLY CIRCUIT-III</b>	<p>1. Disconnect ECM relay.</p> <div style="text-align: center;">  </div> <p style="text-align: right;">SEC950C</p> <p>2. Check voltage between ECM relay terminals 2, 3 and ground with CONSULT-II or tester.</p> <div style="text-align: center;">  <p style="margin-left: 100px;"><b>Voltage: Battery voltage</b></p> </div> <p style="text-align: right;">SEC049E</p> <p style="text-align: center;"><b>OK or NG</b></p>	GI MA EM LC <b>EC</b> FE CL MT AT TF PD FA RA
OK	▶	GO TO 10.	
NG	▶	GO TO 9.	

<b>9</b>	<b>DETECT MALFUNCTIONING PART</b>	<p>Check the following.</p> <ul style="list-style-type: none"> <li>● 20A fuse</li> <li>● Harness for open or short between ECM relay and fuse</li> </ul> <p style="text-align: right;">▶ Repair open circuit or short to ground or short to power in harness or connectors.</p>	BR ST
----------	-----------------------------------	---	----------

<b>10</b>	<b>CHECK OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT</b>	<p>1. Disconnect ECM harness connector.</p> <p>2. Check harness continuity between ECM terminal 4 and ECM relay terminal 1. Refer to Wiring Diagram. <b>Continuity should exist.</b></p> <p>3. Also check harness for short to ground and short to power.</p> <p style="text-align: center;"><b>OK or NG</b></p>	RS BT HA EL
OK	▶	GO TO 12.	
NG	▶	GO TO 11.	

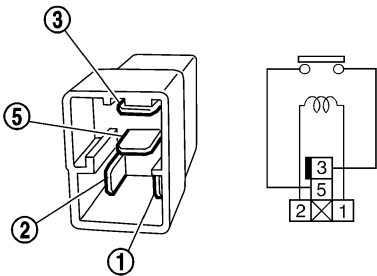
GI  
MA  
EM  
LC  
**EC**  
FE  
CL  
MT  
AT  
TF  
PD  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX

**Main Power Supply and Ground Circuit  
(Cont'd)**

<b>11</b>	<b>DETECT MALFUNCTIONING PART</b>
Check the following. ● Harness connectors E101, M5 ● Harness for open or short between ECM and ECM relay	
▶ Repair open circuit or short to ground or short to power in harness or connectors.	

<b>12</b>	<b>CHECK ECM POWER SUPPLY CIRCUIT-IV</b>
1. Check harness continuity between ECM terminals 56, 61 and ECM relay terminal 5. Refer to Wiring Diagram. <b>Continuity should exist.</b> 2. Also check harness for short to ground and short to power.	
<b>OK or NG</b>	
OK	▶ GO TO 14.
NG	▶ GO TO 13.

<b>13</b>	<b>DETECT MALFUNCTIONING PART</b>
Check the following. ● Harness connectors E101, M5 ● Harness for open or short between ECM and ECM relay	
▶ Repair open circuit or short to ground or short to power in harness or connectors.	

<b>14</b>	<b>CHECK ECM RELAY</b>						
1. Apply 12V direct current between ECM relay terminals 1 and 2. 2. Check continuity between ECM relay terminals 3 and 5.							
							
<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Conditions</th> <th>Continuity</th> </tr> </thead> <tbody> <tr> <td>12V direct current supply between terminals 1 and 2</td> <td style="text-align: center;">Yes</td> </tr> <tr> <td>No current supply</td> <td style="text-align: center;">No</td> </tr> </tbody> </table>		Conditions	Continuity	12V direct current supply between terminals 1 and 2	Yes	No current supply	No
Conditions	Continuity						
12V direct current supply between terminals 1 and 2	Yes						
No current supply	No						
SEC340C							
<b>OK or NG</b>							
OK	▶ GO TO 15.						
NG	▶ Replace ECM relay.						

## Main Power Supply and Ground Circuit (Cont'd)

<b>15</b>	<b>CHECK ECM GROUND CIRCUIT FOR OPEN AND SHORT</b>	
1. Check harness continuity between ECM terminals 39, 43, 106, 112, 118 and engine ground. Refer to Wiring Diagram. <b>Continuity should exist.</b> 2. Also check harness for short to ground and short to power. <div style="text-align: center;"><b>OK or NG</b></div>		
OK	▶	GO TO 17.
NG	▶	GO TO 16.

<b>16</b>	<b>DETECT MALFUNCTIONING PART</b>	
Check harness for open or engine ground.		
	▶	Repair open circuit or short to power in harness or connectors.

<b>17</b>	<b>CHECK INTERMITTENT INCIDENT</b>	
Refer to "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT", EC-561 in Service Manual (Publication No. SM1E-1D22FG1).		
	▶	<b>INSPECTION END</b>

GI

MA

EM

LC

EC

FE

CL

MT

AT

TF

PD

FA

RA

BR

ST

RS

BT

HA

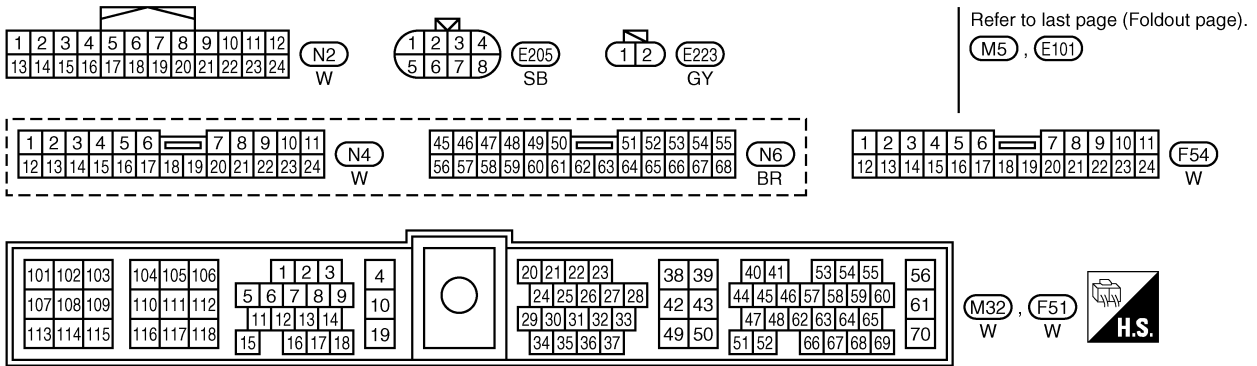
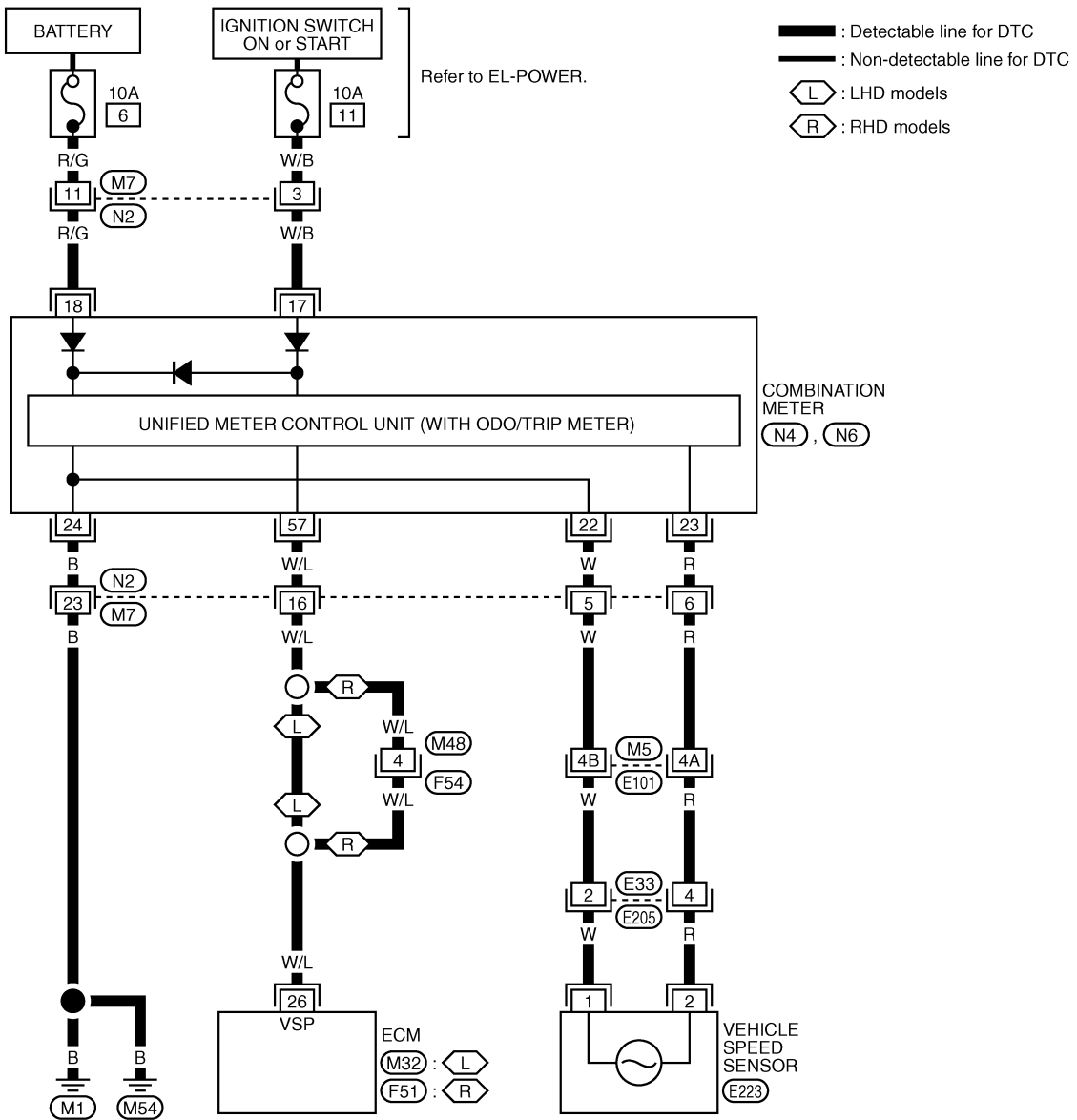
EL

IDX

Wiring Diagram

MODELS WITH TACHOMETER

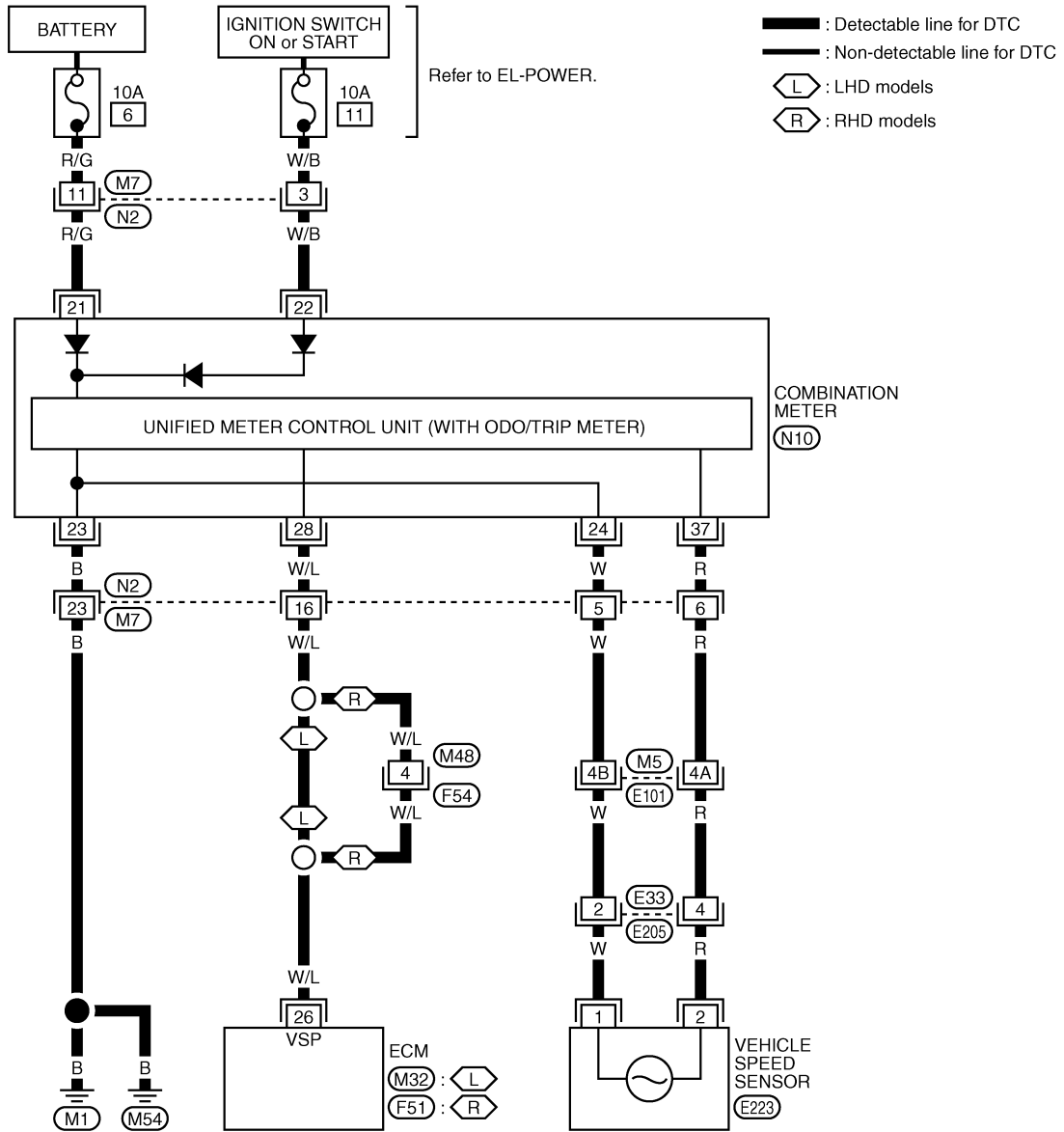
EC-VSS-01



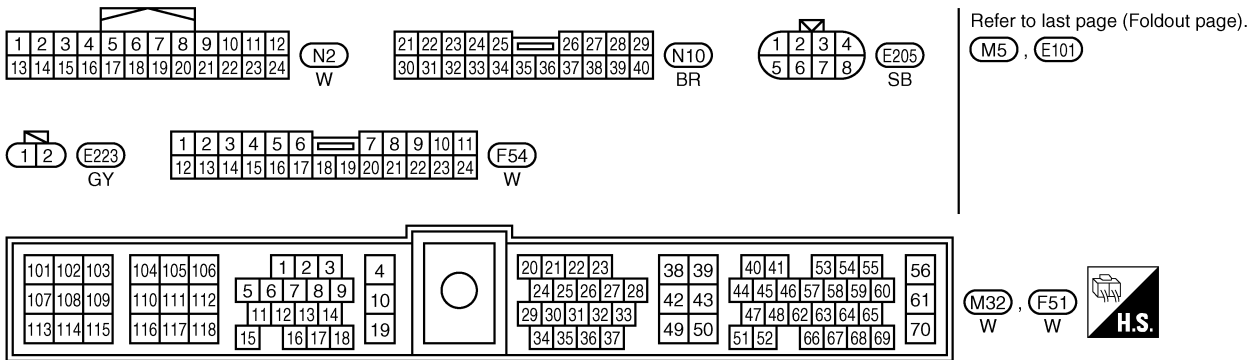
Wiring Diagram (Cont'd)

MODELS WITHOUT TACHOMETER

EC-VSS-02



GI  
MA  
EM  
LC  
**EC**  
FE  
CL  
MT  
AT  
TF  
PD  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX



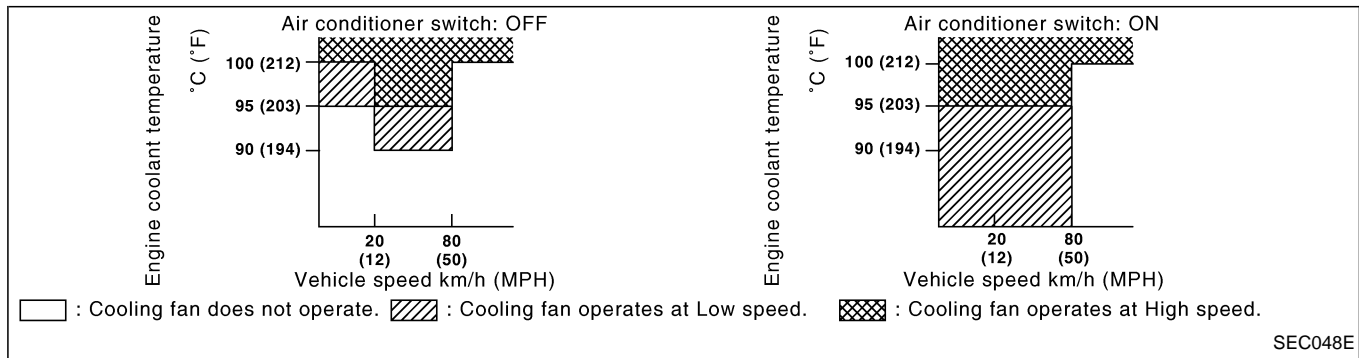
Description

SYSTEM DESCRIPTION

Sensor	Input signal to ECM	ECM function	Actuator
Vehicle speed sensor	Vehicle speed	Cooling fan control	Cooling fan relay
Engine coolant temperature sensor	Engine coolant temperature		
Air conditioner switch	Air conditioner "ON" signal		

The ECM controls the cooling fan corresponding to the vehicle speed, engine coolant temperature. The control system has 3-step control [HIGH/LOW/OFF].

OPERATION



CONSULT-II Reference Value in Data Monitor Mode

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
AIR COND RLY	● Engine: After warming up, idle the engine Air conditioner switch: OFF	OFF
	Air conditioner switch: ON (Compressor operates.)	ON
COOLING FAN	● When cooling fan is stopped.	OFF
	● When cooling fan operates at low speed.	LOW
	● When cooling fan operates at high speed.	HIGH

ECM Terminals and Reference Value

Specification data are reference values and are measured between each terminal and ground.

**CAUTION:**

Do not use ECM ground terminals when measuring input/output voltage. Doing so may damage the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
13	OR	Cooling fan high relay	Engine is running. └ Cooling fan is not operating └ Cooling fan is operating at low speed	BATTERY VOLTAGE (11 - 14V)
			Engine is running. └ Cooling fan is operating at high speed	Approximately 0.1V
14	G/B	Cooling fan relay	Engine is running. └ Cooling fan is not operating	BATTERY VOLTAGE (11 - 14V)
			Engine is running. └ Cooling fan is operating	Approximately 0.1V

On Board Diagnosis Logic

This diagnosis continuously monitors the engine coolant temperature.

If the cooling fan or another component in the cooling system malfunctions, engine coolant temperature will rise.

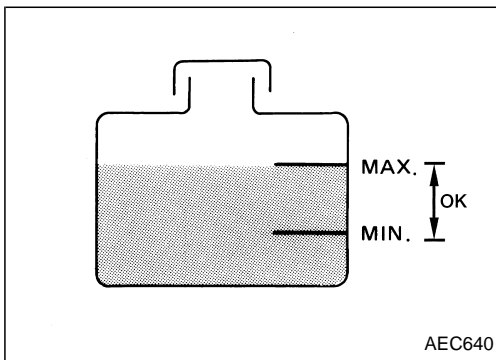
When the engine coolant temperature reaches an abnormally high temperature condition, a malfunction is indicated.

Malfunction is detected when ...	Check Items (Possible Cause)
<ul style="list-style-type: none"> <li>● Cooling fan does not operate properly (Overheat).</li> <li>● Cooling fan system does not operate properly (Overheat).</li> <li>● Engine coolant was not added to the system using the proper filling method.</li> <li>● Engine coolant is not within the specified range.</li> </ul>	<ul style="list-style-type: none"> <li>● Harness or connectors (The cooling fan circuit is open or shorted.)</li> <li>● Cooling fan</li> <li>● Radiator hose</li> <li>● Radiator</li> <li>● Radiator cap</li> <li>● Water pump</li> <li>● Thermostat</li> <li>● Fan belt</li> <li>● Engine coolant temperature sensor</li> </ul> <p>For more information, refer to "MAIN 12 CAUSES OF OVERHEATING", EC-44.</p>

**CAUTION:**

When a malfunction is indicated, be sure to replace the coolant following the procedure in the MA section ("Changing Engine Coolant", "ENGINE MAINTENANCE"). Also, replace the engine oil.

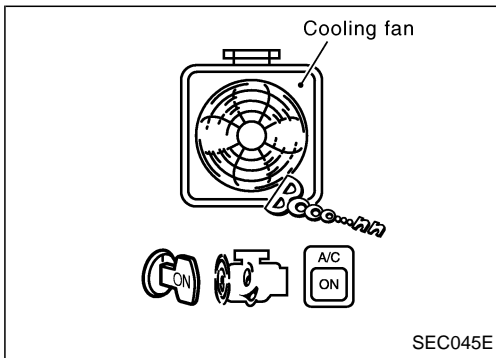
- 1) Fill radiator with coolant up to specified level with a filling speed of 2 liters per minute. Be sure to use coolant with the proper mixture ratio. Refer to MA section ("Anti-freeze Coolant Mixture Ratio", "RECOMMENDED LUBRICANTS AND FLUIDS").
- 2) After refilling coolant, run engine to ensure that no water-flow noise is emitted.



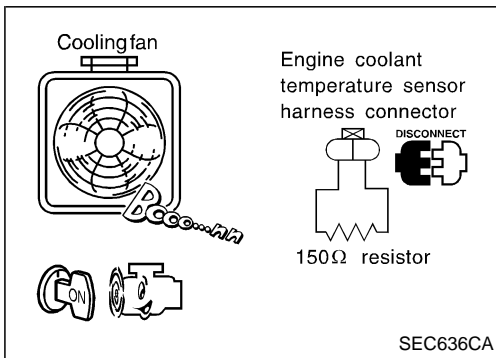
AEC640

ACTIVE TEST	
COOLING FAN	OFF
MONITOR	
COOLAN TEMP/S	XXX °C

SEF111X



SEC045E



SEC636CA

## Overall Function Check

Use this procedure to check the overall function of the cooling fan. During this check, a DTC might not be confirmed.

### WARNING:

**Never remove the radiator cap when the engine is hot. Serious burns could be caused by high pressure fluid escaping from the radiator.**

**Wrap a thick cloth around the cap. Carefully remove the cap by turning it a quarter turn to allow built-up pressure to escape. Then turn the cap all the way off.**

### WITH CONSULT-II

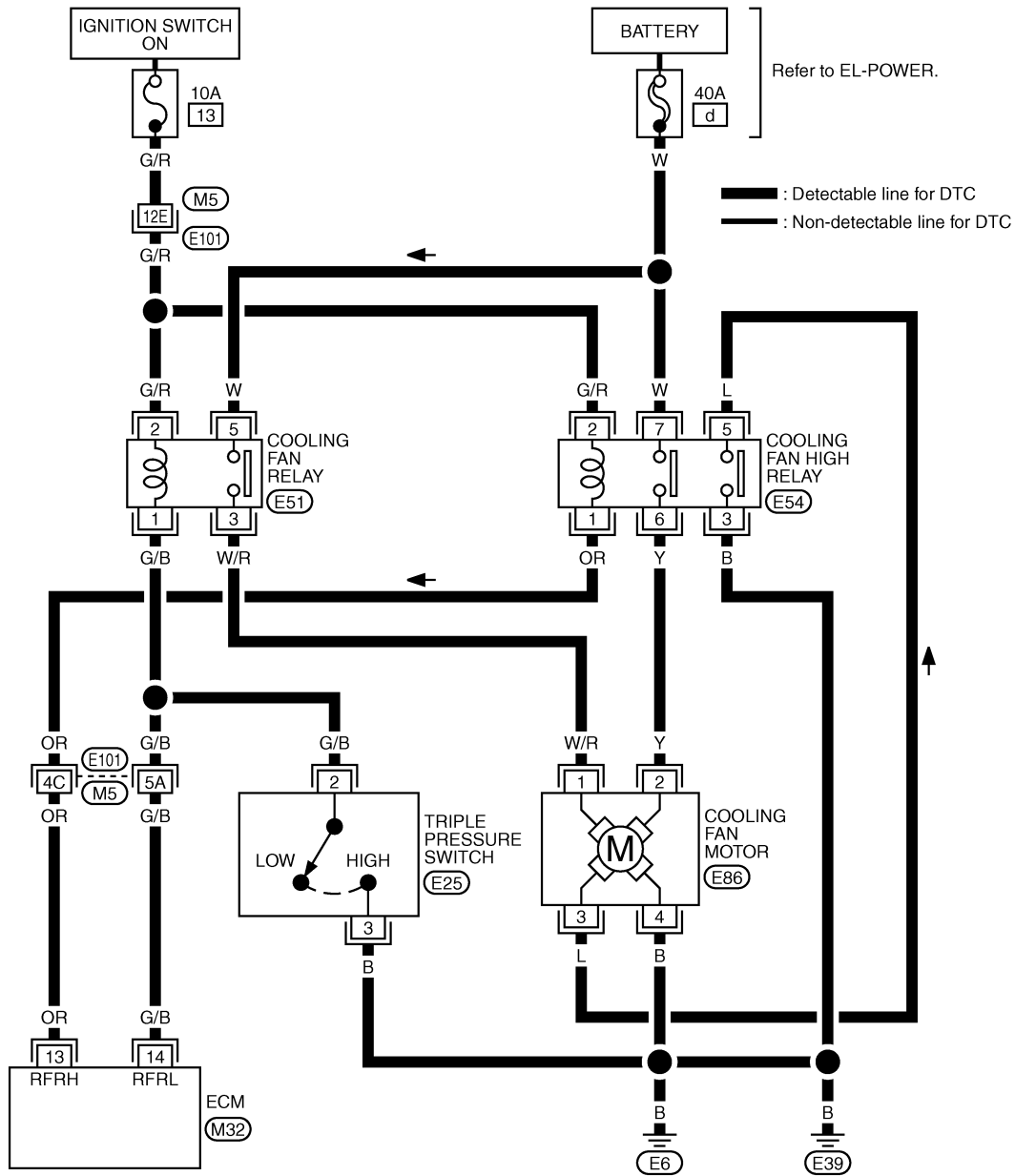
- 1) Check the coolant level in the reservoir tank and radiator.  
**Allow engine to cool before checking coolant level.**  
If the coolant level in the reservoir tank and/or radiator is below the proper range, skip the following steps and go to "Diagnostic Procedure", EC-34.
- 2) Confirm whether customer filled the coolant or not. If customer filled the coolant, skip the following steps and go to "Diagnostic Procedure", EC-34.
- 3) Turn ignition switch "ON".
- 4) Perform "COOLING FAN" in "ACTIVE TEST" mode with CONSULT-II and make sure that cooling fans operate when touching "HIGH" or "LOW".  
If NG, go to "Diagnostic Procedure", EC-34.

### WITHOUT CONSULT-II

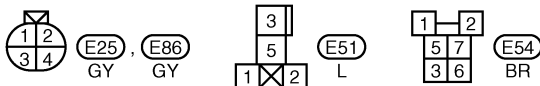
- 1) Check the coolant level in the reservoir tank and radiator.  
**Allow engine to cool before checking coolant level.**  
If the coolant level in the reservoir tank and/or radiator is below the proper range, skip the following steps and go to "Diagnostic Procedure", EC-34.
- 2) Confirm whether customer filled the coolant or not. If customer filled the coolant, skip the following steps and go to "Diagnostic Procedure", EC-34.
- 3) Start engine.  
**Be careful not to overheat engine.**
- 4) Set temperature control lever to full cold position.
- 5) Turn air conditioner switch "ON".
- 6) Turn blower fan switch "ON".
- 7) Run engine at idle for a few minutes with air conditioner operating.  
**Be careful not to overheat engine.**
- 8) Make sure that cooling fans operate at low speed.
- 9) Turn ignition switch "OFF".
- 10) Turn air conditioner switch and blower fan switch "OFF".
- 11) Disconnect engine coolant temperature sensor harness connector.
- 12) Connect 150Ω resistor to engine coolant temperature sensor harness connector.
- 13) Start engine and make sure that cooling fans operate at higher speed than low speed.  
**Be careful not to overheat engine.**
- 14) If NG, go to "Diagnostic Procedure", EC-34.

Wiring Diagram

EC-COOL/F-01

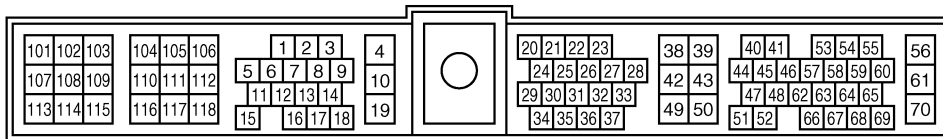


GI  
 MA  
 EM  
 LC  
**EC**  
 FE  
 CL  
 MT  
 AT  
 TF  
 PD  
 FA  
 RA  
 BR  
 ST  
 RS  
 BT  
 HA  
 EL  
 IDX




Refer to last page (Foldout page).


(M5), (E101)



### Diagnostic Procedure

<b>1</b>	<b>CHECK COOLING FAN (CRANKSHAFT DRIVEN) OPERATION</b>	
Start engine and make sure that cooling fan (crankshaft driven) operates.		
<b>OK or NG</b>		
OK (With CONSULT-II)	▶	GO TO 2.
OK (Without CONSULT-II)	▶	GO TO 4.
NG	▶	Check cooling fan (crankshaft driven). Refer to LC section, "Cooling Fan".

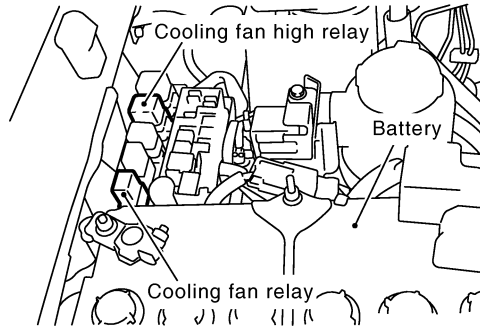
<b>2</b>	<b>CHECK COOLING FAN LOW SPEED OPERATION</b>																							
<p> <b>With CONSULT-II</b></p> <p>1. Turn ignition switch "ON".</p> <p>2. Perform "COOLING FAN" in "ACTIVE TEST" mode with CONSULT-II.</p>																								
<table border="1" style="margin: auto;"> <tr><th colspan="2">ACTIVE TEST</th></tr> <tr><th>COOLING FAN</th><th>OFF</th></tr> <tr><th colspan="2">MONITOR</th></tr> <tr><th>COOLAN TEMP/S</th><th>XXX °C</th></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table>			ACTIVE TEST		COOLING FAN	OFF	MONITOR		COOLAN TEMP/S	XXX °C														
ACTIVE TEST																								
COOLING FAN	OFF																							
MONITOR																								
COOLAN TEMP/S	XXX °C																							
SEF646X																								
<p>3. Touch "LOW".</p> <p>4. Make sure that cooling fan operates at low speed.</p>																								
<b>OK or NG</b>																								
OK	▶	GO TO 3.																						
NG	▶	Check cooling fan low speed control circuit. (Go to PROCEDURE A, EC-39.)																						

<b>3</b>	<b>CHECK COOLING FAN HIGH SPEED OPERATION</b>																							
<p> <b>With CONSULT-II</b></p> <p>1. Touch "HIGH".</p>																								
<table border="1" style="margin: auto;"> <tr><th colspan="2">ACTIVE TEST</th></tr> <tr><th>COOLING FAN</th><th>OFF</th></tr> <tr><th colspan="2">MONITOR</th></tr> <tr><th>COOLAN TEMP/S</th><th>XXX °C</th></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table>			ACTIVE TEST		COOLING FAN	OFF	MONITOR		COOLAN TEMP/S	XXX °C														
ACTIVE TEST																								
COOLING FAN	OFF																							
MONITOR																								
COOLAN TEMP/S	XXX °C																							
SEF111X																								
<p>2. Make sure that cooling fan operates at higher speed than low speed.</p>																								
<b>OK or NG</b>																								
OK	▶	GO TO 6.																						
NG	▶	Check cooling fan high speed control circuit. (Go to PROCEDURE B, EC-42.)																						

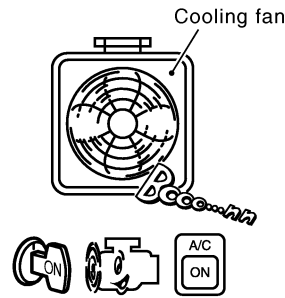
Diagnostic Procedure (Cont'd)

4 CHECK COOLING FAN LOW SPEED OPERATION

- ⊗ Without CONSULT-II
- 1. Turn ignition switch "OFF".
- 2. Disconnect cooling fan high relay.



- 3. Start engine and let it idle.
- 4. Set temperature lever at full cold position.
- 5. Turn air conditioner switch "ON".
- 6. Turn blower fan switch "ON".
- 7. Make sure that cooling fan operates at low speed.



SEC044E

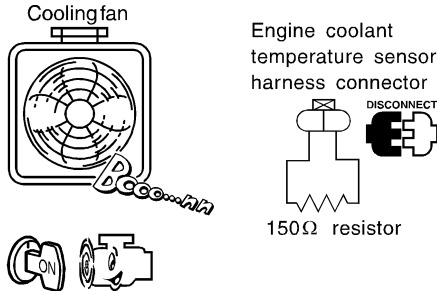
SEC045E

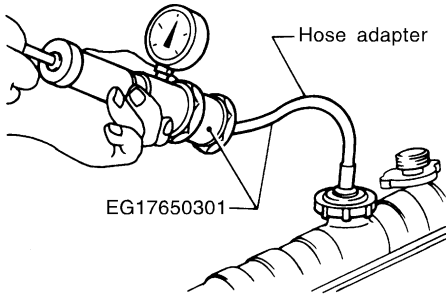
OK or NG

OK	▶	GO TO 5.
NG	▶	Check cooling fan low speed control circuit. (Go to PROCEDURE A, EC-39.)

GI  
MA  
EM  
LC  
EC  
FE  
CL  
MT  
AT  
TF  
PD  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX

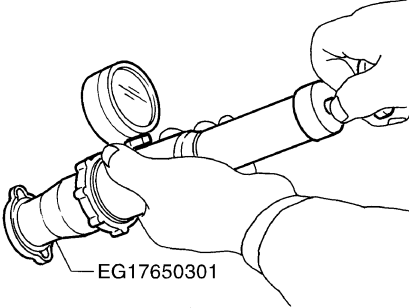
Diagnostic Procedure (Cont'd)

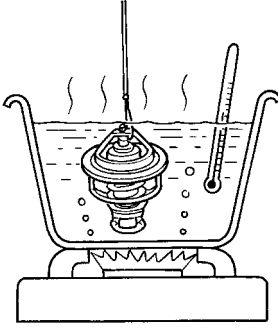
<b>5</b>	<b>CHECK COOLING FAN HIGH SPEED OPERATION</b>
<p>⊗ <b>Without CONSULT-II</b></p> <ol style="list-style-type: none"> <li>1. Turn ignition switch "OFF".</li> <li>2. Reconnect cooling fan high relay.</li> <li>3. Turn air conditioner switch and blower fan switch "OFF".</li> <li>4. Disconnect engine coolant temperature sensor harness connector.</li> <li>5. Connect 150Ω resistor to engine coolant temperature sensor harness connector.</li> <li>6. Restart engine and make sure that cooling fan operates at high speed.</li> </ol>	
	
SEC636CA	
<b>OK or NG</b>	
OK	▶ GO TO 6.
NG	▶ Check cooling fan high speed control circuit. (Go to PROCEDURE B, EC-42.)

<b>6</b>	<b>CHECK COOLING SYSTEM FOR LEAK</b>
<p>Apply pressure to the cooling system with a tester, and check if the pressure drops.  <b>Testing pressure: 157 kPa (1.57 bar, 1.6 kg/cm<sup>2</sup>, 23 psi)</b>  <b>CAUTION:</b>  Higher than the specified pressure may cause radiator damage.</p>	
	
SLC754AB	
<p><b>Pressure should not drop.</b></p> <p style="text-align: center;"><b>OK or NG</b></p>	
OK	▶ GO TO 8.
NG	▶ GO TO 7.

<b>7</b>	<b>DETECT MALFUNCTIONING PART</b>
<p>Check the following for leak.</p> <ul style="list-style-type: none"> <li>● Hose</li> <li>● Radiator</li> <li>● Water pump (Refer to LC section, "Water Pump".)</li> </ul>	
	▶ Repair or replace.

Diagnostic Procedure (Cont'd)

<b>8</b>	<b>CHECK RADIATOR CAP</b>	
Apply pressure to cap with a tester and check radiator cap relief pressure.		
		
SLC755AE		
<p><b>Radiator cap relief pressure:</b>  <b>79 - 98 kPa (0.78 - 0.98 bar, 0.8 - 1.0 kg/cm<sup>2</sup>, 11 - 14 psi)</b></p> <p style="text-align: center;"><b>OK or NG</b></p>		
OK	▶	GO TO 9.
NG	▶	Replace radiator cap.

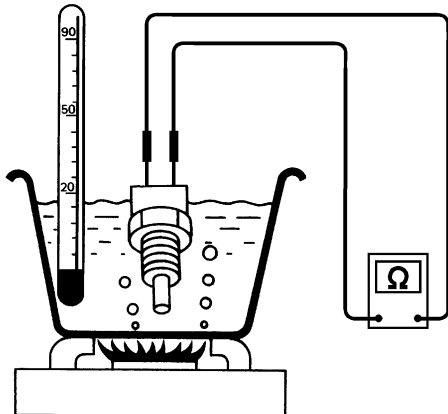
<b>9</b>	<b>CHECK THERMOSTAT</b>	
<ol style="list-style-type: none"> <li>1. Remove thermostat.</li> <li>2. Check valve seating condition at normal room temperatures.  <b>It should seat tightly.</b></li> <li>3. Check valve opening temperature and valve lift.</li> </ol>		
		
SLC343		
<p><b>Valve opening temperature:</b>  <b>82°C (180°F) [standard]</b></p> <p><b>Valve lift:</b>  <b>More than 10 mm/95°C (0.394 in/203°F)</b></p> <ol style="list-style-type: none"> <li>4. Check if valve is closed at 5°C (9°F) below valve opening temperature. For details, refer to LC section, "Thermostat".</li> </ol> <p style="text-align: center;"><b>OK or NG</b></p>		
OK	▶	GO TO 10.
NG	▶	Replace thermostat.

GI  
MA  
EM  
LC  
EC  
FE  
CL  
MT  
AT  
TF  
PD  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX

Diagnostic Procedure (Cont'd)

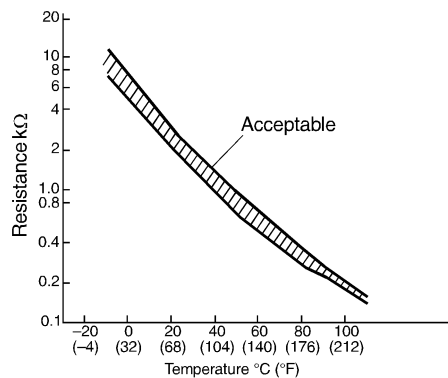
**10 CHECK ENGINE COOLANT TEMPERATURE SENSOR**

1. Remove engine coolant temperature sensor.
2. Check resistance between engine coolant temperature sensor terminals 1 and 2 as shown in the figure.



<Reference data>

Temperature °C (°F)	Resistance kΩ
20 (68)	2.1 - 2.9
50 (122)	0.68 - 1.00
90 (194)	0.236 - 0.260



SEF304X

**OK or NG**

OK ► GO TO 11.

NG ► Replace engine coolant temperature sensor.

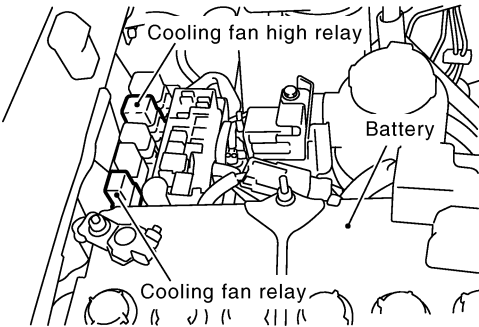




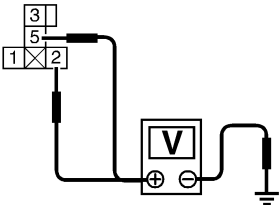
**11 CHECK MAIN 12 CAUSES**

If the cause cannot be isolated, go to "MAIN 12 CAUSES OF OVERHEATING", EC-44.

► **INSPECTION END**


Diagnostic Procedure (Cont'd)

PROCEDURE A

<b>1</b>	<b>CHECK COOLING FAN POWER SUPPLY CIRCUIT</b>	GI MA EM LC <b>EC</b> FE CL MT AT TF PD FA RA
<p>1. Turn ignition switch "OFF". 2. Disconnect cooling fan relay.</p> <div style="text-align: center;">  </div> <p style="text-align: right;">SEC044E</p> <p>3. Turn ignition switch "ON". 4. Check voltage between cooling fan relay terminals 2, 5 and ground with CONSULT-II or tester.</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-right: 20px;">     </div> <div style="margin-right: 20px;">  </div> <div> <p><b>Voltage: Battery voltage</b></p> <p style="text-align: right;">SEC161D</p> </div> </div> <p style="text-align: center;"><b>OK or NG</b></p>		
OK	▶	GO TO 3.
NG	▶	GO TO 2.

<b>2</b>	<b>DETECT MALFUNCTIONING PART</b>	BR ST RS BT HA EL IDX
<p>Check the following.</p> <ul style="list-style-type: none"> <li>● Harness connectors M5, E101</li> <li>● 10A fuse</li> <li>● 40A fusible link</li> <li>● Harness for open or short between cooling fan relay and fuse</li> <li>● Harness for open or short between cooling fan relay and battery</li> </ul>		
▶		Repair open circuit or short to ground or short to power in harness or connectors.

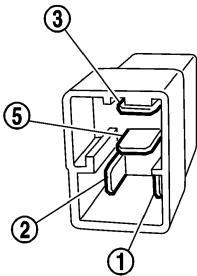
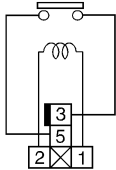
Diagnostic Procedure (Cont'd)

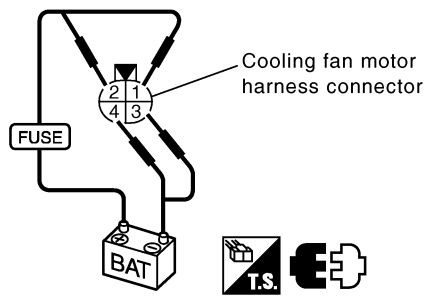
<b>3</b>	<b>CHECK COOLING FAN GROUND CIRCUIT FOR OPEN AND SHORT</b>
<p>1. Turn ignition switch "OFF".                  2. Disconnect cooling fan motor harness connector.</p> <div style="text-align: center;">  <p style="margin-left: 150px;">Cooling fan motor harness connector</p> </div> <p style="text-align: right;">SEC232D</p> <p>3. Check harness continuity between cooling fan relay terminal 3 and cooling fan motor terminals 1, cooling fan motor terminals 4 and body ground. Refer to Wiring Diagram.  <b>Continuity should exist.</b></p> <p>4. Also check harness for short to ground and short to power.</p> <p style="text-align: center;"><b>OK or NG</b></p>	
OK	▶ GO TO 4.
NG	▶ Repair open circuit or short to ground or short to power in harness or connectors.

<b>4</b>	<b>CHECK COOLING FAN OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT</b>
<p>1. Disconnect ECM harness connector.                  2. Disconnect triple-pressure switch harness connector.                  3. Check harness continuity between ECM terminal 14 and cooling fan relay terminal 1, cooling fan relay terminal 1 and triple-pressure switch terminal 2, triple-pressure switch terminal 3 and ground. Refer to Wiring Diagram.  <b>Continuity should exist.</b></p> <p>4. Also check harness for short to ground and short to power.</p> <p style="text-align: center;"><b>OK or NG</b></p>	
OK	▶ GO TO 6.
NG	▶ GO TO 5.

<b>5</b>	<b>DETECT MALFUNCTIONING PART</b>
<p>Check the following.</p> <ul style="list-style-type: none"> <li>● Harness connectors M5, E101</li> <li>● Harness for open or short between cooling fan relay and ECM</li> <li>● Harness for open or short between cooling fan relay and triple-pressure switch</li> <li>● Harness for open or short between triple-pressure switch and ground</li> </ul>	
	▶ Repair open circuit or short to ground or short to power in harness or connectors.

Diagnostic Procedure (Cont'd)

<b>6</b>	<b>CHECK COOLING FAN RELAY</b>								
Check continuity between cooling fan relay terminals 3 and 5 under the following conditions.									
			<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="border: none;">Conditions</th> <th style="border: none;">Continuity</th> </tr> </thead> <tbody> <tr> <td style="border: none;">12V direct current supply between terminals 1 and 2</td> <td style="border: none;">Yes</td> </tr> <tr> <td style="border: none;">No current supply</td> <td style="border: none;">No</td> </tr> </tbody> </table>	Conditions	Continuity	12V direct current supply between terminals 1 and 2	Yes	No current supply	No
Conditions	Continuity								
12V direct current supply between terminals 1 and 2	Yes								
No current supply	No								
SEC340C									
<b>OK or NG</b>									
OK	▶	GO TO 7.							
NG	▶	Replace cooling fan relay.							

<b>7</b>	<b>CHECK COOLING FAN MOTOR</b>															
Supply battery voltage between the following terminals and check operation.																
		<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2" style="border: none;"></th> <th rowspan="2" style="border: none;">Speed</th> <th colspan="2" style="border: none;">Terminals</th> </tr> <tr> <th style="border: none;">(+)</th> <th style="border: none;">(-)</th> </tr> </thead> <tbody> <tr> <td style="border: none;">Cooling fan motor</td> <td style="border: none;">Low</td> <td style="border: none;">1</td> <td style="border: none;">4</td> </tr> <tr> <td style="border: none;"></td> <td style="border: none;">High</td> <td style="border: none;">1, 2</td> <td style="border: none;">3, 4</td> </tr> </tbody> </table>		Speed	Terminals		(+)	(-)	Cooling fan motor	Low	1	4		High	1, 2	3, 4
	Speed	Terminals														
		(+)	(-)													
Cooling fan motor	Low	1	4													
	High	1, 2	3, 4													
SEC046E																
<b>OK or NG</b>																
OK	▶	GO TO 8.														
NG	▶	Replace cooling fan motor.														

<b>8</b>	<b>CHECK TRIPLE PRESSURE SWITCH</b>		
Refer to HA section.			
<b>OK or NG</b>			
OK	▶	GO TO 9.	
NG	▶	Replace triple pressure switch.	

<b>9</b>	<b>CHECK INTERMITTENT INCIDENT</b>		
Perform "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT", EC-561 in Service Manual (Publication No. SM1E-1D22FG1).			
		▶	<b>INSPECTION END</b>

GI  
 MA  
 EM  
 LC  
 EC  
 FE  
 CL  
 MT  
 AT  
 TF  
 PD  
 FA  
 RA  
 BR  
 ST  
 RS  
 BT  
 HA  
 EL  
 IDX

Diagnostic Procedure (Cont'd)

PROCEDURE B

<b>1</b>	<b>CHECK COOLING FAN POWER SUPPLY CIRCUIT</b>
<p>1. Turn ignition switch "OFF".                  2. Disconnect cooling fan high relay.                  3. Turn ignition switch "ON".                  4. Check voltage between cooling fan high relay terminals 2, 7 and ground with CONSULT-II or tester.</p>	
SEC047E	
OK	▶ GO TO 3.
NG	▶ GO TO 2.

<b>2</b>	<b>DETECT MALFUNCTIONING PART</b>
<p>Check the following.</p> <ul style="list-style-type: none"> <li>● Harness connectors M5, E101</li> <li>● 10A fuse</li> <li>● 40A fusible link</li> <li>● Harness for open between cooling fan high relay and fuse</li> <li>● Harness for open between cooling fan high relay and battery</li> </ul>	
▶ Repair harness or connectors.	

<b>3</b>	<b>CHECK COOLING FAN GROUND CIRCUIT FOR OPEN AND SHORT</b>
<p>1. Turn ignition switch "OFF".                  2. Disconnect cooling fan motor harness connector.                  3. Check harness continuity between cooling fan high relay terminal 6 and cooling fan motor terminal 2, cooling fan motor terminal 3 and cooling fan high relay terminal 5, cooling fan high relay terminal 3 and body ground. Refer to Wiring Diagram.  <b>Continuity should exist.</b>                  4. Also check harness for short to ground and short to power.</p>	
OK or NG	
OK	▶ GO TO 4.
NG	▶ Repair open circuit or short to power in harness or connectors.

<b>4</b>	<b>CHECK COOLING FAN OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT</b>
<p>1. Disconnect ECM harness connector.                  2. Check harness continuity between ECM terminal 13 and cooling fan high relay terminal 1. Refer to Wiring Diagram.  <b>Continuity should exist.</b>                  3. Also check harness for short to ground and short to power.</p>	
OK or NG	
OK	▶ GO TO 6.
NG	▶ GO TO 5.

Diagnostic Procedure (Cont'd)

<b>5</b>	<b>DETECT MALFUNCTIONING PART</b>
Check the following. <ul style="list-style-type: none"> <li>● Harness connectors E101, M5</li> <li>● Harness for open between cooling fan high relay and ECM</li> </ul>	
▶ Repair open circuit or short to ground or short to power in harness or connectors.	

<b>6</b>	<b>CHECK COOLING FAN HIGH RELAY</b>
Check continuity between cooling fan high relay terminals 3 and 5, 7 and 6 under the following conditions.	
SEF296X	
<b>OK or NG</b>	
OK	▶ GO TO 7.
NG	▶ Replace cooling fan high relay.

<b>7</b>	<b>CHECK COOLING FAN MOTOR</b>
Supply battery voltage between the following terminals and check operation.	
SEC046E	
<b>OK or NG</b>	
OK	▶ GO TO 8.
NG	▶ Replace cooling fan motor.

<b>8</b>	<b>CHECK INTERMITTENT INCIDENT</b>
1. Perform "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT", EC-561 in Service Manual (Publication No. SM1E-1D22FG1).	
▶ <b>INSPECTION END</b>	

GI  
 MA  
 EM  
 LC  
 EC  
 FE  
 CL  
 MT  
 AT  
 TF  
 PD  
 FA  
 RA  
 BR  
 ST  
 RS  
 BT  
 HA  
 EL  
 IDX

Main 12 Causes of Overheating

Engine	Step	Inspection item	Equipment	Standard	Reference page
OFF	1	<ul style="list-style-type: none"> <li>● Blocked radiator</li> <li>● Blocked condenser</li> <li>● Blocked radiator grille</li> <li>● Blocked bumper</li> </ul>	● Visual	No blocking	—
	2	● Coolant mixture	● Coolant tester	30 - 50% coolant mixture	See "RECOMMENDED FLUIDS AND LUBRICANTS" in MA section.
	3	● Coolant level	● Visual	Coolant up to MAX level in reservoir tank and radiator filler neck	See "Changing Engine Coolant", "ENGINE MAINTENANCE" in MA section.
	4	● Radiator cap	● Pressure tester	78 - 98 kPa (0.78 - 0.98 bar, 0.8 - 1.0 kg/cm <sup>2</sup> , 11 - 14 psi) 59 - 98 kPa (0.59 - 0.98 bar, 0.6 - 1.0 kg/cm <sup>2</sup> , 9 - 14 psi) (Limit)	See "System Check", "ENGINE COOLING SYSTEM" in LC section.
ON*2	5	● Coolant leaks	● Visual	No leaks	See "System Check", "ENGINE COOLING SYSTEM" in LC section.
ON*2	6	● Thermostat	● Touch the upper and lower radiator hoses	Both hoses should be hot.	See "Thermostat" and "Radiator", "ENGINE COOLING SYSTEM" in LC section.
ON*1	7	● Cooling fan	● Visual	Operating	See "DTC 0208 OVER HEAT", EC-30.
ON*2	7	● Cooling fan (Crankshaft driven)	● Visual	Operating	See "Cooling Fan" in LC section.
OFF	8	● Combustion gas leak	● Color checker chemical tester 4 gas analyzer	Negative	—
ON*3	9	● Coolant temperature gauge	● Visual	Gauge less than 3/4 when driving	—
		● Coolant overflow to reservoir tank	● Visual	No overflow during driving and idling	See "Changing Engine Coolant", "ENGINE MAINTENANCE" in MA section.
OFF*4	10	● Coolant return from reservoir tank to radiator	● Visual	Should be initial level in reservoir tank	See "ENGINE MAINTENANCE" in MA section.
OFF	11	● Cylinder head	● Straight gauge feeler gauge	0.1 mm (0.004 in) Maximum distortion (warping)	See "Inspection", "CYLINDER HEAD" in EM section.
	12	● Cylinder block and pistons	● Visual	No scuffing on cylinder walls or piston	See "Inspection", "CYLINDER BLOCK" in EM section.

\*1: Engine running at idle.

\*2: Engine running at 3,000 rpm for 10 minutes.

\*3: Drive at 90 km/h (55 MPH) for 30 minutes and then let idle for 10 minutes.

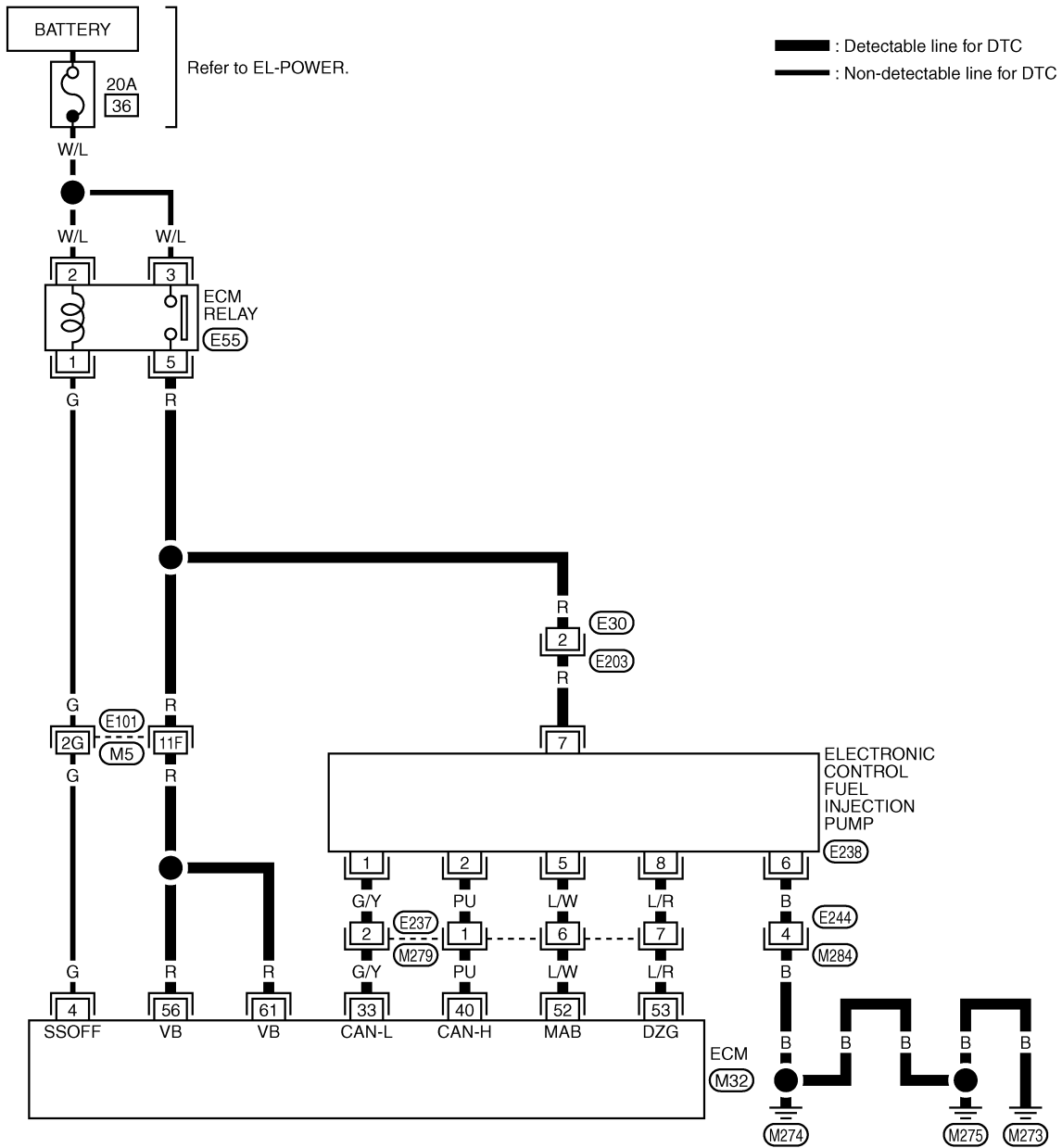
\*4: After 60 minutes of cool down time.

For more information, refer to "OVERHEATING CAUSE ANALYSIS" in LC section.

Wiring Diagram

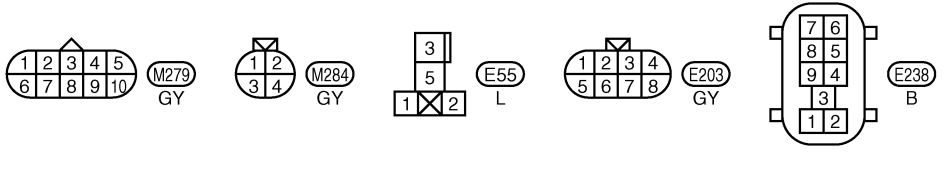
FOR MIDDLE EAST

EC-INJPMP-01

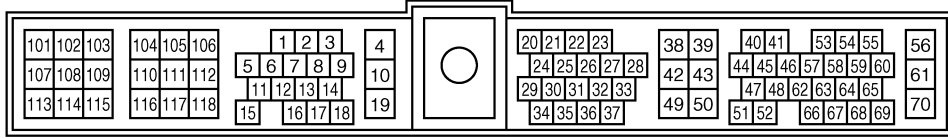


— : Detectable line for DTC  
 — : Non-detectable line for DTC

GI  
 MA  
 EM  
 LC  
**EC**  
 FE  
 CL  
 MT  
 AT  
 TF  
 PD  
 FA  
 RA  
 BR  
 ST  
 RS  
 BT  
 HA  
 EL  
 IDX



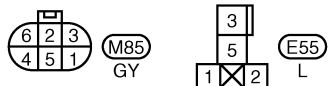
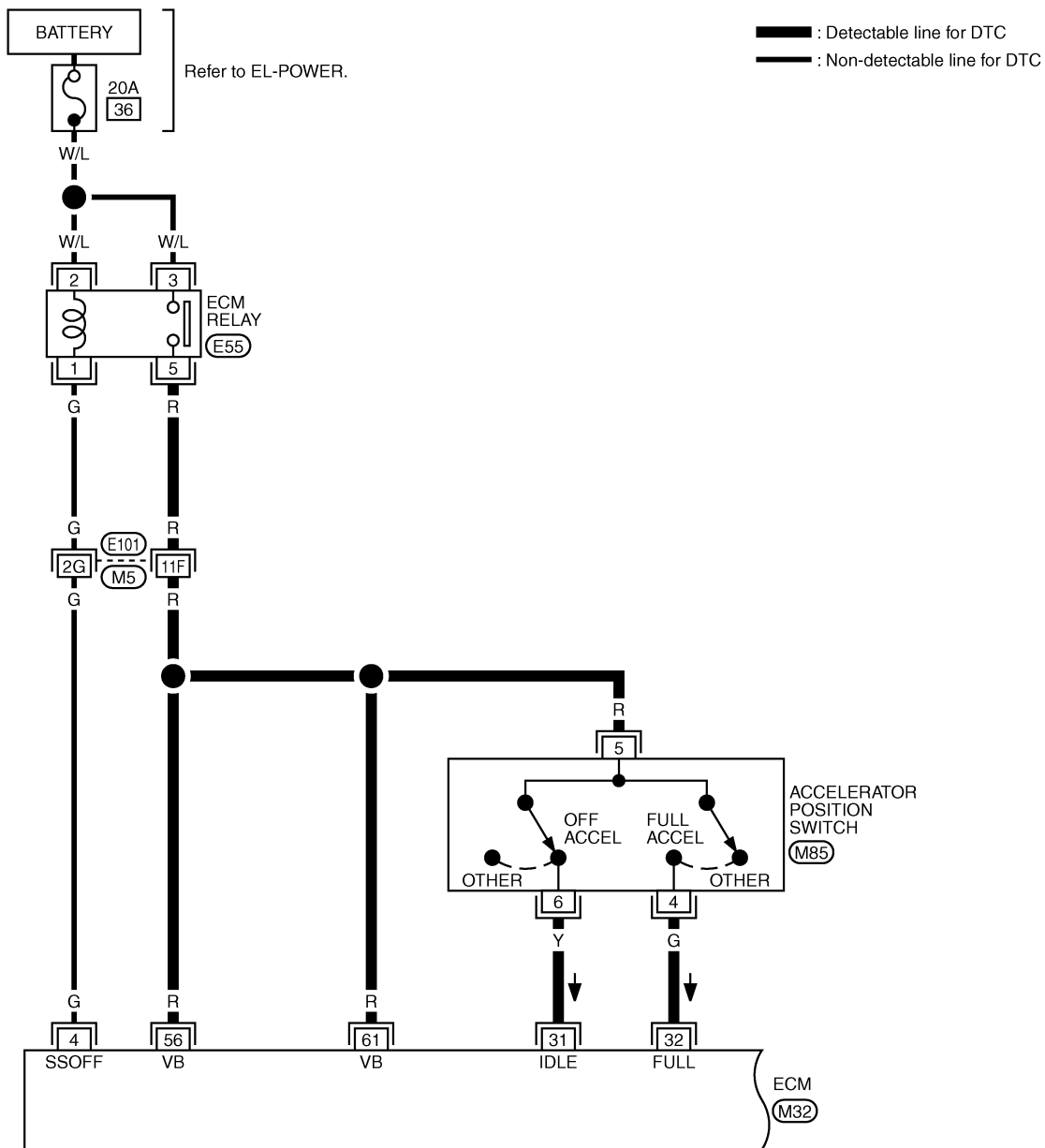
Refer to last page (Foldout page).  
 (M5), (E101)



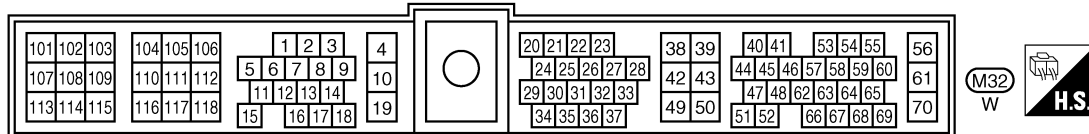
Wiring Diagram

FOR MIDDLE EAST

EC-APS-01



Refer to last page (Foldout page).  
 (M5), (E101)

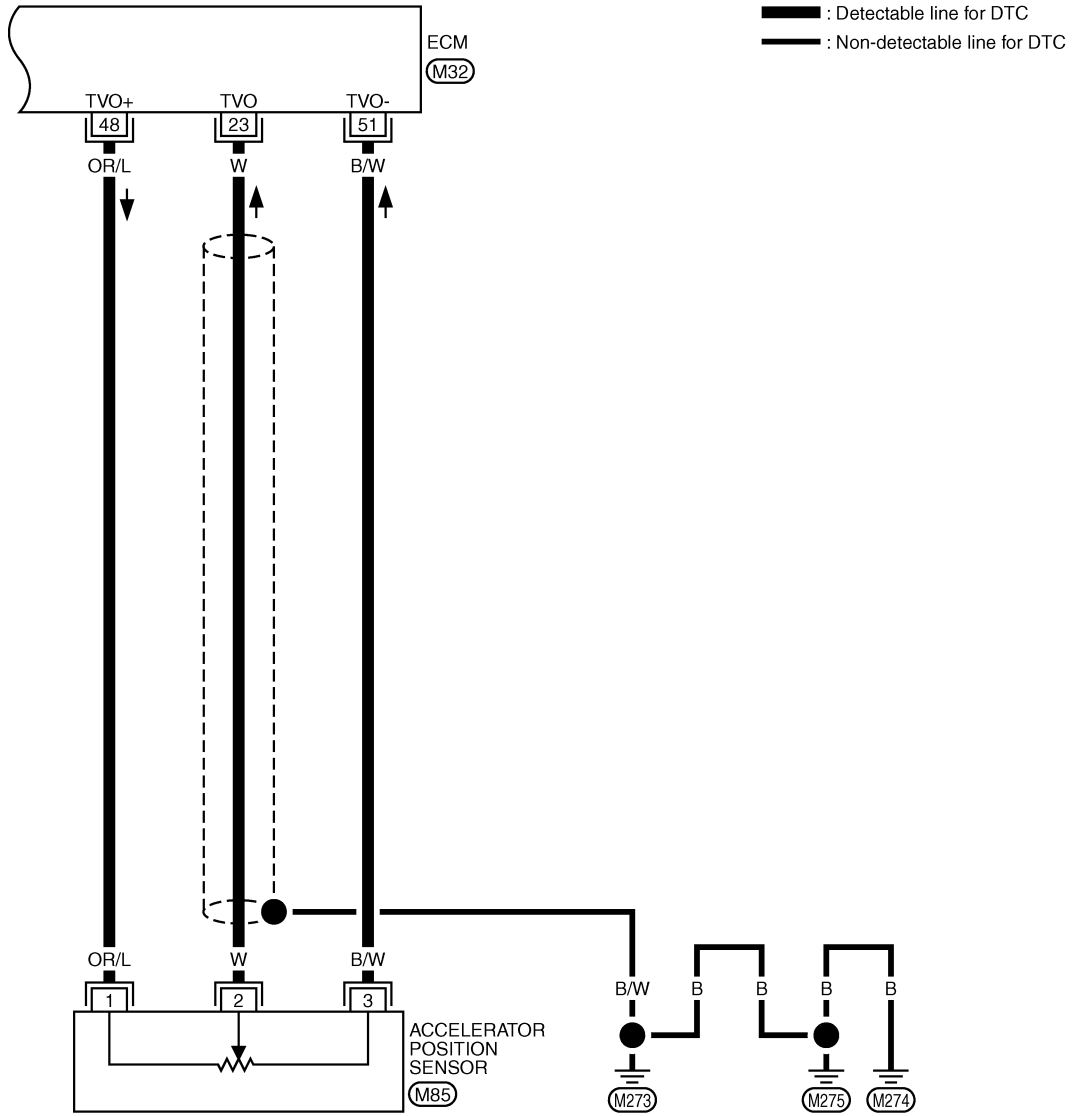


# DTC 0403 ACCEL POS SENSOR

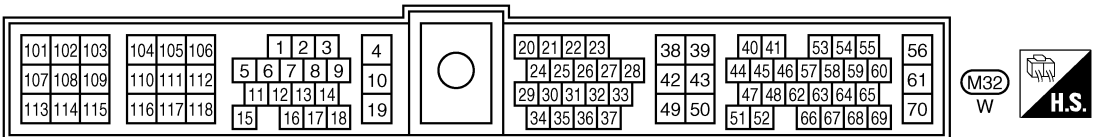
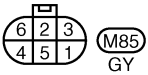
## Wiring Diagram (Cont'd)

YD25DDTi

EC-APS-02



GI  
 MA  
 EM  
 LC  
**EC**  
 FE  
 CL  
 MT  
 AT  
 TF  
 PD  
 FA  
 RA  
 BR  
 ST  
 RS  
 BT  
 HA  
 EL  
 IDX

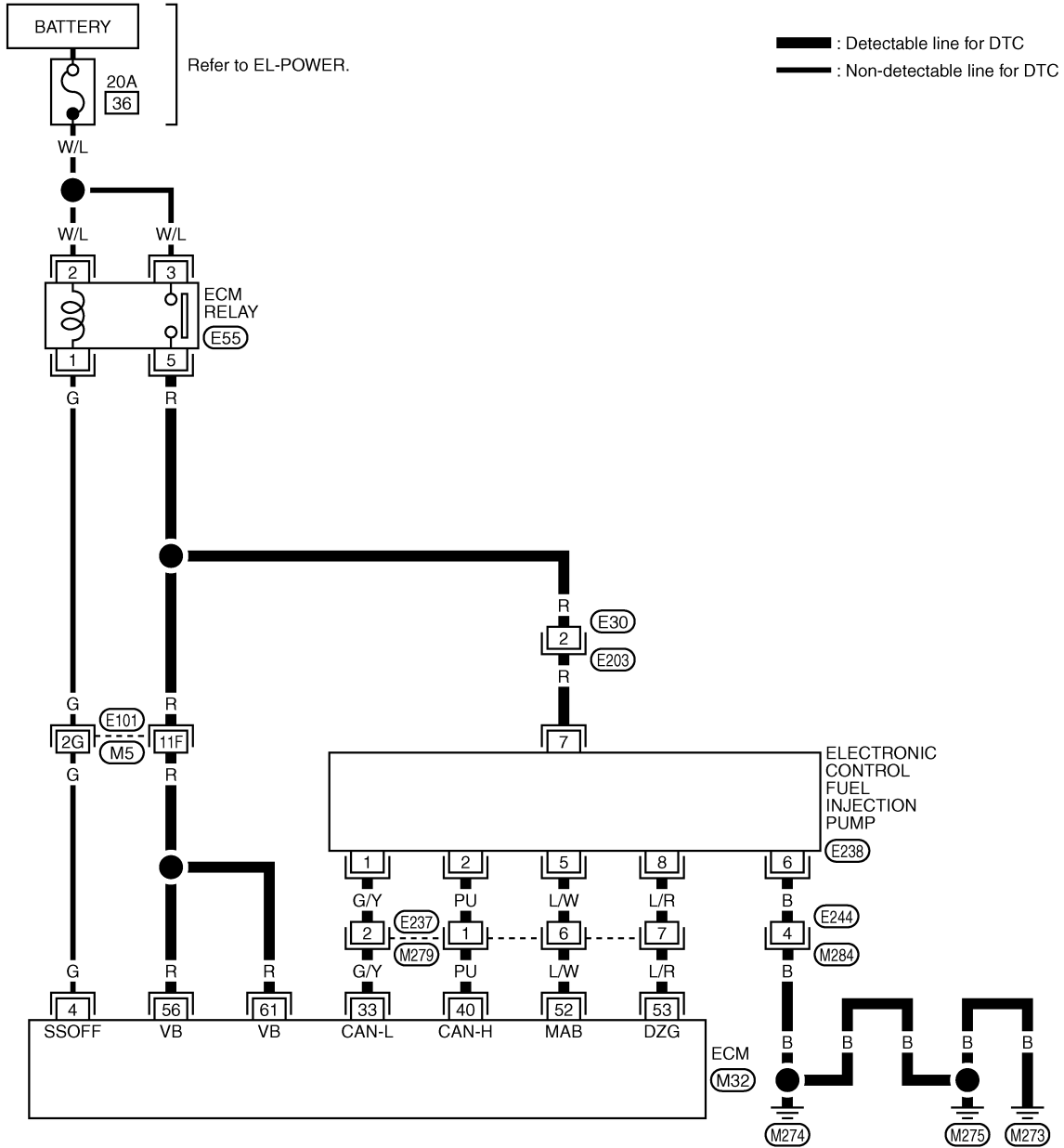


GEC278A

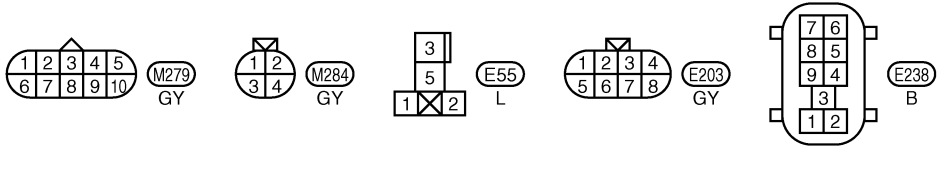
Wiring Diagram

FOR MIDDLE EAST

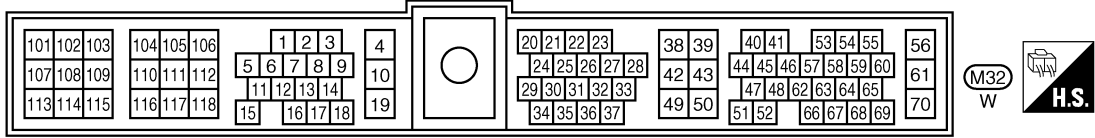
EC-INJPMP-01



— : Detectable line for DTC  
 — : Non-detectable line for DTC



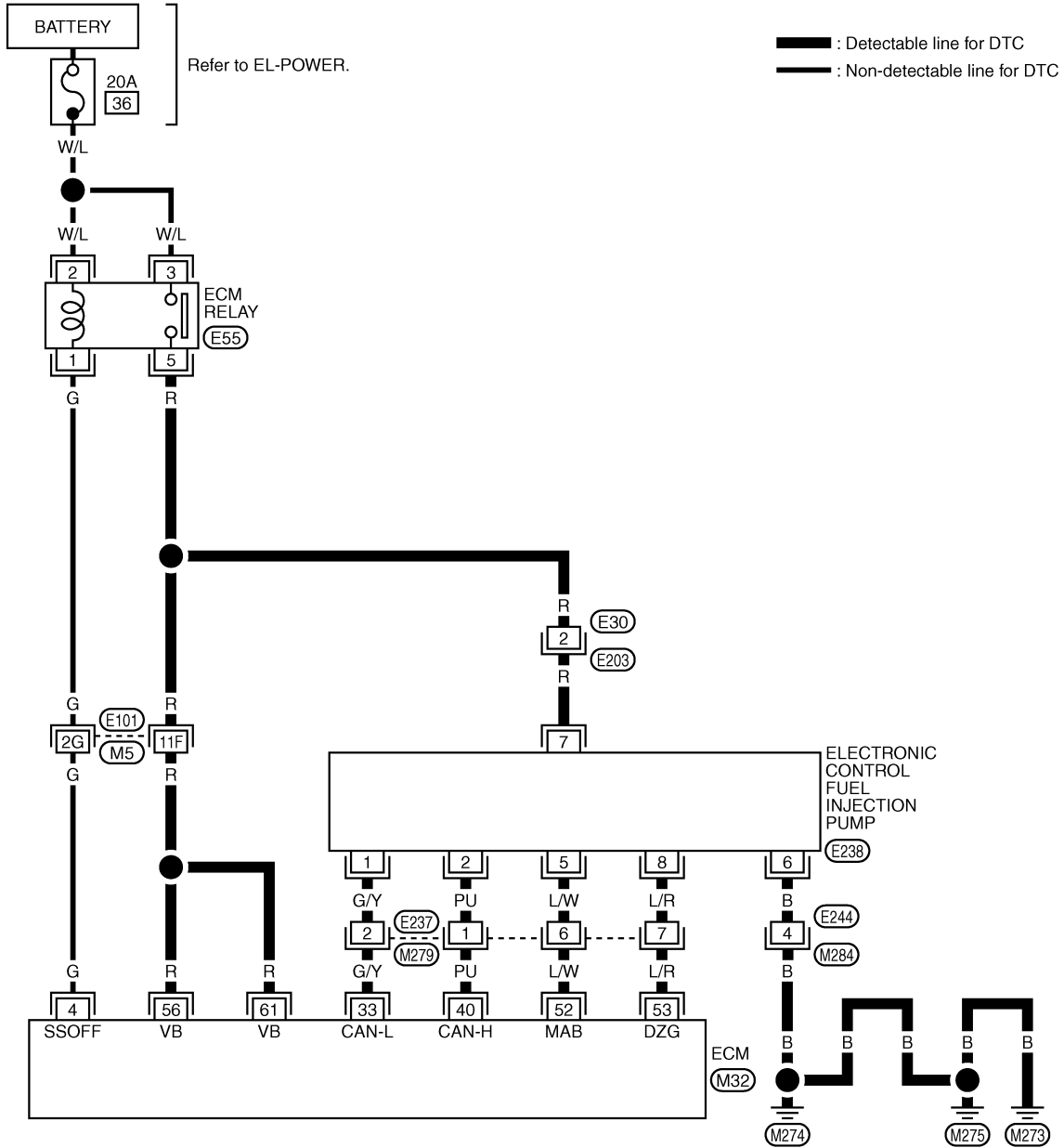
Refer to last page (Foldout page).  
 (M5), (E101)



Wiring Diagram

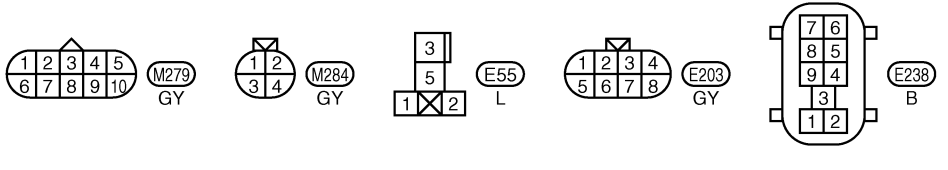
FOR MIDDLE EAST

EC-INJPMP-01

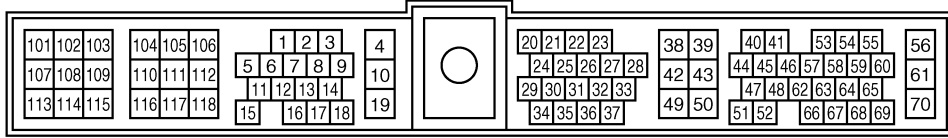


— : Detectable line for DTC  
 — : Non-detectable line for DTC

GI  
 MA  
 EM  
 LC  
**EC**  
 FE  
 CL  
 MT  
 AT  
 TF  
 PD  
 FA  
 RA  
 BR  
 ST  
 RS  
 BT  
 HA  
 EL  
 IDX



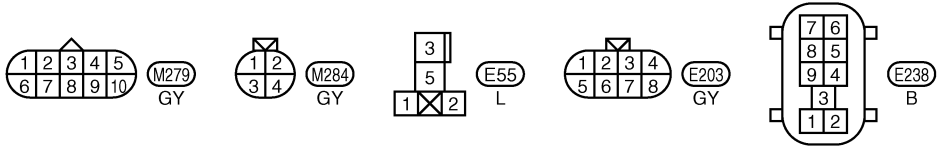
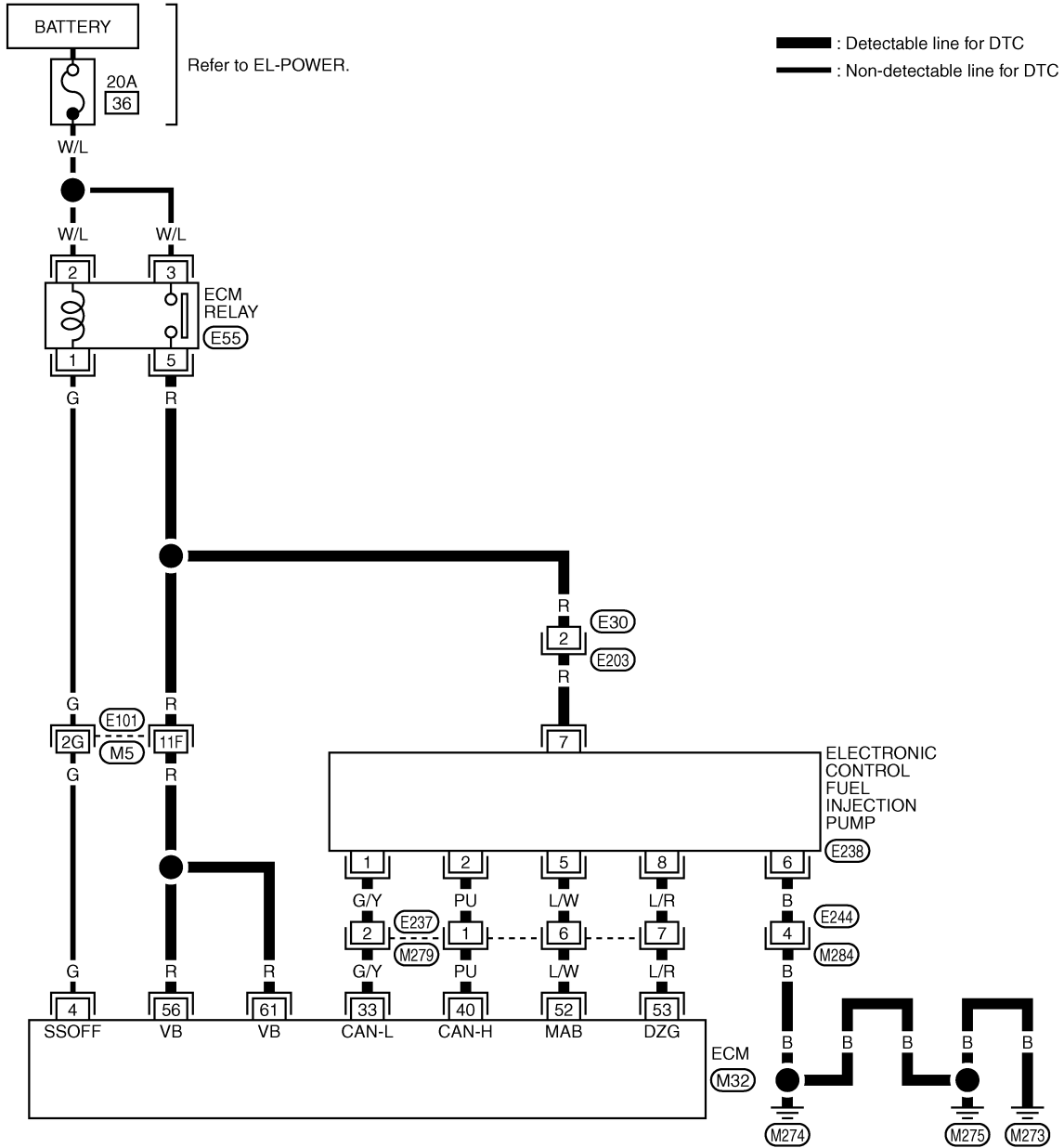
Refer to last page (Foldout page).  
 (M5), (E101)



Wiring Diagram

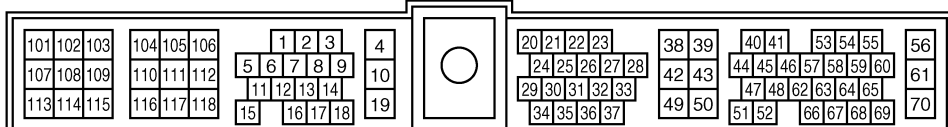
FOR MIDDLE EAST

EC-INJPMP-01



Refer to last page (Foldout page).

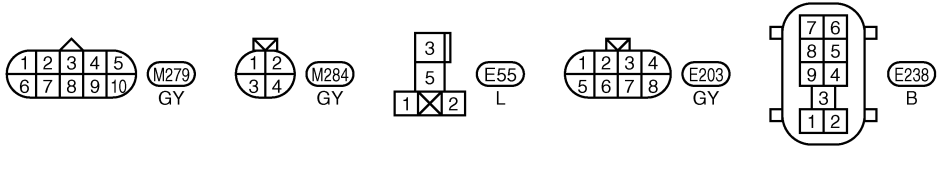
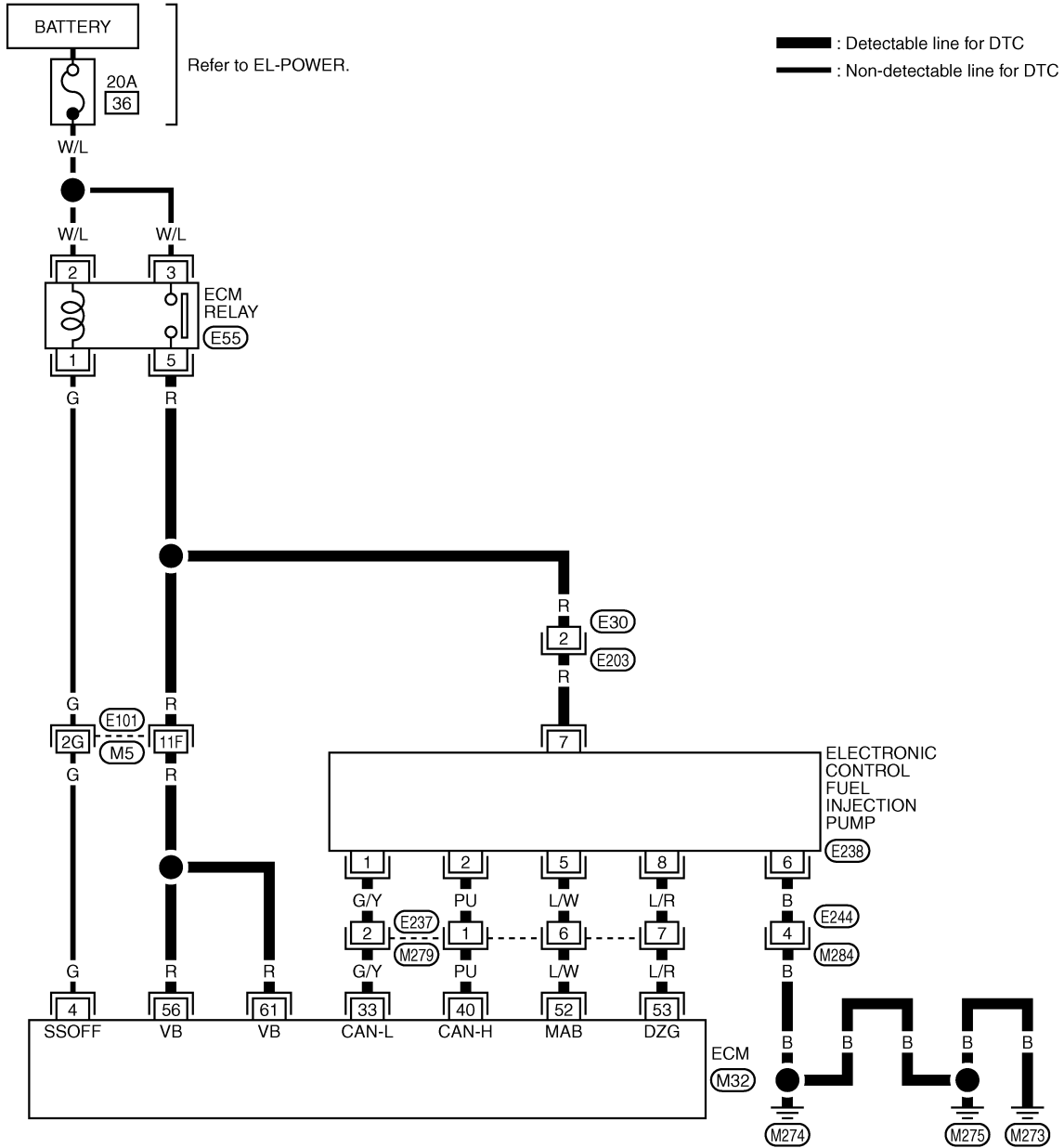
(M5), (E101)



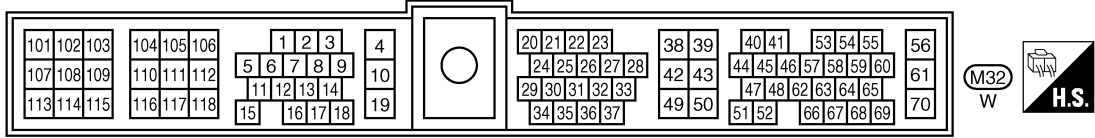
## Wiring Diagram

FOR MIDDLE EAST

EC-INJPMP-01



Refer to last page (Foldout page).  
M5, E101

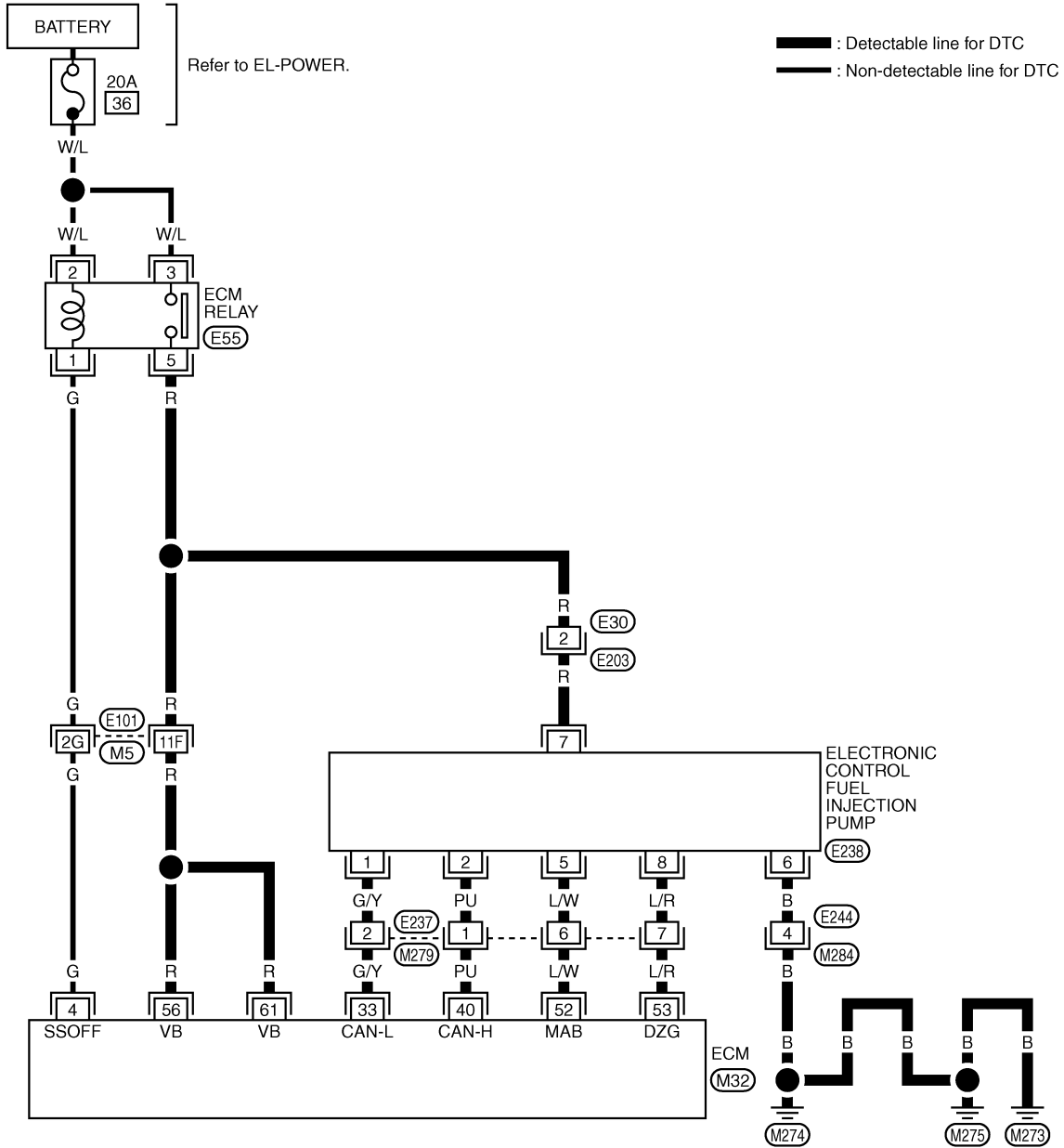


GI  
 MA  
 EM  
 LC  
**EC**  
 FE  
 CL  
 MT  
 AT  
 TF  
 PD  
 FA  
 RA  
 BR  
 ST  
 RS  
 BT  
 HA  
 EL  
 IDX

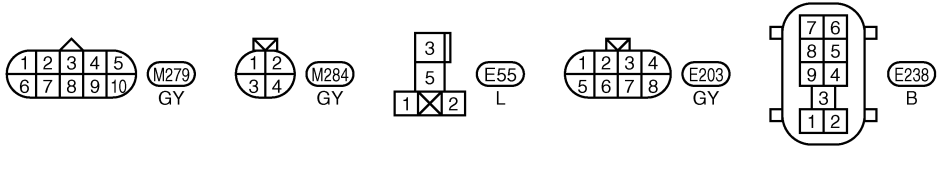
Wiring Diagram

FOR MIDDLE EAST

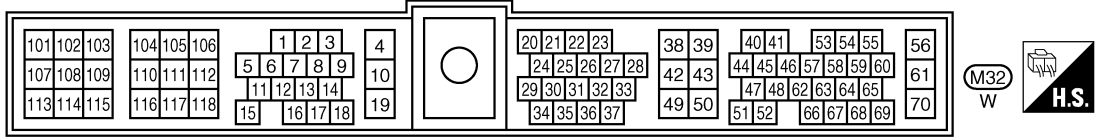
EC-INJPMP-01



— : Detectable line for DTC  
 — : Non-detectable line for DTC



Refer to last page (Foldout page).  
 (M5), (E101)

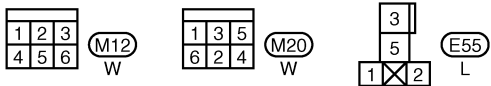
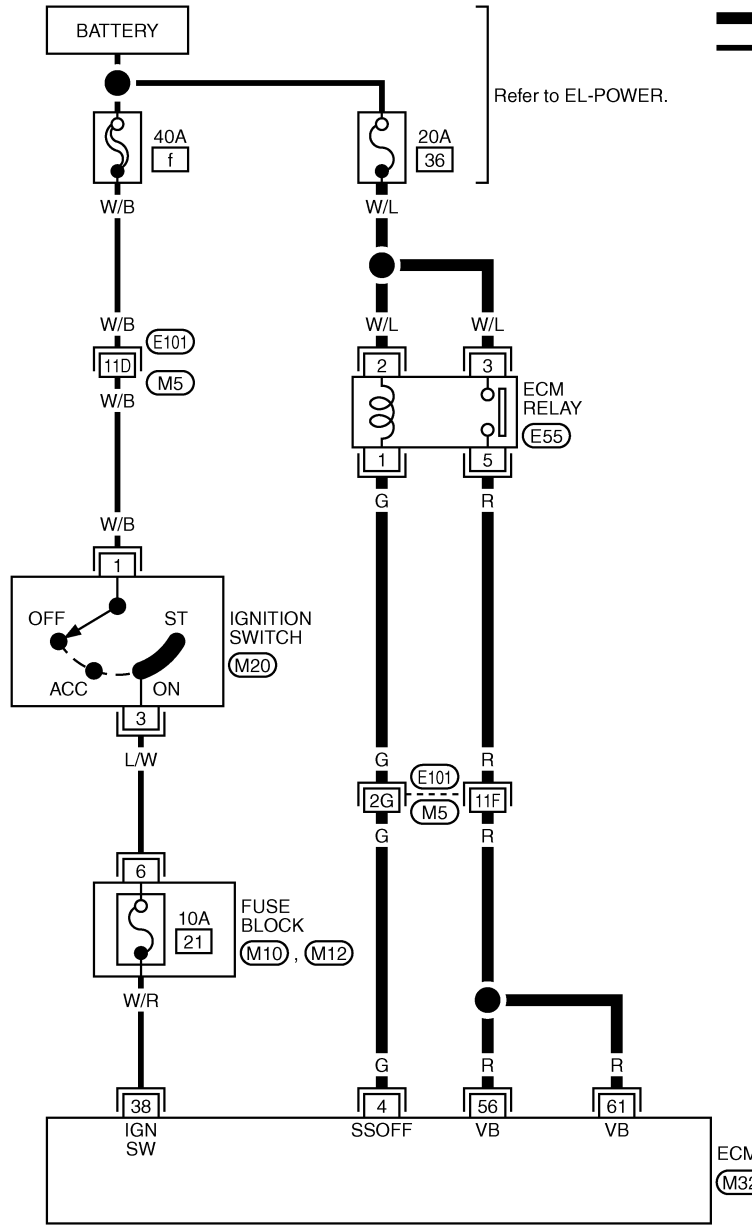


Wiring Diagram

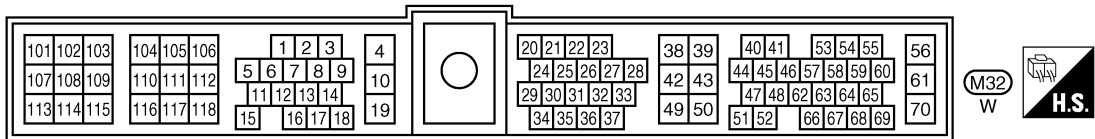
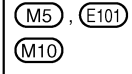
FOR MIDDLE EAST

EC-ECMRLY-01

— : Detectable line for DTC  
 — : Non-detectable line for DTC



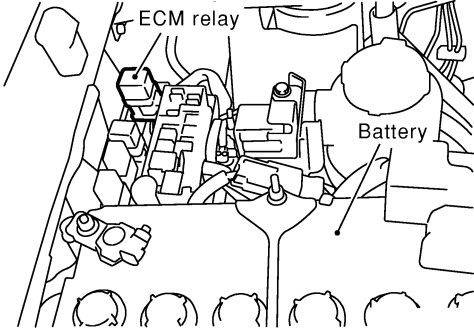
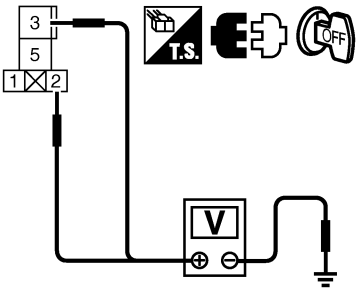
Refer to last page (Foldout page).



GI  
 MA  
 EM  
 LC  
**EC**  
 FE  
 CL  
 MT  
 AT  
 TF  
 PD  
 FA  
 RA  
 BR  
 ST  
 RS  
 BT  
 HA  
 EL  
 IDX

Diagnostic Procedure

FOR MIDDLE EAST

<b>1</b>	<b>CHECK ECM POWER SUPPLY CIRCUIT</b>
<p>1. Turn ignition switch "OFF". 2. Disconnect ECM relay.</p> <div style="text-align: center;">  </div> <p style="text-align: right;">SEC950C</p> <p>3. Check voltage between ECM terminals 2, 3 and ground with CONSULT-II or tester.</p> <div style="text-align: center;">  <p style="text-align: right;"><b>Voltage: Battery voltage</b></p> <p style="text-align: center;"><b>OK or NG</b></p> </div> <p style="text-align: right;">SEC049E</p>	
OK	▶ GO TO 3.
NG	▶ GO TO 2.

<b>2</b>	<b>DETECT MALFUNCTIONING PART</b>
<p>Check the following.</p> <ul style="list-style-type: none"> <li>● 20A fuse</li> <li>● Harness for open and short between ECM relay and battery</li> </ul> <p style="text-align: right;">▶ Repair open circuit or short to ground or short to power in harness or connectors.</p>	

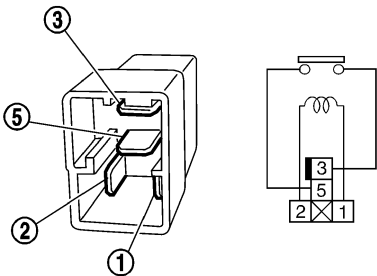
<b>3</b>	<b>CHECK ECM INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT</b>
<p>1. Disconnect ECM harness connector. 2. Check harness continuity between ECM terminals 56, 61 and ECM relay terminal 5. Refer to Wiring Diagram. <b>Continuity should exist.</b> 3. Also check harness for short to ground and short to power.</p> <p style="text-align: center;"><b>OK or NG</b></p>	
OK	▶ GO TO 5.
NG	▶ GO TO 4.

Diagnostic Procedure (Cont'd)

<b>4</b>	<b>DETECT MALFUNCTIONING PART</b>
Check the following. ● Harness connectors E101, M5 ● Harness for open or short between ECM and ECM relay	
▶ Repair open circuit or short to ground or short to power in harness or connectors.	

<b>5</b>	<b>CHECK ECM OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT</b>
1. Check harness continuity between ECM terminal 4 and ECM relay terminal 1. Refer to Wiring Diagram. <b>Continuity should exist.</b> 2. Also check harness for short to ground and short to power.	
<b>OK or NG</b>	
OK	▶ GO TO 7.
NG	▶ GO TO 6.

<b>6</b>	<b>DETECT MALFUNCTIONING PART</b>
Check the following. ● Harness connectors E101, M5 ● Harness for open or short between ECM and ECM relay	
▶ Repair open circuit or short to ground or short to power in harness or connectors.	

<b>7</b>	<b>CHECK ECM RELAY</b>						
1. Apply 12V direct current between ECM relay terminals 1 and 2. 2. Check continuity between ECM relay terminals 3 and 5.							
 <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Conditions</th> <th>Continuity</th> </tr> </thead> <tbody> <tr> <td>12V direct current supply between terminals 1 and 2</td> <td style="text-align: center;">Yes</td> </tr> <tr> <td>No current supply</td> <td style="text-align: center;">No</td> </tr> </tbody> </table>		Conditions	Continuity	12V direct current supply between terminals 1 and 2	Yes	No current supply	No
Conditions	Continuity						
12V direct current supply between terminals 1 and 2	Yes						
No current supply	No						
SEC340C							
<b>OK or NG</b>							
OK	▶ GO TO 8.						
NG	▶ Replace ECM relay.						

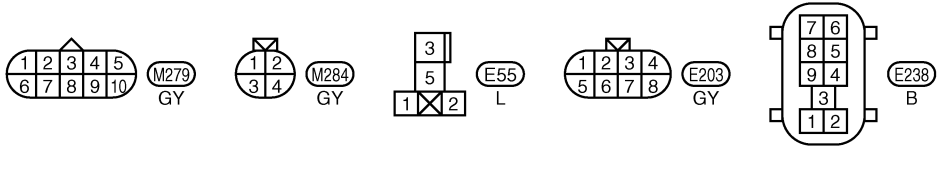
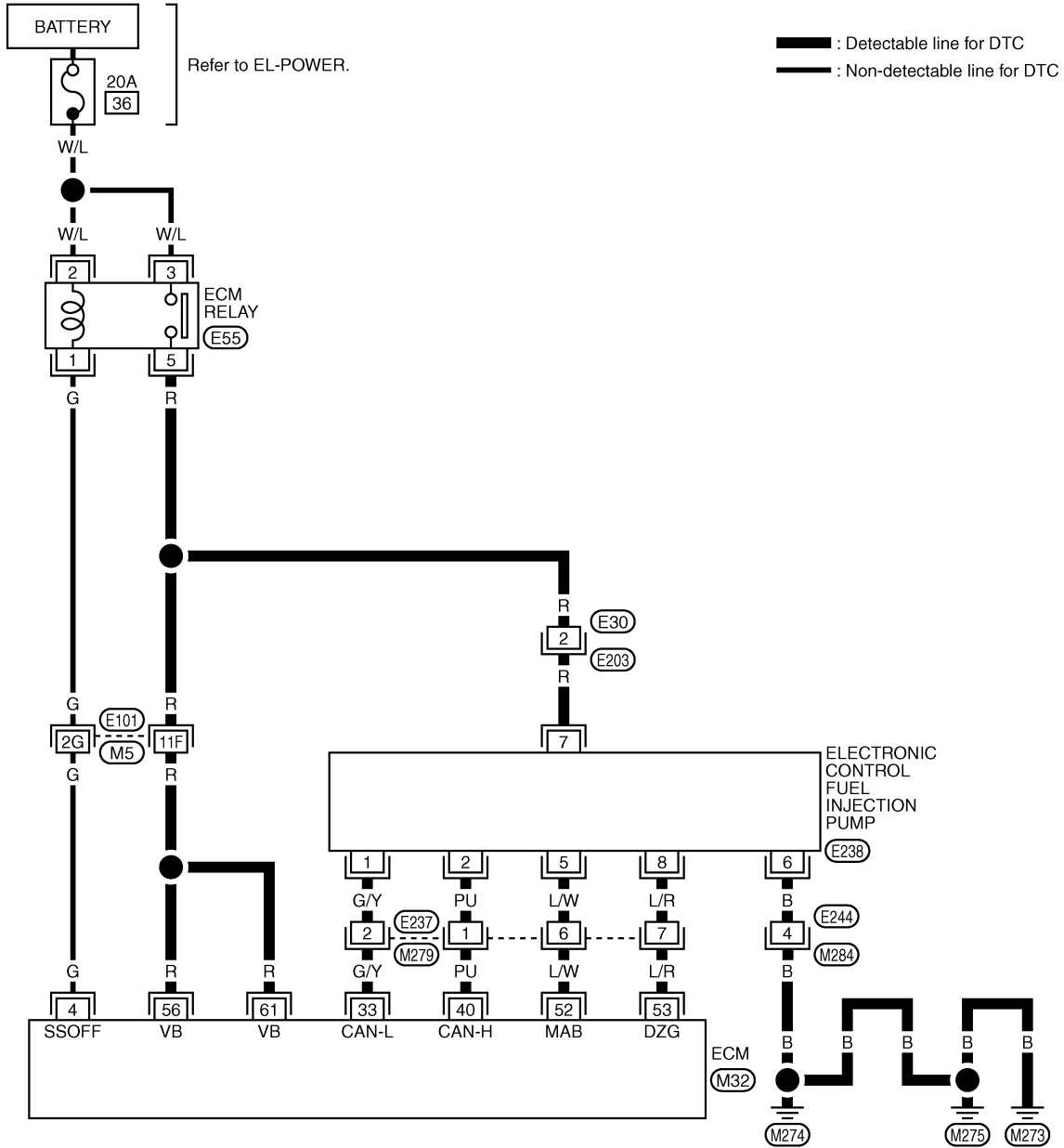
<b>8</b>	<b>CHECK INTERMITTENT INCIDENT</b>
Refer to "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT", EC-561 in Service Manual (Publication No. SM1E-1D22FG1).	
▶ <b>INSPECTION END</b>	

GI  
MA  
EM  
LC  
EC  
FE  
CL  
MT  
AT  
TF  
PD  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX

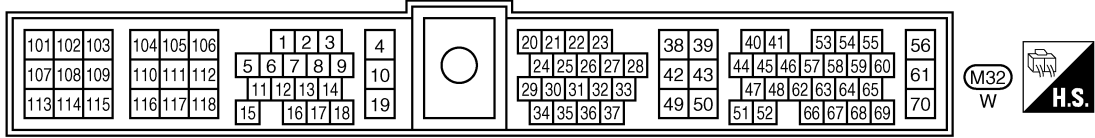
Wiring Diagram

FOR MIDDLE EAST

EC-INJPMP-01

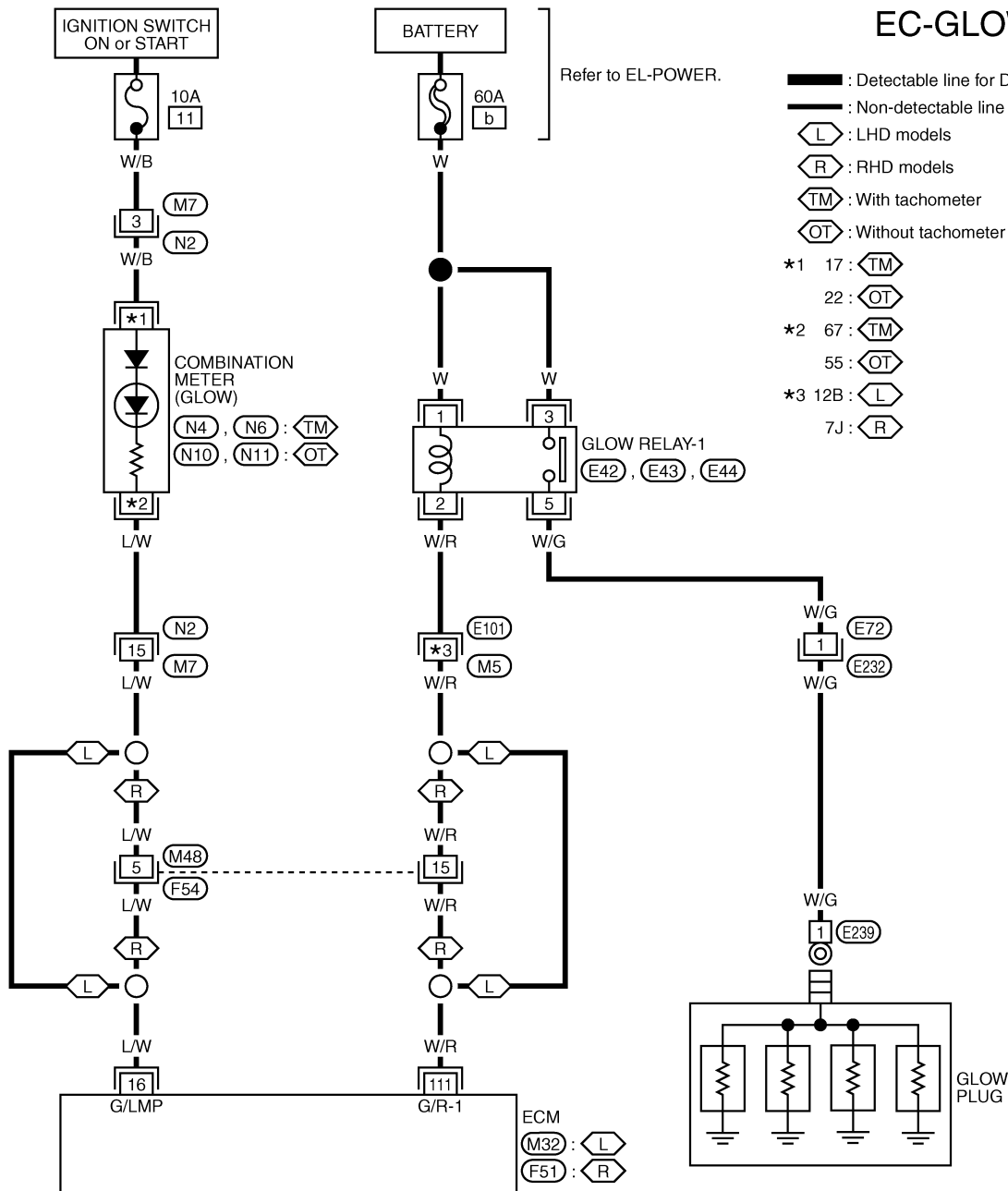


Refer to last page (Foldout page).  
 M5, E101



Wiring Diagram

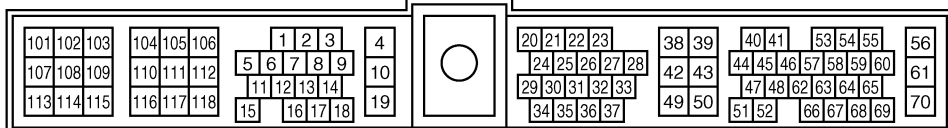
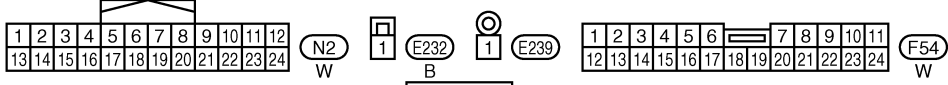
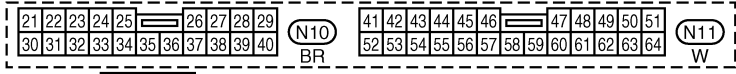
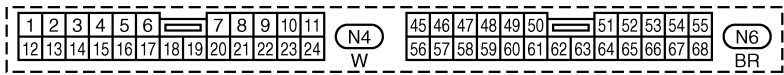
EC-GLOW-01



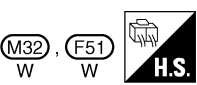
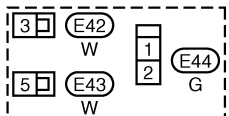
Refer to EL-POWER.

- : Detectable line for DTC
- - - : Non-detectable line for DTC
- (L) : LHD models
- (R) : RHD models
- (TM) : With tachometer
- (OT) : Without tachometer
- \*1 17 : (TM)
- 22 : (OT)
- \*2 67 : (TM)
- 55 : (OT)
- \*3 12B : (L)
- 7J : (R)

GI  
MA  
EM  
LC  
**EC**  
FE  
CL  
MT  
AT  
TF  
PD  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX









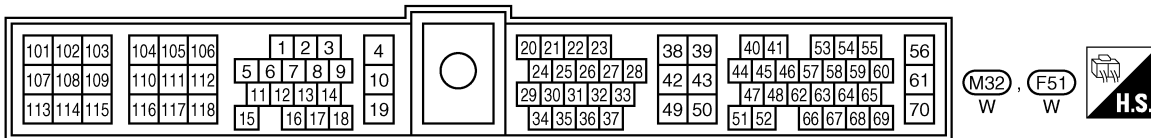
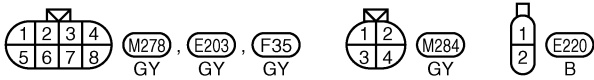
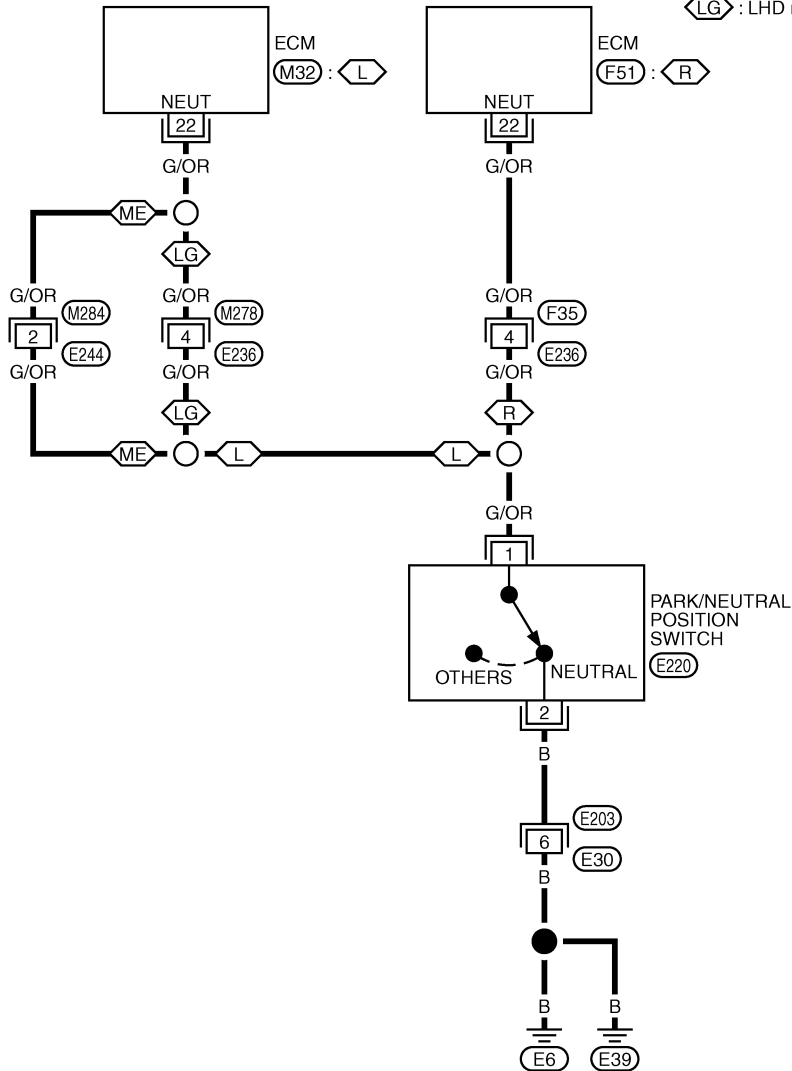
Refer to last page (Foldout page).  
(M5), (E101)





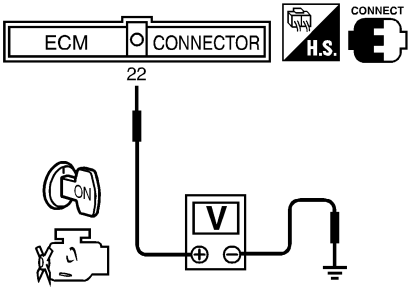
Wiring Diagram

EC-PNP/SW-01

-  : Detectable line for DTC
-  : Non-detectable line for DTC
-  : LHD models
-  : RHD models
-  : For the Middle East
-  : LHD models except for the Middle East

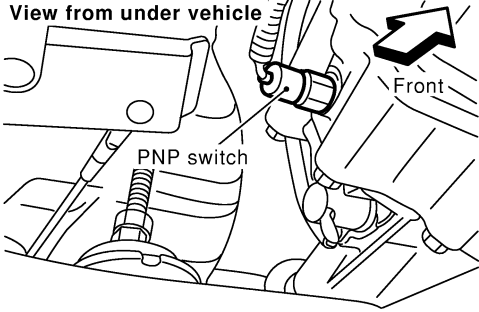


Diagnostic Procedure

<b>1</b>	<b>CHECK OVERALL FUNCTION</b>												
<p> <b>With CONSULT-II</b></p> <p>1. Turn ignition switch "ON".                  2. Select "P/N POSI SW" in "DATA MONITOR" mode with CONSULT-II.                  3. Check "P/N POSI SW" signal under the following conditions.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <thead> <tr> <th colspan="2">DATA MONITOR</th> </tr> <tr> <th>MONITOR</th> <th>NO DTC</th> </tr> </thead> <tbody> <tr> <td>P/N POSI SW</td> <td>ON</td> </tr> </tbody> </table> <table border="1" style="border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Condition (Gear position)</th> <th>P/N POSI SW</th> </tr> </thead> <tbody> <tr> <td>Neutral position</td> <td>ON</td> </tr> <tr> <td>Except the above position</td> <td>OFF</td> </tr> </tbody> </table> </div> <p style="text-align: right;">SEF049YA</p>		DATA MONITOR		MONITOR	NO DTC	P/N POSI SW	ON	Condition (Gear position)	P/N POSI SW	Neutral position	ON	Except the above position	OFF
DATA MONITOR													
MONITOR	NO DTC												
P/N POSI SW	ON												
Condition (Gear position)	P/N POSI SW												
Neutral position	ON												
Except the above position	OFF												
<p> <b>Without CONSULT-II</b></p> <p>1. Turn ignition switch "ON".                  2. Check voltage between ECM terminal 22 and ground under the following conditions.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;">  <table border="1" style="border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Condition (Gear position)</th> <th>Voltage V</th> </tr> </thead> <tbody> <tr> <td>Neutral position</td> <td>Approx. 0V</td> </tr> <tr> <td>Except the above position</td> <td>Battery voltage</td> </tr> </tbody> </table> </div> <p style="text-align: right;">SEF419Y</p> <p style="text-align: center;"><b>OK or NG</b></p>		Condition (Gear position)	Voltage V	Neutral position	Approx. 0V	Except the above position	Battery voltage						
Condition (Gear position)	Voltage V												
Neutral position	Approx. 0V												
Except the above position	Battery voltage												
OK	▶ <b>INSPECTION END</b>												
NG	▶ <b>GO TO 2.</b>												

GI  
MA  
EM  
LC  
EC  
FE  
CL  
MT  
AT  
TF  
PD  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX

Diagnostic Procedure (Cont'd)

<b>2</b>	<b>CHECK PNP SWITCH GROUND CIRCUIT FOR OPEN AND SHORT</b>
<p>1. Turn ignition switch "OFF".                  2. Disconnect park/neutral position (PNP) switch harness connector.</p> <div style="text-align: center;">  <p>View from under vehicle</p> <p>PNP switch</p> <p>Front</p> </div> <p style="text-align: right;">SEC170D</p> <p>3. Check harness continuity between PNP switch terminal 2 and body ground. Refer to Wiring Diagram.  <b>Continuity should exist.</b>                  4. Also check harness for short to ground and short to power.</p> <p style="text-align: center;"><b>OK or NG</b></p>	
OK	▶ GO TO 4.
NG	▶ GO TO 3.

<b>3</b>	<b>DETECT MALFUNCTIONING PART</b>
<p>Check the following.</p> <ul style="list-style-type: none"> <li>● Harness connectors E203, E30</li> <li>● Harness for open or short between PNP switch and body ground</li> </ul>	
	▶ Repair open circuit or short to ground or short to power in harness or connectors.

<b>4</b>	<b>CHECK PNP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT</b>
<p>1. Disconnect ECM harness connector.                  2. Check harness continuity between ECM terminal 22 and PNP switch terminal 1. Refer to Wiring Diagram.  <b>Continuity should exist.</b>                  3. Also check harness for short to ground and short to power.</p> <p style="text-align: center;"><b>OK or NG</b></p>	
OK	▶ GO TO 6.
NG	▶ GO TO 5.

<b>5</b>	<b>DETECT MALFUNCTIONING PART</b>
<p>Check the following.</p> <ul style="list-style-type: none"> <li>● Harness connectors M278, E236 (LHD models except for Middle East)</li> <li>● Harness connectors F35, E236 (RHD models)</li> <li>● Harness connectors M284, E244 (for Middle East)</li> <li>● Harness for open or short between PNP switch and ECM</li> </ul>	
	▶ Repair open circuit or short to ground or short to power in harness or connectors.

<b>6</b>	<b>CHECK PARK/NEUTRAL POSITION SWITCH</b>
<p>Refer to MT section ("POSITION SWITCH CHECK").</p> <p style="text-align: center;"><b>OK or NG</b></p>	
OK	▶ GO TO 7.
NG	▶ Replace park/neutral position switch.

Diagnostic Procedure (Cont'd)

7	CHECK INTERMITTENT INCIDENT
Refer to "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT", EC-561 in Service Manual (Publication No. SM1E-1D22FG1).	
▶ INSPECTION END	

GI

MA

EM

LC

**EC**

FE

CL

MT

AT

TF

PD

FA

RA

BR

ST

RS

BT

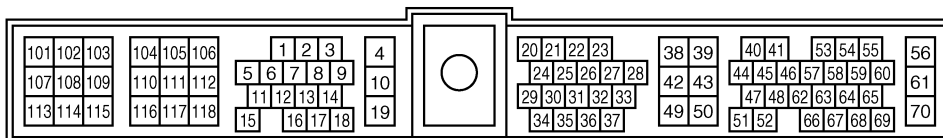
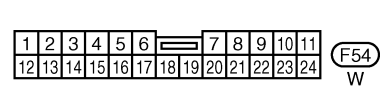
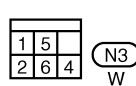
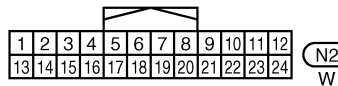
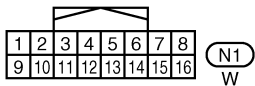
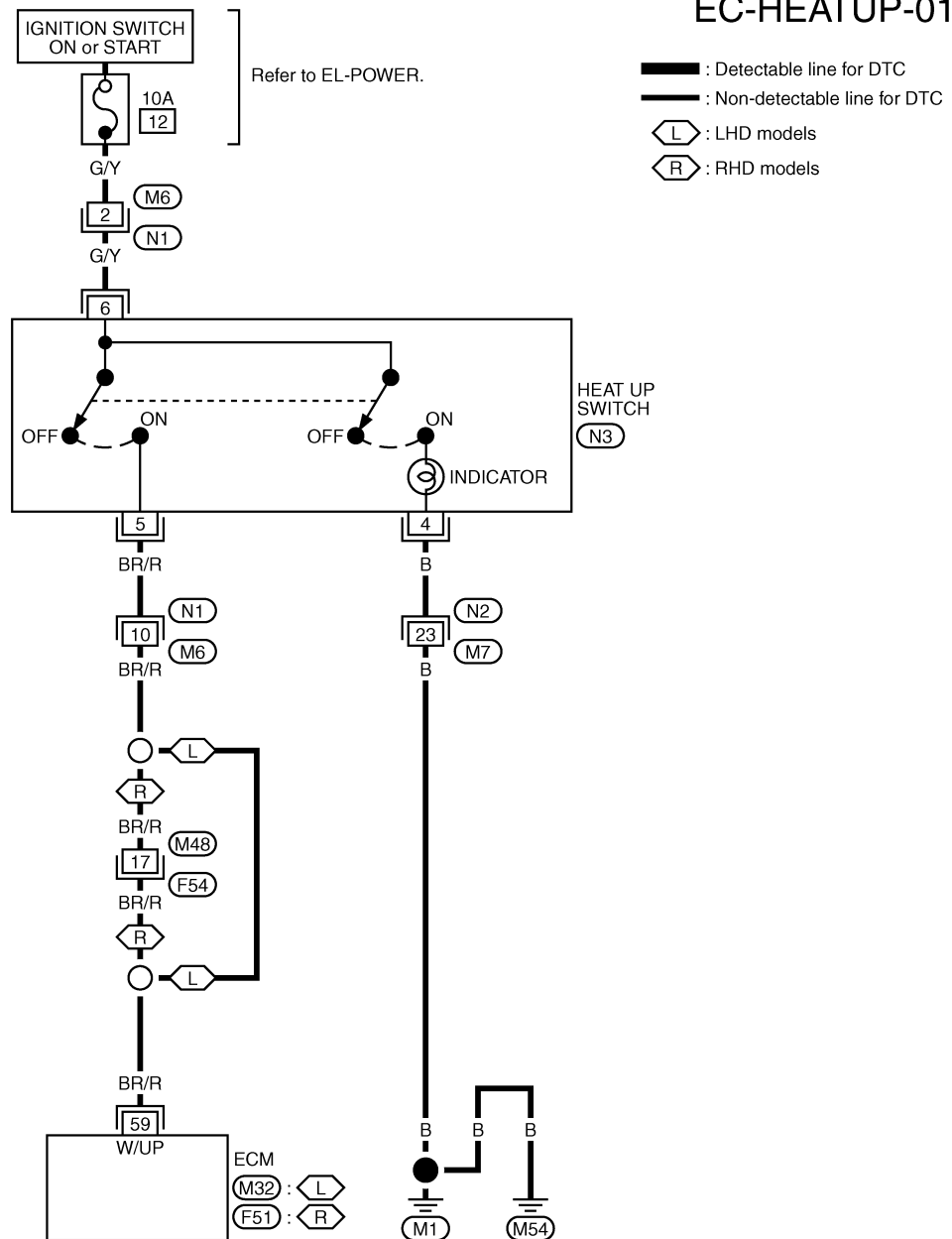
HA

EL

IDX

## Wiring Diagram

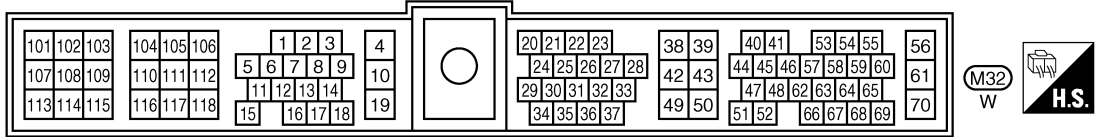
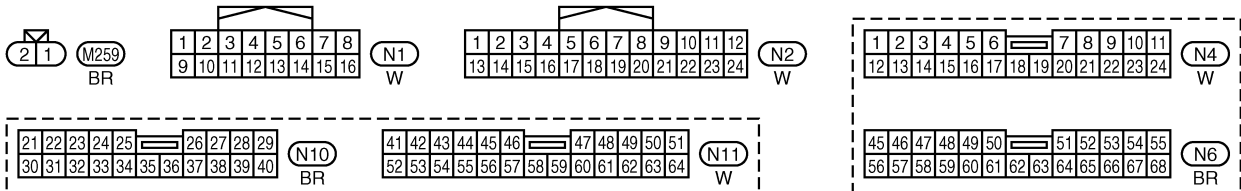
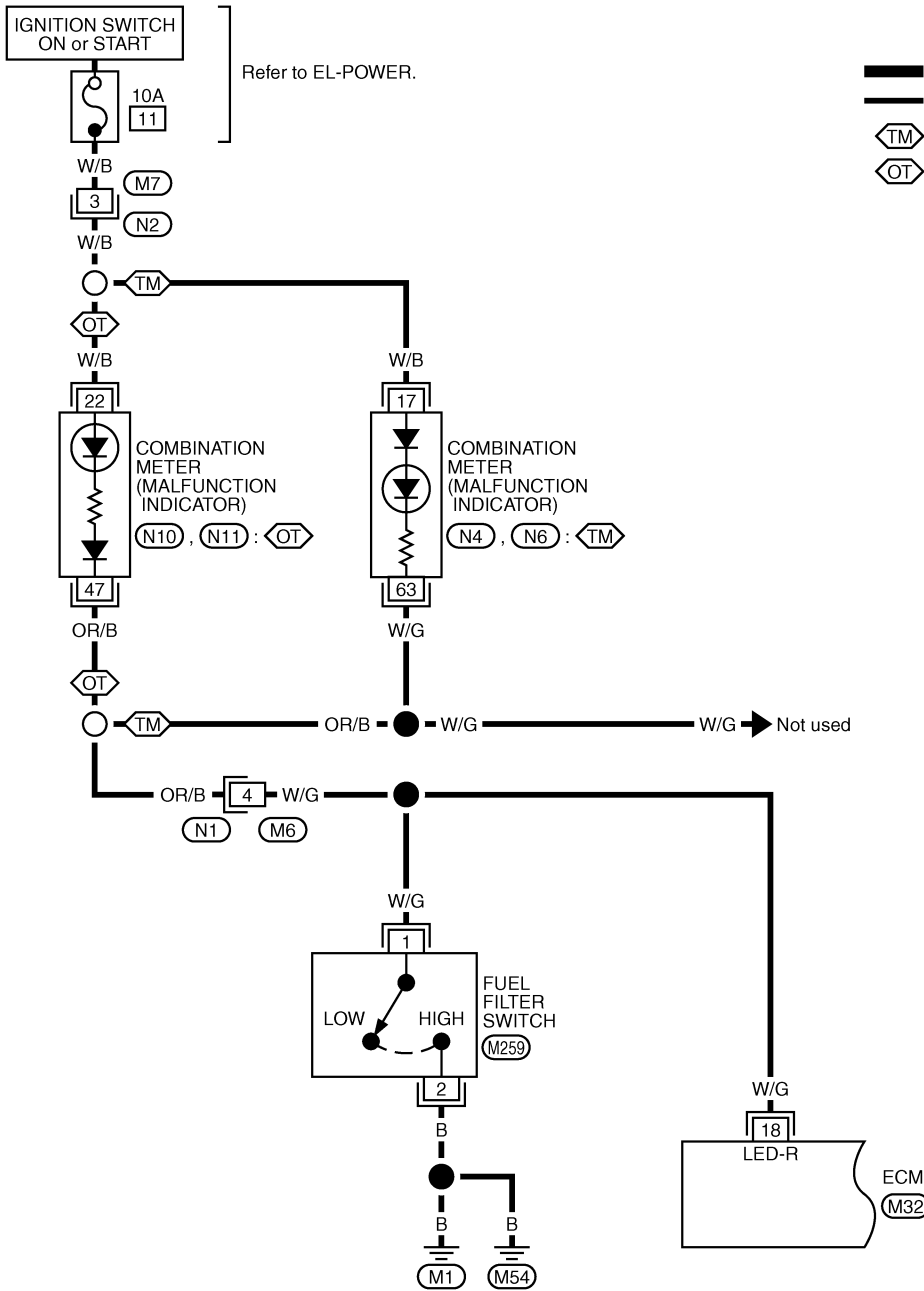
### EC-HEATUP-01



Wiring Diagram

LHD MODELS

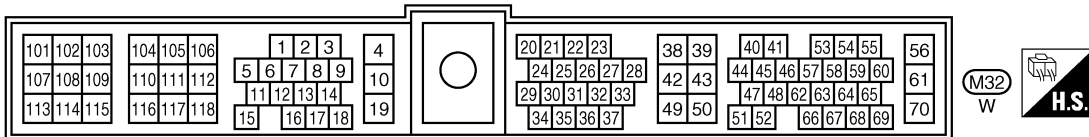
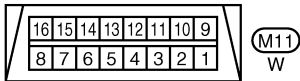
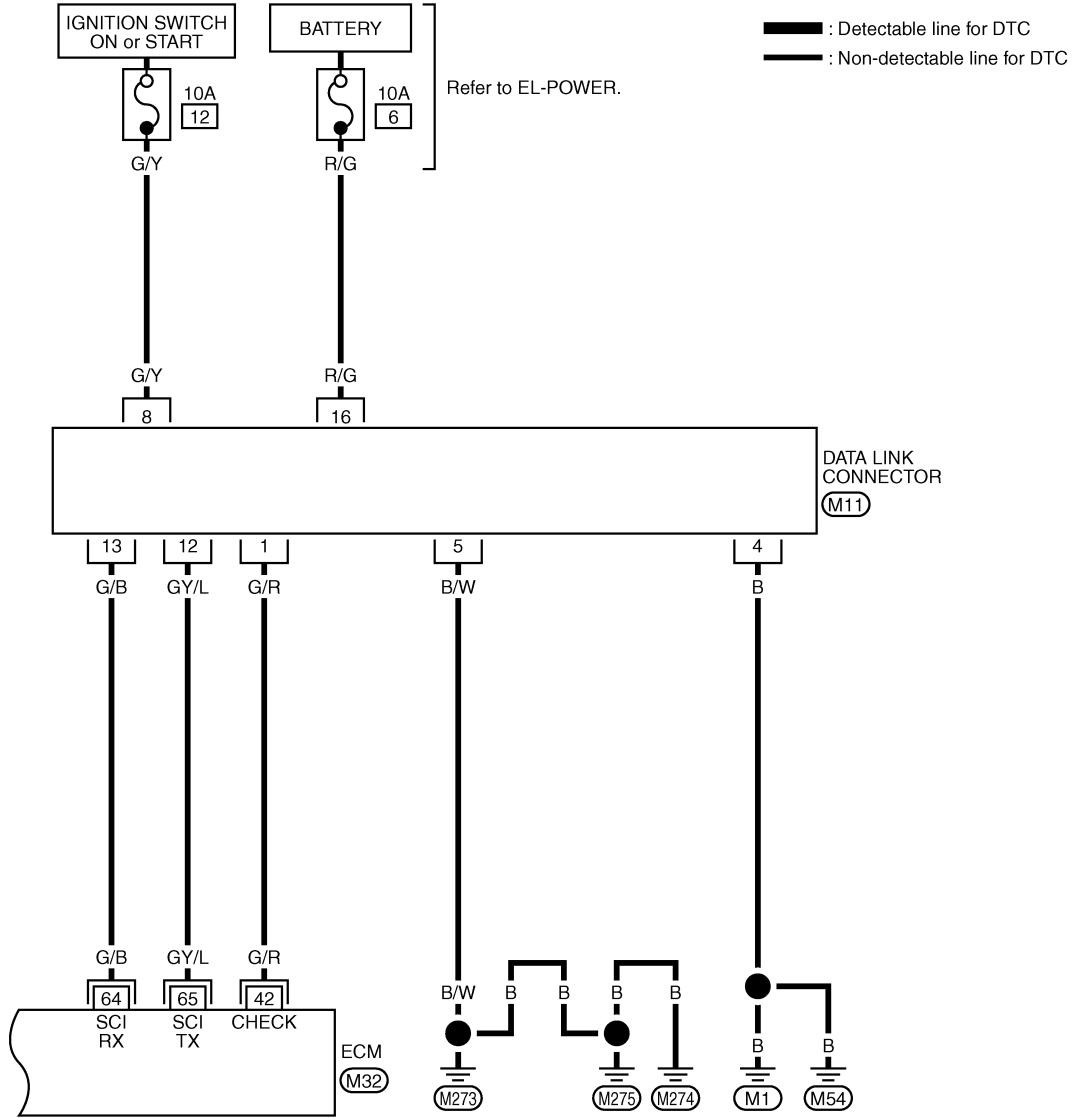
EC-MIL/DL-01



GI  
MA  
EM  
LC  
EC  
FE  
CL  
MT  
AT  
TF  
PD  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX

Wiring Diagram (Cont'd)





EC-MIL/DL-02

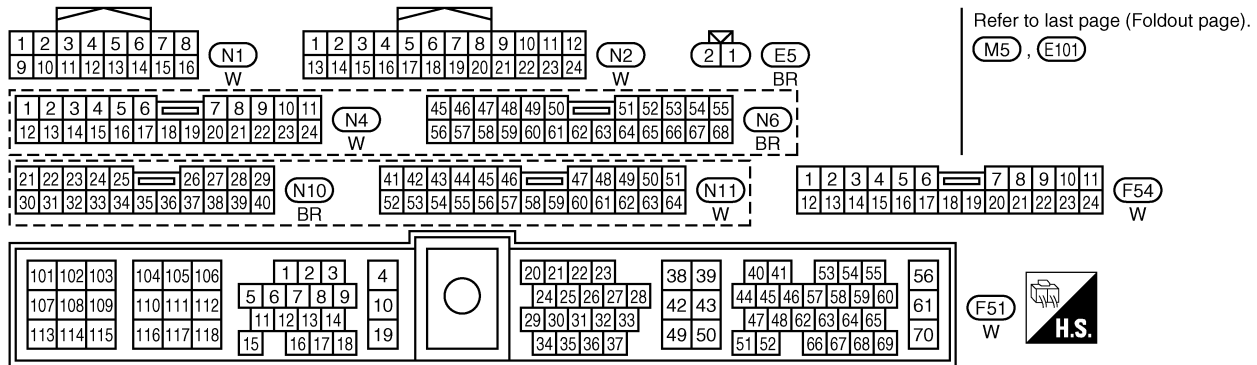
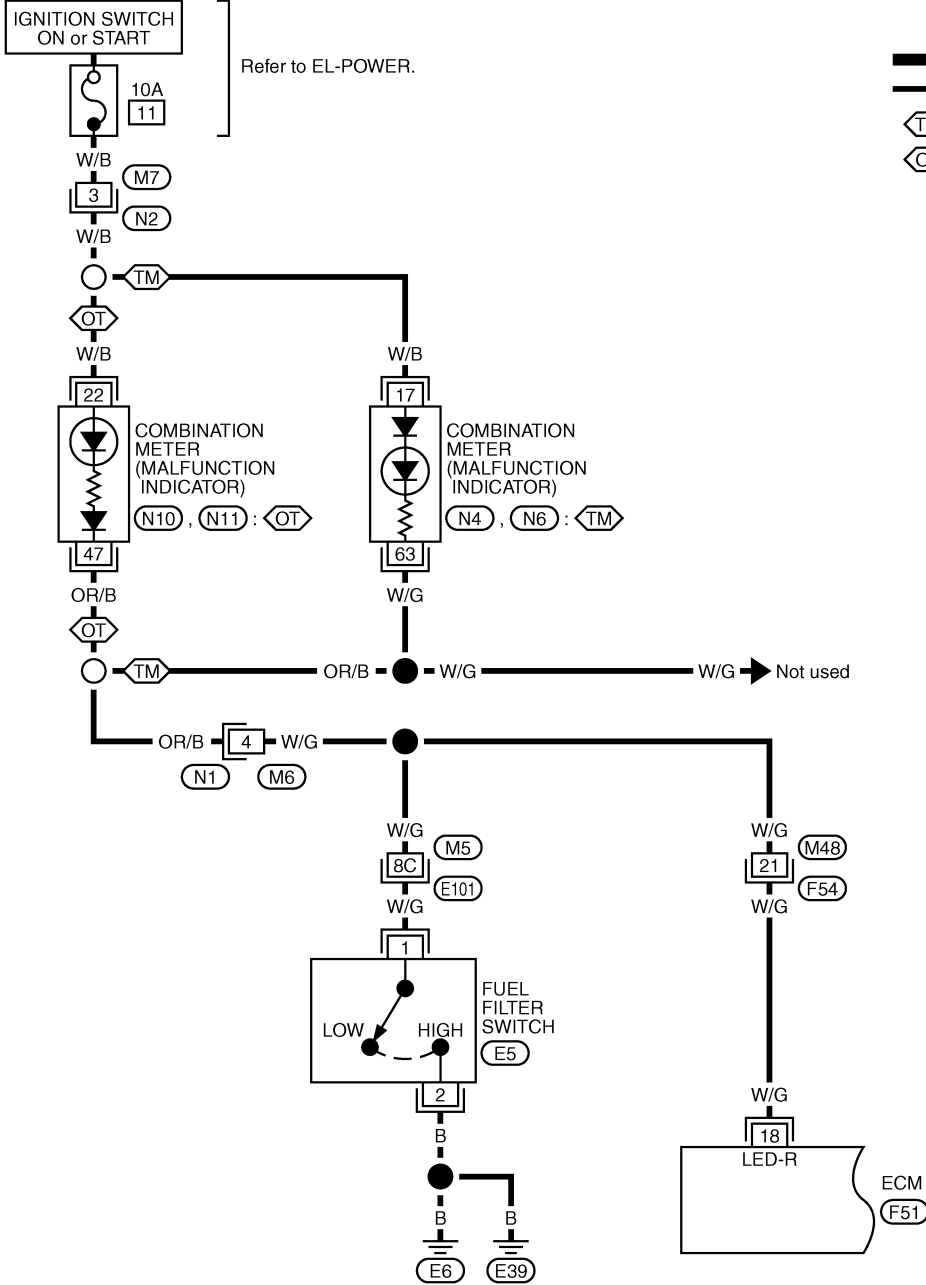


Wiring Diagram (Cont'd)

RHD MODELS

EC-MIL/DL-03

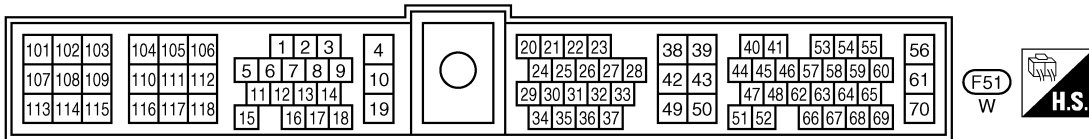
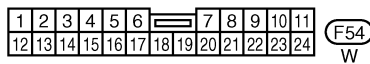
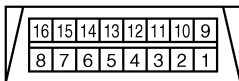
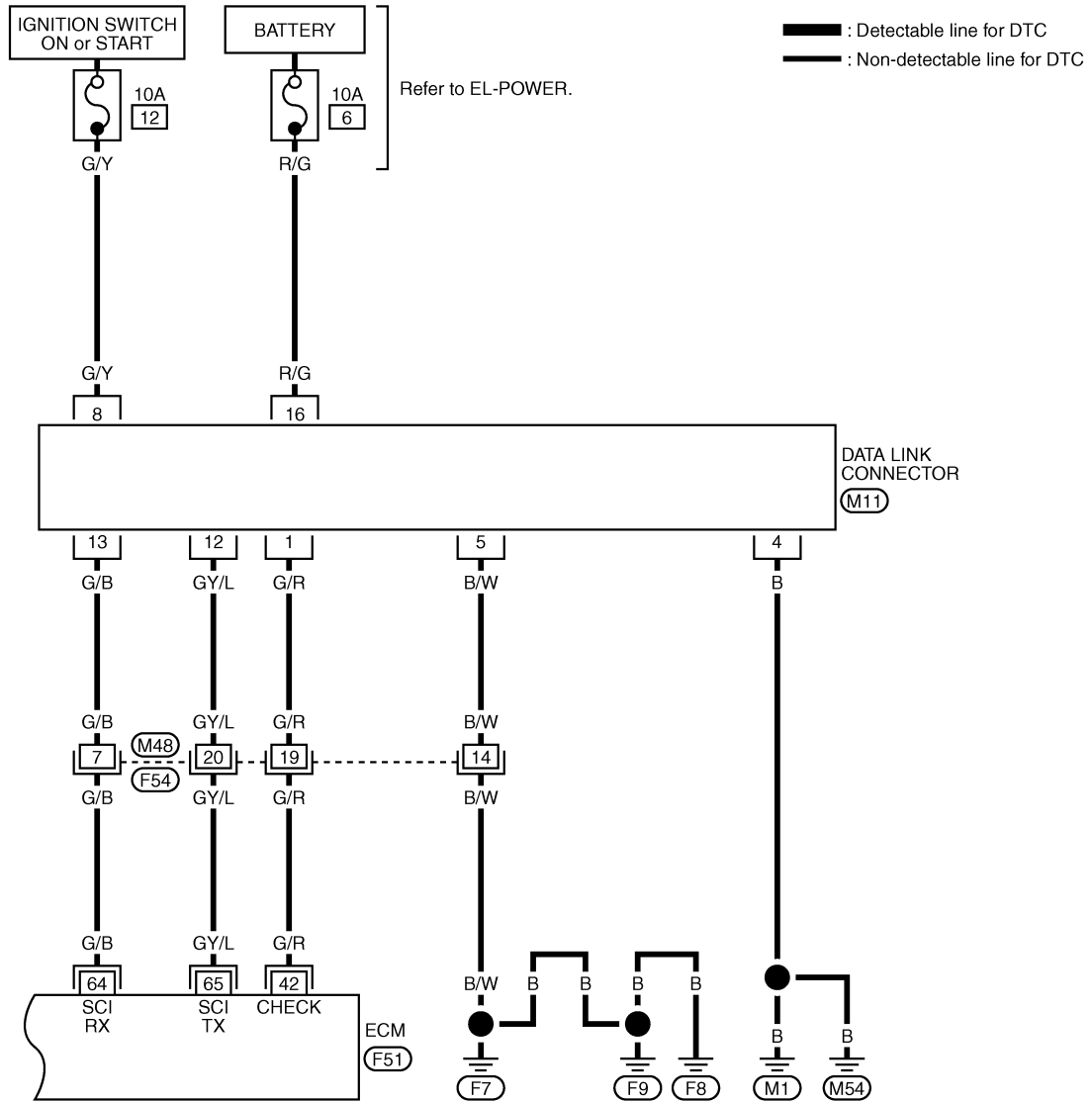
-  : Detectable line for DTC
-  : Non-detectable line for DTC
-  : With tachometer
-  : Without tachometer



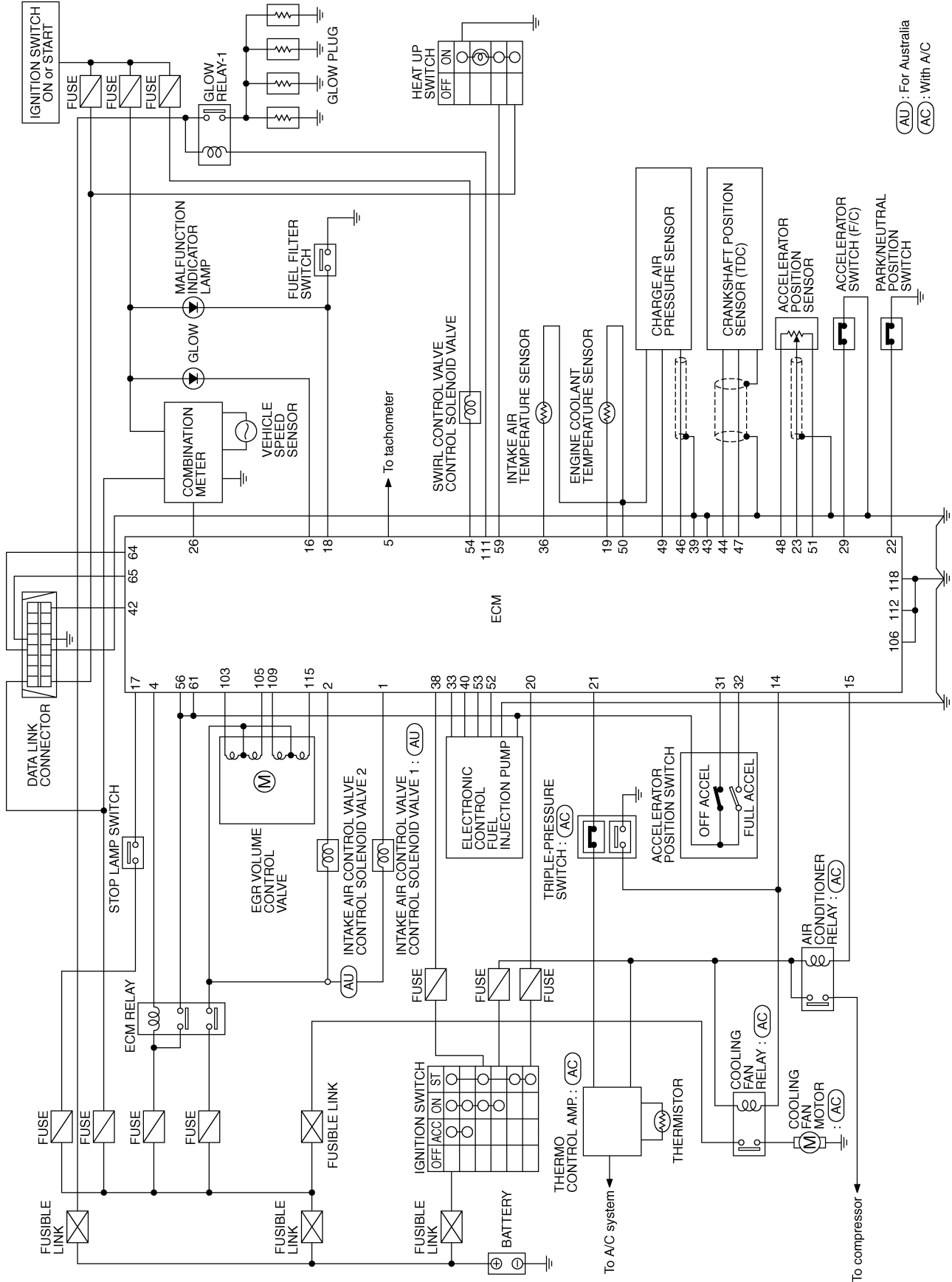
GI  
MA  
EM  
LC  
EC  
FE  
CL  
MT  
AT  
TF  
PD  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX

Wiring Diagram (Cont'd)

EC-MIL/DL-04



Circuit Diagram



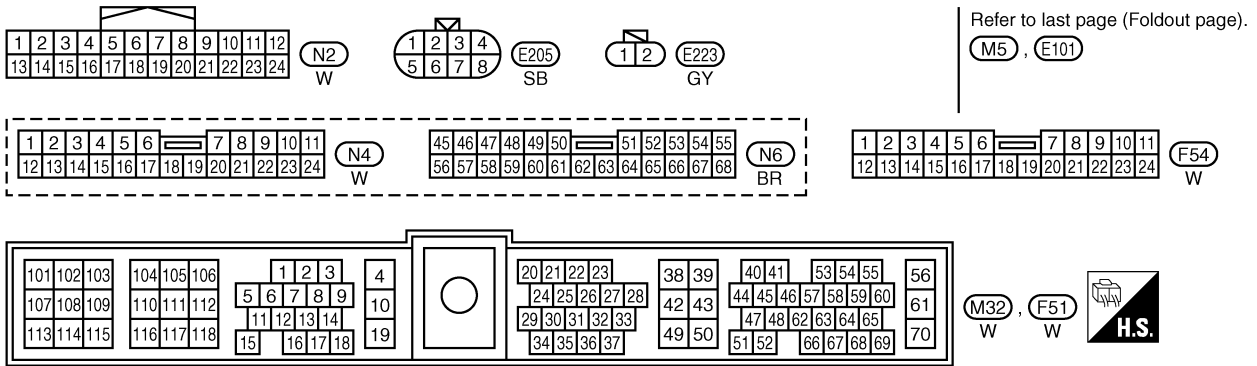
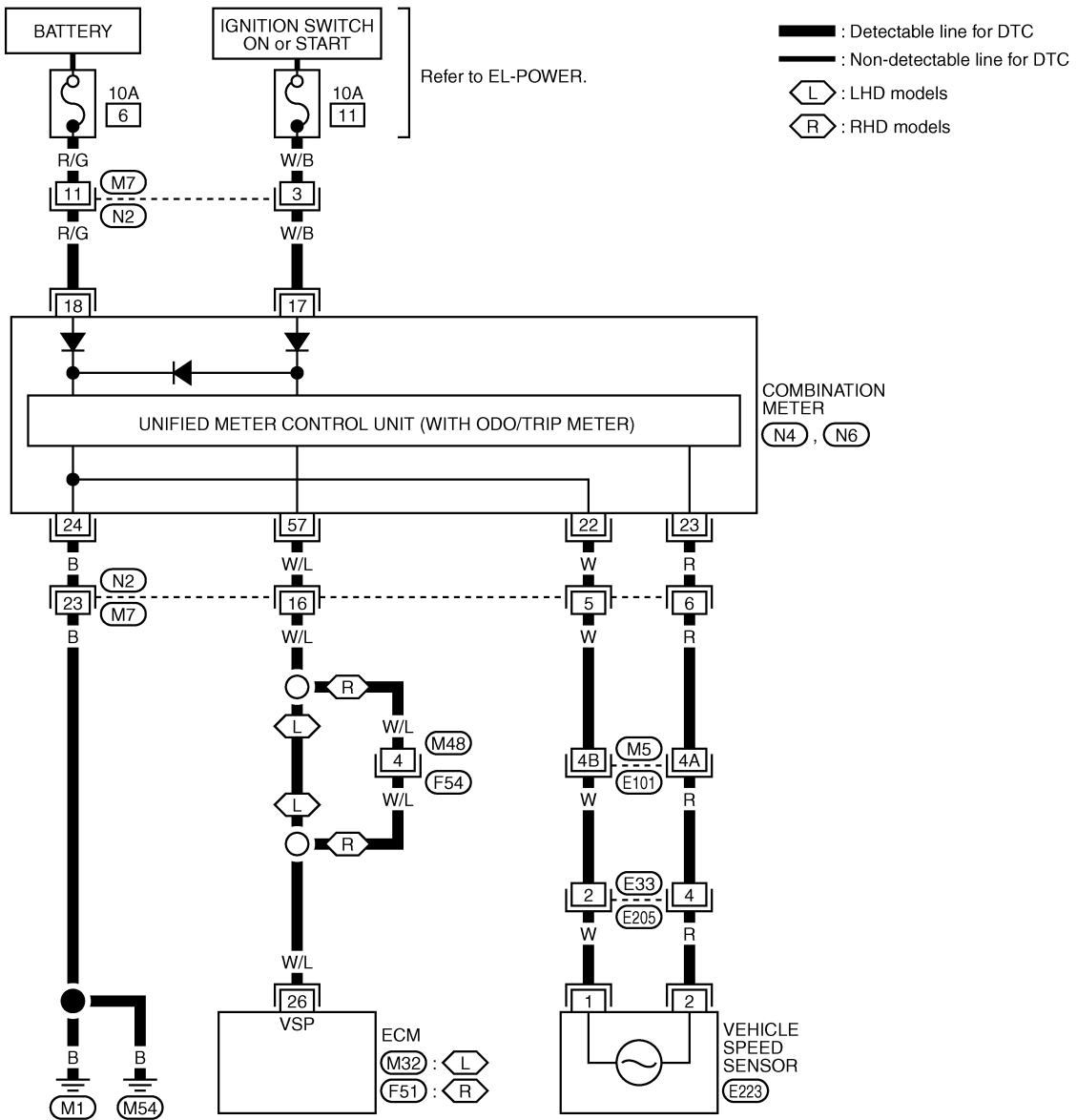
(AU) : For Australia  
(AC) : With A/C

GI  
MA  
EM  
LC  
**EC**  
FE  
CL  
MT  
AT  
TF  
PD  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX

Wiring Diagram

MODELS WITH TACHOMETER

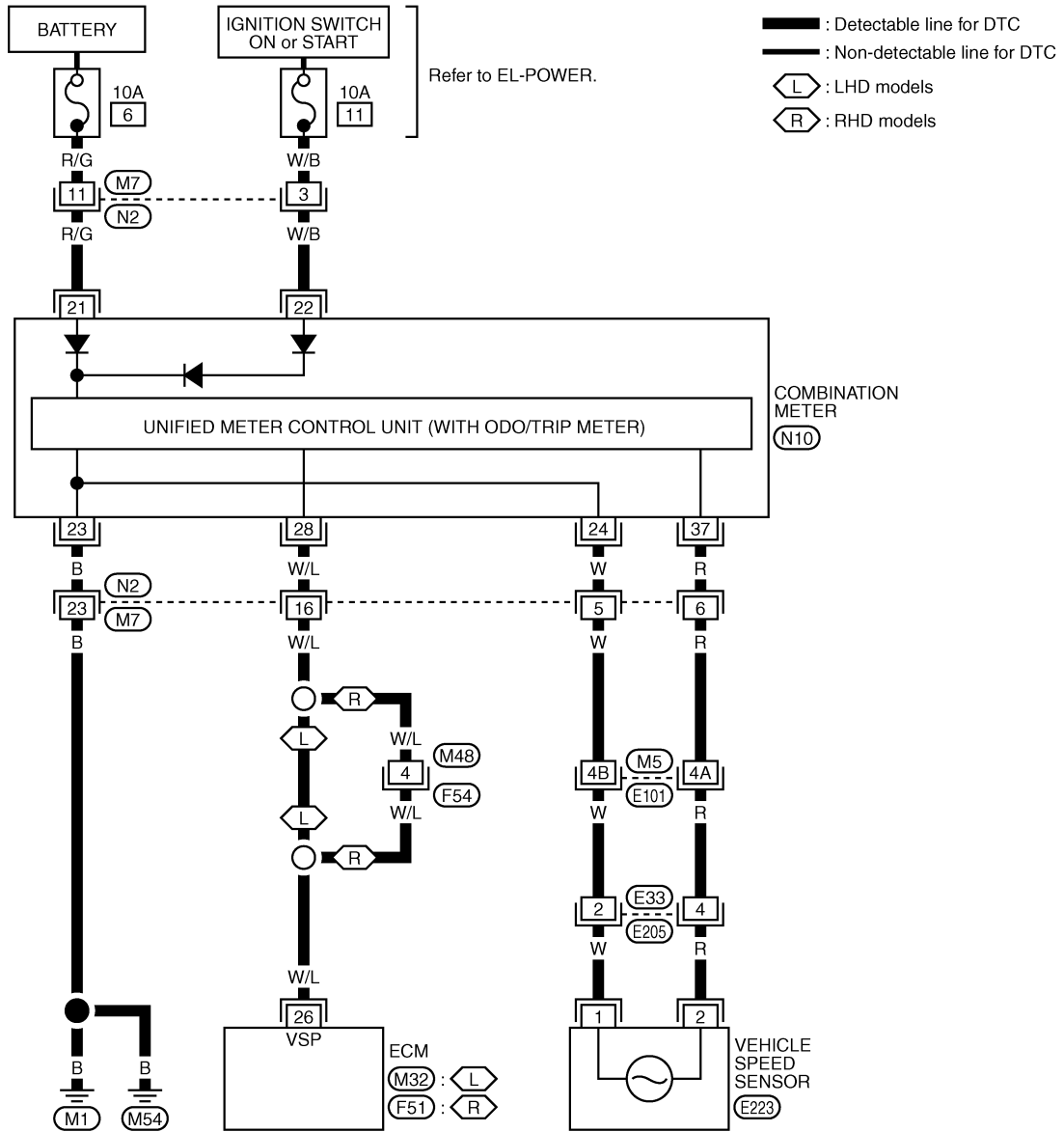
EC-VSS-01



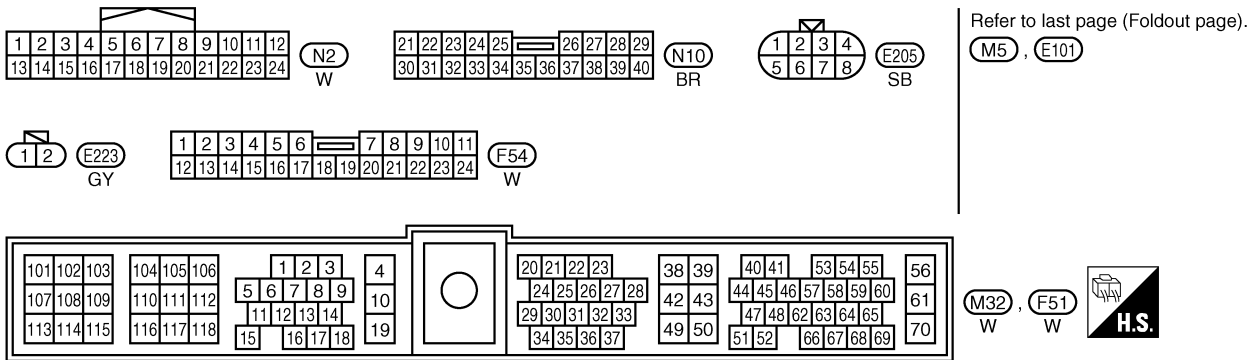
Wiring Diagram (Cont'd)

MODELS WITHOUT TACHOMETER

EC-VSS-02

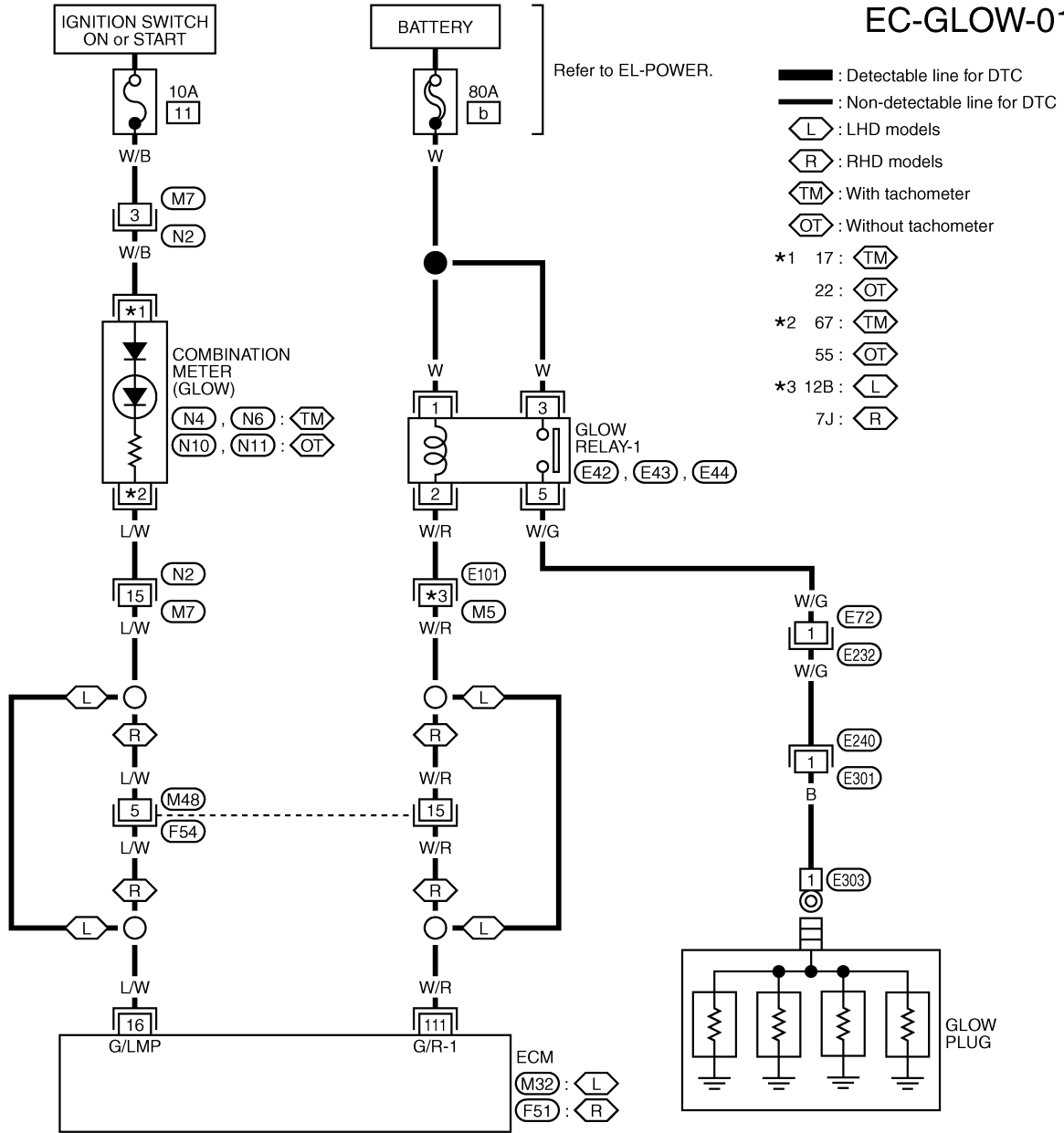


GI  
 MA  
 EM  
 LC  
 EC  
 FE  
 CL  
 MT  
 AT  
 TF  
 PD  
 FA  
 RA  
 BR  
 ST  
 RS  
 BT  
 HA  
 EL  
 IDX

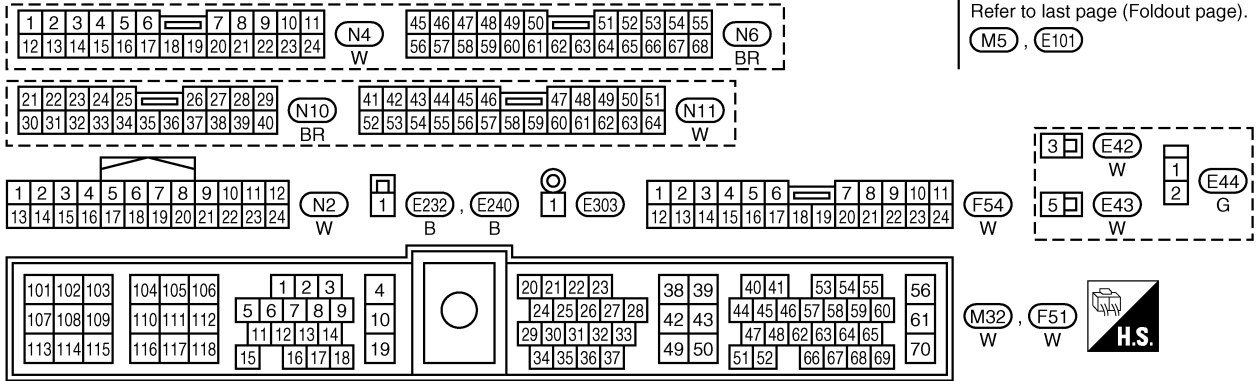


Wiring Diagram

EC-GLOW-01

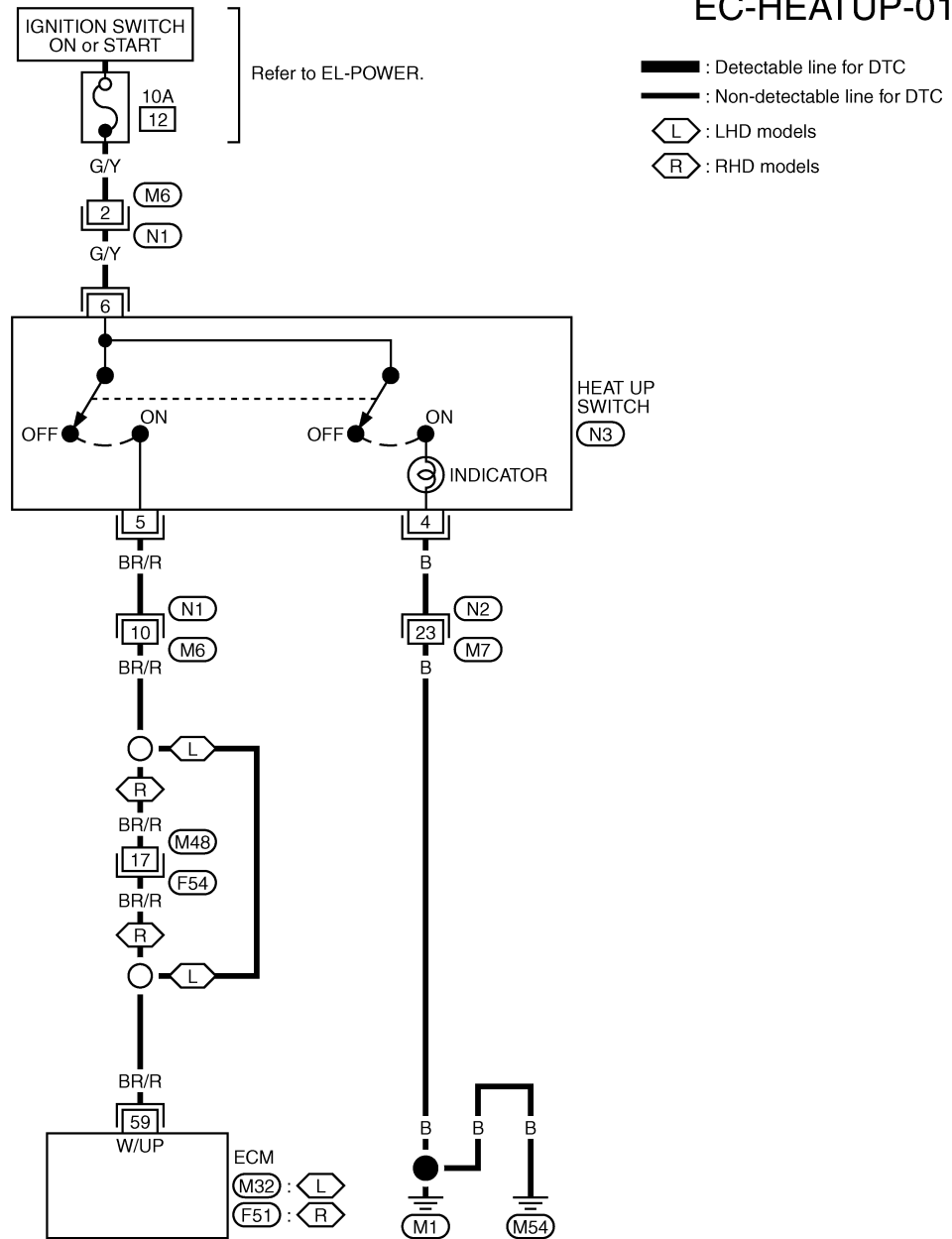


- Refer to EL-POWER.
- : Detectable line for DTC
  - - - : Non-detectable line for DTC
  - (L) : LHD models
  - (R) : RHD models
  - (TM) : With tachometer
  - (OT) : Without tachometer
- \*1 17: (TM)  
 22: (OT)
- \*2 67: (TM)  
 55: (OT)
- \*3 12B: (L)  
 7J: (R)

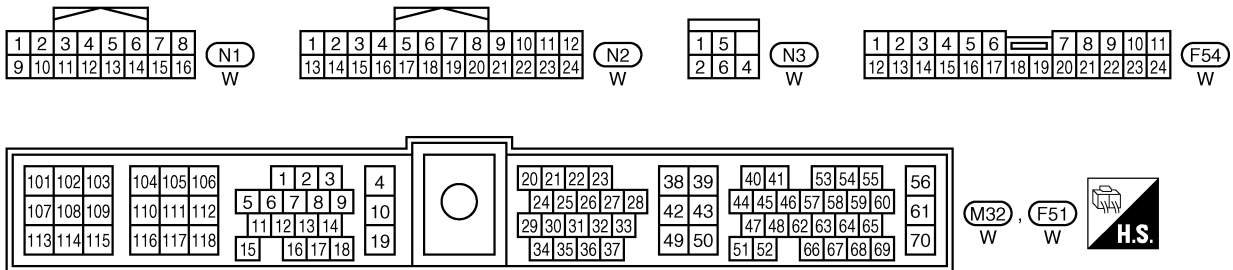


## Wiring Diagram

### EC-HEATUP-01



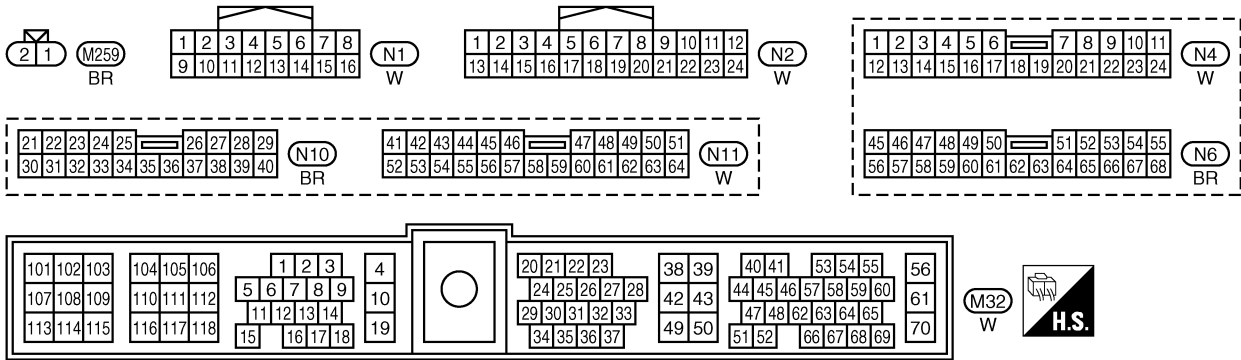
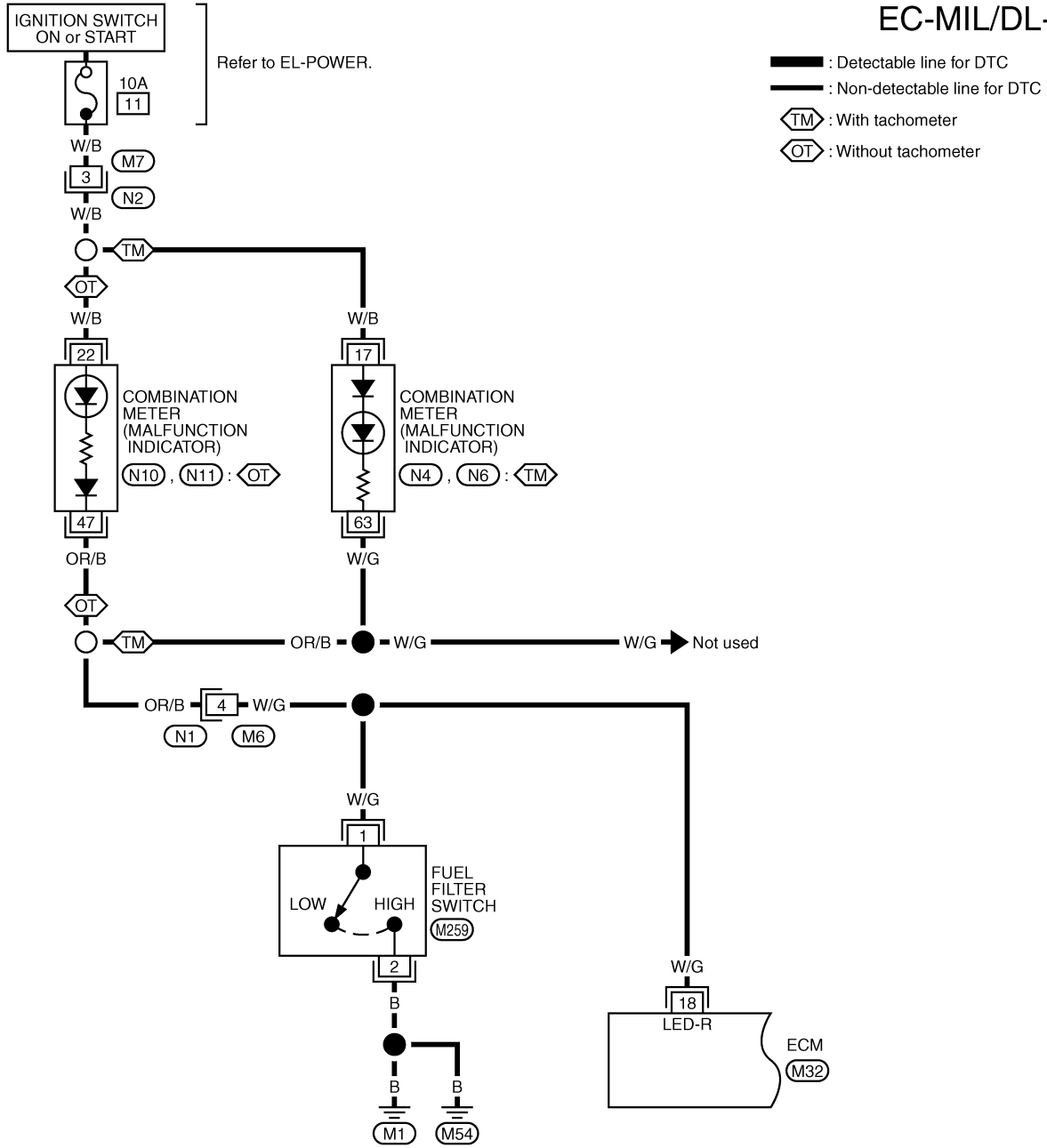
GI  
MA  
EM  
LC  
**EC**  
FE  
CL  
MT  
AT  
TF  
PD  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX



Wiring Diagram

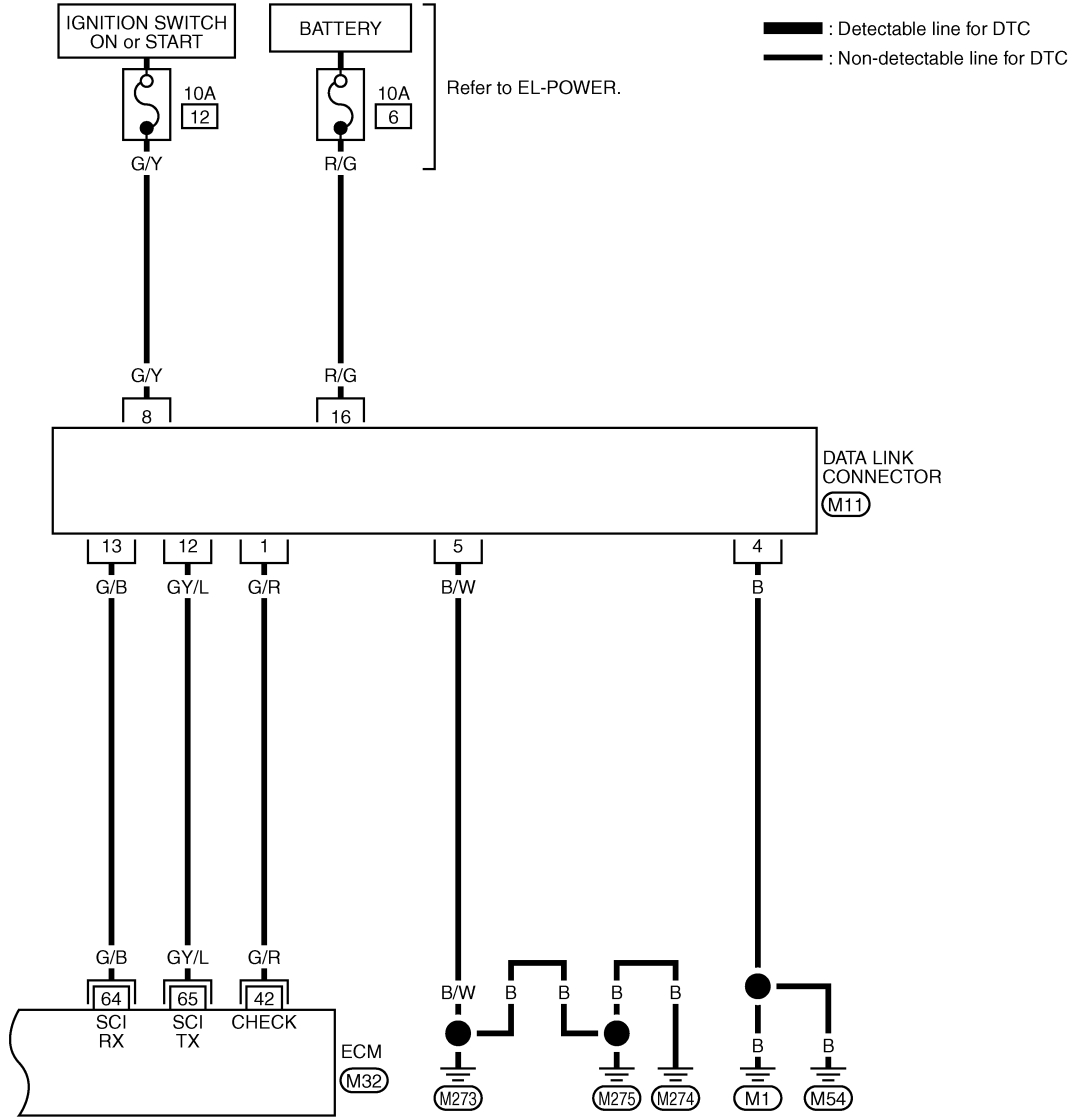
LHD MODELS

EC-MIL/DL-01

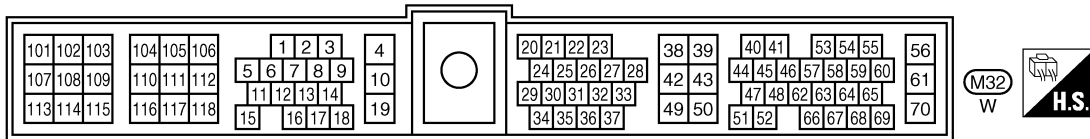
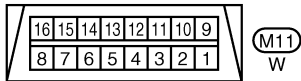


Wiring Diagram (Cont'd)

EC-MIL/DL-02



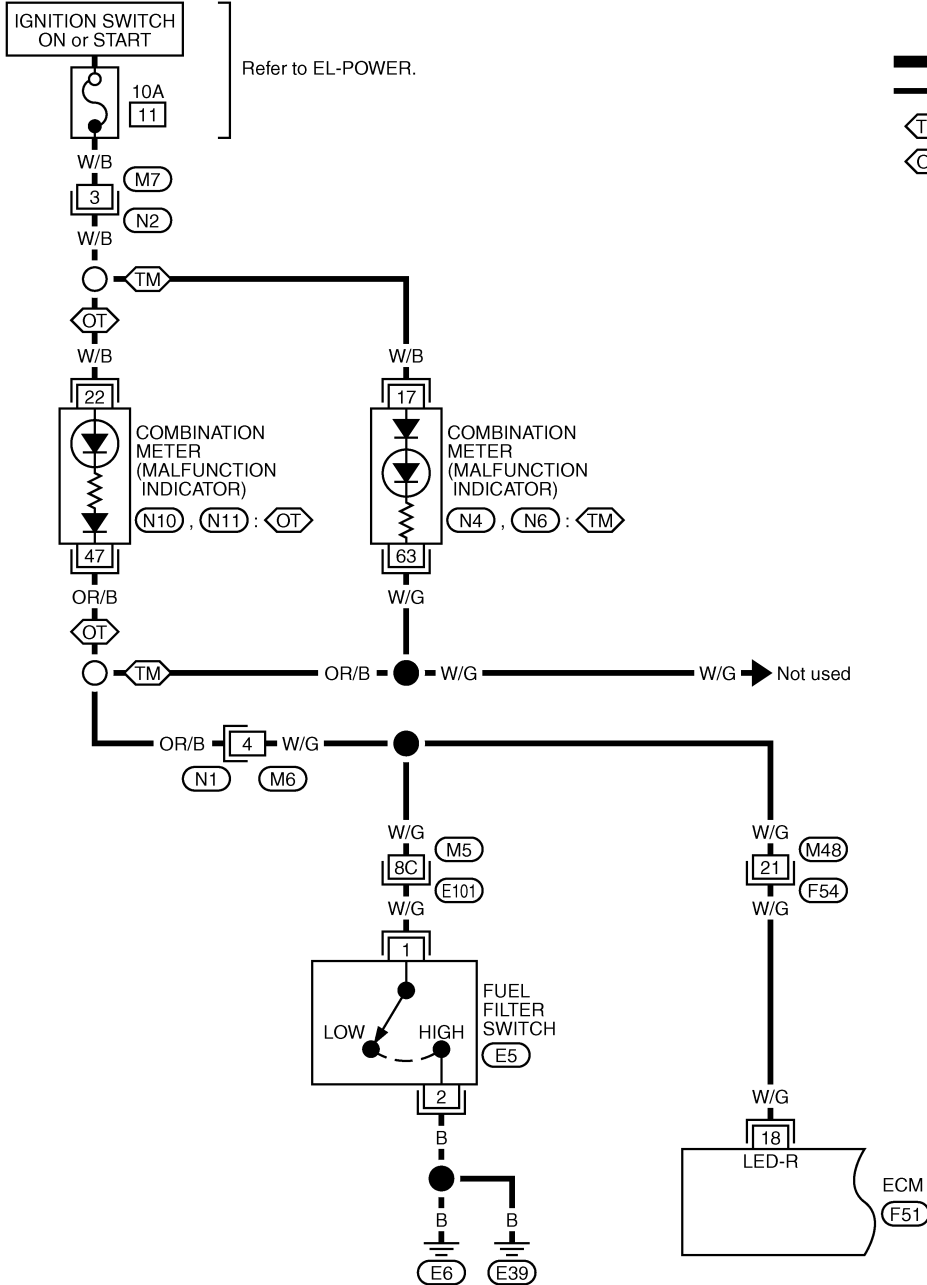
GI  
MA  
EM  
LC  
**EC**  
FE  
CL  
MT  
AT  
TF  
PD  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX



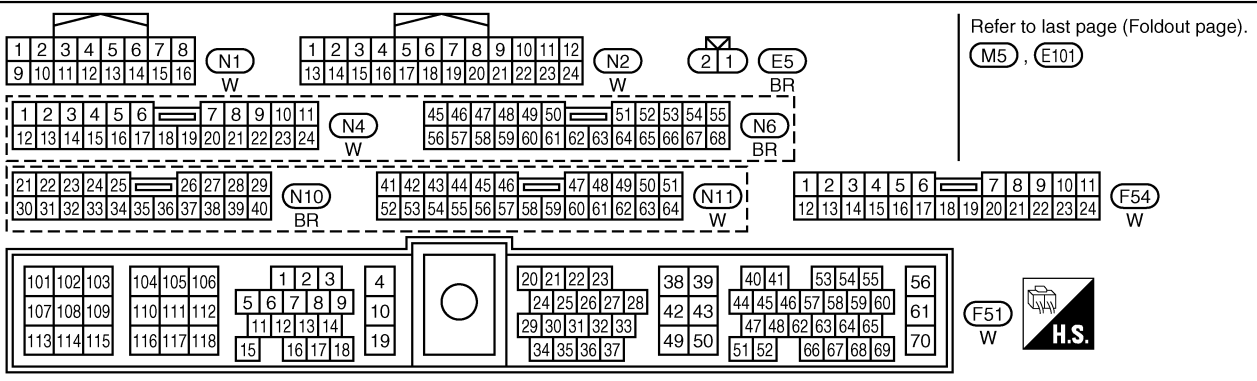
Wiring Diagram (Cont'd)

RHD MODELS

EC-MIL/DL-03

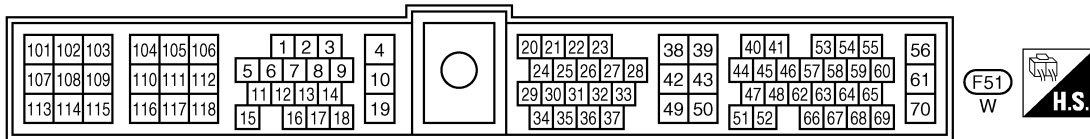
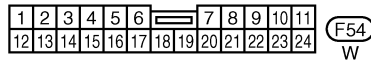
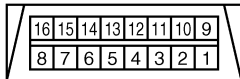
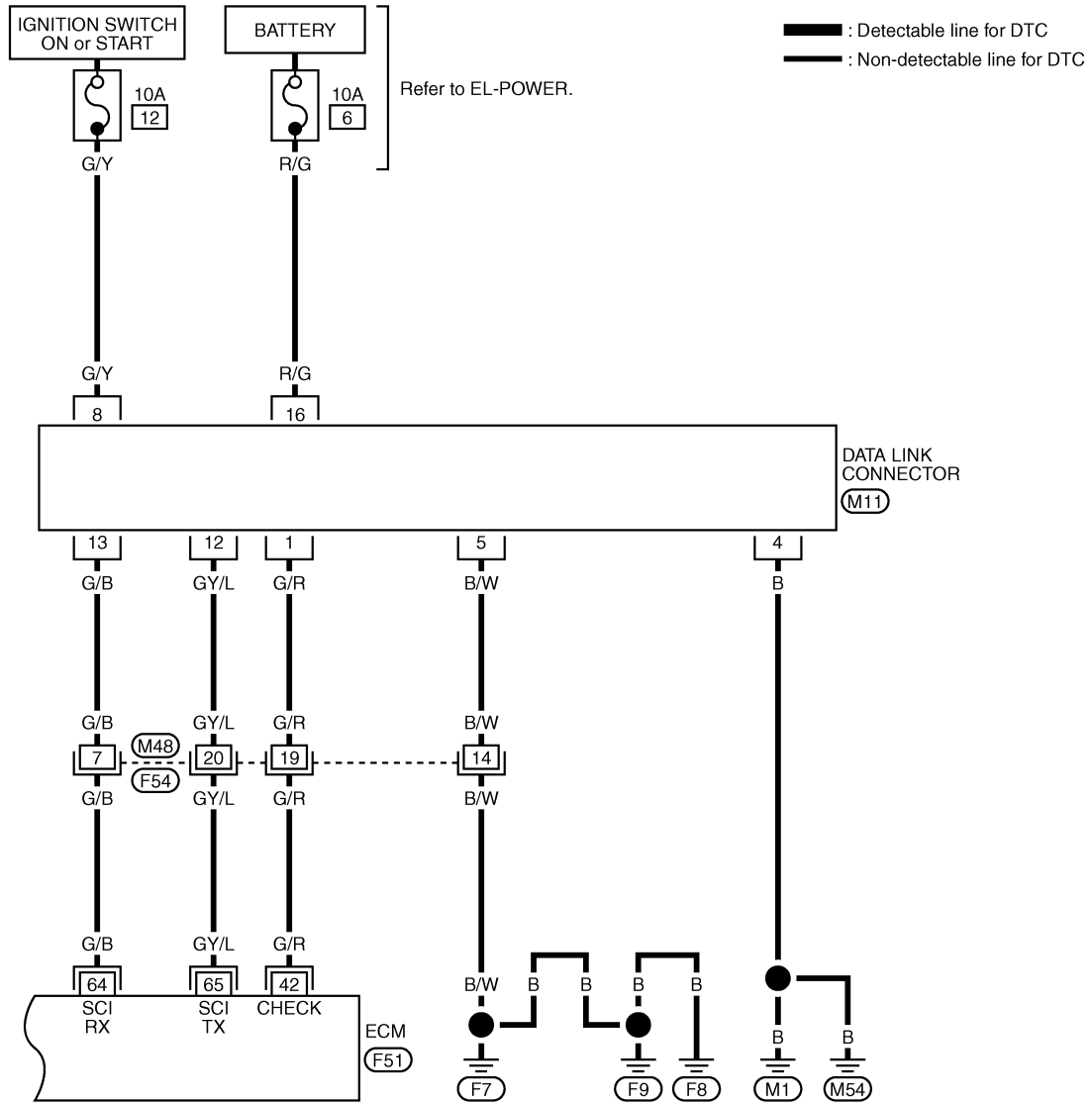


- : Detectable line for DTC
- : Non-detectable line for DTC
- TM : With tachometer
- OT : Without tachometer



Wiring Diagram (Cont'd)

EC-MIL/DL-04



GI  
MA  
EM  
LC  
EC  
FE  
CL  
MT  
AT  
TF  
PD  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX