NISSAN

MODEL S14 SERIES

FOREWORD

This supplement contains information concerning necessary service procedures and relevant data for the model S14 series face-lift.

All information, illustrations and specifications contained in this supplement are based on the latest product information available at the time of publication. If your NISSAN model differs from the specifications contained in this supplement, consult your NISSAN distributor for information.

The right is reserved to make changes in specifications and methods at any time without notice.

NISSAN MOTOR CO., LTD.

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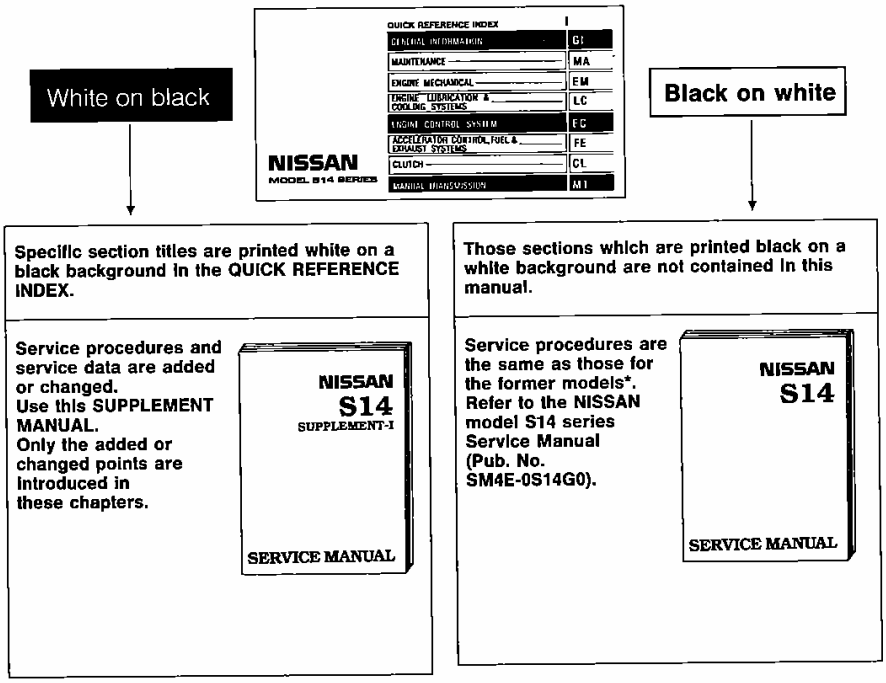
HOW TO USE THIS MANUAL

- This Service Manual contains the new service procedures, service data and specifications for the face-lifted model S14 series which has been in production since July, 1995.
- This Service Manual does not contain the service procedures, etc. which are the same as those for former models*.
  Please use this manual in conjunction with the NISSAN model S14 series Service Manual (Pub. No. SM4E-0S14G0).
- Follow the instruction below when using this manual.



* Former models: Models before the model S14 series introduced in July, 1995.

IMPORTANT SAFETY NOTICE

The proper performance of service is essential for both the safety of the technician and the efficient functioning of the vehicle.
The service methods in this Service Manual are described in such a manner that the service may be performed safely and accurately.

Service varies with the procedures used, the skills of the technician and the tools and parts available. Accordingly, anyone using service procedures, tools or parts which are not specifically recommended by NISSAN must first be completely satisfied that neither personal safety nor the vehicle's safety will be jeopardized by the service method selected.

SECTION GI

APPLIED FROM: **For Europe:** ◆ JN1GBAS14U0010001 ◆
For Australia: JN1GBAS14A0002001
For New Zealand: JN1GBAS14A0700501
Except for Europe, Australia and New Zealand: GBAS14-001001

OUTLINE OF MODIFICATIONS:

Electrical system

- NATS V2.0 (Nissan Anti-theft System Ver. 2.0)* has been adopted on models for Europe. (*Immobiliser)
- A rear fog lamp warning buzzer has been adopted on models for Europe.
- A seat belt warning lamp/buzzer has been adopted on models for Australia.

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Precautions for NATS V2.0 (For Europe)

NATS (Nissan Anti-Theft System)

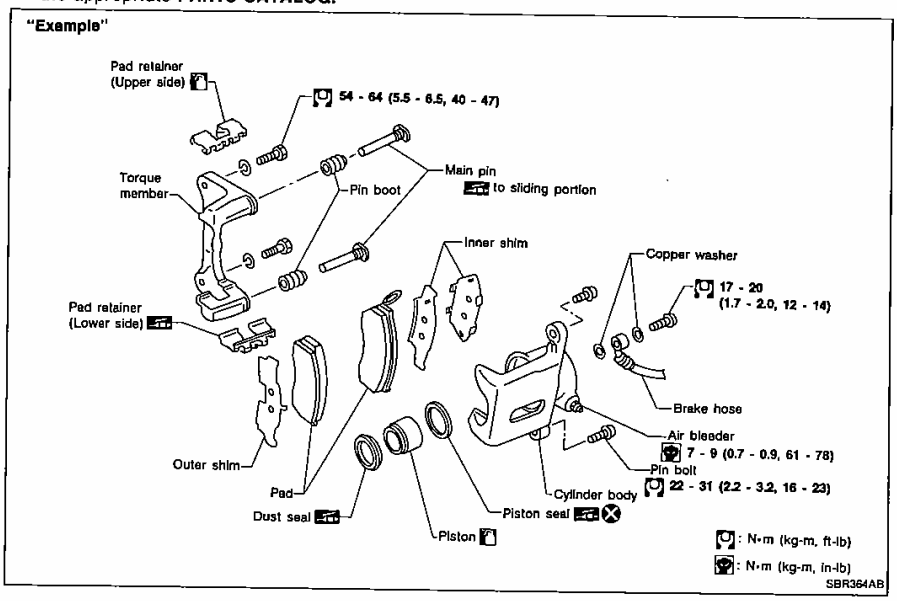
NATS V2.0 will immobilize the engine if someone tries to start it without the registered key of NATS V2.0.
Both of the originally supplied ignition key IDs have been NATS registered.
The NATS security indicator is located on the instrument panel. The indicator blinks when the ignition switch is in "OFF" or "ACC" position. Therefore, NATS warns outsiders that the vehicle is equipped with the anti-theft system.

- When NATS detects trouble, the malfunction indicator lamp (MIL) blinks.
  This blinking indicates that the anti-theft is not functioning, so prompt service is required.
- When servicing NATS (trouble diagnoses, system initialisation and additional registration of other NATS ignition key IDs), CONSULT hardware and CONSULT NATS software is necessary.
  Regarding the procedures of NATS initialisation and NATS ignition key ID registration, refer to CONSULT operation manual, NATS V2.0.

Therefore, CONSULT NATS software (program card and operation manual) must be kept strictly confidential to maintain the integrity of the anti-theft function.

- When servicing NATS V2.0 (trouble diagnoses, system initialisation and additional registration of other NATS ignition key IDs), it may be necessary to re-register original key identification. Therefore, be sure to receive all keys from vehicle owner.
  A maximum of four key IDs can be registered into NATS.
- When failing to start the engine first-time using the key of NATS V2.0, start as follows.
  (1) Turn ignition key to "OFF".
  (2) Wait approx. 5 seconds.
  (3) Turn ignition key to "START" again while keeping the key apart from any others on key-chain.

- **THE LARGE ILLUSTRATIONS** are exploded views (See below.) and contain tightening torques, lubrication points and other information necessary to perform repairs.
  The illustrations should be used in reference to service matters only. When ordering parts, refer to the appropriate **PARTS CATALOG.**



- The following **SYMBOLS AND ABBREVIATIONS** are used:

,	: Tightening torque	A/C	: Air Conditioner
	: Should be lubricated with grease. Unless otherwise indicated, use recommended multi-purpose grease.	P/S	: Power Steering
		Tool	: Special Service Tools
		SDS	: Service Data and Specifications
	: Should be lubricated with oil.	SAE	: Society of Automotive Engineers, Inc.
	: Sealing point		
	: Checking point	ATF	: Automatic Transmission Fluid
	: Always replace after every disassembly.	D_1	: Drive range 1st gear
		D_2	: Drive range 2nd gear
LH, RH	: Left-Hand, Right-Hand	D_3	: Drive range 3rd gear
FR, RR	: Front, Rear	D_4	: Drive range 4th gear
Ⓟ	: Apply petroleum jelly.	OD	: Overdrive
ATF	: Apply ATF	2_2	: 2nd range 2nd gear
★	: Select with proper thickness.	2_1	: 2nd range 1st gear
☆	: Adjustment is required.	1_2	: 1st range 2nd gear
M/T	: Manual Transaxle/Transmission	1_1	: 1st range 1st gear
A/T	: Automatic Transaxle/Transmission		

Wiring Diagram Codes (Cell Codes)

- Use the chart below to find out what each wiring diagram code stands for.
- Only the modified wiring diagrams are included in this service manual, as shown in the chart below.

Code	Section	Wiring Diagram Name
AAC/V	EC	IACV-AAC Valve
ABS	BR	Anti-lock Brake System
A/C, A	HA	Auto Air Conditioner
A/C, M	HA	Manual Air Conditioner
A/T	AT	Automatic Transmission
AT/C	EC	A/T Control
CHIME	EL	Warning Chime
CMPS	EC	Camshaft Position Sensor
COOL/F	EC	Cooling Fan Control
DEF/S	EC	Rear Window Defogger Signal
ECTS	EC	Engine Coolant Temperature Sensor
EGRC/V	EC	EGR and canister Control Solenoid Valve
F/FOG	EL	Front Fog Lamp
FICD	EC	IACV-FICD Solenoid Valve
F/PUMP	EC	Fuel Pump
HO2S	EC	Heated Oxygen Sensor
IGN/SG	EC	Ignition Signal
ILL	EL	Illumination
INJECT	EC	Injector
INT/L	EL	Interior, Spot and Trunk Room Lamps
KS	EC	Knock Sensor
MAFS	EC	Mass Air Flow Sensor
MAIN	EC	Main Power Supply and Ground Circuit
METER	EL	Speedometer, Tachometer, Temp. and Fuel Gauges
MIL	EC	MIL, Data Link Connector For Consult
MIRROR	EL	Door Mirror
MULTI	EL	Multi-remote Control System
NATS	EL	Nissan Anti-Theft System
PNP/SW	EC	Park/Neutral Position Switch
POWER	EL	Power Supply Routing
PST/SW	EC	Power Steering Oil Pressure Switch
R/FOG	EL	Rear Fog Lamp
SRS	RS	Supplemental Restraint System
S/SIG	EC	Start Signal
THEFT	EL	Theft Warning System
TPS	EC	Throttle Position Sensor
TURN	EL	Turn Signal and Hazard Warning Lamps
VSS	EC	Vehicle Speed Sensor
VTC	EC	VTC Solenoid Valve
WARN	EL	Warning Lamps
WG/V	EC	Wastegate Valve Control Solenoid Valve
WINDOW	EL	Power Window

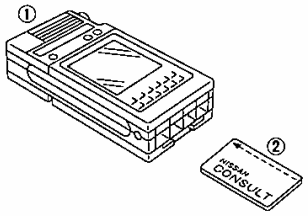
Function and System Application

Diagnostic test mode	Function	ECCS	A/T	Air bag	ABS	NATS*1
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on CONSULT.	×	—	—	—	—
Self-diagnostic results	Self-diagnostic results can be read and erased quickly.	×	×	×	×	×
ECU discriminated No.	Classification number of a replacement ECU can be read to prevent an incorrect ECU from being installed.	—	—	×	—	—
Data monitor	Input/Output data in the ECM can be read.	×	×	—	×	—
Active test	Diagnostic Test Mode in which CONSULT drives some actuators apart from the ECMs and also shifts some parameters in a specified range.	×	—	—	×	—
ECM part number	ECM part number can be read.	×	×	—	×	—
Function test	Conducted by CONSULT instead of a technician to determine whether each system is "OK" or "NG".	×	—	—	—	—
Control unit initialisation	All registered ignition key IDs in NATS components can be initialised and new IDs can be registered.	—	—	—	—	×
Self-function check	ECM checks its own NATS communication interface.	—	—	—	—	×

× : Applicable
*1: NATS: Nissan Anti-Theft System

Checking Equipment

When ordering the below equipment, contact your NISSAN distributor.

Tool name	Description
NISSAN CONSULT ① CONSULT unit and accessories ② Program card • AE950 for Australia • EE940 except for Australia • NATS-E940*1 for NATS	 NT004

*1: An order for NATS program card must be placed only with NISSAN EUROPE N.V.

TIGHTENING TORQUE OF STANDARD BOLTS

Grade	Bolt size	Bolt diameter* mm	Pitch mm	Tightening torque (Without lubricant)							
				Hexagon head bolt				Hexagon flange bolt			
				N·m	kg-m	ft-lb	in-lb	N·m	kg-m	ft-lb	in-lb
4T	M6	6.0	1.0	5.1	0.52	3.8	45.1	6.1	0.62	4.5	53.8
	M8	8.0	1.25	13	1.3	9	—	15	1.5	11	—
			1.0	13	1.3	9	—	16	1.6	12	—
	M10	10.0	1.5	25	2.5	18	—	29	3.0	22	—
			1.25	25	2.6	19	—	30	3.1	22	—
	M12	12.0	1.75	42	4.3	31	—	51	5.2	38	—
			1.25	46	4.7	34	—	56	5.7	41	—
	M14	14.0	1.5	74	7.5	54	—	88	9.0	65	—
7T	M6	6.0	1.0	8.4	0.86	6.2	74.6	10	1.0	7	87
	M8	8.0	1.25	21	2.1	15	—	25	2.5	18	—
			1.0	22	2.2	16	—	26	2.7	20	—
	M10	10.0	1.5	41	4.2	30	—	48	4.9	35	—
			1.25	43	4.4	32	—	51	5.2	38	—
	M12	12.0	1.75	71	7.2	52	—	84	8.6	62	—
			1.25	77	7.9	57	—	92	9.4	68	—
	M14	14.0	1.5	127	13.0	94	—	147	15.0	108	—
9T	M6	6.0	1.0	12	1.2	9	—	15	1.5	11	—
	M8	8.0	1.25	29	3.0	22	—	35	3.6	26	—
			1.0	31	3.2	23	—	37	3.8	27	—
	M10	10.0	1.5	59	6.0	43	—	70	7.1	51	—
			1.25	62	6.3	46	—	74	7.5	54	—
	M12	12.0	1.75	98	10.0	72	—	118	12.0	87	—
			1.25	108	11.0	80	—	137	14.0	101	—
	M14	14.0	1.5	177	18.0	130	—	206	21.0	152	—

1. Special parts are excluded.
2. This standard is applicable to bolts having the following marks embossed on the bolt head.

Grade	Mark
4T	4
7T	7
9T	9

* : Nominal diameter

M 6

Nominal diameter of bolt threads (Unit: mm)

Metric screw threads

SECTION EC

MODIFICATION NOTICE:

- The mass air flow sensor harness connector has been changed.
- The boost pressure sensor has been eliminated.
- The ECM harness connector has been changed from 76-pin type to 64-pin type (Europe models only).

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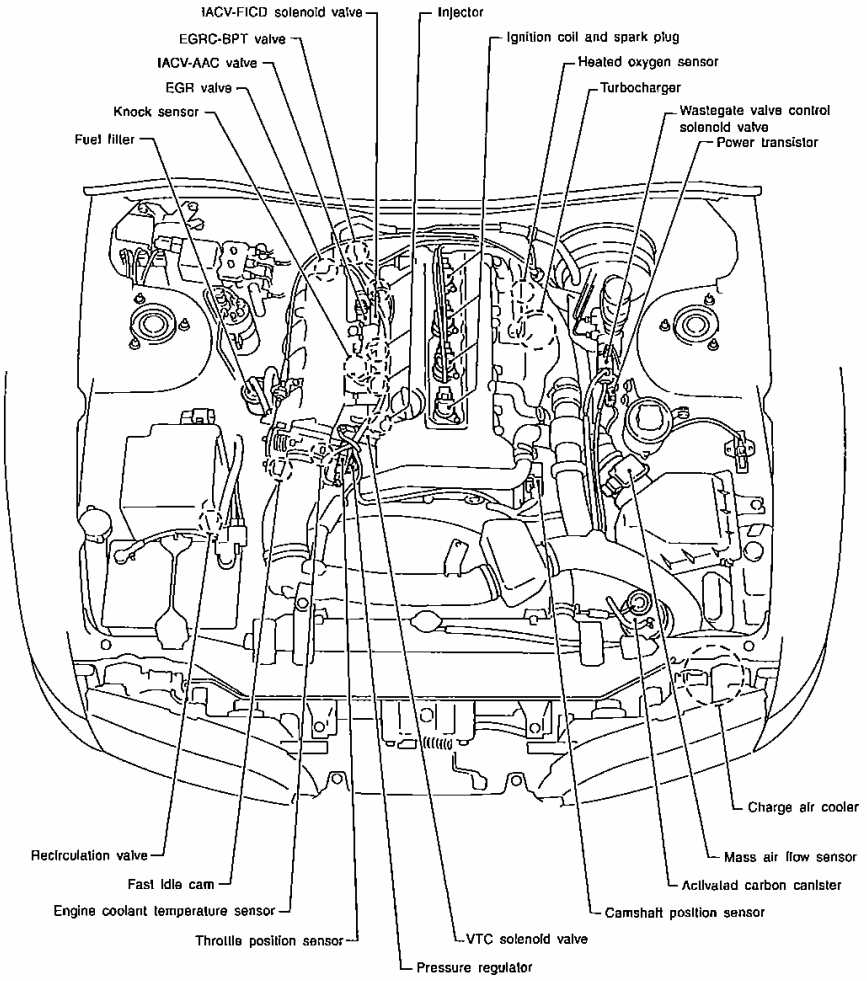
When you read wiring diagrams:
- **Read GI section, "HOW TO READ WIRING DIAGRAMS".**
- **See EL section, "POWER SUPPLY ROUTING" for power distribution circuit.**

When you perform trouble diagnoses, read GI section, "HOW TO FOLLOW FLOW CHART IN TROUBLE DIAGNOSES" and "HOW TO PERFORM EFFICIENT DIAGNOSIS FOR AN ELECTRICAL INCIDENT".

ECCS Component Parts Location



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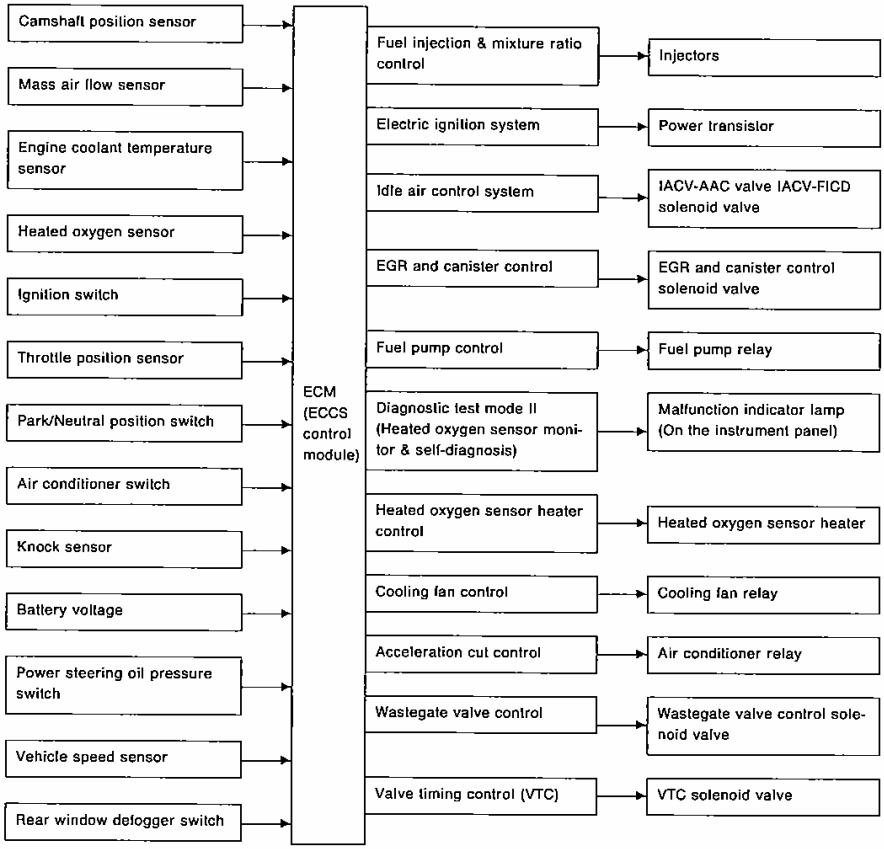
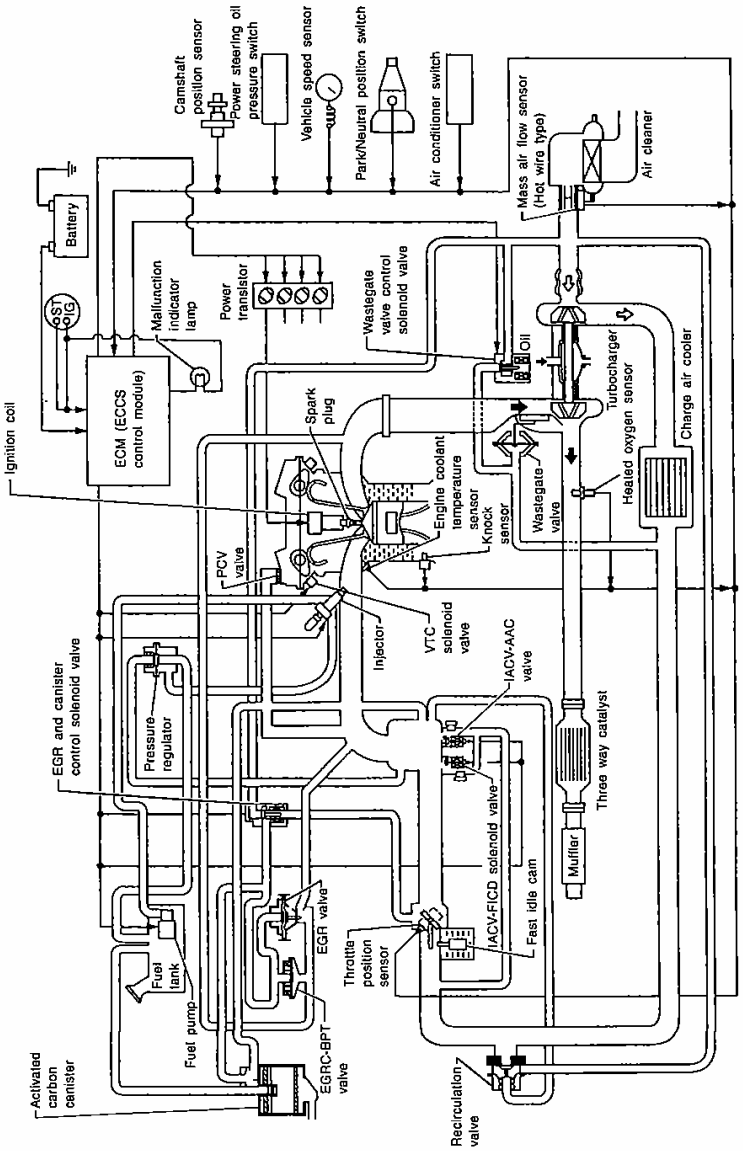
System Chart



EC

System Diagram



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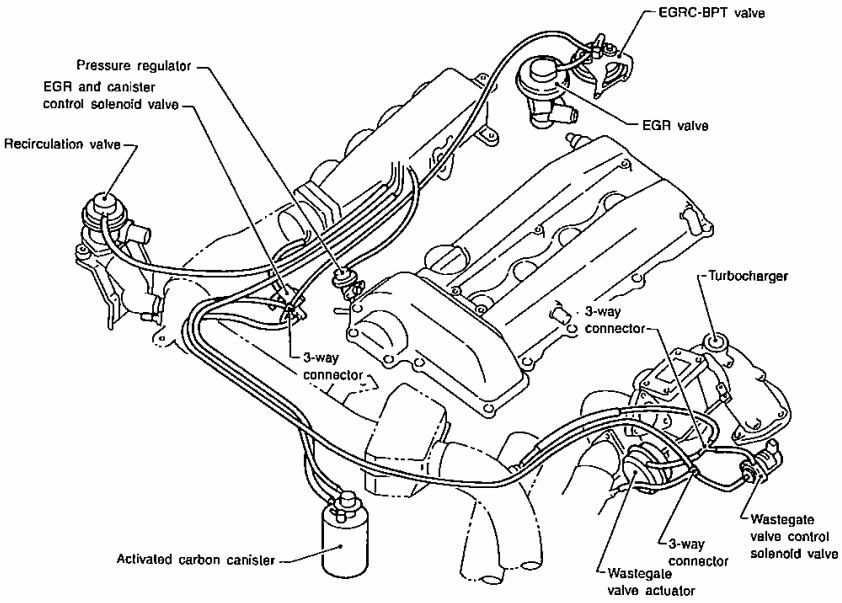
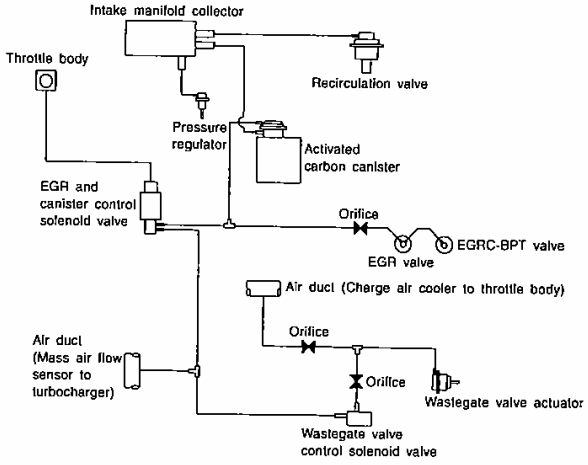
Vacuum Hose Drawing





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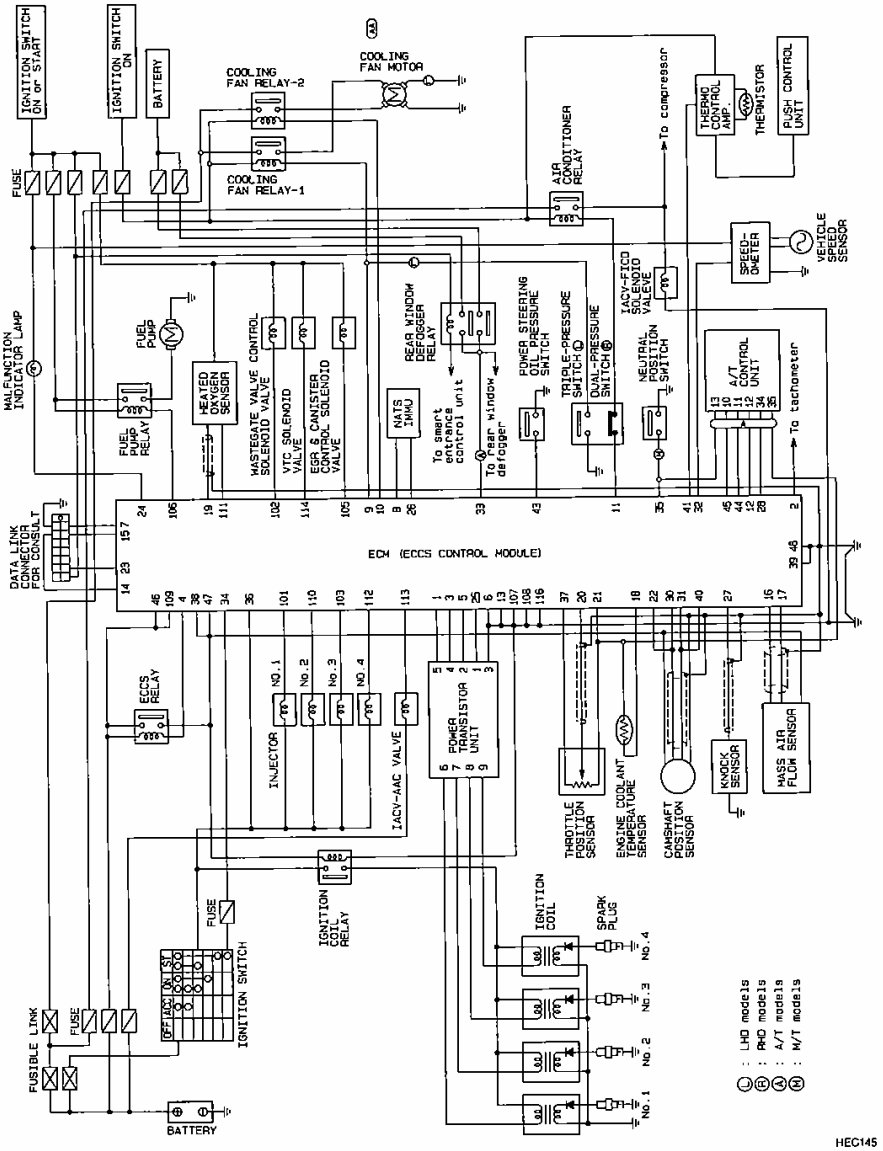
Circuit Diagram

FOR EUROPE



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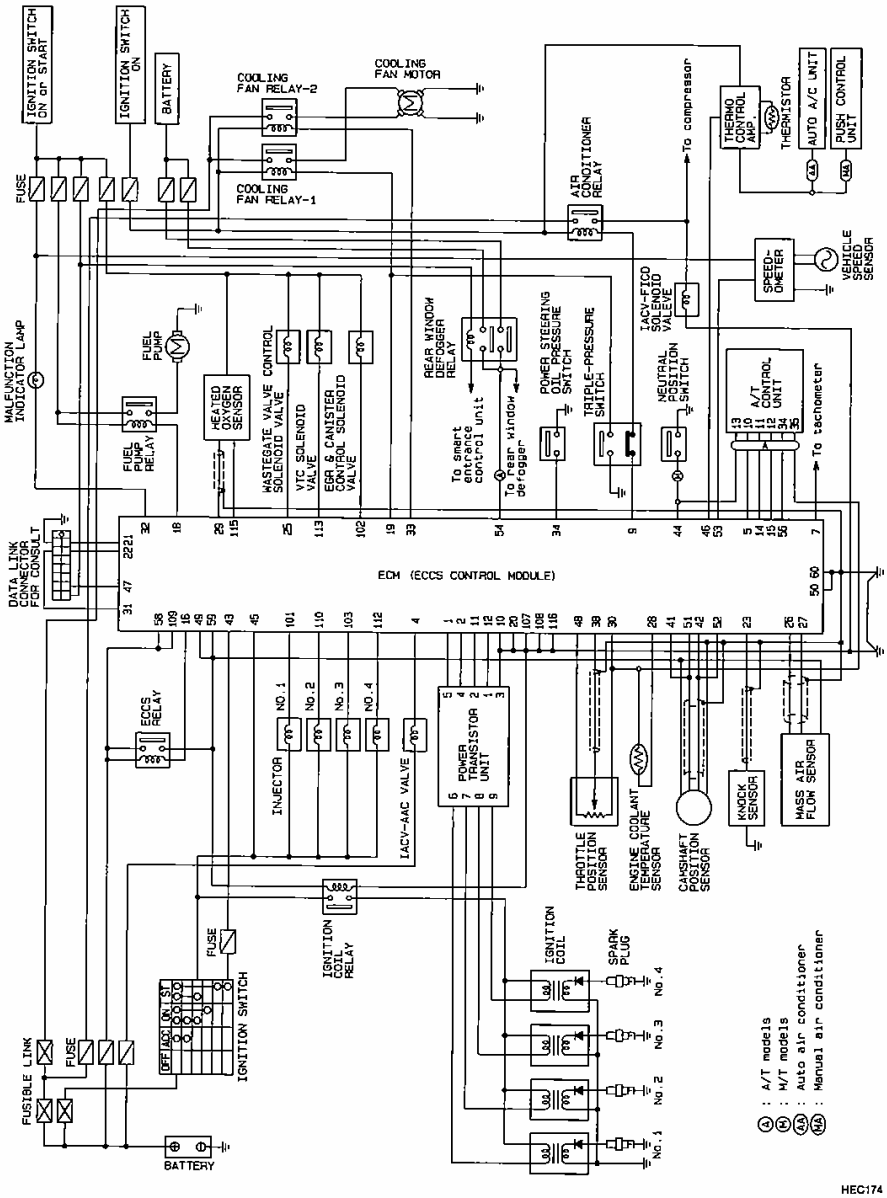
Circuit Diagram (Cont'd)

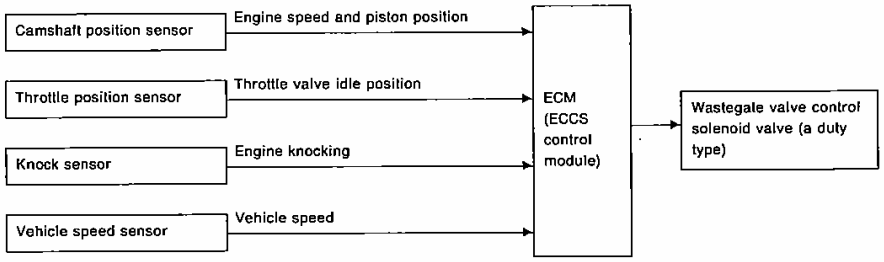
EXCEPT FOR EUROPE



EC

Boost Pressure Control

INPUT/OUTPUT SIGNAL LINE



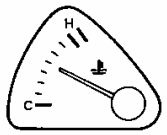
SYSTEM DESCRIPTION

The output signal maps of the ECM are selected according to fuel octane rating, gear position (M/T model) and vehicle speed (A/T model).
The wastegate valve control solenoid valve changes the source vacuum which activates the actuator. This results in a proportional boost pressure to the acceleration.
Knock signs are used to determine fuel octane rating.

OPERATION

Fuel octane rating	Gear position or vehicle speed	Boost pressure control map
Premium	• 1, 2 and 3 speed gears (M/T model) • Less than 46 km/h (29 MPH) (A/T model)	A slow response type
	• 4 and 5 speed gears (M/T model) • More than 46 km/h (29 MPH) (A/T model)	A quick response type
Lower than the above	Any	Fixed

A



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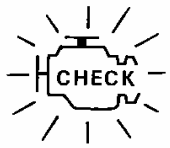
B

SEF247F

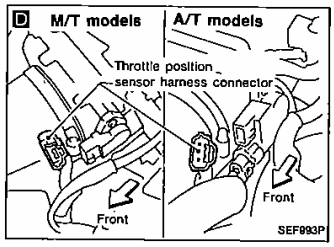
C



Malfunction indicator lamp

SEF051PA

D



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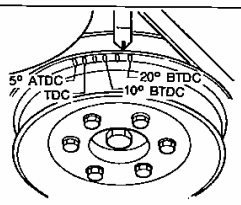
E



SMA189AA

START

Visually check the following:
- Air cleaner clogging
- Hoses and ducts for leaks
- EGR valve operation
- Electrical connectors
- Gasket
- Throttle valve

A

Start engine and warm it up until engine coolant temperature indicator points to the middle of gauge. Ensure that engine speed is below 1,000 rpm.

B

Open engine hood and run engine at about 2,000 rpm for about 2 minutes under no-load.

C

Perform diagnostic test mode II (Self-diagnostic results).

OK

NG

Repair or replace components as necessary.

Run engine at about 2,000 rpm for about 2 minutes under no-load. Race engine two or three times under no-load, then run engine for about 1 minute at idle speed.

D

1) Select "IGNITION TIMING ADJ" in WORK SUPPORT mode.
2) Touch "START".

1) Stop engine and disconnect throttle position sensor harness connector.
2) Start engine.

Race engine two or three times to about 2,000 rpm under no-load. Then run engine at idle speed.

E

Check ignition timing with a timing light.

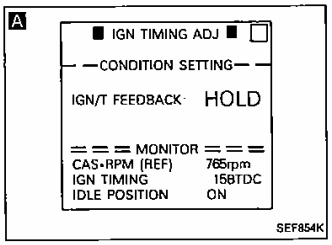
15° ± 2° BTDC

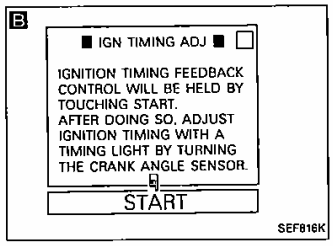
OK

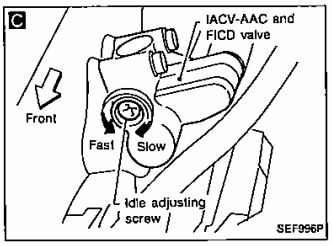
NG

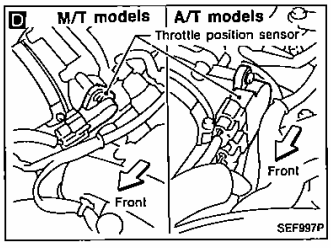
Adjust ignition timing by turning camshaft position sensor after loosening securing bolts.

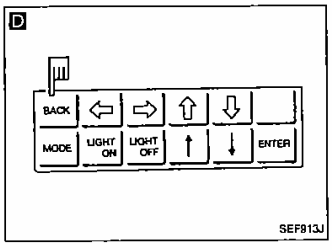
Ⓐ











Ⓐ

A

Check idle speed.

Read idle speed in "IGN TIMING ADJ" in "WORK SUPPORT" mode.

OR

Check idle speed.

800 ± 50 rpm (A/T in "N" position)

OK

NG → Ⓔ

B

1) Select "IGN TIMING ADJ" in "WORK SUPPORT" mode.
2) Touch "START".

OR

Turn off engine and disconnect throttle position sensor harness connector. Then start engine.

Race engine two or three times to about 2,000 rpm under no-load. Then run engine at idle speed.

C

Adjust idle speed by turning idle speed adjusting screw.

750 ± 50 rpm (A/T in "N" position)

D

Touch "Back".

1) Stop engine and connect throttle position sensor harness connector.
2) Start engine.

Race engine two or three times to about 2,000 rpm under no-load. Then run engine at idle speed.

Check idle speed.

Read idle speed in "DATA MONITOR" mode with CONSULT.

OR

Check idle speed.

800 ± 50 rpm (A/T in "N" position)

OK

NG

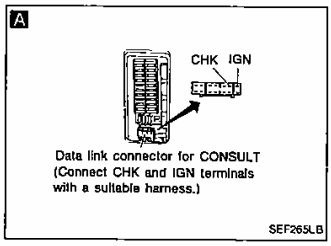
Check AAC valve and replace if necessary.

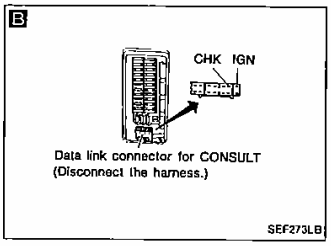
Ⓑ

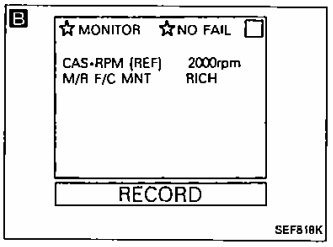
Check AAC valve harness and repair if necessary.

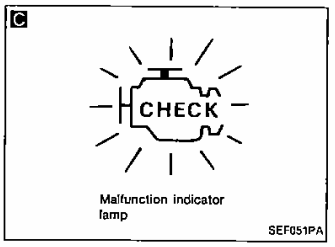
Check ECM function* by substituting another known good ECM.

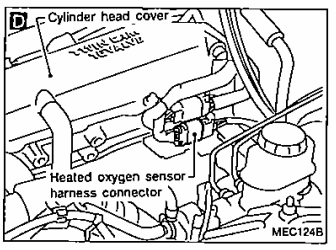
*: ECM may be the cause of a problem, but this is rarely the case. Ⓑ











Ⓑ

Run engine at about 2,000 rpm for about 2 minutes under no-load.

A

Set on-board diagnostic system of ECM to Diagnostic Test Mode II (heated oxygen sensor monitor).

B C

Check heated oxygen sensor signal.
1) See "M/R F/C MNT" in "Data monitor" mode.
2) Maintaining engine at 2,000 rpm under no-load (engine is warmed up sufficiently.), check that the monitor fluctuates between "LEAN" and "RICH" more than 5 times during 10 seconds.
1 cycle: RICH → LEAN → RICH
2 cycles: RICH → LEAN → RICH → LEAN → RICH

NG → Ⓒ

OR

Make sure that malfunction indicator lamp goes on and off more than 5 times during 10 seconds at 2,000 rpm.

OK

END

D

Replace heated oxygen sensor. Connect heated oxygen sensor harness connector.

Ⓕ

Run engine at about 2,000 rpm for about 2 minutes under no-load.

A

Set on-board diagnostic system of ECM to Diagnostic Test Mode II (heated oxygen sensor monitor).

Ⓔ

B C

Check heated oxygen sensor signal.
1) See "M/R F/C MNT" in "Data monitor" mode.
2) Maintaining engine at 2,000 rpm under no-load (engine is warmed up sufficiently.), check that the monitor fluctuates between "LEAN" and "RICH" more than 5 times during 10 seconds.
1 cycle: RICH → LEAN → RICH
2 cycles: RICH → LEAN → RICH → LEAN → RICH

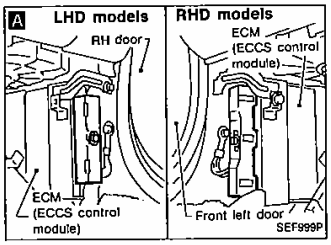
OK → Ⓔ

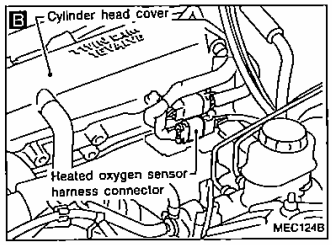
NG → Ⓖ

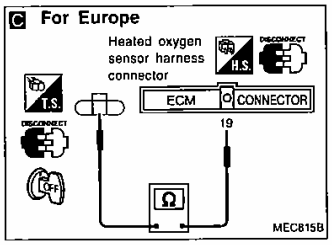
OR

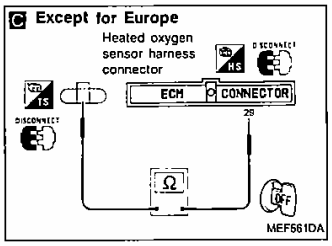
Make sure that malfunction indicator lamp goes on and off more than 5 times during 10 seconds at 2,000 rpm.

EC









Ⓒ

A B C

Check heated oxygen sensor harness:
1) Turn off engine and disconnect battery ground cable
2) Disconnect ECM connector from ECM.
3) Disconnect heated oxygen sensor harness connector. Then connect harness side terminal for heated oxygen sensor to ground with a jumper wire.
4) Check for continuity between terminal No. 19 (for Europe) or No. 29 (except for Europe) of ECM connector and ground metal on vehicle body.

Continuity exists .....OK
Continuity does not exist .....NG

OK

NG

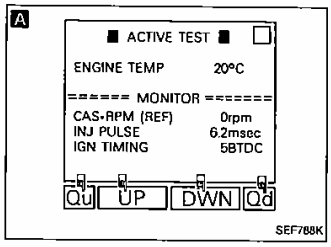
Ⓔ

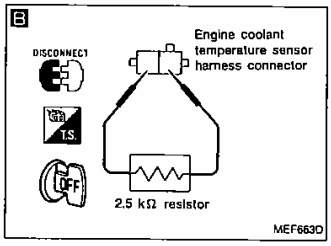
Repair or replace harness.

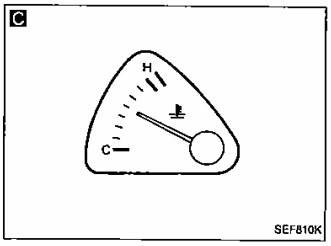
Connect ECM connector to ECM.

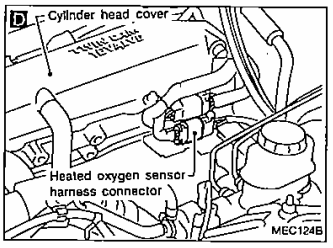
Ⓓ

IDLE SPEED/IGNITION TIMING/IDLE MIXTURE RATIO INSPECTION









Ⓓ

A **B**

1) Select "ENGINE TEMP" or "ENG COOLANT TEMP" in "ACTIVE TEST" mode.
2) Set "ENG COOLANT TEMP" to 20°C (68°F) by touching "DWN" and "Qd".

OR

1) Disconnect engine coolant temperature sensor harness connector.
2) Connect a resistor (2.5 kΩ) between terminals of engine coolant temperature sensor harness connector.

C

Start engine and warm it up until engine coolant temperature indicator points to the middle of gauge. (Be sure to start engine after installing a 2.5 kΩ resistor.)

Race engine two or three times under no-load, then run engine at idle speed.

Check "CO" %.

Idle CO: Less than 10% (and engine runs smoothly)

After checking CO%,
1) Disconnect the resistor from terminals of engine coolant temperature sensor.
2) Connect engine coolant temperature sensor harness connector to engine coolant temperature sensor.

OK → Ⓕ

NG

D

Connect heated oxygen sensor harness connector to heated oxygen sensor. → Ⓖ

Check fuel pressure regulator.

Check mass air flow sensor.

Check injector.
Clean or replace if necessary.

Check engine coolant temperature sensor. → Ⓔ

Check ECM function* by substituting another known good ECM.

*: ECM may be the cause of a problem, but this is rarely the case.

EC

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FOR ALL AREAS

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EC

On-board Diagnostic System — Diagnostic Test Mode II (Self-diagnostic results)

Display diagnostic trouble code table

Diagnostic trouble code No.	Detected items
11*	Camshaft position sensor circuit
12	Mass air flow sensor circuit
13	Engine coolant temperature sensor circuit
21*	Ignition signal circuit
34	Knock sensor circuit
43	Throttle position sensor circuit
54	Signal circuit from A/T control unit to ECM
55	No malfunction in the above circuits

*: Check items causing a malfunction of camshaft position sensor circuit first, if both "CAMSHAFT POSITION SENSOR (No. 11)" and "IGN SIGNAL-PRIMARY (No. 21)" are displayed one after the other.

Diagnostic trouble code No.	Detected items	Malfunction is detected when ...	Check item (remedy)
11*	Camshaft position sensor circuit	• Either 1° or 180° signal is not entered for the first few seconds during engine cranking. • Either 1° or 180° signal is not input often enough while the engine speed is higher than the specified rpm.	• Harness and connector (If harness and connector are normal, replace camshaft position sensor.)
12	Mass air flow sensor circuit	• The mass air flow sensor circuit is open or shorted. (An abnormally high or low voltage is entered.)	• Harness and connector (If harness and connector are normal, replace mass air flow sensor.)
13	Engine coolant temperature sensor circuit	• The engine coolant temperature sensor circuit is open or shorted. (An abnormally high or low output voltage is entered.)	• Harness and connector • Engine coolant temperature sensor
21*	Ignition signal circuit	• The ignition signal in the primary circuit is not entered during engine cranking or running.	• Harness and connector • Power transistor unit
34	Knock sensor circuit	• The knock sensor circuit is open or shorted. (An abnormally high or low voltage is entered.)	• Harness and connector • Knock sensor
43	Throttle position sensor circuit	• The throttle position sensor circuit is open or shorted. (An abnormally high or low voltage is entered.)	• Harness and connector • Throttle position sensor
54	Signal circuit from A/T control unit to ECM (A/T only)	• The A/T communication line is open or shorted.	• Harness and connector

*: Check items causing a malfunction of camshaft position sensor circuit first, if both "CAMSHAFT POSITION SENSOR (No. 11)" and "IGN SIGNAL-PRIMARY (No. 21)" are displayed one after the other.

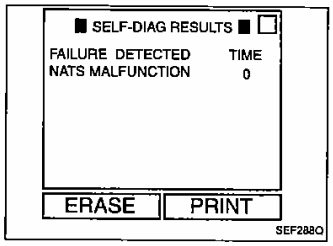
On-board Diagnostic System — Diagnostic Test Mode II (Self-diagnostic results) (Cont'd)

HOW TO ERASE DIAGNOSTIC TEST MODE II (SELF-DIAGNOSTIC RESULTS)

The diagnostic trouble code is erased from the backup memory on the ECM when the diagnostic test mode is changed from Diagnostic Test Mode II to Diagnostic Test Mode I. (Refer to "HOW TO SWITCH DIAGNOSTIC TEST MODES".)

- **If the battery terminal is disconnected, the diagnostic trouble code will be lost from the backup memory within 24 hours.**
- **Be careful not to erase the stored memory before starting trouble diagnoses.**

EC



For Europe models

- **If the MIL blinks or "NATS MALFUNCTION" is displayed on "SELF-DIAG RESULTS" screen, perform self-diagnostic results mode with CONSULT using NATS program card (NATS-E940). Refer to EL section.**
- **Confirm no self-diagnostic results of NATS is displayed before touching "ERASE" in "SELF-DIAG RESULTS" mode with CONSULT.**
- **When replacing ECM, initialisation of NATS V2.0 system and registration of all NATS V2.0 ignition key IDs must be carried out with CONSULT using NATS program card (NATS-E940).**
  Therefore, be sure to receive all keys from vehicle owner. Regarding the procedures of NATS initialisation and NATS ignition key ID registration, refer to CONSULT operation manual, NATS V2.0.

CONSULT

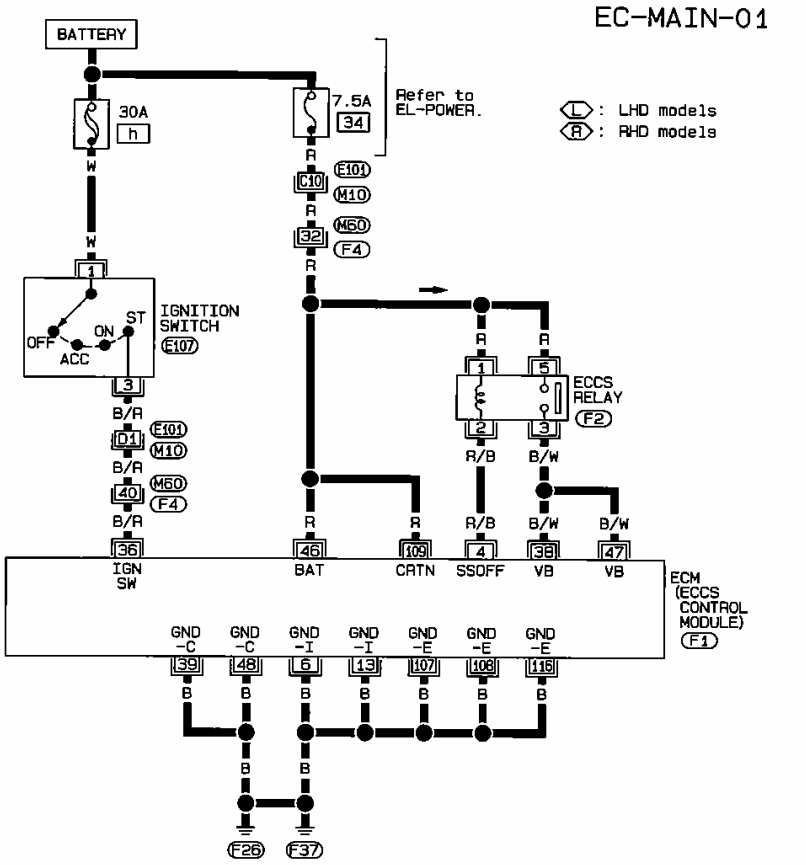
ECCS COMPONENT PARTS APPLICATION

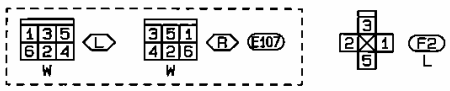
ECCS COMPONENT PARTS		DIAGNOSTIC TEST MODE				
		WORK SUPPORT	SELF-DIAGNOSTIC RESULTS	DATA MONITOR	ACTIVE TEST	FUNCTION TEST
INPUT	Camshaft position sensor		X	X		
	Mass air flow sensor		X	X		
	Engine coolant temperature sensor		X	X	X	
	Heated oxygen sensors			X		X
	Vehicle speed sensors			X		X
	Throttle position sensor	X	X	X		X
	Knock sensor		X			
	Ignition switch (start signal)			X		X
	Air conditioner switch			X		
	Park/Neutral position switch			X		X
	Power steering oil pressure switch			X		X
	Battery			X		
	A/T signal		X			
OUTPUT	Injectors			X	X	X
	Power transistor (ignition timing)	X	X (Ignition signal)	X	X	X
	IACV-AAC valve	X		X	X	X
	Valve timing control solenoid valve			X	X	X
	EGRC-solenoid valve			X	X	X
	Air conditioner relay			X		
	Fuel pump relay	X		X	X	X
	Cooling fan relay			X	X	X
	Wastegate valve control solenoid valve			X		

X: Applicable

Diagnostic Procedure 22

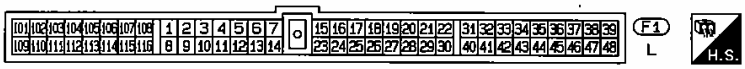
MAIN POWER SUPPLY AND GROUND CIRCUIT (Not self-diagnostic item)





Refer to last page (Foldout page).

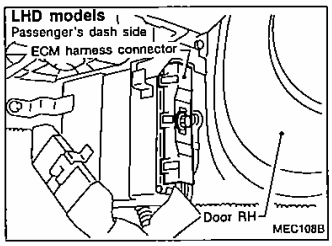
M10, E101
M60, F4

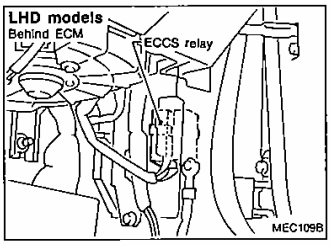


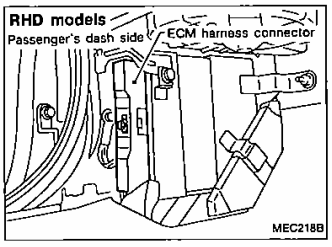
HEC146

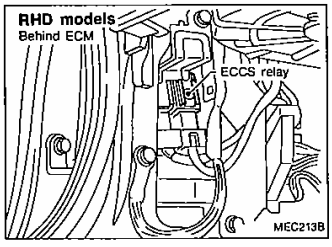
Diagnostic Procedure 22 (Cont'd)

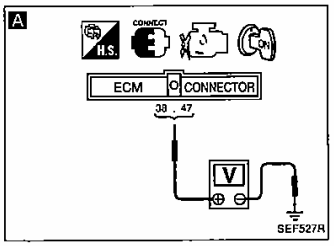
Harness layout

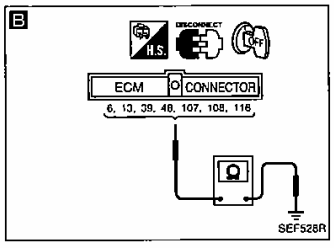


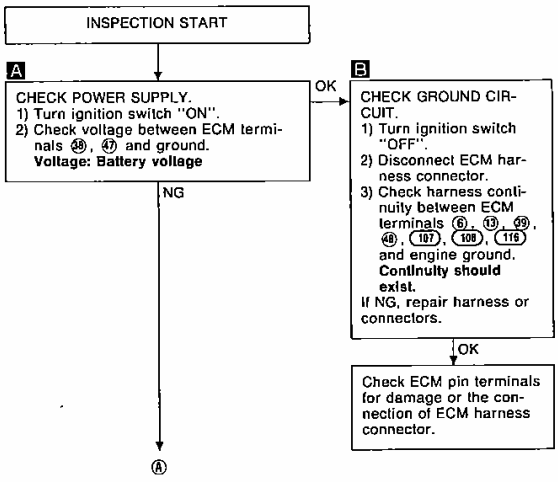




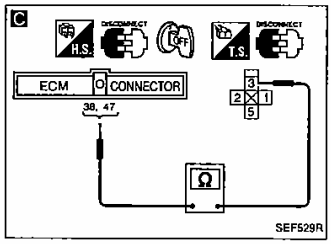


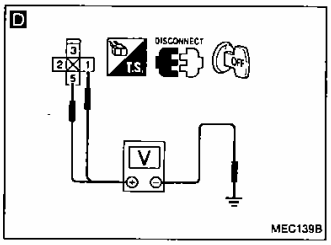


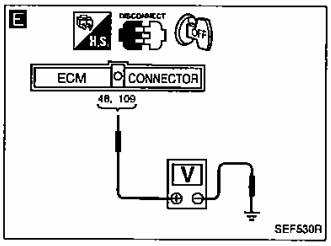


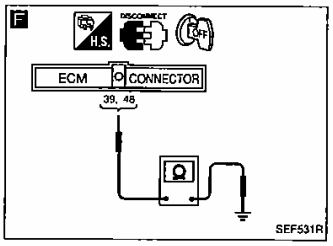


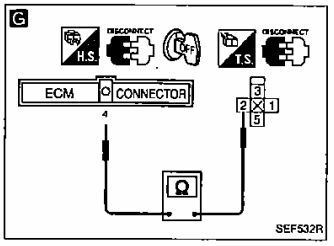
Diagnostic Procedure 22 (Cont'd)











Ⓐ

C

CHECK HARNESS CONTINUITY BETWEEN ECCS RELAY AND ECM.
1) Turn ignition switch "OFF".
2) Disconnect ECM harness connector.
3) Disconnect ECCS relay.
4) Check harness continuity between ECM terminals ㊽, ㊼ and terminal ③.
Continuity should exist.
If OK, check harness for short.

NG → Repair harness or connectors.

OK ↓

D

CHECK VOLTAGE BETWEEN ECCS RELAY AND GROUND.
1) Check voltage between terminals ①, ⑤ and ground.
Voltage: Battery voltage

NG → Check the following.
- 30A fusible link
- 7.5A fuse
- Harness connectors (E101), (M10)
- Harness connectors (M60), (F4)
- Harness for open or short between ECCS relay and battery

If NG, repair harness or connectors.

OK ↓

E

CHECK VOLTAGE BETWEEN ECM AND GROUND.
1) Check voltage between ECM terminals ㊻, (109) and ground.
Voltage: Battery voltage

NG → Check the following.
- Harness for open or short between ECM and harness connector (F4)

If NG, repair harness or connectors.

OK ↓

F

CHECK GROUND CIRCUIT.
1) Check harness continuity between ECM terminals ㊾, ㊽ and engine ground.
Continuity should exist.
If OK, check harness for short.

NG → Repair harness or connectors.

OK ↓

G

CHECK OUTPUT SIGNAL CIRCUIT.
1) Check harness continuity between ECM terminal ④ and terminal ②.
Continuity should exist.
If OK, check harness for short.

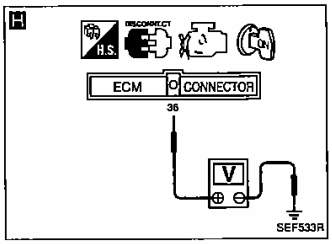
NG → Repair harness or connectors.

OK ↓

Ⓑ

EC

Diagnostic Procedure 22 (Cont'd)



Ⓑ

CHECK INPUT SIGNAL CIRCUIT.
1) Turn ignition switch "ON".
2) Check voltage between ECM terminal ㊱ and ground.
Voltage: Battery voltage

NG → Check the following.
- Harness connectors (M10), (E101)
- Harness for open or short between ECM and ignition switch

If NG, repair harness or connectors.

OK ↓

CHECK COMPONENT (ECCS relay).
Refer to "Electrical Components Inspection".

NG → Replace ECCS relay.

OK ↓

Disconnect and reconnect harness connectors in the circuit. Then retest.

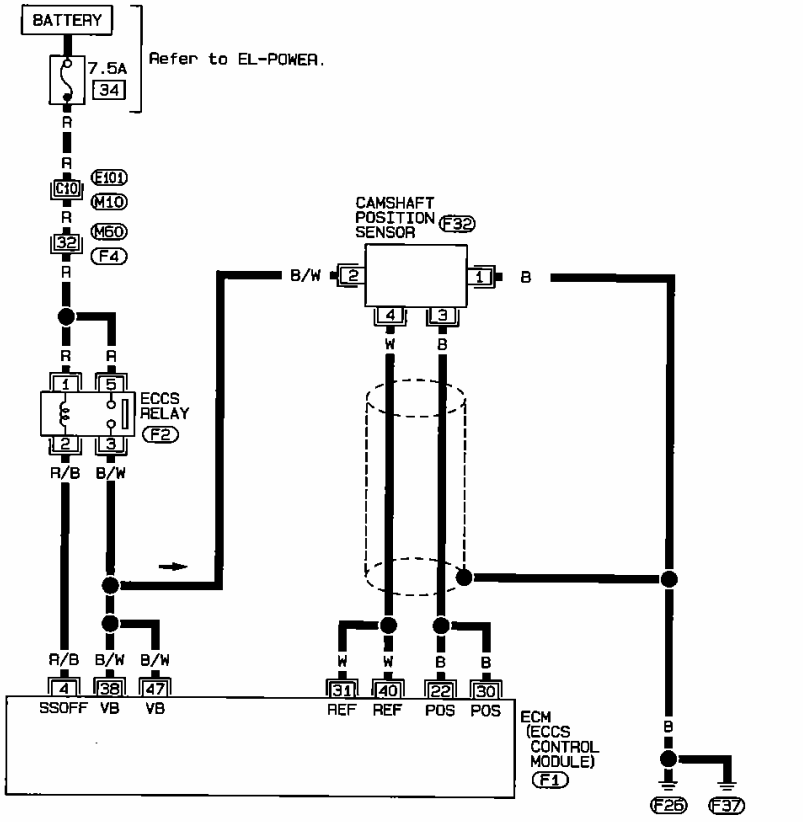
Trouble is not fixed. ↓

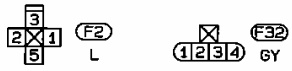
Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

Diagnostic Procedure 23

CAMSHAFT POSITION SENSOR (Diagnostic trouble code No. 11)

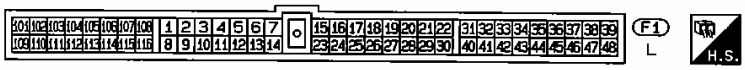
EC-CMPS-01





Refer to last page (Foldout page).

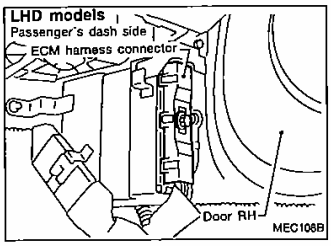
M10, E101, M60, F4

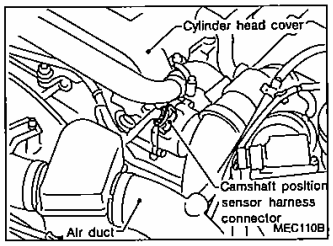


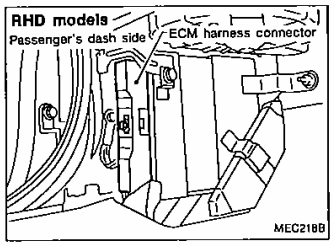
HEC147

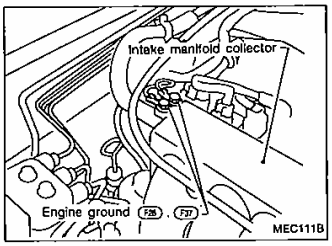
Diagnostic Procedure 23 (Cont'd)

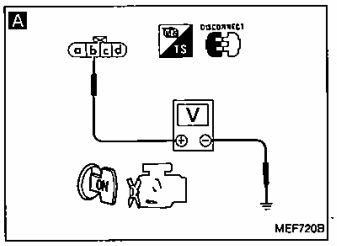
Harness layout

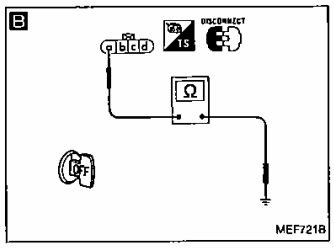


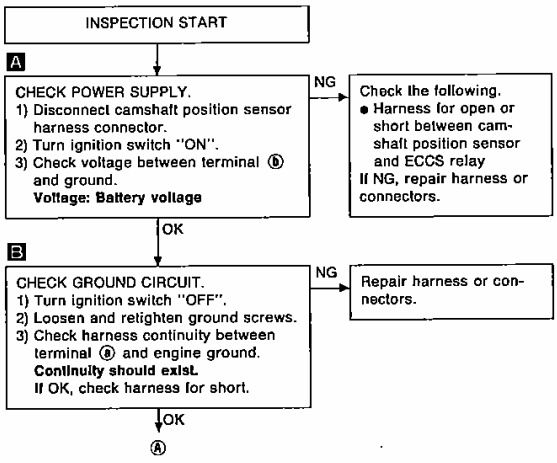




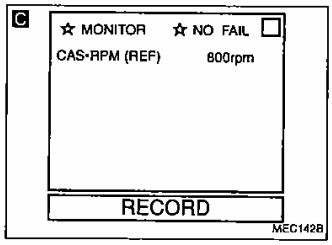


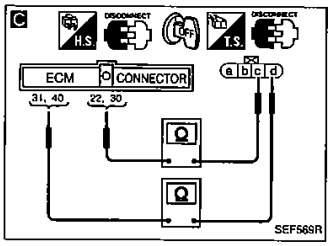






Diagnostic Procedure 23 (Cont'd)





Ⓐ

CHECK INPUT SIGNAL CIRCUIT.
1) Reconnect camshaft position sensor harness connector.
2) Start engine.
3) Read "CAS-RPM" or "CMPS-RPM" signal in "DATA MONITOR" mode with CONSULT.
800 ± 50 rpm (A/T: In "N" position)

NG → Repair harness or connectors.

OR

1) Disconnect ECM harness connector.
2) Check harness continuity between terminal Ⓔ and ECM terminals ㉒, ㊵ (1° signal), terminal ⓓ and ECM terminals ㉛, ㊵ (180° signal).
Continuity should exist.
If OK, check harness for short.

OK ↓

CHECK COMPONENT
(Camshaft position sensor).
Refer to "Electrical Components Inspection".

NG → Replace camshaft position sensor.

OK ↓

Disconnect and reconnect harness connectors in the circuit. Then retest.

Trouble is not fixed. ↓

Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

Perform FINAL CHECK by the following procedure after repair is completed.

FINAL CHECK ↓

1) Erase the diagnostic test mode II (Self-diagnostic results) memory.
2) Perform test drive.
3) Perform diagnostic test mode II (Self-diagnostic results) again.

NG → Recheck ECM pin terminals for damage or the connection of ECM harness connector.

OK ↓

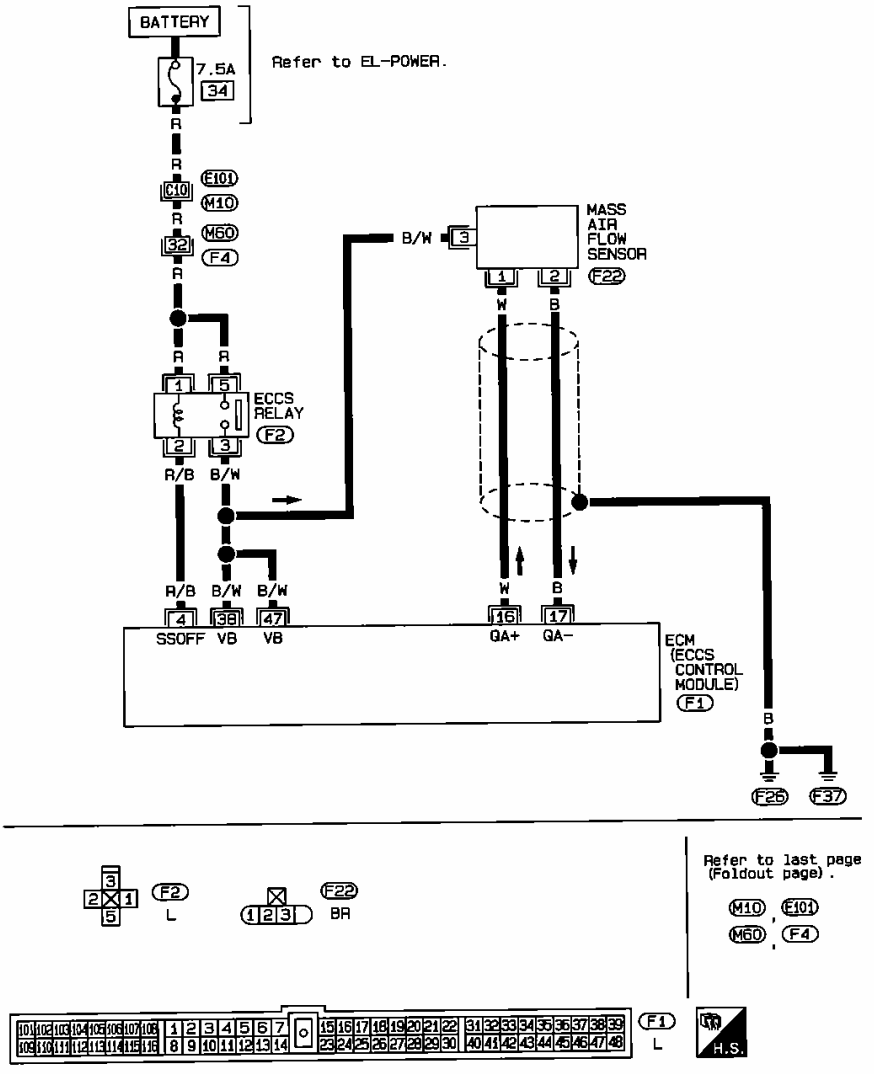
INSPECTION END

EC

Diagnostic Procedure 24

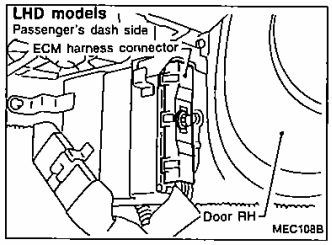
MASS AIR FLOW SENSOR (Diagnostic trouble code No. 12)

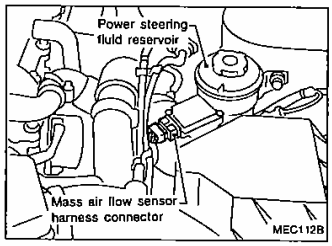
EC-MAFS-01

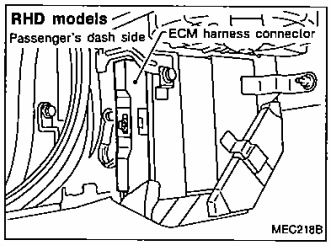


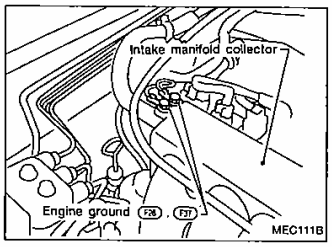
Diagnostic Procedure 24 (Cont'd)

Harness layout

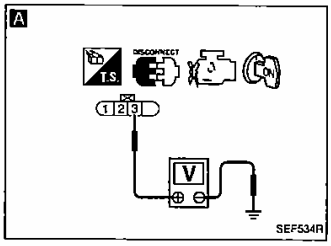


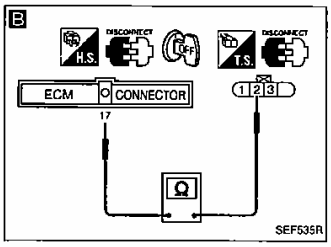






EC





INSPECTION START

A

CHECK POWER SUPPLY.
1) Disconnect mass air flow sensor harness connector.
2) Turn ignition switch "ON".
3) Check voltage between terminal ③ and ground.
Voltage: Battery voltage

NG → Check the following.
- Harness for open or short between mass air flow sensor and ECCS relay

If NG, repair harness or connectors.

OK

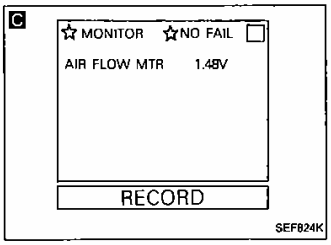
B

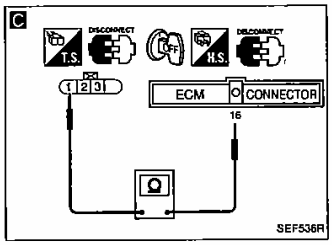
CHECK GROUND CIRCUIT.
1) Turn ignition switch "OFF".
2) Disconnect ECM harness connector.
3) Loosen and retighten ground screws.
4) Check harness continuity between terminal ② and ECM terminal ⑰.
Continuity should exist.
If OK, check harness for short.

NG → Repair harness or connectors.

OK → Ⓐ

Diagnostic Procedure 24 (Cont'd)





Ⓐ

CHECK INPUT SIGNAL CIRCUIT.
1) Reconnect mass air flow sensor harness connector and ECM harness connector.
2) Start engine and warm it up sufficiently.
3) Read "AIR FLOW MTR" or "MAS AIR/FL SE" signal in "DATA MONITOR" mode with CONSULT.
Voltage: 0.8 - 1.5V
(At Idle)

NG → Repair harness or connectors.

OR

1) Check harness continuity between terminal ① and ECM terminal ⑯.
Continuity should exist.
If OK, check harness for short.

OK ↓

CHECK COMPONENT
(Mass air flow sensor).
Refer to "Electrical Components Inspection". (See page EC-137.)

NG → Replace mass air flow sensor.

OK ↓

Disconnect and reconnect harness connectors in the circuit. Then retest.

Trouble is not fixed. ↓

Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

Perform FINAL CHECK by the following procedure after repair is completed.

FINAL CHECK ↓

1) Erase the diagnostic test mode II (Self-diagnostic results) memory.
2) Perform test drive.
3) Perform diagnostic test mode II (Self-diagnostic results) again.

NG → Recheck ECM pin terminals for damage or the connection of ECM harness connector.

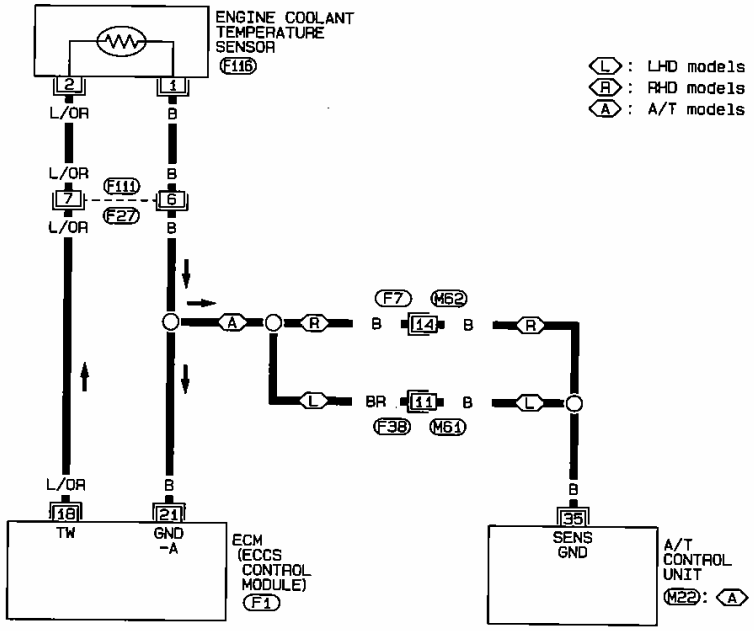
OK ↓

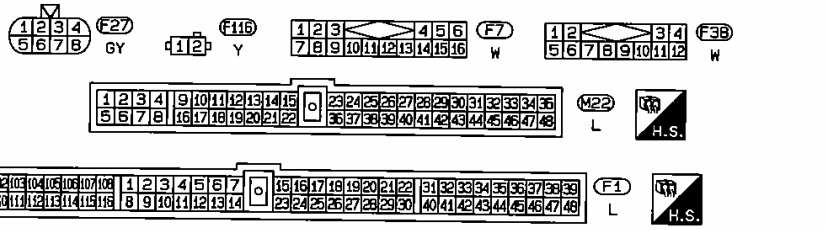
INSPECTION END

Diagnostic Procedure 25

ENGINE COOLANT TEMPERATURE SENSOR (Diagnostic trouble code No. 13)

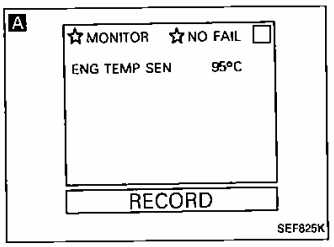
EC-ECTS-01

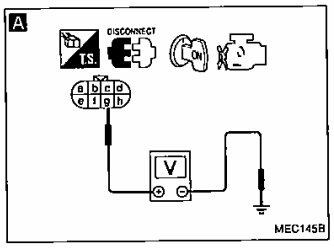


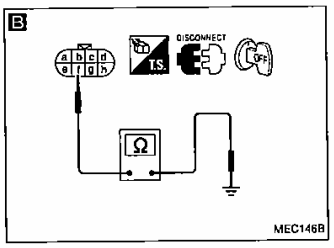


HEC149

Diagnostic Procedure 25 (Cont'd)







INSPECTION START

A

CHECK POWER SUPPLY.

1) Start engine and warm it up sufficiently.
2) Select "ENG TEMP SEN" or "COOLAN TEMP/S" signal in "DATA MONITOR" mode with CONSULT.
3) Stop engine.
4) When restarting engine make sure that CONSULT indicates "ENG TEMP SEN" or "COOLAN TEMP/S" is 50°C (122°F) or more.

NG → Check the following.
- Harness for open or short between ECM and harness connector (F27)

If NG, repair harness or connectors.

OR

1) Disconnect harness connectors (F27), (F111).
2) Turn ignition switch "ON".
3) Check voltage between terminal ⓖ and ground.

Voltage: Approximately 5V

OK

B

CHECK GROUND CIRCUIT.

1) Turn ignition switch "OFF".
2) Check harness continuity between terminal ⓕ and engine ground.

Continuity should exist.

If OK, check harness for short.

NG → Check the following.
- Harness connectors (F7), (M62) (A/T models)
- Harness for open or short between ECM and harness connector (F27)
- Harness for open or short between A/T control unit and harness connector (F27)

If NG, repair harness or connectors.

OK

CHECK COMPONENT
(Engine coolant temperature sensor).
Refer to "Electrical Components Inspection".

NG → Replace engine coolant temperature sensor.

OK

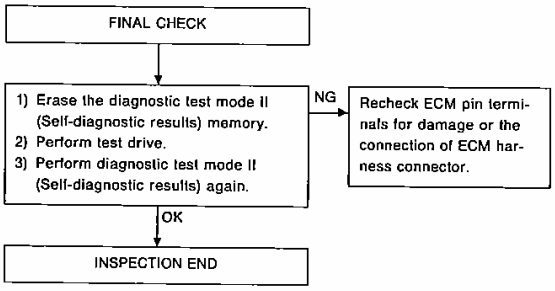
Disconnect and reconnect harness connectors in the circuit. Then retest.

Trouble is not fixed.

Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

Diagnostic Procedure 25 (Cont'd)

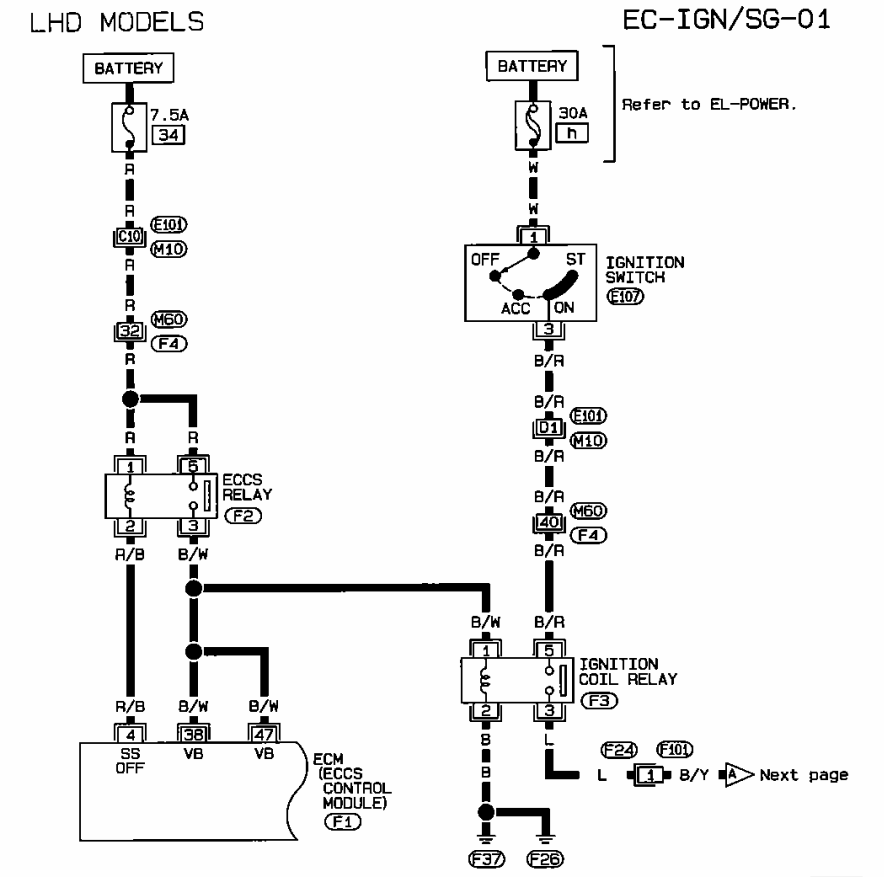
Perform FINAL CHECK by the following procedure after repair is completed.



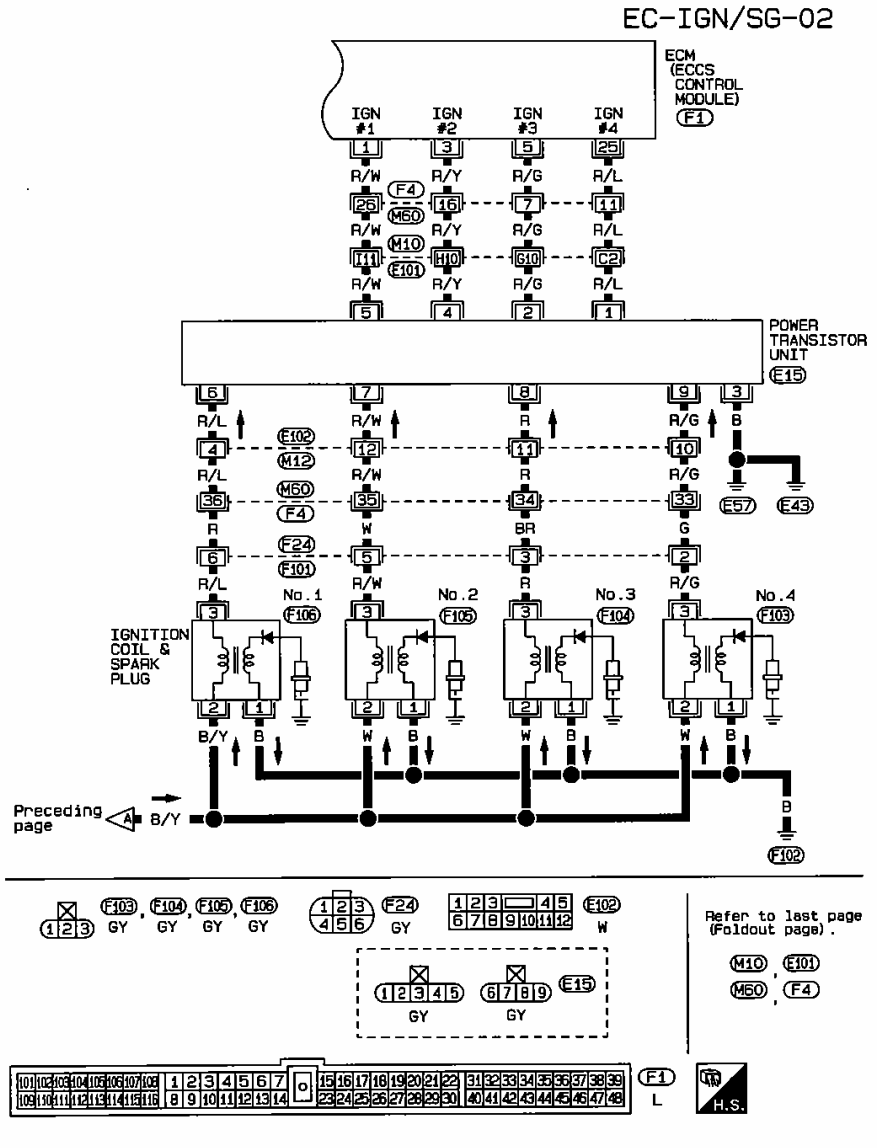
EC

Diagnostic Procedure 26

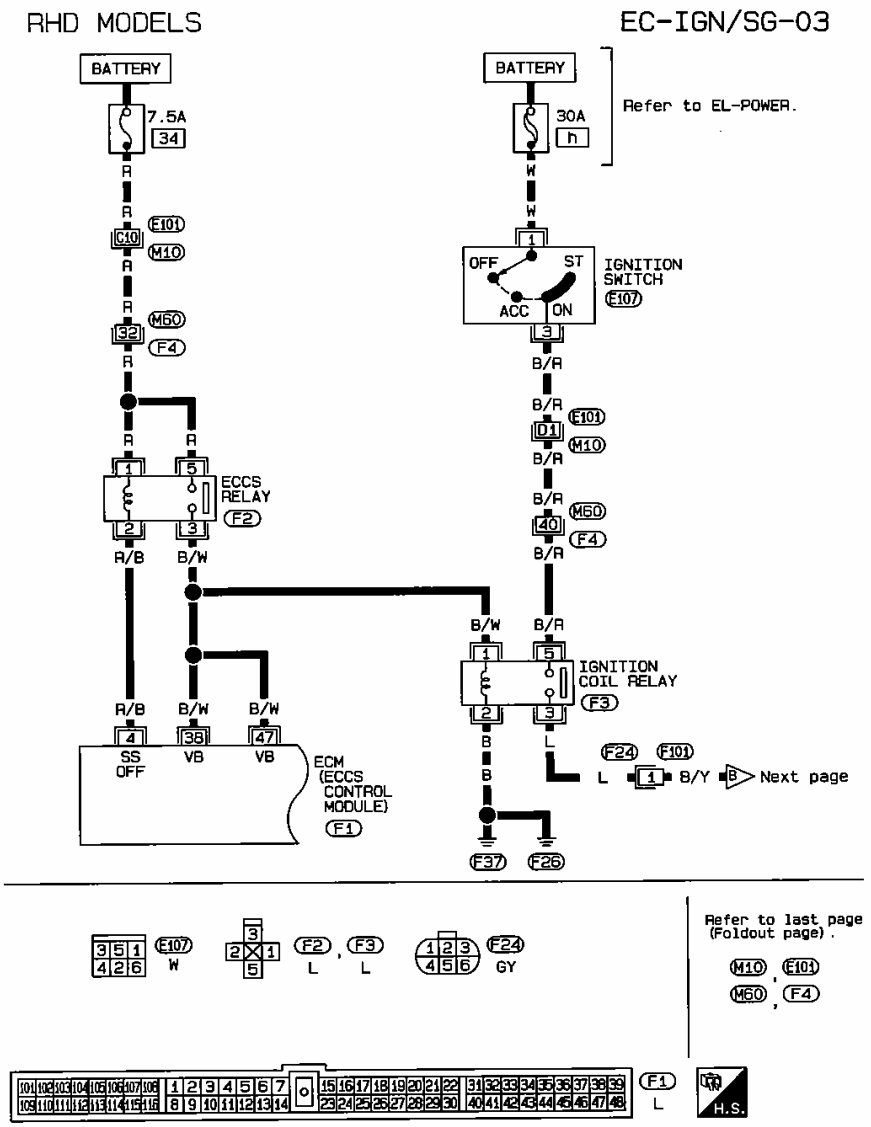
IGNITION SIGNAL (Diagnostic trouble code No. 21)



HEC150

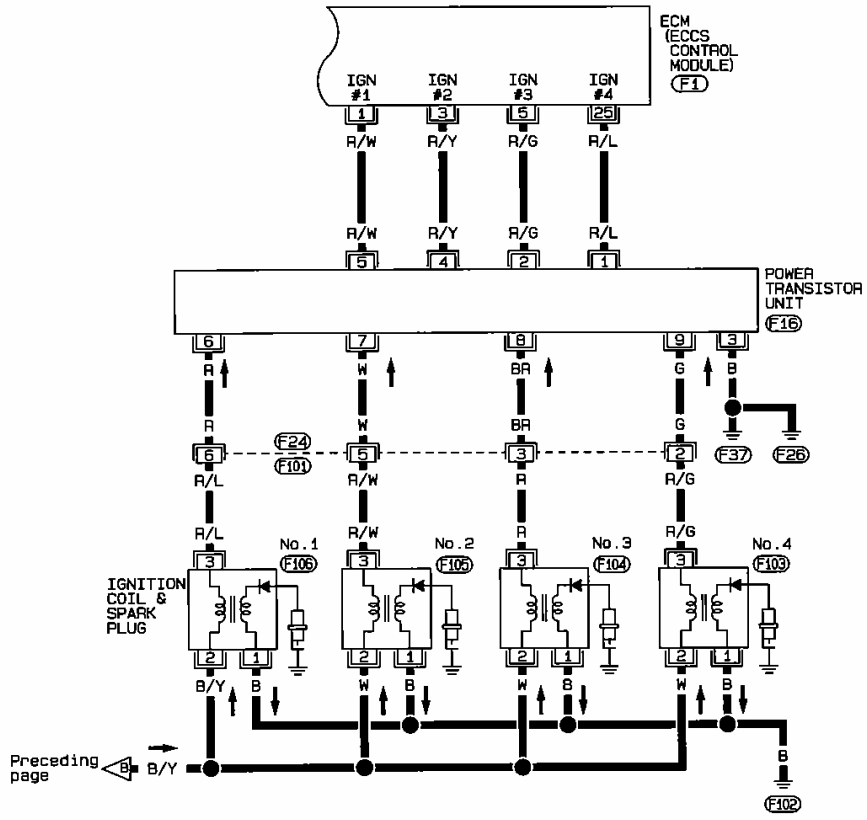

EC-IGN/SG-02
ECM (ECCS CONTROL MODULE) F1
IGN #1
IGN #2
IGN #3
IGN #4
POWER TRANSISTOR UNIT E15
IGNITION COIL & SPARK PLUG
No.1 F106
No.2 F105
No.3 F104
No.4 F103
E102 M12
M60 F4
F24 F101
E57
E43
F102
Preceding page A
B/Y
Refer to last page (Foldout page).
M10, E101
M60, F4
H.S.

HEC151


RHD MODELS
EC-IGN/SG-03
BATTERY
7.5A
34
BATTERY
30A
h
Refer to EL-POWER.
IGNITION SWITCH
E107
OFF
ST
ACC
ON
E101
C10
M10
M60
32
F4
D1
40
ECCS RELAY
F2
IGNITION COIL RELAY
F3
ECM (ECCS CONTROL MODULE)
F1
SS
VB
VB
SS OFF
F24
F101
L
B/Y
Next page
F37
F26
W
L
GY
Refer to last page (Foldout page).
M10, E101
M60, F4
H.S.

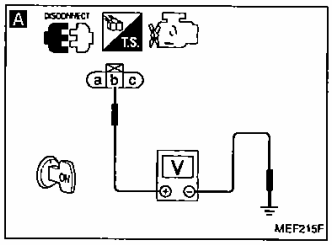
HEC152

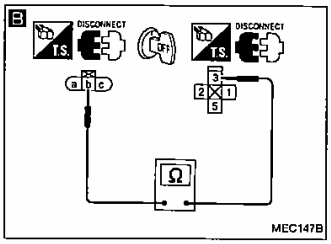
EC-IGN/SG-04

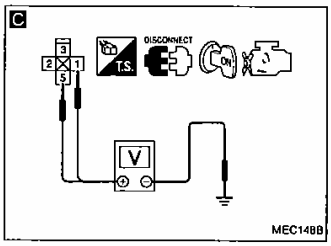


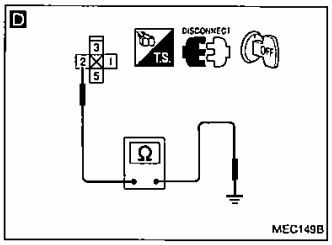
HEC153

Diagnostic Procedure 26 (Cont'd)









INSPECTION START

A

CHECK POWER SUPPLY-I.
1) Disconnect ignition coil harness connectors.
2) Turn ignition switch "ON".
3) Check voltage between terminal ⓑ and ground.
Voltage: Battery voltage

OK → Go to "CHECK GROUND CIRCUIT-II" on next page.

NG

B

CHECK POWER SUPPLY-II.
1) Turn ignition switch "OFF".
2) Disconnect ignition coil relay.
3) Check harness continuity between terminal ⓑ and terminal ③.
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (F24), (F101)
- Harness for open or short between ignition coil and ignition coil relay

If NG, repair harness or connectors.

OK

C

CHECK POWER SUPPLY-III.
1) Turn ignition switch "ON".
2) Check voltage between terminals ①, ⑤ and ground.
Voltage: Battery voltage

NG → Check the following.
- Harness connectors (E101), (M10)
- Harness connectors (M60), (F4)
- Harness for open or short between ignition coil relay and ignition switch
- Harness for open or short between ignition coil relay and ECCS relay

If NG, repair harness or connectors.

OK

D

CHECK GROUND CIRCUIT-I.
1) Turn ignition switch "OFF".
2) Check harness continuity between terminal ② and engine ground.
Continuity should exist.
If OK, check harness for short.

NG → Repair harness or connectors.

OK

CHECK COMPONENT (Ignition coil relay).
Refer to "Electrical Components Inspection".

NG → Replace ignition coil relay.

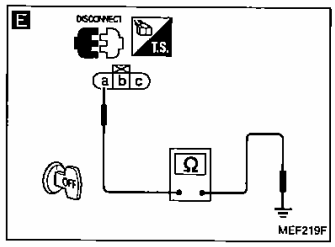
OK

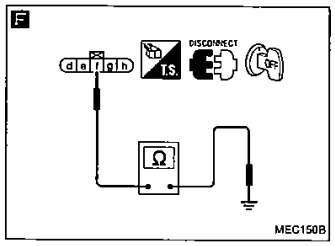
Disconnect and reconnect harness connectors in the circuit. Then retest.

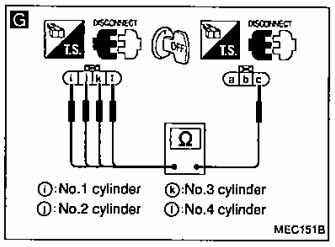
Trouble is not fixed.

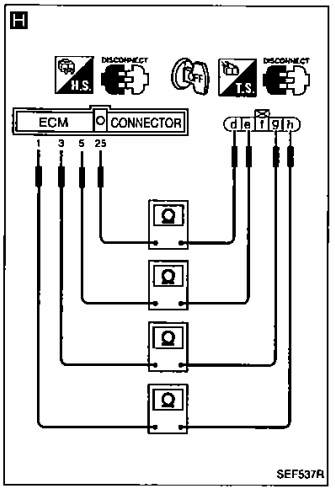
Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

Diagnostic Procedure 26 (Cont'd)









CHECK GROUND CIRCUIT-II.
1) Turn ignition switch "OFF".
E 2) Check harness continuity between terminal ⓐ and engine ground.
Continuity should exist.
If OK, check harness for short.
3) Disconnect power transistor unit harness connector.
F 4) Check harness continuity between terminal ⓕ and engine ground.
Continuity should exist.
If OK, check harness for short.

NG → Repair harness or connectors.

OK ↓

CHECK OUTPUT SIGNAL CIRCUIT.
G 1) Check harness continuity between terminals ⓙ, ⓛ, ⓚ, ⓜ and terminal ⓔ.
Continuity should exist.
If OK, check harness for short.
2) Disconnect ECM harness connector.
H 3) Check harness continuity between following terminals.
① - ⓗ ⑤ - ⓔ
③ - ⓖ ㉕ - ⓓ
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (F24), (F101)
- Harness connectors (M60), (F4) (LHD models)
- Harness connectors (E102), (M12) (LHD models)
- Harness connectors (M10), (E101) (LHD models)
- Harness for open or short between ignition coil and power transistor unit
- Harness for open or short between ECM and power transistor unit

If NG, repair harness or connectors.

OK ↓

CHECK COMPONENTS
(Ignition coil and power transistor unit).
Refer to "Electrical Components Inspection".

NG → Replace malfunctioning component(s).

OK ↓

Disconnect and reconnect harness connectors in the circuit. Then retest.

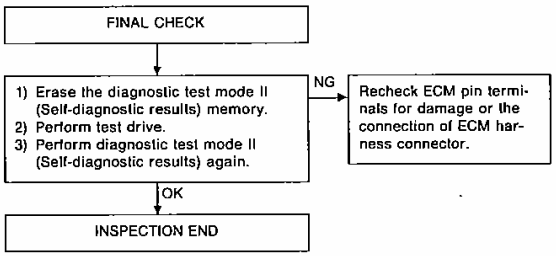
Trouble is not fixed. ↓

Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

EC

Diagnostic Procedure 26 (Cont'd)

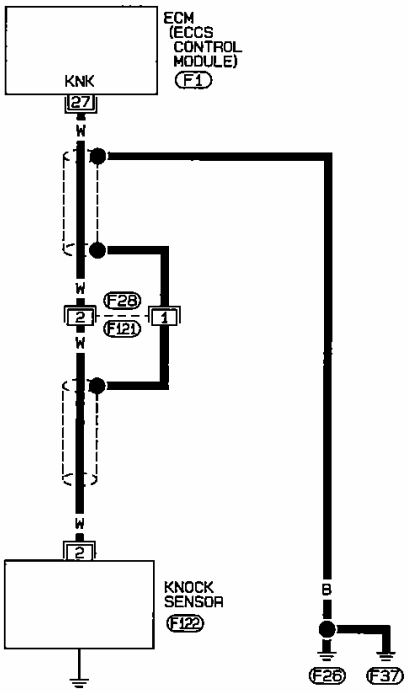
Perform FINAL CHECK by the following procedure after repair is completed.



Diagnostic Procedure 28

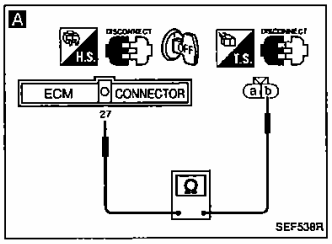
KNOCK SENSOR (Diagnostic trouble code No. 34)

EC-KS-01



HEC154

Diagnostic Procedure 28 (Cont'd)



INSPECTION START

A

CHECK INPUT SIGNAL CIRCUIT.
1) Disconnect ECM harness connector and harness connectors (F28), (F121).
2) Check harness continuity between terminal (b) and ECM terminal (27).
Continuity should exist.
If OK, check harness for short.

NG → Repair harness or connectors.

OK ↓

Loosen and retighten ground screws.

CHECK COMPONENT
(Knock sensor).
Refer to "Electrical Components Inspection"

NG → Replace knock sensor.

OK ↓

Disconnect and reconnect harness connectors in the circuit. Then retest.

Trouble is fixed. ↓

Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

Perform FINAL CHECK by the following procedure after repair is completed.

FINAL CHECK

1) Erase the diagnostic test mode II (Self-diagnostic results) memory.
2) Perform test drive.
3) Perform diagnostic test mode II (Self-diagnostic results) again.

NG → Recheck ECM pin terminals for damage or the connection of ECM harness connector.

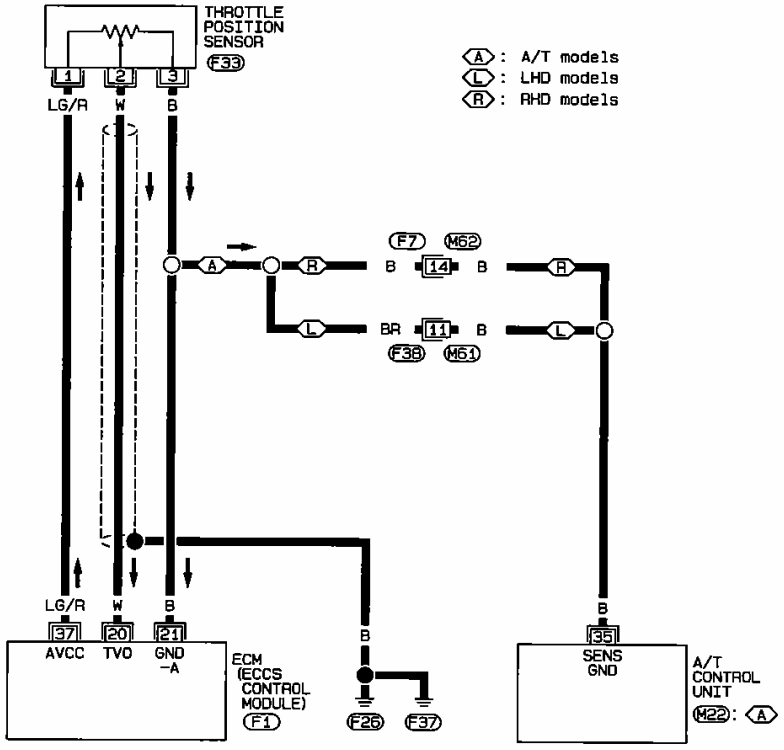
OK ↓

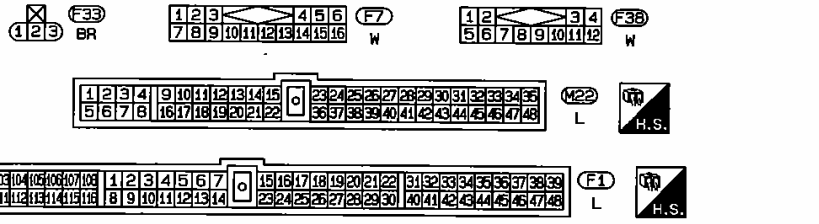
INSPECTION END

Diagnostic Procedure 29

THROTTLE POSITION SENSOR (Diagnostic trouble code No. 43)

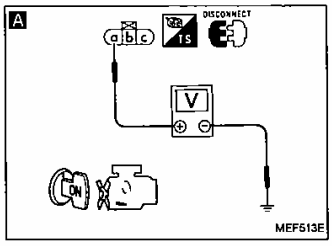
EC-TPS-01

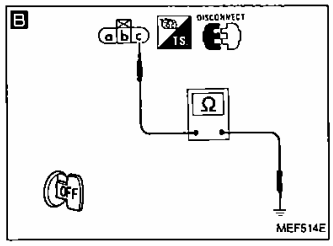


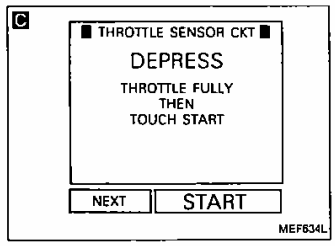


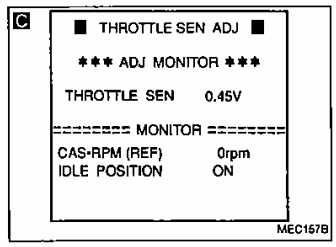
HEC155

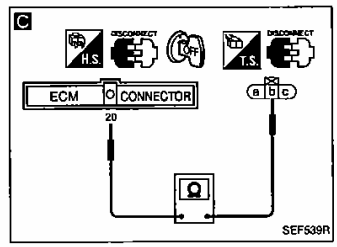
Diagnostic Procedure 29 (Cont'd)











INSPECTION START

A

CHECK POWER SUPPLY.
1) Disconnect throttle position sensor harness connector.
2) Turn ignition switch "ON".
3) Check voltage between terminal ⑧ and ground.
Voltage: Approximately 5V

NG → Repair harness or connectors.

OK

B

CHECK GROUND CIRCUIT.
1) Turn ignition switch "OFF".
2) Loosen and retighten ground screws.
3) Check harness continuity between terminal ⑥ and engine ground.
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (F38), (M61) (LHD A/T models)
- Harness connectors (F7), (M62) (RHD A/T models)
- Harness for open or short between ECM and throttle position sensor
- Harness for open or short between A/T control unit and throttle position sensor

If NG, repair harness or connectors.

OK

C

CHECK INPUT SIGNAL CIRCUIT.

1) Reconnect throttle position sensor harness connector.
2) Turn ignition switch "ON".
3) Perform "THROTTLE SENSOR CKT" or "THROTTLE POSI SEN CKT" in "FUNCTION TEST" mode with CONSULT.

— OR —

3) Read "THROTTLE SEN" or "THRTL POS SEN" signal in "WORK SUPPORT" mode with CONSULT.
Throttle valve fully closed:
0.35 - 0.65V
Throttle valve fully open:
Approx. 4.0V

— OR —

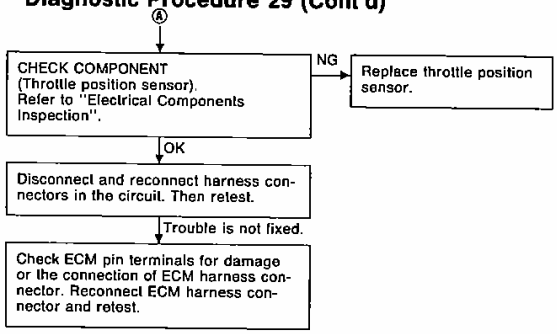
1) Disconnect ECM harness connector.
2) Check harness continuity between ECM terminal ⑳ and terminal ⑮.
Continuity should exist.
If OK, check harness for short.

NG → Repair harness or connectors.

OK

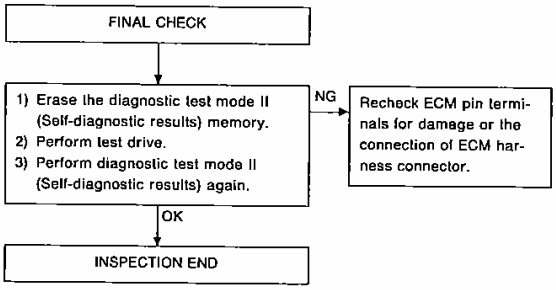
Ⓐ

Diagnostic Procedure 29 (Cont'd)



EC

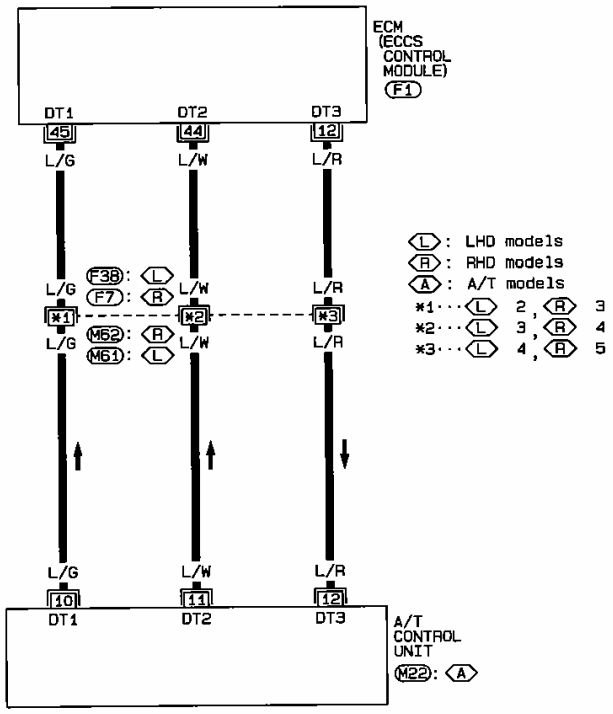
Perform FINAL CHECK by the following procedure after repair is completed.

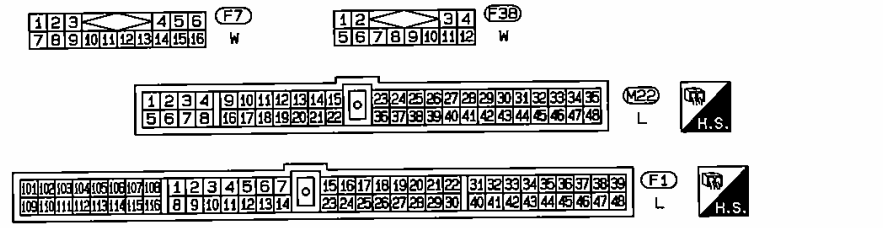


Diagnostic Procedure 30

A/T CONTROL (Diagnostic trouble code No. 54)

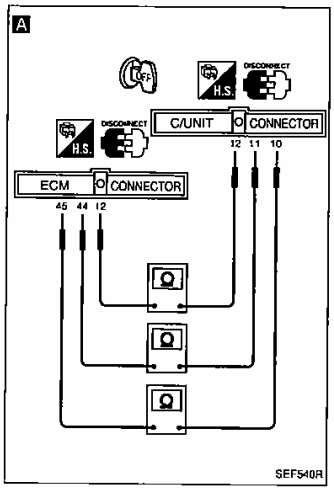
EC-AT/C-01





HEC156

Diagnostic Procedure 30 (Cont'd)



INSPECTION START

A

CHECK INPUT SIGNAL CIRCUIT.
1) Disconnect ECM harness connector and A/T control unit harness connector.
2) Check harness continuity between ECM terminal ㊺ and terminal ⑩, ECM terminal ㊹ and terminal ⑪, ECM terminal ⑫ and terminal ⑫.
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (F38), (M61) (LHD models)
- Harness connectors (F7), (M52) (RHD models)
- Harness for open or short between ECM and A/T control unit

If NG, repair harness or connectors.

OK ↓

Disconnect and reconnect harness connectors in the circuit. Then retest.

Trouble is not fixed. ↓

Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

Perform FINAL CHECK by the following procedure after repair is completed.

FINAL CHECK

1) Erase the diagnostic test mode II (Self-diagnostic results) memory.
2) Perform test drive.
3) Perform diagnostic test mode II (Self-diagnostic results) again.

NG → Recheck ECM pin terminals for damage or the connection of ECM harness connector.

OK ↓

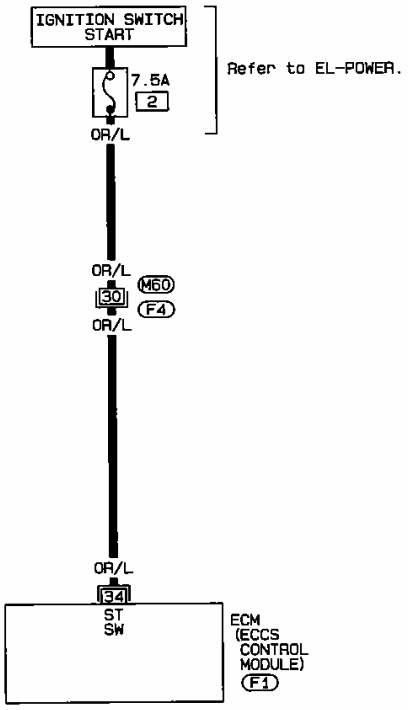
INSPECTION END

EC

Diagnostic Procedure 31

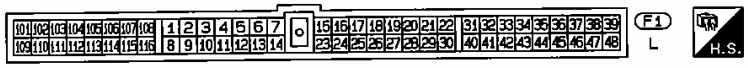
START SIGNAL (Not self-diagnostic item)

EC-S/SIG-01



Refer to last page
(Foldout page).

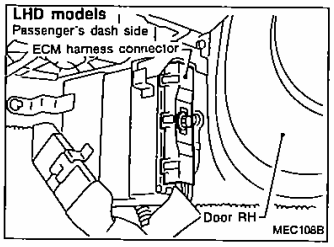
M60, F4

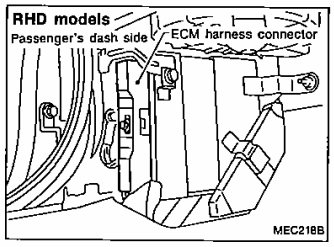


HEC157

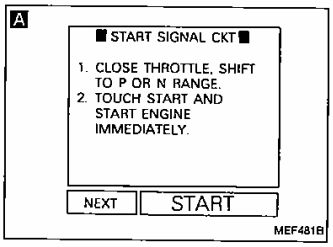
Diagnostic Procedure 31 (Cont'd)

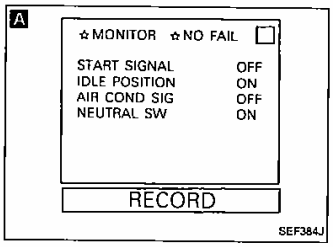
Harness layout

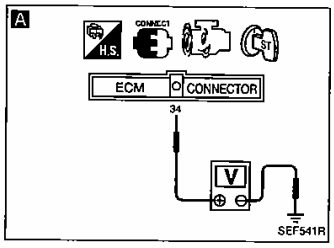


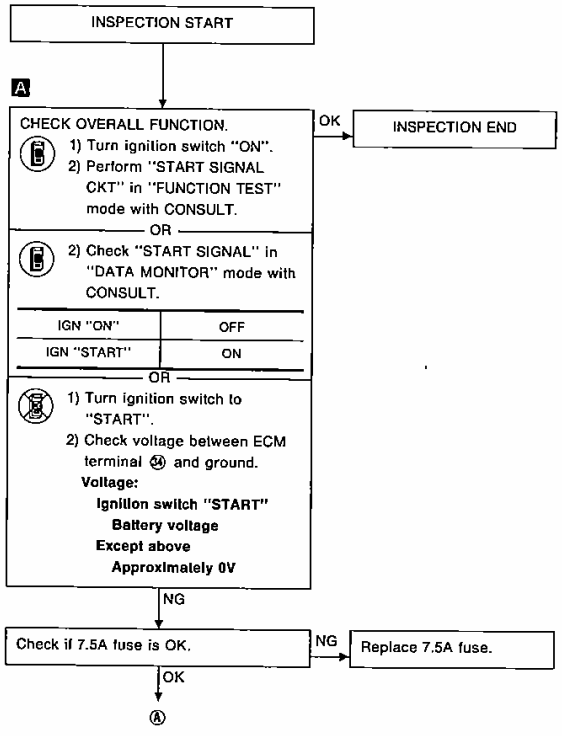


EC

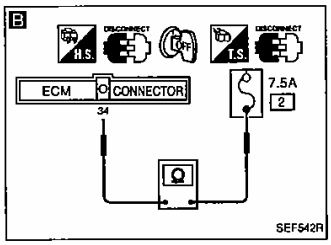








Diagnostic Procedure 31 (Cont'd)



Ⓐ

B

CHECK INPUT SIGNAL CIRCUIT.
1) Turn ignition switch "OFF".
2) Disconnect ECM harness connector and 7.5A fuse.
3) Check harness continuity between ECM terminal ㉞ and fuse block.
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (F4), (M60)
- Harness for open or short between ECM and fuse block

If NG, repair harness or connectors.

OK ↓

Disconnect and reconnect harness connectors in the circuit. Then retest.

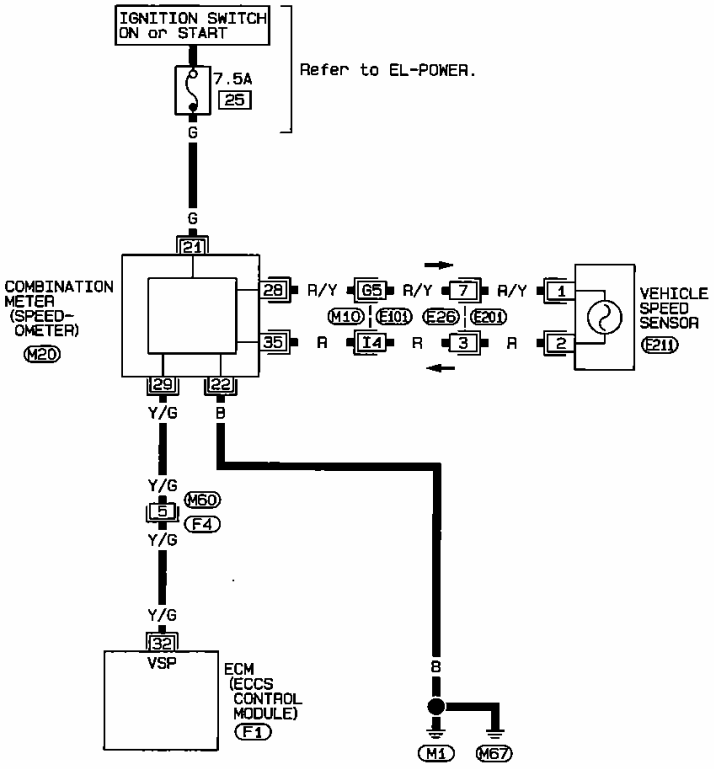
Trouble is not fixed. ↓

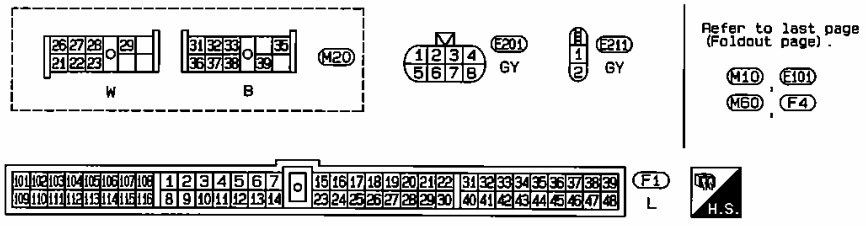
Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

Diagnostic Procedure 32

VEHICLE SPEED SENSOR (Not self-diagnostic item)

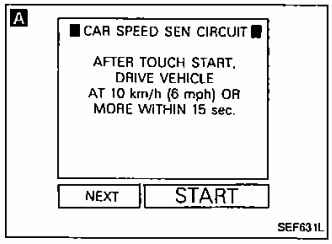
EC-VSS-01

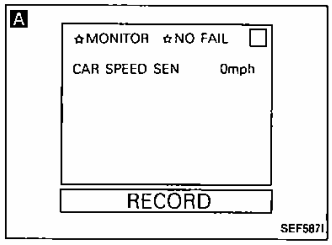


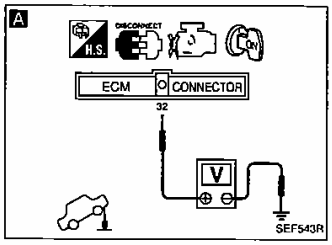


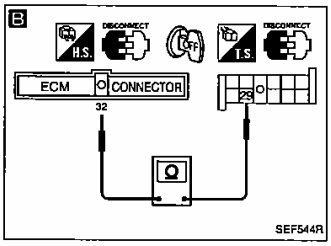
HEC158

Diagnostic Procedure 32 (Cont'd)









INSPECTION START

A

CHECK OVERALL FUNCTION.
1) Jack up drive wheels.
2) Perform "CAR SPEED SEN CIRCUIT" or "VEHICLE SPEED SEN CKT" in "FUNCTION TEST" mode with CONSULT.

OK → INSPECTION END

OR

2) Read "CAR SPEED SEN" or "VHCL SPEED SE" signal in "DATA MONITOR" mode with CONSULT.
CONSULT value should be the same as the speedometer indication.

OR

2) Disconnect ECM harness connector.
3) Turn ignition switch "ON".
4) Rotate drive wheel by hand.
5) Check voltage between ECM terminal ㉜ and body ground.
Voltage should vary between approx. 0 to 5V.

NG ↓

CHECK SPEEDOMETER FUNCTION.
Make sure that speedometer functions properly.

NG → Check vehicle speed sensor and circuit. (Refer to EL section.)

OK ↓

B

CHECK INPUT SIGNAL CIRCUIT.
1) Turn ignition switch "OFF".
2) Disconnect ECM harness connector and combination meter harness connector.
3) Check harness continuity between ECM terminal ㉜ and terminal ㉙.
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (F4), (M60)
- Harness for open or short between ECM and combination meter

If NG, repair harness or connectors.

OK ↓

Disconnect and reconnect harness connectors in the circuit. Then retest.

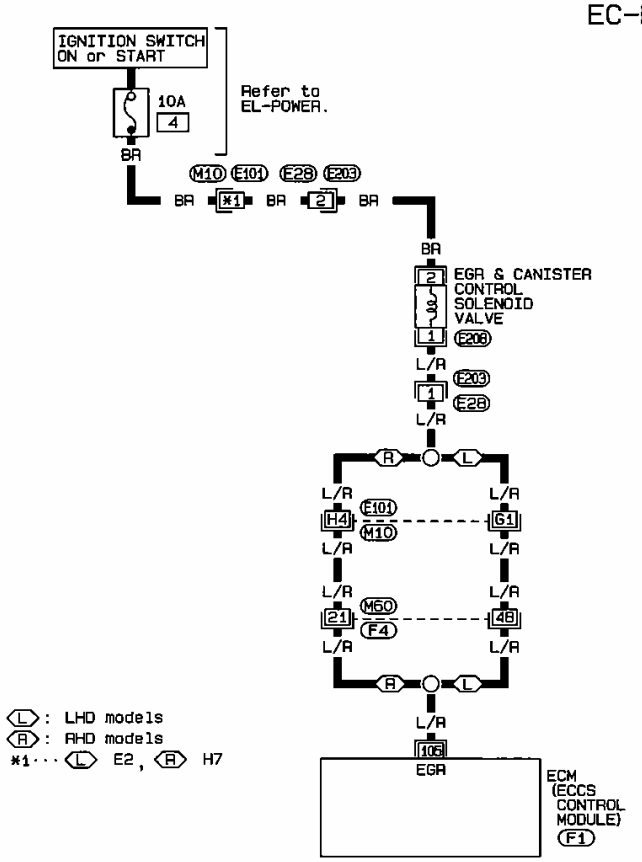
Trouble is not fixed. ↓

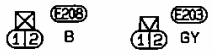
Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

Diagnostic Procedure 33

EGR AND CANISTER CONTROL (Not self-diagnostic item)

EC-EGRC/V-01





Refer to last page (Foldout page).

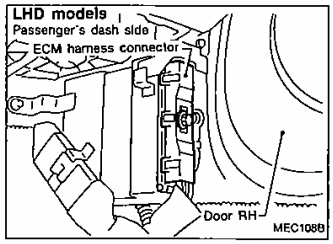
M10, E101

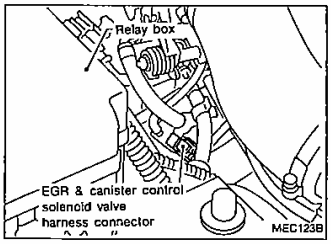
M60, F4

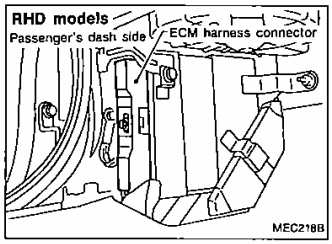
HEC159

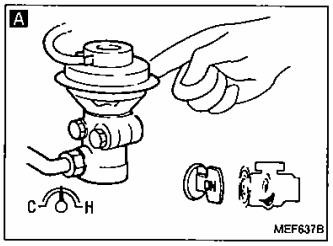
Diagnostic Procedure 33 (Cont'd)

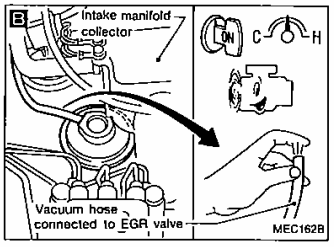
Harness layout

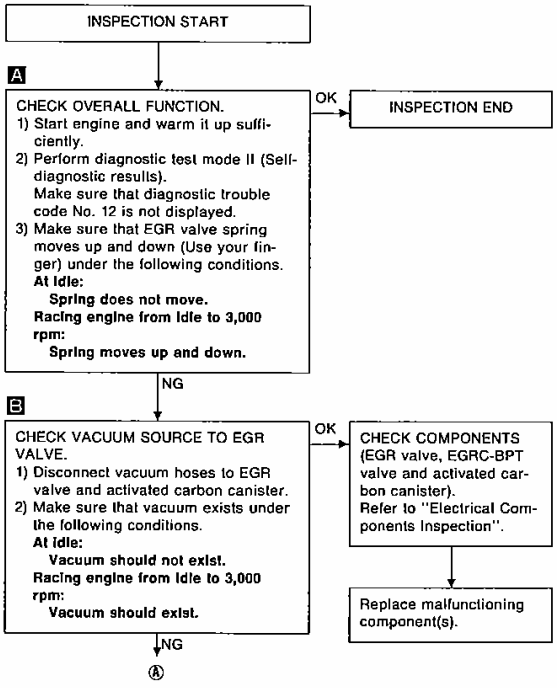




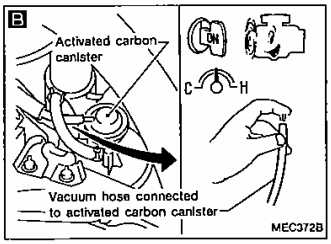


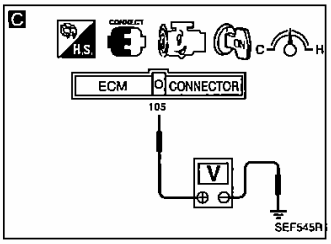


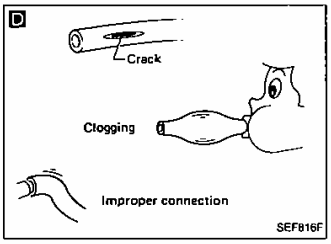


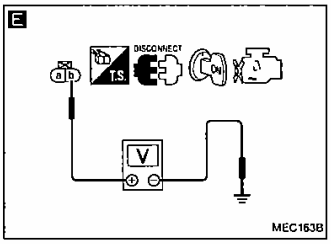


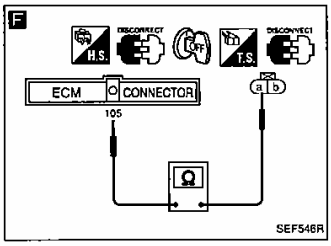
Diagnostic Procedure 33 (Cont'd)











Ⓐ

C CHECK CONTROL FUNCTION.
1) Check voltage between ECM terminal (105) and ground under the following conditions.
Voltage:
At idle
Approximately 0V
Engine speed is 2,000 rpm
Battery voltage

OK → **D** CHECK VACUUM HOSE.
1) Check vacuum hose for clogging, cracks and proper connection.

NG ↓

E CHECK POWER SUPPLY.
1) Stop engine.
2) Disconnect EGR & canister control solenoid valve harness connector.
3) Turn ignition switch "ON".
4) Check voltage between terminal ⓑ and ground.
Voltage: Battery voltage

NG → Check the following.
- Harness connectors (M10), (E101)
- Harness connectors (E28), (E203)
- 10A fuse
- Harness for open or short between EGR & canister control solenoid valve and fuse

If NG, repair harness or connectors.

OK ↓

F CHECK OUTPUT SIGNAL CIRCUIT.
1) Turn ignition switch "OFF".
2) Disconnect ECM harness connector.
3) Check harness continuity between ECM terminal (105) and terminal ⓐ.
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (E203), (E28)
- Harness connectors (E101), (M10)
- Harness connectors (M60), (F4) (RHD models)
- Harness connectors (M62), (F7) (LHD models)
- Harness for open or short between ECM and EGR & canister control solenoid valve

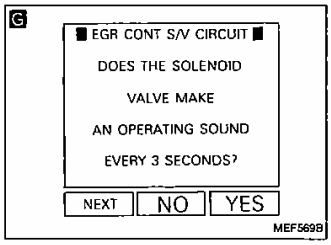
If NG, repair harness or connectors.

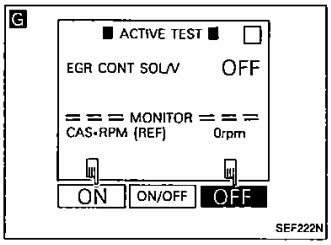
OK ↓

Ⓑ

EC

Diagnostic Procedure 33 (Cont'd)





Ⓐ

G

CHECK COMPONENT (EGR & canister control solenoid valve).

1) Reconnect EGR & canister control solenoid valve harness connector and ECM harness connector.
2) Turn ignition switch "ON".
3) Perform "EGR CONT S/V CIRCUIT" or "EGRC SOL/V CIRCUIT" in "FUNCTION TEST" mode with CONSULT.

NG → Replace EGR & canister control solenoid valve.

— OR —

3) Turn EGR & canister control solenoid valve "ON" and "OFF" in "ACTIVE TEST" mode with CONSULT and check operating sound.

— OR —

Refer to "Electrical Components Inspection".

OK ↓

Disconnect and reconnect harness connectors in the circuit. Then retest.

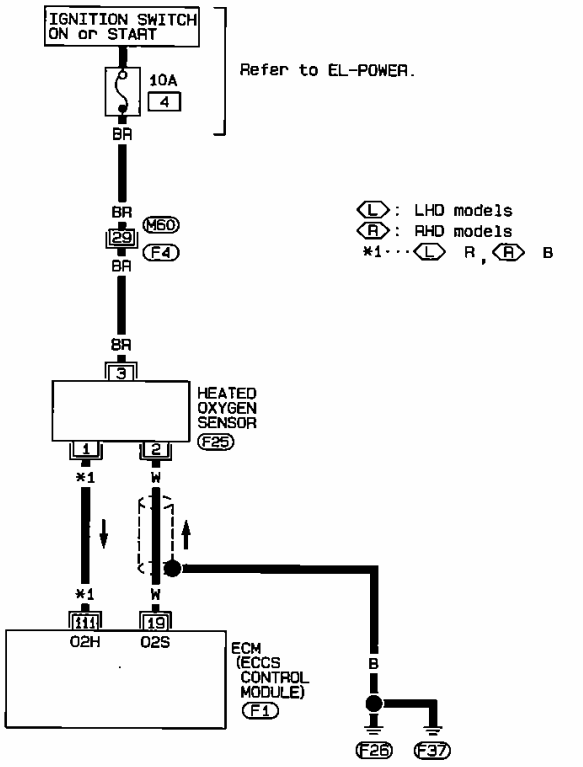
Trouble is not fixed. ↓

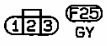
Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

Diagnostic Procedure 34

HEATED OXYGEN SENSOR (Not self-diagnostic item)

EC-H02S-01



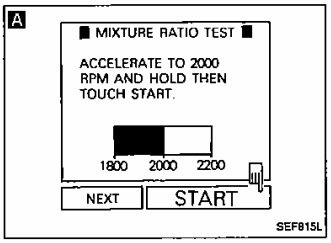


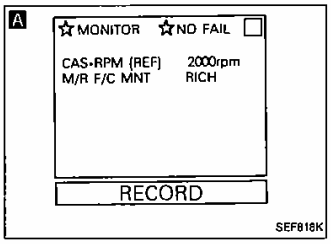
Refer to last page (Foldout page).

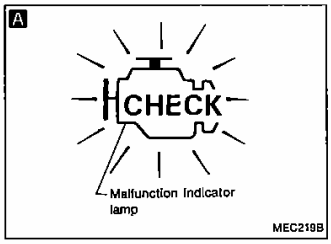
M60, F4

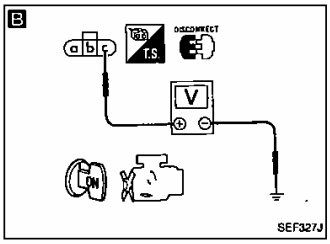
HEC160

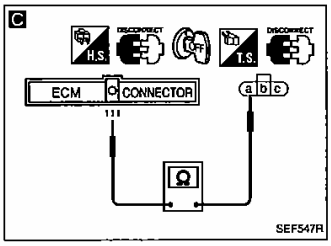
Diagnostic Procedure 34 (Cont'd)











INSPECTION START

A

CHECK HEATED OXYGEN SENSOR CIRCUIT.
1) Start engine and warm it up sufficiently.
2) Perform "MIXTURE RATIO TEST" in "FUNCTION TEST" mode with CONSULT.

— OR —

2) Make sure that "M/R F/C MNT" in "DATA MONITOR" mode indicates "RICH" and "LEAN" periodically more than 5 times during 10 seconds at 2,000 rpm.

— OR —

2) Run engine at about 2,000 rpm for about 2 minutes under no-load.
3) Set ECM Diagnostic Test Mode II.
4) Keep engine speed at 2,000 rpm and make sure that the malfunction indicator lamp on the instrument panel goes on and off more than 5 times during 10 seconds.

OK → INSPECTION END

NG ↓

B

CHECK POWER SUPPLY.
1) Stop engine.
2) Disconnect heated oxygen sensor harness connector.
3) Turn ignition switch "ON".
4) Check voltage between terminal ⑥ and ground.
Voltage: Battery voltage

NG → Check the following.
- Harness connectors (F4), (M60)
- 10A fuse
- Harness for open or short between heated oxygen sensor and fuse

If NG, repair harness or connectors.

OK ↓

C

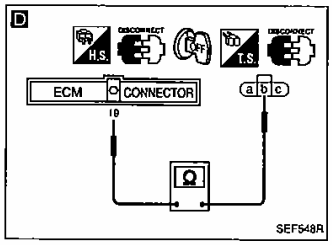
CHECK OUTPUT SIGNAL CIRCUIT.
1) Turn ignition switch "OFF".
2) Disconnect ECM harness connector.
3) Check harness continuity between terminal ⑧ and ECM terminal (111).
Continuity should exist.
If OK, check harness for short.

NG → Repair harness or connectors.

OK ↓

Ⓐ

Diagnostic Procedure 34 (Cont'd)



Ⓐ

D

CHECK INPUT SIGNAL CIRCUIT.
1) Loosen and retighten ground screws.
2) Check harness continuity between ECM terminal ⑱ and terminal ⓑ.
Continuity should exist.
If OK, check harness for short.

NG → Repair harness or connectors.

OK ↓

Disconnect and reconnect harness connectors in the circuit. Then retest.

Trouble is not fixed. ↓

Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

Trouble is not fixed. ↓

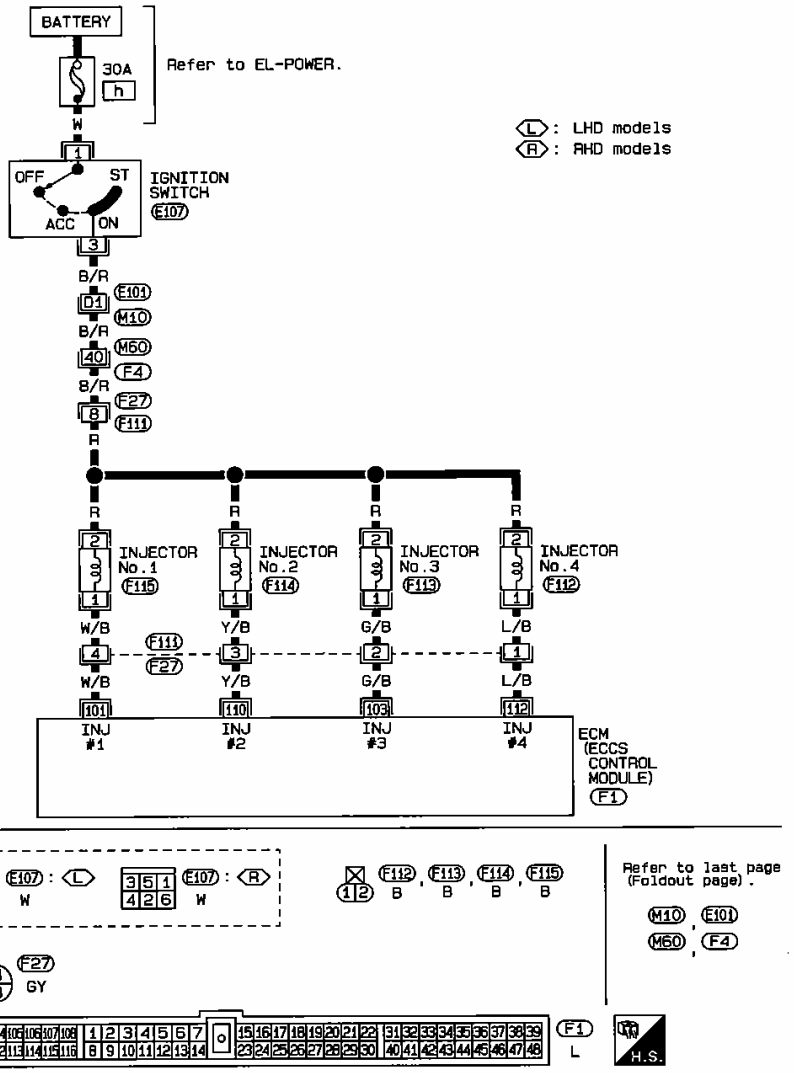
Replace heated oxygen sensor.

EC

Diagnostic Procedure 35

INJECTOR CIRCUIT (Not self-diagnostic item)

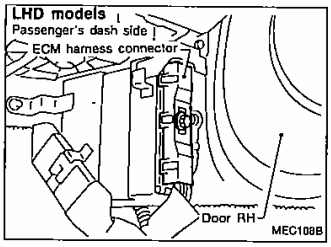
EC-INJECT-01

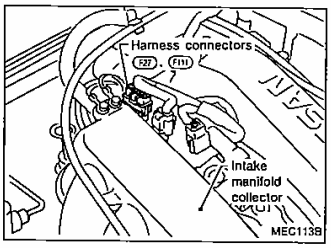


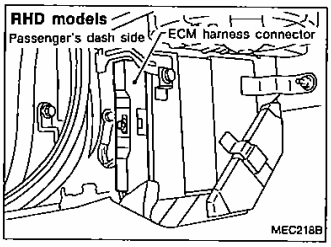
HEC161

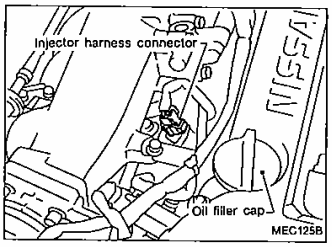
Diagnostic Procedure 35 (Cont'd)

Harness layout

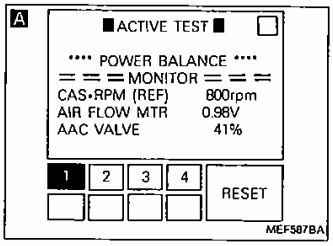


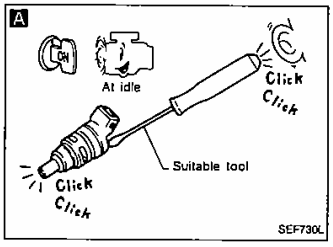






EC





INSPECTION START

A

CHECK OVERALL FUNCTION.
1) Start engine.
2) Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT.
3) Make sure that each circuit produces a momentary engine speed drop.

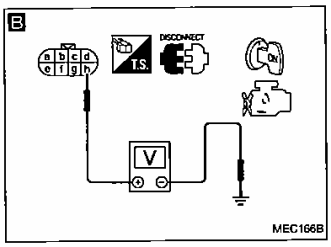
OR

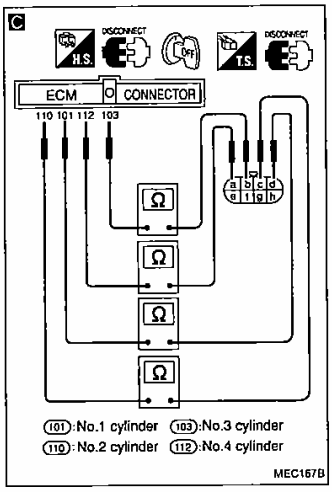
2) Listen to each injector operating sound.
Clicking noise could be heard.

OK → INSPECTION END

NG → Ⓐ

Diagnostic Procedure 35 (Cont'd)





Ⓐ

B

CHECK POWER SUPPLY.
1) Stop engine.
2) Disconnect harness connectors (F27), (F111).
3) Turn ignition switch "ON".
4) Check voltage between terminal ⓗ and ground.
Voltage: Battery voltage

NG → Check the following.
- Harness connectors (F27), (F111)
- Harness connectors (F4), (M60)
- Harness connectors (M10), (E101)
- Harness for open or short between ignition switch and harness connector (F27)

If NG, repair harness or connectors.

OK ↓

C

CHECK OUTPUT SIGNAL CIRCUIT.
1) Turn ignition switch "OFF".
2) Disconnect ECM harness connector.
3) Check harness continuity between
ECM terminal (101) and terminal ⓓ,
ECM terminal (110) and terminal ⓔ,
ECM terminal (103) and terminal ⓑ,
ECM terminal (112) and terminal ⓐ.
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (F27), (F111)
- Harness for open or short between ECM and harness connector (F27)

If NG, repair harness or connectors.

OK ↓

CHECK COMPONENT (Injector).
Refer to "Electrical Components Inspection".

NG → Replace injector.

OK ↓

Disconnect and reconnect harness connectors in the circuit. Then retest.

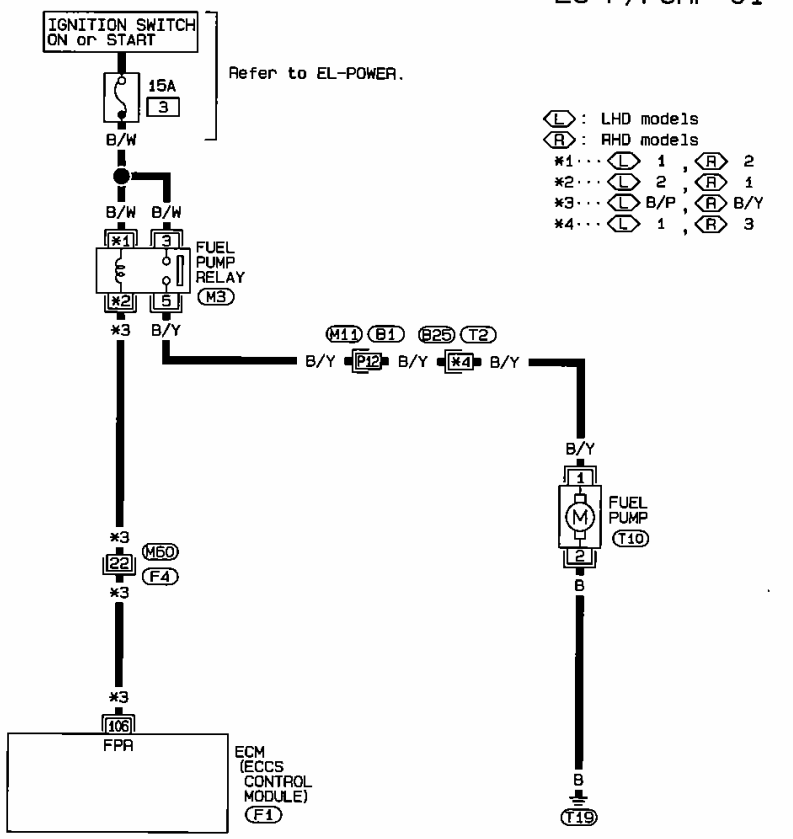
Trouble is not fixed. ↓

Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

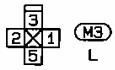
Diagnostic Procedure 36

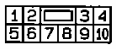
FUEL PUMP (Not self-diagnostic item)

EC-F/PUMP-01



EC

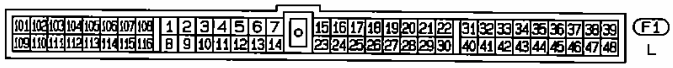




Refer to last page (Foldout page).

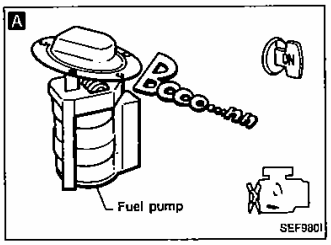
M11, B1

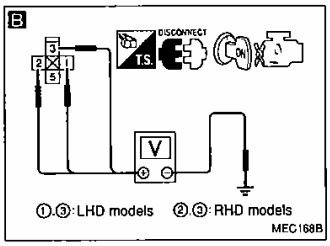
M60, F4

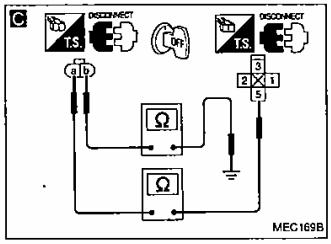


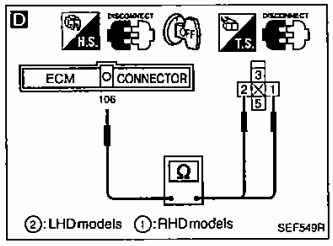
HEC162

Diagnostic Procedure 36 (Cont'd)









INSPECTION START

A

CHECK OVERALL FUNCTION.
1) Turn ignition switch "ON".
2) Listen to fuel pump operating sound.
Fuel pump should operate for 1 second after ignition switch is turned "ON".

OK → INSPECTION END

NG

B

CHECK POWER SUPPLY.
1) Turn ignition switch "OFF".
2) Disconnect fuel pump relay.
3) Turn ignition switch "ON".
4) Check voltage between terminals ①, ③ (LHD models), ②, ③ (RHD models) and ground.
Voltage: Battery voltage

NG → Check the following.
- 15A fuse
- Harness for open or short between fuel pump relay and fuse

If NG, repair harness or connectors.

OK

C

CHECK GROUND CIRCUIT.
1) Turn ignition switch "OFF".
2) Disconnect fuel pump harness connector.
3) Check harness continuity between terminal ⓑ and body ground, terminal ⓐ and terminal ⑤.
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (M11), (B1)
- Harness connectors (B25), (T2)
- Harness for open or short between fuel pump and fuel pump relay
- Harness for open or short between fuel pump and body ground

If NG, repair harness or connectors.

OK

D

CHECK OUTPUT SIGNAL CIRCUIT.
1) Disconnect ECM harness connector.
2) Check harness continuity between ECM terminal (106) and terminal ② (LHD models), ① (RHD models).
Continuity should exist.
If OK, check harness for short.

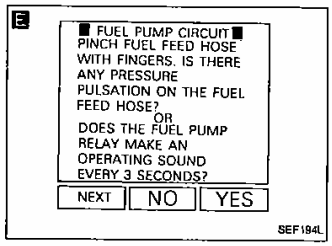
NG → Check the following.
- Harness connectors (F4), (M60)
- Harness for open or short between ECM and fuel pump relay

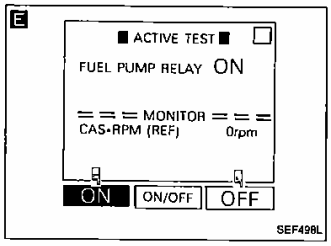
If NG, repair harness or connectors.

OK

Ⓐ

Diagnostic Procedure 36 (Cont'd)





Ⓐ

E

CHECK COMPONENT (Fuel pump relay).

1) Reconnect fuel pump relay, fuel pump harness connector and ECM harness connector.
2) Turn ignition switch "ON".
3) Perform "FUEL PUMP CIRCUIT" in "FUNCTION TEST" mode with CONSULT.

OR

3) Turn fuel pump relay "ON" and "OFF" in "ACTIVE TEST" mode with CONSULT and check operating sound.

OR

Refer to "Electrical Components Inspection".

NG → Replace fuel pump relay.

OK ↓

CHECK COMPONENT (Fuel pump). Refer to "Electrical Components Inspection".

NG → Replace fuel pump.

OK ↓

Disconnect and reconnect harness connectors in the circuit. Then retest.

Trouble is not fixed. ↓

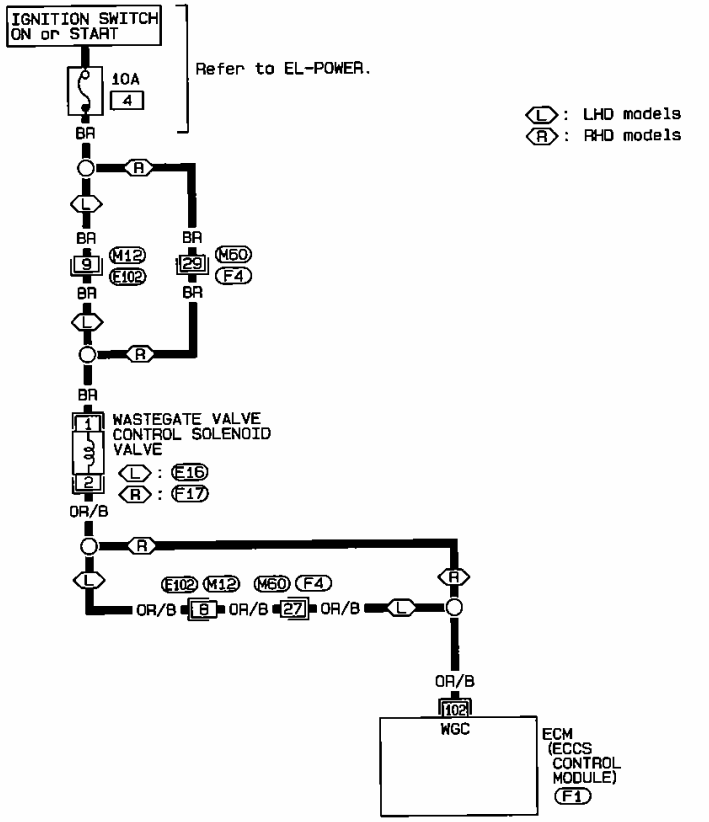
Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

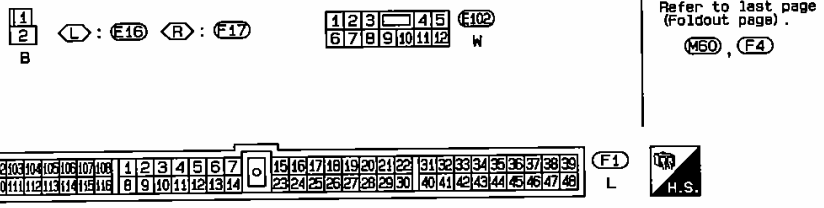
EC

Diagnostic Procedure 37

WASTEGATE VALVE CONTROL (Not self-diagnostic item)

EC-WG/V-01

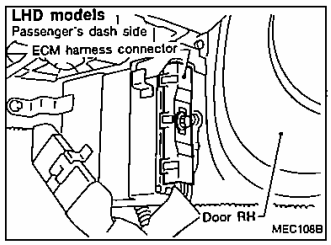


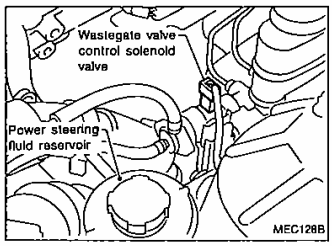


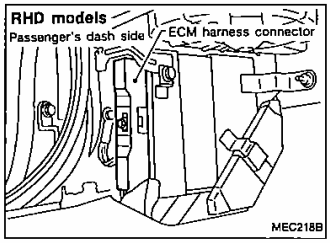
HEC163

Diagnostic Procedure 37 (Cont'd)

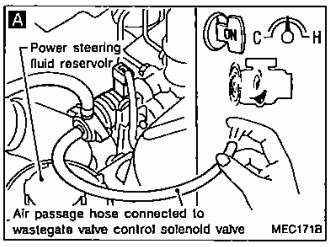
Harness layout







EC



INSPECTION START

A

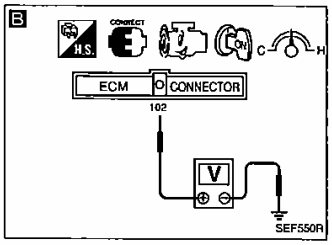
CHECK OVERALL FUNCTION.
1) Start engine and warm it up sufficiently.
2) Perform diagnostic test mode II (Self-diagnostic results). Make sure that diagnostic trouble code No. 55 is displayed.
3) Stop engine.
4) Disconnect air passage hose to wastegate valve control solenoid valve and restart engine.
5) Make sure that boost pressure exists under the following conditions.
At Idle:
Boost pressure should not exist.
Engine is racing quickly (Up to about 5,000 rpm).
Boost pressure should exist.

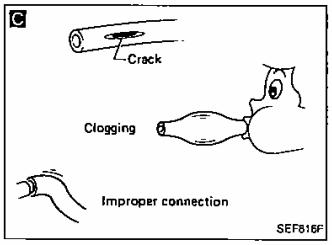
OK → CHECK COMPONENT (Wastegate valve actuator).
Refer to "TURBOCHARGER" in EM section.
If NG, replace wastegate valve actuator.

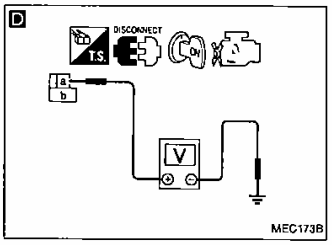
OK → INSPECTION END

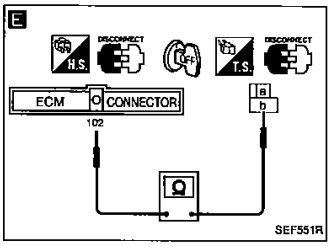
NG → Ⓐ

Diagnostic Procedure 37 (Cont'd)









Ⓐ

B CHECK CONTROL FUNCTION.
1) Check voltage between ECM terminal (102) and ground under the following conditions.
Voltage:
At idle
Battery voltage
Engine is racing quickly (Up to about 5,000 rpm).
Approximately 4 - 5V

OK → **C** Check air passage hose for clogging, cracks and proper connection.

NG ↓

D CHECK POWER SUPPLY.
1) Stop engine.
2) Disconnect wastegate valve control solenoid valve harness connector.
3) Turn ignition switch "ON".
4) Check voltage between terminal ⓐ and ground.
Voltage: Battery voltage

NG → Check the following.
- Harness connectors (M12), (E102) (LHD models)
- Harness connectors (M60), (F4) (RHD models)
- 10A fuse
- Harness for open or short between wastegate valve control solenoid valve and fuse.

If NG, repair harness or connectors.

OK ↓

E CHECK OUTPUT SIGNAL CIRCUIT.
1) Turn ignition switch "OFF".
2) Disconnect ECM harness connector.
3) Check harness continuity between ECM terminal (102) and terminal ⓑ.
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (E102), (M12) (LHD models)
- Harness connectors (M60), (F4) (LHD models)
- Harness for open or short between ECM and wastegate valve control solenoid valve

If NG, repair harness or connectors.

OK ↓

CHECK COMPONENT
(Wastegate valve control solenoid valve).
Refer to "Electrical Components Inspection".

NG → Replace wastegate valve control solenoid valve.

OK ↓

Disconnect and reconnect harness connectors in the circuit. Then retest.

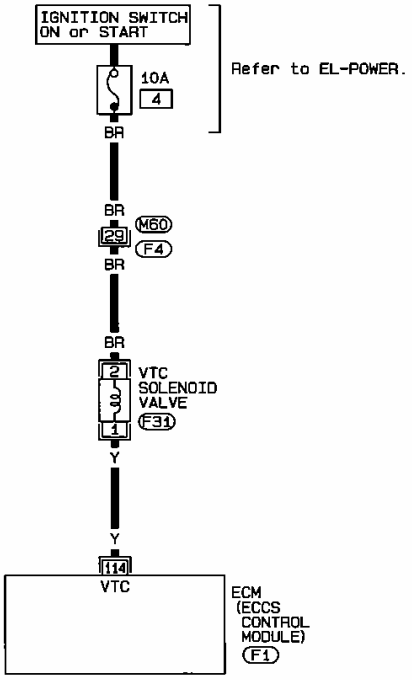
Trouble is not fixed. ↓

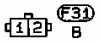
Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

Diagnostic Procedure 38

VALVE TIMING CONTROL (Not self-diagnostic item)

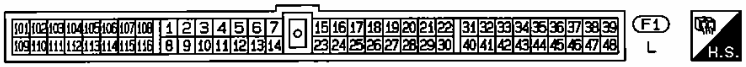
EC-VTC-01





Refer to last page
(Foldout page).

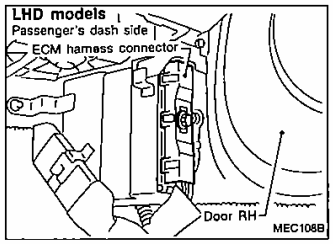
M60, F4

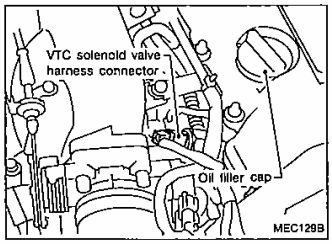


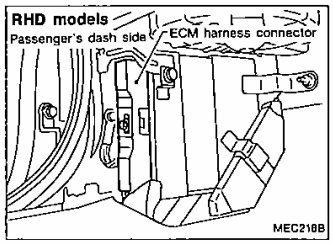
HEC164

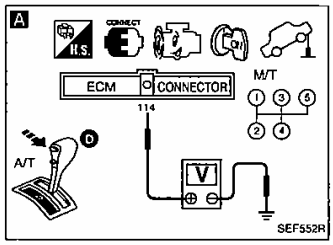
Diagnostic Procedure 38 (Cont'd)

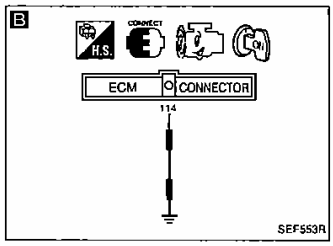
Harness layout

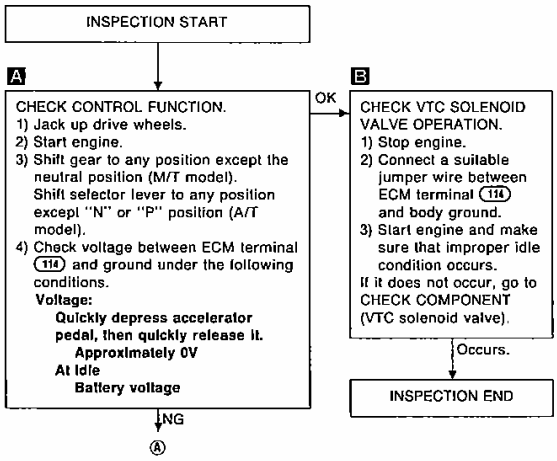








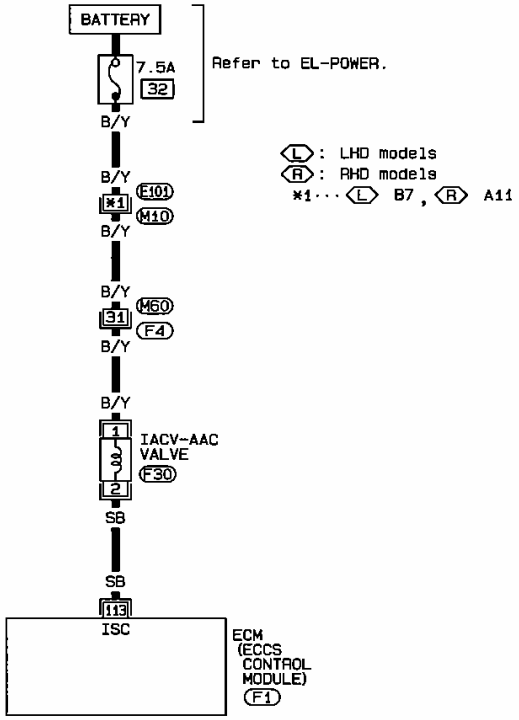




Diagnostic Procedure 39

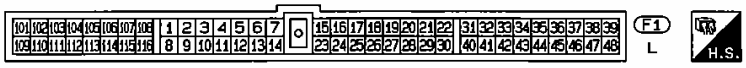
IACV-AAC VALVE (Not self-diagnostic item)

EC-AAC/V-01



Refer to last page (Foldout page).

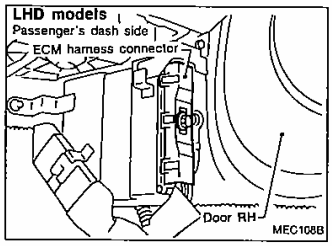
M10, E101
M60, F4

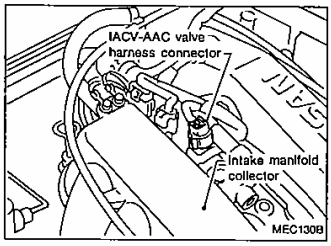


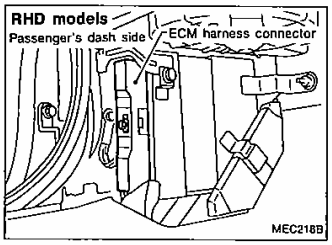
HEC165

Diagnostic Procedure 39 (Cont'd)

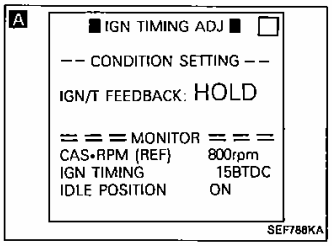
Harness layout

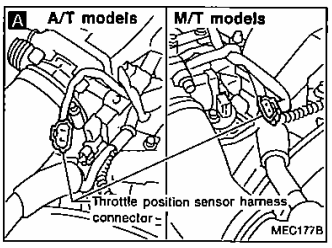


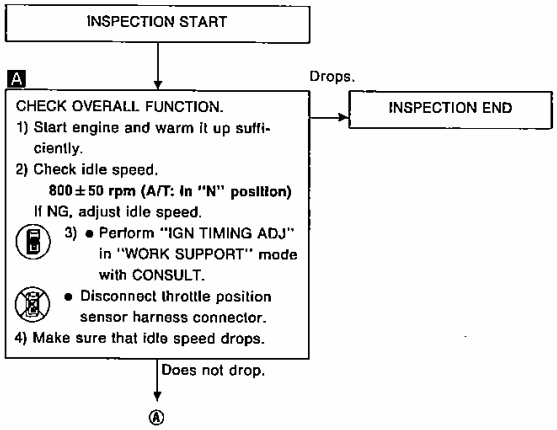




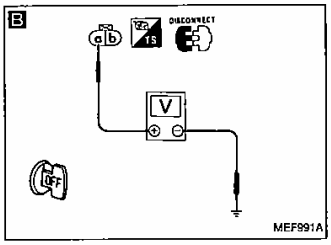
EC

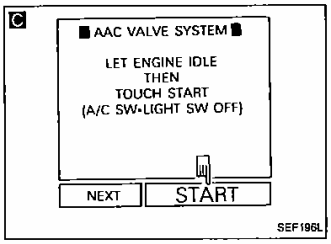


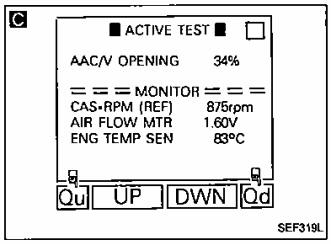


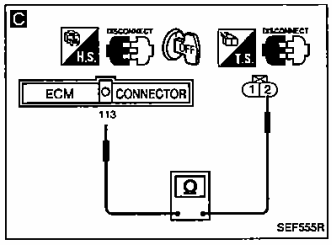


Diagnostic Procedure 39 (Cont'd)









Ⓐ

B

CHECK POWER SUPPLY.
1) Stop engine.
2) Disconnect IACV-AAC valve harness connector.
3) Check voltage between terminal Ⓑ and ground.
Voltage: Battery voltage

NG → Check the following.
- Harness connectors (E101), (M10)
- Harness connectors (M60), (F4)
- 7.5A fuse
- Harness for open or short between IACV-AAC valve and fuse

If NG, repair harness or connectors.

OK ↓

C

CHECK OUTPUT SIGNAL CIRCUIT.
1) Reconnect IACV-AAC valve harness connector.
2) Perform "AAC VALVE SYSTEM" or "IACV-AAC/V SYSTEM" in "FUNCTION TEST" mode with CONSULT.

NG → Repair harness or connectors.

OR

2) Perform "AAC VALVE OPENING TEST" or "IACV-AAC/V OPENING" in "ACTIVE TEST" mode with CONSULT.

OR

1) Disconnect ECM harness connector.
2) Check harness continuity between ECM terminal (113) and terminal Ⓑ.
Continuity should exist.
If OK, check harness for short.

OK ↓

CHECK COMPONENT (IACV-AAC valve).
Refer to "Electrical Components Inspection".

NG → Replace IACV-AAC valve.

OK ↓

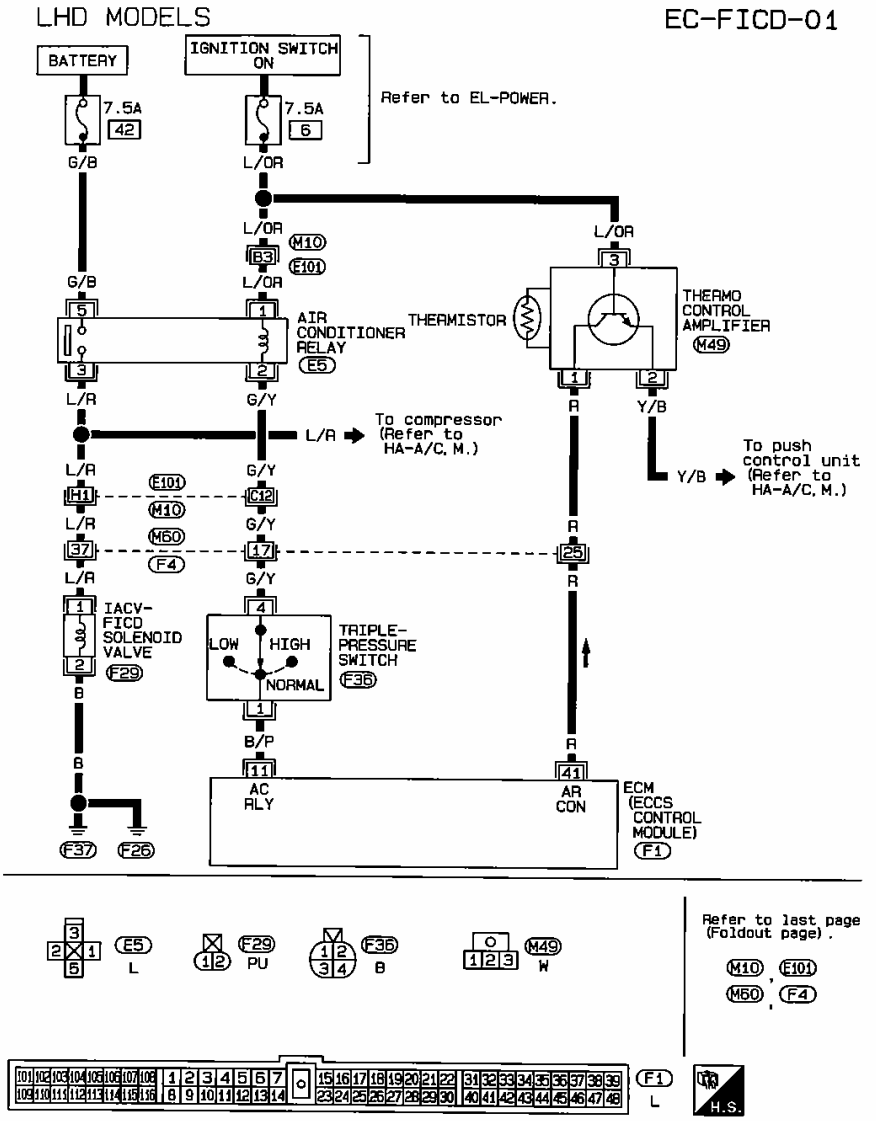
Disconnect and reconnect harness connectors in the circuit. Then retest.

Trouble is not fixed. ↓

Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

Diagnostic Procedure 40

IACV-FICD SOLENOID VALVE (Not self-diagnostic item)



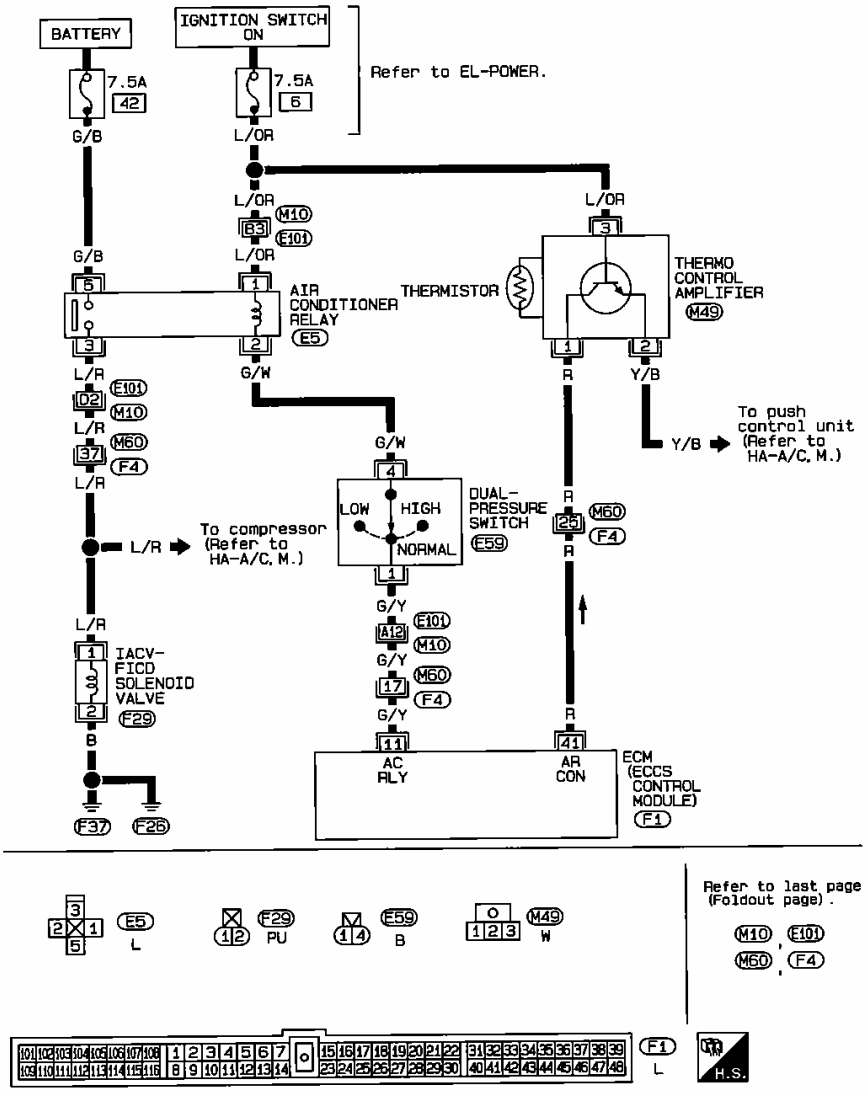
Refer to last page (Foldout page).

M10, E101, M60, F4

HEC166

RHD MODELS

EC-FICD-02



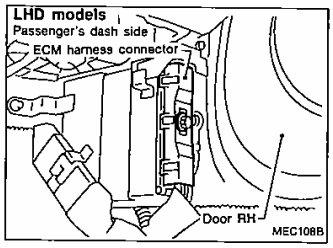
Refer to last page (Foldout page).

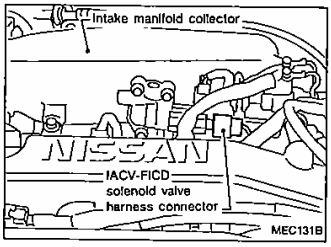
M10, E101
M60, F4

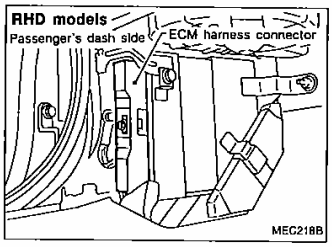
HEC167

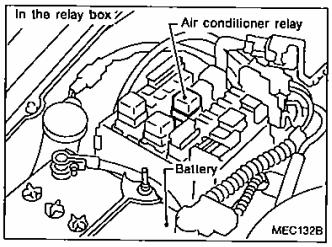
Diagnostic Procedure 40 (Cont'd)

Harness layout

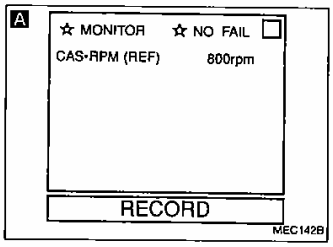


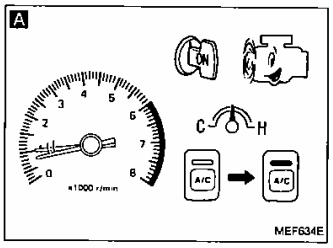


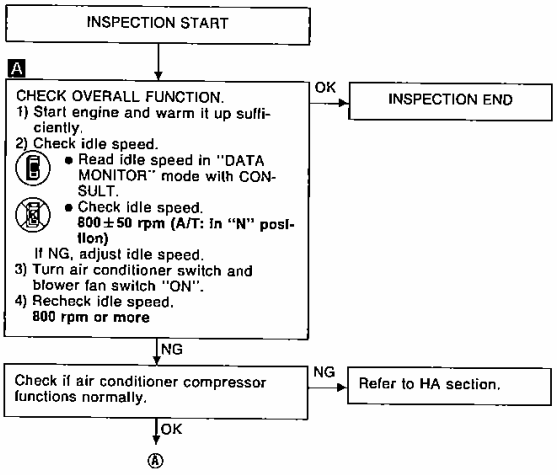




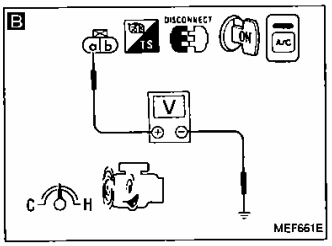
EC

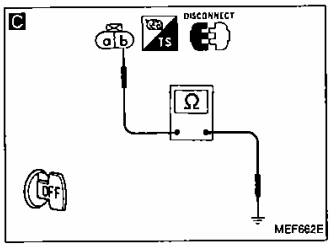






Diagnostic Procedure 40 (Cont'd)





Ⓐ

B

CHECK POWER SUPPLY.
1) Stop engine and turn air conditioner switch and blower fan switch "OFF".
2) Disconnect IACV-FICD solenoid valve harness connector.
3) Restart engine and turn air conditioner switch and blower fan switch "ON".
4) Check voltage between terminal Ⓐ and ground.
Voltage: Battery voltage

NG → Check the following.
- Harness connectors (E101), (M18)
- Harness connectors (M60), (F4)
- Harness for open or short between A/C relay and IACV-FICD solenoid valve

If NG, repair harness or connectors.

OK ↓

C

CHECK GROUND CIRCUIT.
1) Stop engine.
2) Check harness continuity between terminal Ⓑ and engine ground.
Continuity should exist.
If OK, check harness for short.

NG → Repair harness or connectors.

OK ↓

CHECK COMPONENT (IACV-FICD solenoid valve).
Refer to "Electrical Components Inspection".

NG → Replace IACV-FICD solenoid valve.

OK ↓

Disconnect and reconnect harness connectors in the circuit. Then retest.

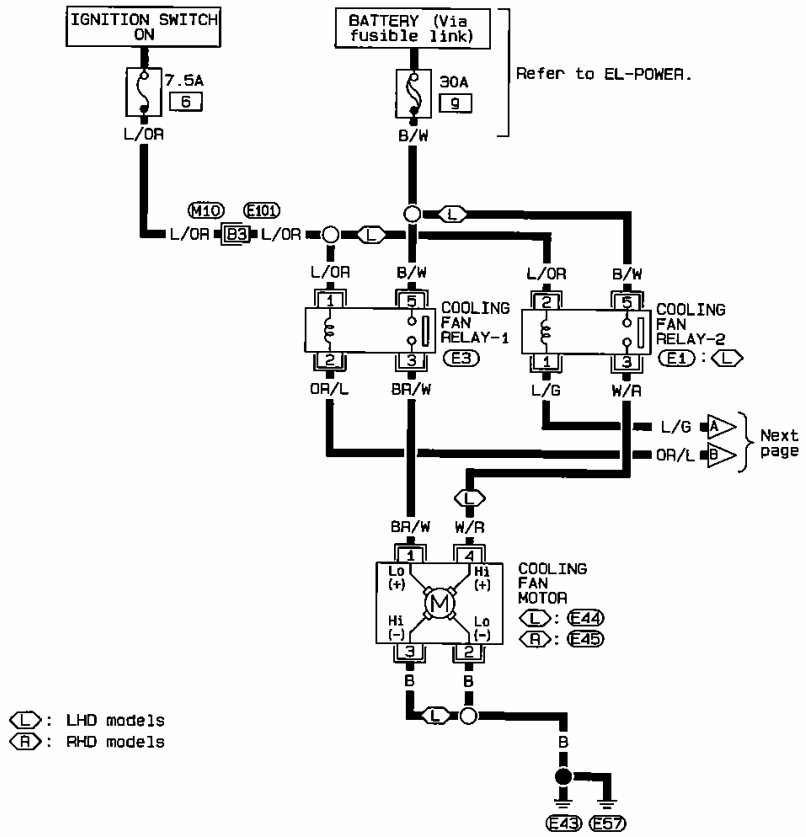
Trouble is not fixed. ↓

Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

Diagnostic Procedure 41

COOLING FAN CONTROL (Not self-diagnostic item)

EC-COOL/F-01



E1, E3 L L

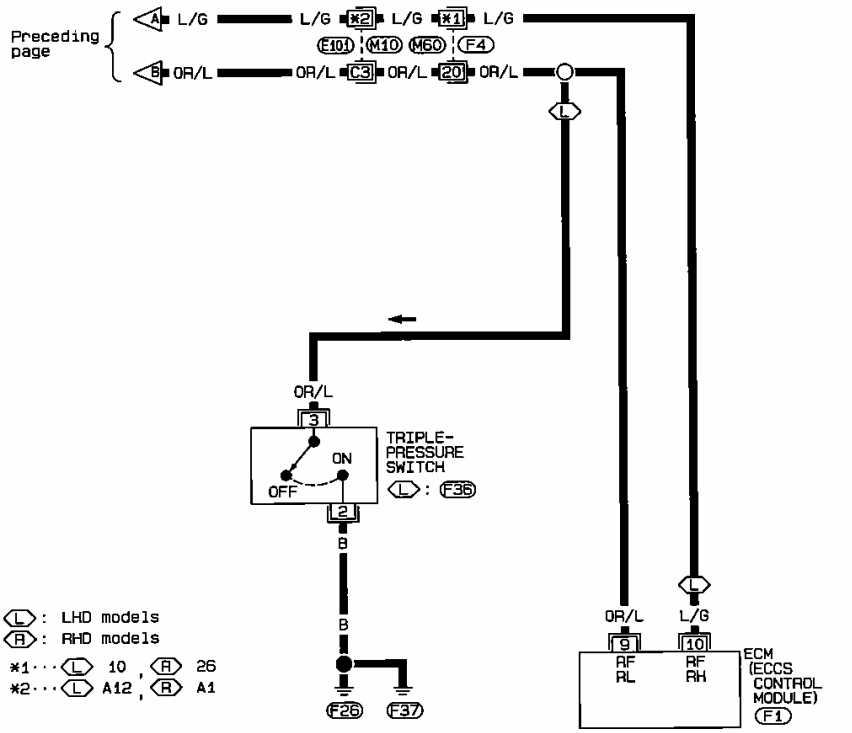
E44 GY

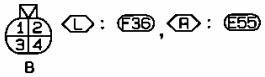
E45 GY

Refer to last page (Foldout page).

M10, E101

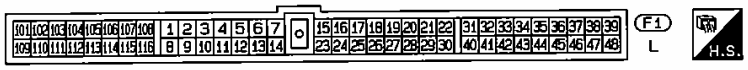
EC-COOL/F-02





Refer to last page (Foldout page).

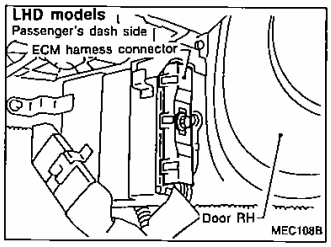
M10, E101
M60, F4

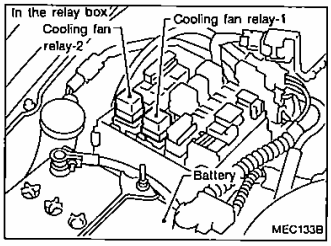


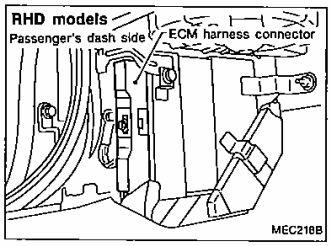
HEC169

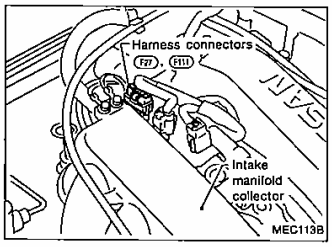
Diagnostic Procedure 41 (Cont'd)

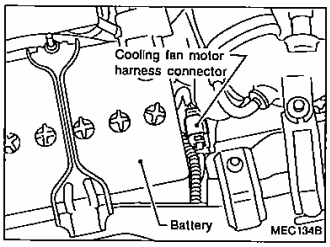
Harness layout



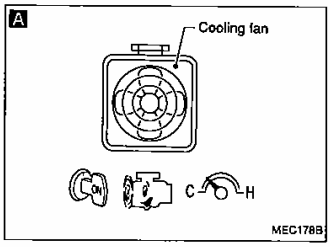


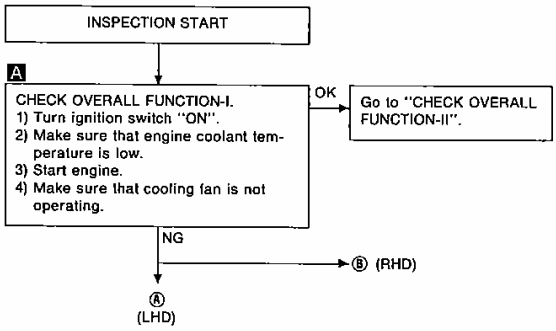






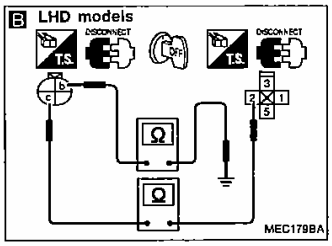
EC





Diagnostic Procedure 41 (Cont'd)

B LHD models



Ⓐ

B LHD models

CHECK HARNESS CONTINUITY BETWEEN COOLING FAN RELAY-1 AND GROUND.
1) Stop engine.
2) Disconnect cooling fan relay-1.
3) Disconnect triple-pressure switch harness connector.
4) Check harness continuity between terminal ② and terminal ⓔ, terminal ⓑ and body ground.
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (E101), (M18)
- Harness connectors (M50), (F4)
- Harness for open or short between cooling fan relay-1 and triple-pressure switch
- Harness for open or short between triple-pressure switch and body ground.

If NG, repair harness or connectors.

OK ↓

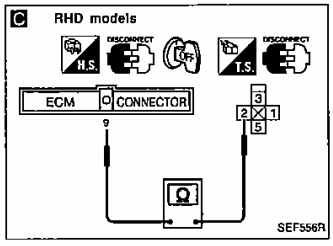
CHECK COMPONENT (Triple-pressure switch).
Refer to "HA section".

NG → Replace triple-pressure switch.

OK ↓

Go to "CHECK OUTPUT SIGNAL CIRCUIT" in PROCEDURE A.

C RHD models



Ⓑ

C RHD models

CHECK HARNESS CONTINUITY BETWEEN COOLING FAN RELAY-1 AND ECM.
1) Stop engine.
2) Disconnect cooling fan relay-1.
3) Disconnect ECM harness connector.
4) Check harness continuity between terminal ② and ECM terminal ⑨.
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (E101), (M18)
- Harness connectors (M50), (F4)
- Harness for open or short between cooling fan relay-1 and ECM

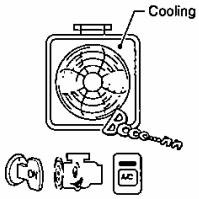
If NG, repair harness or connectors.

OK ↓

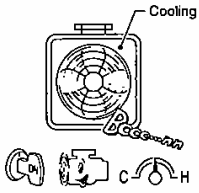
Go to "CHECK OUTPUT SIGNAL CIRCUIT" in PROCEDURE A.

Diagnostic Procedure 41 (Cont'd)

D With air conditioner

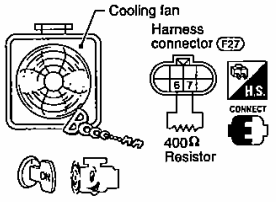


Without air conditioner



MEC180B

E



MEC181B

CHECK OVERALL FUNCTION-II.

D

CHECK COOLING FAN LOW SPEED OPERATION.

With air conditioner

1) Start engine.
2) Set temperature lever at full cold position.
3) Turn air conditioner switch "ON".
4) Turn blower fan switch "ON".
5) Run engine at idle for a few minutes with air conditioner operating.
6) Make sure that cooling fan operates at low speed.

Without air conditioner

1) Start engine.
2) Keep engine speed at about 2,000 rpm until engine is warmed up sufficiently.
3) Make sure that cooling fan begins to operate at low speed during warm-up.

NG → Check cooling fan low speed control circuit. (Go to PROCEDURE A.)

(RH): RHD models
(LH): LHD models

OK

(RH) → INSPECTION END

(LH)

E

CHECK COOLING FAN HIGH SPEED OPERATION.

1) Turn both air conditioner switch and blower fan switch "OFF".
2) Stop engine.
3) Connect 400 Ω resistor between terminals ⑥ and ⑦ on harness connector F27. {Refer to "Diagnostic Procedure 25".}
4) Restart engine and make sure that cooling fan operates at high speed.

NG → Check cooling fan high speed control circuit. (Go to PROCEDURE B.)

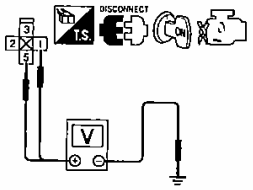
OK

INSPECTION END

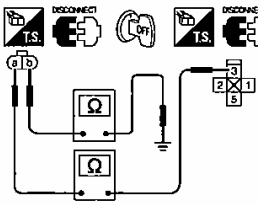
EC

Diagnostic Procedure 41 (Cont'd)

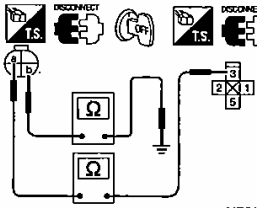
E



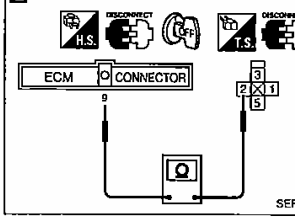
F RHD models



LHD models



G RHD models



PROCEDURE A

INSPECTION START

E

CHECK POWER SUPPLY.
1) Stop engine.
2) Disconnect cooling fan relay-1.
3) Turn ignition switch "ON".
4) Check voltage between terminals ①, ⑤ and ground.
Voltage: Battery voltage

NG → Check the following.
- Harness connectors (M10), (E101)
- 7.5A fuse
- 30A fusible link
- Harness for open or short between cooling fan relay-1 and fuse
- Harness for open or short between cooling fan relay-1 and fusible link

If NG, repair harness or connectors.

OK

F

CHECK GROUND CIRCUIT.
1) Turn ignition switch "OFF".
2) Disconnect cooling fan motor harness connector.
3) Check harness continuity between terminal ③ and terminal ⓐ, terminal ⓑ and body ground.
Continuity should exist.
If OK, check harness for short.

NG → Repair harness or connectors.

OK

G RHD models

CHECK OUTPUT SIGNAL CIRCUIT.
1) Disconnect ECM harness connector.
2) Check harness continuity between ECM terminal ⑨ and terminal ②.
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (E101), (M10)
- Harness connectors (M60), (F4)
- Harness for open or short between ECM and cooling fan relay-1

If NG, repair harness or connectors.

OK

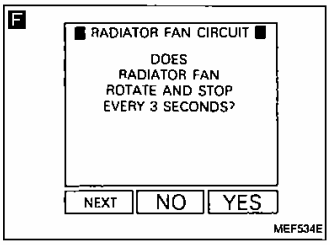
CHECK COMPONENT (Cooling fan relay-1).
Refer to "Electrical Components Inspection".

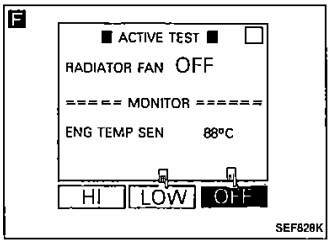
NG → Replace cooling fan relay.

OK

Ⓓ

Diagnostic Procedure 41 (Cont'd)





Ⓓ

F

CHECK COMPONENT (Cooling fan motor).
1) Reconnect cooling fan relay-1, cooling fan motor harness connector and ECM harness connector.
2) Turn ignition switch "ON".
3) Perform "RADIATOR FAN CIRCUIT" or "COOLING FAN CIRCUIT in "FUNCTION TEST" mode with CONSULT.

NG → Replace cooling fan motor.

OR

3) Perform "RADIATOR FAN TEST" or "COOLING FAN" in "ACTIVE TEST" mode with CONSULT.

OR

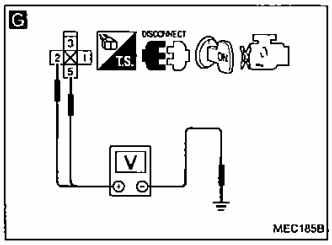
Refer to "Electrical Components Inspection".

OK

Disconnect and reconnect harness connectors in the circuit. Then retest.

Trouble is not fixed.

Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.



PROCEDURE B

INSPECTION START

G

CHECK POWER SUPPLY.
1) Stop engine.
2) Disconnect cooling fan relay-2.
3) Turn ignition switch "ON".
4) Check voltage between terminals ②, ⑤ and ground.
Voltage: Battery voltage

NG → Check the following.
- Harness for open or short between cooling fan relay-2 and harness connector (E101)
- Harness for open or short between cooling fan relay-2 and fusible link

If NG, repair harness or connectors.

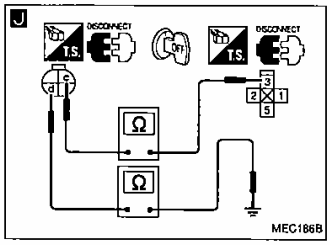
OK

Ⓔ

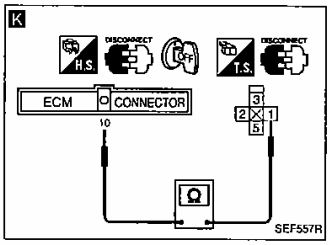
EC

Diagnostic Procedure 41 (Cont'd)

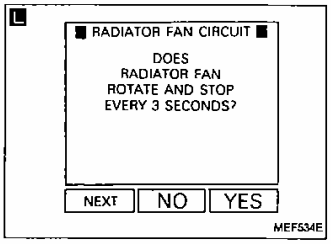
J



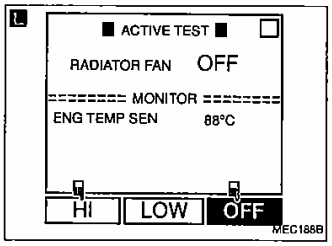
K



L



L



Ⓔ

J

CHECK GROUND CIRCUIT.
1) Turn ignition switch "OFF".
2) Disconnect cooling fan motor harness connector.
3) Check harness continuity between terminal ③ and terminal Ⓒ, terminal ⓓ and body ground.
Continuity should exist.
If OK, check harness for short.

NG → Repair harness or connectors.

OK ↓

K

CHECK OUTPUT SIGNAL CIRCUIT.
1) Disconnect ECM harness connector.
2) Check harness continuity between ECM terminal ⑩ and terminal ①.
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (E101), (M10)
- Harness connectors (M68), (F4)
- Harness for open or short between ECM and cooling fan relay-2

If NG, repair harness or connectors.

OK ↓

CHECK COMPONENT
(Cooling fan relay-2).
Refer to "Electrical Components Inspection".

NG → Replace cooling fan relay.

OK ↓

L

CHECK COMPONENT
(Cooling fan motor).
1) Reconnect cooling fan relay-2, cooling fan motor harness connector and ECM harness connector.
2) Disconnect 400 Ω resistor from harness connector (F27).
3) Turn ignition switch "ON".
4) Perform "RADIATOR FAN CIRCUIT" or "COOLING FAN CIRCUIT" in "FUNCTION TEST" mode with CONSULT.

— OR —

4) Perform "RADIATOR FAN TEST" or "COOLING FAN" in "ACTIVE TEST" mode with CONSULT.

— OR —

Refer to "Electrical Components Inspection".

NG → Replace cooling fan motor.

OK ↓

Disconnect and reconnect harness connectors in the circuit. Then retest.

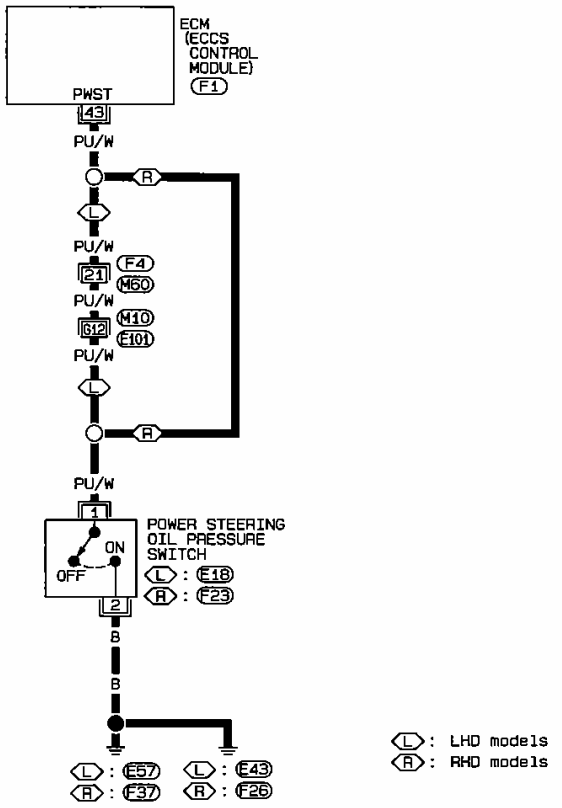
Trouble is not fixed. ↓

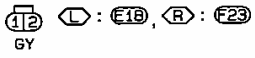
Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

Diagnostic Procedure 42

POWER STEERING OIL PRESSURE SWITCH (Not self-diagnostic item)

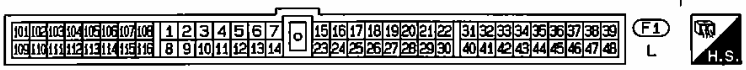
EC-PST/SW-01





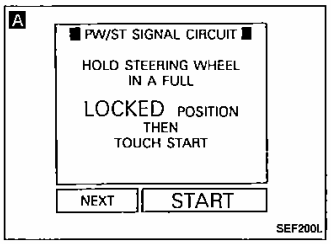
Refer to last page
(Foldout page).

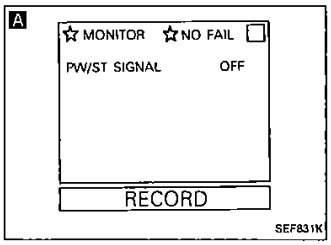
M10, E101
M60, F4

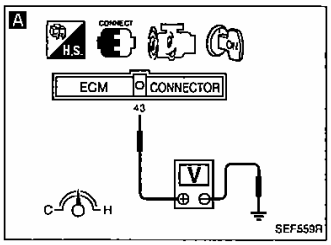


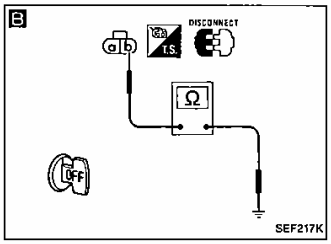
HEC170

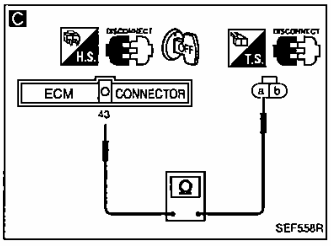
Diagnostic Procedure 42 (Cont'd)











INSPECTION START

A

CHECK CONTROL FUNCTION.
1) Start engine and warm it up sufficiently.
2) Perform "PW/ST SIGNAL CIRCUIT" in "FUNCTION TEST" mode with CONSULT.

OR

2) Check "PW/ST SIGNAL" in "DATA MONITOR" mode with CONSULT.
Steering is neutral position: OFF
Steering is turned: ON

OR

2) Check voltage between ECM terminal (43) and ground.
Voltage:
When steering wheel is turned quickly
Approximately 0V
Except above
4 - 5V

OK → INSPECTION END

NG

B

CHECK GROUND CIRCUIT.
1) Stop engine.
2) Disconnect power steering oil pressure switch harness connector.
3) Check harness continuity between terminal (b) and body ground.
Continuity should exist.
If OK, check harness for short.

NG → Repair harness or connectors.

OK

C

CHECK INPUT SIGNAL CIRCUIT.
1) Disconnect ECM harness connector.
2) Check harness continuity between ECM terminal (43) and terminal (a).
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (F4), (M60) (LHD models)
- Harness connectors (M18), (E101) (LHD models)
- Harness for open or short between ECM and power steering oil pressure switch

If NG, repair harness or connectors.

OK

CHECK COMPONENT
(Power steering oil pressure switch).
Refer to "Electrical Components Inspection".

NG → Replace power steering oil pressure switch.

OK

Disconnect and reconnect harness connectors in the circuit. Then retest.

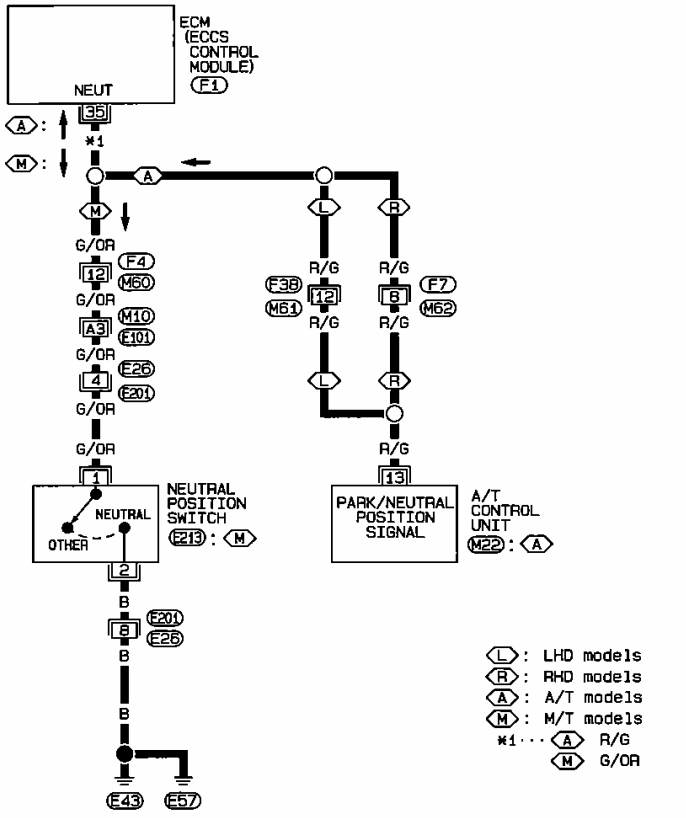
Trouble is not fixed.

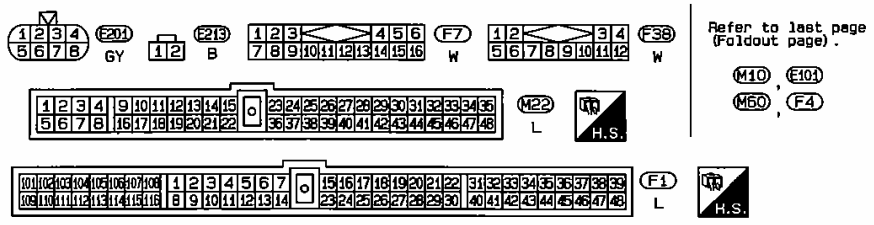
Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

Diagnostic Procedure 43

NEUTRAL POSITION SWITCH & A/T CONTROL UNIT (PARK/NEUTRAL POSITION SIGNAL)
(Not self-diagnostic item)

EC-PNP/SW-01



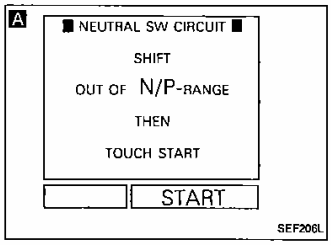


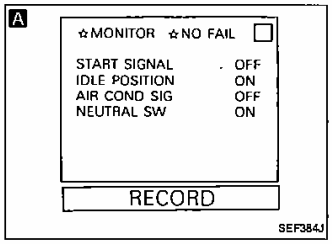
Refer to last page
(Foldout page).

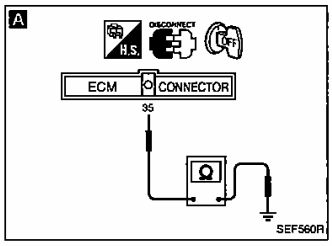
M10, E101
M60, F4

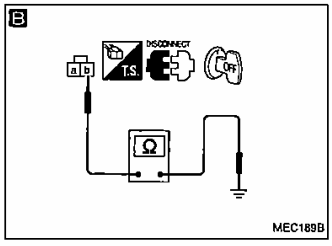
HEC171

Diagnostic Procedure 43 (Cont'd)









Neutral position switch

INSPECTION START

A

CHECK OVERALL FUNCTION.
1) Turn ignition switch "ON".
2) Perform "NEUTRAL SW CIRCUIT" or "NEUTRAL POSI SW CKT" in "FUNCTION TEST" mode with CONSULT.

OK → INSPECTION END

OR

2) Check "NEUTRAL SW" or "NEUT POSI SW" signal in "DATA MONITOR" mode with CONSULT.
Neutral position: ON
Except above: OFF

OR

1) Set shift lever to the neutral position.
2) Disconnect ECM harness connector.
3) Check harness continuity between ECM terminal ㉟ and body ground.
Continuity should exist.
If OK, check harness for short.

NG

Turn ignition switch "OFF".

B

CHECK GROUND CIRCUIT.
1) Disconnect neutral position switch harness connector.
2) Check harness continuity between terminal ⓑ and body ground.
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (E201), (E26)
- Harness for open or short between neutral position switch and body ground

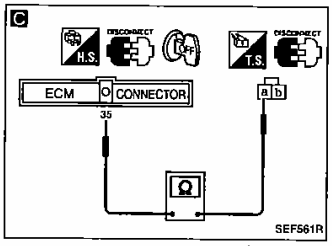
If NG, repair harness or connectors.

OK

Disconnect ECM harness connector.

Ⓐ

Diagnostic Procedure 43 (Cont'd)



Ⓐ

C

CHECK INPUT SIGNAL CIRCUIT.
1) Check harness continuity between ECM terminal 35 and terminal Ⓑ.
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (F4), (M80)
- Harness connectors (M19), (E101)
- Harness connectors (E26), (E201)
- Harness for open or short between ECM and neutral position switch

If NG, repair harness or connectors.

OK ↓

CHECK COMPONENT
(Neutral position switch).
Refer to "ON-VEHICLE SERVICE" in MT section.

NG → Replace neutral position switch.

OK ↓

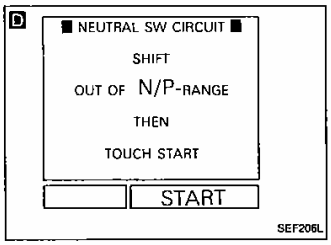
Disconnect and reconnect harness connectors in the circuit. Then retest.

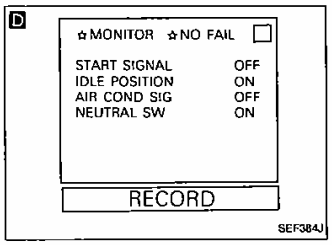
Trouble is not fixed. ↓

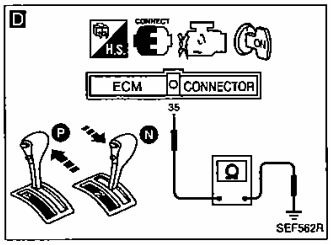
Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

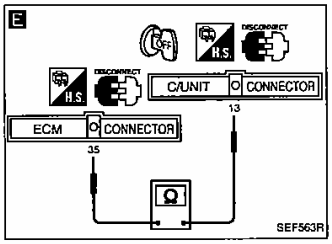
EC

Diagnostic Procedure 43 (Cont'd)









A/T CONTROL UNIT (PARK/NEUTRAL POSITION SIGNAL) CIRCUIT

INSPECTION START

D

CHECK OVERALL FUNCTION.
1) Turn ignition switch "ON".
2) Perform "NEUTRAL SW CIRCUIT" or "NEUTRAL POSI SW CKT" in "FUNCTION TEST" mode with CONSULT.

OR

2) Check "NEUTRAL SW" or "NEUT POSI SW" signal in "DATA MONITOR" mode with CONSULT.
"N" or "P": ON
Except above: OFF

OR

2) Check voltage between ECM terminal ㉟ and ground under the following conditions.
Voltage:
"N" or "P"
Approximately 0V
Except above
Approximately 5V

OK → INSPECTION END

NG

E

CHECK INPUT SIGNAL CIRCUIT.
1) Turn ignition switch "OFF".
2) Disconnect ECM harness connector.
3) Disconnect A/T control unit harness connector.
4) Check harness continuity between ECM terminal ㉟ and terminal ⑬.
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (F38), (M61) (LHD models)
- Harness connectors (F7), (M62) (RHD models)
- Harness for open or short between ECM and A/T control unit

If NG, repair harness or connectors.

OK

CHECK INHIBITOR SWITCH FUNCTION.
Make sure that inhibitor switch functions properly. (Refer to AT section).

NG → Check inhibitor switch and circuit (Refer to AT section.)

OK

Disconnect and reconnect harness connectors in the circuit. Then retest.

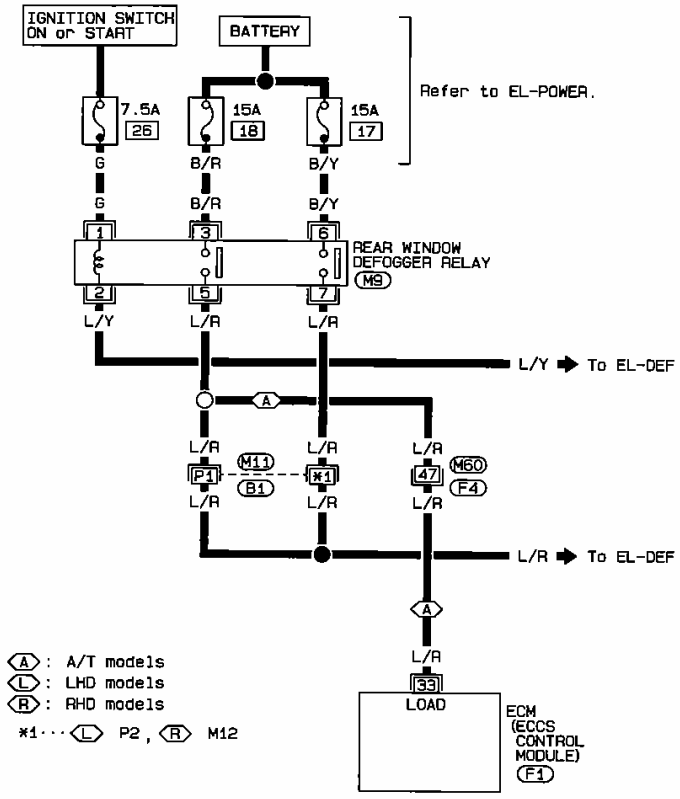
Trouble is not fixed.

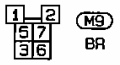
Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

Diagnostic Procedure 44

REAR WINDOW DEFOGGER SWITCH (Not self-diagnostic item)

EC-DEF/S-01



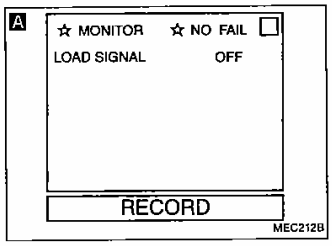


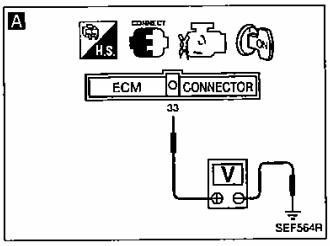
Refer to last page (Foldout page).

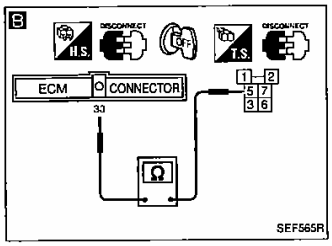
M11, B1
M60, F4

HEC172

Diagnostic Procedure 44 (Cont'd)







INSPECTION START

A

CHECK OVERALL FUNCTION.
1) Turn ignition switch "ON".
2) Check "LOAD SIGNAL" in "DATA MONITOR" mode with CONSULT.
Rear window defogger switch "ON": ON
Rear window defogger switch "OFF": OFF

OK → INSPECTION END

OR

2) Check voltage between ECM terminal 33 and ground under the following conditions.
Voltage:
Rear window defogger switch "ON"
Battery voltage
Rear window defogger switch "OFF"
Approximately 0V

NG

Check if rear window defogger functions normally.

NG → Check rear window defogger circuit. (Refer to EL section.)

OK

B

CHECK INPUT SIGNAL CIRCUIT.
1) Turn ignition switch "OFF".
2) Disconnect ECM harness connector.
3) Disconnect rear window defogger relay.
4) Check harness continuity between ECM terminal 33 and terminal 5.
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (M60), (F4)
- Harness for open or short between ECM and rear window defogger relay

If NG, repair harness or connectors.

OK

Disconnect and reconnect harness connectors in the circuit. Then retest.

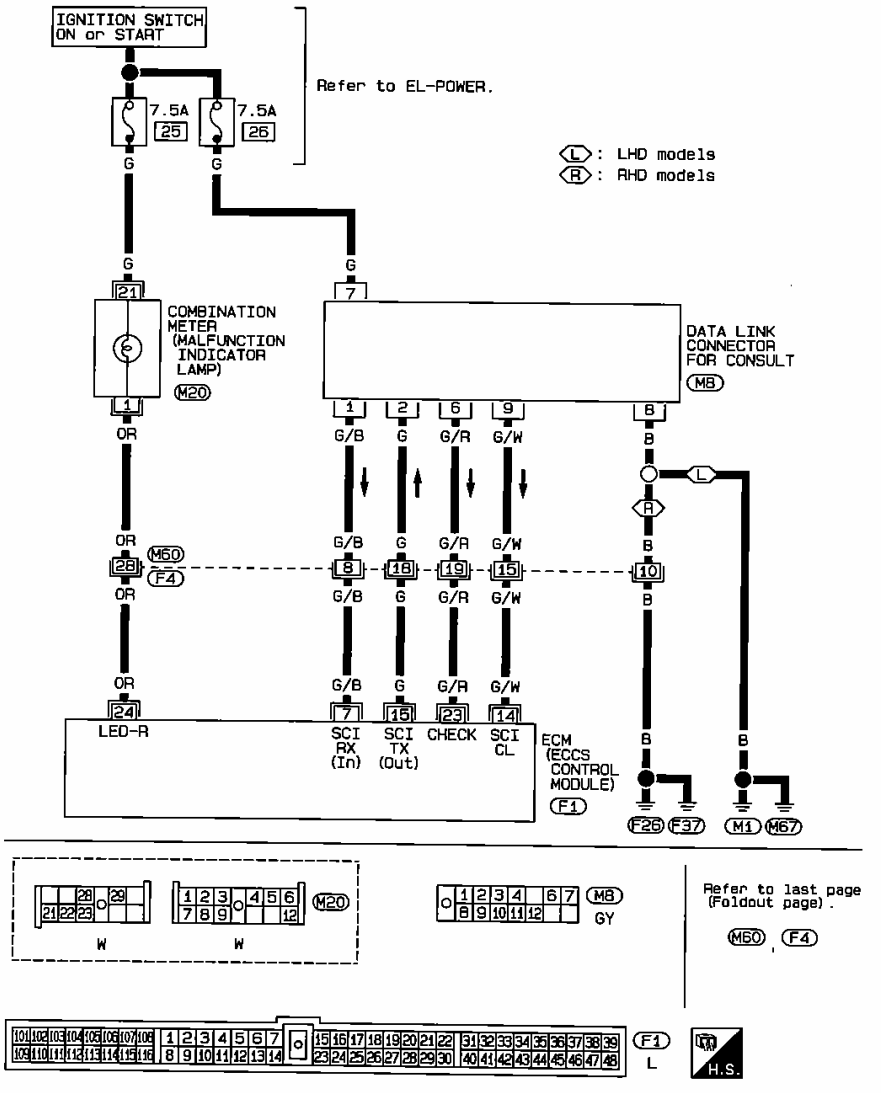
Trouble is not fixed.

Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

Diagnostic Procedure 45

MALFUNCTION INDICATOR LAMP & DATA LINK CONNECTOR FOR CONSULT (Not self-diagnostic item)

EC-MIL-01

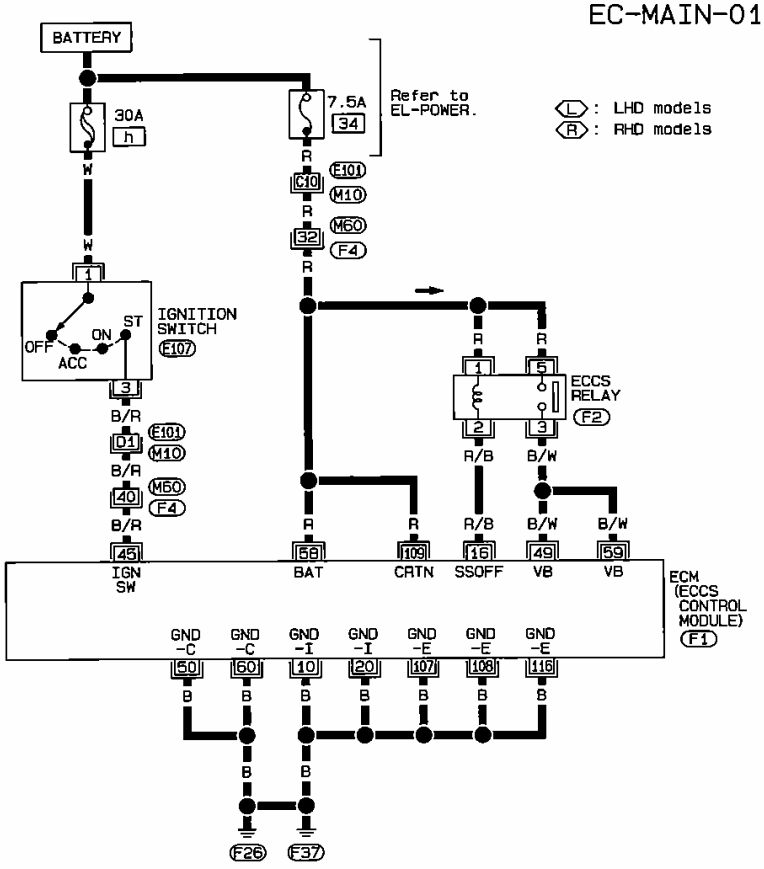


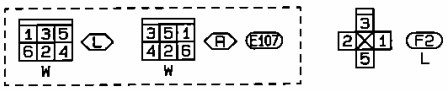
HEC173

Diagnostic Procedure 22

MAIN POWER SUPPLY AND GROUND CIRCUIT (Not self-diagnostic item)

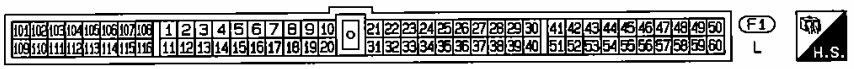
EC-MAIN-01





Refer to last page (Foldout page).

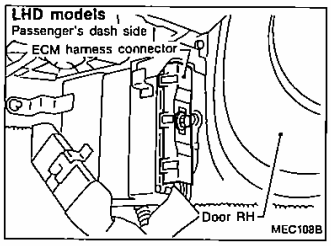
M10, E101
M60, F4

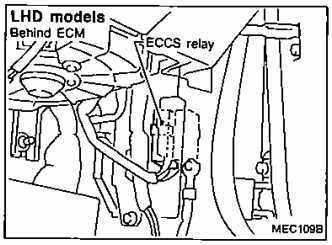


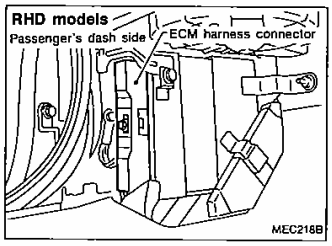
HEC175

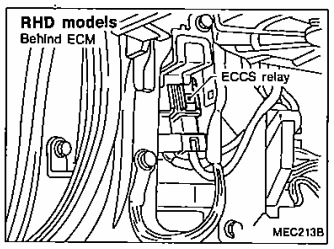
Diagnostic Procedure 22 (Cont'd)

Harness layout

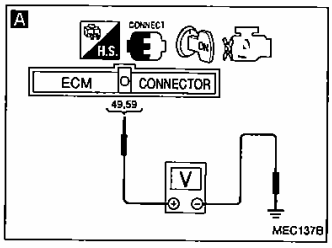


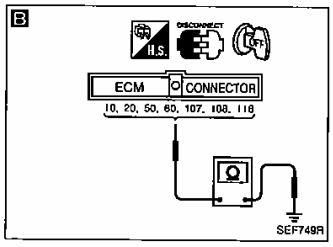


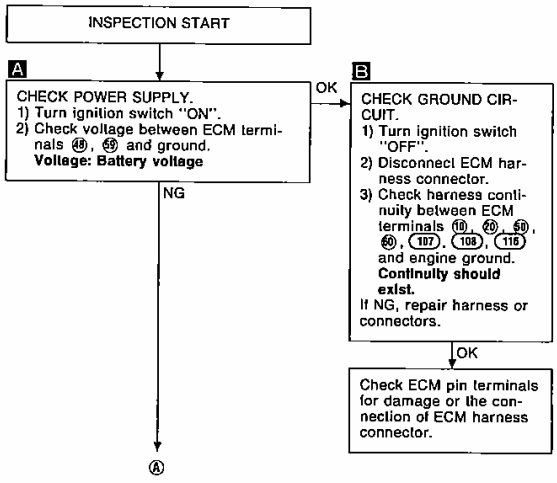




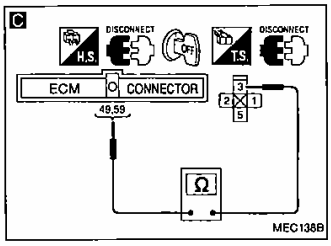
EC

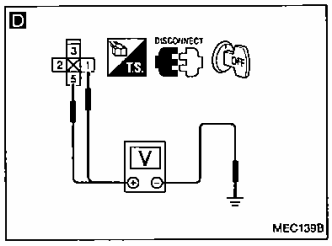


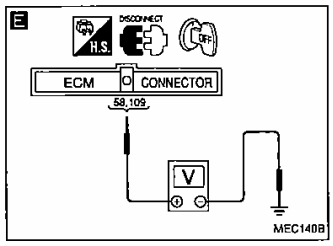


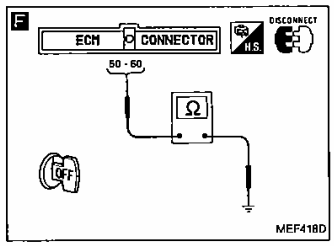


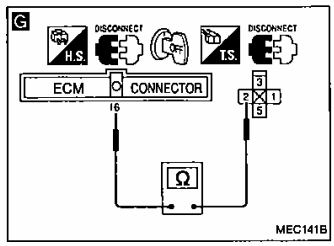
Diagnostic Procedure 22 (Cont'd)











Ⓐ

C

CHECK HARNESS CONTINUITY BETWEEN ECCS RELAY AND ECM.
1) Turn ignition switch "OFF".
2) Disconnect ECM harness connector.
3) Disconnect ECCS relay.
4) Check harness continuity between ECM terminals ㊾, ㊾ and terminal ③.
Continuity should exist.
If OK, check harness for short.

NG → Repair harness or connectors.

OK ↓

D

CHECK VOLTAGE BETWEEN ECCS RELAY AND GROUND.
1) Check voltage between terminals ①, ⑤ and ground.
Voltage: Battery voltage

NG → Check the following.
- 7.5A fuse
- Harness connectors (E101), (M10)
- Harness connectors (M60), (F4)
- Harness for open or short between ECCS relay and battery

If NG, repair harness or connectors.

OK ↓

E

CHECK VOLTAGE BETWEEN ECM AND GROUND.
1) Check voltage between ECM terminals ㊾, (109) and ground.
Voltage: Battery voltage

NG → Check the following.
- Harness for open or short between ECM and harness connector (F4)

If NG, repair harness or connectors.

OK ↓

F

CHECK GROUND CIRCUIT.
1) Check harness continuity between ECM terminals ㊿, ㊿ and engine ground.
Continuity should exist.
If OK, check harness for short.

NG → Repair harness or connectors.

OK ↓

G

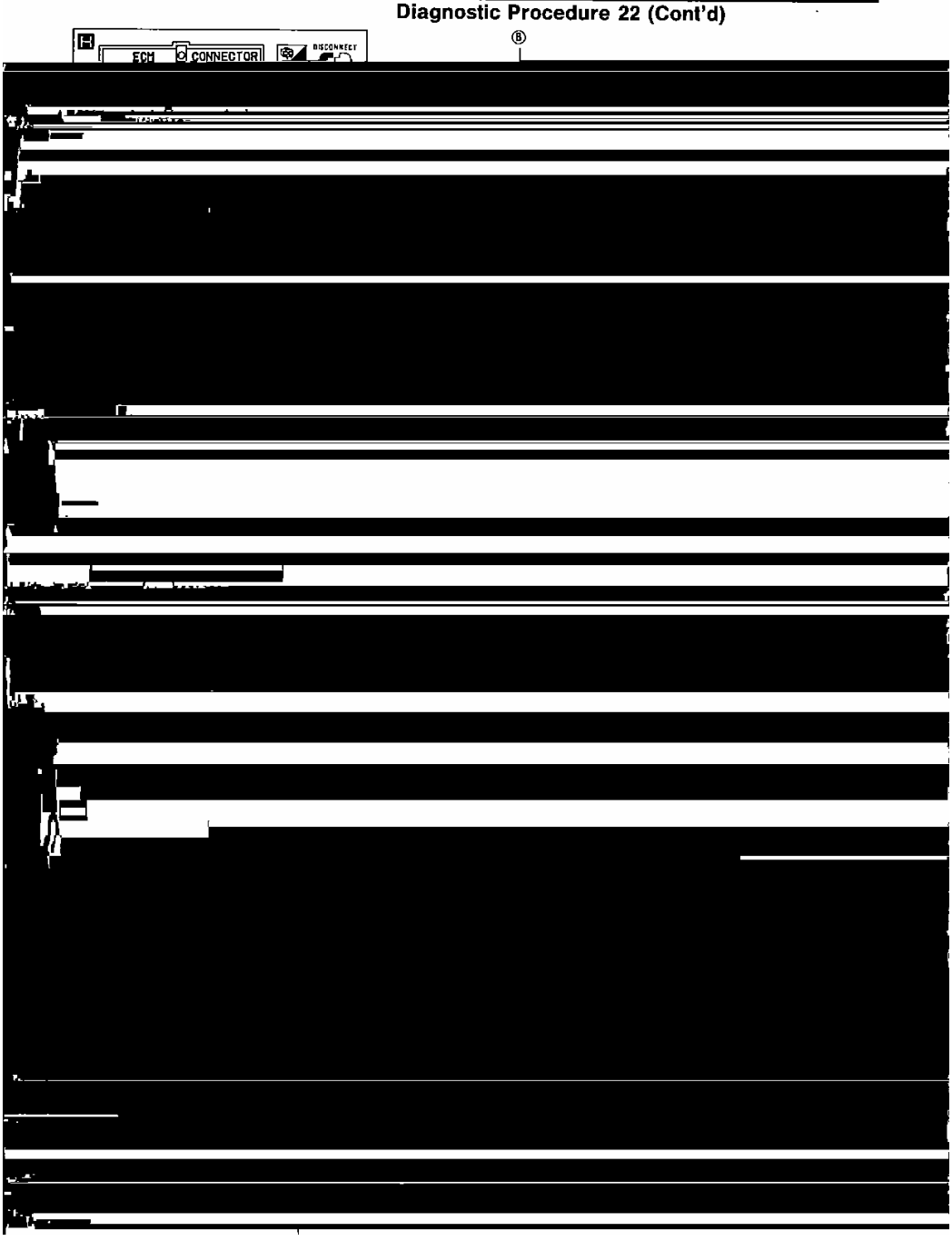
CHECK OUTPUT SIGNAL CIRCUIT.
1) Check harness continuity between ECM terminal ⑯ and terminal ②.
Continuity should exist.
If OK, check harness for short.

NG → Repair harness or connectors.

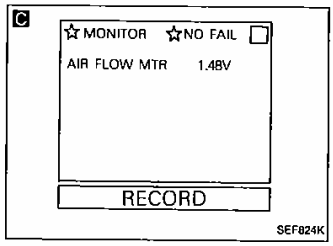
OK ↓

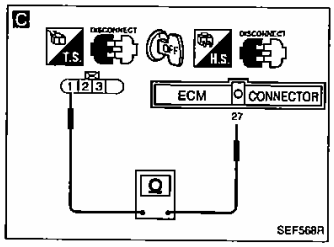
Ⓑ

Diagnostic Procedure 22 (Cont'd)



Diagnostic Procedure 24 (Cont'd)





Ⓐ

CHECK INPUT SIGNAL CIRCUIT.
1) Reconnect mass air flow sensor harness connector and ECM harness connector.
2) Start engine and warm it up sufficiently.
3) Read "AIR FLOW MTR" or "MAS AIR/FL SE" signal in "DATA MONITOR" mode with CONSULT.
Voltage: 0.8 - 1.5V
(At Idle)

NG → Repair harness or connectors.

OR

1) Check harness continuity between terminal ① and ECM terminal ㉗ .
Continuity should exist.
If OK, check harness for short.

OK ↓

CHECK COMPONENT
(Mass air flow sensor).
Refer to "Electrical Components Inspection". (See page EC-137.)

NG → Replace mass air flow sensor.

OK ↓

Disconnect and reconnect harness connectors in the circuit. Then retest.

Trouble is not fixed. ↓

Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

Perform FINAL CHECK by the following procedure after repair is completed.

FINAL CHECK ↓

1) Erase the diagnostic test mode II (Self-diagnostic results) memory.
2) Perform test drive.
3) Perform diagnostic test mode II (Self-diagnostic results) again.

NG → Recheck ECM pin terminals for damage or the connection of ECM harness connector.

OK ↓

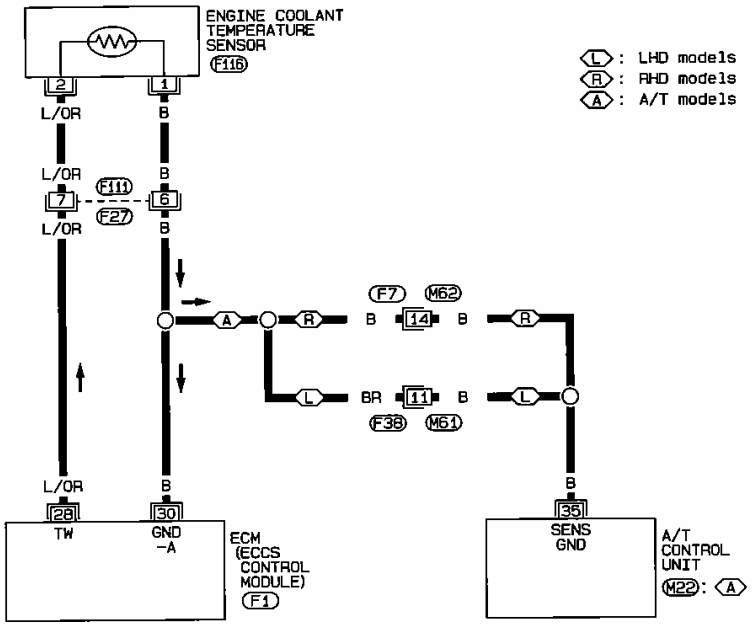
INSPECTION END

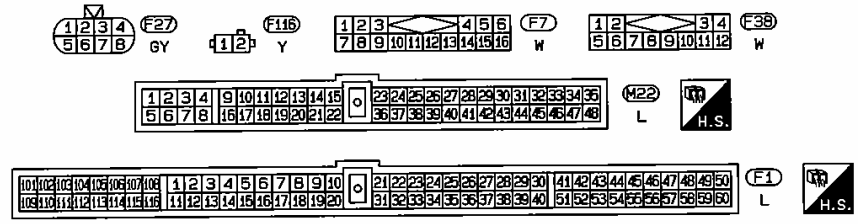
EC

Diagnostic Procedure 25

ENGINE COOLANT TEMPERATURE SENSOR (Diagnostic trouble code No. 13)

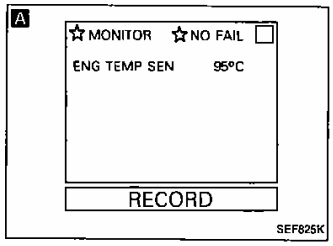
EC-ECTS-01

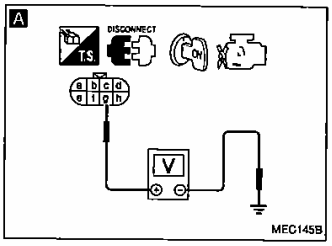


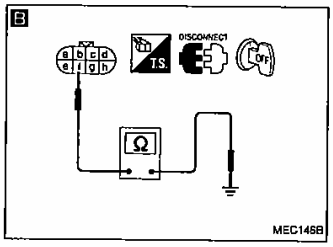


HEC178

Diagnostic Procedure 25 (Cont'd)







INSPECTION START

A

CHECK POWER SUPPLY.

1) Start engine and warm it up sufficiently.
2) Select "ENG TEMP SEN" or "COOLAN TEMP/S" signal in "DATA MONITOR" mode with CONSULT.
3) Stop engine.
4) When restarting engine make sure that CONSULT indicates "ENG TEMP SEN" or "COOLAN TEMP/S" is 50°C (122°F) or more.

NG → Check the following.
- Harness for open or short between ECM and harness control (F27)

If NG, repair harness or connectors.

— OR —

1) Disconnect harness connectors (F27), (F111).
2) Turn ignition switch "ON".
3) Check voltage between terminal ⑫ and ground.
Voltage: Approximately 5V

OK ↓

B

CHECK GROUND CIRCUIT.
1) Turn ignition switch "OFF".
2) Check harness continuity between terminal ⑰ and engine ground.
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (F38), (M61) (LHD A/T models)
- Harness connectors (F7), (M62) (RHD A/T models)
- Harness for open or short between ECM and harness connector (F27)
- Harness for open or short between A/T control unit and harness connector (F27)

If NG, repair harness or connectors.

OK ↓

CHECK COMPONENT
(Engine coolant temperature sensor).
Refer to "Electrical Components Inspection".

NG → Replace engine coolant temperature sensor.

OK ↓

Disconnect and reconnect harness connectors in the circuit. Then retest.

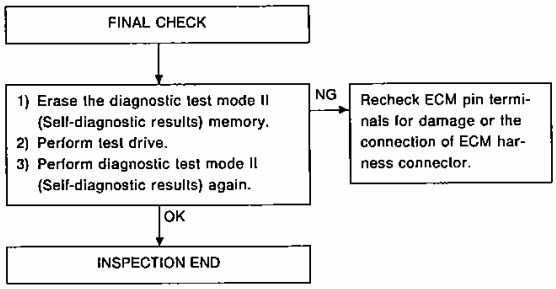
Trouble is not fixed. ↓

Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

EC

Diagnostic Procedure 25 (Cont'd)

Perform FINAL CHECK by the following procedure after repair is completed.

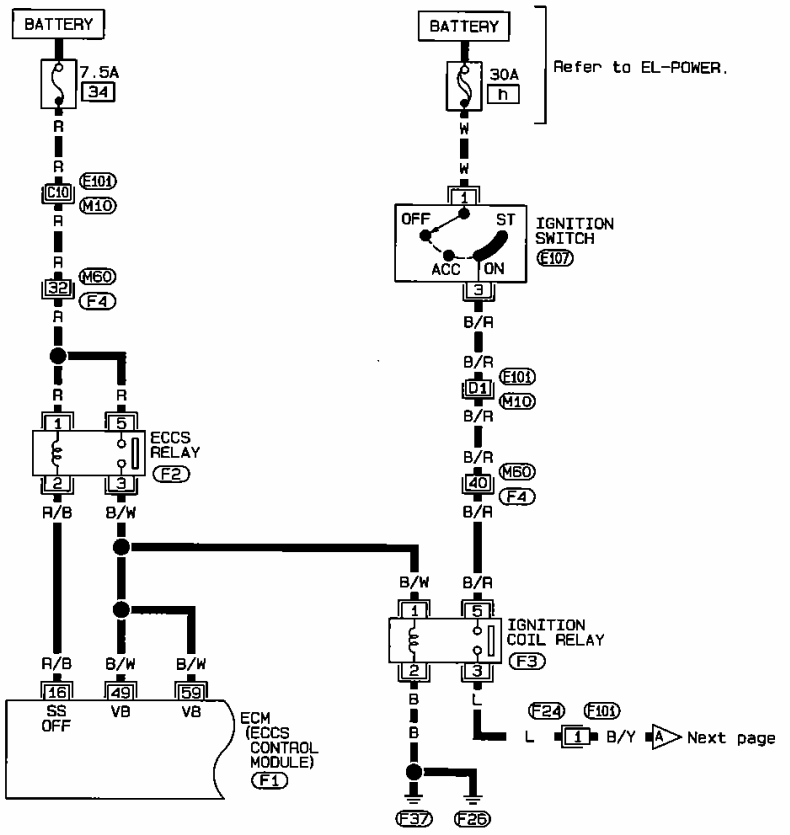


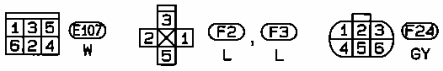
Diagnostic Procedure 26

IGNITION SIGNAL (Diagnostic trouble code No. 21)

LHD MODELS

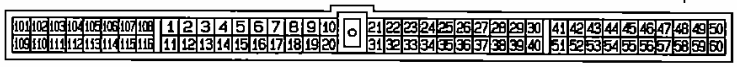
EC-IGN/SG-01



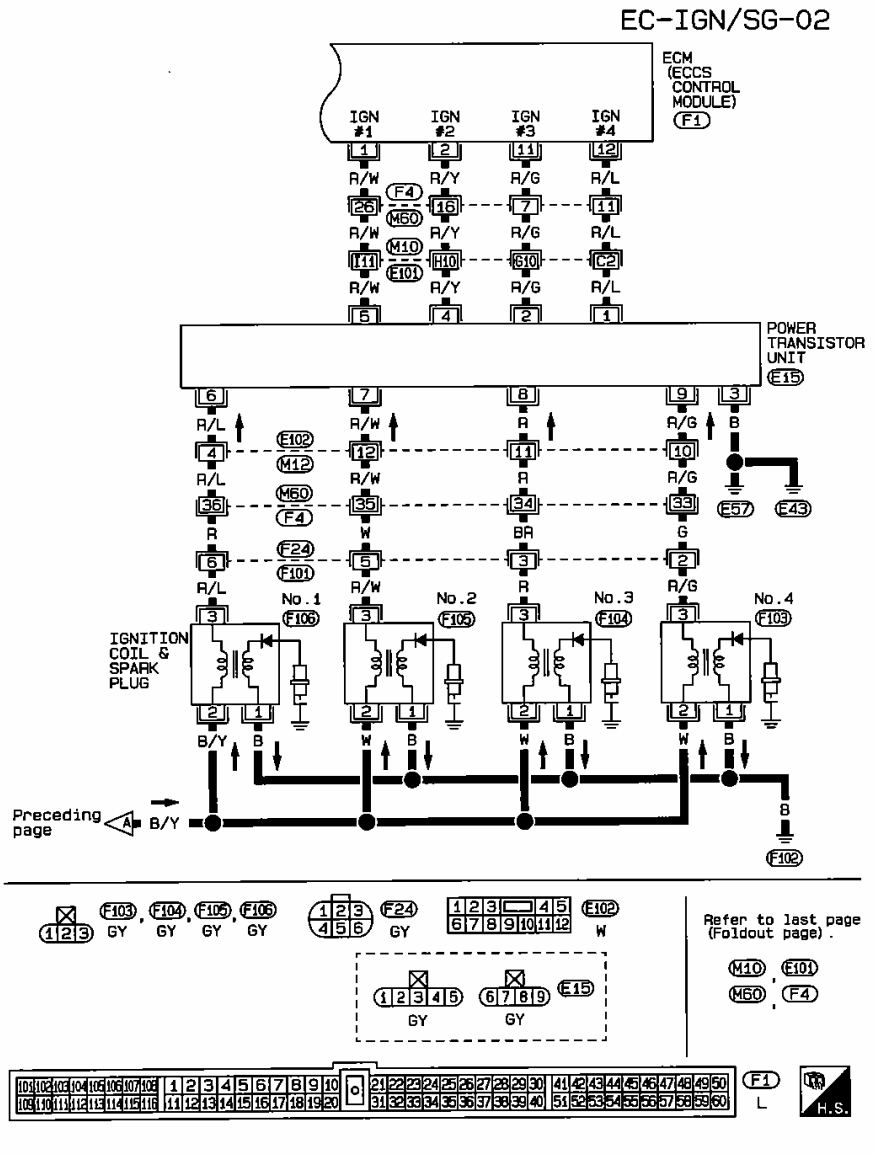


Refer to last page (Foldout page).

M10, E101
M60, F4



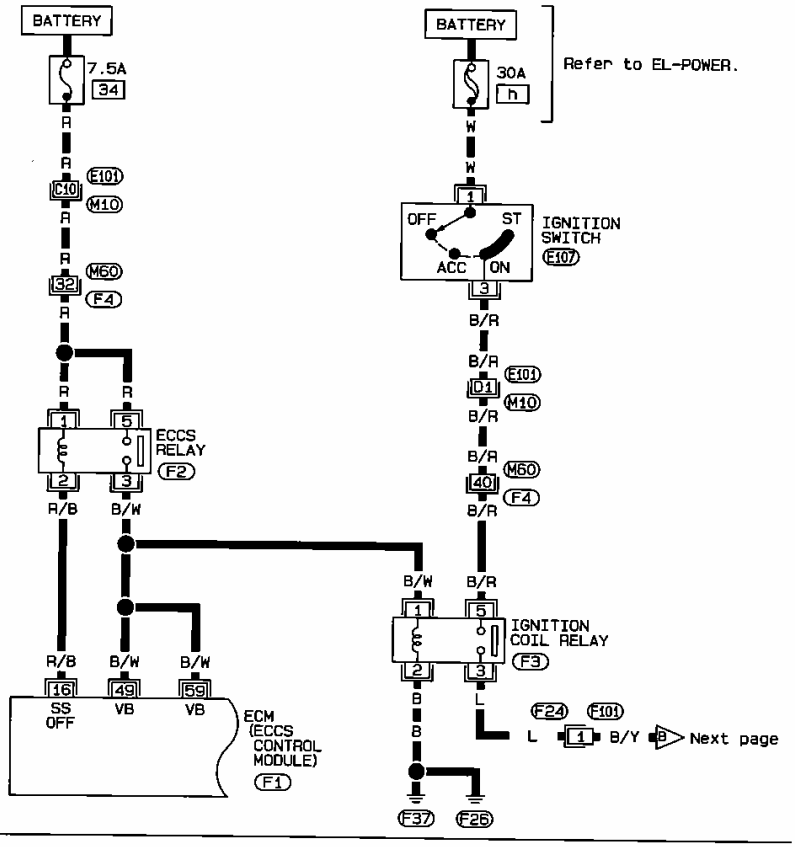
HEC179

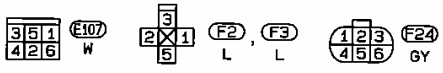

EC-IGN/SG-02
ECM (ECCS CONTROL MODULE) F1
IGN #1
IGN #2
IGN #3
IGN #4
POWER TRANSISTOR UNIT E15
IGNITION COIL & SPARK PLUG
No.1 F106
No.2 F105
No.3 F104
No.4 F103
E102 M12
M60 F4
F24 F101
M10 E101
E57 E43
F102
Preceding page
Refer to last page (Foldout page).
M10, E101
M60, F4
F1
L
H.S.

HEC160

RHD MODELS

EC-IGN/SG-03



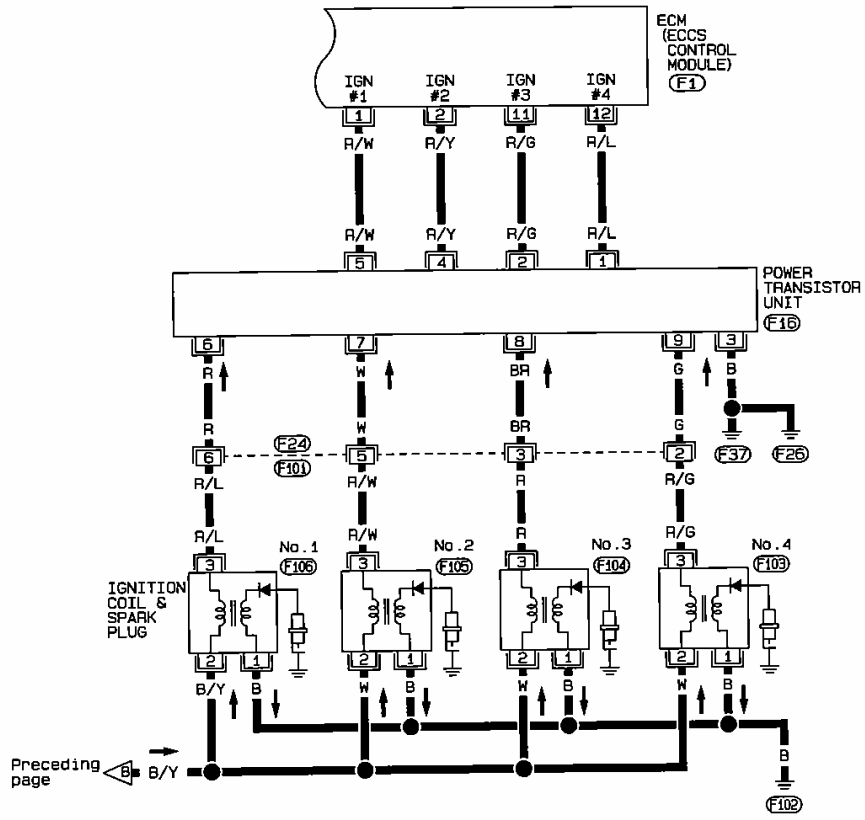


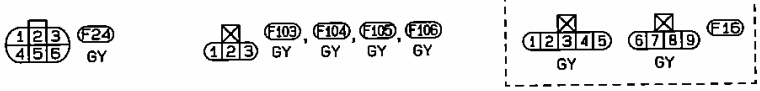
Refer to last page (Foldout page).

M10, E101
M60, F4

HEC181

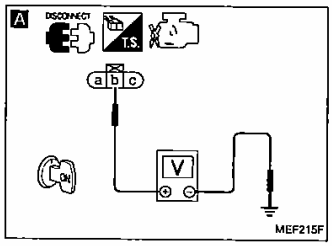
EC-IGN/SG-04

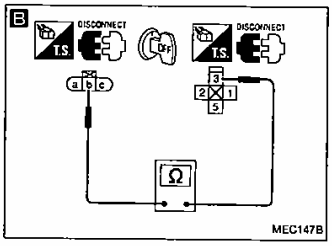


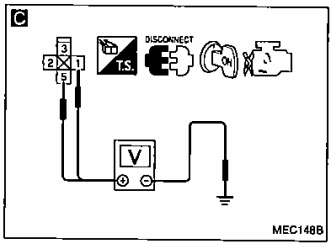


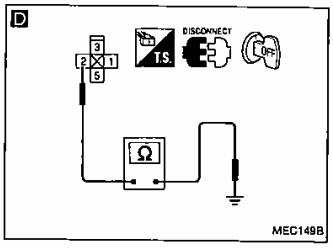
HEC182

Diagnostic Procedure 26 (Cont'd)









INSPECTION START

A

CHECK POWER SUPPLY-I.
1) Disconnect ignition coil harness connectors.
2) Turn ignition switch "ON".
3) Check voltage between terminal ⓑ and ground.
Voltage: Battery voltage

OK → Go to "CHECK GROUND CIRCUIT-II" on next page.

NG ↓

B

CHECK POWER SUPPLY-II.
1) Turn ignition switch "OFF".
2) Disconnect ignition coil relay.
3) Check harness continuity between terminal ⓑ and terminal ③.
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (F24), (F101)
- Harness for open or short between ignition coil and ignition coil relay

If NG, repair harness or connectors.

OK ↓

C

CHECK POWER SUPPLY-III.
1) Turn ignition switch "ON".
2) Check voltage between terminals ①, ⑤ and ground.
Voltage: Battery voltage

NG → Check the following.
- Harness connectors (E101), (M18)
- Harness connectors (M60), (F4)
- Harness for open or short between ignition coil relay and ignition switch
- Harness for open or short between ignition coil relay and ECCS relay

If NG, repair harness or connectors.

OK ↓

D

CHECK GROUND CIRCUIT-I.
1) Turn ignition switch "OFF".
2) Check harness continuity between terminal ② and engine ground.
Continuity should exist.
If OK, check harness for short.

NG → Repair harness or connectors.

OK ↓

CHECK COMPONENT (Ignition coil relay).
Refer to "Electrical Components Inspection".

NG → Replace ignition coil relay.

OK ↓

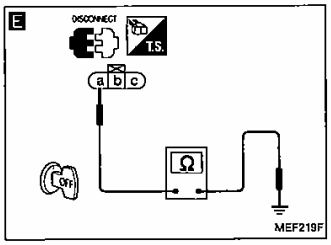
Disconnect and reconnect harness connectors in the circuit. Then retest.

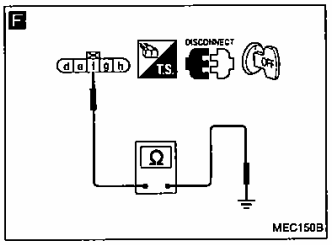
Trouble is not fixed. ↓

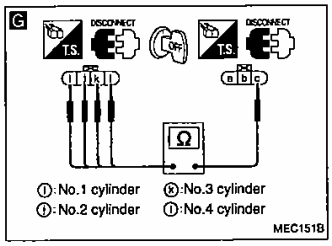
Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

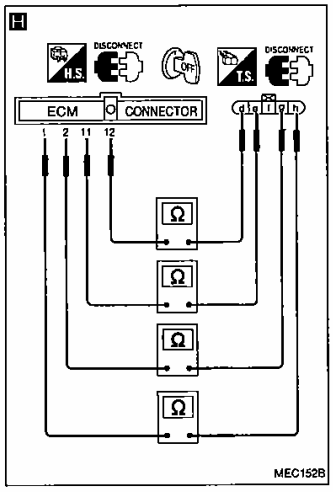
EC

Diagnostic Procedure 26 (Cont'd)









CHECK GROUND CIRCUIT-II.
1) Turn ignition switch "OFF".
E 2) Check harness continuity between terminal ⑧ and engine ground.
Continuity should exist.
If OK, check harness for short.
3) Disconnect power transistor unit harness connector.
F 4) Check harness continuity between terminal ⓘ and engine ground.
Continuity should exist.
If OK, check harness for short.

NG → Repair harness or connectors.

OK ↓

CHECK OUTPUT SIGNAL CIRCUIT.
G 1) Check harness continuity between terminals ⓘ, ⓙ, ⓚ, ⓛ and terminal ⑥.
Continuity should exist.
If OK, check harness for short.
2) Disconnect ECM harness connector.
H 3) Check harness continuity between following terminals.
① - ⓗ ⑪ - ⑧
② - ⓖ ⑫ - ⓓ
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (F24), (F101)
- Harness connectors (M80), (F4) (LHD models)
- Harness connectors (E102), (M12) (LHD models)
- Harness connectors (M10), (E101) (LHD models)
- Harness for open or short between ignition coil and power transistor unit
- Harness for open or short between ECM and power transistor unit

If NG, repair harness or connectors.

OK ↓

CHECK COMPONENTS
(Ignition coil and power transistor unit).
Refer to "Electrical Components Inspection".

NG → Replace malfunctioning component(s).

OK ↓

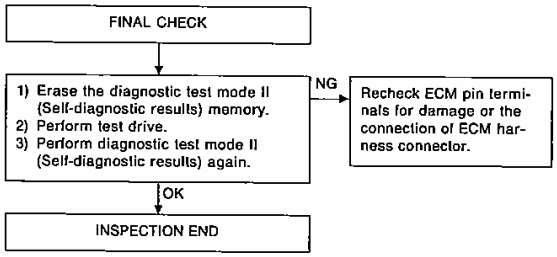
Disconnect and reconnect harness connectors in the circuit. Then retest.

Trouble is not fixed. ↓

Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

Diagnostic Procedure 26 (Cont'd)

Perform FINAL CHECK by the following procedure after repair is completed.

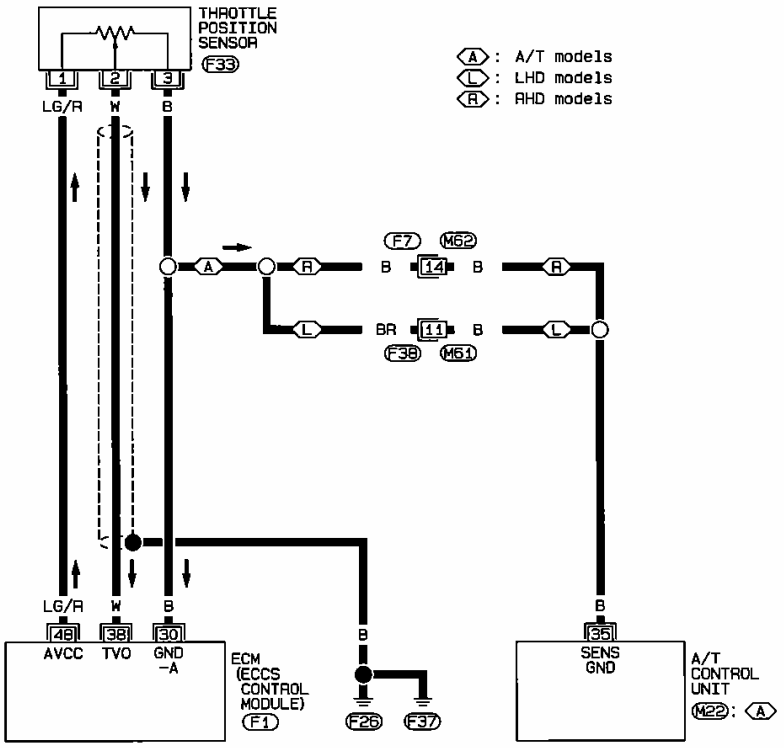


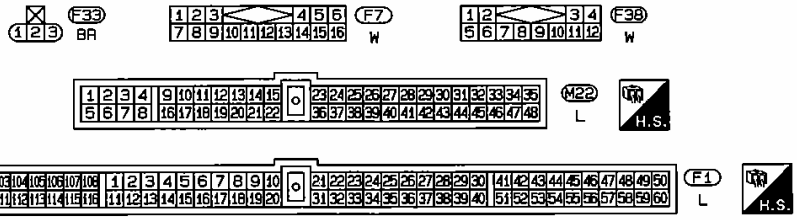
EC

Diagnostic Procedure 29

THROTTLE POSITION SENSOR (Diagnostic trouble code No. 43)

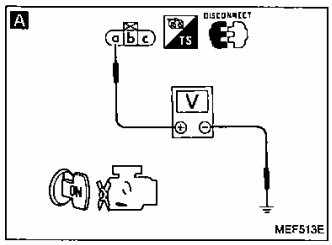
EC-TPS-01

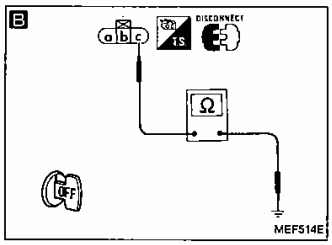


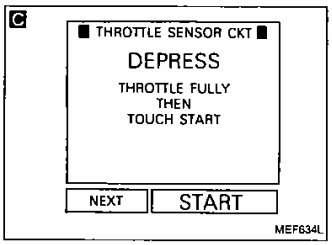


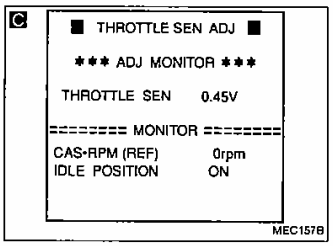
HEC183

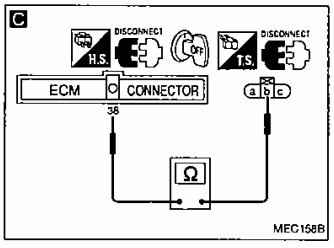
Diagnostic Procedure 29 (Cont'd)











INSPECTION START

A

CHECK POWER SUPPLY.
1) Disconnect throttle position sensor harness connector.
2) Turn ignition switch "ON".
3) Check voltage between terminal ⑧ and ground.
Voltage: Approximately 5V

NG → Repair harness or connectors.

OK

B

CHECK GROUND CIRCUIT.
1) Turn ignition switch "OFF".
2) Loosen and retighten ground screws.
3) Check harness continuity between terminal ⑥ and engine ground.
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (F38), (M61) (LHD A/T models)
- Harness connectors (F7), (M62) (RHD A/T models)
- Harness for open or short between ECM and throttle position sensor
- Harness for open or short between A/T control unit and throttle position sensor

If NG, repair harness or connectors.

OK

C

CHECK INPUT SIGNAL CIRCUIT.
1) Reconnect throttle position sensor harness connector.
2) Turn ignition switch "ON".
3) Perform "THROTTLE SENSOR CKT" or "THROTTLE POSI SEN CKT" in "FUNCTION TEST" mode with CONSULT.

NG → Repair harness or connectors.

OR

3) Read "THROTTLE SEN" or "THRTL POS SEN" signal in "WORK SUPPORT" mode with CONSULT.
Throttle valve fully closed:
0.35 - 0.65V
Throttle valve fully open:
Approx. 4.0V

OR

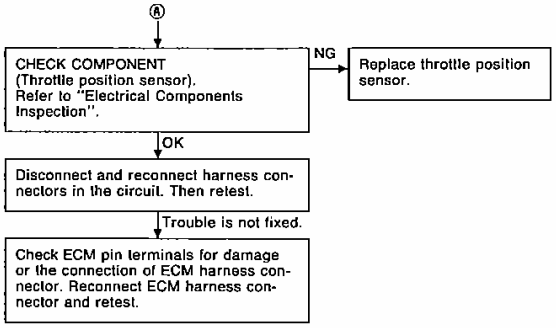
1) Disconnect ECM harness connector.
2) Check harness continuity between ECM terminal ㊳ and terminal ⑥.
Continuity should exist.
If OK, check harness for short.

OK

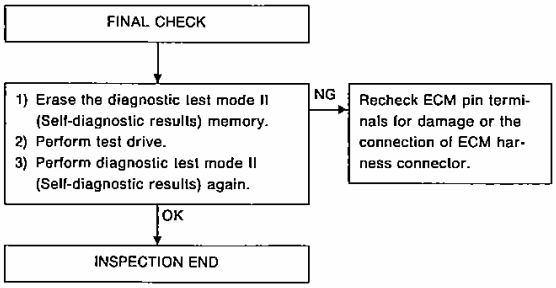
Ⓐ

EC

Diagnostic Procedure 29 (Cont'd)



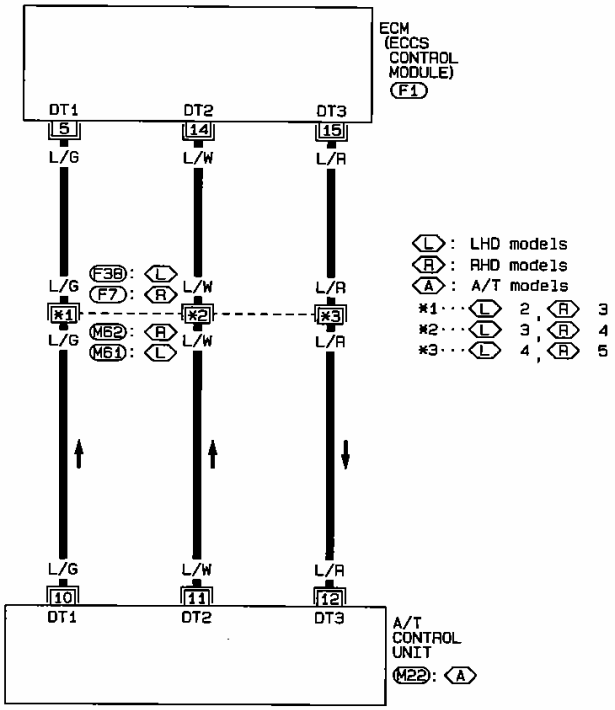
Perform FINAL CHECK by the following procedure after repair is completed.

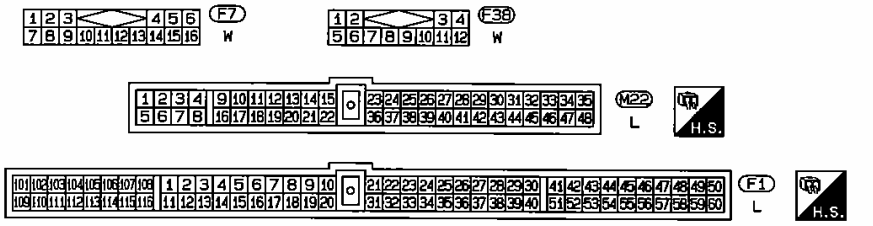


Diagnostic Procedure 30

A/T CONTROL (Diagnostic trouble code No. 54)

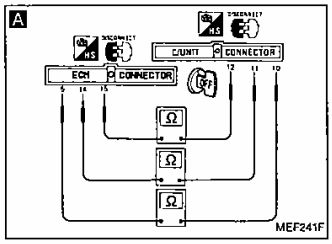
EC-AT/C-01





HEC184

Diagnostic Procedure 30 (Cont'd)



INSPECTION START

A

CHECK INPUT SIGNAL CIRCUIT.
1) Disconnect ECM harness connector and A/T control unit harness connector.
2) Check harness continuity between ECM terminal ⑤ and terminal ⑩, ECM terminal ⑭ and terminal ⑪, ECM terminal ⑮ and terminal ⑫.
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (F38), (M61) (LHD models)
- Harness connectors (F7), (M62) (RHD models)
- Harness for open or short between ECM and A/T control unit

If NG, repair harness or connectors.

OK ↓

Disconnect and reconnect harness connectors in the circuit. Then retest.

Trouble is not fixed. ↓

Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

Perform FINAL CHECK by the following procedure after repair is completed.

FINAL CHECK

1) Erase the diagnostic test mode II (Self-diagnostic results) memory.
2) Perform test drive.
3) Perform diagnostic test mode II (Self-diagnostic results) again.

NG → Recheck ECM pin terminals for damage or the connection of ECM harness connector.

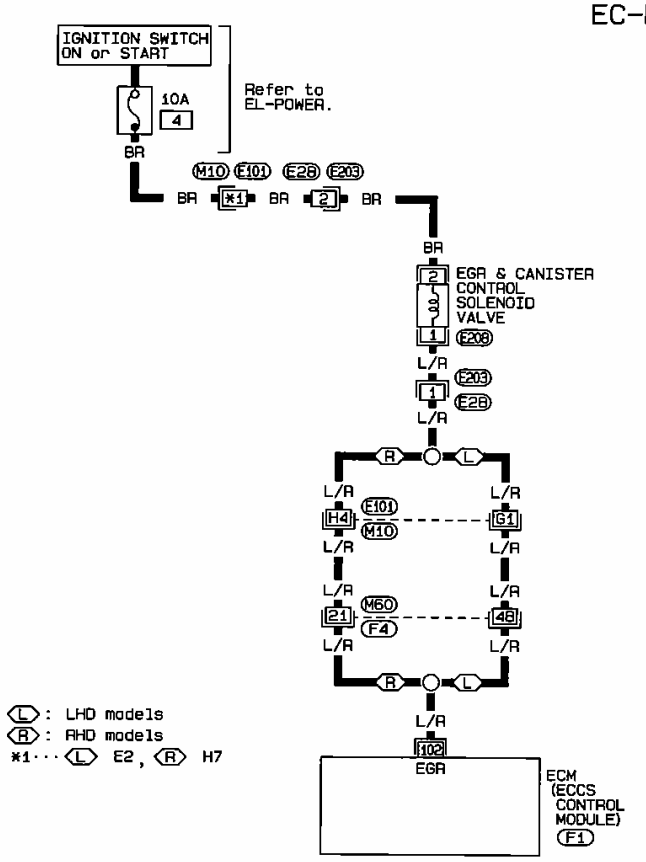
OK ↓

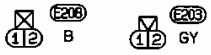
INSPECTION END

Diagnostic Procedure 33

EGR AND CANISTER CONTROL (Not self-diagnostic item)

EC-EGRC/V-01

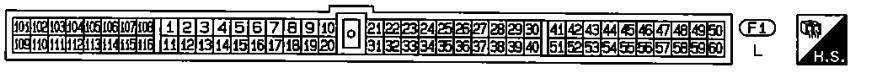




Refer to last page (Foldout page).

M10, E101

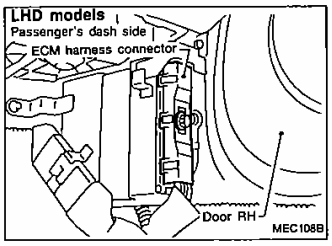
M60, F4

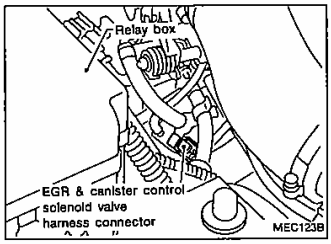


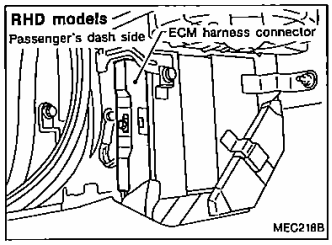
HEC185

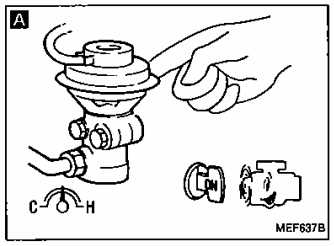
Diagnostic Procedure 33 (Cont'd)

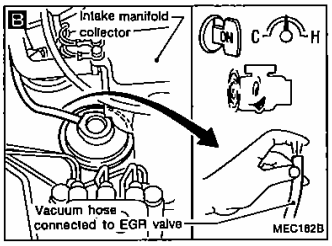
Harness layout











INSPECTION START

A

CHECK OVERALL FUNCTION.
1) Start engine and warm it up sufficiently.
2) Perform diagnostic test mode II (Self-diagnostic results).
Make sure that diagnostic trouble code No. 12 is not displayed.
3) Make sure that EGR valve spring moves up and down (Use your finger) under the following conditions.
At idle:
Spring does not move.
Racing engine from idle to 3,000 rpm:
Spring moves up and down.

OK → INSPECTION END

NG ↓

B

CHECK VACUUM SOURCE TO EGR VALVE.
1) Disconnect vacuum hoses to EGR valve and activated carbon canister.
2) Make sure that vacuum exists under the following conditions.
At idle:
Vacuum should not exist.
Racing engine from idle to 3,000 rpm:
Vacuum should exist.

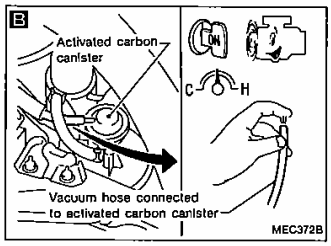
OK → CHECK COMPONENTS (EGR valve, EGRC-BPT valve and activated carbon canister).
Refer to "Electrical Components Inspection".

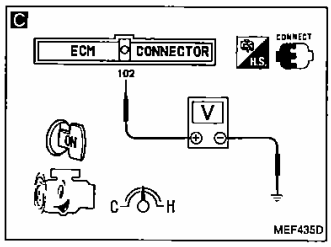
Replace malfunctioning component(s).

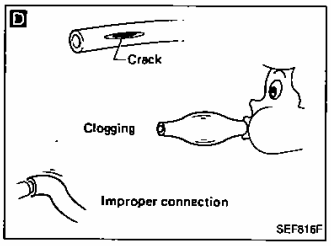
NG ↓

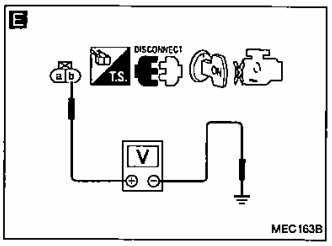
Ⓐ

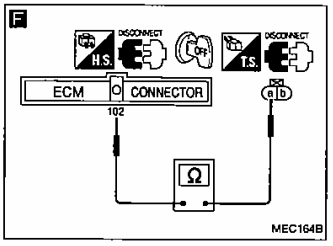
Diagnostic Procedure 33 (Cont'd)











Ⓐ

C CHECK CONTROL FUNCTION.
1) Check voltage between ECM terminal (102) and ground under the following conditions.
Voltage:
At Idle
Approximately 0V
Engine speed is 2,000 rpm
Battery voltage

OK → **D** CHECK VACUUM HOSE.
1) Check vacuum hose for clogging, cracks and proper connection.

NG ↓

E CHECK POWER SUPPLY.
1) Stop engine.
2) Disconnect EGR & canister control solenoid valve harness connector.
3) Turn ignition switch "ON".
4) Check voltage between terminal Ⓑ and ground.
Voltage: Battery voltage

NG → Check the following.
- Harness connectors (M10), (E101)
- Harness connectors (E28), (E203)
- 10A fuse
- Harness for open or short between EGR & canister control solenoid valve and fuse

If NG, repair harness or connectors.

OK ↓

F CHECK OUTPUT SIGNAL CIRCUIT.
1) Turn ignition switch "OFF".
2) Disconnect ECM harness connector.
3) Check harness continuity between ECM terminal (102) and terminal Ⓑ.
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (E203), (E28)
- Harness connectors (E101), (M10)
- Harness connectors (M60), (F4)
- Harness for open or short between ECM and EGR & canister control solenoid valve

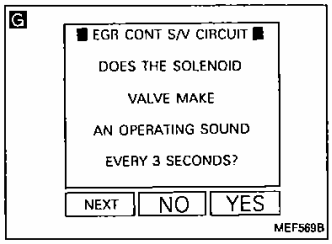
If NG, repair harness or connectors.

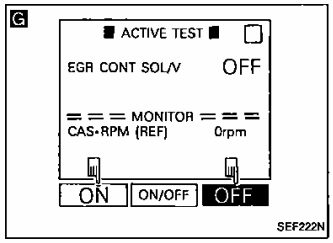
OK ↓

Ⓑ

EC

Diagnostic Procedure 33 (Cont'd)





Ⓐ

G

CHECK COMPONENT
(EGR & canister control solenoid valve).

1) Reconnect EGR & canister control solenoid valve harness connector and ECM harness connector.
2) Turn ignition switch "ON".
3) Perform "EGR CONT S/V CIRCUIT" or "EGRC SOL/V CIRCUIT" in "FUNCTION TEST" mode with CONSULT.

NG → Replace EGR & canister control solenoid valve.

OR

3) Turn EGR & canister control solenoid valve "ON" and "OFF" in "ACTIVE TEST" mode with CONSULT and check operating sound.

OR

Refer to "Electrical Components Inspection".

OK ↓

Disconnect and reconnect harness connectors in the circuit. Then retest.

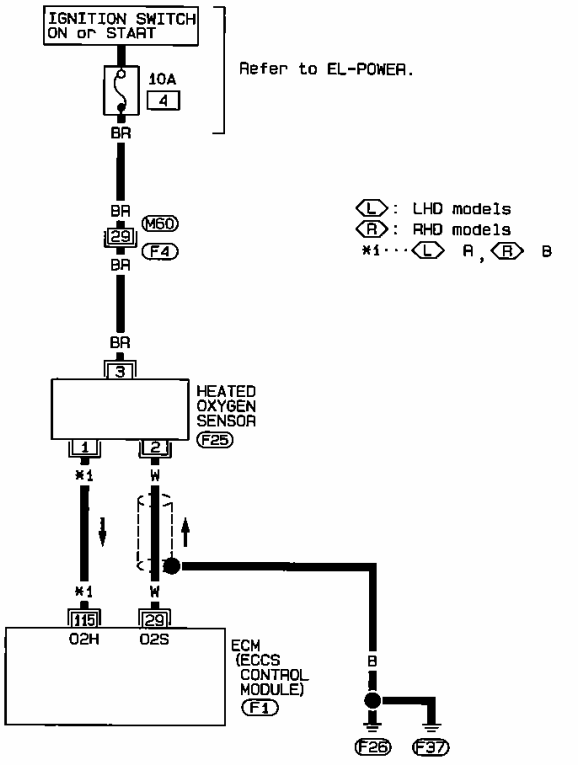
Trouble is not fixed. ↓

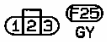
Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

Diagnostic Procedure 34

HEATED OXYGEN SENSOR (Not self-diagnostic item)

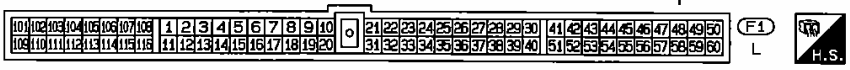
EC-H02S-01





Refer to last page (Foldout page).

M60, F4

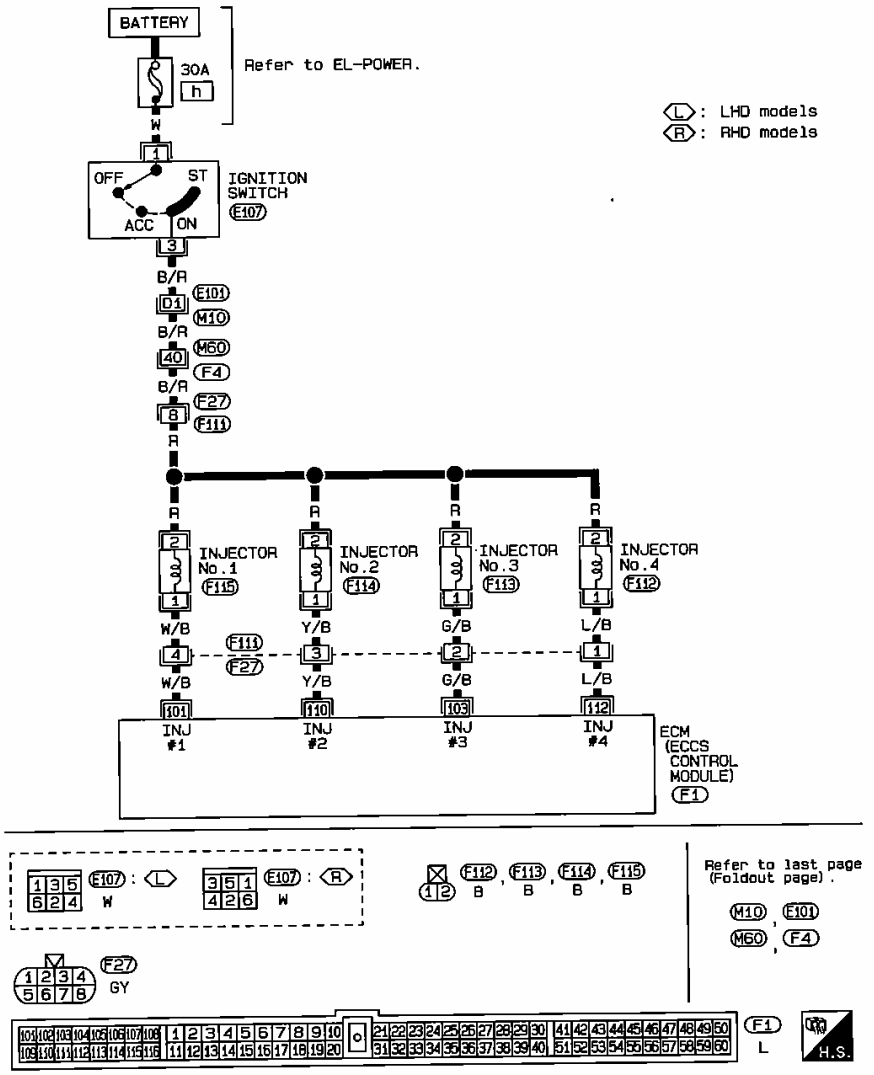


HEC186

Diagnostic Procedure 35

INJECTOR CIRCUIT (Not self-diagnostic item)

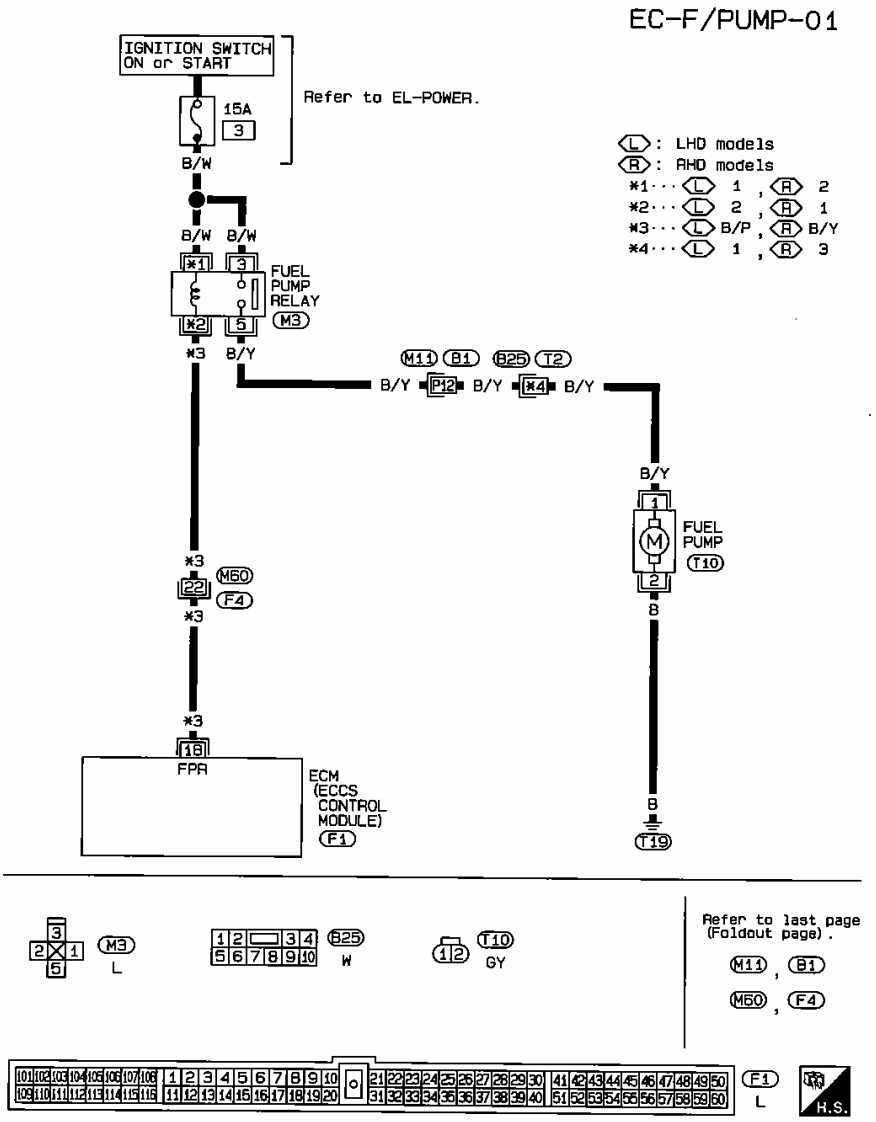
EC-INJECT-01



HEC187

Diagnostic Procedure 36

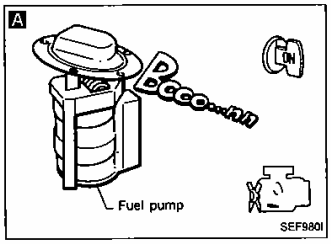
FUEL PUMP (Not self-diagnostic item)

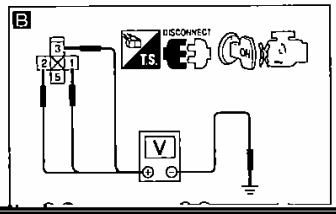


HEC188

Except for Europe

Diagnostic Procedure 36 (Cont'd)





INSPECTION START

A

CHECK OVERALL FUNCTION.
1) Turn ignition switch "ON".
2) Listen to fuel pump operating sound.
Fuel pump should operate for 1 second after ignition switch is turned "ON".

OK → INSPECTION END

NG

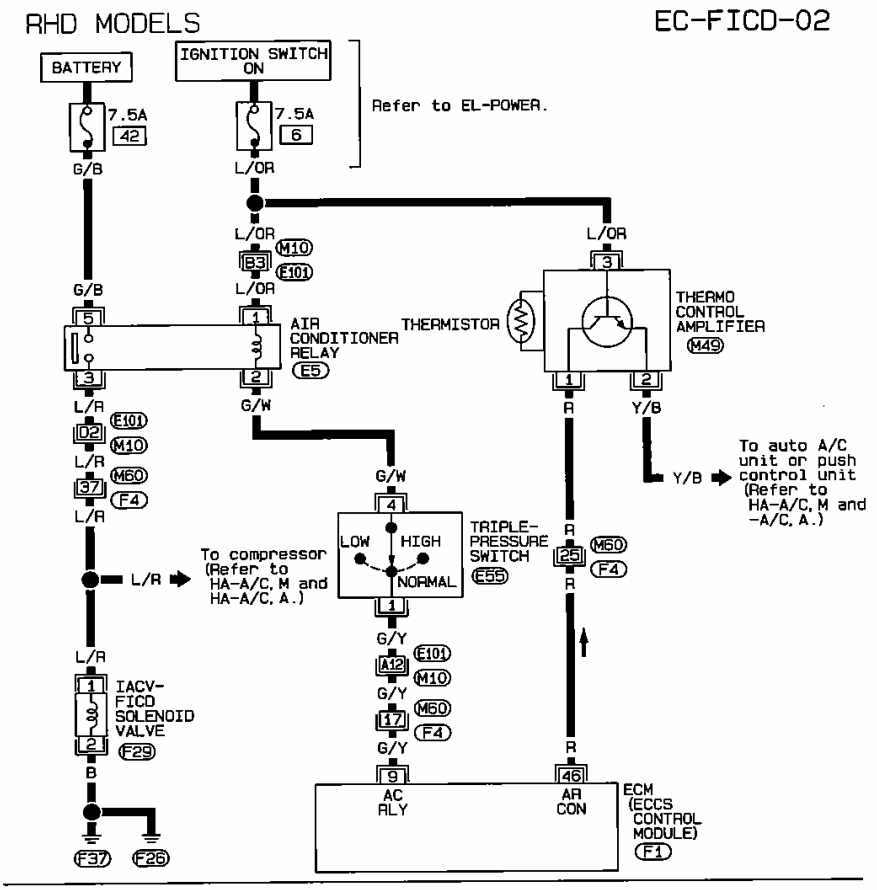
B

CHECK POWER SUPPLY.
1) Turn ignition switch "OFF".
2) Disconnect fuel pump relay.
3) Turn ignition switch "ON".
4) Check voltage between terminals ①, ③ (LHD models), ②, ③ (RHD models) and ground.
Voltage: Battery voltage

NG → Check the following.
- 15A fuse
- Harness for open or short between fuel pump relay and fuse

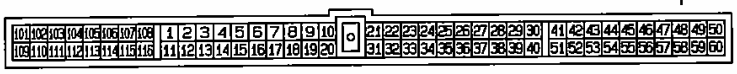
If NG, repair harness or connectors.

[redacted]



Refer to last page (Foldout page).

M10, E101
M60, F4

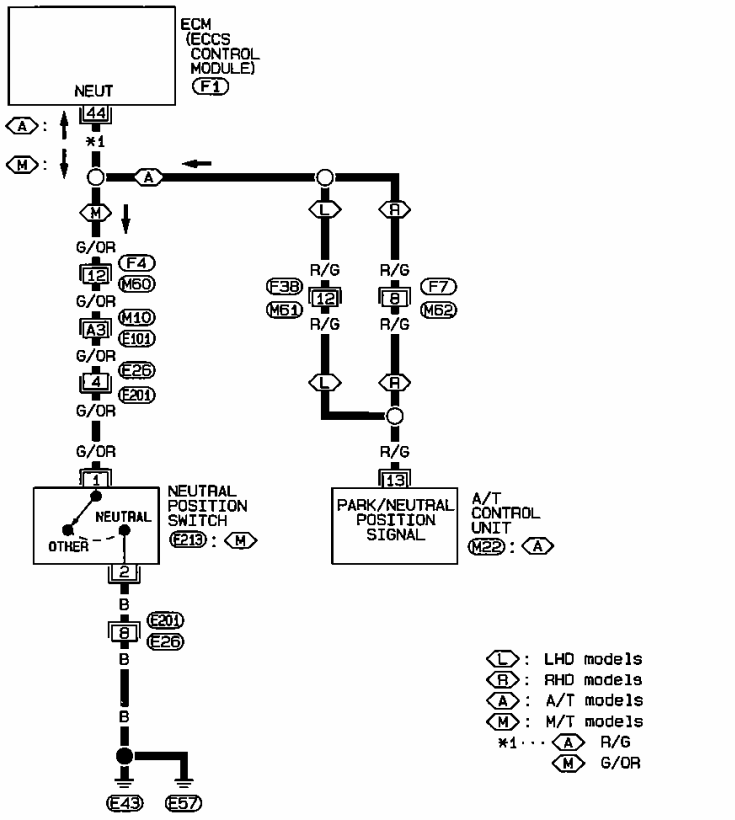


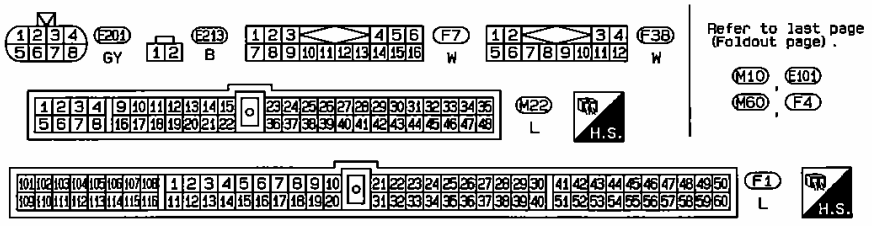
HEC190

Diagnostic Procedure 43

NEUTRAL POSITION SWITCH & A/T CONTROL UNIT (PARK/NEUTRAL POSITION SIGNAL)
(Not self-diagnostic item)

EC-PNP/SW-01



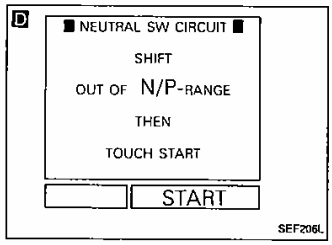


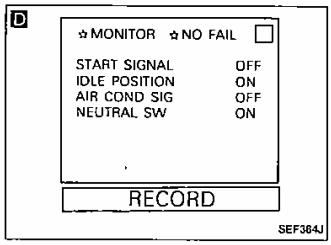
Refer to last page (Foldout page).

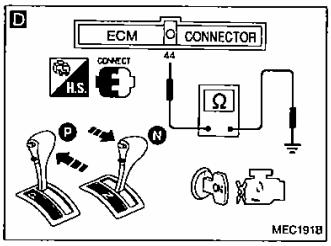
M10, E101
M60, F4

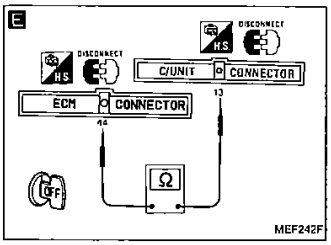
HEC191

Diagnostic Procedure 43 (Cont'd)









A/T CONTROL UNIT (PARK/NEUTRAL POSITION SIGNAL) CIRCUIT

INSPECTION START

D

CHECK OVERALL FUNCTION.
1) Turn ignition switch "ON".
2) Perform "NEUTRAL SW CIRCUIT" or "NEUTRAL POSI SW CKT" in "FUNCTION TEST" mode with CONSULT.

OR

2) Check "NEUTRAL SW" or "NEUT POSI SW" signal in "DATA MONITOR" mode with CONSULT.
"N" or "P": ON
Except above: OFF

OR

2) Check voltage between ECM terminal ㊹ and ground under the following conditions.
Voltage:
"N" or "P"
Approximately 0V
Except above
Approximately 5V

OK → INSPECTION END

NG

E

CHECK INPUT SIGNAL CIRCUIT.
1) Turn ignition switch "OFF".
2) Disconnect ECM harness connector.
3) Disconnect A/T control unit harness connector.
4) Check harness continuity between ECM terminal ㊹ and terminal ⑬.
Continuity should exist.
If OK, check harness for short.

NG → Check the following.
- Harness connectors (F38), (M61) (LHD models)
- Harness connectors (F7), (M62) (RHD models)
- Harness for open or short between ECM and A/T control unit

If NG, repair harness or connectors.

OK

CHECK INHIBITOR SWITCH FUNCTION.
Make sure that inhibitor switch functions properly. (Refer to AT section).

NG → Check inhibitor switch and circuit (Refer to AT section.)

OK

Disconnect and reconnect harness connectors in the circuit. Then retest.

Trouble is not fixed.

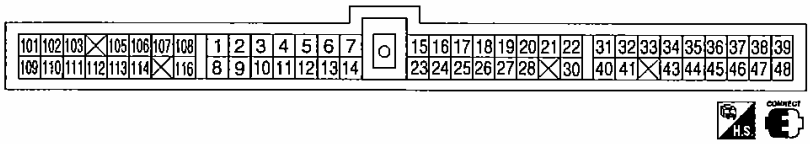
Check ECM pin terminals for damage or the connection of ECM harness connector. Reconnect ECM harness connector and retest.

EC

Electrical Components Inspection

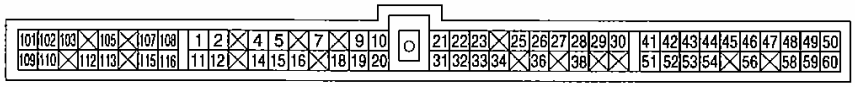
ECM HARNESS CONNECTOR TERMINAL LAYOUT

For Europe



SEF632R

Except for Europe



SEF633R

Electrical Components Inspection (Cont'd)

ECM INSPECTION TABLE (For Europe)

*Data are reference values.

TERMINAL NO.	ITEM	CONDITION	*DATA
1 3 5 25	Ignition signal	Engine is running. └ Idle speed	0 - 0.1V
		Engine is running. └ Engine speed is 2,000 rpm.	Approximately 0.2V
2	Tachometer	Engine is running. └ Idle speed	Approximately 1V
4	ECCS relay (Self-shutoff)	Engine is running. Ignition switch "OFF" └ For a few seconds after turning ignition switch "OFF"	Approximately 1V
		Ignition switch "OFF" └ A few seconds after turning ignition switch "OFF" and thereafter	BATTERY VOLTAGE (11 - 14V)
9	Cooling fan relay (Low speed)	Engine is running. └ Cooling fan is not operating.	BATTERY VOLTAGE (11 - 14V)
		Engine is running. └ Cooling fan is operating.	Approximately 0.1V
10	Cooling fan relay (High speed)	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
11	Air conditioner relay	Engine is running. └ Both A/C switch and blower switch are "ON".	Approximately 0.1V
		Engine is running └ A/C switch is "OFF".	BATTERY VOLTAGE (11 - 14V)
16	Mass air flow sensor	Engine is running. (Warm-up condition) └ Idle speed	0.8 - 1.5V
		Engine is running. (Warm-up condition) └ Engine sped is 3,000 rpm.	1.4 - 2.0V
18	Engine coolant temperature sensor	Engine is running.	0 - 5.0V Output voltage varies with engine coolant temperature.

EC

Electrical Components Inspection (Cont'd)

*Data are reference values.

TERMINAL NO.	ITEM	CONDITION	*DATA
19	Heated oxygen sensor	Engine is running. └ Engine speed is 2,000 rpm after warming up sufficiently.	0 - 0.3V ⟷ 0.6 - 0.9V
20	Throttle position sensor	Ignition switch "ON" └ Accelerator pedal released	0.35 - 0.65V
		Ignition switch "ON" └ Accelerator pedal fully depressed	Approximately 3V
22 30	Camshaft position sensor (Position signal)	Engine is running.	2.0 - 3.0V
27	Knock sensor	Engine is running. └ Idle speed	2.0 - 3.0V
31 40	Camshaft position sensor (Reference signal)	Engine is running.	Approximately 0.6V
33	Load signal	Ignition switch "ON" └ Rear window defogger switch is "ON".	BATTERY VOLTAGE (11 - 14V)
34	Start signal	Ignition switch "ON"	Approximately 0V
		Ignition switch "START"	BATTERY VOLTAGE (11 - 14V)
35	Neutral position/Inhibitor switch	Ignition switch "ON" ├ Neutral position (M/T models) └ "N" or "P" position (A/T models)	0V
		Ignition switch "ON" └ Except the above gear position	Approximately 5V
36	Ignition switch	Ignition switch "OFF"	0V
		Ignition switch "ON"	BATTERY VOLTAGE (11 - 14V)
37	Throttle position sensor power supply	Ignition switch "ON"	Approximately 5V
38 47	Power supply for ECM	Ignition switch "ON"	BATTERY VOLTAGE (11 - 14V)
41	Air conditioner switch	Engine is running. └ Both air conditioner switch and blower switch are "ON".	Approximately 0V
		Engine is running. └ Air conditioner switch is "OFF".	BATTERY VOLTAGE (11 - 14V)

Electrical Components Inspection (Cont'd)

*Data are reference values.

TER-MINAL NO.	ITEM	CONDITION	*DATA
43	Power steering oil pressure switch	Engine is running. └ Steering wheel is being turned.	Approximately 0V
		Engine is running. └ Steering wheel is not being turned.	4 - 5V
46	Power supply (Back-up)	Ignition switch "OFF"	BATTERY VOLTAGE (11 - 14V)
101	Injector No. 1	Engine is running.	BATTERY VOLTAGE (11 - 14V)
103	Injector No. 3		
110	Injector No. 2		
112	Injector No. 4		
102	Wastegate valve control solenoid valve	Engine is running. └ Idle speed	BATTERY VOLTAGE (11 - 14V)
		Engine is running. └ Revving engine up to 5,000 rpm.	Approximately 5V
105	EGR valve & canister control solenoid valve	Engine is running. (Warm-up condition) └ Idle speed	Approximately 0V
		Engine is running. (Warm-up condition) └ Engine speed is 2,000 rpm	BATTERY VOLTAGE (11 - 14)
106	Fuel pump relay	Ignition switch "ON" └ For 5 seconds after turning ignition switch "ON" Engine is running.	Approximately 0V
		Ignition switch "ON" └ 5 seconds after turning ignition switch "ON" and thereafter	BATTERY VOLTAGE (11 - 14V)
111	Heated oxygen sensor heater	Engine is running. └ Engine speed is below 4,000 rpm.	Approximately 0V
		Engine is running. └ Engine speed is above 4,000 rpm.	BATTERY VOLTAGE (11 - 14V)
113	IACV-AAC valve	Engine is running. └ Idle speed	9 - 14V
		Engine is running. ├ Steering wheel is being turned. ├ Air conditioner is operating. └ Rear defogger is "ON".	5 - 9V

EC

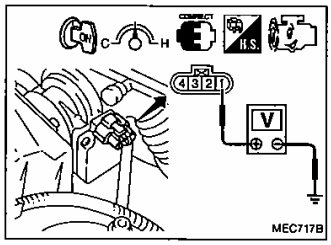
Electrical Components Inspection (Cont'd)

*Data are reference values.

TER-MINAL NO.	ITEM	CONDITION	*DATA
114	VTC solenoid valve	Engine is running. (Jacked-up condition) └ Idle speed	BATTERY VOLTAGE (11 - 14V)
		Engine is running. └ Engine speed is above 1,050 rpm	Approximately 4V

Electrical Components Inspection (Cont'd)

MASS AIR FLOW SENSOR



1. Fold back mass air flow sensor harness connector rubber as shown in the figure if the harness connector is connected.
2. Turn ignition switch "ON".
3. Start engine and warm it up sufficiently.
4. Check voltage between terminal ① and ground.

Conditions	Voltage V
Idle speed	0.8 - 1.5
3,000 rpm	1.4 - 2.0

5. If NG, remove mass air flow sensor from air duct. Check hot film for damage or dust.

EC

MANUAL TRANSMISSION

SECTION MT

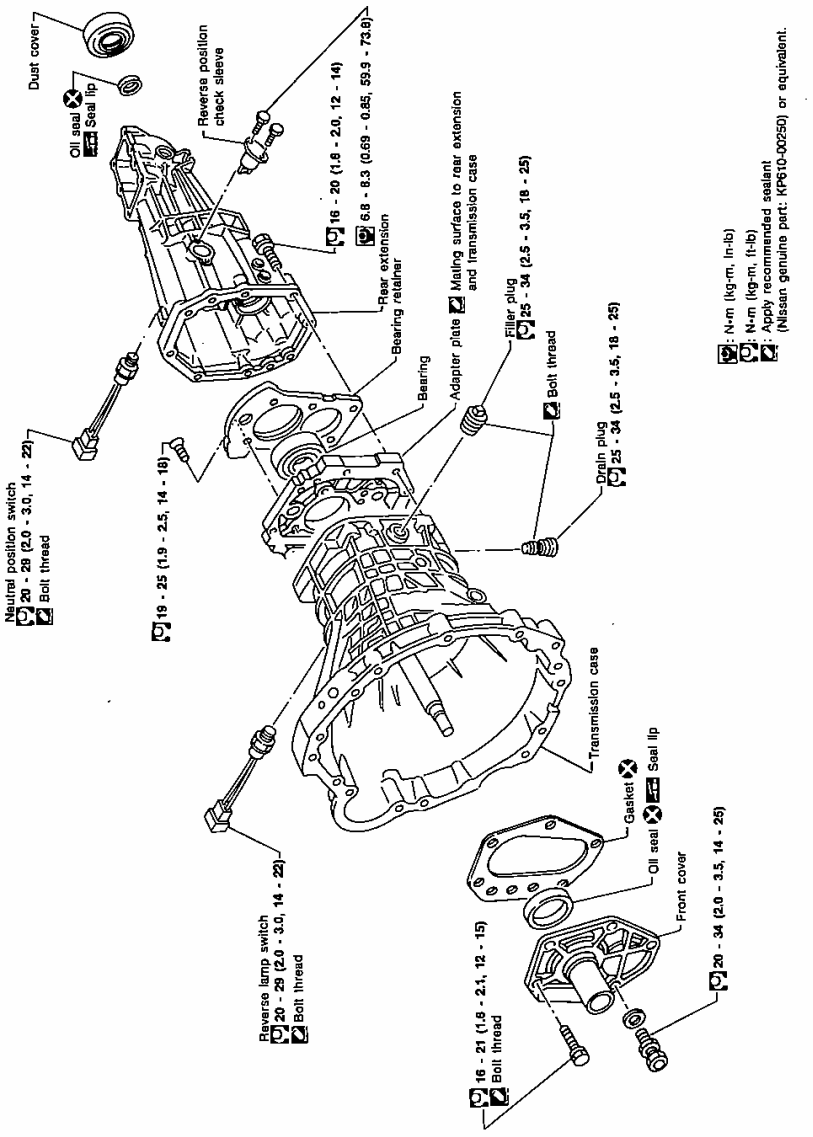
MODIFICATION NOTICE:
The service data and specifications (SDS), case and gear components have been changed.

CONTENTS

MAJOR OVERHAUL 2
Case Components 2
Gear Components 3
SERVICE DATA AND SPECIFICATIONS (SDS) 4
General Specifications 4
Inspection and Adjustment 5

MT

Case Components

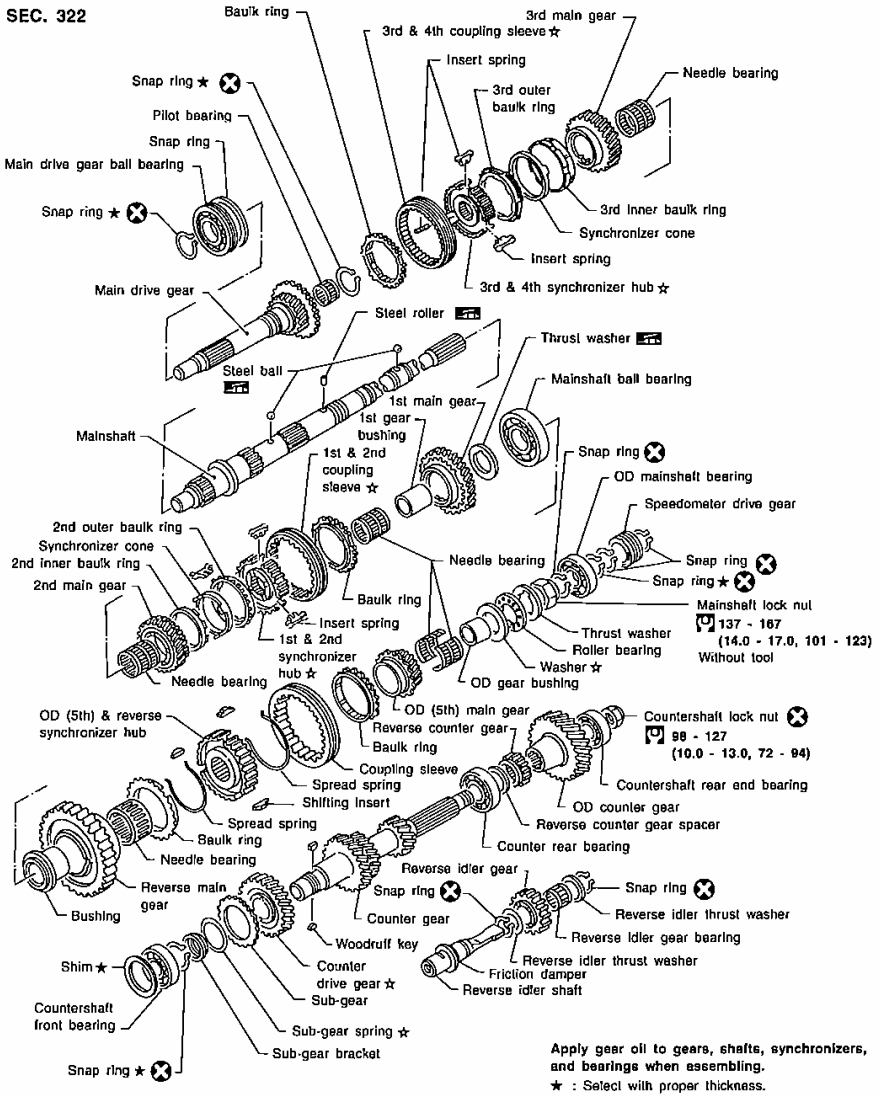


SMT577CA

SEC. 320-321

Gear Components

SEC. 322



Apply gear oil to gears, shafts, synchronizers, and bearings when assembling.

★ : Select with proper thickness.

☆ : Pay attention to its direction.

[O] : N•m (kg-m, ft-lb)

SMT777C

MT

General Specifications

Transmission model		FS5W71C
Number of speeds		5
Shift pattern		
Synchromesh type		Warner
Gear ratio	1st	3.321
	2nd	1.902
	3rd	1.308
	4th	1.000
	OD	0.838
	Reverse	3.362
Number of teeth		
Mainshaft	Drive	22
	1st	33
	2nd	27
	3rd	26
	OD	22
	Reverse	36
Countershaft	Drive	31
	1st	14
	2nd	20
	3rd	28
	OD	37
	Reverse	15
Reverse idler gear		21
Oil capacity	ℓ (Imp pt)	2.5 (4-3/8)
Remarks	Sub-gear	○
	Reverse synchronizer	○
	Double baulk ring type synchronizer	2nd and 3rd synchronizer

Inspection and Adjustment

GEAR END PLAY

Gear	End play mm (in)
1st gear	0.31 - 0.41 (0.0122 - 0.0161)
2nd gear	0.11 - 0.21 (0.0043 - 0.0083)
3rd gear	0.11 - 0.21 (0.0043 - 0.0083)
OD gear	0.24 - 0.41 (0.0094 - 0.0161)

CLEARANCE BETWEEN BAULK RING AND GEAR

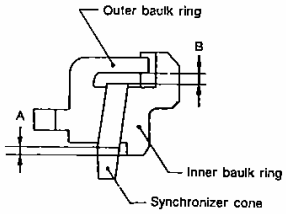
1st, main drive, OD and reverse baulk ring

Unit: mm (in)

	Standard	Wear limit
1st	1.2 - 1.6 (0.047 - 0.063)	0.8 (0.031)
Main drive	1.2 - 1.6 (0.047 - 0.063)	
OD	1.2 - 1.6 (0.047 - 0.063)	
Reverse	1.10 - 1.55 (0.0433 - 0.0610)	0.7 (0.028)

2nd and 3rd baulk ring

Unit: mm (in)



SMT044B

Dimension	Standard	Wear limit
A	0.7 - 0.9 (0.028 - 0.035)	0.2 (0.008)
B	0.6 - 1.1 (0.024 - 0.043)	

AVAILABLE SNAP RINGS

Main drive gear bearing

Allowable clearance	0 - 0.13 mm (0 - 0.0051 in)
Thickness mm (in)	Part number
1.87 (0.0736)	32204-78001
1.94 (0.0764)	32204-78002
2.01 (0.0791)	32204-78003

Mainshaft front

Allowable clearance	0 - 0.18 mm (0 - 0.0071 in)
Thickness mm (in)	Part number
2.4 (0.094)	32263-V5200
2.5 (0.098)	32263-V5201

OD mainshaft bearing

Allowable clearance	0 - 0.14 mm (0 - 0.0055 in)
Thickness mm (in)	Part number
1.1 (0.043)	32228-20100
1.2 (0.047)	32228-20101
1.3 (0.051)	32228-20102
1.4 (0.055)	32228-20103

Counter drive gear

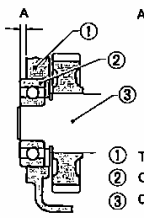
Allowable clearance	0 - 0.13 mm (0 - 0.0051 in)
Thickness mm (in)	Part number
1.4 (0.055)	32215-E9000
1.5 (0.059)	32215-E9001
1.6 (0.063)	32215-E9002

Inspection and Adjustment (Cont'd)

AVAILABLE SHIMS

Counter front bearing

Unit: mm (in)



A: Distance from bearing surface to transmission case

① Transmission case
② Counter gear front bearing
③ Counter gear

TM371

Allowable clearance	0 - 0.16 (0 - 0.0063)	
"A"	Thickness of shim	Part number
4.52 - 4.71 (0.1780 - 0.1854)	Not necessary	
4.42 - 4.51 (0.1740 - 0.1776)	0.1 (0.004)	32218-V5000
4.32 - 4.41 (0.1701 - 0.1736)	0.2 (0.008)	32218-V5001
4.22 - 4.31 (0.1661 - 0.1697)	0.3 (0.012)	32218-V5002
4.12 - 4.21 (0.1622 - 0.1657)	0.4 (0.016)	32218-V5003
4.02 - 4.11 (0.1583 - 0.1618)	0.5 (0.020)	32218-V5004
3.92 - 4.01 (0.1543 - 0.1579)	0.6 (0.024)	32218-V5005

AUTOMATIC TRANSMISSION

SECTION AT

MODIFICATION NOTICE:

- The wiring diagrams and service data and specifications (SDS) have been changed.

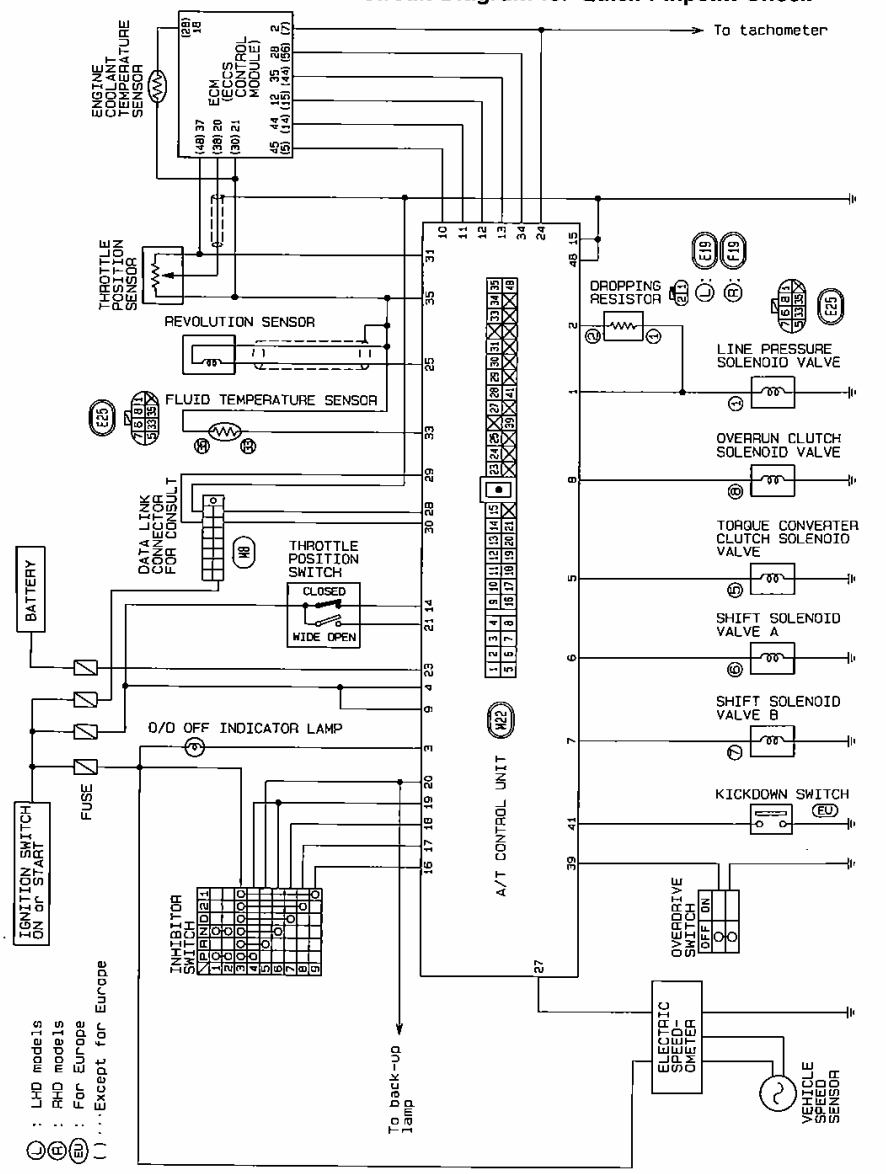
CONTENTS

TROUBLE DIAGNOSES 2
Circuit Diagram for Quick Pinpoint Check 2
Wiring Diagram — AT — 3

SERVICE DATA AND SPECIFICATIONS (SDS) 15
General Specifications 15
Specifications and Adjustment 15

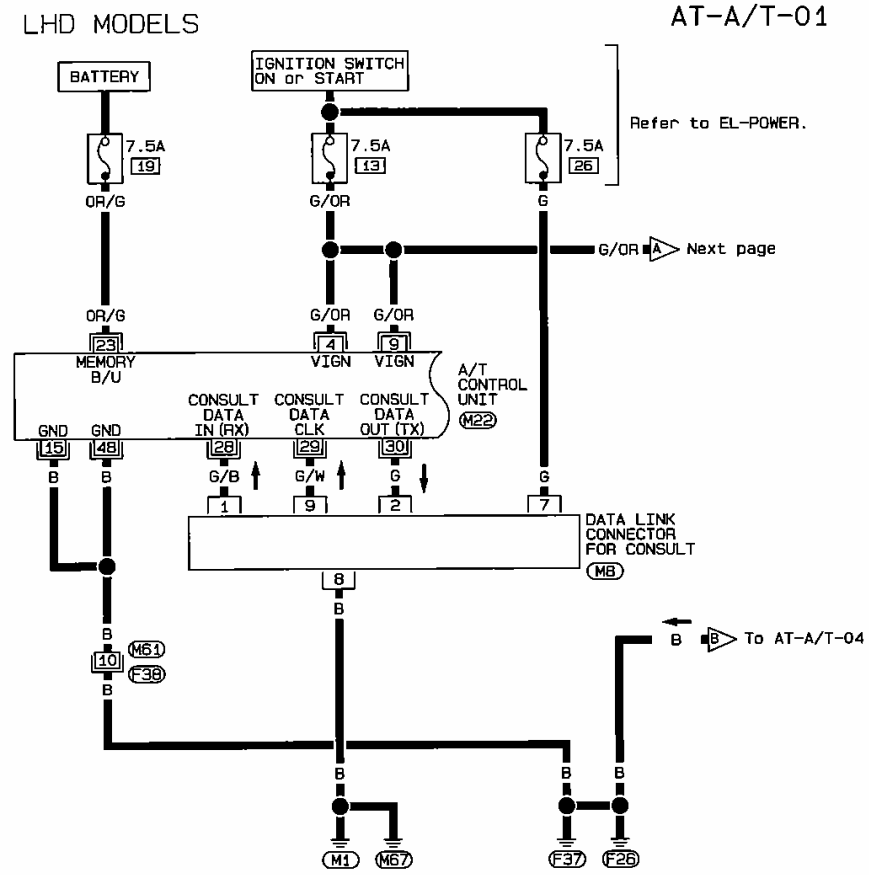
AT

Circuit Diagram for Quick Pinpoint Check



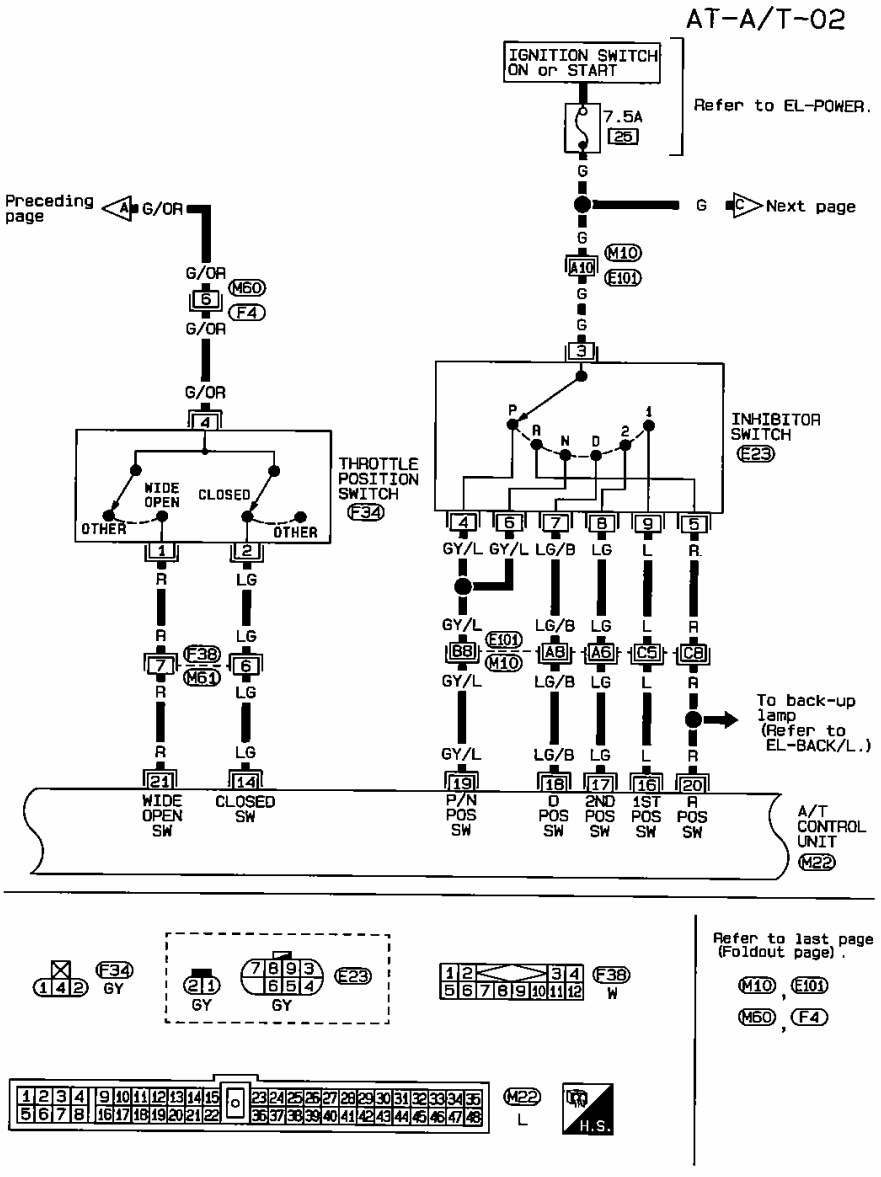
HAT012

Wiring Diagram — AT —



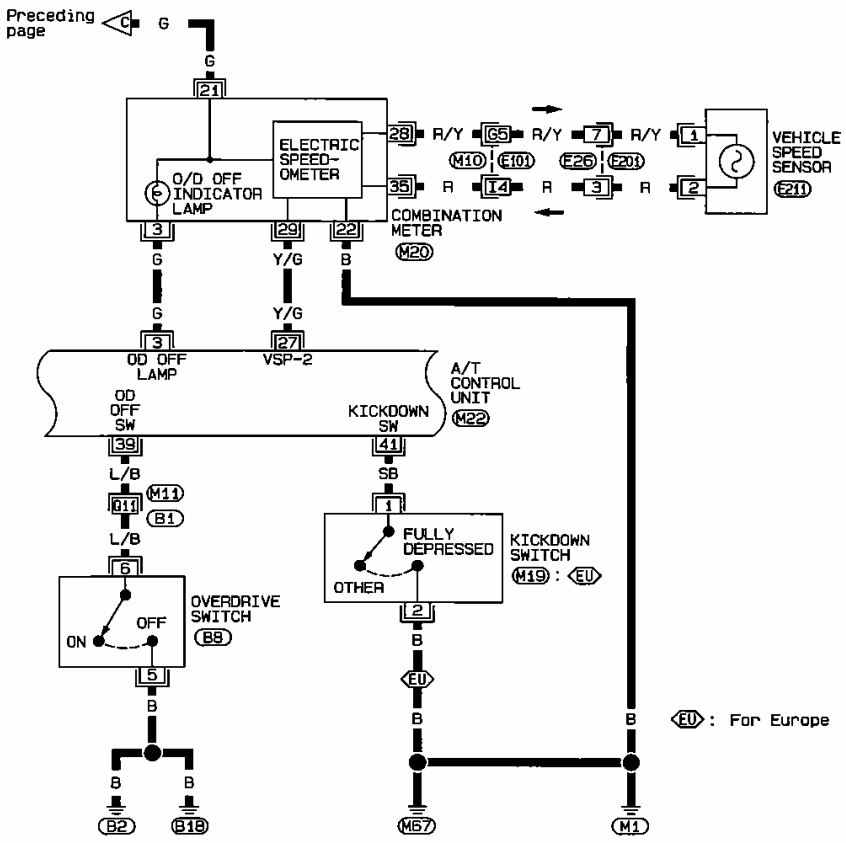
HAT013

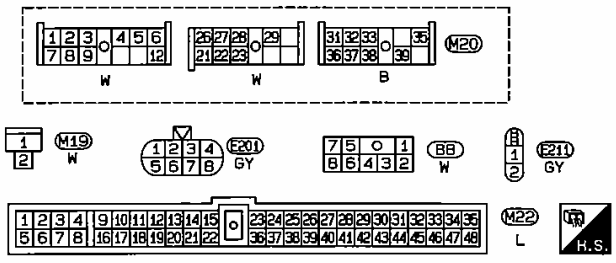
Wiring Diagram — AT — (Cont'd)



Wiring Diagram — AT — (Cont'd)

AT-A/T-03





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M10, E101

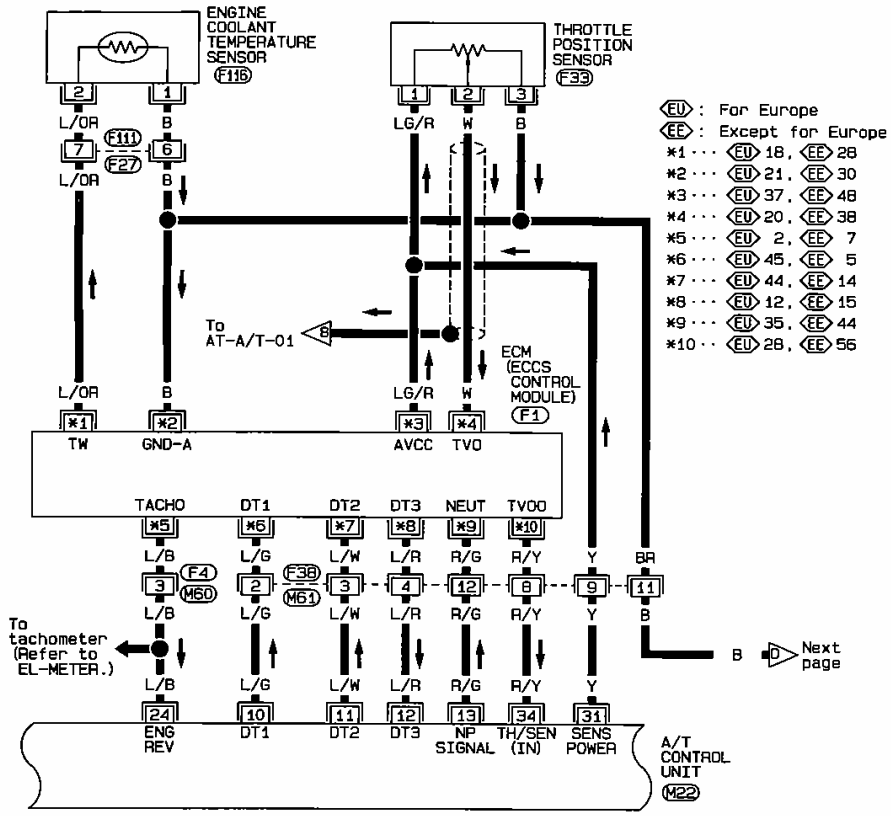
M11, B1

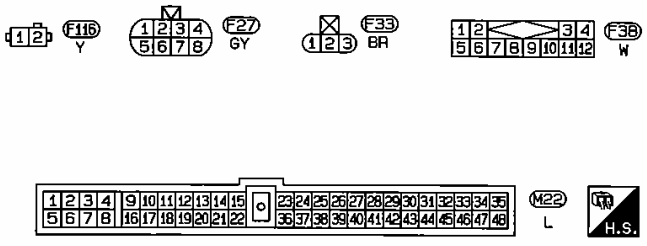
HAT015

AT

Wiring Diagram — AT — (Cont'd)

AT-A/T-04





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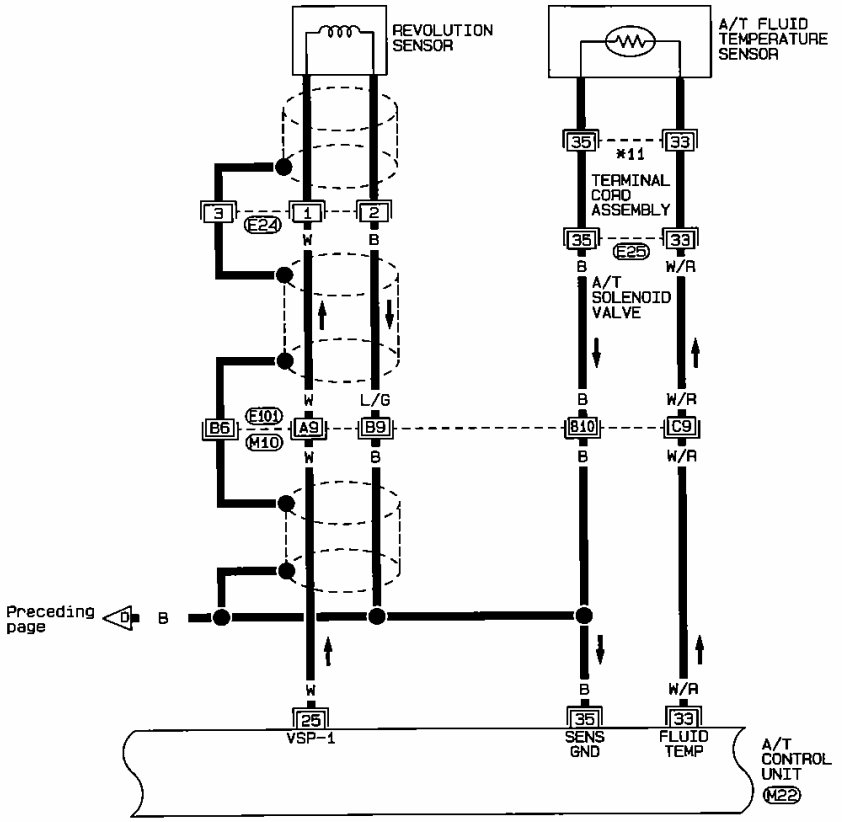
M60, F4

F1

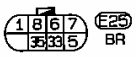
IIAT016

Wiring Diagram — AT — (Cont'd)

AT-A/T-05



AT



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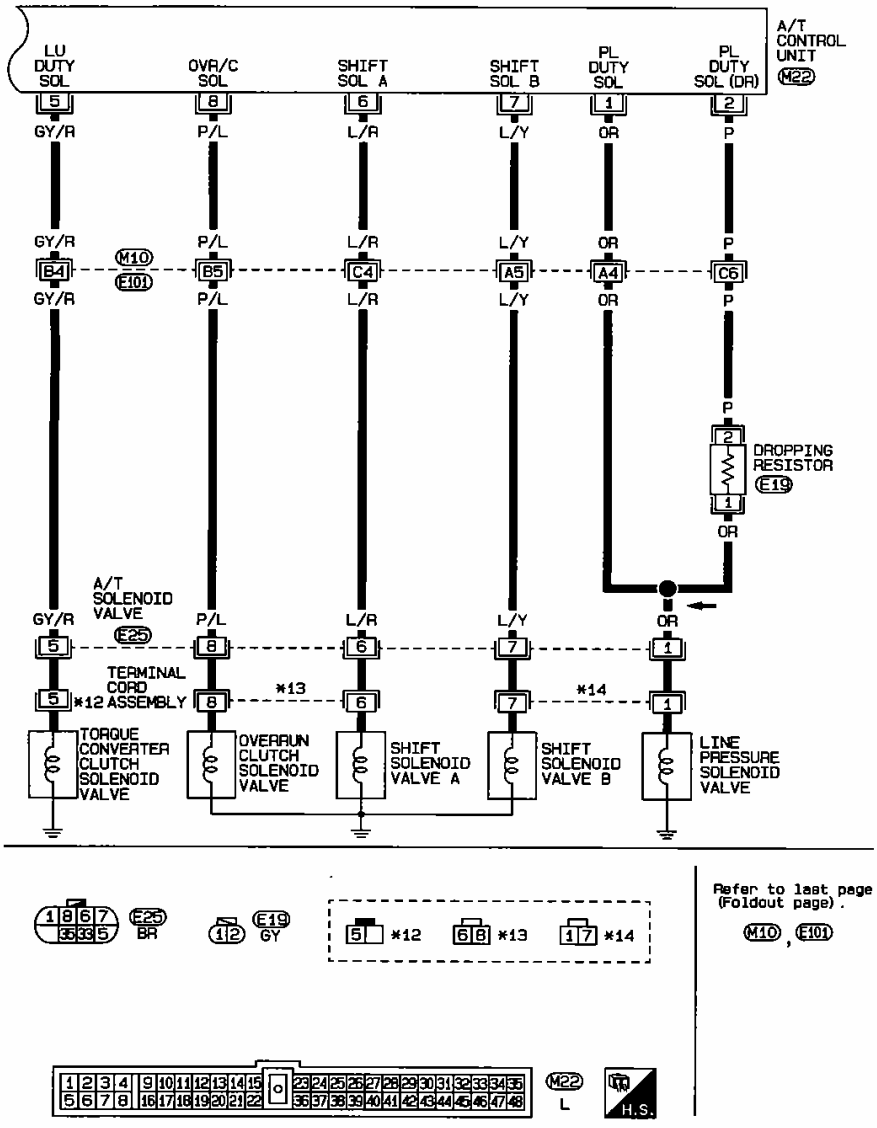
M10, E101

HAT017

Wiring Diagram — AT — (Cont'd)

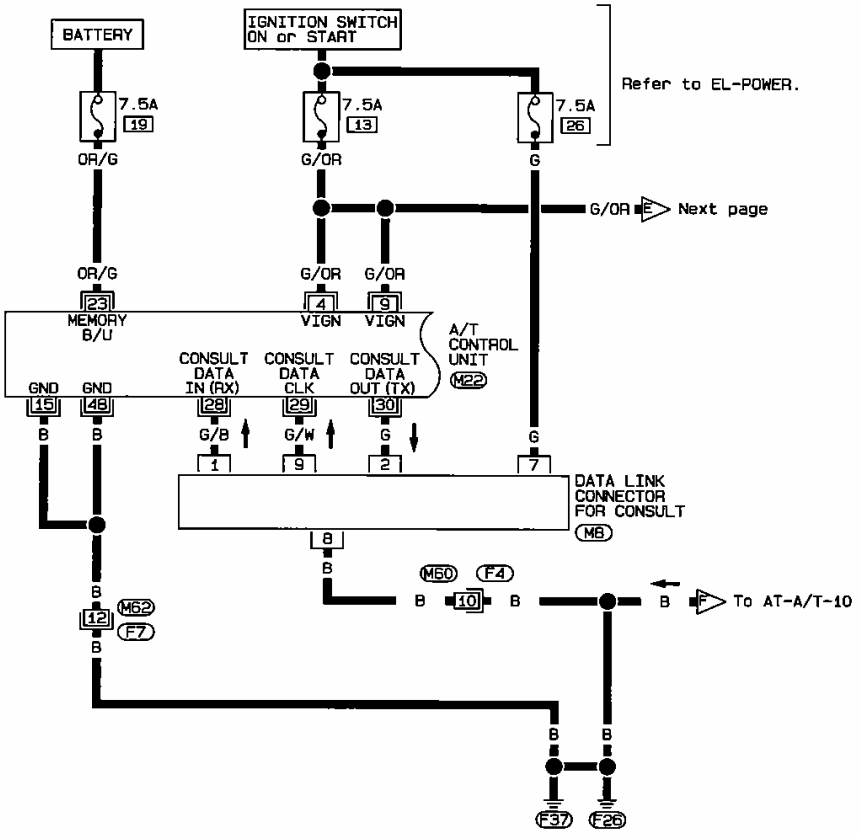
AT-A/T-06

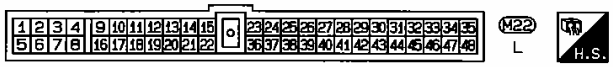


Wiring Diagram — AT — (Cont'd)

RHD MODELS

AT-A/T-07





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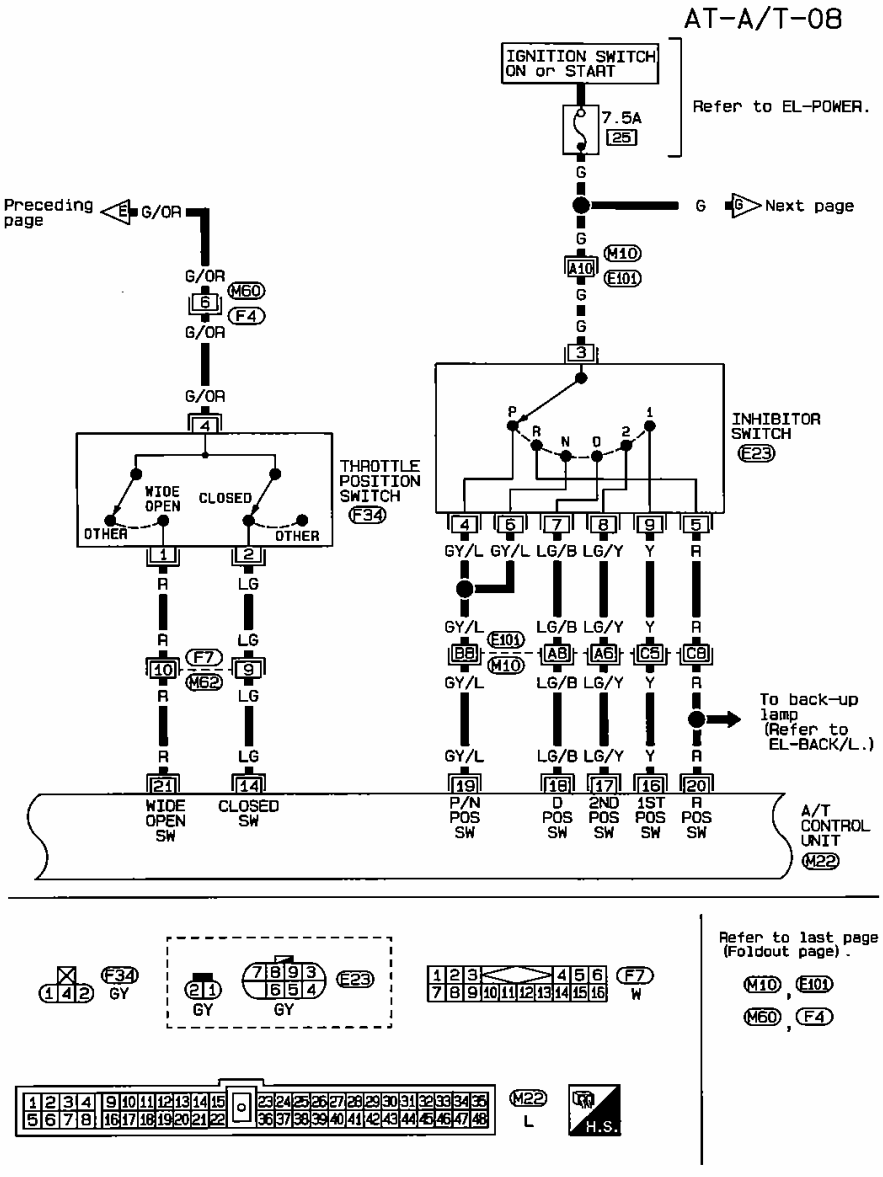
M60, F4

HAT010

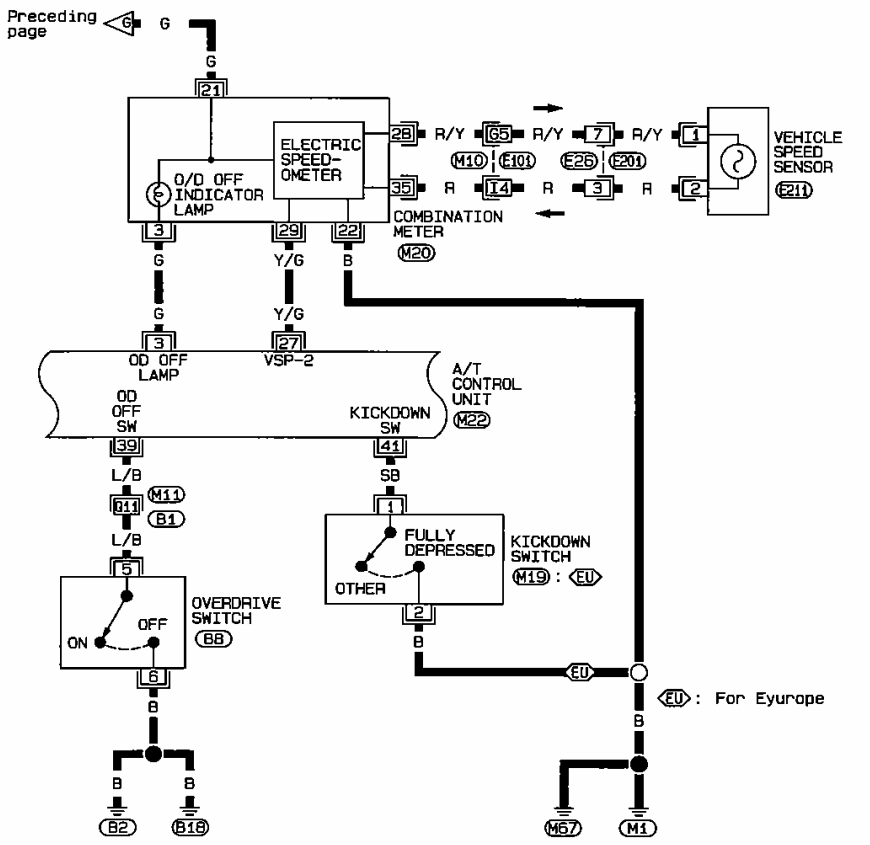
Wiring Diagram — AT — (Cont'd)

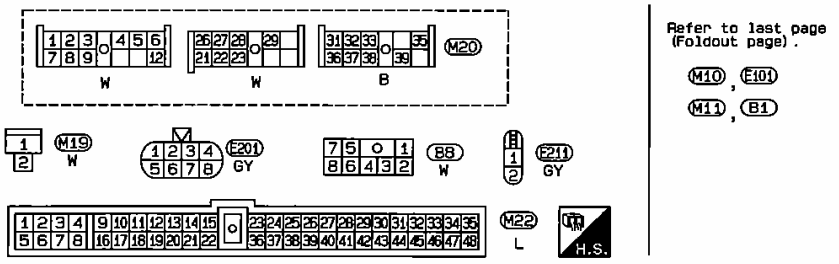


HAT020

Wiring Diagram — AT — (Cont'd)

AT-A/T-09





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M10, E101

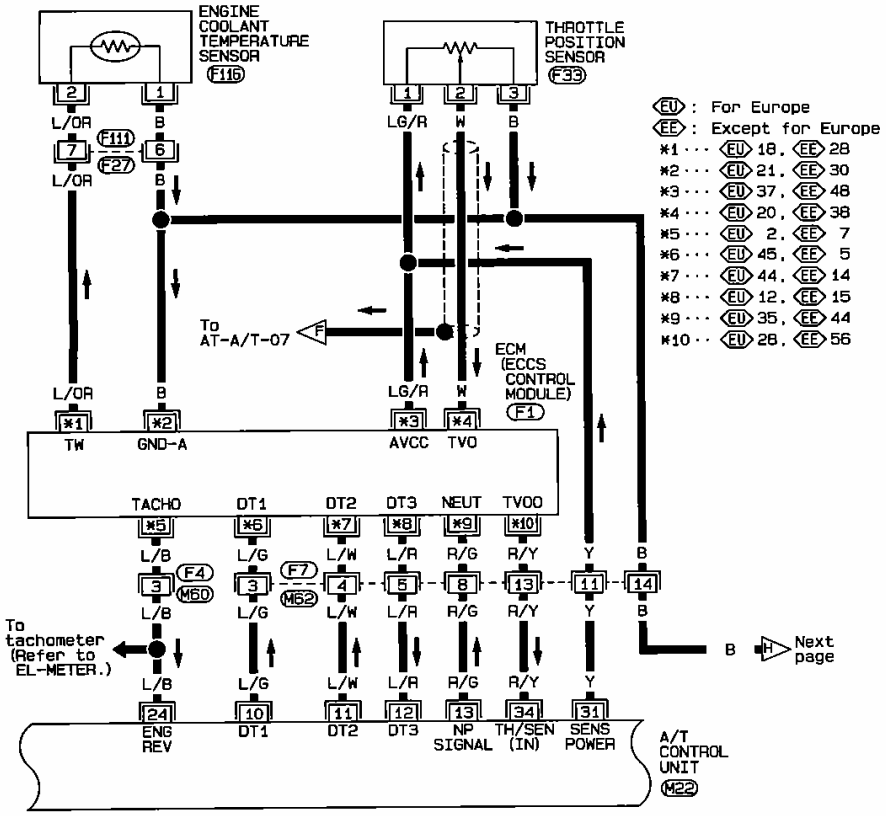
M11, B1

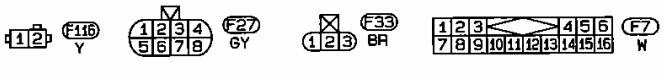
HAT021

AT

Wiring Diagram — AT — (Cont'd)

AT-A/T-10





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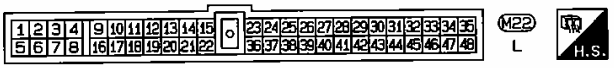
M60, F4

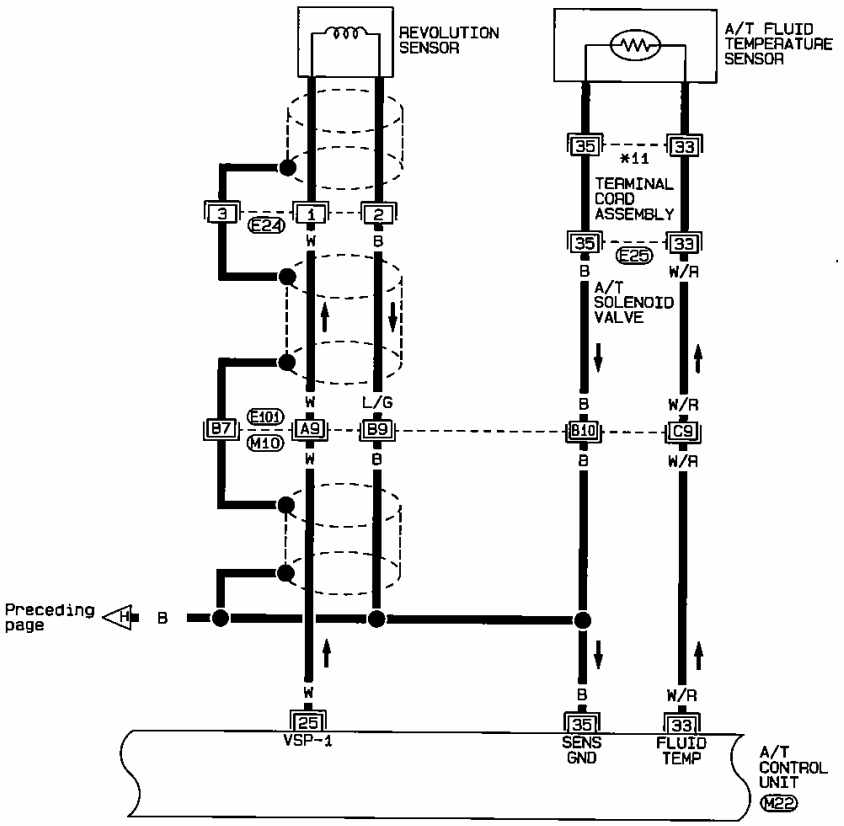
F1

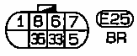


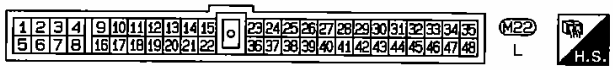
HAT022

Wiring Diagram — AT — (Cont'd)

AT-A/T-11







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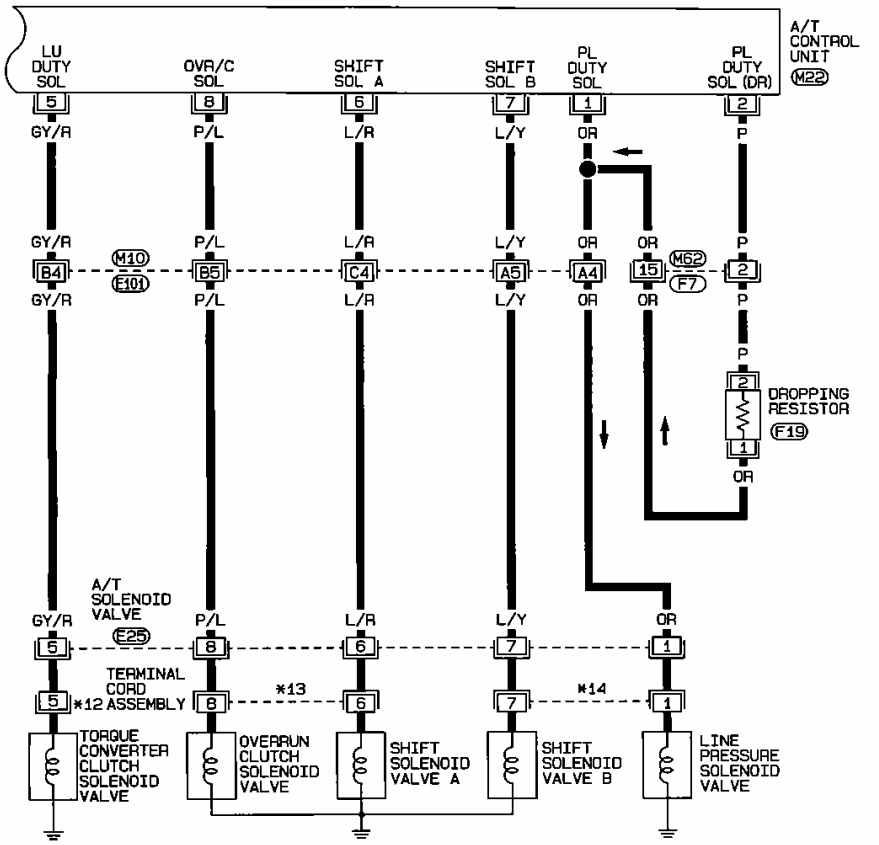
M10, E101

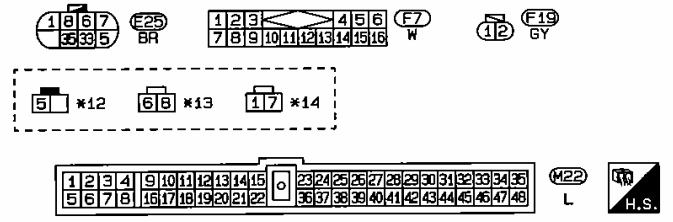
HAT023

AT

Wiring Diagram — AT — (Cont'd)

AT-A/T-12





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M10, E101

HAT024

General Specifications

Engine	SR20DET
Automatic transmission model	RE4R01A
Transmission model code number	42X65
Stall torque ratio	2.3 : 1
Transmission gear ratio	
1st	2.785
2nd	1.545
Top	1.000
OD	0.694
Reverse	2.272
Recommended oil	Genuine Nissan ATF or equivalent
Oil capacity ℓ (Imp qt)	7.9 (7)

Specifications and Adjustment

VEHICLE SPEED WHEN SHIFTING GEARS

Throttle position	Vehicle speed km/h (MPH)						
	$D_1 \rightarrow D_2$	$D_2 \rightarrow D_3$	$D_3 \rightarrow D_4$	$D_4 \rightarrow D_5$	$D_3 \rightarrow D_2$	$D_2 \rightarrow D_1$	$1_2 \rightarrow 1_1$
Full throttle	64 - 68 (40 - 42)	114 - 122 (71 - 76)	182 - 192 (113 - 119)	176 - 186 (109 - 116)	103 - 111 (64 - 69)	40 - 44 (25 - 27)	46 - 50 (29 - 31)
Half throttle	51 - 55 (32 - 34)	93 - 99 (58 - 62)	146 - 154 (91 - 96)	87 - 95 (54 - 59)	39 - 45 (24 - 28)	10 - 14 (6 - 9)	46 - 50 (29 - 31)

AT

VEHICLE SPEED WHEN PERFORMING AND RELEASING LOCK-UP

Throttle position	OD switch [Shift position]	Vehicle speed km/h (MPH)	
		Lock-up "ON"	Lock-up "OFF"
Full throttle	ON [D_4]	183 - 191 (114 - 119)	177 - 185 (110 - 115)
	OFF [D_3]	91 - 99 (57 - 62)	86 - 94 (53 - 58)
Half throttle	ON [D_4]	146 - 154 (91 - 96)	122 - 130 (76 - 81)
	OFF [D_3]	92 - 100 (57 - 62)	86 - 94 (53 - 58)

STALL REVOLUTION

Stall revolution rpm
2,725 - 2,975

LINE PRESSURE

Engine speed rpm	Line pressure kPa (bar, kg/cm², psi)	
	D, 2 and 1 positions	R position
Idle	432 - 471 (4.320 - 4.710, 4.41 - 4.80, 62.6 - 68.3)	676.7 - 715.0 (6.767 - 7.150, 6.90 - 7.29, 98.1 - 103.7)
Stall	1,039 - 1,118 (10.390 - 11.180, 10.60 - 11.40, 150.7 - 162.1)	1,480 - 1,558 (14.800 - 15.580, 15.10 - 15.89, 214.6 - 225.9)

Specifications and Adjustment (Cont'd)

RETURN SPRINGS

Unit: mm (in)

Parts			Part No.	Free length	Outer diameter
Control valve	Upper body	① Torque converter relief valve spring	31742-41X23	38.0 (1.496)	9.0 (0.354)
		② Pressure regulator valve spring	31742-41X24	44.0 (1.732)	14.0 (0.551)
		③ Pressure modifier valve spring	31742-41X19	31.95 (1.2579)	6.8 (0.268)
		④ Shuttle shift valve D spring	31762-41X00	26.5 (1.043)	6.0 (0.236)
		⑤ 4-2 sequence valve spring	31756-41X00	29.1 (1.146)	6.95 (0.2736)
		⑥ Shift valve B spring	31762-41X01	25.0 (0.984)	7.0 (0.276)
		⑦ 4-2 relay valve spring	31756-41X00	29.1 (1.146)	6.95 (0.2736)
		⑧ Shift valve A spring	31762-41X01	25.0 (0.984)	7.0 (0.276)
		⑨ Overrun clutch control valve spring	31762-41X03	23.6 (0.929)	7.0 (0.276)
		⑩ Overrun clutch reducing valve spring	31742-41X20	32.5 (1.280)	7.0 (0.276)
		⑪ Shuttle shift valve S spring	31762-41X04	51.0 (2.008)	5.65 (0.2224)
		⑫ Pilot valve spring	31742-41X13	25.7 (1.012)	9.1 (0.358)
		⑬ Lock-up control valve spring	31742-41X22	18.5 (0.728)	13.0 (0.512)
	Lower body	① Modifier accumulator piston spring	31742-27X70	31.4 (1.236)	9.8 (0.386)
		② 1st reducing valve spring	31756-41X05	25.4 (1.000)	6.75 (0.2657)
		③ 3-2 timing valve spring	31742-41X06	23.0 (0.906)	6.7 (0.264)
		④ Servo charger valve spring	31742-41X06	23.0 (0.906)	6.7 (0.264)
Reverse clutch		16 pcs	31505-41X02	19.69 (0.7752)	11.6 (0.457)
High clutch		16 pcs	31505-21X03	22.1 (0.870)	11.6 (0.457)
Forward clutch (Overrun clutch)		20 pcs	31521-41X00 (Assembly)	35.77 (1.4083)	9.7 (0.382)
Low & reverse brake		18 pcs	31505-41X05	22.3 (0.878)	11.6 (0.457)
Band servo		Spring A	31605-41X05	45.6 (1.795)	34.3 (1.350)
		Spring B	31605-41X00	53.8 (2.118)	40.3 (1.587)
		Spring C	31605-41X01	29.7 (1.169)	27.6 (1.087)
Accumulator		Accumulator A	31605-41X02	43.0 (1.693)	—
		Accumulator B	31605-41X10	66.0 (2.598)	—
		Accumulator C	31605-41X09	45.0 (1.772)	—
		Accumulator D	31605-41X06	58.4 (2.299)	—

Specifications and Adjustment (Cont'd)

ACCUMULATOR O-RING

Accumulator	Diameter mm (in)			
	A	B	C	D
Small diameter end	29 (1.14)	32 (1.26)	45 (1.77)	29 (1.14)
Large diameter end	45 (1.77)	50 (1.97)	50 (1.97)	45 (1.77)

CLUTCHES AND BRAKES

Reverse clutch

Number of drive plates	2
Number of driven plates	2
Thickness of drive plate mm (in)	
Standard	2.0 (0.079)
Wear limit	1.8 (0.071)
Clearance mm (in)	
Standard	0.5 - 0.8 (0.020 - 0.031)
Allowable limit	1.2 (0.047)

Thickness of retaining plate	Thickness mm (in)	Part number
	4.8 (0.189)	31537-42X02
	5.0 (0.197)	31537-42X03
	5.2 (0.205)	31537-42X04
	5.4 (0.213)	31537-42X05
	5.6 (0.220)	31537-42X06

High clutch

Number of drive plates	5
Number of driven plates	5
Thickness of drive plate mm (in)	
Standard	1.6 (0.063)
Wear limit	1.4 (0.055)
Clearance mm (in)	
Standard	1.8 - 2.2 (0.071 - 0.087)
Allowable limit	3.0 (0.118)

Thickness of retaining plate	Thickness mm (in)	Part number
	3.4 (0.134)	31537-41X71
	3.6 (0.142)	31537-41X61
	3.8 (0.150)	31537-41X62
	4.0 (0.157)	31537-41X63
	4.2 (0.165)	31537-41X64
	4.4 (0.173)	31537-41X65
	4.6 (0.181)	31537-41X66
	4.8 (0.189)	31537-41X67

Forward clutch

Number of drive plates	7
Number of driven plates	7
Thickness of drive plate mm (in)	
Standard	1.6 (0.063)
Wear limit	1.4 (0.055)
Clearance mm (in)	
Standard	0.45 - 0.85 (0.0177 - 0.0335)
Allowable limit	1.85 (0.0728)

Thickness of retaining plate	Thickness mm (in)	Part number
	4.6 (0.181)	31537-42X13
	4.8 (0.189)	31537-42X14
	5.0 (0.197)	31537-42X15
	5.2 (0.205)	31537-42X16
	5.4 (0.213)	31537-42X17
	5.6 (0.220)	31537-42X18

Overrun clutch

Number of drive plates	3
Number of driven plates	5
Thickness of drive plate mm (in)	
Standard	2.0 (0.079)
Wear limit	1.8 (0.071)
Clearance mm (in)	
Standard	1.0 - 1.4 (0.039 - 0.055)
Allowable limit	2.0 (0.079)

Thickness of retaining plate	Thickness mm (in)	Part number
	4.2 (0.165)	31537-41X80
	4.4 (0.173)	31537-41X81
	4.6 (0.181)	31537-41X82
	4.8 (0.189)	31537-41X83
	5.0 (0.197)	31537-41X84

AT

Specifications and Adjustment (Cont'd)

Low & reverse brake		
Number of drive plates	8	
Number of driven plates	8	
Thickness of drive plate mm (in)		
Standard	2.0 (0.079)	
Wear limit	1.8 (0.071)	
Clearance mm (in)		
Standard	0.7 - 1.1 (0.028 - 0.043)	
Allowable limit	2.3 (0.091)	
Thickness of retaining plate	Thickness mm (in)	Part number
	6.2 (0.244)	31667-41X15
	6.4 (0.252)	31667-41X16
	6.6 (0.260)	31667-41X17
	6.8 (0.268)	31667-41X11
	7.0 (0.276)	31667-41X12
	7.2 (0.283)	31667-41X13
Brake band		
Anchor end bolt tightening torque N·m (kg-m, in-lb)	4 - 6 (0.4 - 0.6, 35 - 52)	
Number of returning revolutions for anchor end bolt	2.5	

OIL PUMP AND LOW ONE-WAY CLUTCH

Oil pump clearance mm (in)	
Cam ring — oil pump housing	
Standard	0.01 - 0.024 (0.0004 - 0.0009)
Rotor, vanes and control piston — oil pump housing	
Standard	0.03 - 0.044 (0.0012 - 0.0017)
Seal ring clearance mm (in)	
Standard	0.10 - 0.25 (0.0039 - 0.0098)
Allowable limit	0.25 (0.0098)

TOTAL END PLAY

Total end play "T_1"	0.25 - 0.55 mm (0.0098 - 0.0217 in)	
Thickness of oil pump cover bearing race	Thickness mm (in)	Part number
	0.8 (0.031)	31435-41X01
	1.0 (0.039)	31435-41X02
	1.2 (0.047)	31435-41X03
	1.4 (0.055)	31435-41X04
	1.6 (0.063)	31435-41X05
	1.8 (0.071)	31435-41X06
	2.0 (0.079)	31435-41X07

REVERSE CLUTCH DRUM END PLAY

Reverse clutch drum end play "T_2"	0.55 - 0.90 mm (0.0217 - 0.0354 in)	
Thickness of oil pump thrust washer	Thickness mm (in)	Part number
	0.9 (0.035)	31528-21X01
	1.1 (0.043)	31528-21X02
	1.3 (0.051)	31528-21X03
	1.5 (0.059)	31528-21X04
	1.7 (0.067)	31528-21X05
	1.9 (0.075)	31528-21X06

REMOVAL AND INSTALLATION

Manual control linkage	
Number of returning revolutions for lock nut	1
Lock nut tightening torque	11 - 15 N·m (1.1 - 1.5 kg-m, 8 - 11 ft-lb)
Distance between end of clutch housing and torque converter	23.5 mm (0.925 in) or more

FRONT AXLE & FRONT SUSPENSION

SECTION FA

MODIFICATION NOTICE:

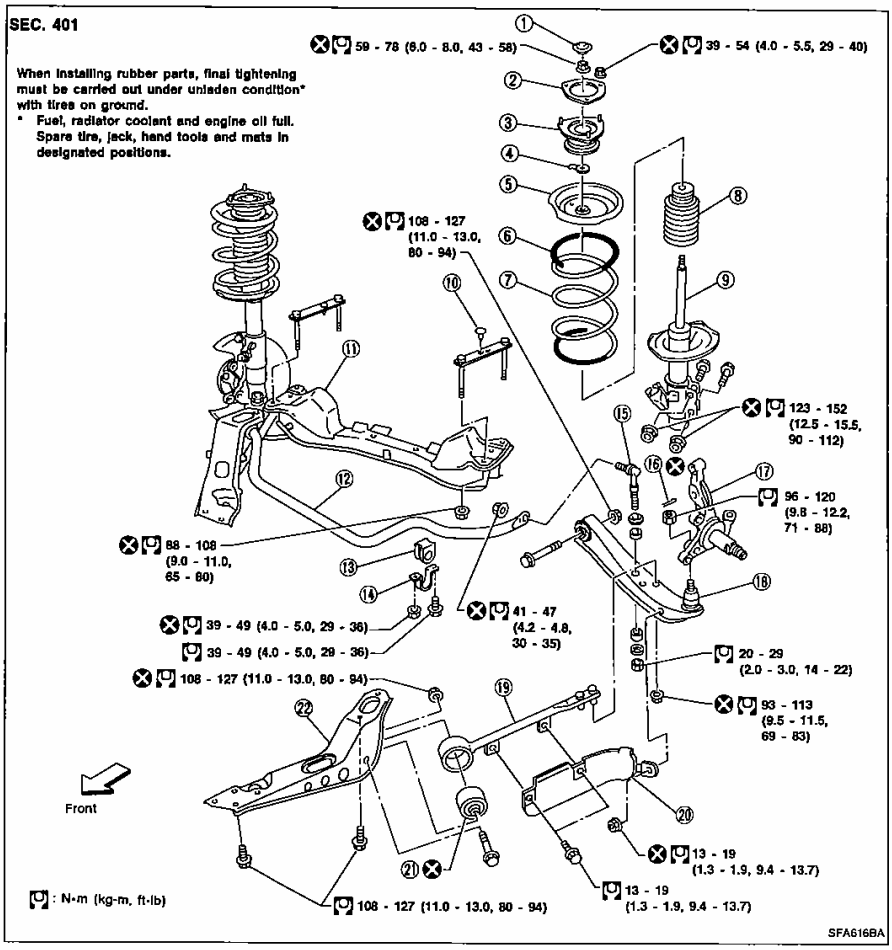
- The service data and specifications (SDS) have been changed.

CONTENTS

FRONT SUSPENSION 2

SERVICE DATA AND SPECIFICATIONS (SDS) 3

Inspection and Adjustment 3



① Cap
② Gasket
③ Strut mounting insulator
④ Lock washer
⑤ Upper seat
⑥ (Polyurethane tube)
⑦ Coil spring
⑧ Bound bumper
⑨ Strut assembly
⑩ Plastic clip
⑪ Front suspension member
⑫ Stabilizer
⑬ Bushing
⑭ Clamp
⑮ Stabilizer connecting rod
⑯ Cotter pin
⑰ Knuckle spindle
⑱ Transverse link with ball joint
⑲ Tension rod
⑳ Air guide
㉑ Tension rod bushing
㉒ Tension rod bracket

Inspection and Adjustment

LOWER BALL JOINT

Swinging force "A" (Measuring point: cotter pin hole of ball stud) N (kg, lb)	7.8 - 54.9 (0.8 - 5.6, 1.8 - 12.3)
Turning torque "B" N·m (kg-cm, in-lb)	0.5 - 3.4 (5 - 35, 4.3 - 30.4)
Vertical end play "C" mm (in)	0 (0)

REAR AXLE & REAR SUSPENSION

SECTION RA

MODIFICATION NOTICE:

- The service data and specifications (SDS) have been changed.

CONTENTS

SERVICE DATA AND SPECIFICATIONS (SDS) 2
General Specifications 2

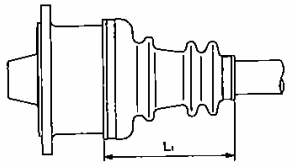
RA

General Specifications

DRIVE SHAFT

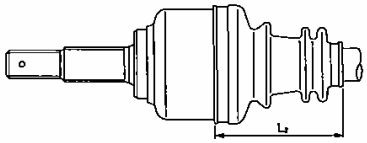
Joint type	
Final drive side	TS82F
Wheel side	TS82C
Grease name	
Final drive side	Nissan genuine grease or equivalent
Wheel side	Nissan genuine grease or equivalent
Specified amount of grease g (oz)	
Final drive side	102 - 107 (3.60 - 3.77)
Wheel side	115 - 125 (4.06 - 4.41)
Boot length mm (in)	
Final drive side (L_1)	95 - 97 (3.74 - 3.82)
Wheel side (L_2)	

Final drive side



SRA133A

Wheel side



SRA543A

SECTION BR

MODIFICATION NOTICE:

- The anti-lock brake system wiring diagrams have been changed.
- The service data and specifications (SDS) have been changed.

CONTENTS

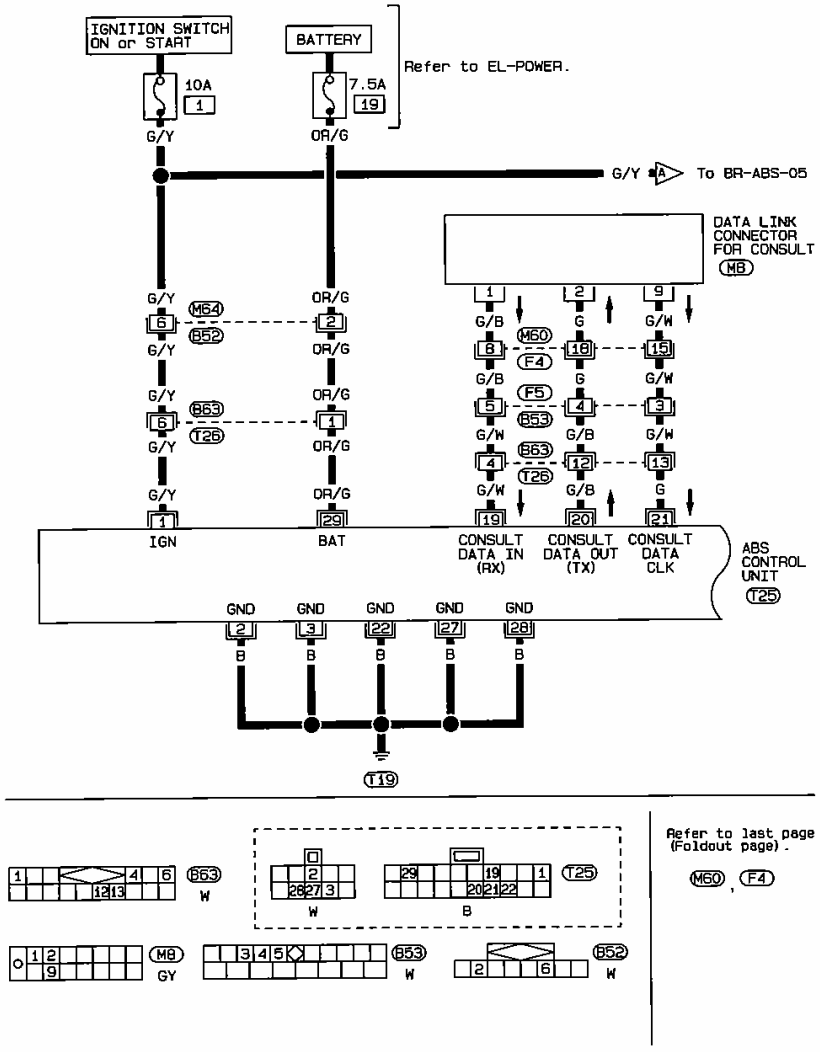
ANTI-LOCK BRAKE SYSTEM 2
Wiring Diagram — ABS — 2

SERVICE DATA AND SPECIFICATIONS (SDS) 12
General Specifications 12
Inspection and Adjustment 12

Wiring Diagram — ABS —

LHD MODELS

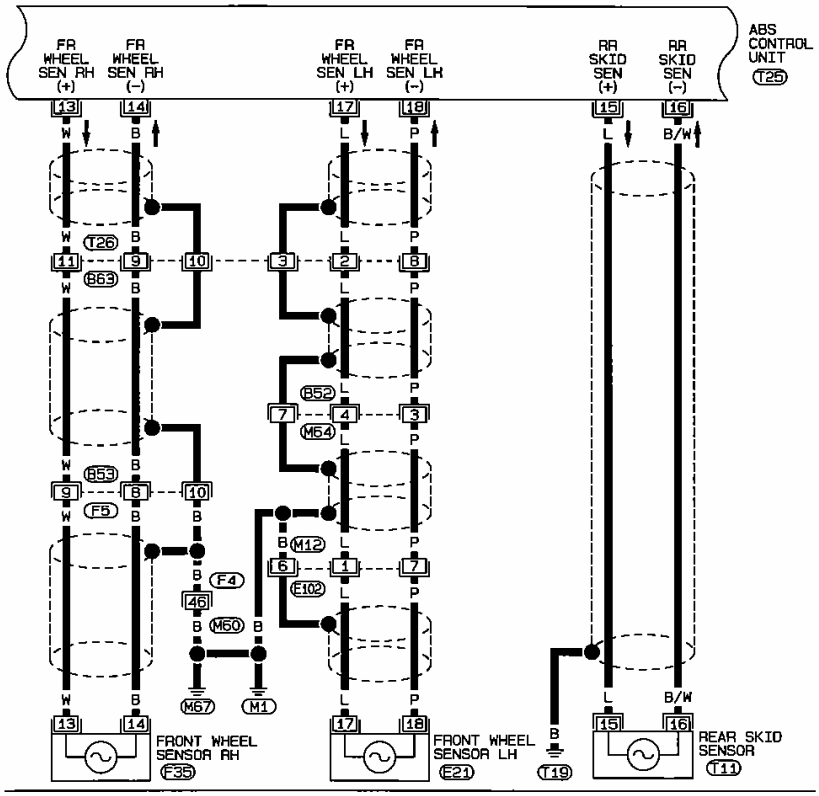
BR-ABS-01

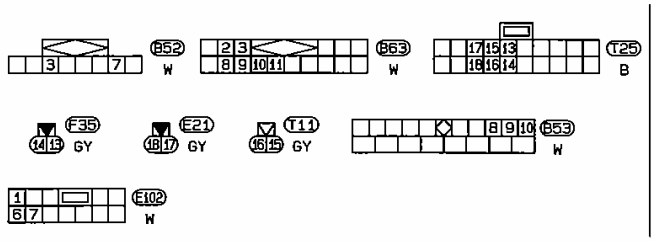


HBR014

Wiring Diagram — ABS — (Cont'd)

BR-ABS-02





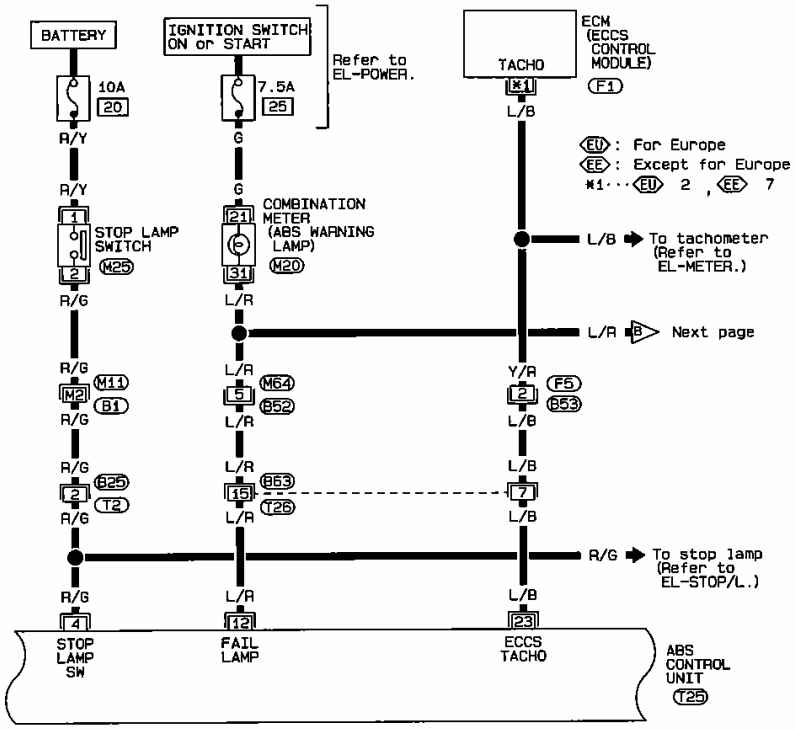
Refer to last page (Foldout page).
M60, F4

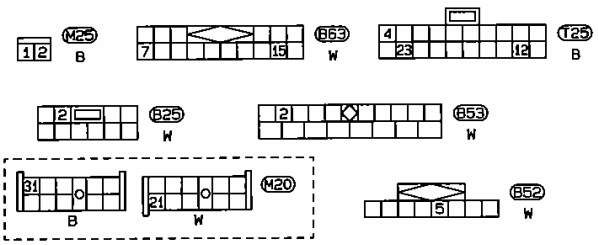
BR

HBR015

Wiring Diagram — ABS — (Cont'd)

BR-ABS-03

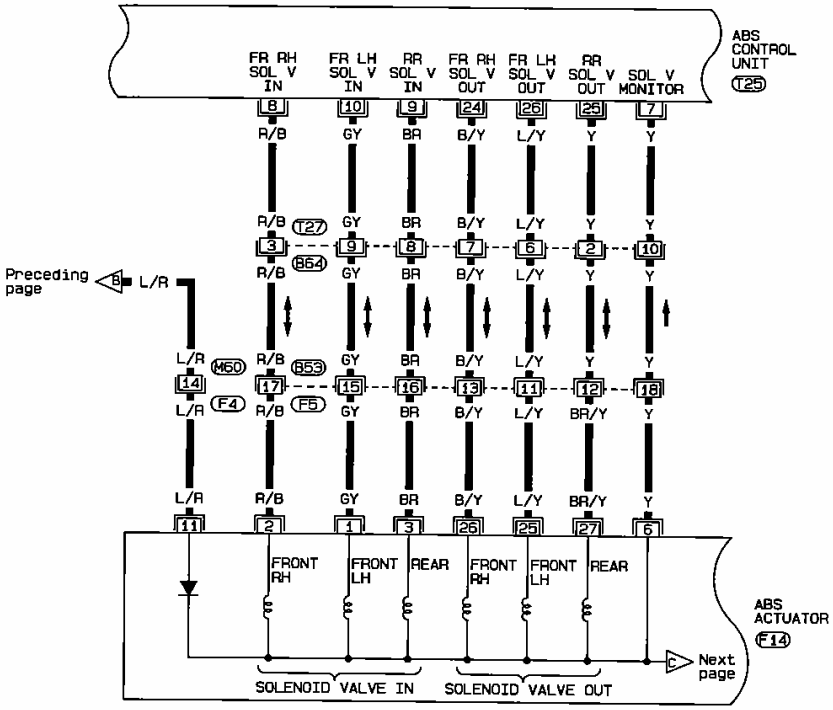


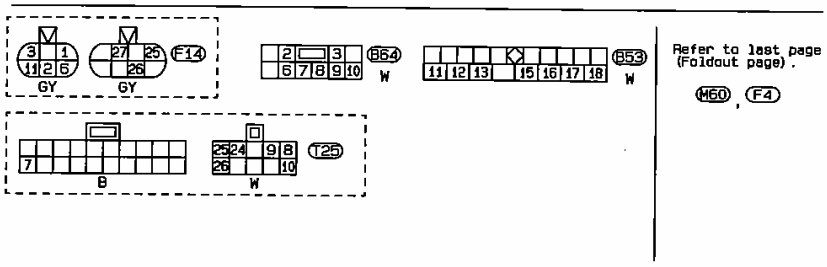


HBR016

Wiring Diagram — ABS — (Cont'd)

BR-ABS-04

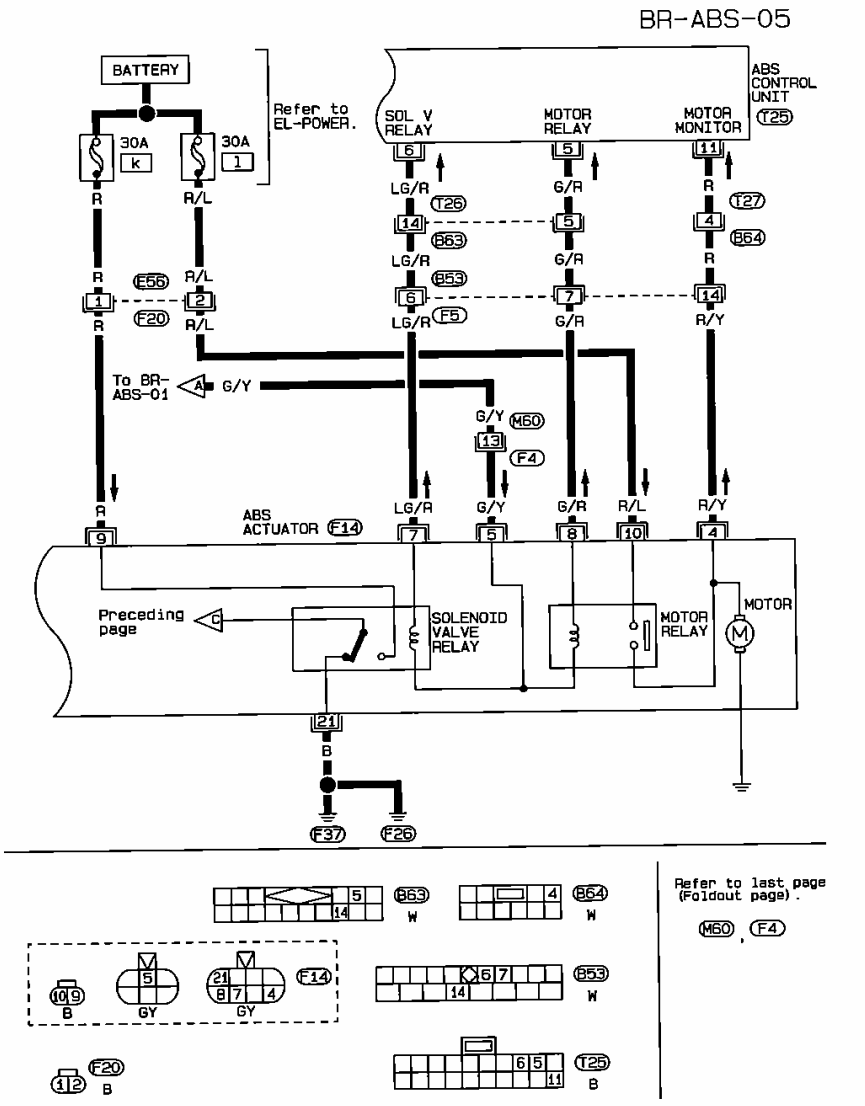




SBR004D

BR

Wiring Diagram — ABS — (Cont'd)

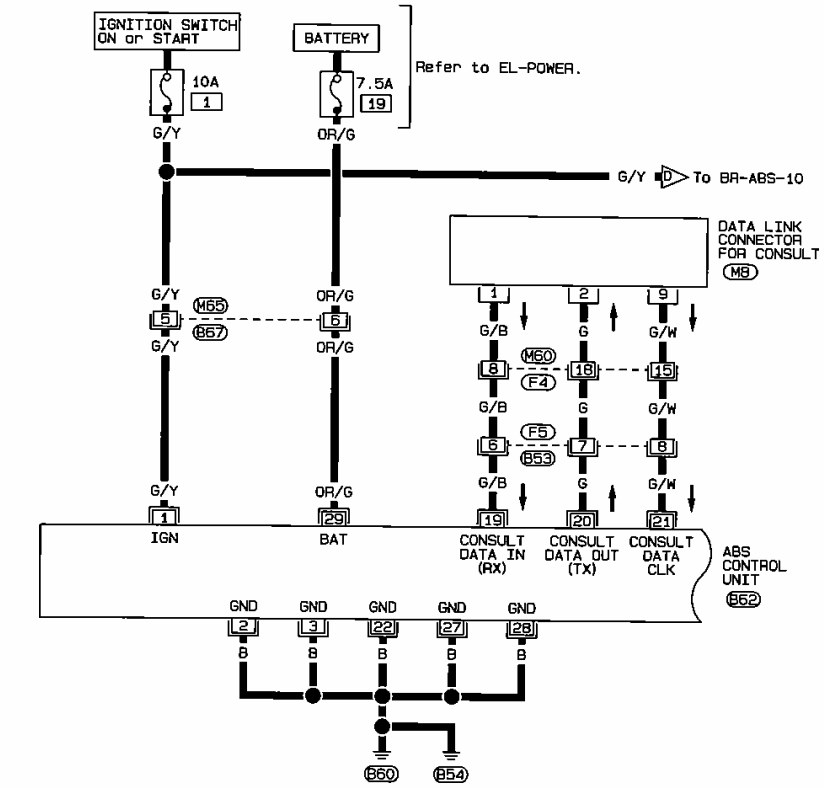


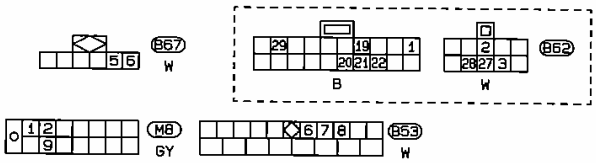
SBR005D

Wiring Diagram — ABS — (Cont'd)

RHD MODELS

BR-ABS-06





Refer to last page (Foldout page).

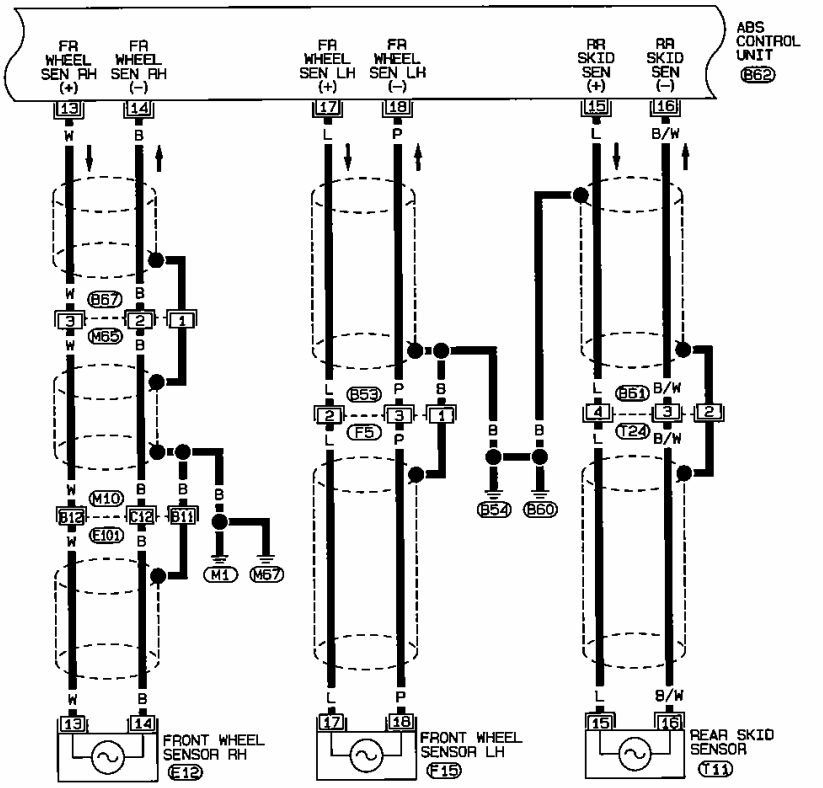
M60, F4

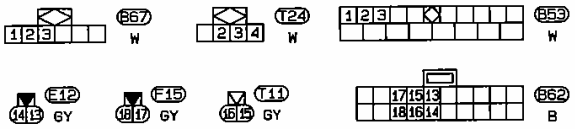
BR

HBR017

Wiring Diagram — ABS — (Cont'd)

BR-ABS-07





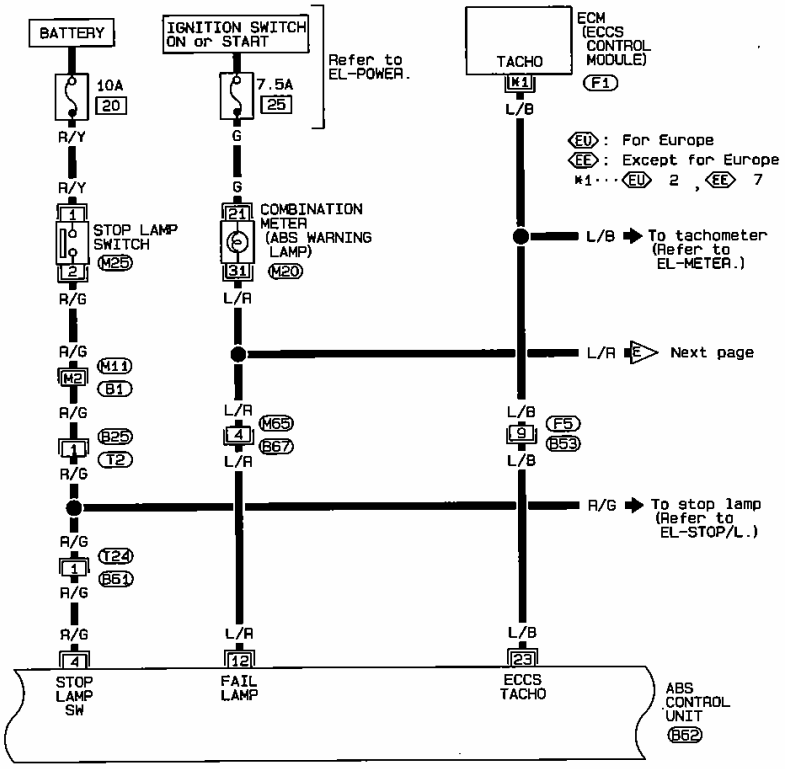
Refer to last page (Foldout page).

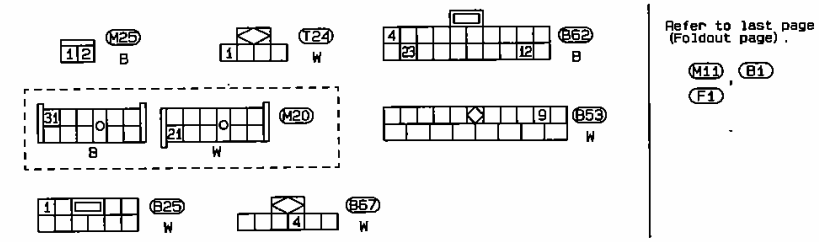
M10, E101

HBR018

Wiring Diagram — ABS — (Cont'd)

BR-ABS-08





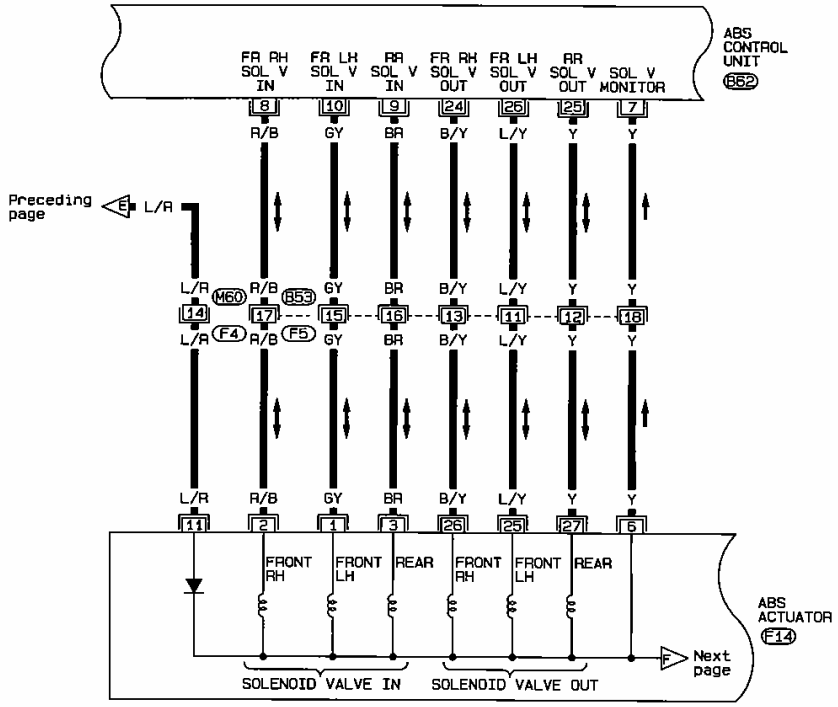
Refer to last page (Foldout page).
M11, B1
F1

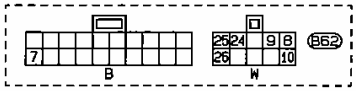
BR

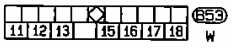
H6R019

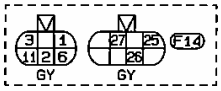
Wiring Diagram — ABS — (Cont'd)

BR-ABS-09









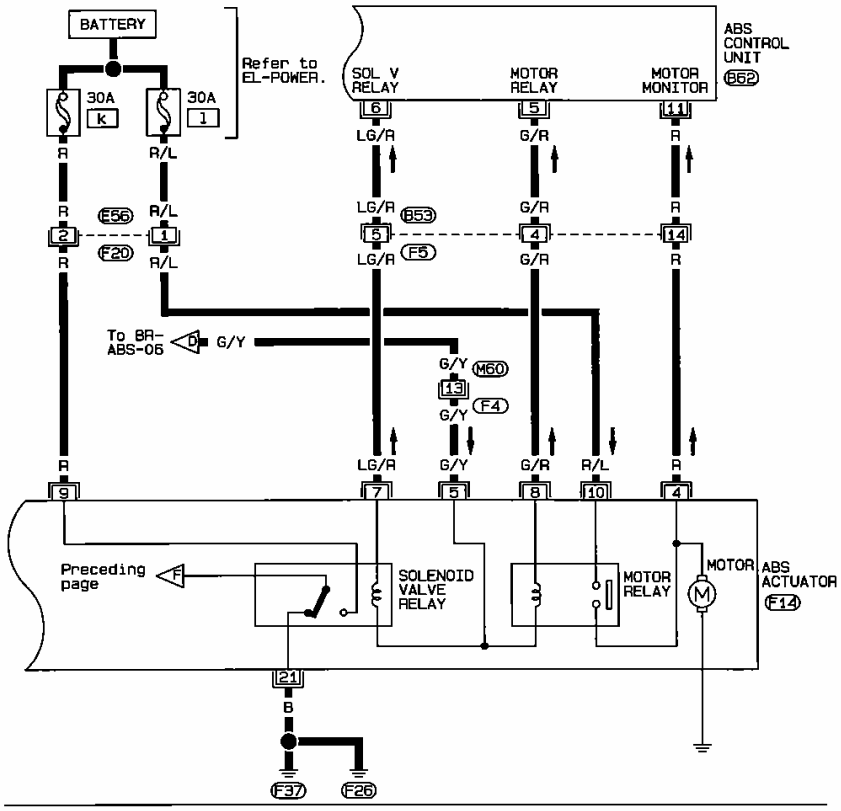
Refer to last page (Foldout page).

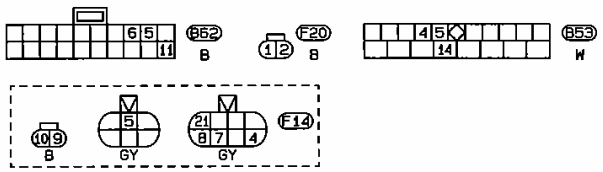
M60, F4

SBR009D

Wiring Diagram — ABS — (Cont'd)

BR-ABS-10





Refer to last page (Foldout page).

M60, F4

SBR010D

BR

General Specifications

Front brake	
Brake model	OPF25VA disc brake
Cylinder bore diameter mm (in)	40.4 (1.59) x 2
Pad mm (in) Length x width x thickness	116.0 x 50.0 x 10.0 (4.57 x 1.969 x 0.394)
Rotor outer diameter x thickness mm (in)	280 x 30 (11.02 x 1.18)
Rear brake	
Brake model	CL11H disc brake
Cylinder bore diameter mm (in)	38.18 (1.5031)
Pad mm (in) Length x width x thickness	75.0 x 40.0 x 9.5 (2.953 x 1.575 x 0.374)
Rotor outer diameter x thickness mm (in)	258 x 9 (10.16 x 0.35)

	Without ABS	With ABS
Master cylinder		
Cylinder bore diameter mm (in)	23.81 (15/16)	25.40 (1)
Control valve		
Valve model	Proportioning valve (built into master cylinder)	
Split point kPa (bar, kg/cm^2, psi) x reducing ratio	3,923 (39.2, 40, 569) x 0.4	
Brake booster		
Booster model	M23 or G23	M195T
Diaphragm diameter mm (in)	230 (9.06)	Primary: 205 (8.07) Secondary: 180 (7.09)
Recommended brake fluid		
For Europe*	DOT3 or DOT4	
Except for Europe	DOT 3	

*For Europe, never mix different type brake fluids (DOT3 and DOT4).

Inspection and Adjustment

DISC BRAKE

Brake model	OPF25VA	CL11H
Pad wear limit mm (in)		
Minimum thickness	2.0 (0.079)	
Rotor repair limit mm (in)		
Minimum thickness	28 (1.10)	8 (0.31)

BRAKE PEDAL

Vehicle model	LHD	RHD
Free height "H" mm (in)		
M/T	181 - 191 (7.13 - 7.52)	179 - 189 (7.05 - 7.44)
A/T	191 - 201 (7.52 - 7.91)	189 - 199 (7.44 - 7.83)
Depressed height "D" mm (in) [under force of 490 N (50 kg, 110 lb) with engine running]		
M/T	120 (4.72) 130 (5.12)*	
A/T	130 (5.12) 135 (5.31)*	
Clearance "C" between pedal stopper and threaded end of stop lamp switch or ASCD swith mm (in)	0.3 - 1.0 (0.012 - 0.039)	

*Without ABS for Australia

PARKING BRAKE

Type	Center lever
Number of notches [under force of 196 N (20 kg, 44 lb)]	7 - 9
Number of notches when warning lamp switch comes on	1

SECTION RS

MODIFICATION NOTICE:
Wiring diagrams have been changed.

CONTENTS

PRECAUTION 2
Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER" 2
TROUBLE DIAGNOSES — Supplemental Restraint System (SRS) 3
Wiring Diagram — SRS — 3

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

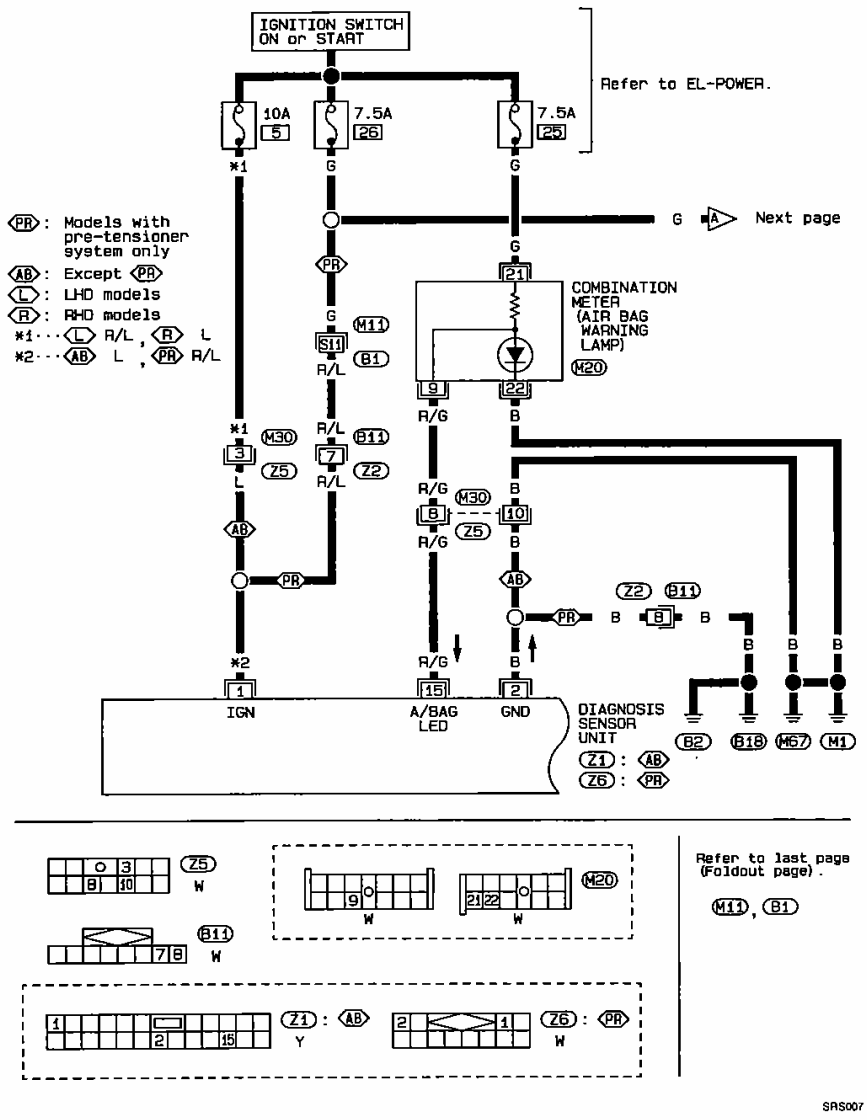
The Supplemental Restraint System "Air Bag" and "Seat Belt Pre-tensioner", used along with a seat belt, help to reduce the risk or severity of injury to the driver and front passenger in a frontal collision. The Supplemental Restraint System consists of air bag modules (located in the center of the steering wheel and on the instrument panel on the passenger side), seat belt pre-tensioners, a diagnosis sensor unit, warning lamp, wiring harness and spiral cable.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system.**
- **All SRS air bag electrical wiring harnesses and connectors are covered with yellow outer insulation. Do not use electrical test equipment on any circuit related to the SRS.**

Wiring Diagram — SRS —

RS-SRS-01

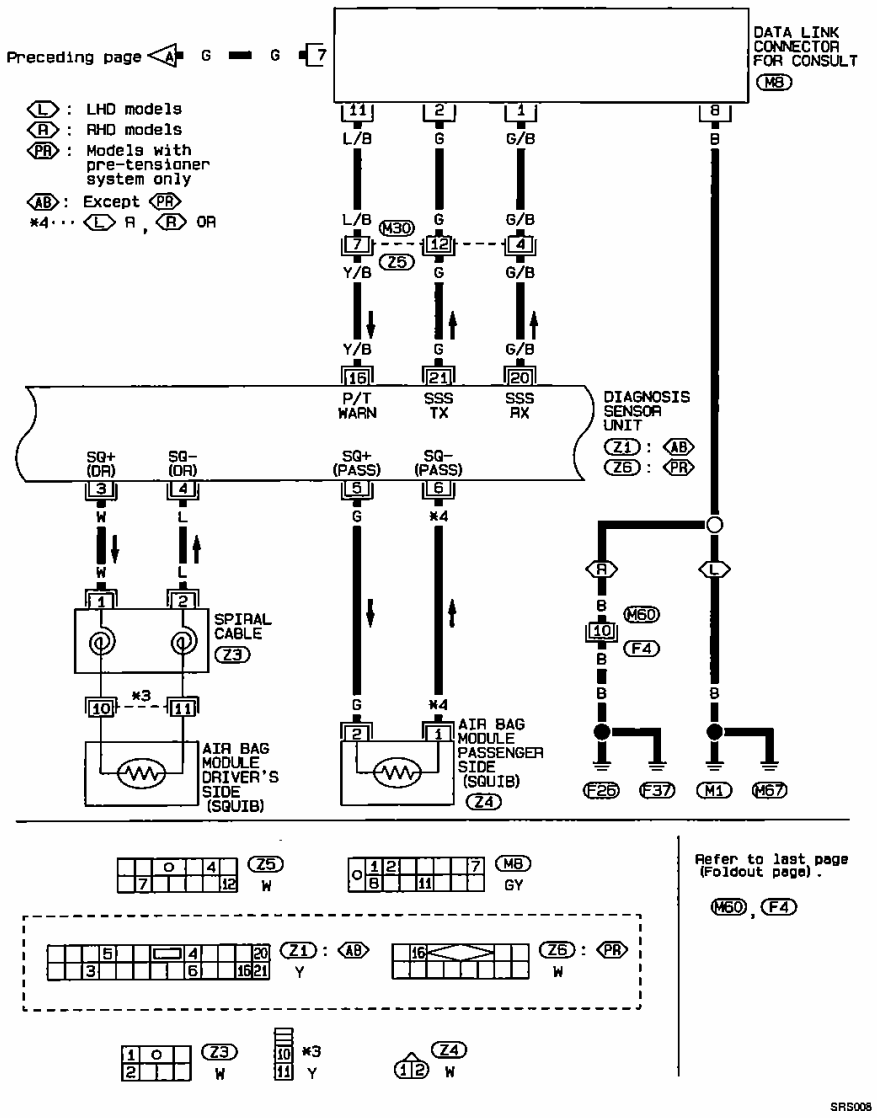


SRS007

RS

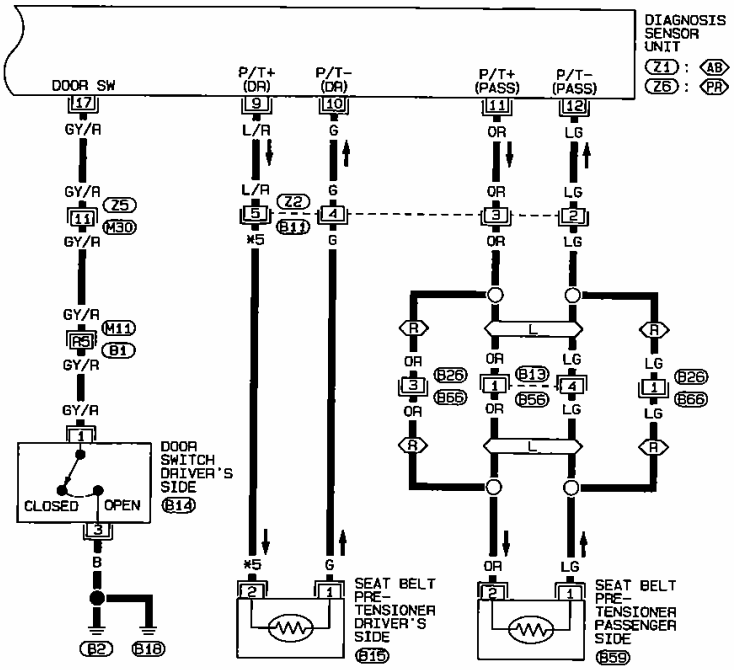
Wiring Diagram — SRS — (Cont'd)

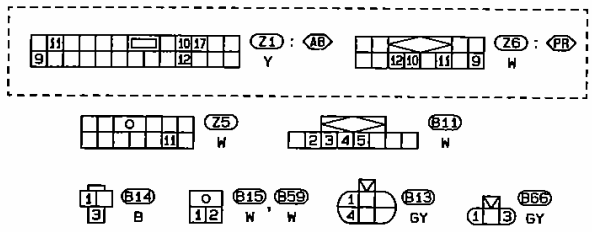
RS-SRS-02



Wiring Diagram — SRS — (Cont'd)

RS-SRS-03





Refer to last page (Foldout page).

M11, B1

RS

HRS011

HEATER & AIR CONDITIONER

SECTION HA

MODIFICATION NOTICE:

- On RHD models for Europe, the triple-pressure switch has been replaced by a dual-pressure switch.
- Wiring diagrams have been changed.

CONTENTS

MANUAL

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- Circuit Diagram — Manual Air Conditioner 2
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- Diagnostic Procedure 6 13
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AUTO

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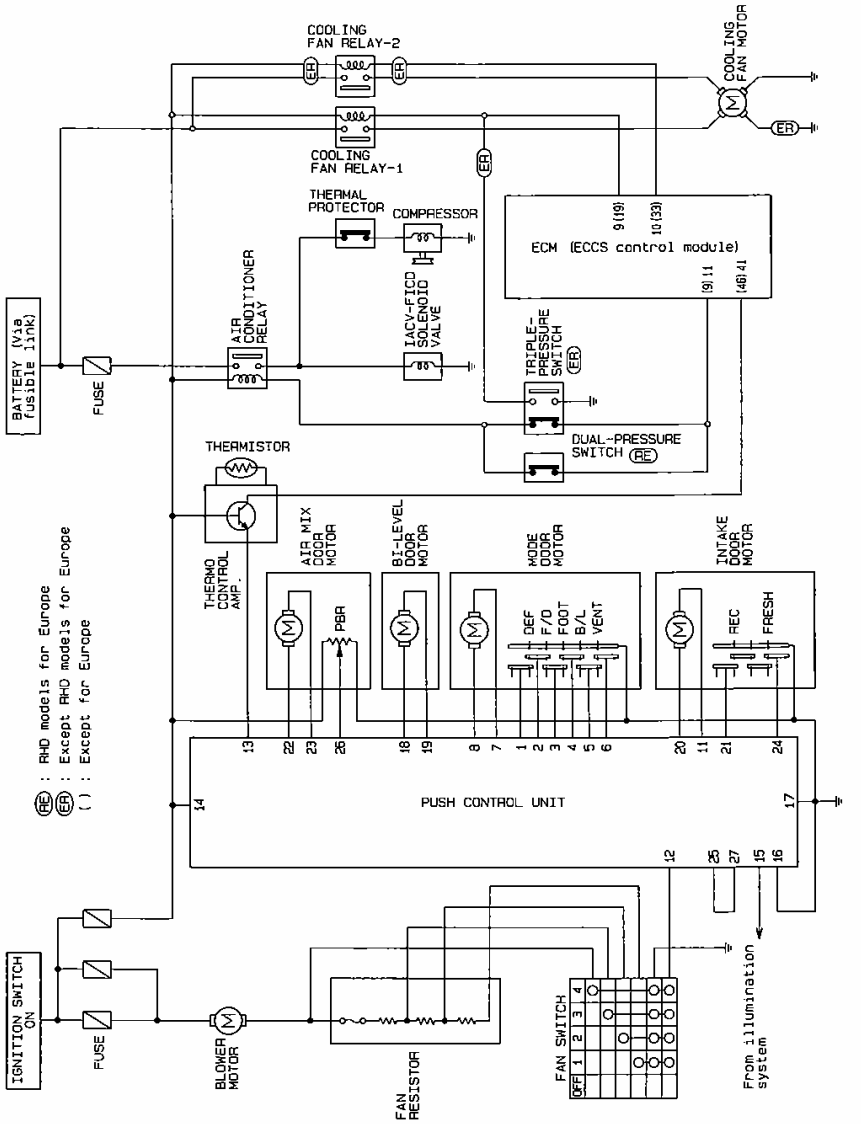
- Refrigerant Lines 24

SERVICE DATA AND SPECIFICATIONS (SDS) 25
- General Specifications 25
- Inspection and Adjustment 25

HA

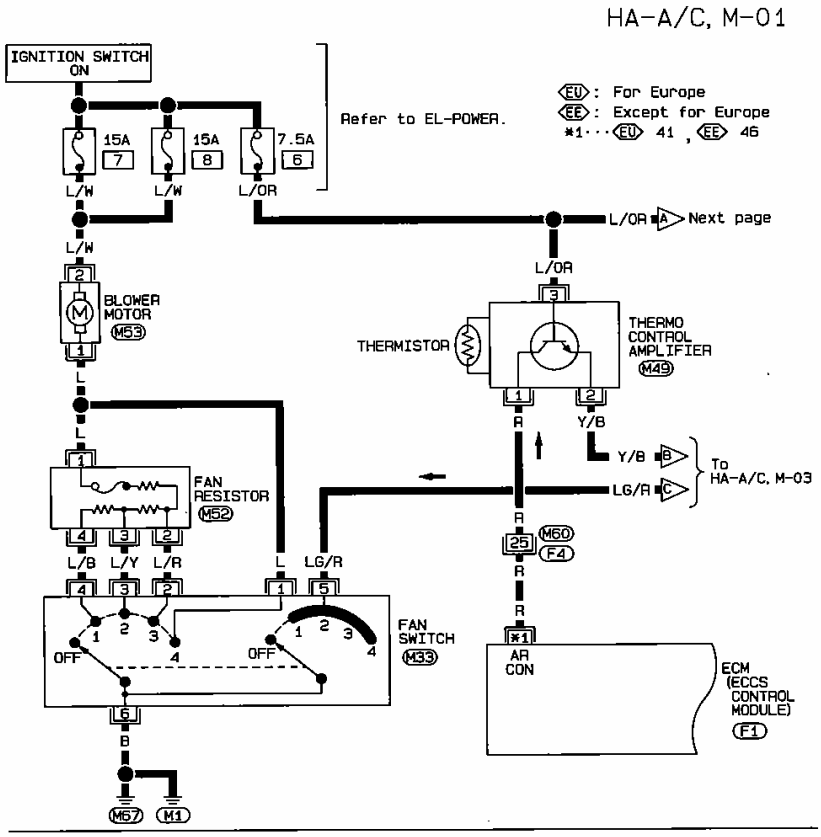
Circuit Diagram — Manual Air Conditioner



HHA034

Wiring Diagram — A/C, M —

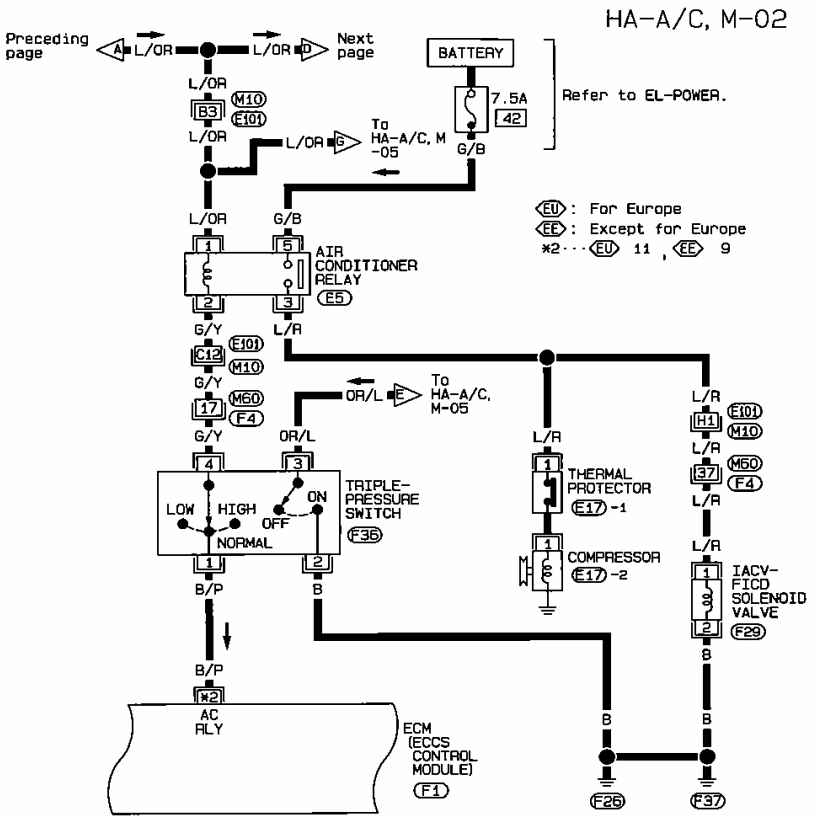
LHD MODEL



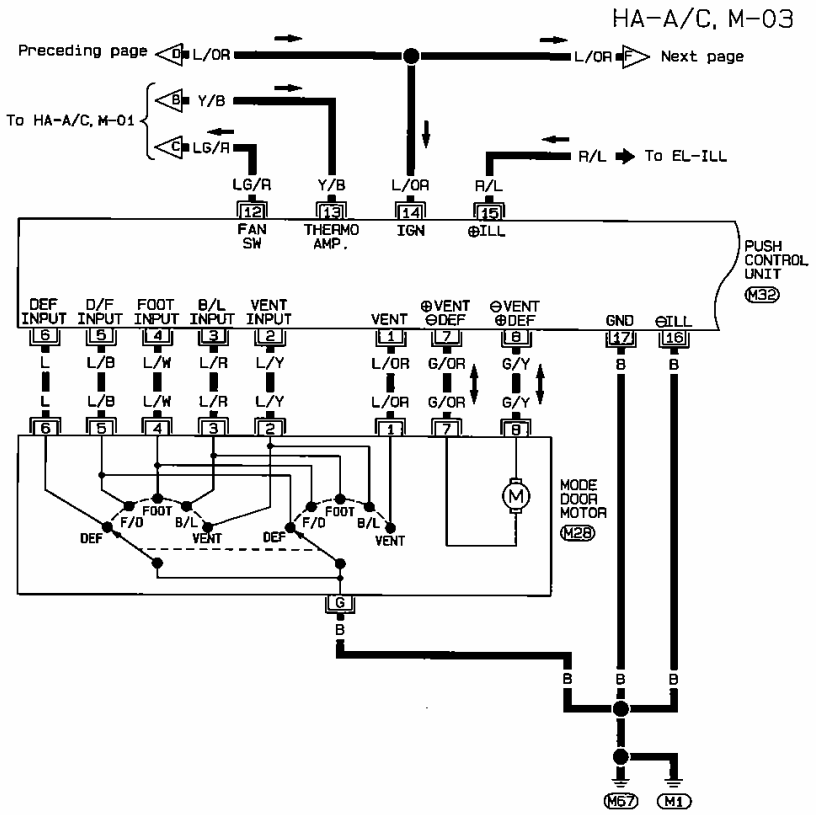
HA

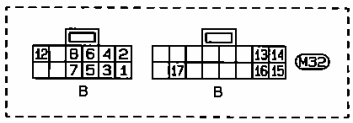
HHA035

Wiring Diagram — A/C, M — (Cont'd)



Wiring Diagram — A/C, M — (Cont'd)



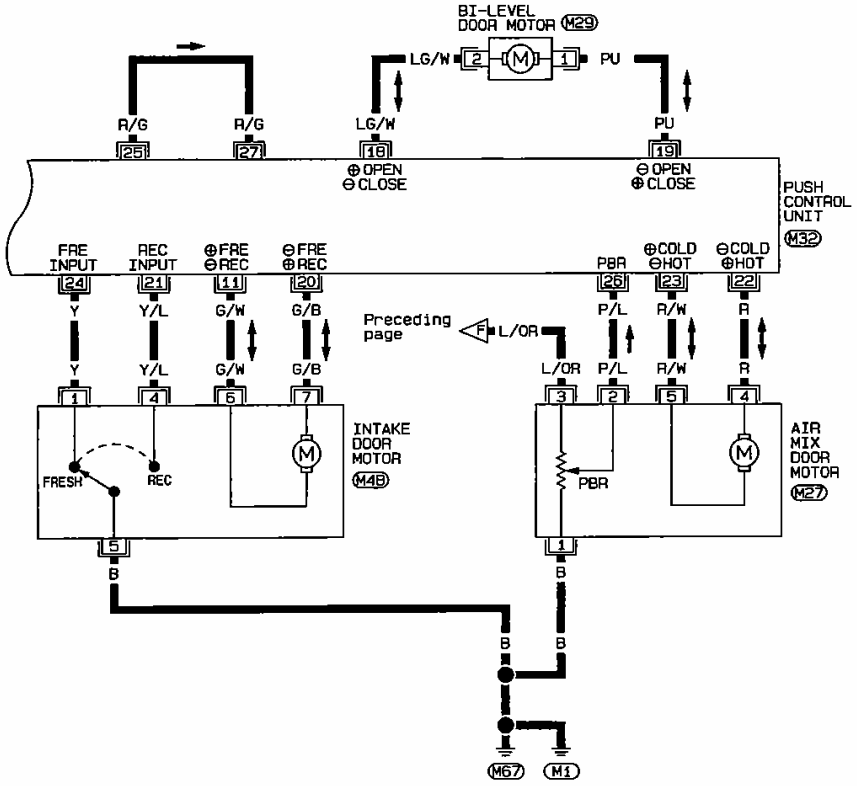


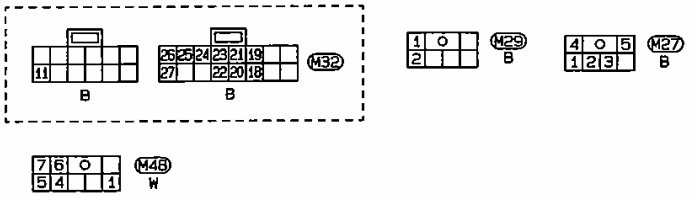
HA

HHA037

Wiring Diagram — A/C, M — (Cont'd)

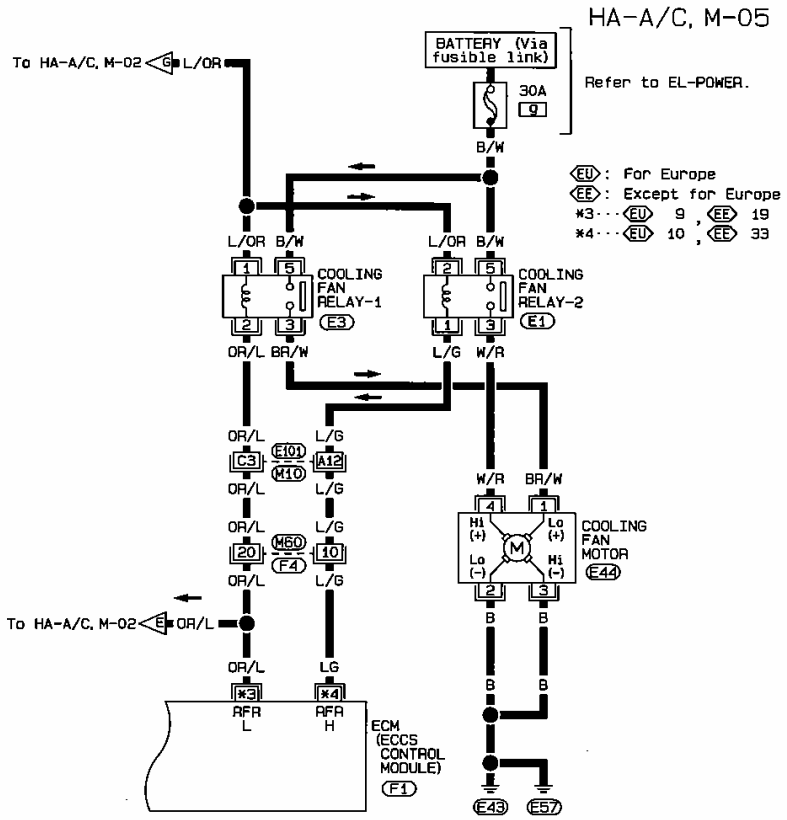
HA-A/C, M-04





SHA460E

Wiring Diagram — A/C, M — (Cont'd)



E1, E3 — L, L

E44 — GY

Refer to last page (Foldout page).

M10, E101

M60, F4

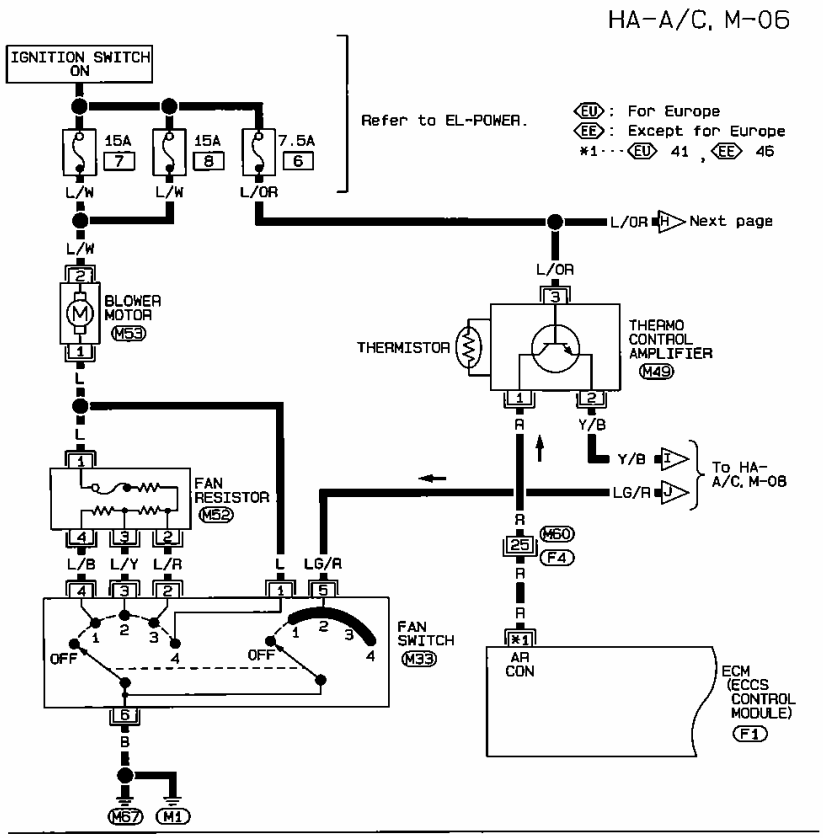
F1

HA

HHA038

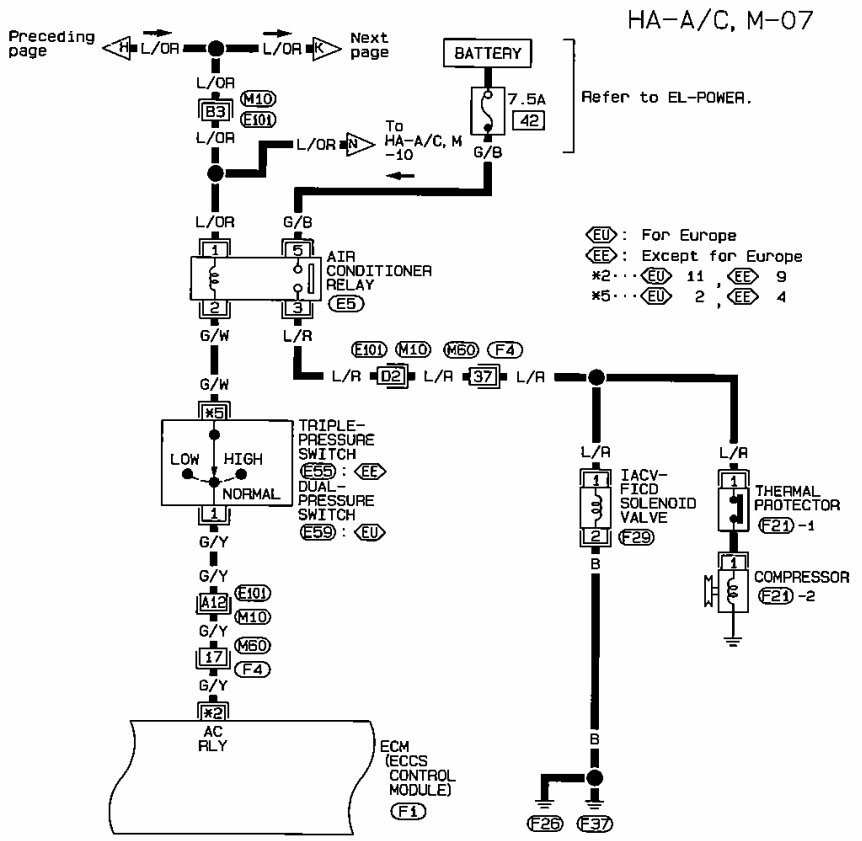
Wiring Diagram — A/C, M — (Cont'd)

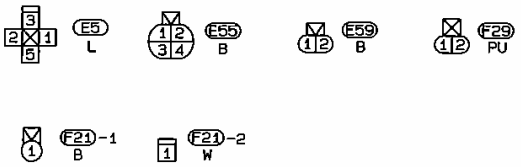
RHD MODEL



HHA039

Wiring Diagram — A/C, M — (Cont'd)





Refer to last page (Foldout page).

M10, E101

M60, F4

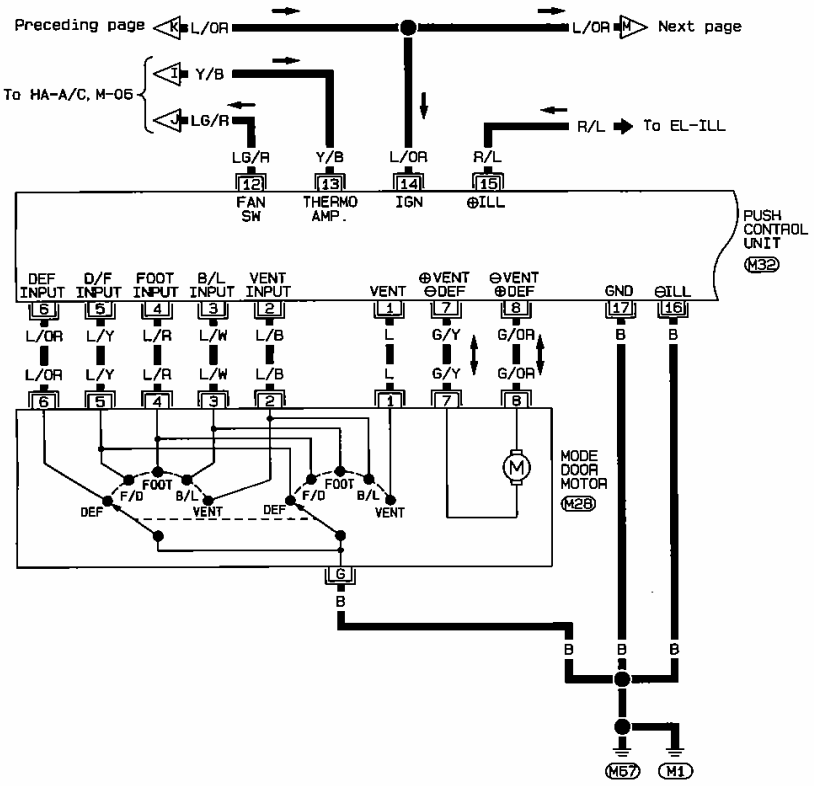
F1

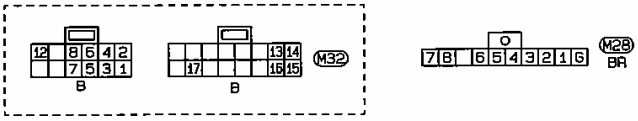
HA

HHA040

Wiring Diagram — A/C, M — (Cont'd)

HA-A/C, M-08

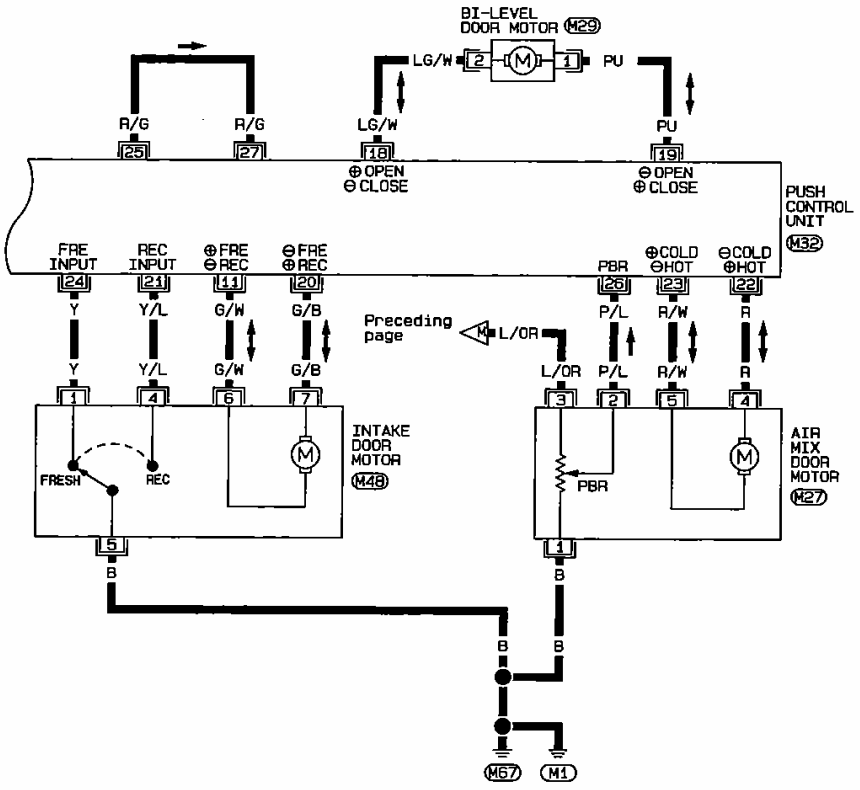


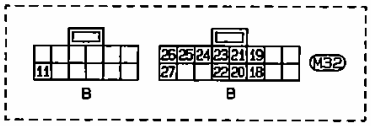


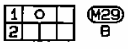
HHA041

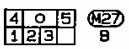
Wiring Diagram — A/C, M — (Cont'd)

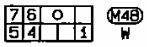
HA-A/C, M-09







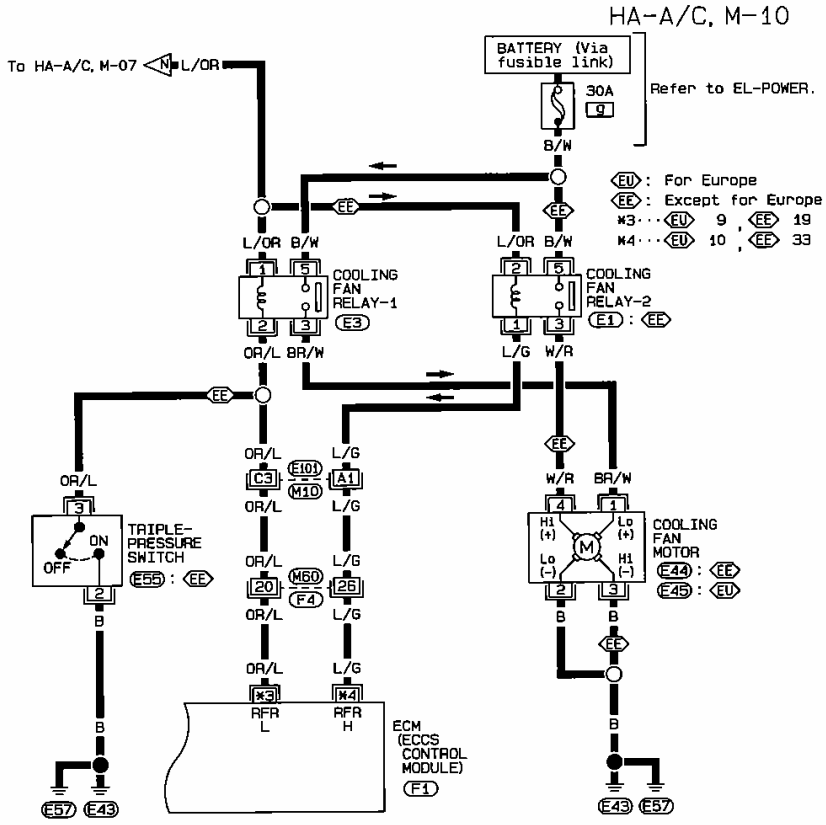




HA

SHA465E

Wiring Diagram — A/C, M — (Cont'd)



E1 L, E3 L — E55 B — E44 : EE GY — E45 : EU GY

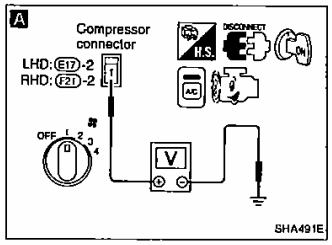
Refer to last page (Foldout page).

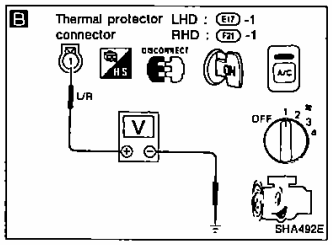
M10, E101

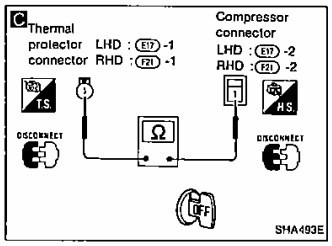
M60, F4

F1

H-HA042







Diagnostic Procedure 6

SYMPTOM: Magnet clutch does not operate when A/C switch and fan switch are ON.

- **Perform PRELIMINARY CHECK 2 before referring to the following flow chart.**

A

CHECK POWER SUPPLY FOR COMPRESSOR.
Disconnect compressor harness connector.
Do approx. 12 volts exist between compressor harness terminal No. ① and body ground?

No → **B**

CHECK POWER SUPPLY FOR THERMAL PROTECTOR.
Disconnect thermal protector harness connector.
Do approx. 12V exist between thermal protector harness terminal No. ① and body ground?

No → Ⓐ (Go to next page.)

Yes → **C**

CHECK THERMAL PROTECTOR.
Check circuit continuity between thermal protector harness terminal No. ① and compressor harness terminal No. ①.

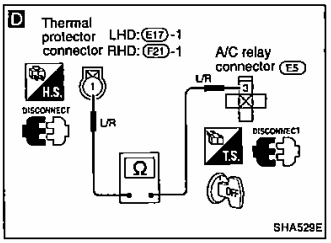
NG → Replace thermal protector.

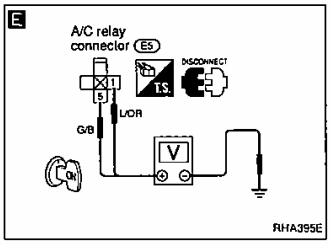
Yes → Check magnet clutch coil.

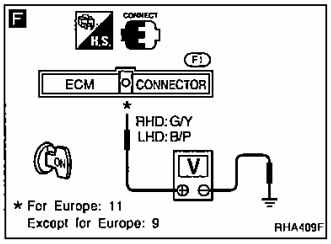
NG → Replace magnet clutch.
(Refer to HA-146 in S14 SERVICE MANUAL, Publication No.: SM4E-0S14G0.)

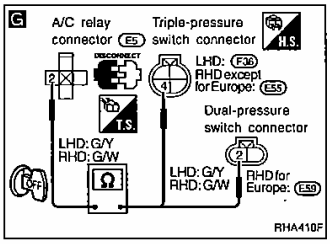
HA

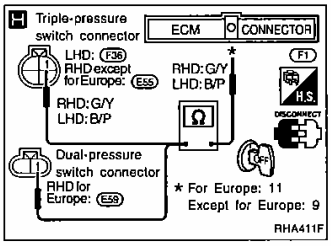
Diagnostic Procedure 6 (Cont'd)











Ⓐ

Disconnect A/C relay harness connector.

D Note

Check circuit continuity between A/C relay harness terminal No. ③ and thermal protector harness terminal No. ①.

OK

E

CHECK POWER SUPPLY FOR A/C RELAY.
Disconnect A/C relay.
Do approx. 12 volts exist between A/C relay harness terminal No. ①, ⑤ and body ground?

No → CHECK POWER SUPPLY CIRCUIT AND 7.5A FUSES AT FUSE BLOCK. (Refer to "POWER SUPPLY ROUTING" in EL section and Wiring Diagram.)

Yes

CHECK A/C RELAY AFTER DISCONNECTING IT.
(Refer to HA-70 in S14 SERVICE MANUAL, Publication No.: SM4E-0S14G0.)

NG → Replace A/C relay.

OK

Reconnect A/C relay.

F

CHECK COIL SIDE CIRCUIT OF A/C RELAY.
Do approx. 12 volts exist between ECM (ECCS control module) harness terminal No. ⑨ or ⑪ and body ground?

No → G Note

Check circuit continuity between A/C relay harness terminal No. ② and triple-pressure switch harness terminal No. ④ or dual-pressure switch harness terminal No. ②.

OK → H Note

Check circuit continuity between triple or dual-pressure switch harness terminal No. ① and ECM (ECCS control module) harness terminal No. ⑨ or ⑪.
[For terminal arrangement, refer to last page (Foldout page).]

OK

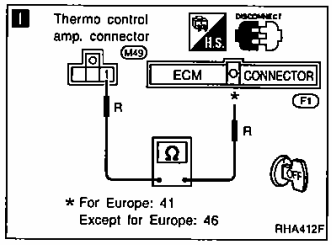
- CHECK TRIPLE-PRESSURE SWITCH.
  (Refer to HA-69 in S14 SERVICE MANUAL, Publication No.: SM4E-0S14G0.)
- CHECK DUAL-PRESSURE SWITCH.
  Refer to HA-17.

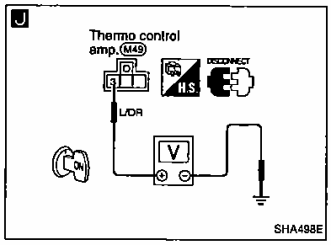
Yes

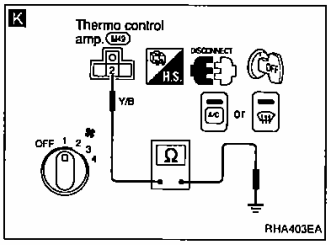
Ⓑ
(Go to next page.)

Note: If the result is NG after checking circuit continuity, repair harness or connector.

Diagnostic Procedure 6 (Cont'd)







Ⓑ

Disconnect thermo control amp. harness connector.

I Note

Check circuit continuity between thermo control amp. harness terminal No. ① and ECM (ECCS control module) harness terminal No. ㊶ or ㊻.

OK

J

CHECK POWER SUPPLY FOR THERMO CONTROL AMP.
Disconnect thermo control amp. harness connector.
Do approx. 12 volts exist between thermo control amp. harness terminal No. ③ and body ground?

No → Check 7.5A fuse at fuse block.
Refer to EL section ("Wiring Diagram", "POWER SUPPLY ROUTING").

Yes

K

CHECK BODY GROUND CIRCUIT FOR THERMO CONTROL AMP.
Turn A/C switch or DEF switch ON.
Check for continuity between thermo control amp. harness terminal ② and body ground.

NG → Disconnect push control unit harness connector.

OK

Ⓒ
(Go to next page.)

CHECK THERMO CONTROL AMP.
(Refer to HA-68 in S14 SERVICE MANUAL, Publication No.: SM4E-0S14G0.)

NG → Replace thermo control amp.

OK

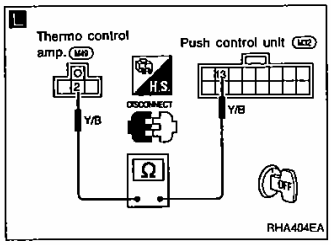
Check voltage between ECM (ECCS control module) harness terminals ⑨, ㊻ and body ground.
Refer to EC section ("ECM Terminals and Reference Value", "TROUBLE DIAGNOSES — General Description") in S14 SERVICE MANUAL, Publication No.: SM4E-0S14G0.

Note:
If the result is NG after checking circuit continuity, repair harness or connector.

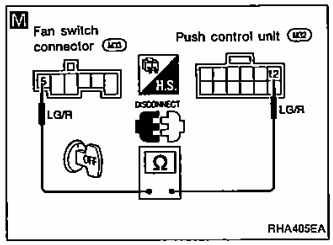
HA

Diagnostic Procedure 6 (Cont'd)

L



M



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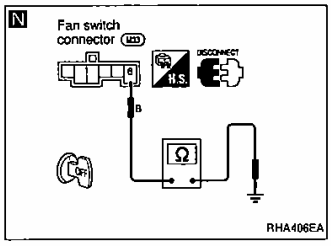


Ⓒ

L Note

Check circuit continuity between thermo control amp. harness terminal No. ② and push control unit harness terminal No. ⑬.

OK

Disconnect fan switch harness connector.

OK

M Note

Check circuit continuity between push control unit terminal No. ⑫ and fan switch harness terminal No. ⑤.

OK

N Note

CHECK BODY GROUND CIRCUIT FOR FAN SWITCH.
Check for continuity between fan switch harness terminal ⑥ and body ground.

OK

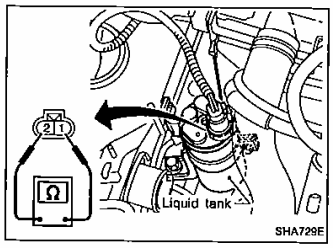
CHECK FAN SWITCH.
(Refer to HA-68 in S14 SERVICE MANUAL, Publication No.: SM4E-0S14G0.)

NG → Replace fan switch.

OK

Replace push control unit.

Note:
If the result is NG after checking circuit continuity, repair harness or connector.



Electrical Components Inspection

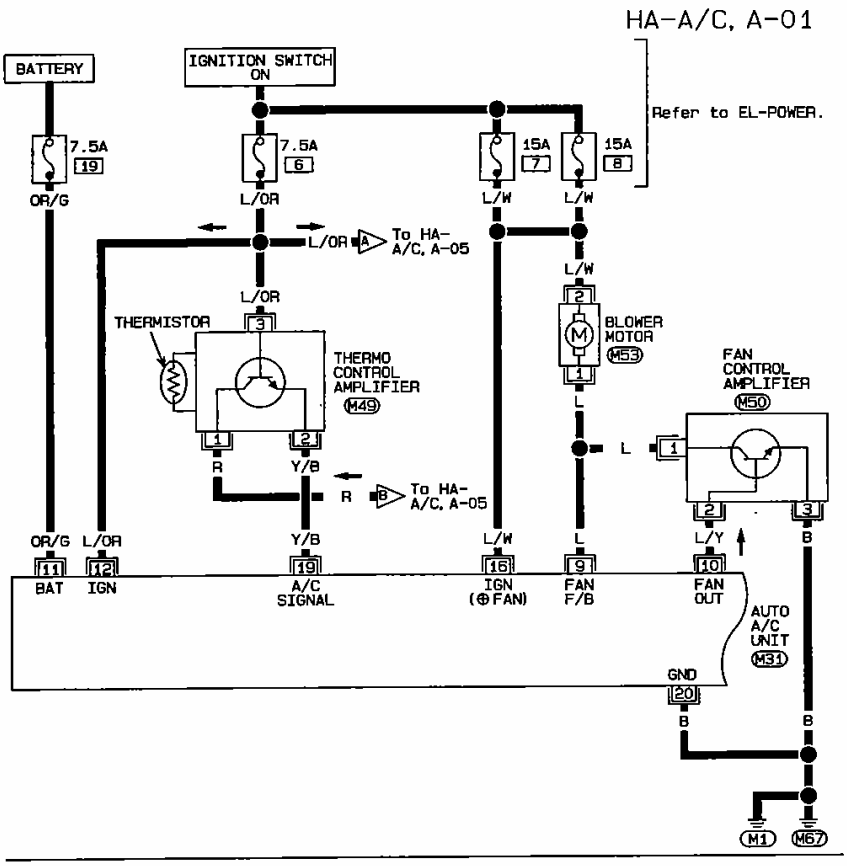
DUAL-PRESSURE SWITCH

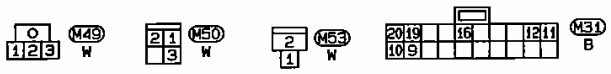
RHD models for Europe

	ON kPa (bar, kg/cm^2, psi)	OFF kPa (bar, kg/cm^2, psi)
Low-pressure side	Increasing to 157 - 216 (1.57 - 2.16, 1.6 - 2.2, 23 - 31)	Decreasing to 152.0 - 201.0 (1.520 - 2.010, 1.55 - 2.05, 22.0 - 29.2)
High-pressure side	Decreasing to 1,275 - 1,667 (12.7 - 16.7, 13 - 17, 185 - 242)	Increasing to 2,452 - 2,844 (24.5 - 28.4, 25 - 29, 356 - 412)

HA

Wiring Diagram — A/C, A —

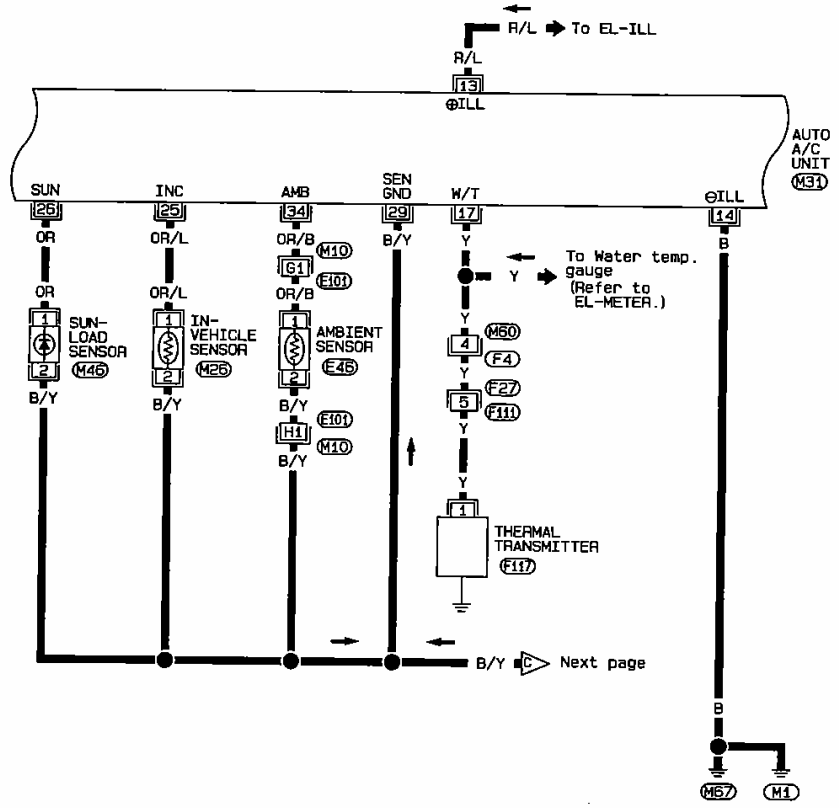


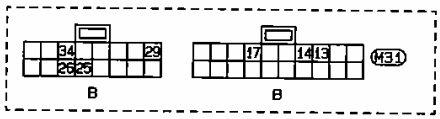


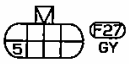
SHA468E

Wiring Diagram — A/C, A — (Cont'd)

HA-A/C, A-02





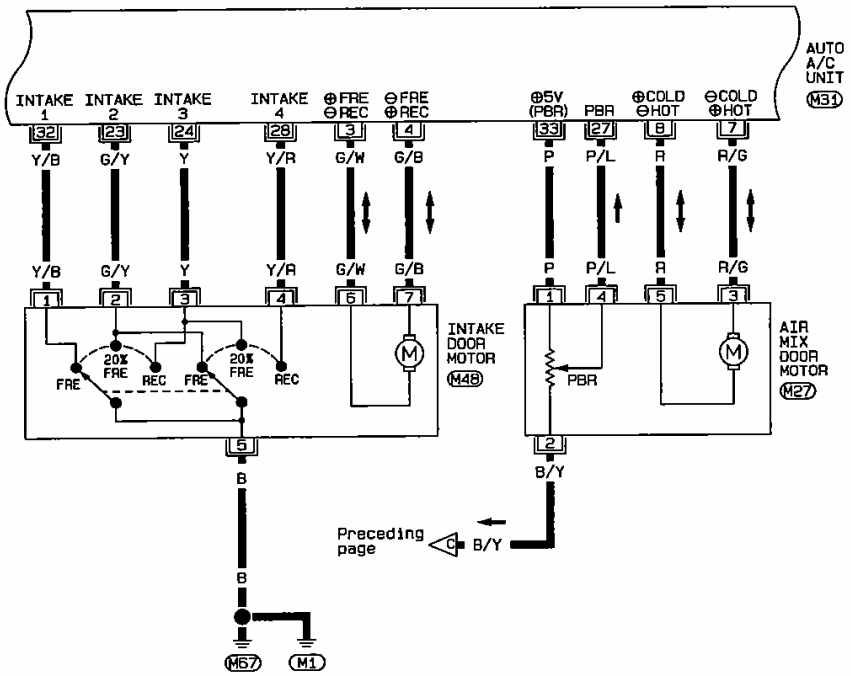


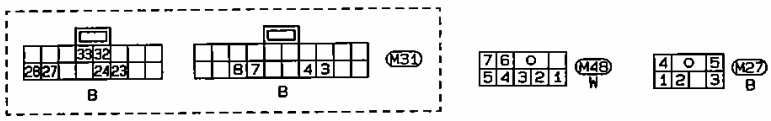
Refer to last page (Foldout page).
M10, E101
M60, F4

HA

SHA469E

HA-A/C, A-03

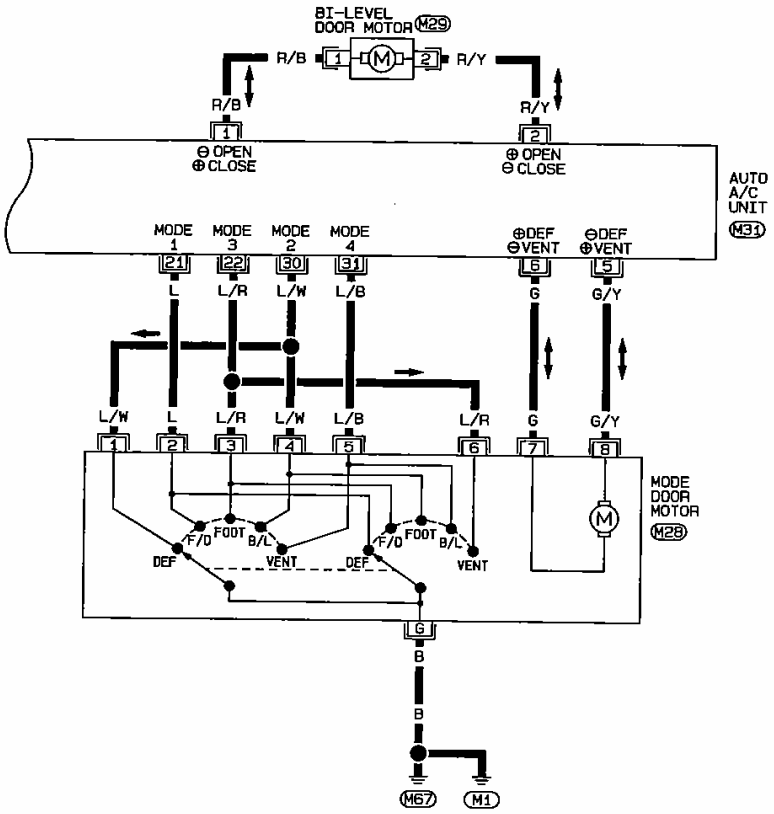


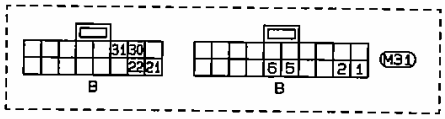


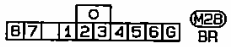
SHA470E

Wiring Diagram — A/C, A — (Cont'd)

HA-A/C, A-04



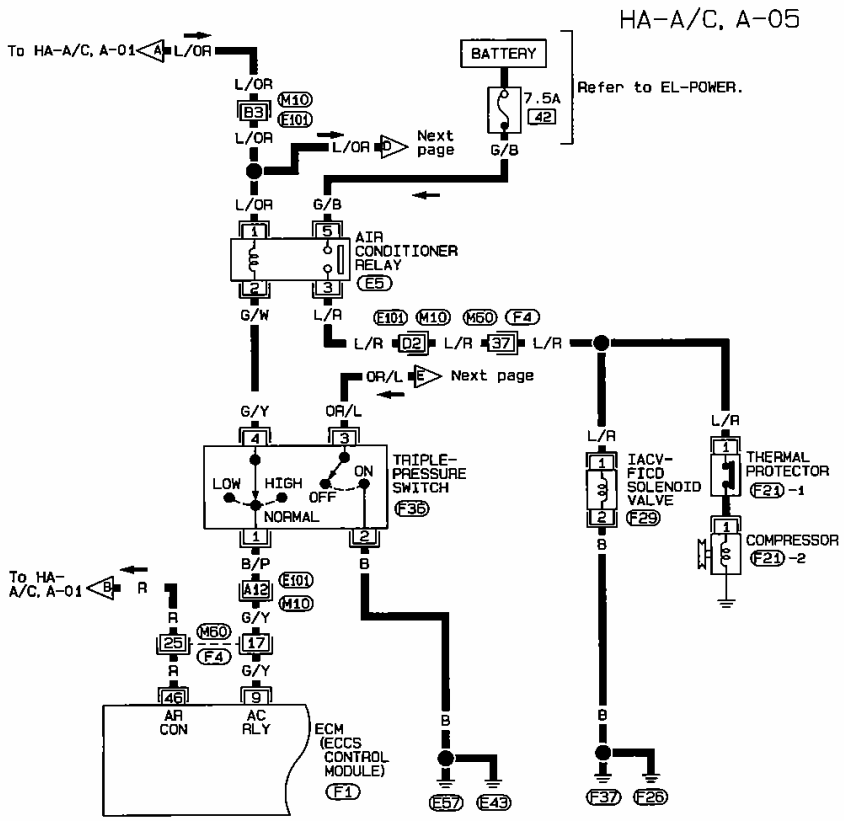


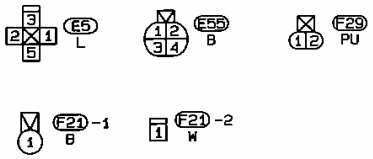


HA

SHA471E

Wiring Diagram — A/C, A — (Cont'd)





Refer to last page (Foldout page).

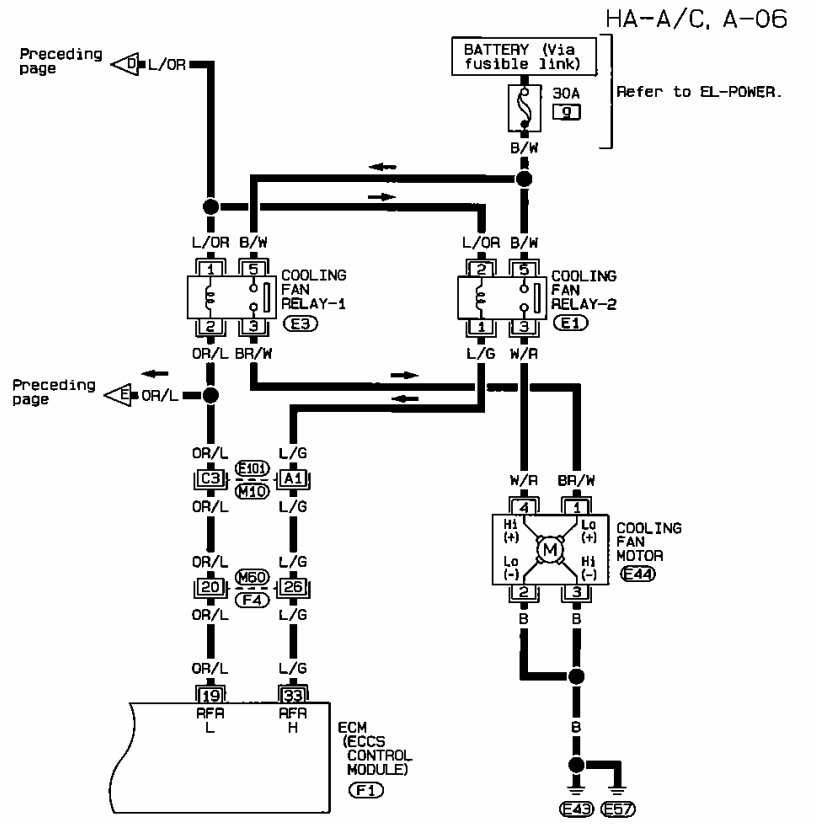
M10, E101

M50, F4

F1

HHA043

Wiring Diagram — A/C, A — (Cont'd)



E1 L , E3 L

E44 GY

Refer to last page (Foldout page).

M10 , E101

M60 , F4

F1

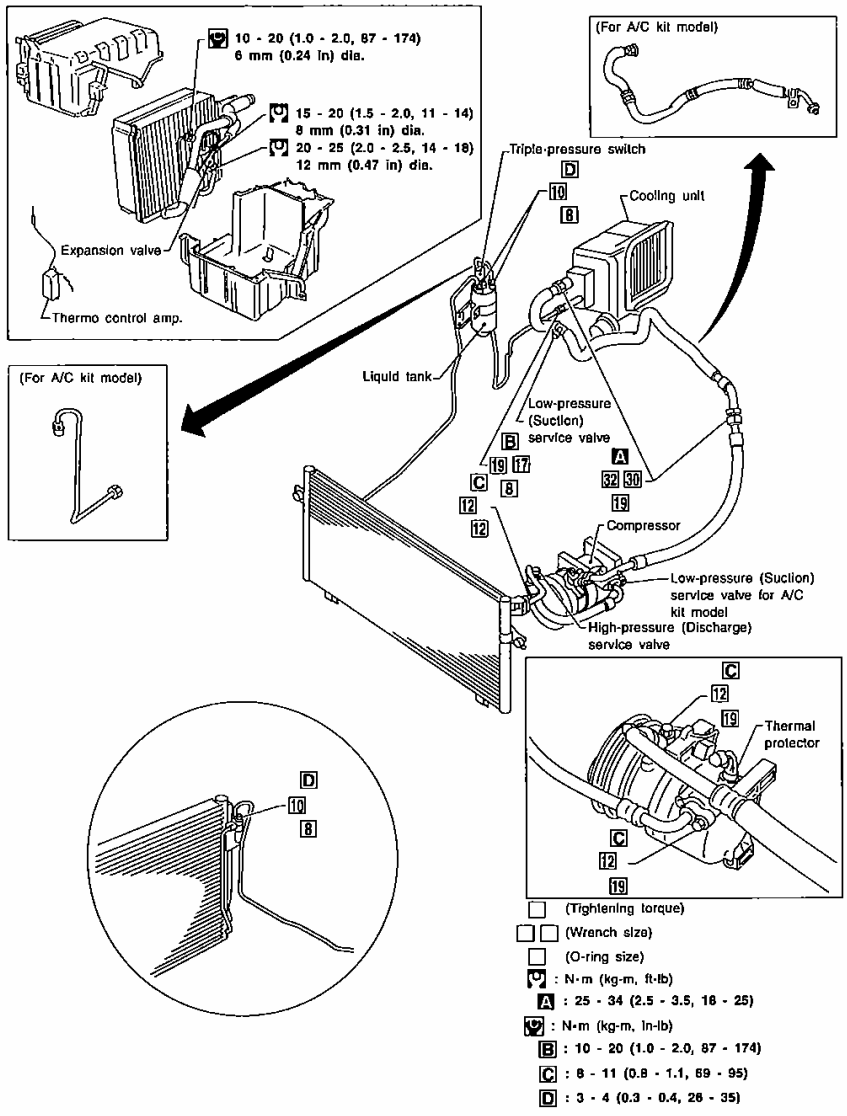
HA

HHA044

Refrigerant Lines

LHD MODEL

SEC. 271•272•276



RHA413F

General Specifications

COMPRESSOR

Model	DKV-14C
Type	Vane rotary
Displacement cm³ (cu in)/Rev	140 (8.54)
Direction of rotation	Clockwise (Viewed from drive end)
Drive belt	Poly V type

LUBRICANT

Model	ZEXEL make DKV-14C
Name	Nissan A/C System Oil Type R
Part No.	KLH00-RAGR0
Capacity mℓ (Imp fl oz)	
Total in system	200 (7.0)
Compressor (Service part) charging amount	200 (7.0)

REFRIGERANT

Type	HFC-134a (R-134a)
Capacity kg (lb)	0.60 - 0.70 (1.32 - 1.54)

Inspection and Adjustment

ENGINE IDLING SPEED
When A/C is ON

- **Refer to EC section ("Inspection and Adjustments", "SERVICE DATA AND SPECIFICATIONS").**

BELT TENSION

- **Refer to MA section ("Checking Drive Belts", "ENGINE MAINTENANCE").**

COMPRESSOR

Model	DKV-14C
Clutch disc-pulley clearance mm (in)	0.3 - 0.6 (0.012 - 0.024)

HA

ELECTRICAL SYSTEM

SECTION EL

When you read wiring diagrams:
• Read GI section, "HOW TO READ WIRING DIAGRAMS".
When you perform trouble diagnoses, read GI section, "HOW TO FOLLOW FLOW CHART IN TROUBLE DIAGNOSES" and "HOW TO PERFORM EFFICIENT DIAGNOSIS FOR AN ELECTRICAL INCIDENT".

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WIRING DIAGRAM REFERENCE CHART

ECCS ..... EC SECTION
A/T CONTROL ..... AT SECTION
ANTI-LOCK BRAKING SYSTEM ..... BR SECTION
AIR BAG AND SEAT BELT PRE-TENSIONER ..... RS SECTION
HEATER AND AIR CONDITIONER ..... HA SECTION

EL

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

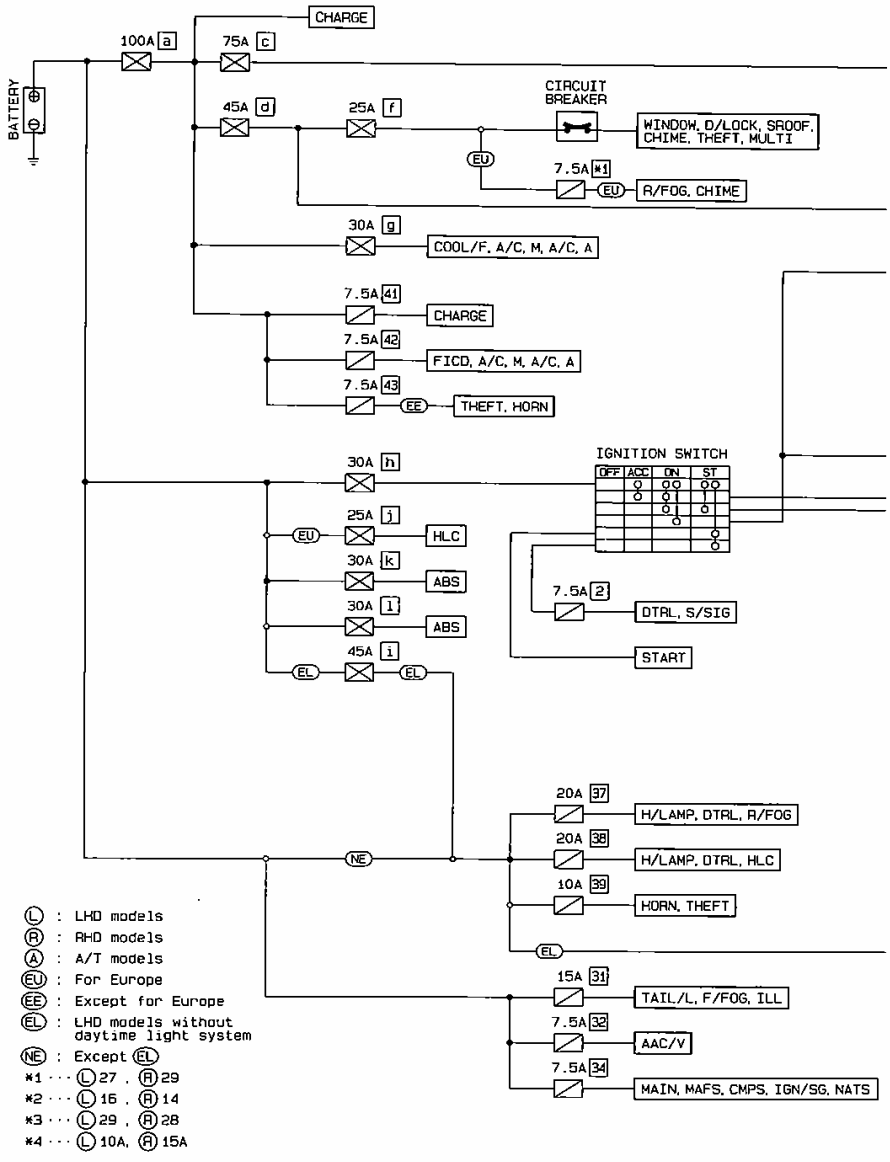
The Supplemental Restraint System "Air Bag" and "Seat Belt Pre-tensioner", used along with a seat belt, help to reduce the risk or severity of injury to the driver and front passenger in a frontal collision. The Supplemental Restraint System consists of air bag modules (located in the center of the steering wheel and on the instrument panel on the passenger side), seat belt pre-tensioners, a diagnostic sensor unit, warning lamp, wiring harness and spiral cable. Information necessary to service the system safely is included in the **RS section** of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses are covered with yellow insulation either just before the harness connectors or the complete harness, for easy identification.**

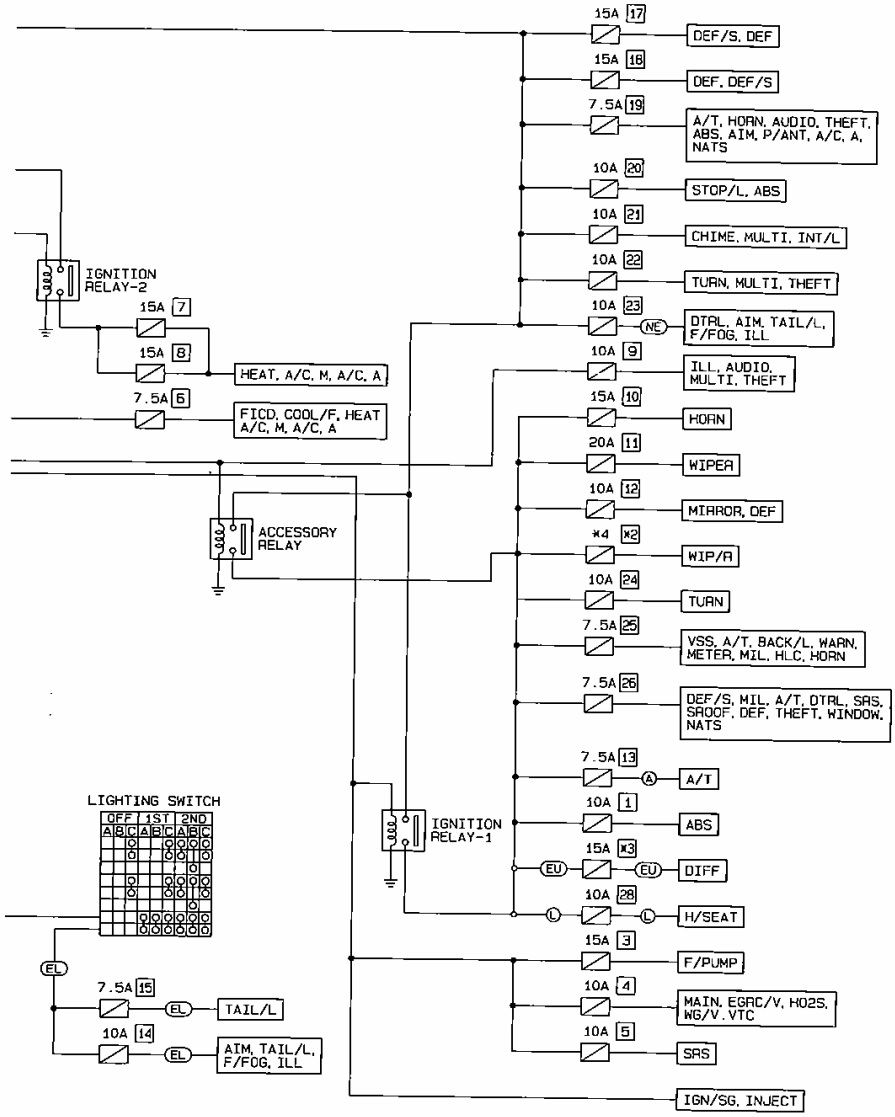
NOTE

Schematic



HEL211

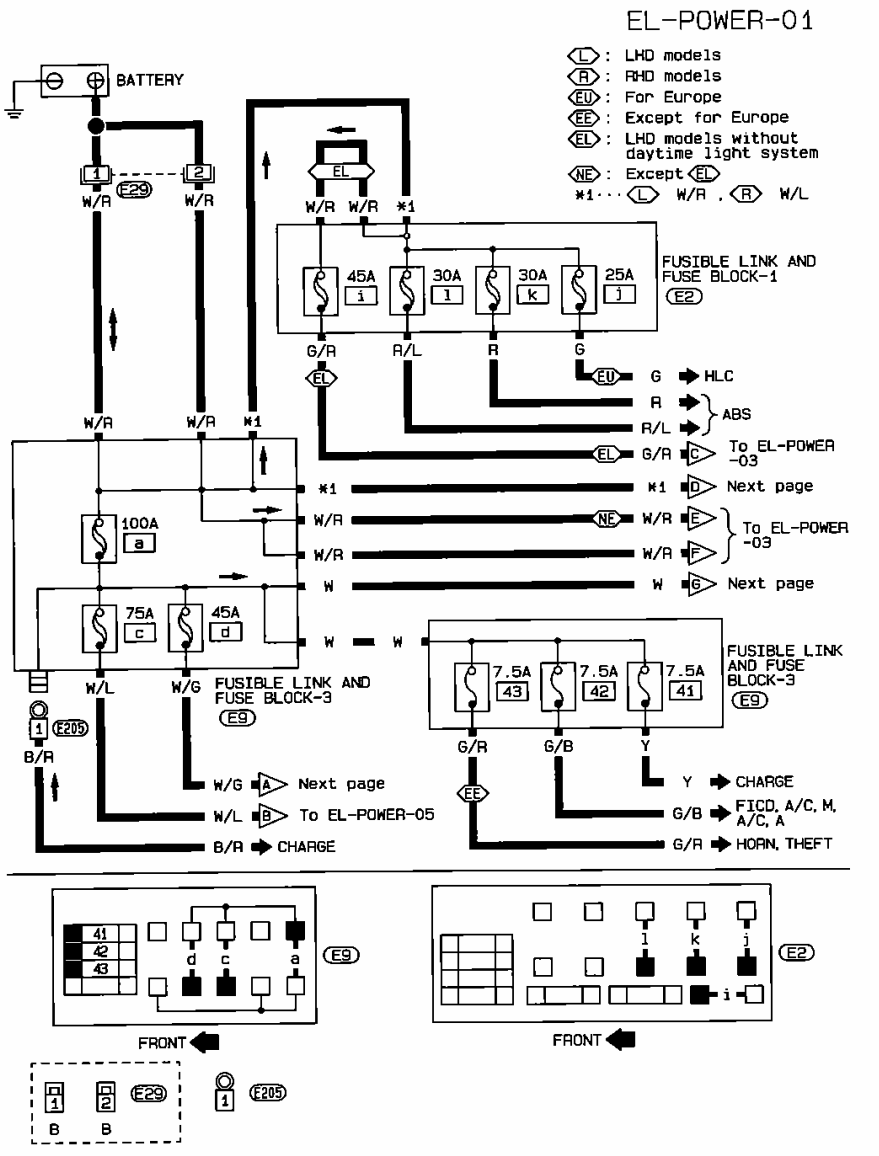
Schematic (Cont'd)



HEL212

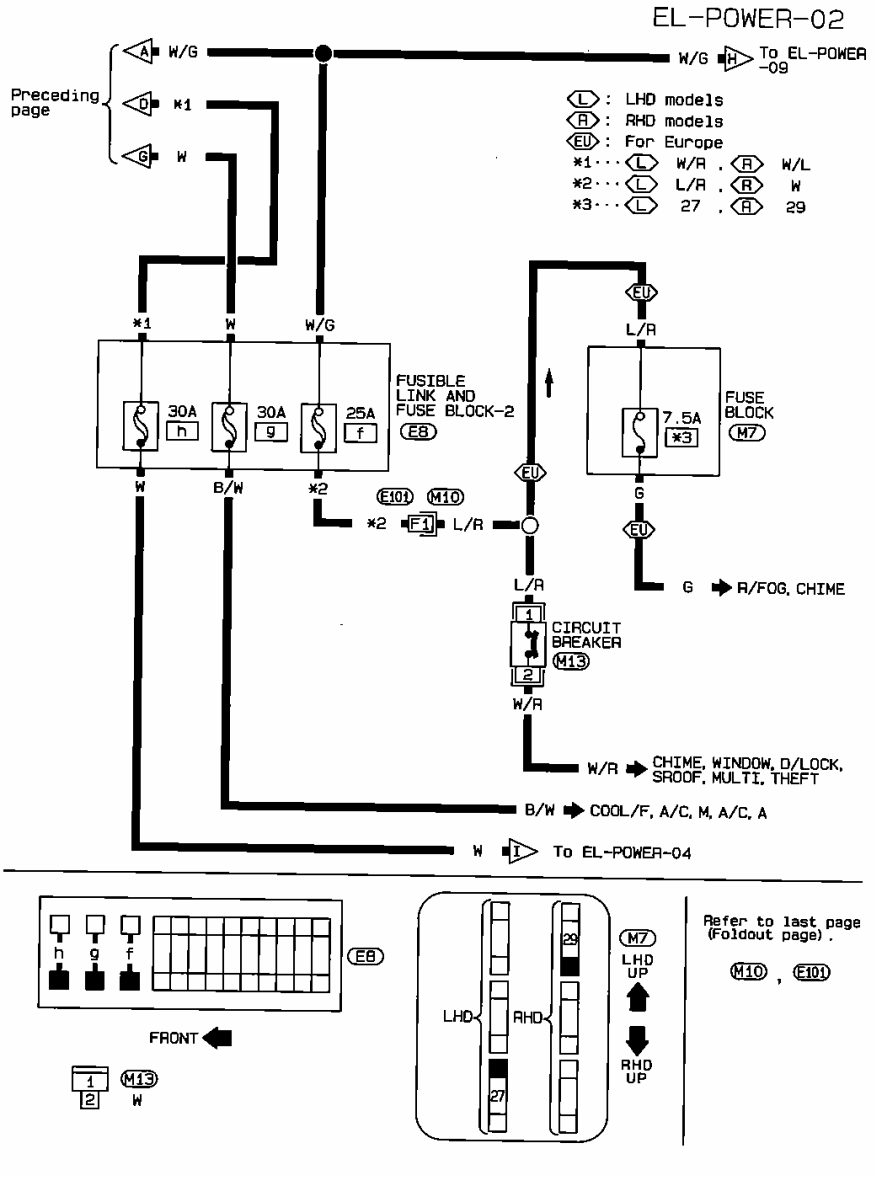
EL

Wiring Diagram — POWER —



SEL668T

Wiring Diagram — POWER — (Cont'd)

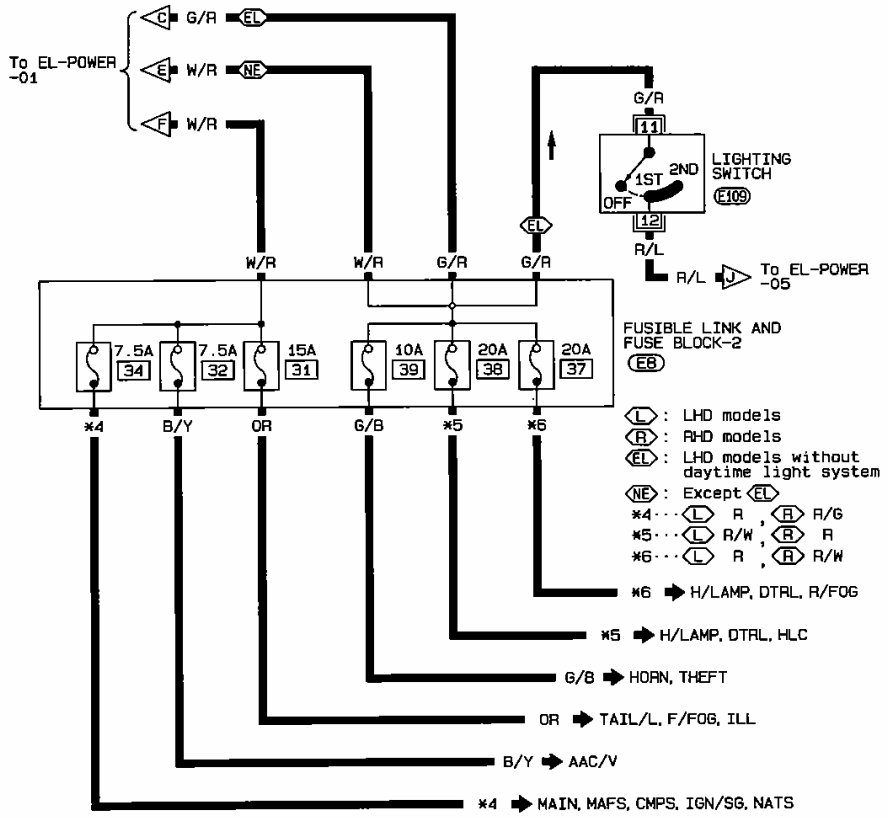


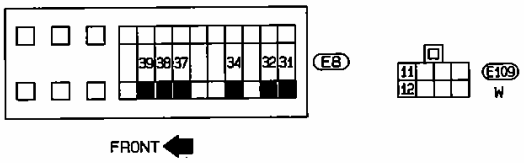
HEL213

EL

Wiring Diagram — POWER — (Cont'd)

EL-POWER-03

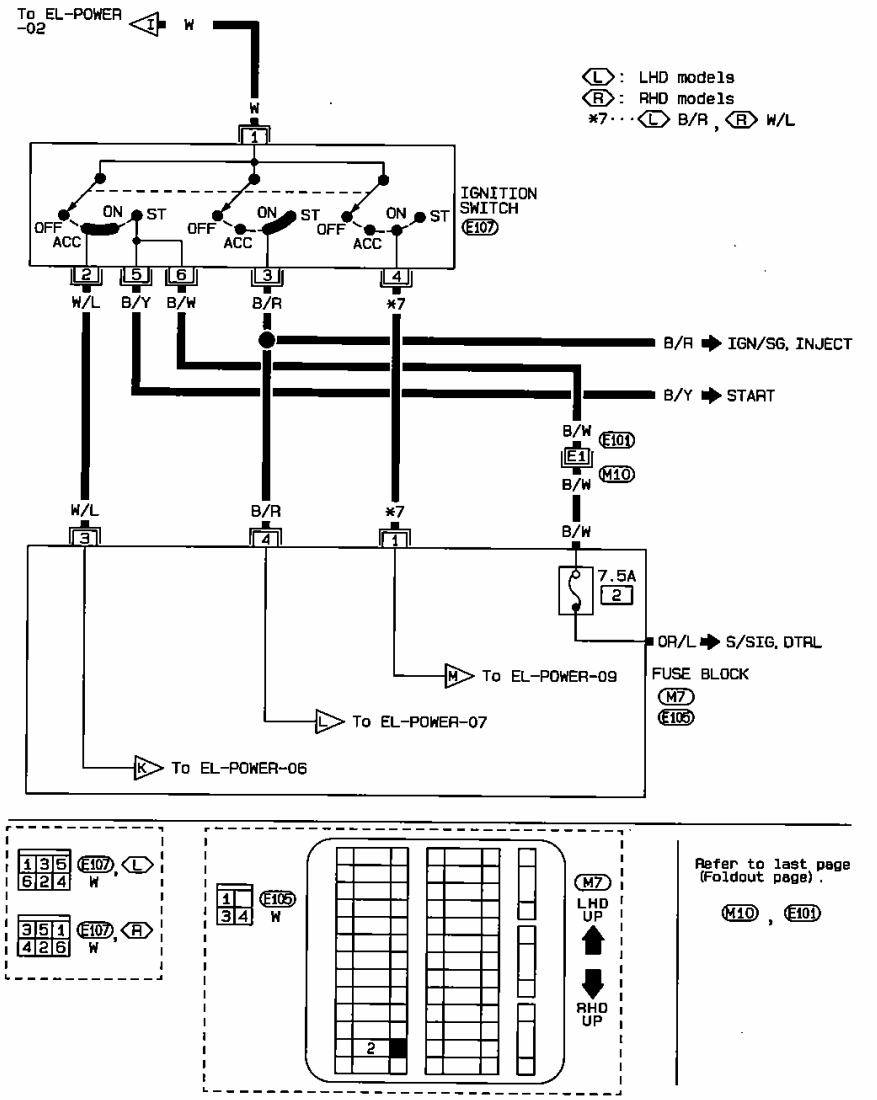




HEL214

Wiring Diagram — POWER — (Cont'd)

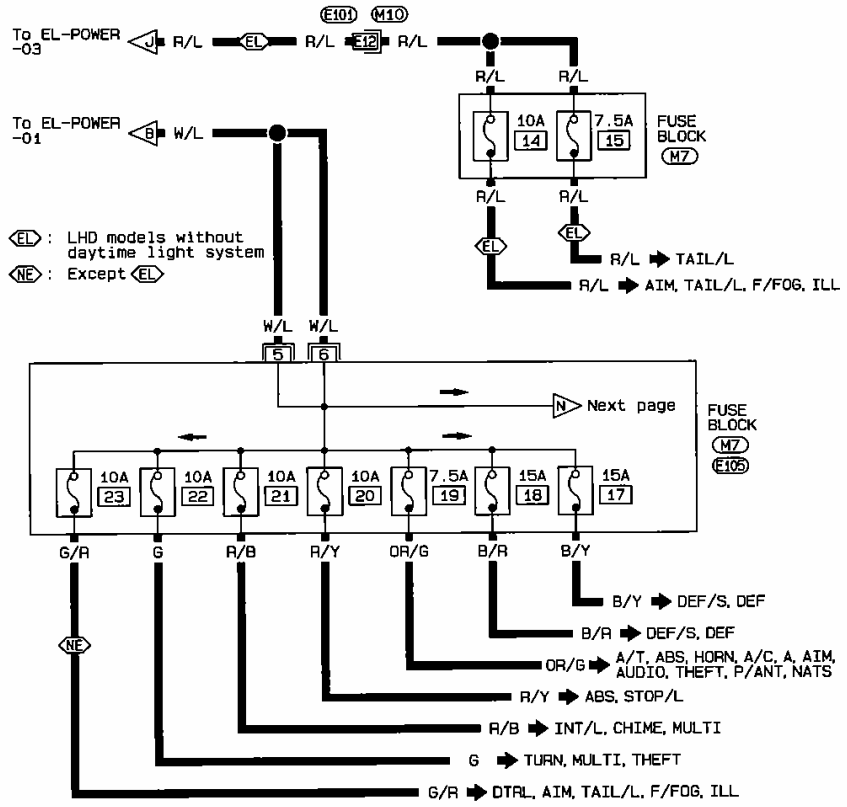
EL-POWER-04

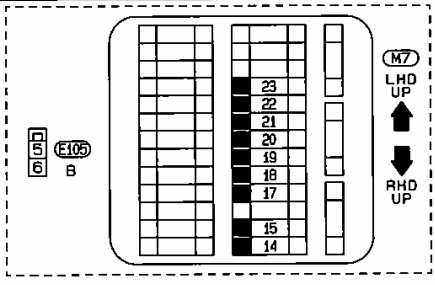


SEL071T

Wiring Diagram — POWER — (Cont'd)

EL-POWER-05



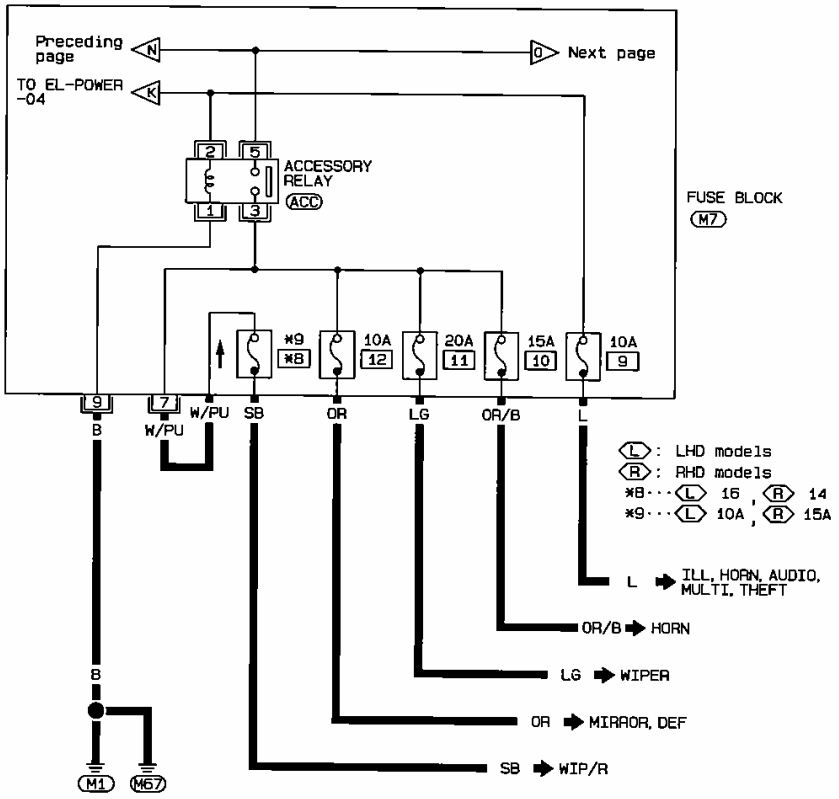


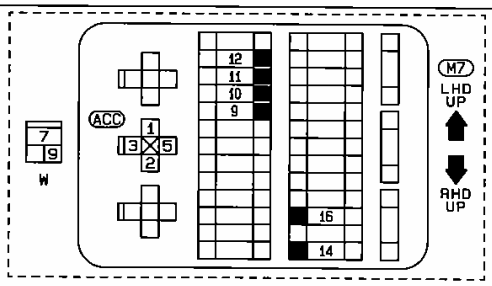
Refer to last page (Foldout page).
M10 , E101

HEL215

Wiring Diagram — POWER — (Cont'd)

EL-POWER-06



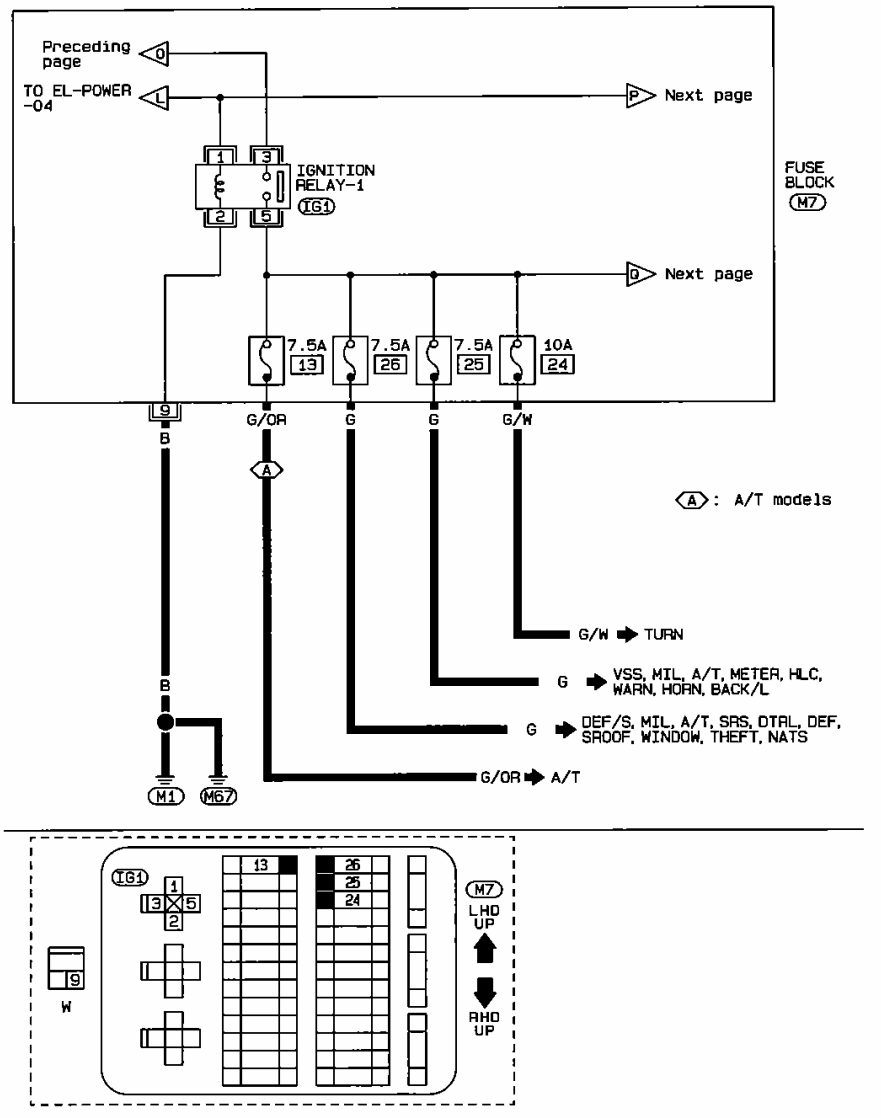


EL

SEL673T

Wiring Diagram — POWER — (Cont'd)

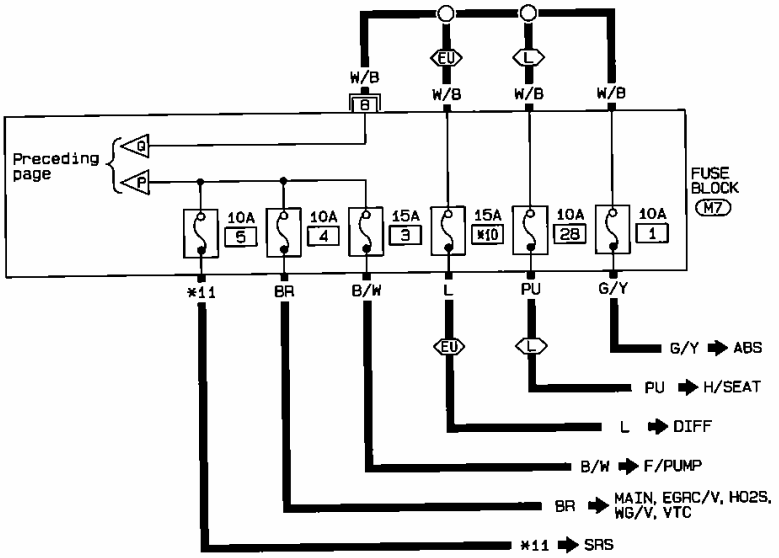
EL-POWER-07

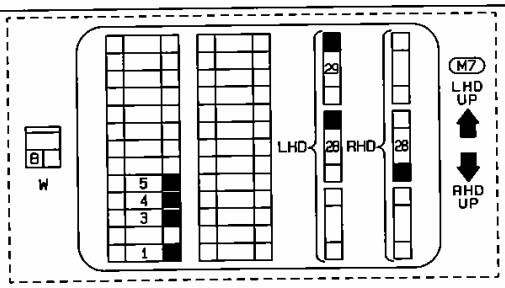


HEL216

EL-POWER-08

Ⓛ : LHD models
Ⓡ : RHD models
ⓔⓤ : For Europe
*10 ··· Ⓛ 29 , Ⓡ 28
*11 ··· Ⓛ R/L , Ⓡ L

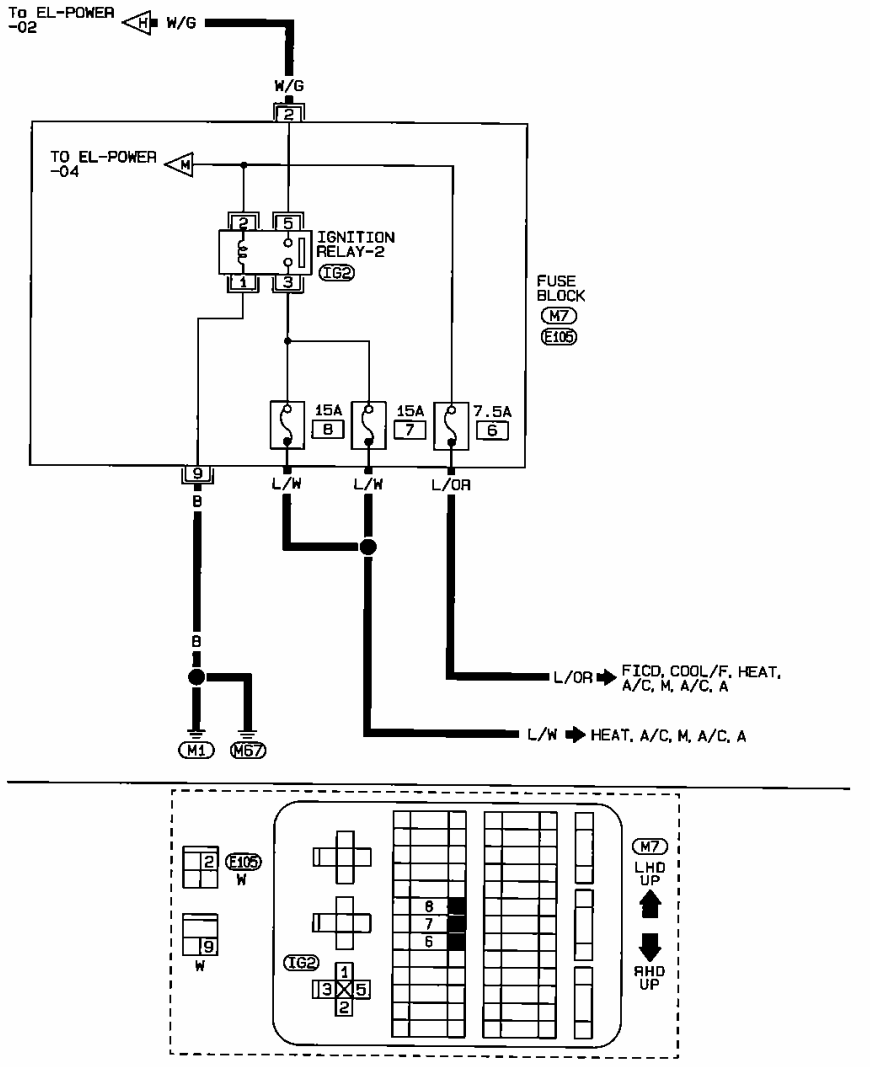




SEL675T

EL

EL-POWER-09

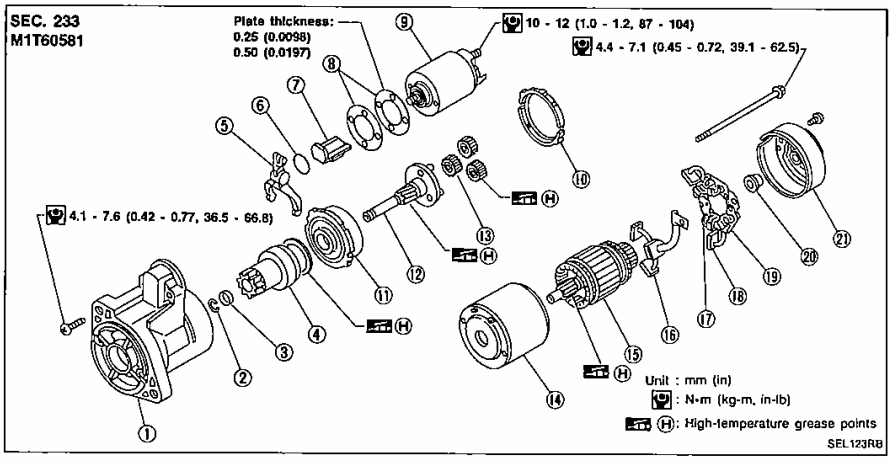


SEL676T

Service Data and Specifications (SDS)

Applied model	For Europe and Australia	Except for Europe and Australia	Optional on LHD models for Europe
Type	55D23R	65D26R	80D26R
Capacity V-AH	12 - 60	12 - 65	12 - 65

Construction



① Gear case
② Stopper clip
③ Pinion stopper
④ Pinion assembly
⑤ Shift lever
⑥ Plate
⑦ Packing
⑧ Adjusting plate
⑨ Magnetic switch assembly
⑩ Packing
⑪ Internal gear
⑫ Shaft
⑬ Planetary gear
⑭ Yoke
⑮ Armature
⑯ Brush (+)
⑰ Brush spring
⑱ Brush (–)
⑲ Brush holder
⑳ Bearing
㉑ Rear cover

Service Data and Specifications (SDS)

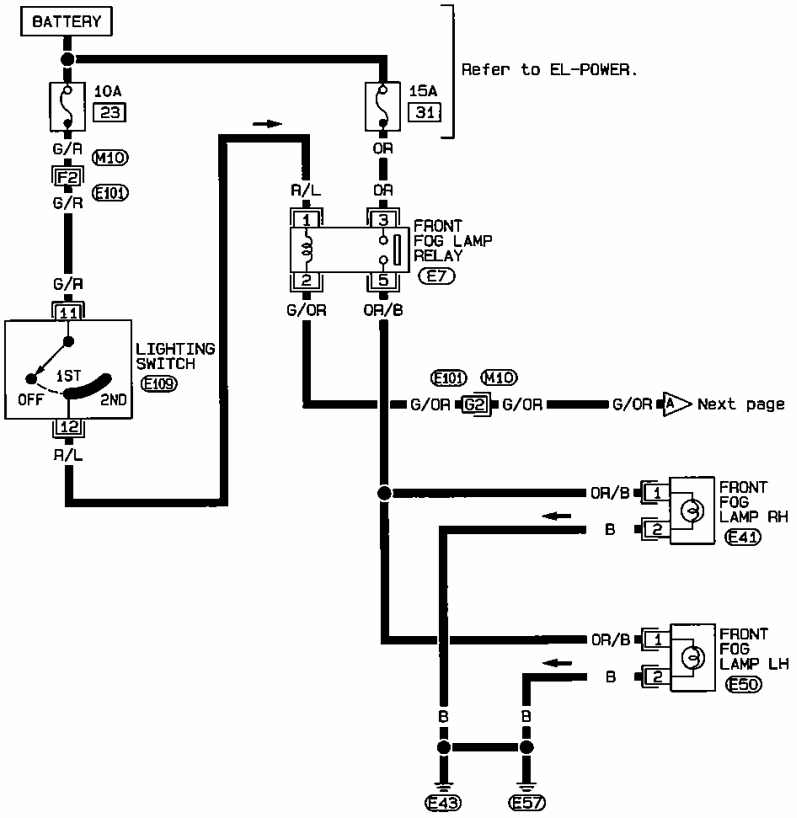
STARTER MOTOR

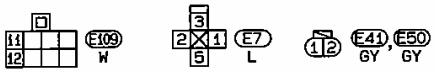
Type		M1T60581 Reduction gear type MITSUBISHI
System voltage	V	12
No load		
Terminal voltage	V	11.0
Current	A	50 - 75
Revolution	rpm	3,000 - 4,000
Minimum diameter of commutator	mm (in)	28.8 (1.134)
Minimum length of brush	mm (in)	12.0 (0.472)
Brush spring tension	N (kg, lb)	13.7 - 25.5 (1.4 - 2.6, 3.1 - 5.7)
Movement "L" in height of pinion assembly	mm (in)	0.5 - 2.0 (0.020 - 0.079)

Front Fog Lamp/Wiring Diagram — F/FOG —

LHD MODELS WITH DAYTIME LIGHT SYSTEM

EL-F/FOG-01





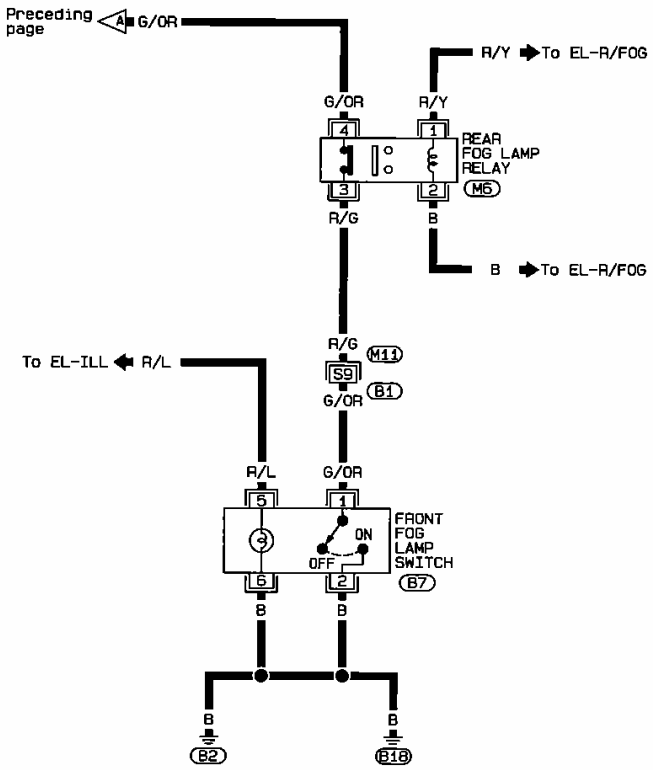
Refer to last page (Foldout page).
M10, E101

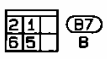
EL

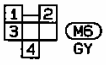
HEL217

Front Fog Lamp/Wiring Diagram — F/FOG — (Cont'd)

EL-F/FOG-02







Refer to last page (Foldout page).

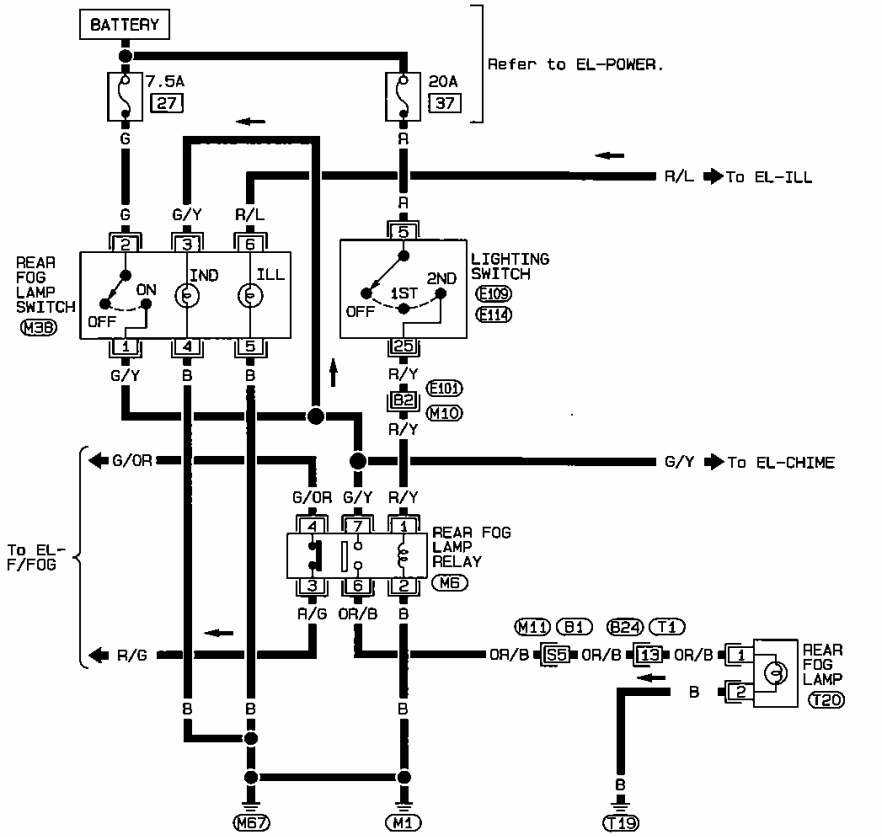
M11, B1

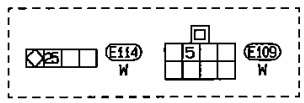
SEL699T

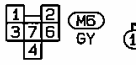
Rear Fog Lamp/Wiring Diagram — R/FOG —

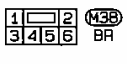
WITH DAYTIME LIGHT SYSTEM

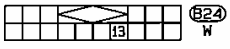
EL-R/FOG-01











Refer to last page (Foldout page).

M10, E101

M11, B1

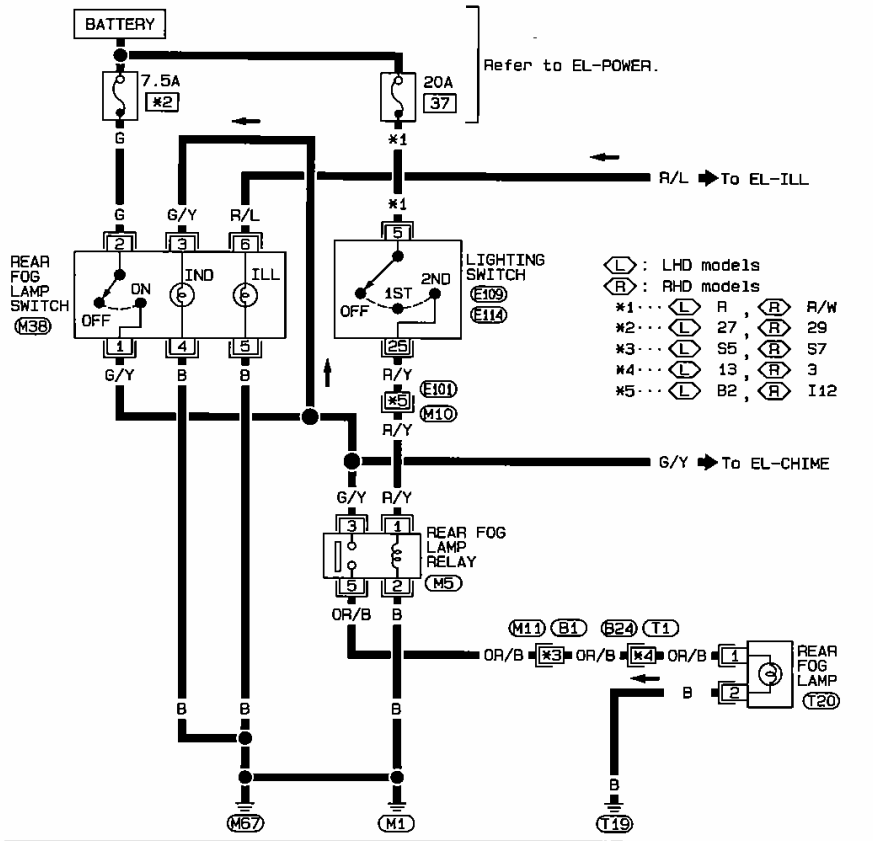
EL

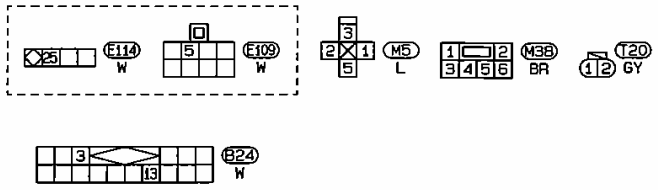
HEL218

Rear Fog Lamp/Wiring Diagram — R/FOG — (Cont'd)

WITHOUT DAYTIME LIGHT SYSTEM

EL-R/FOG-02

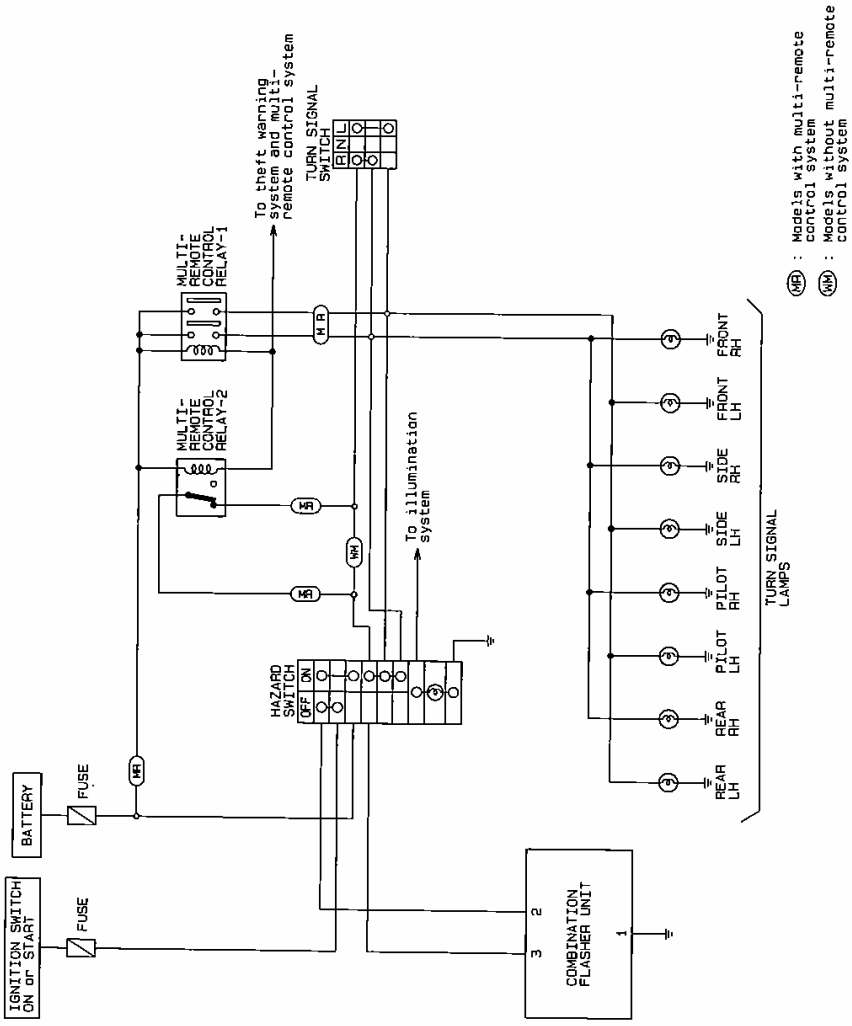




Refer to last page (Foldout page).
M10, E101
M11, B1

HEL219

Turn Signal and Hazard Warning Lamps/ Schematic



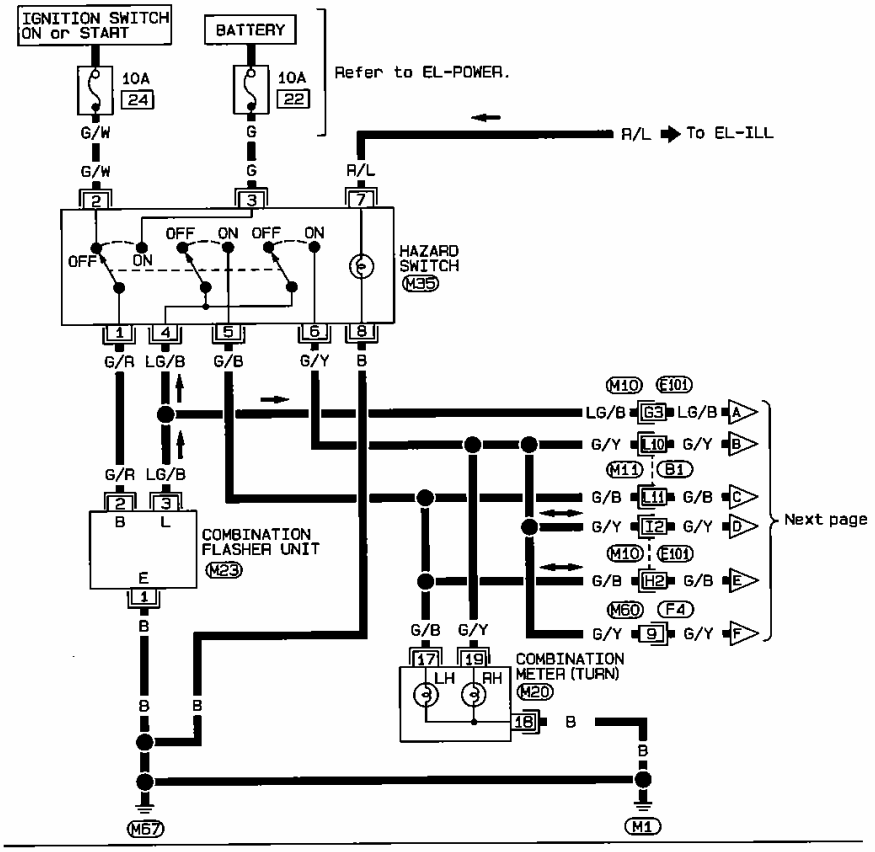
EL

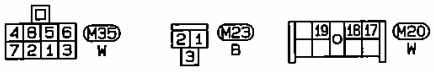
HEL220

Turn Signal and Hazard Warning Lamps/Wiring Diagram — TURN —

LHD MODELS

EL-TURN-01



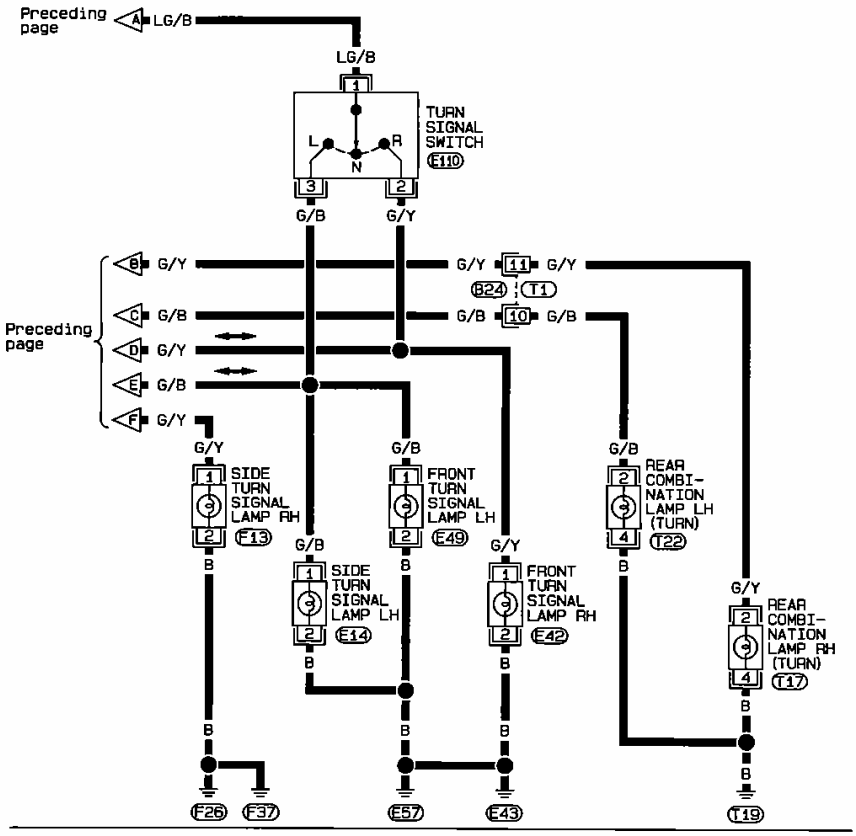


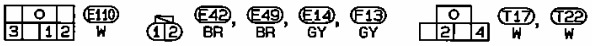
Refer to last page (Foldout page).
M10, E101
M11, B1
M60, F4

HEL221

Turn Signal and Hazard Warning Lamps/Wiring Diagram — TURN — (Cont'd)

EL-TURN-02





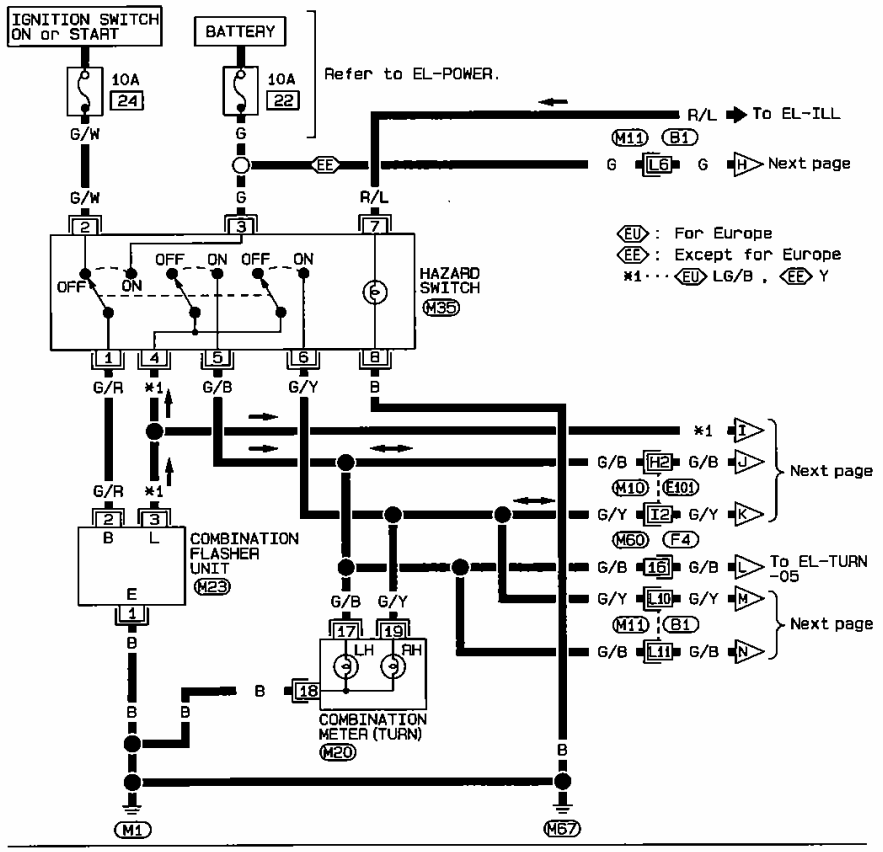
EL

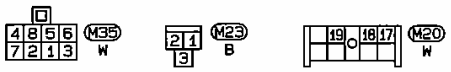
SEL707T

Turn Signal and Hazard Warning Lamps/Wiring Diagram — TURN — (Cont'd)

RHD MODELS

EL-TURN-03



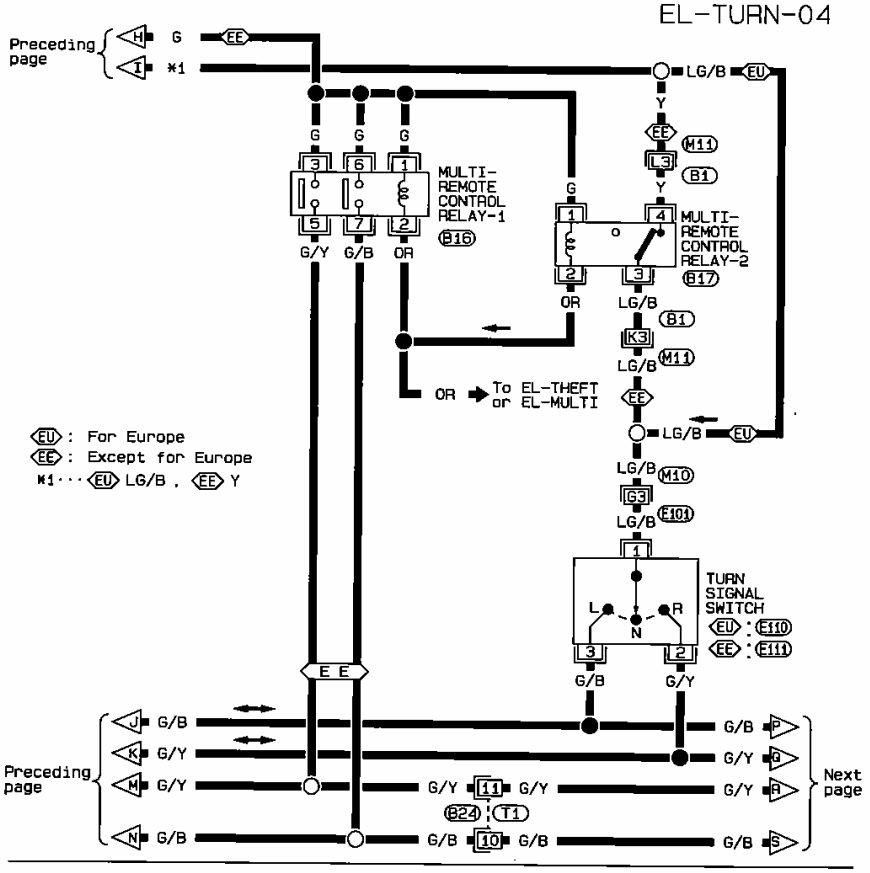


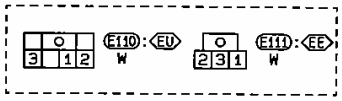
Refer to last page (Foldout page).
M10, E101
M11, B1
M60, F4

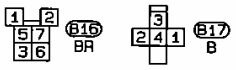
HEL222

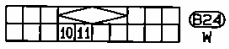
Turn Signal and Hazard Warning Lamps/Wiring Diagram — TURN — (Cont'd)

EL-TURN-04









Refer to last page (Foldout page).

M10 , E101

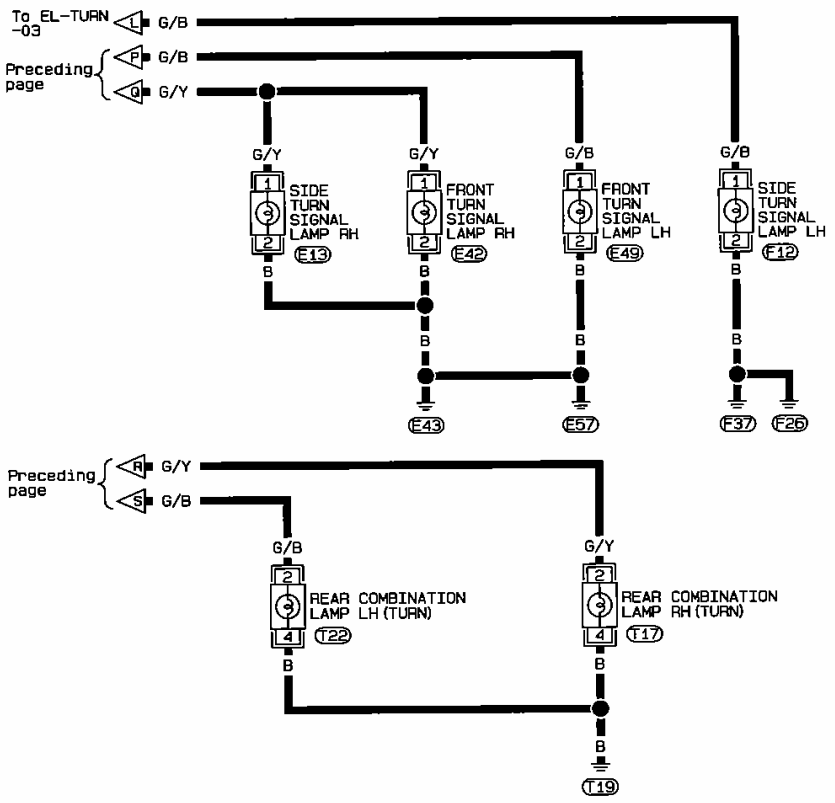
M11 , B1

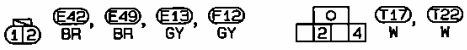
EL

SEL709T

Turn Signal and Hazard Warning Lamps/Wiring Diagram — TURN — (Cont'd)

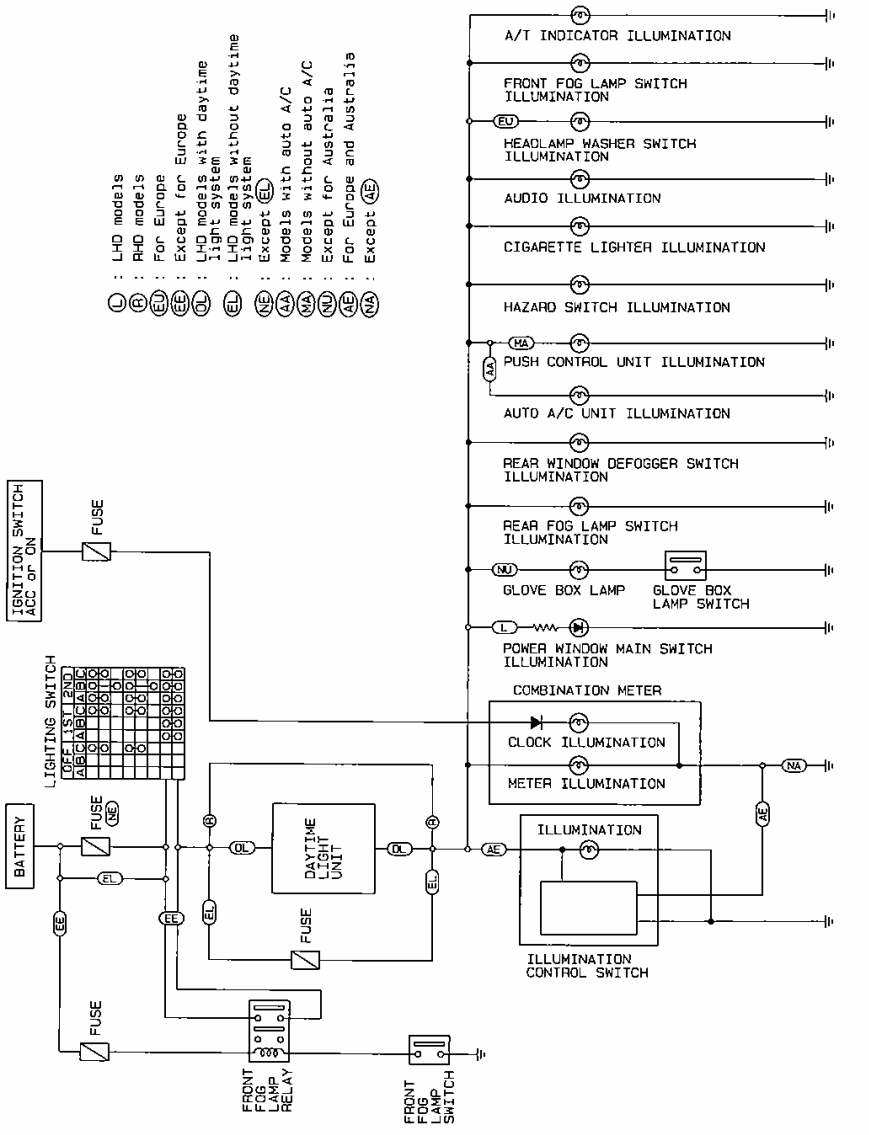
EL-TURN-05





SEL710T

Illumination/Schematic

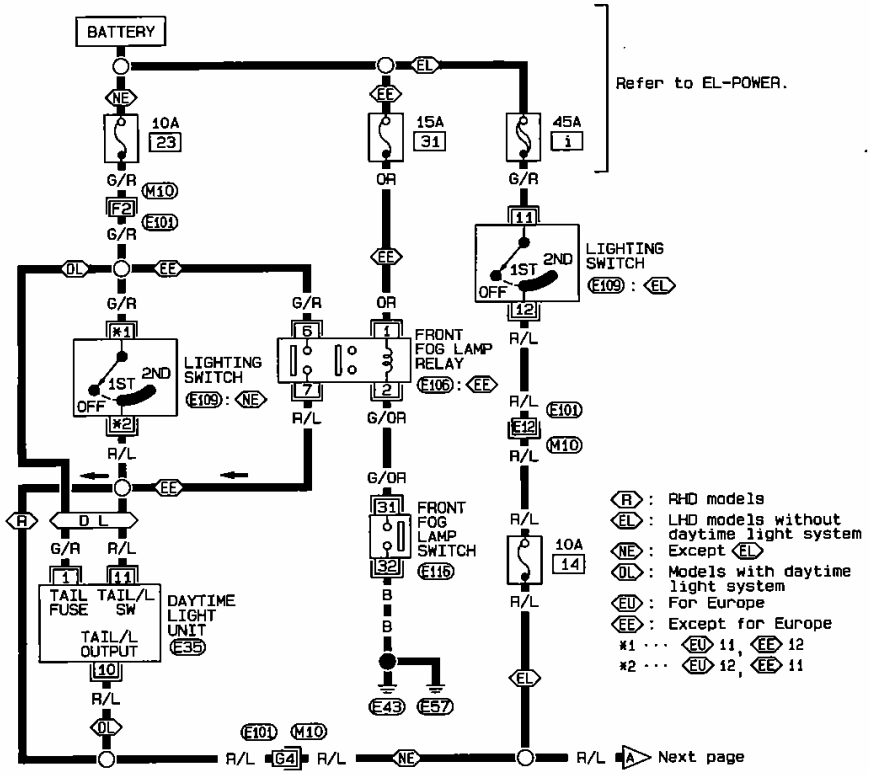


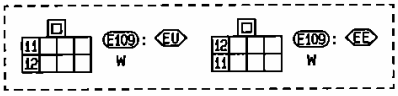
HEL223

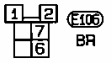
EL

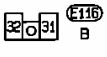
Illumination/Wiring Diagram — ILL —

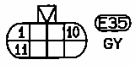
EL-ILL-01









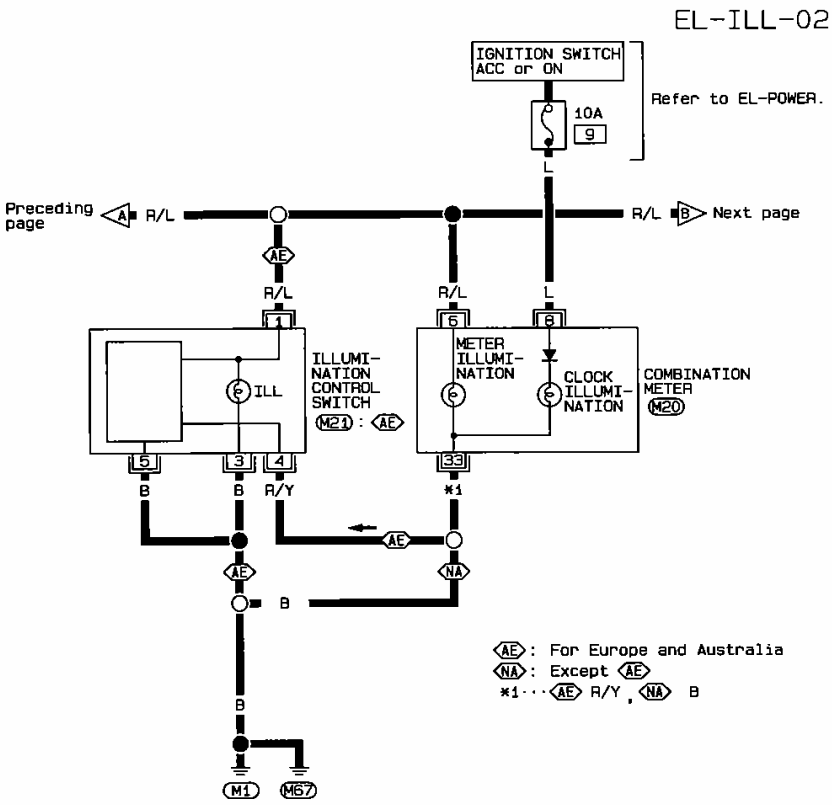


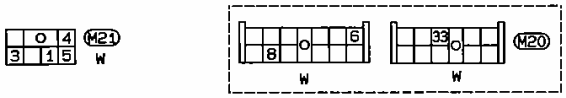
Refer to last page (Foldout page).

M10 , E101

SEL712T

Illumination/Wiring Diagram — ILL — (Cont'd)

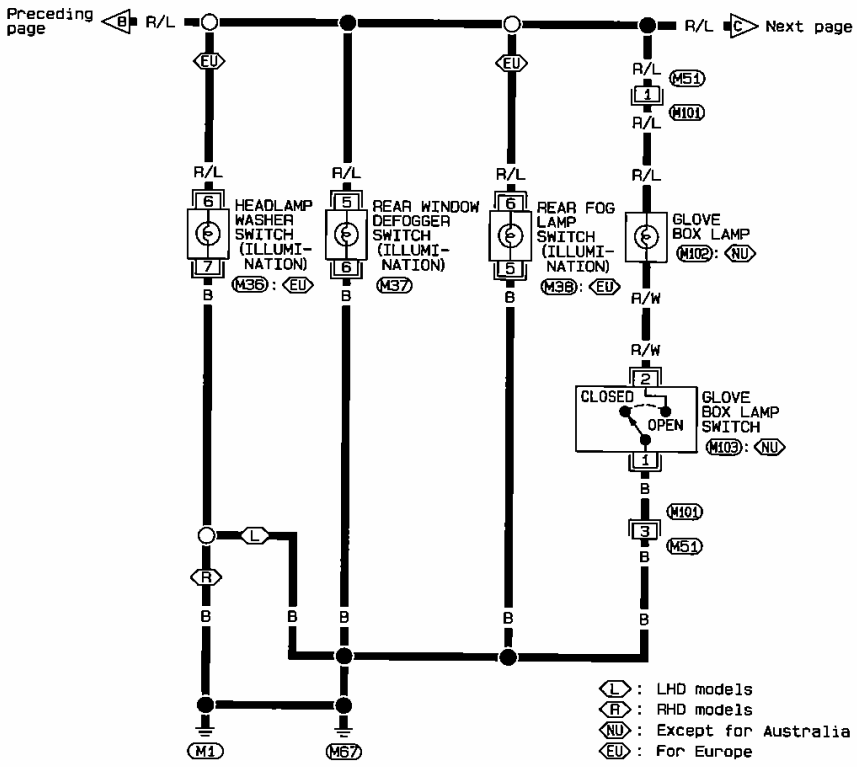


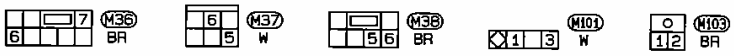


EL

SEL713T

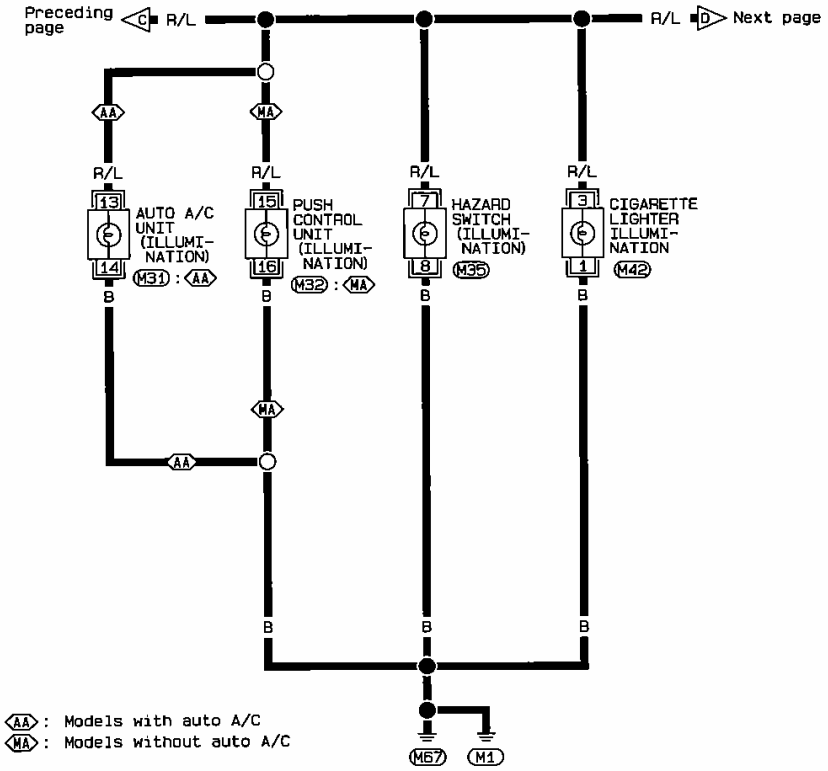
EL-ILL-03

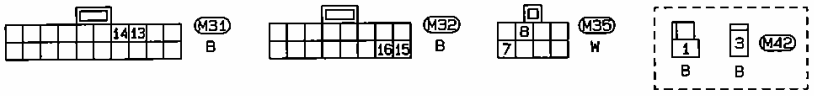




SEL714T

EL-ILL-04



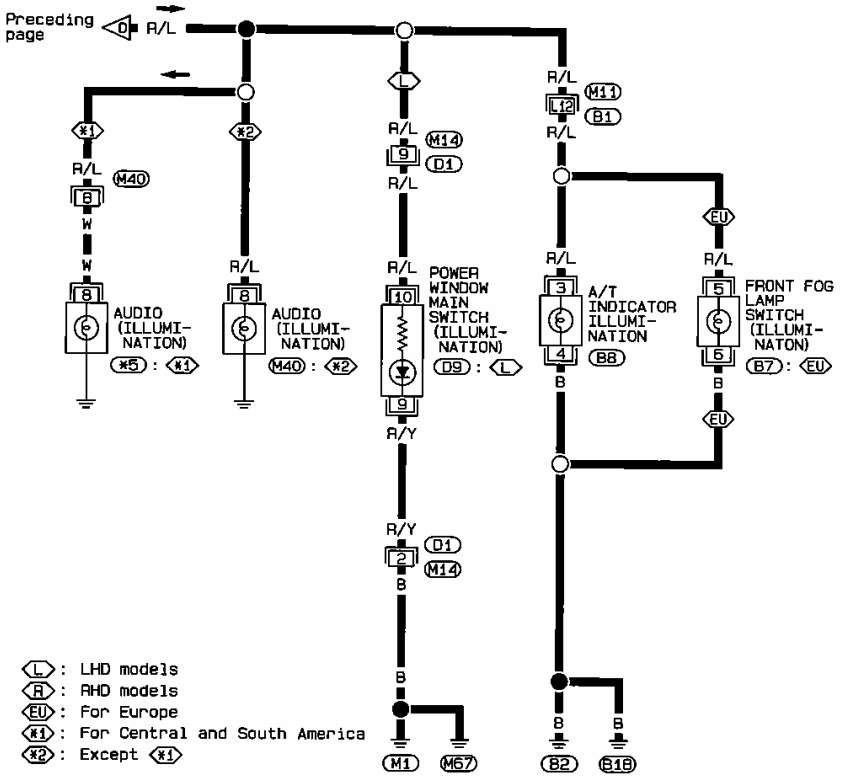


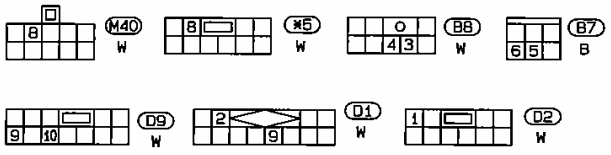
EL

HEL224

Illumination/Wiring Diagram — ILL — (Cont'd)

EL-ILL-05





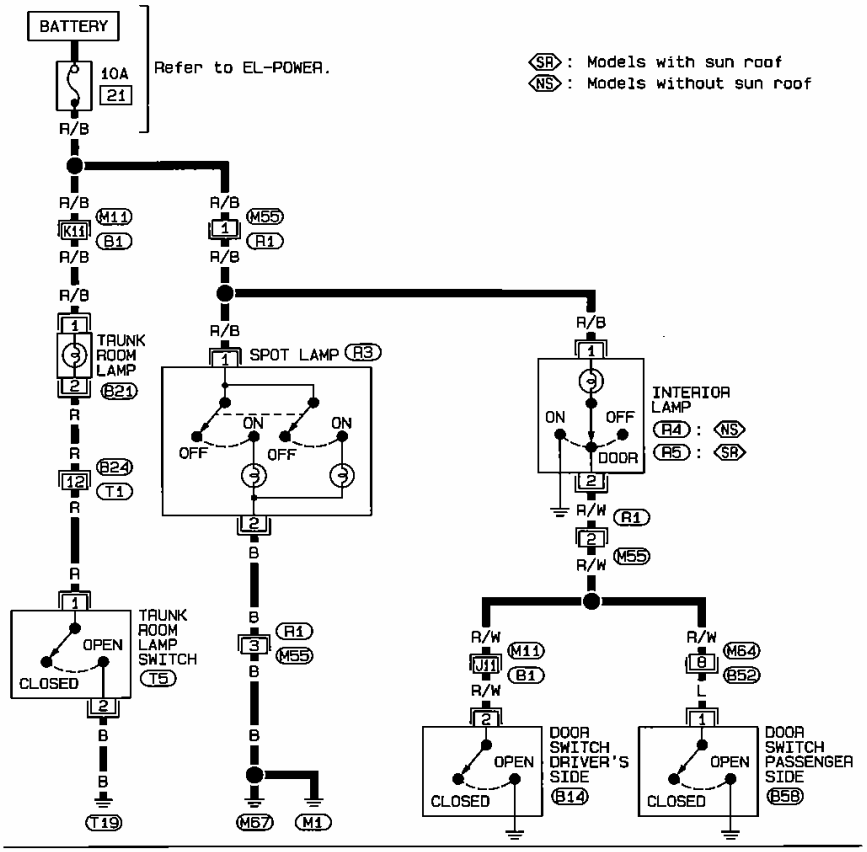
Refer to last page (Foldout page).
M11 , B1

HEL225

Interior, Spot and Trunk Room Lamps/Wiring Diagram — INT/L —

LHD MODELS

EL-INT/L-01



Refer to last page (Foldout page).

M11, B1

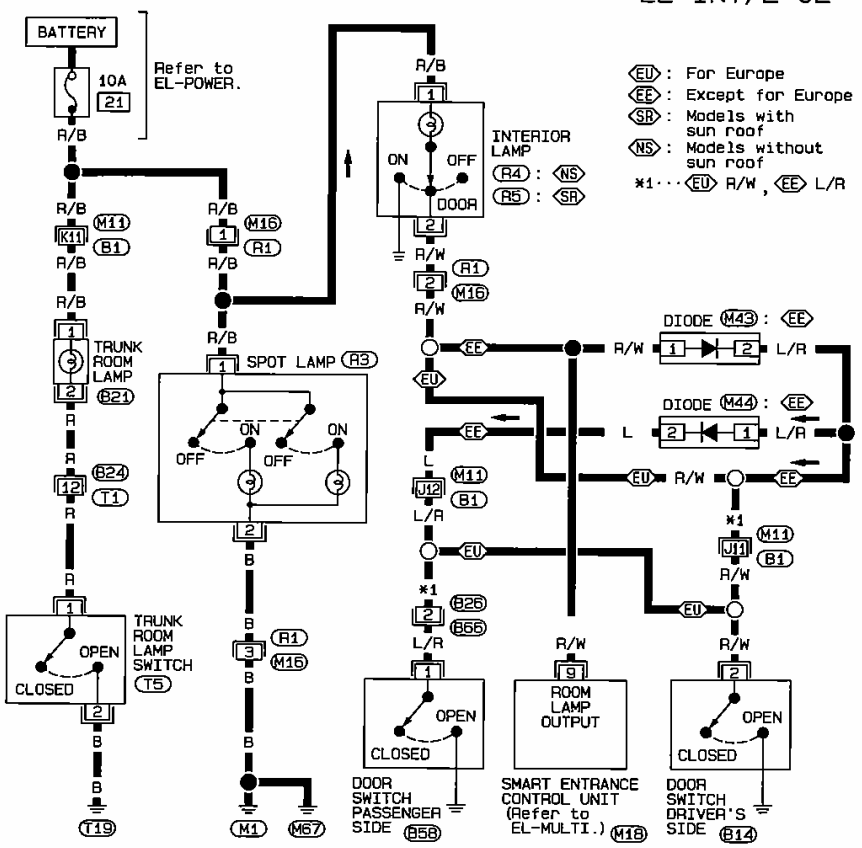
EL

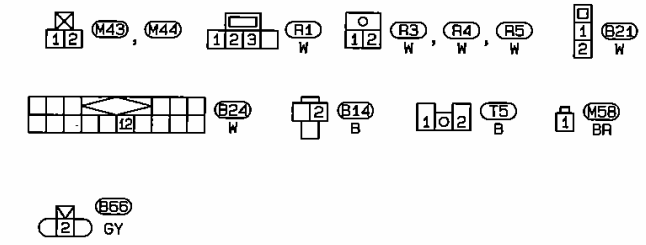
HEL226

Interior, Spot and Trunk Room Lamps/Wiring Diagram — INT/L — (Cont'd)

RHD MODELS

EL-INT/L-02





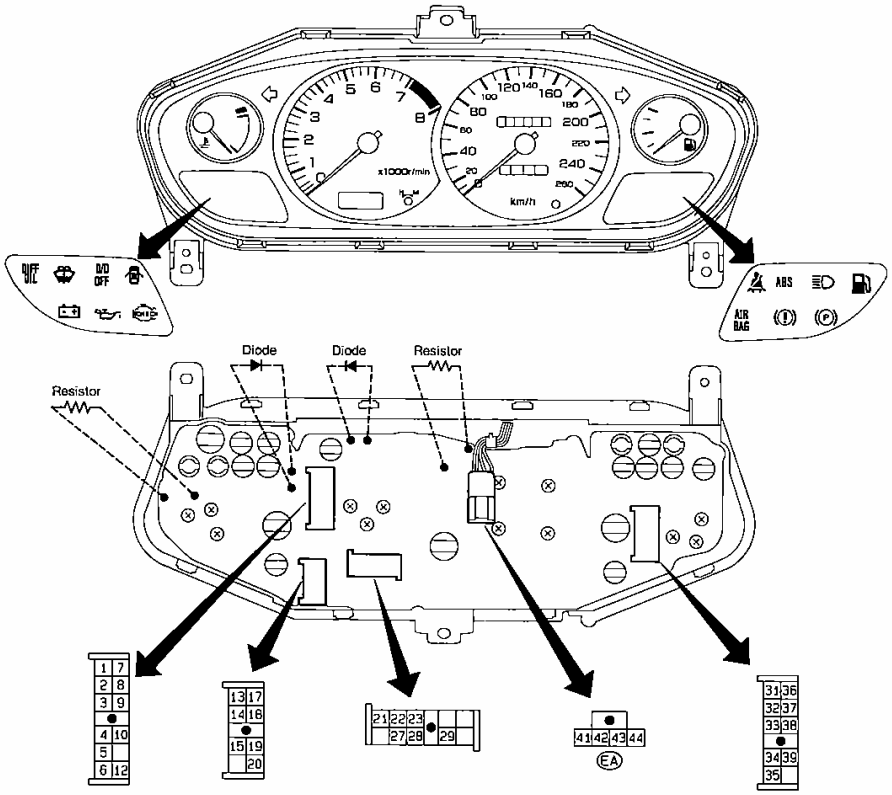
Refer to last page (Foldout page).

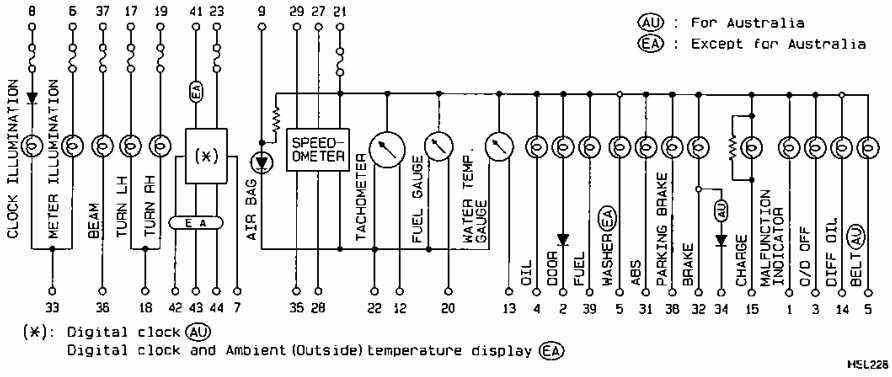
M11 , B1

M18

HEL227

Combination Meter

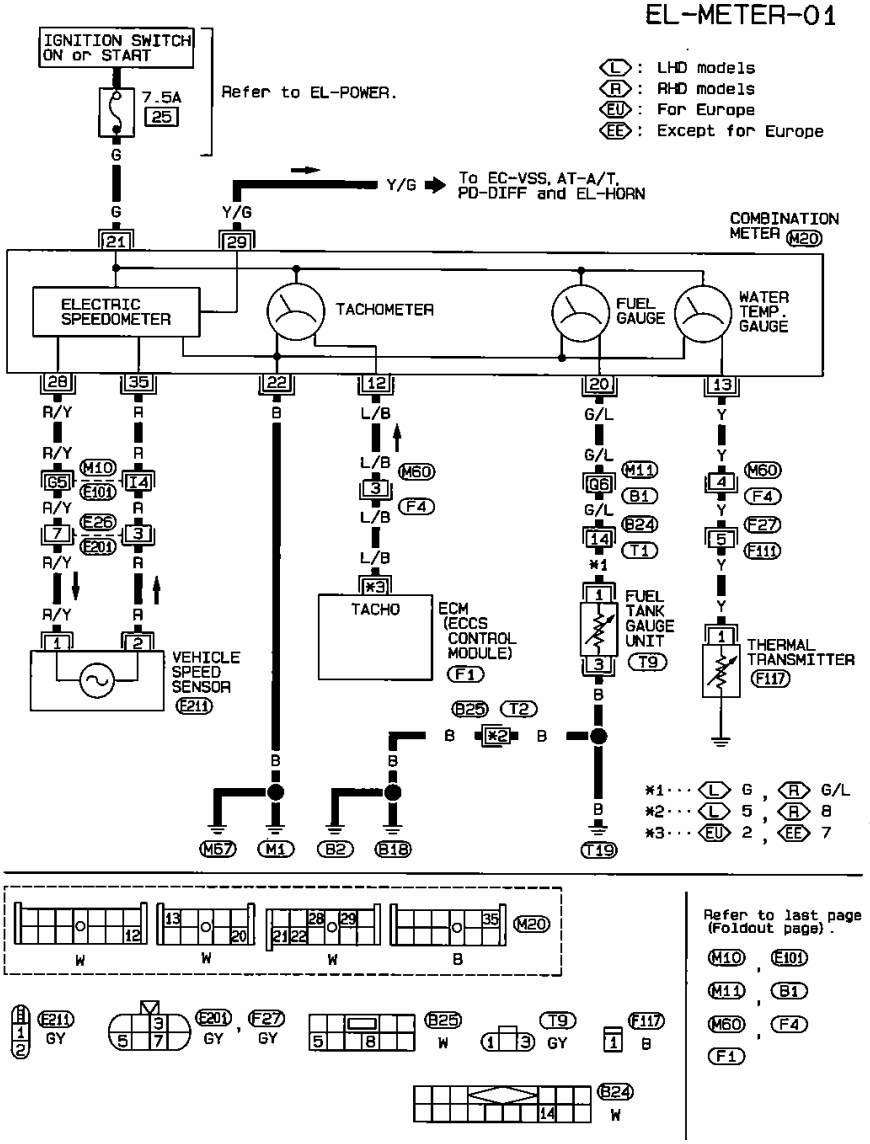




H5L228

Speedometer, Tachometer, Temp. and Fuel Gauges/Wiring Diagram — METER —

EL-METER-01

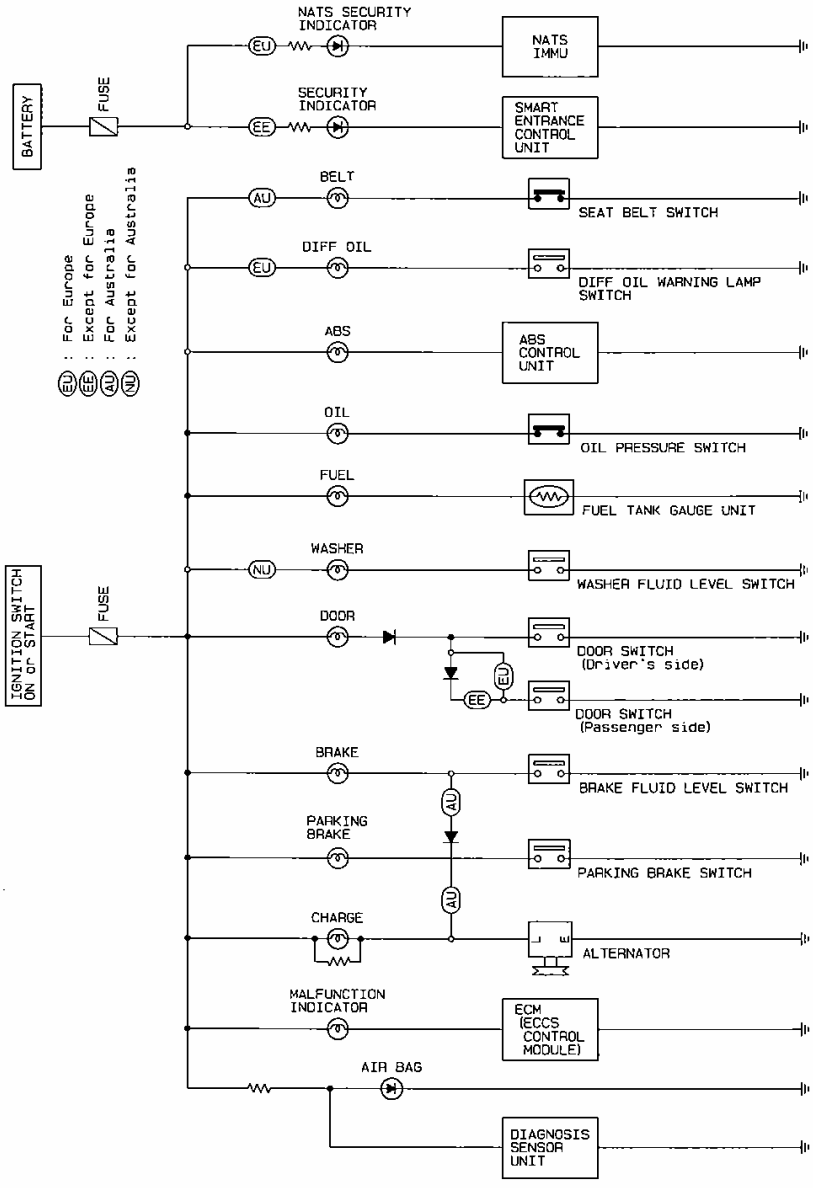


Refer to last page (Foldout page).

M10 , E101
M11 , B1
M60 , F4
F1

HEL229

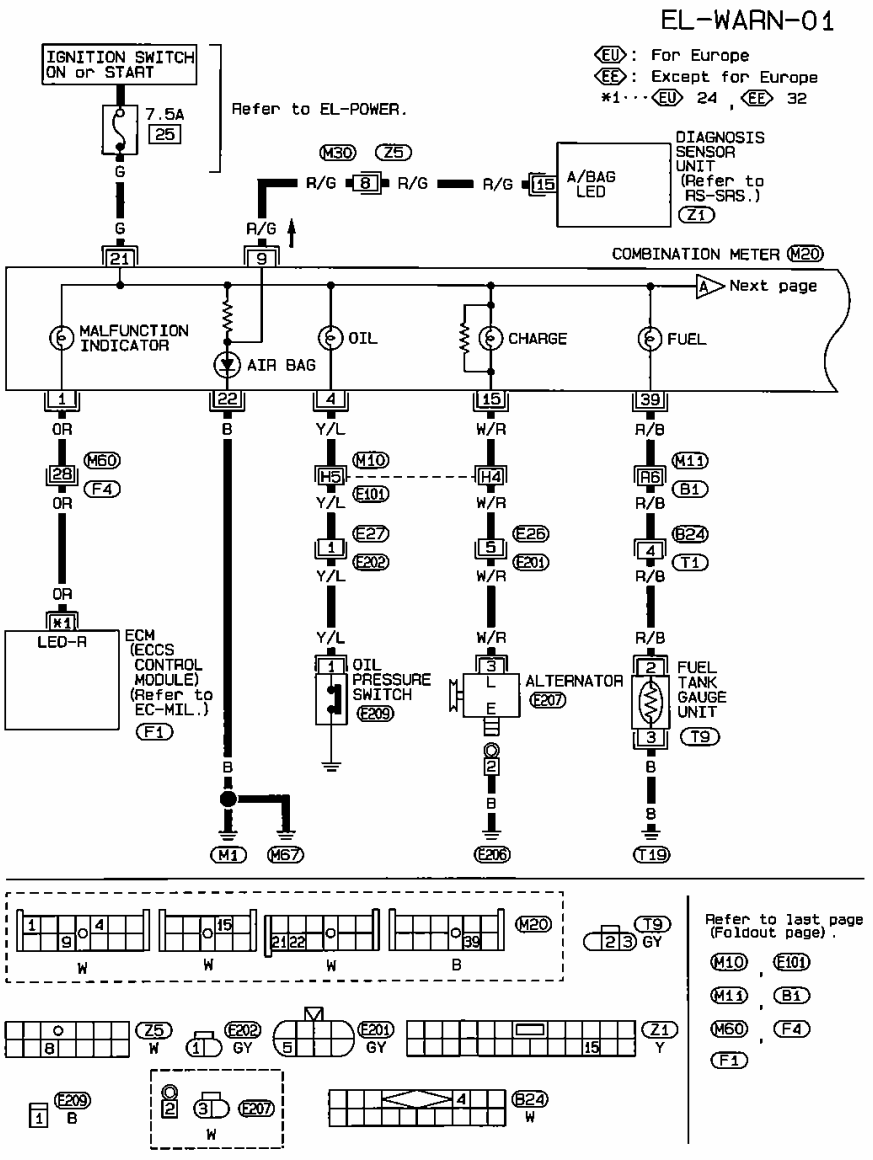
Warning Lamps/Schematic



EL

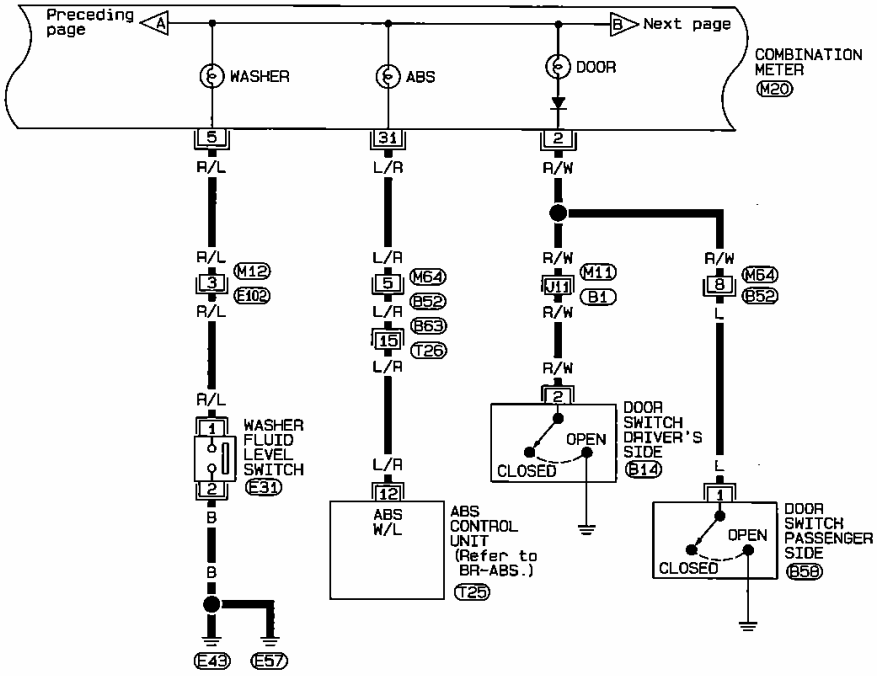
Warning Lamps/Wiring Diagram — WARN —

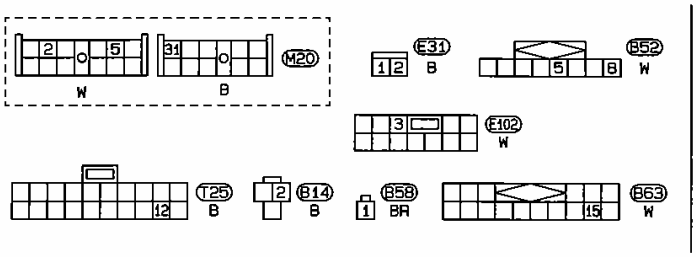
LHD MODELS



Warning Lamps/Wiring Diagram — WARN — (Cont'd)

EL-WARN-02





Refer to last page (Foldout page).

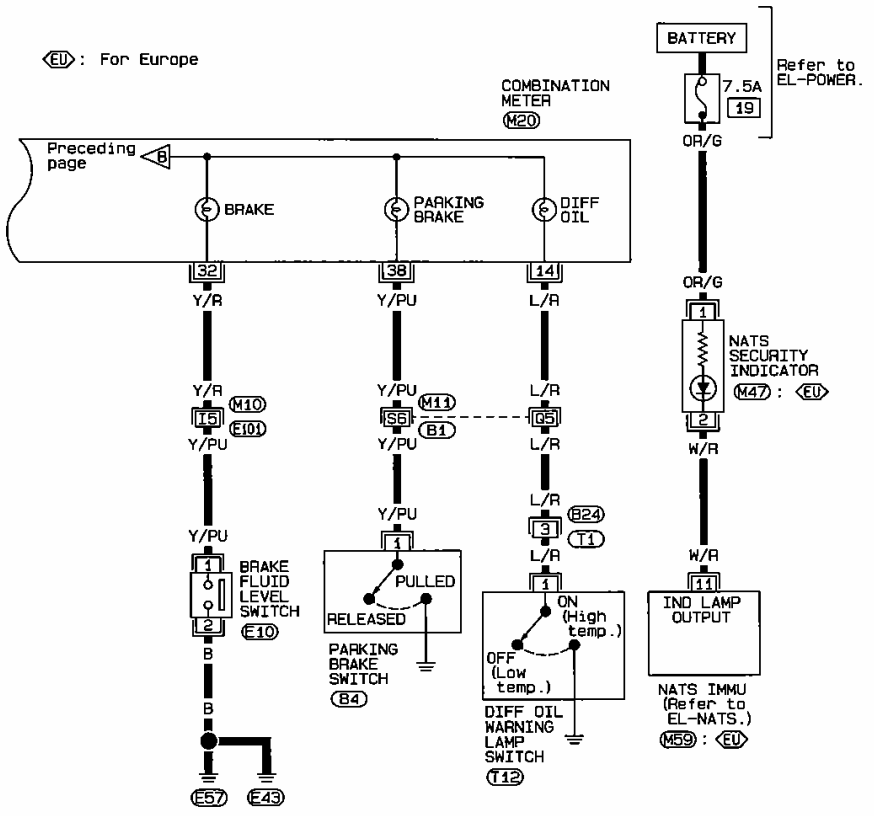
M11, B1

EL

HEL232

Warning Lamps/Wiring Diagram — WARN — (Cont'd)

EL-WARN-03



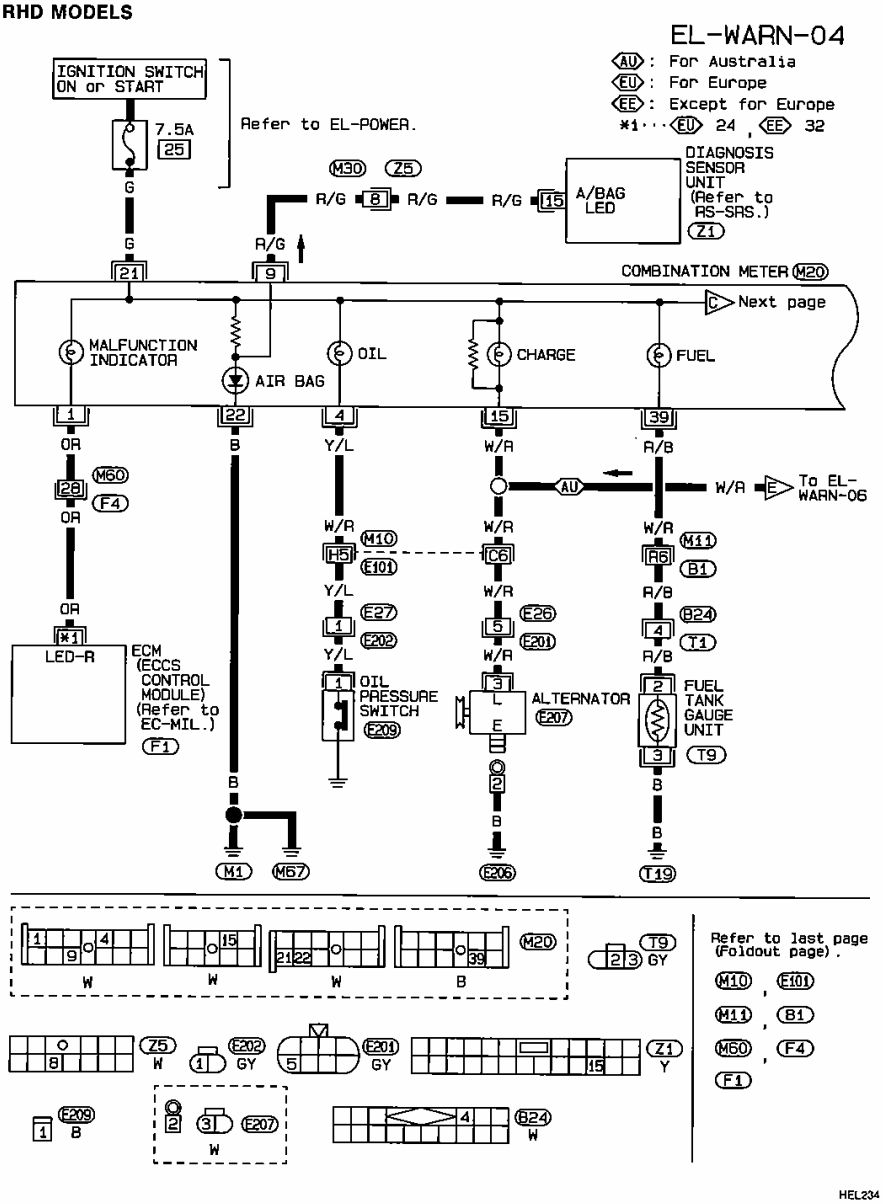
Refer to last page (Foldout page).

M10 , E101

M11 , B1

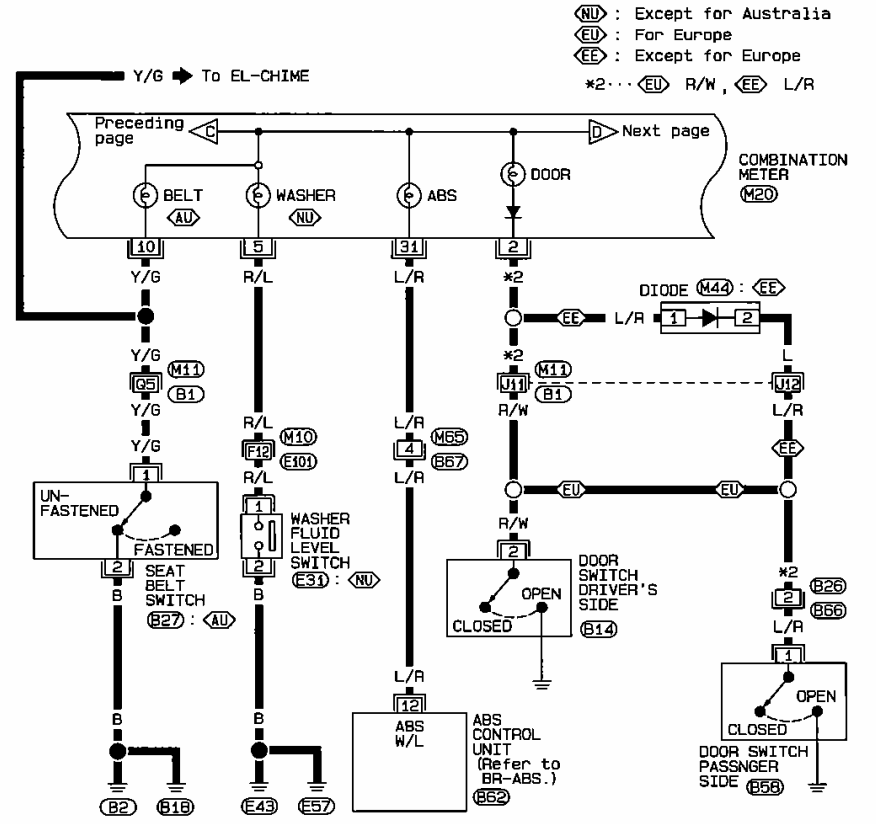
Warning Lamps/Wiring Diagram — WARN — (Cont'd)

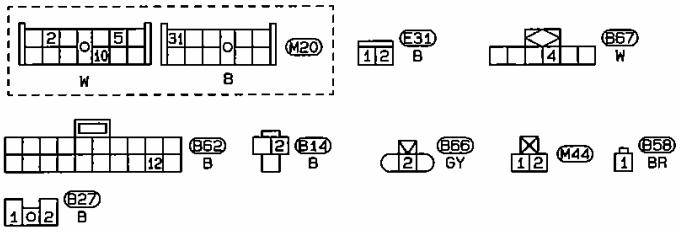
RHD MODELS



Warning Lamps/Wiring Diagram — WARN — (Cont'd)

EL-WARN-05





Refer to last page (Foldout page).

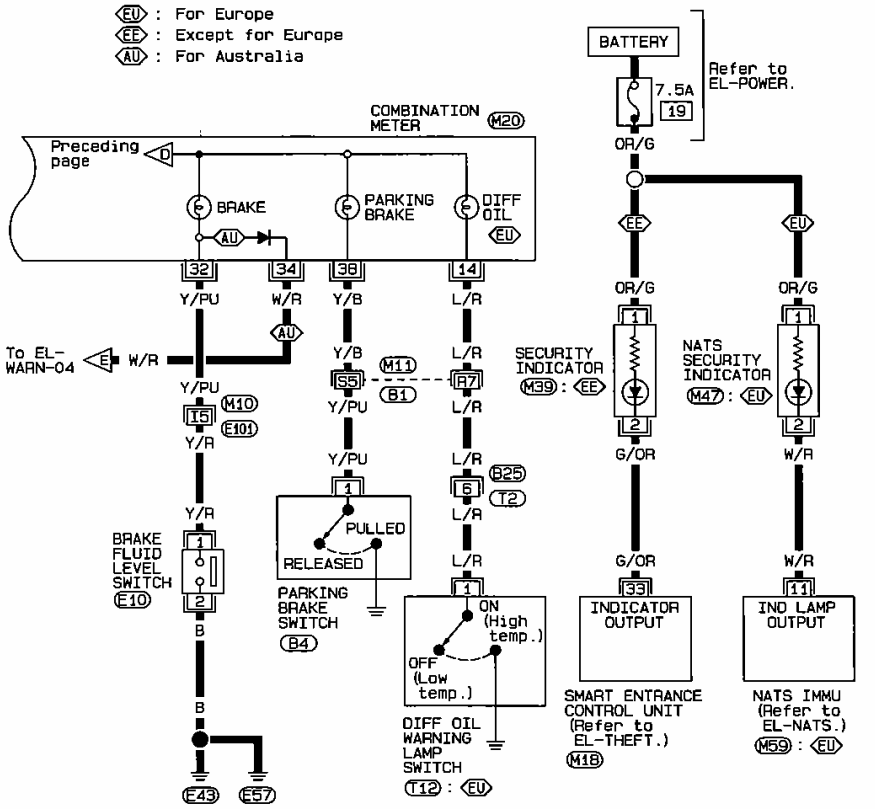
M10 , E101

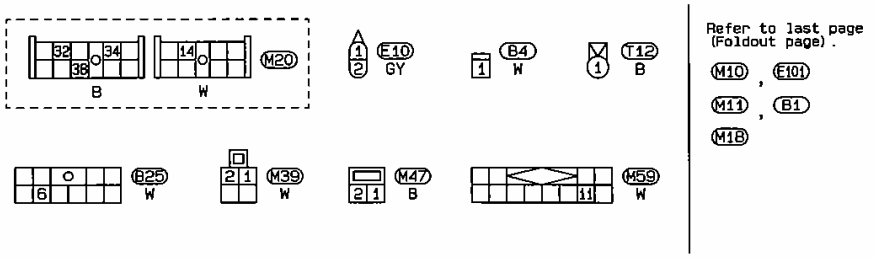
M11 , B1

HEL235

Warning Lamps/Wiring Diagram — WARN — (Cont'd)

EL-WARN-06





Refer to last page (Foldout page).

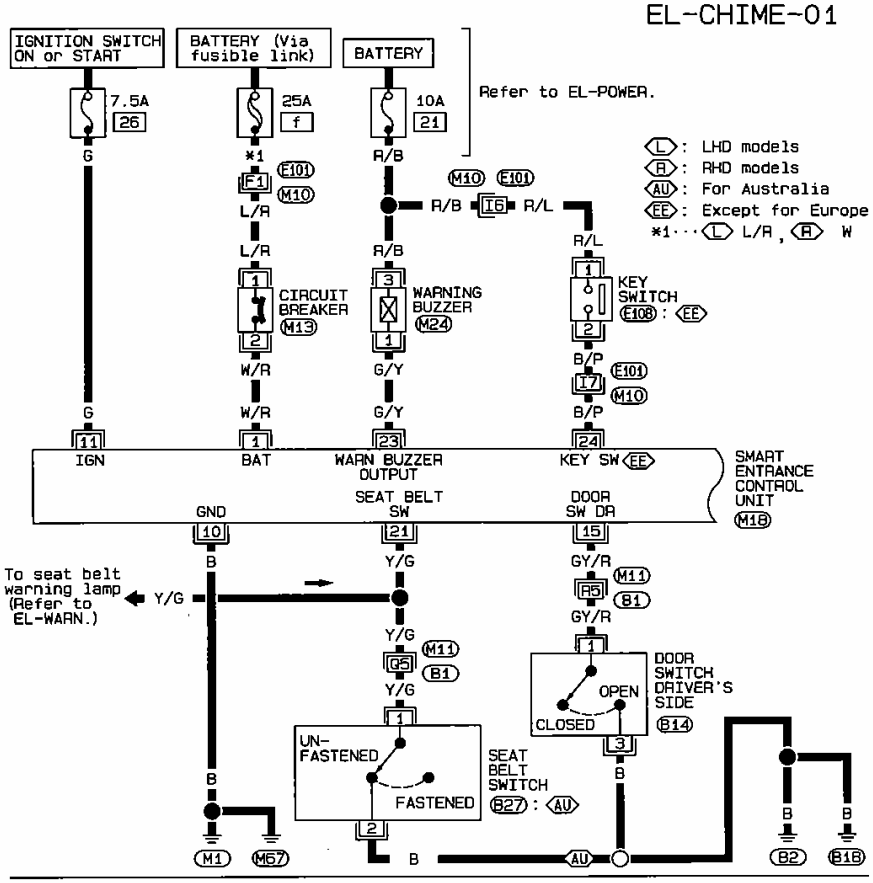
(M10), (E101)
(M11), (B1)
(M18)

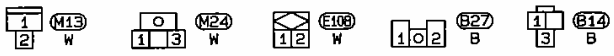
EL

HEL236

Warning Buzzer/Wiring Diagram — CHIME —

EL-CHIME-01



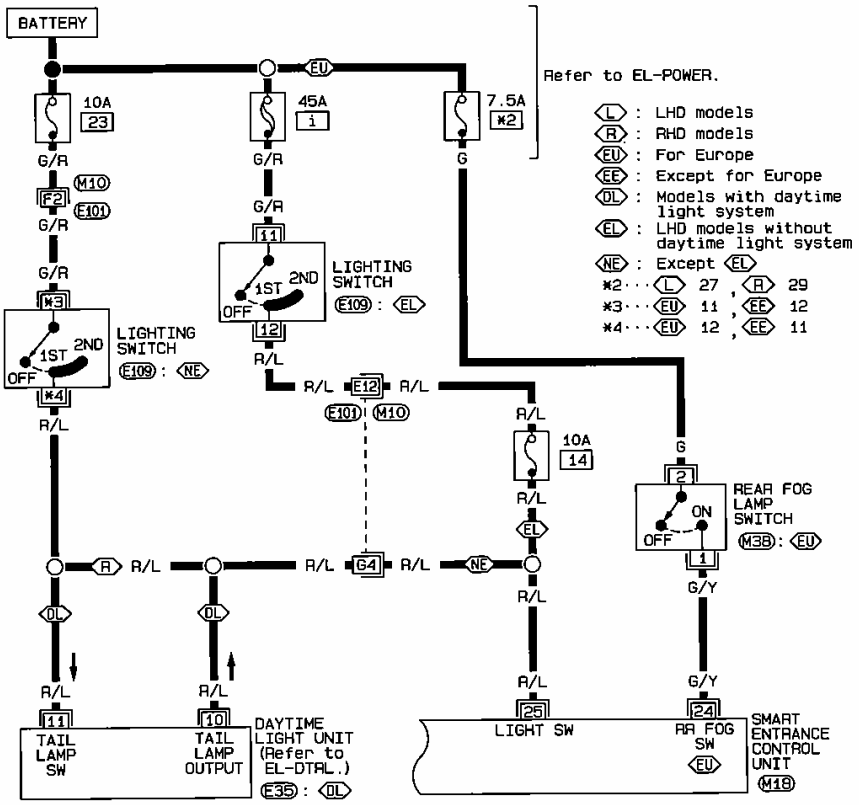


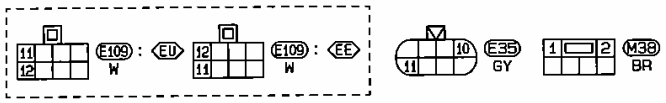
Refer to last page (Foldout page).
M10 , E101
M11 , B1
M18

HEL237

Warning Buzzer/Wiring Diagram — CHIME — (Cont'd)

EL-CHIME-02



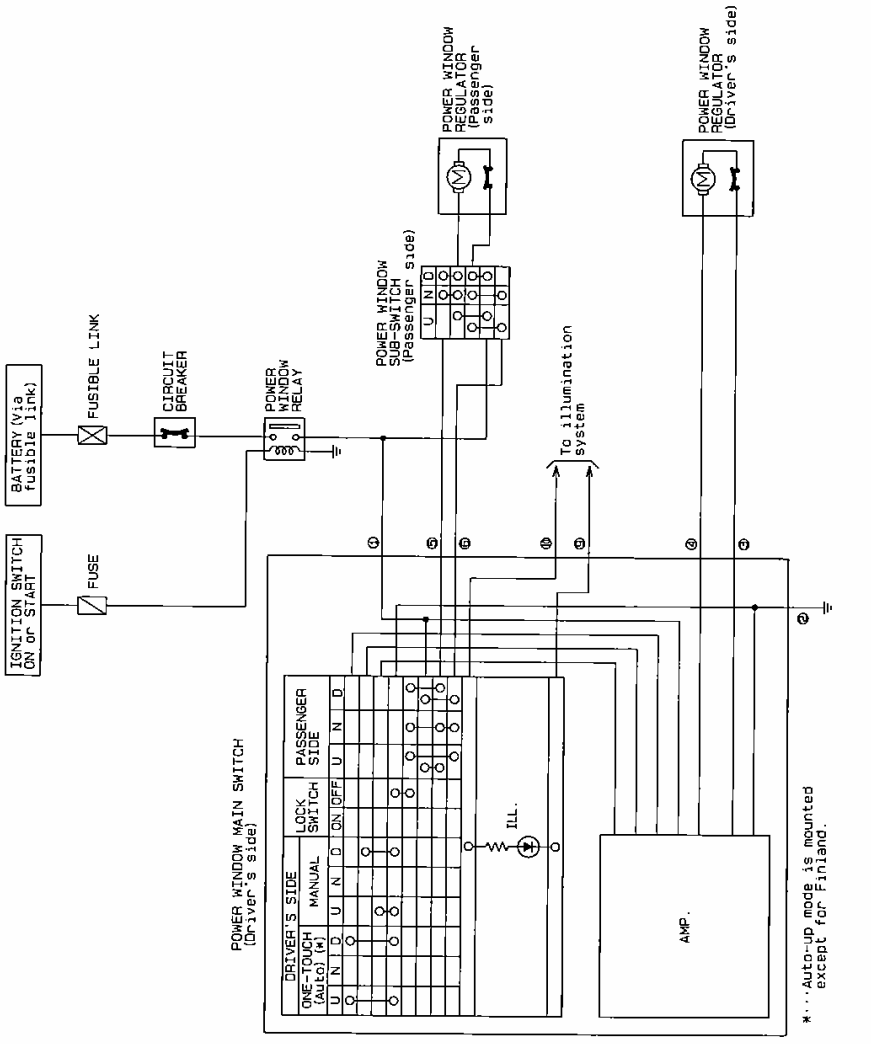


Refer to last page (Foldout page).
M10 , E101
M18

EL

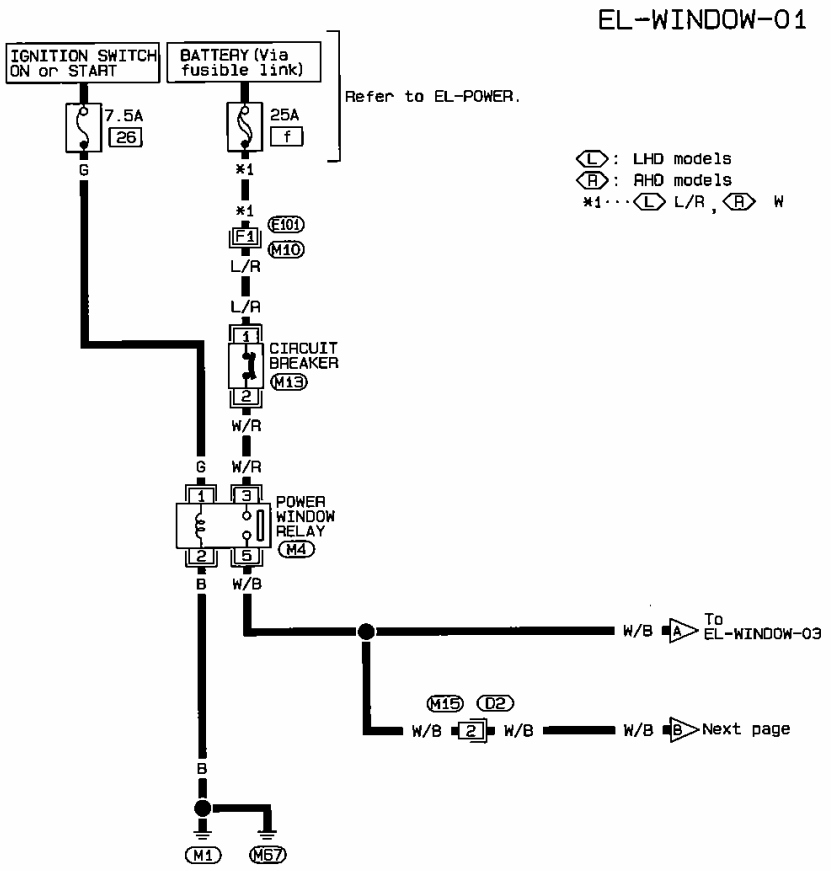
HEL238

Schematic



HEL239

Wiring Diagram — WINDOW —



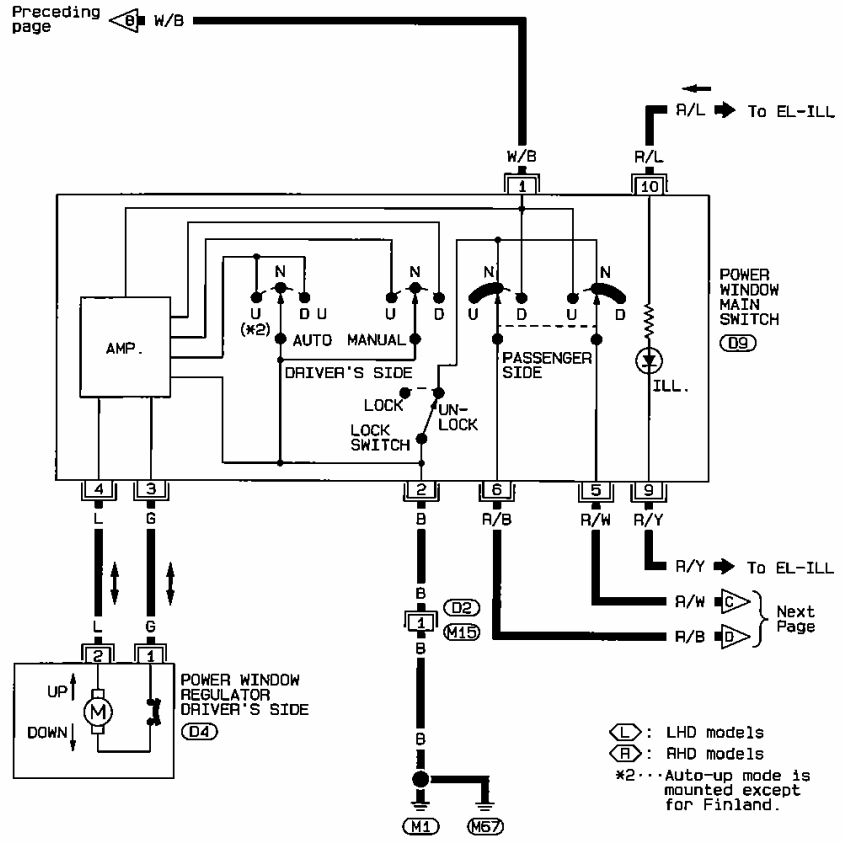
Refer to last page (Foldout page).
M10 , E101

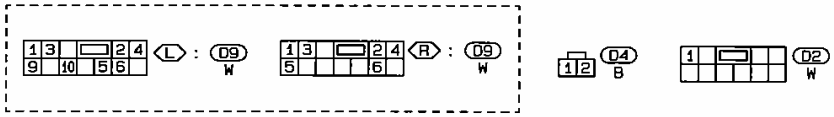
EL

HEL240

Wiring Diagram — WINDOW — (Cont'd)

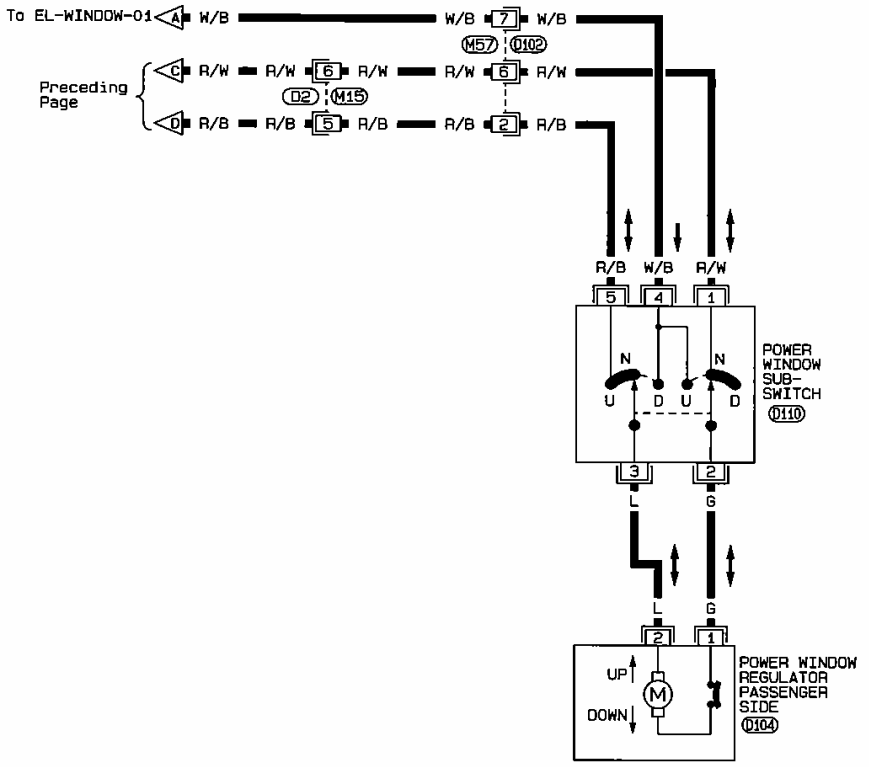
EL-WINDOW-02

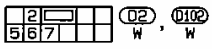


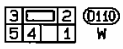


HEL241

EL-WINDOW-03







EL

HEL242

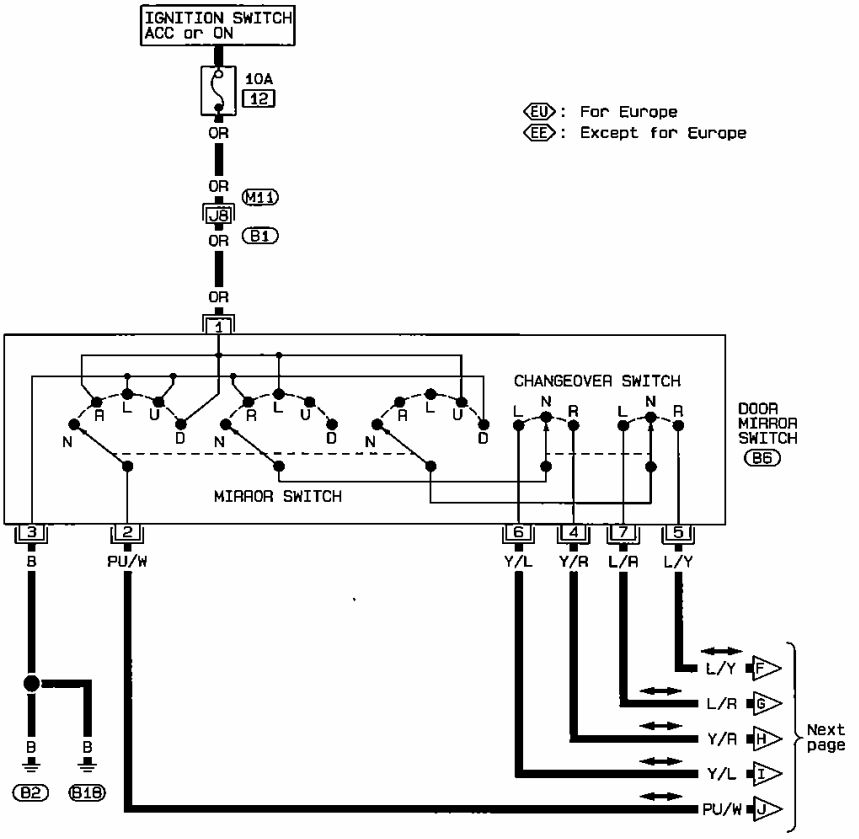
Trouble Diagnoses

Symptom	Possible cause	Repair order
None of the power windows can be operated using any switch.	1. 7.5A fuse, 25A fusible link and (M13) circuit breaker	1. Check 7.5A fuse (No. 26 , located in fuse block), 25A fusible link (letter I , located in fuse and fusible link box) and (M13) circuit breaker. Turn ignition switch "ON" and verify battery positive voltage is present at terminal ① of power window main switch and terminal ④ of sub-switches.
	2. Grounds (M1) and (M67)	2. Check grounds (M1) and (M67).
	3. Power window relay	3. Check power window relay.
	4. Open/short in power window main switch circuit	4. Check W/B wire between power window relay and power window main switch for open/short circuit.
Driver's side power window cannot be operated but passenger windows can be operated.	1. Driver's side power window regulator circuit	1. Check driver's side power window regulator circuit
	2. Driver's side power window regulator	2. Check driver's side power window regulator
Passenger power windows cannot be operated.	1. Power window sub-switch	1. Check power window sub-switch
	2. Passenger side power window regulators	2. Check passenger side power window regulator
	3. Power window main switch	3. Check power window main switch
	4. Power window circuit	4-1. Check harnesses between power window main switch and power window sub-switch for open/short circuit. 4-2. Check harnesses between power window sub-switch and passenger side power window regulator for open/short circuit.
Passenger power window cannot be operated using power window main switch but can be operated by power window sub-switch.	1. Power window main switch	1. Check power window main switch.
Driver's side power window auto function cannot be operated using power window main switch.	1. Power window main switch	1. Check power window main switch.

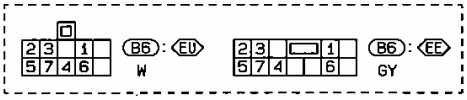
Wiring Diagram — MIRROR —

RHD MODELS

EL-MIRROR-03



EU: For Europe
EE: Except for Europe



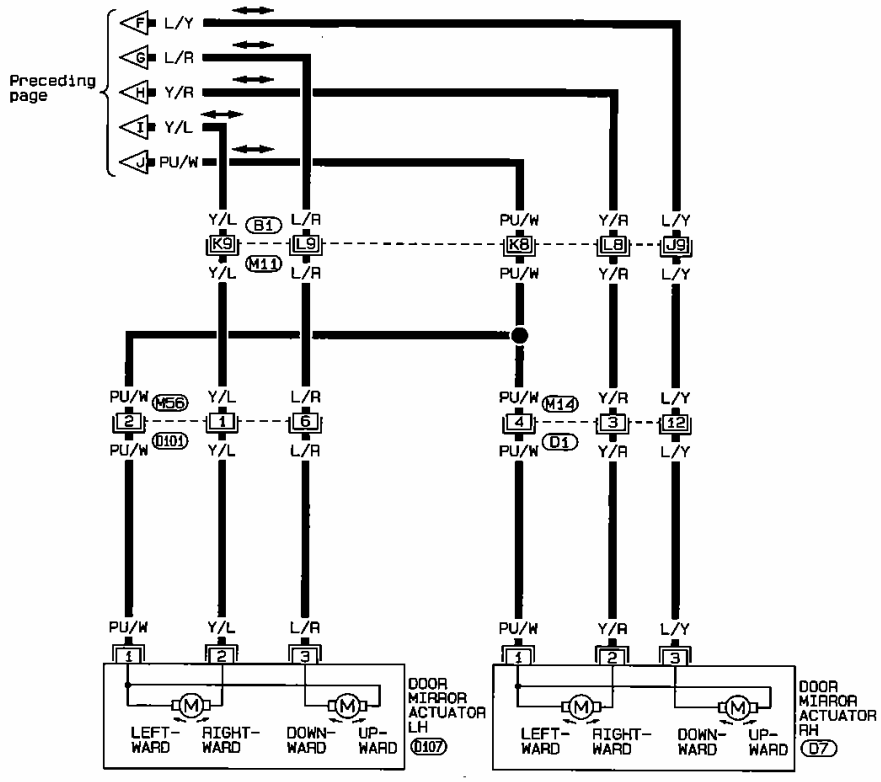
Refer to last page (Foldout page).
M11, B1

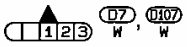
EL

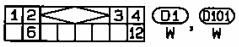
HEL386

Wiring Diagram — MIRROR — (Cont'd)

EL-MIRROR-04





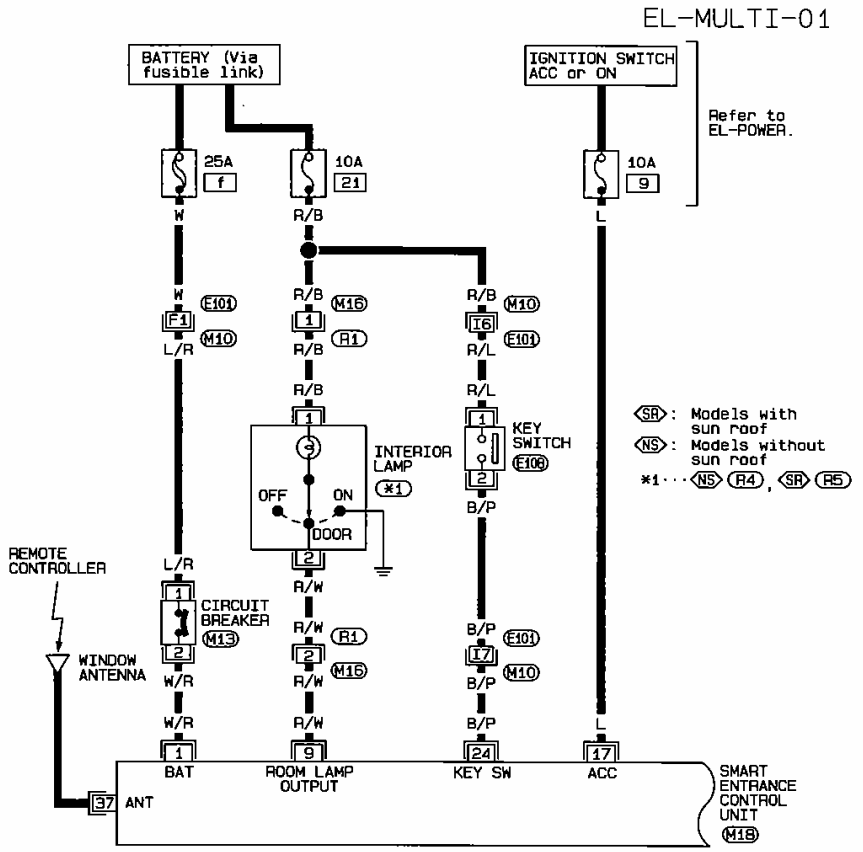


Refer to last page (Foldout page).

M11, B1

SEL838T

Wiring Diagram — MULTI —



1 2 M13 W

1 2 R1 W

1 2 R4, R5 W

1 2 E108 W

Refer to last page (Foldout page).

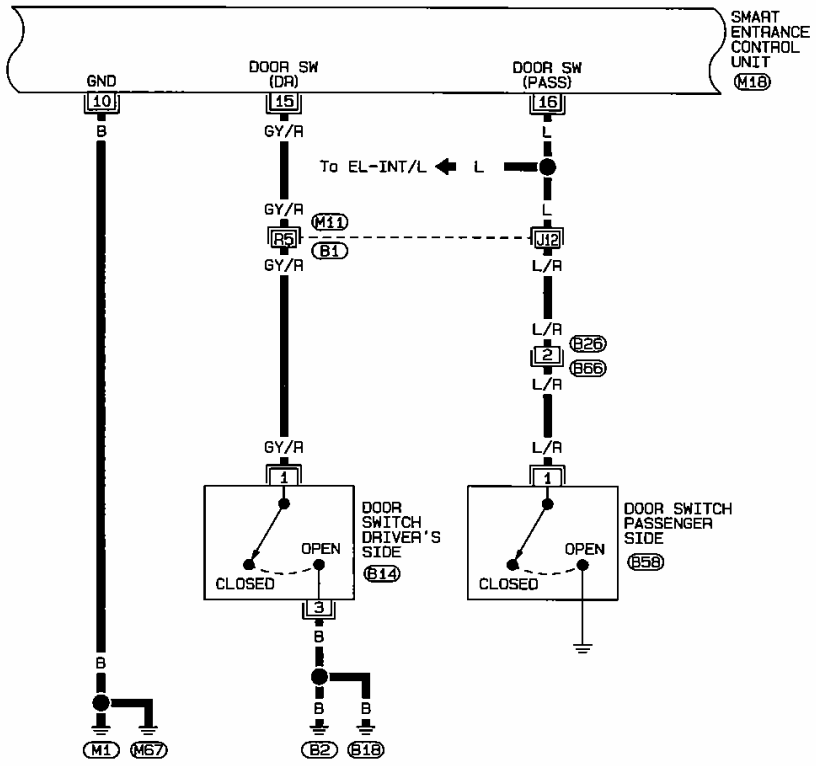
M10, E101

M18

EL

SEL770T

EL-MULTI-02

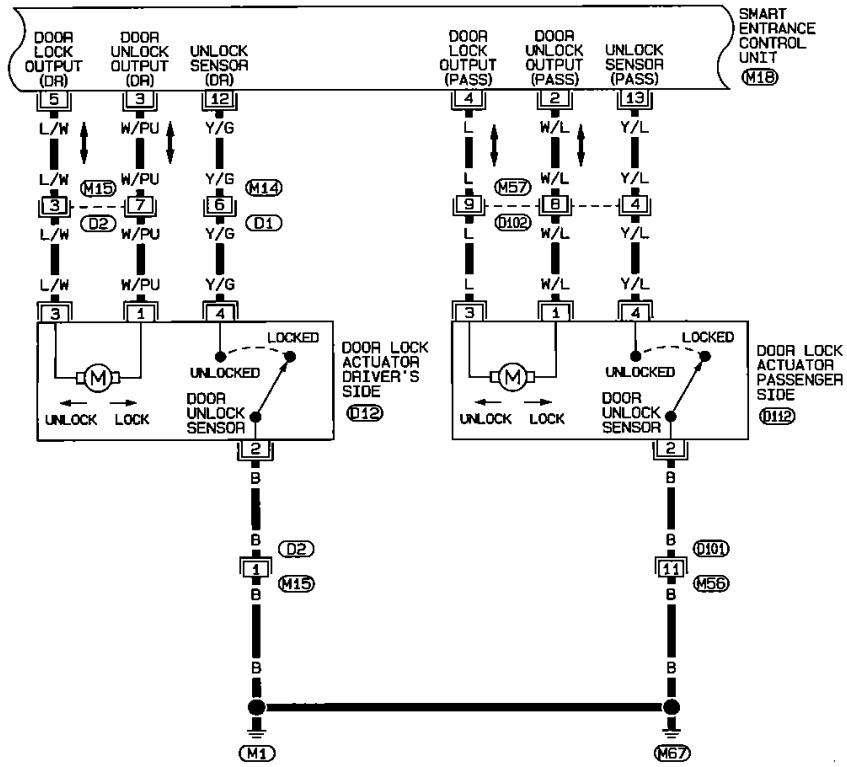


Refer to last page (Foldout page).
M11, B1
M18

HEL243

Wiring Diagram — MULTI — (Cont'd)

EL-MULTI-03



D1, D101 W, W

D2, D102 W, W

D12, D112 GY, GY

Refer to last page (Foldout page).

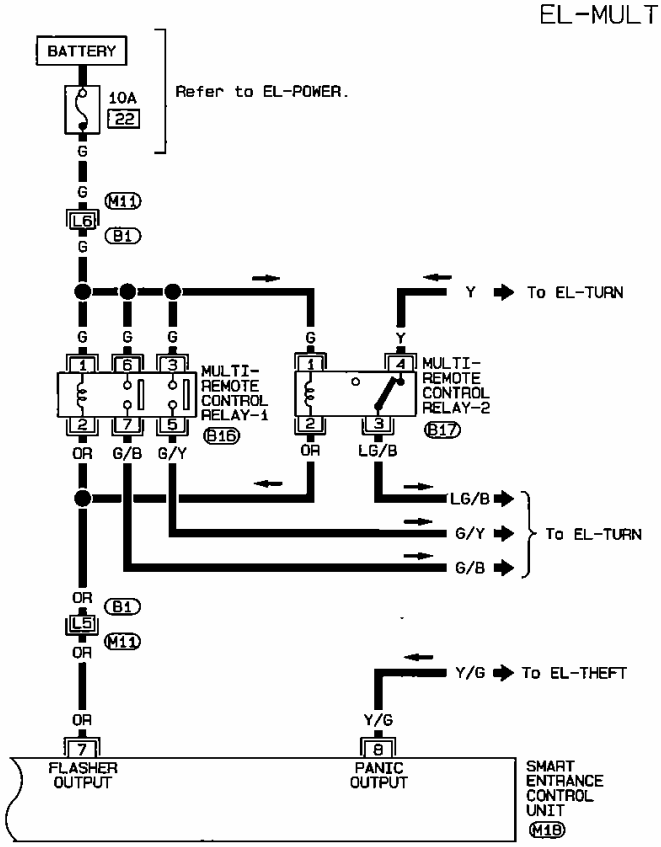
M18

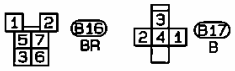
EL

SEL772T

Wiring Diagram — MULTI — (Cont'd)

EL-MULTI-04





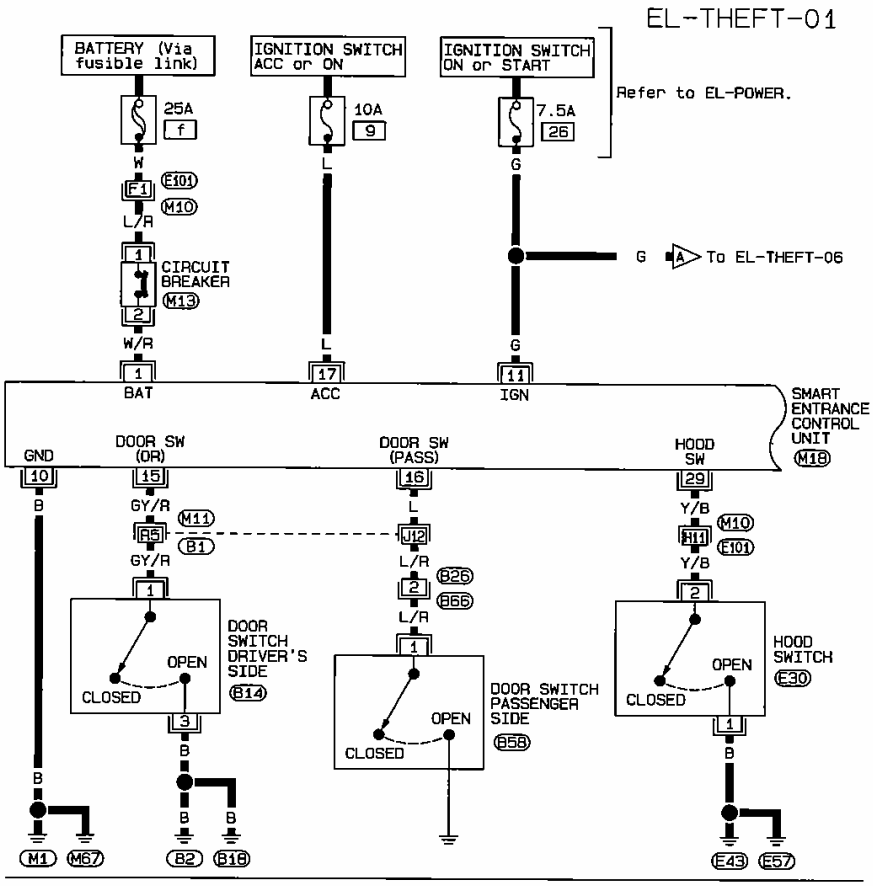
Refer to last page (Foldout page).

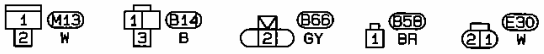
M11, B1

M18

SEL773T

Wiring Diagram — THEFT —





Refer to last page (Foldout page).

M10, E101

M11, B1

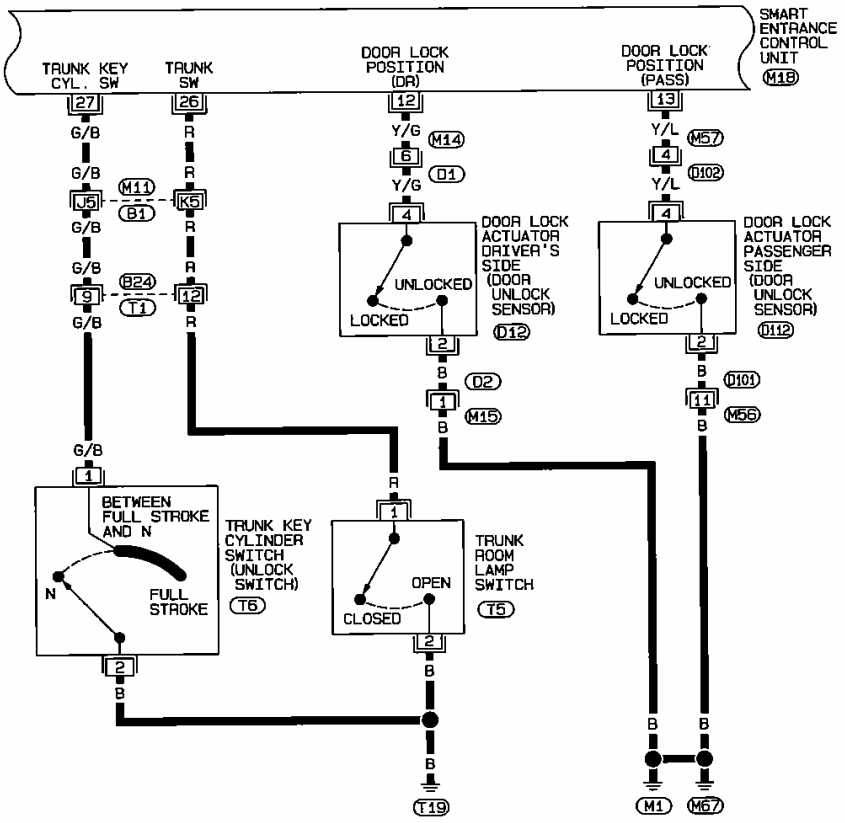
M18

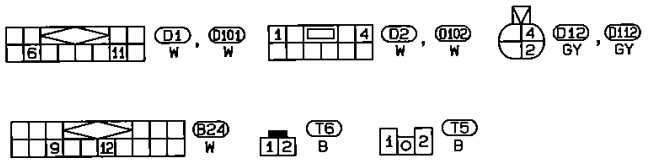
EL

HEL244

Wiring Diagram — THEFT — (Cont'd)

EL-THEFT-02



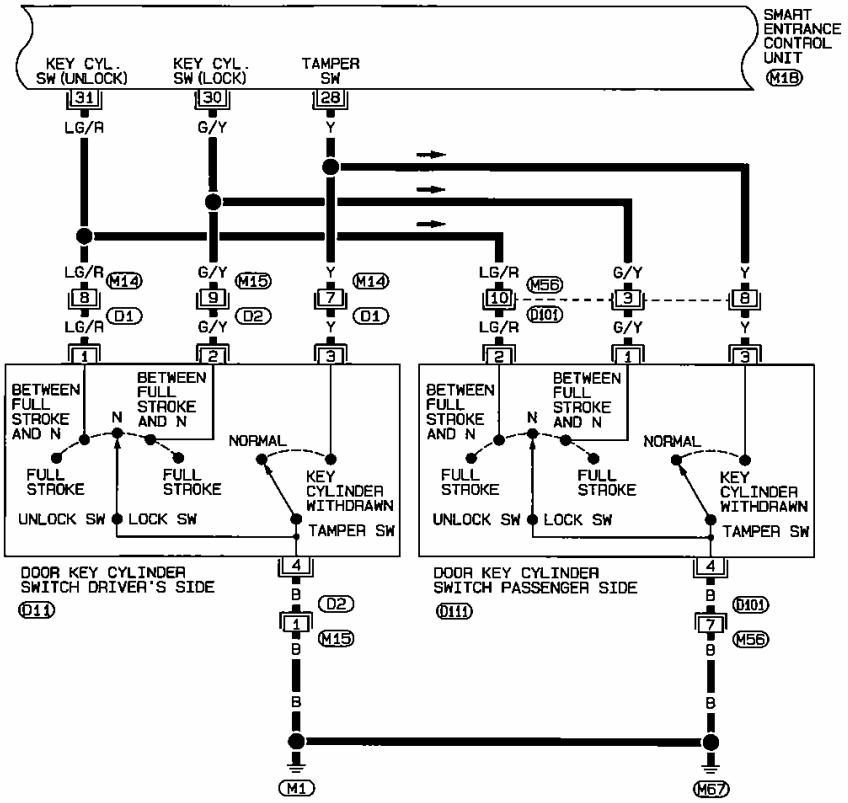


Refer to last page (Foldout page).
M11, B1
M18

SEL776T

Wiring Diagram — THEFT — (Cont'd)

EL-THEFT-03



Refer to last page (Foldout page).

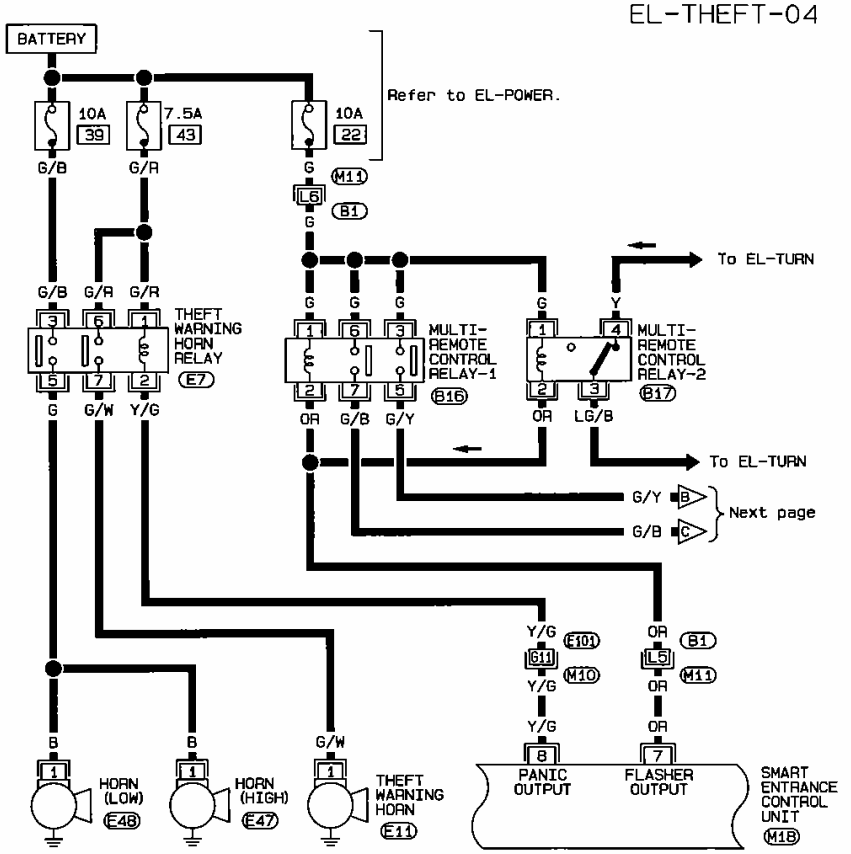
M18

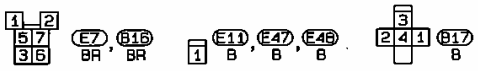
EL

SEL777T

Wiring Diagram — THEFT — (Cont'd)

EL-THEFT-04





Refer to last page (Foldout page).

M10, E101

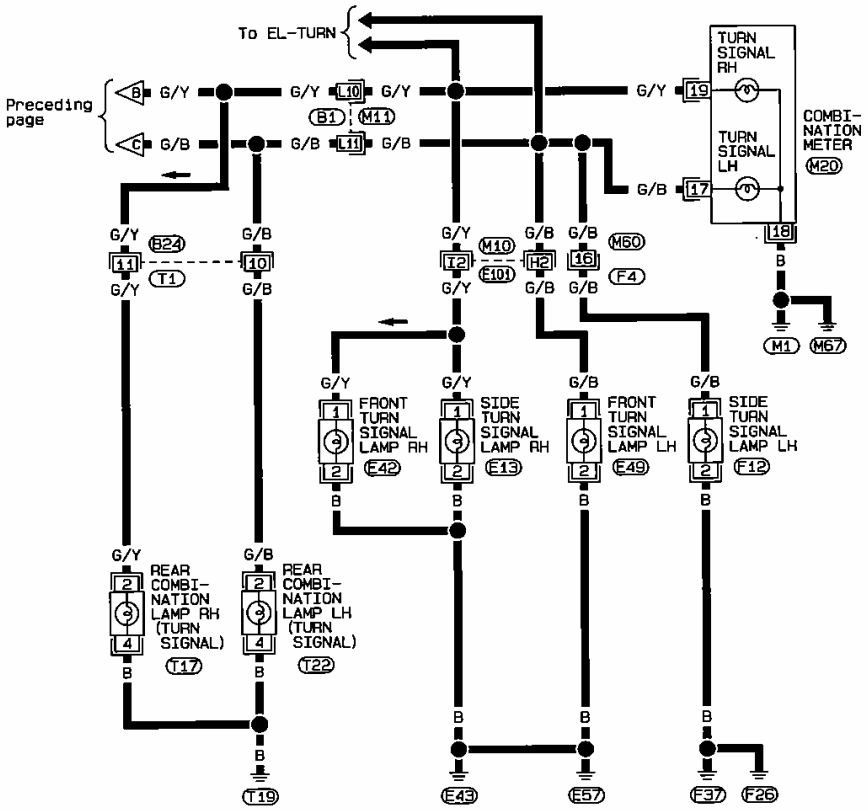
M11, B1

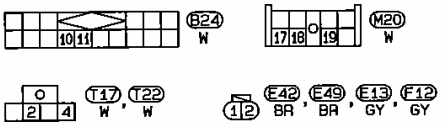
M18

SEL778T

Wiring Diagram — THEFT — (Cont'd)

EL-THEFT-05





Refer to last page (Foldout page).

M10, E101

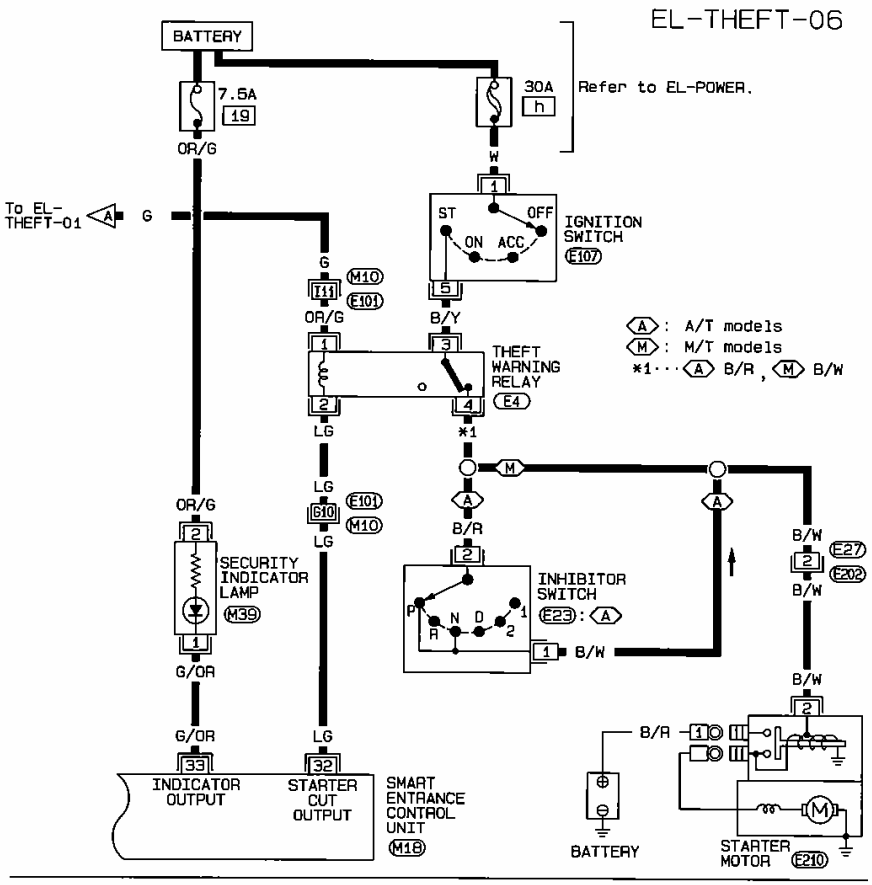
M11, B1

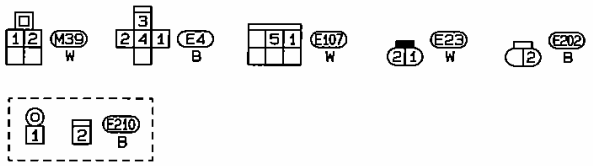
M60, F4

EL

SEL779T

Wiring Diagram — THEFT — (Cont'd)





Refer to last page (Foldout page).

M10 , E101

M18

HEL245

System Description

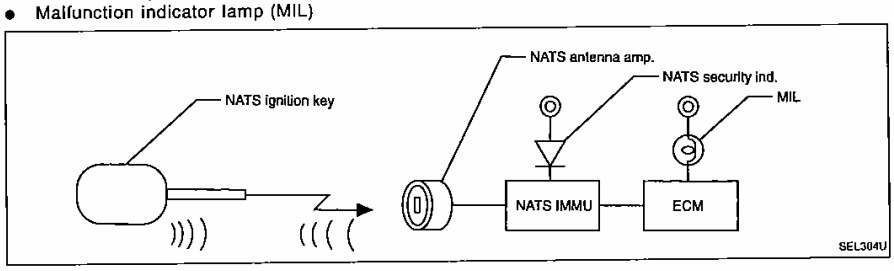
NATS V2.0 for the S14 model has the following immobiliser functions:

- Since only NATS ignition keys, whose ID nos. have been registered into the ECM and IMMU of NATS, allow the engine to run, operation of a stolen vehicle without a NATS registered key is prevented by NATS.
  That is to say, NATS V2.0 will immobilize the engine if someone tries to start it without the registered key of NATS V2.0.
- Both of the originally supplied ignition key IDs have been NATS registered.
  If requested by the vehicle owner, a maximum of four key IDs can be registered into the NATS components.
- The NATS security indicator (NATS security ind.) blinks when the ignition switch is in "OFF" or "ACC" position. Therefore, NATS warns outsiders that the vehicle is equipped with the anti-theft system.
- When NATS detects trouble, the malfunction indicator lamp (MIL) blinks.
- NATS trouble diagnoses, system initialisation and additional registration of other NATS ignition key IDs must be carried out using CONSULT hardware and CONSULT NATS software.
  When NATS initialisation has been completed, the ID of the inserted ignition key is automatically NATS registered. Then, if necessary, additional registration of other NATS ignition key IDs can be carried out.
  Regarding the procedures of NATS initialisation and NATS ignition key ID registration, refer to CONSULT operation manual, NATS V2.0.
- When diagnosing NATS V2.0 using CONSULT, adapter and adapter harness for NATS V1.0 are not necessary, although a direct DDL cable connection between CONSULT and DDL connector is required.
- When servicing a malfunction of the NATS V2.0 (indicated by flashing of Malfunction Indicator Lamp) or registering another NATS ignition key ID no., it may be necessary to re-register original key identification. Therefore, be sure to receive all keys from vehicle owner.

System Composition

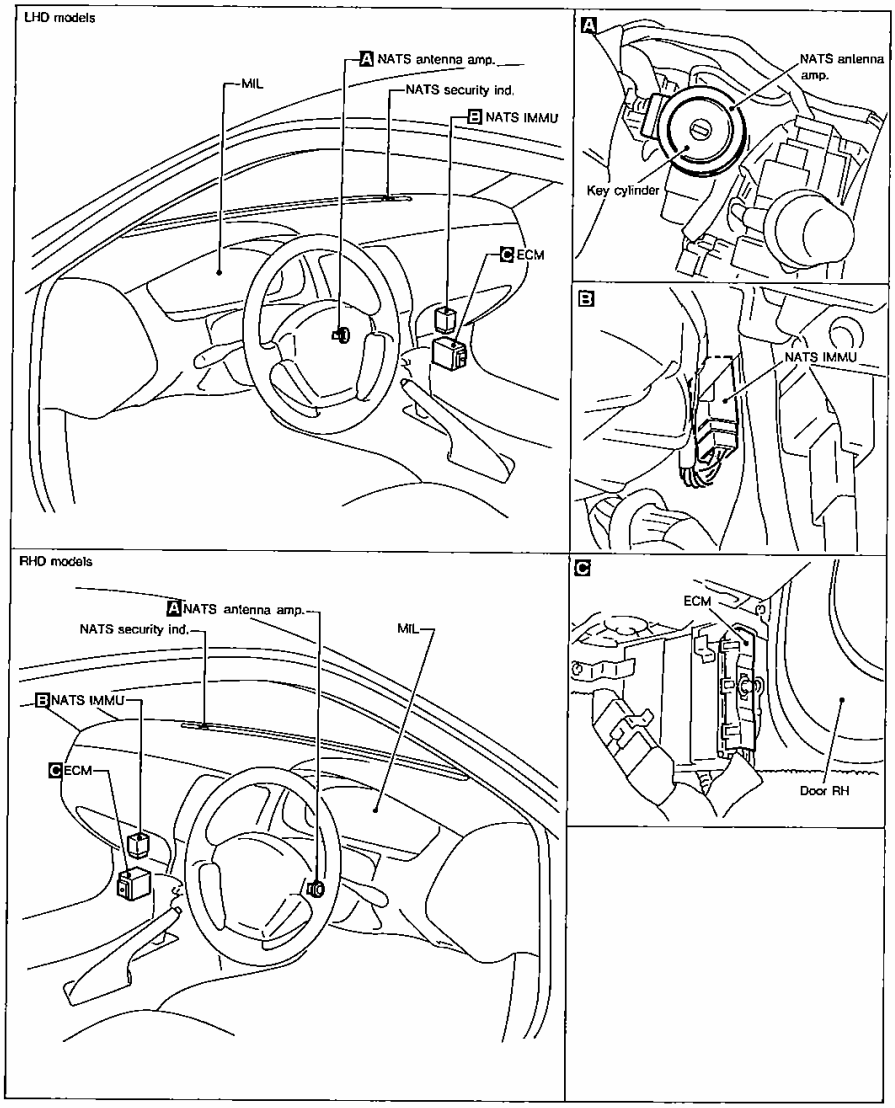
The immobiliser function of the NATS for the S14 model consists of the following:

- NATS ignition key
- NATS antenna amp. located in the ignition key cylinder
- NATS immobiliser control unit (NATS IMMU)
- Engine control module (ECM)
- NATS security indicator (NATS security ind.)
- Malfunction indicator lamp (MIL)



EL

Component Parts Location

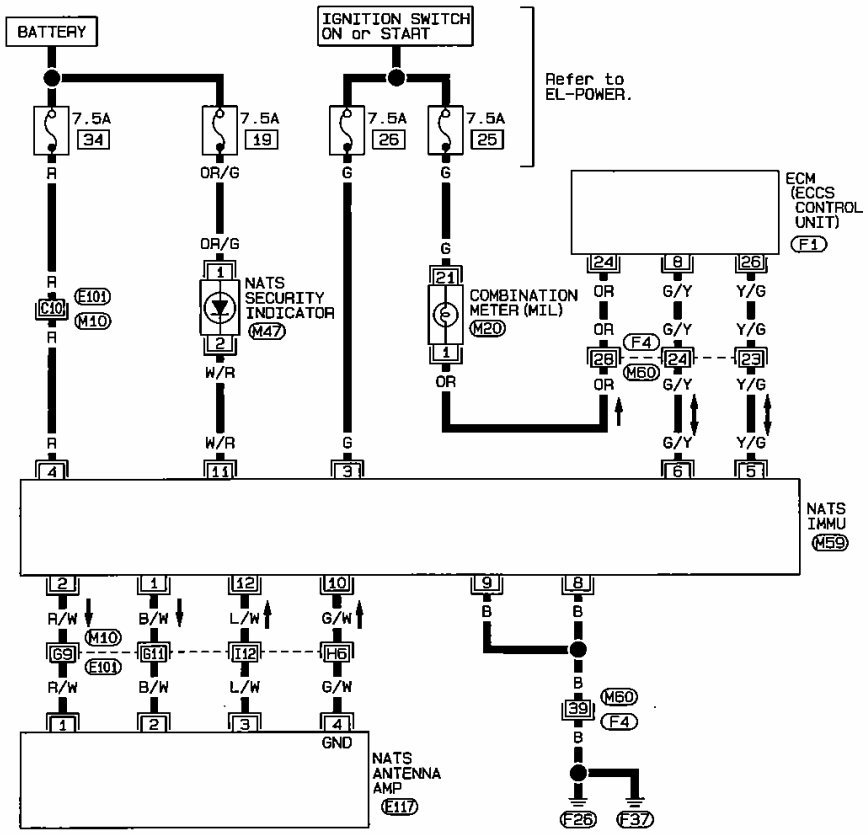


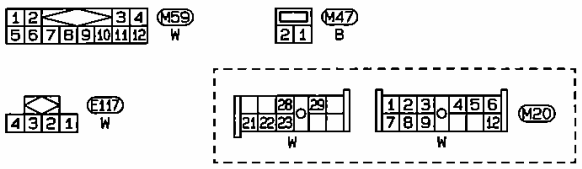
HEL250

Wiring Diagram — NATS —

LHD MODELS

EL-NATS-01





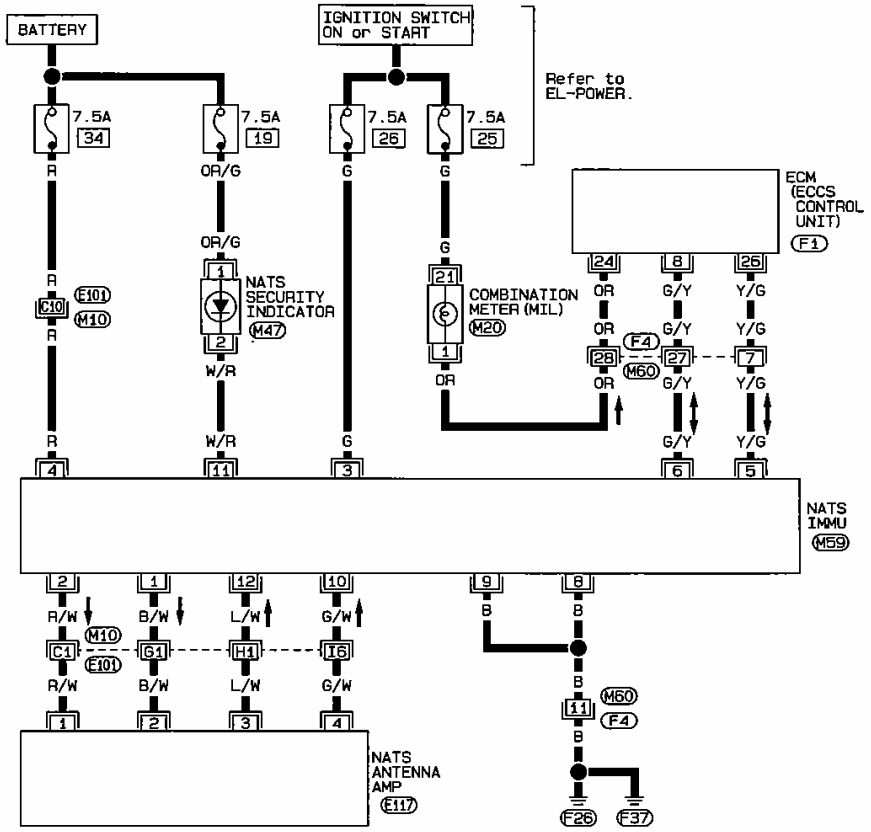
Refer to last page (Foldout page).

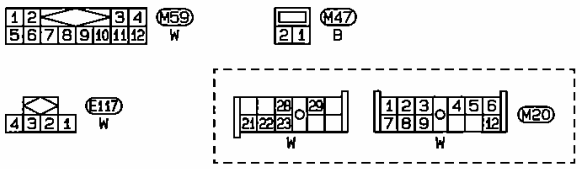
M10, E101
M60, F4
F1

Wiring Diagram — NATS — (Cont'd)

RHD MODELS

EL-NATS-02





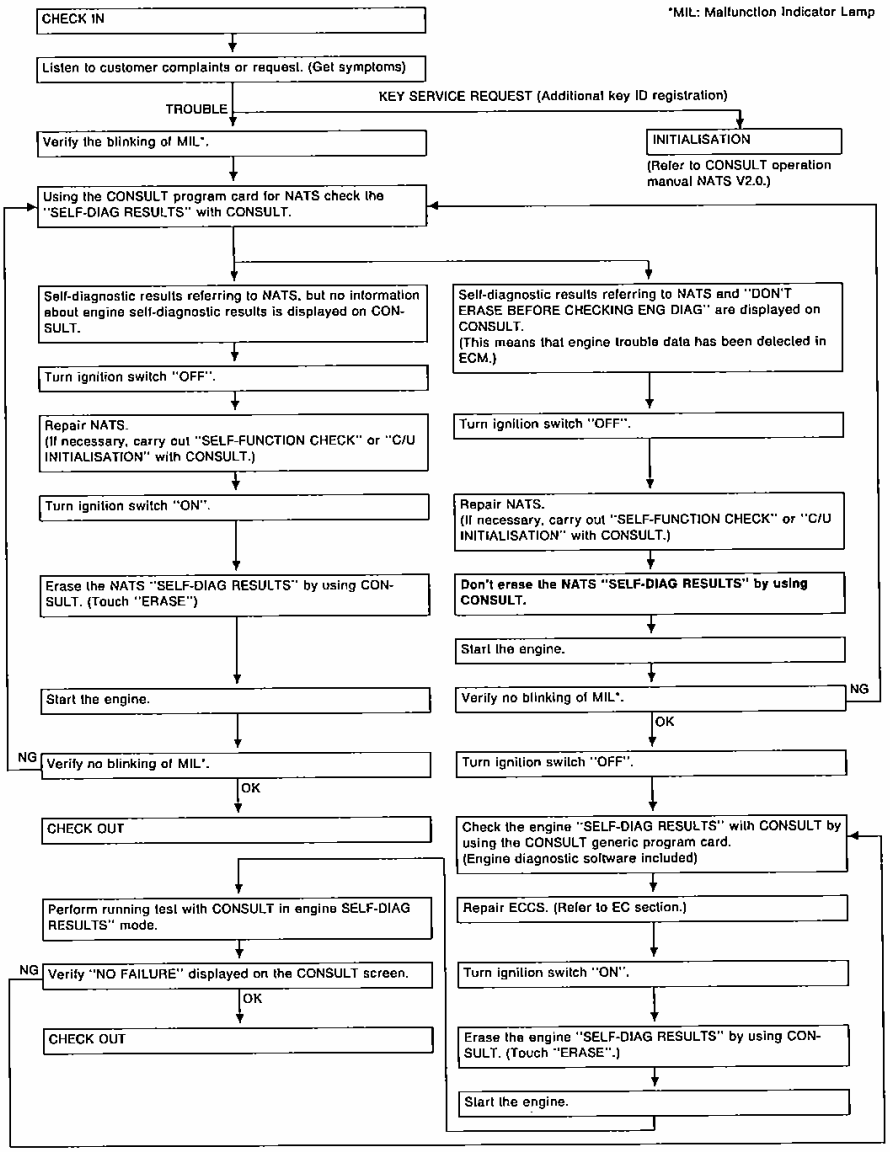
Refer to last page (Foldout page).

M10, E101
M60, F4
F1

HEL247

Trouble Diagnoses

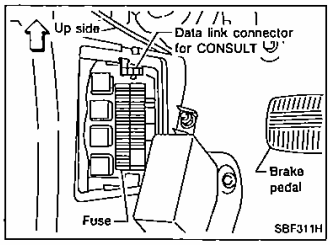
WORK FLOW



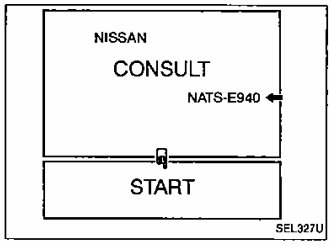
EL

Trouble Diagnoses (Cont'd)

CONSULT INSPECTION PROCEDURE



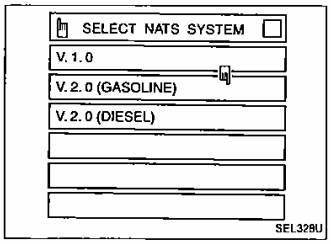
1. Turn off ignition switch.
2. Connect "CONSULT" to Data link connector for CONSULT. (Data link connector for CONSULT is located behind the fuse box cover.)



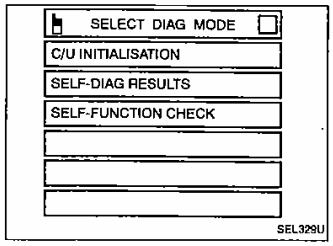
3. Insert NATS program card into CONSULT.

⇐: Program card
NATS-E940

4. Turn on ignition switch.
5. Touch "START".



6. Touch "V.2.0 (GASOLINE)".



7. Perform each diagnostic test mode according to each service procedure.

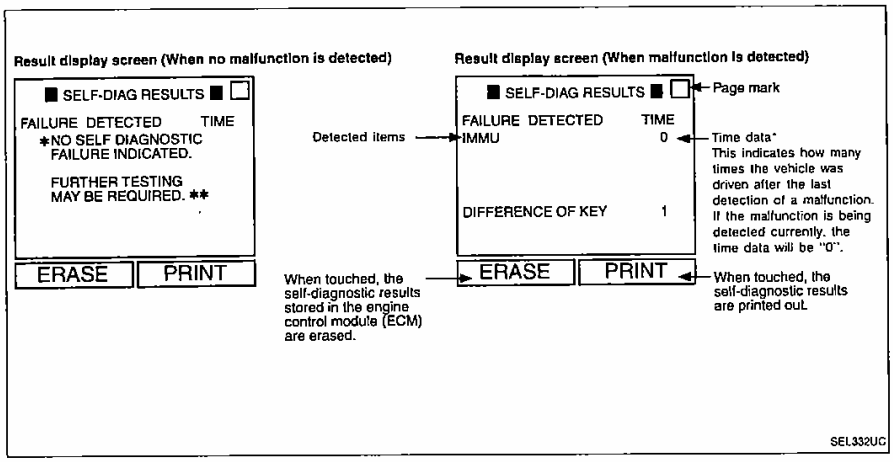
For further information, see the CONSULT Operation Manual, NATS V2.0.

Trouble Diagnoses (Cont'd)

CONSULT DIAGNOSTIC TEST MODE FUNCTION

CONSULT DIAGNOSTIC TEST MODE	Description
C/U INITIALIZATION	When replacing any of following three components, C/U initialization is necessary. [NATS ignition key/IMMU/ECM]
SELF-FUNCTION CHECK	ECM checks its own NATS communication interface by itself.
SELF-DIAGNOSTIC RESULTS	Detected items (screen terms) are as shown in the chart below.

HOW TO READ SELF-DIAGNOSTIC RESULTS



* If trip number is more than 1, MIL does not blink.

SELF-DIAGNOSTIC RESULTS ITEM CHART

Detected items (Screen terms)	Description	Reference page
IMMU	ECM received the signal from IMMU that IMMU is malfunctioning.	EL-72
ECM	ECM is malfunctioning.	EL-72
CHAIN OF ECM-IMMU	Communication impossible between ECM and IMMU.	EL-73
DIFFERENCE OF KEY	IMMU can receive the key ID signal but the result of ID verification between key ID and IMMU is NG.	EL-75
CHAIN OF IMMU-KEY	IMMU cannot receive the key ID signal.	EL-76
ID DISCORD, IMM-ECM	The result of ID verification between IMMU and ECM is NG. System initialisation is required.	EL-78
MINGLE NOISE	Noise (interference) mingled into NATS communication lines during communicating.	EL-79
DON'T ERASE BEFORE CHECKING ENG DIAG	Engine trouble data and NATS trouble data have been detected in ECM.	EL-67

EL

SYMPTOM MATRIX CHART 1
(Self-diagnosis related item)

X: Possibility item, *MIL: Malfunction Indicator Lamp

SYSTEM (Malfunctioning part or mode)	REFERENCE PART NO. OF ILLUSTRATION ON NEXT PAGE	SYMPTOM		Displayed "SELF-DIAG RESULTS" on CONSULT screen.	DIAGNOSTIC PROCEDURE (Reference page)
		• Blinking of MIL*. • Engine will start.	• Blinking of MIL*. • Hard to start engine.		
IMMU	A	X		IMMU	PROCEDURE 1 (EL-72)
ECM	B	X		ECM	PROCEDURE 2 (EL-72)
Open circuit in battery voltage line of IMMU circuit	C1		X	CHAIN OF ECM-IMMU	PROCEDURE 3 (EL-73)
Open circuit in ignition line of IMMU circuit	C2		X		
Open circuit in ground line of IMMU circuit	C3		X		
Open circuit in communication line between IMMU and ECM	C4		X		
Short circuit between IMMU and ECM communication line and battery voltage line	C4		X		
Short circuit between IMMU and ECM communication line and ground line	C4		X		
Open circuit in power source line of ANT/AMP circuit	E3		X		
ECM	B		X		
IMMU	A		X		
Unregistered key	D		X	DIFFERENCE OF KEY	PROCEDURE 4 (EL-75)
IMMU	A		X		
Communication line between ANT/AMP and IMMU: Open circuit or short circuit of battery voltage line or short circuit of ground line	E1		X	CHAIN OF IMMU-KEY	PROCEDURE 5 (EL-76)
	E2		X		
Open circuit in power source line of ANT/AMP circuit	E3		X		
Open circuit in ground line of ANT/AMP circuit	E4		X		
Malfunction of key ID chip	E5		X		
IMMU	A		X		
Antenna amp.	E6		X		

Trouble Diagnoses (Cont'd)

X: Possibility item. *MIL: Malfunction Indicator Lamp

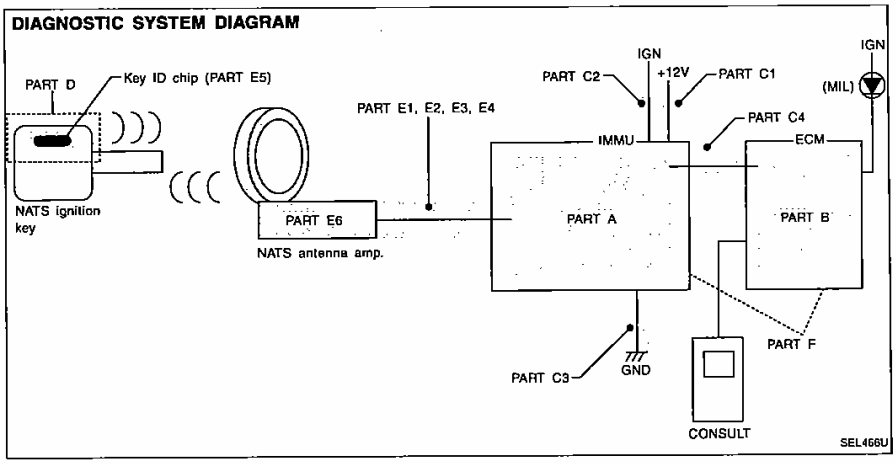
SYSTEM (Malfunctioning part or mode)	REFERENCE PART NO. OF ILLUSTRATION ON NEXT PAGE	SYMPTOM		Displayed "SELF-DIAG RESULTS" on CONSULT screen.	DIAGNOSTIC PROCEDURE (Reference page)
		• Blinking of MIL*. • Engine will start.	• Blinking of MIL*. • Hard to start engine.		
System initialisation has not yet been completed.	F		X	ID DISCORD, IMM-ECM	PROCEDURE 6 (EL-78)
ECM	F		X		
Noise interference in communication line			X	MINGLE NOISE	PROCEDURE 7 (EL-79)
Engine trouble data and NATS trouble data have been detected in ECM		X	X	DON'T ERASE BEFORE CHECKING ENG DIAG	WORK FLOW (EL-67)

SYMPTOM MATRIX CHART 2
(Non self-diagnosis related item)

X: Possibility item

SYSTEM (Malfunctioning part or mode)	SYMPTOM	DIAGNOSTIC PROCEDURE (Reference page)
	NATS security ind. does not light up.	
NATS security ind.	X	PROCEDURE 8 (EL-79)
Open circuit between Fuse and NATS IMMU		
Continuation of initialisation mode		
NATS IMMU		

DIAGNOSTIC SYSTEM DIAGRAM

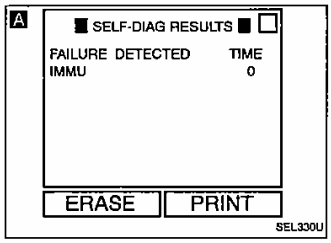


EL

Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 1

Self-diagnostic results:
"IMMU" displayed on CONSULT screen



A

Confirm SELF-DIAGNOSTIC RESULTS "IMMU" displayed on CONSULT screen.
Ref. part No.* A.

↓ Yes

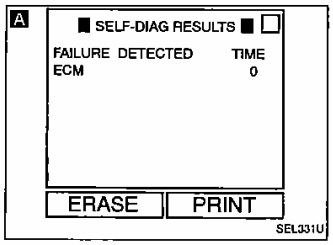
Replace IMMU.

Perform initialisation with CONSULT.
For the operation of initialisation, refer to "CONSULT operation manual NATS V2.0".

* Ref. part No.: reference part No. of Diagnostic System Diagram on EL-71.

DIAGNOSTIC PROCEDURE 2

Self-diagnostic results:
"ECM" displayed on CONSULT screen



A

Confirm SELF-DIAGNOSTIC RESULTS "ECM" displayed on CONSULT screen.
Ref. part No. B.

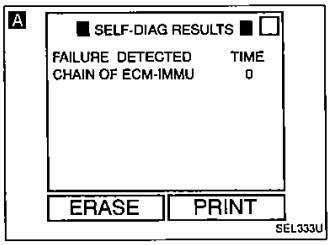
Replace ECM.

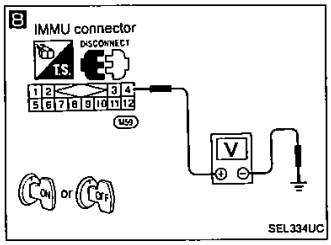
Perform initialisation with CONSULT.
For the operation of initialisation, refer to "CONSULT operation manual NATS V2.0".

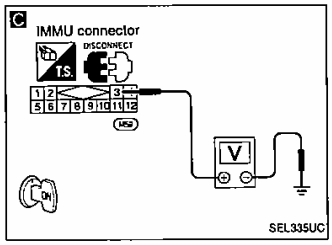
Trouble Diagnoses (Cont'd)

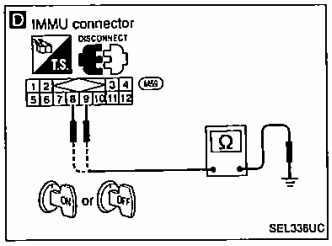
DIAGNOSTIC PROCEDURE 3

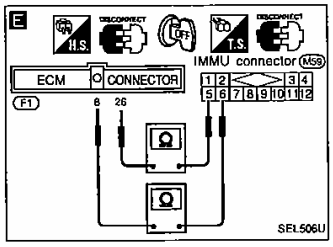
Self-diagnostic results:
"CHAIN OF ECM-IMMU" displayed on CONSULT screen











A

Confirm SELF-DIAGNOSTIC RESULTS "CHAIN OF ECM-IMMU" displayed on CONSULT screen.

OK ↓

B

Check voltage between terminal ④ of IMMU and ground with CONSULT or tester.
Voltage: Battery voltage

NG → Check the following:
- 7.5A fuse
- Harness continuity between fuse and IMMU connector (M59)

If NG, repair harness or connector.
Ref. part No. C1

OK ↓

C

Check voltage between terminal ③ of IMMU and ground with CONSULT or tester.
Voltage: Battery voltage

NG → Check the following:
- 7.5A fuse
- Harness continuity between fuse and IMMU connector (M59), or between ignition switch and fuse.

If NG, repair harness or connectors.
Ref. part No. C2

OK ↓

D

Check harness continuity between IMMU terminal ⑧ or ⑨ and ground.
Continuity should exist.

NG → Repair harness or check the body ground screws. (F26) and (F37)
Ref. part No. C3

OK ↓

E

Check harness continuity between the following ECM terminals and IMMU terminals.
ECM ⑧ and IMMU ⑥
ECM ㉖ and IMMU ⑤
Continuity should exist.

NG → Check the following.
- Harness connection between (F4) and (M60)
- Harness continuity between ECM and IMMU.

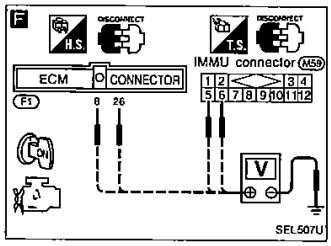
If NG, repair harness or connectors.
Ref. part No. C4

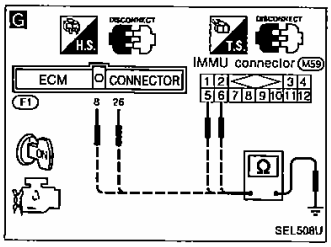
OK ↓

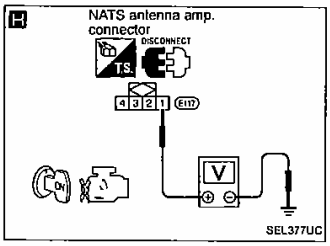
Ⓐ

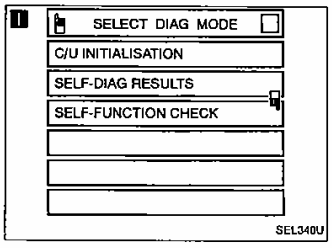
EL

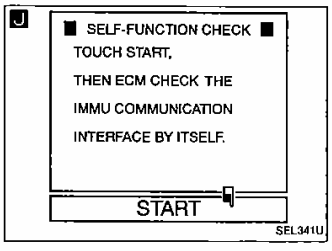
Trouble Diagnoses (Cont'd)











Ⓐ

F CHECK COMMUNICATION LINE CIRCUIT.
1) Disconnect ECM connector and IMMU connector.
2) Check voltage between the following terminals and ground.
ECM ⑧, ECM ㉖, IMMU ⑤ and IMMU ⑥
Voltage: 0V

NG → Communication line is short-circuited with battery voltage line or ignition switch ON line. Repair harness or connectors. **Ref. part No. C4**

OK

G Check continuity between the following terminals and ground.
ECM ⑧, ECM ㉖, IMMU ⑤ and IMMU ⑥
Continuity should not exist.

NG → Communication line is short-circuited with ground line. Repair harness or connectors. **Ref. part No. C4**

OK

H CHECK NATS ANTENNA AMP. CIRCUIT.
1) Disconnect NATS antenna amp. connector.
2) Turn ignition switch "ON".
3) Check voltage between antenna amp. terminal ① and ground.
Voltage: More than 4.7V

NG → NATS antenna amp. +5V line is short-circuited with battery voltage line or ground line. Repair harness or connectors. **Ref. part No. E3**

OK

I SELF-FUNCTION CHECK
1) Connect ECM connector and disconnect IMMU connector.
2) Turn ignition switch "ON".
3) Touch "SELF-FUNCTION CHECK" on CONSULT "SELECT DIAG MODE" screen.

J Touch "START". ECM will then check its communication interface by itself.

NG → **K** ECM is malfunctioning. Replace ECM. **Ref. part No. B**

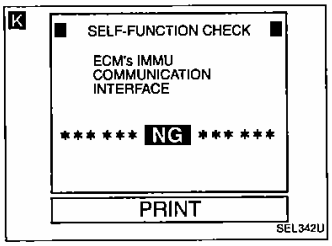
OK → **L** (See next page.)

IMMU is malfunctioning. Replace IMMU. **Ref. part No. A**

Ⓑ

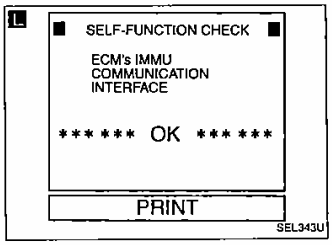
Perform initialisation with CONSULT. For the operation of initialisation, refer to "CONSULT operation manual NATS V2.0".

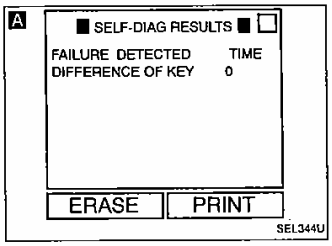
Trouble Diagnoses (Cont'd)



Ⓑ

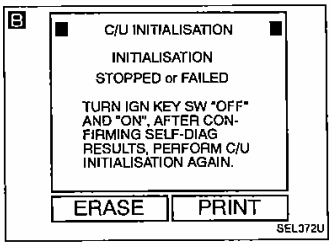
Perform initialisation with CONSULT.
For the operation of initialisation, refer to "CONSULT operation manual NATS V2.0".





DIAGNOSTIC PROCEDURE 4

Self-diagnostic results:
"DIFFERENCE OF KEY" displayed on CONSULT screen



A

Confirm SELF-DIAGNOSTIC RESULTS "DIFFERENCE OF KEY" displayed on CONSULT screen.

OK

Perform initialisation with CONSULT.
Re-register all NATS ignition key IDs.
For the operation of initialisation, refer to "CONSULT operation manual NATS V2.0".

Initialisation incompleted or failed with CONSULT → B

IMMU is malfunctioning.
Replace IMMU.
Ref. part No. A

Initialisation completed

Start engine.

END
(Ignition key ID was unregistered.)
Ref. part No. D

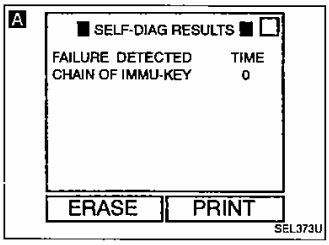
Perform initialisation with CONSULT.
For the operation of initialisation, refer to "CONSULT operation manual NATS V2.0".

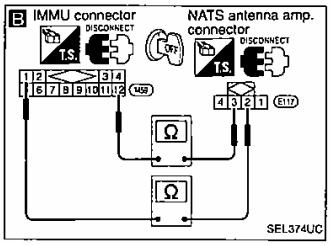
EL

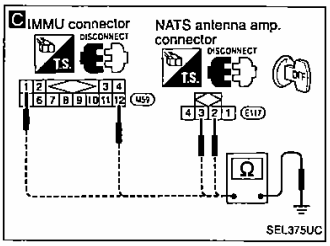
Trouble Diagnoses (Cont'd)

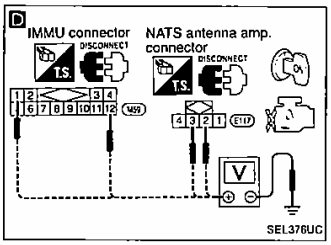
DIAGNOSTIC PROCEDURE 5

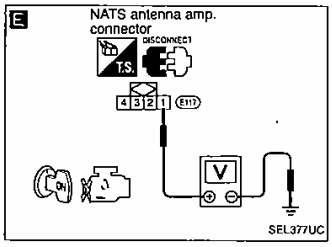
Self-diagnostic results:
"CHAIN OF IMMU-KEY" displayed on CONSULT screen











A

Confirm SELF-DIAGNOSTIC RESULTS "CHAIN OF IMMU-KEY" displayed on CONSULT screen.

OK ↓

B

CHECK ANTENNA AMP. CIRCUIT.
1) Disconnect IMMU connector and NATS antenna amp. connector.
2) Check continuity between the following IMMU terminals and NATS antenna amp. terminals.

IMMU terminal	NATS antenna amp. terminal	Ref. part No.
⑫	③	E1
①	②	E2

Continuity should exist.

NG → Check harness and connectors. If NG, repair harness or connectors.

OK ↓

C

Check continuity between the following terminals and ground.

IMMU terminal	NATS antenna amp. terminal	Ref. part No.
⑫	③	E1
①	②	E2

Continuity should not exist.

NG → Communication line is short-circuited with ground line. Repair harness or connectors.

OK ↓

D

Check voltage between the following terminals and ground.

IMMU terminal	NATS antenna amp. terminal	Ref. part No.
⑫	③	E1
①	②	E2

Voltage: 0V

NG → Communication line is short-circuited with battery voltage line or ignition switch "ON" line. Repair harness or connectors.

OK ↓

E

CHECK ANTENNA AMP. POWER SOURCE CIRCUIT.
1) Connect IMMU connector.
2) Check voltage between NATS antenna amp. terminal ① and ground.

Voltage: More than 4.7V

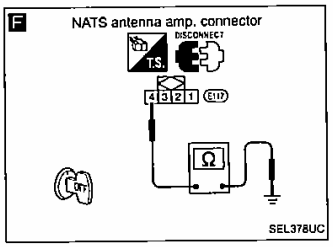
NG → Power source line is open circuit. Repair harness or connector. **Ref. part No. E3**

OK ↓

Ⓐ

Trouble Diagnoses (Cont'd)

F NATS antenna amp. connector



Ⓐ

F CHECK ANTENNA AMP. GROUND LINE CIRCUIT.
1) Turn ignition switch "OFF".
2) Check continuity between NATS antenna amp. terminal ④ and ground.
Continuity should exist.

NG → NATS antenna amp. ground line is open circuit.
Check harness continuity between IMMU terminal ⑩ and NATS antenna amp. terminal ④.
If NG, repair harness or connectors.
Ref. part No. E4

OK ↓

CHECK NATS IGNITION KEY ID CHIP.
1) Connect NATS antenna amp. connector.
2) Pull the ignition key out.
3) Start engine with another registered NATS ignition key.

Start OK → Ignition key ID chip was malfunctioning.
Replace the ignition key.
Ref. part No. E5

Start NG ↓

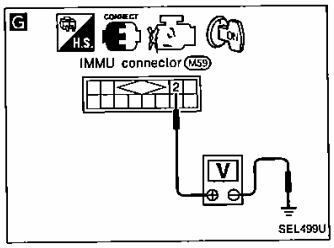
G CHECK IMMU OUTPUT VOLTAGE.
1) Turn the ignition switch "ON".
2) Check voltage between IMMU terminal ② and ground.
Voltage: More than 4.7V

NG → Perform initialisation with CONSULT.
For the operation of initialisation, refer to "CONSULT operation manual NATS V2.0".

Replace IMMU.
Ref. part No. A

OK ↓

G

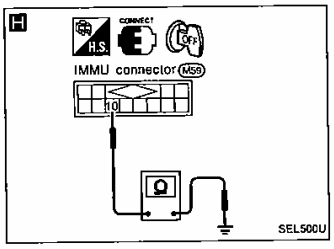


H CHECK IMMU GROUND CIRCUIT.
1) Turn the ignition switch "OFF".
2) Disconnect IMMU connector.
3) Check continuity between IMMU terminal ⑩ and ground.
Continuity should exist.

NG → Replace IMMU.
Ref. part No. A

OK ↓

H



I CHECK IMMU FUNCTION 1.
1) Connect IMMU connector and NATS antenna amp. connector.
2) Check voltage between IMMU terminal ① and ground.

Voltage

Time (After turning ignition switch "ON".)	Voltage
For approx. 0.5 sec.	Approx. 2.3 - 5
After 1 sec.	0

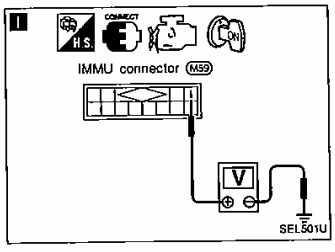
NG → Replace IMMU.
Ref. part No. A

Perform initialisation with CONSULT.
For the operation of initialisation, refer to "CONSULT operation manual NATS V2.0".

OK ↓

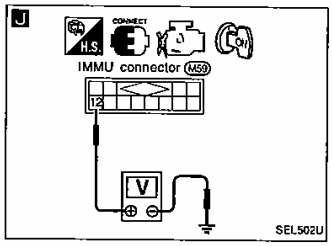
Ⓑ

I



EL

Trouble Diagnoses (Cont'd)



Ⓑ

J

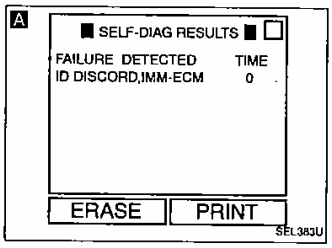
CHECK IMMU FUNCTION 2.
1) Disconnect NATS antenna amp. connector.
2) Turn ignition switch "ON".
3) Check voltage between IMMU terminal ⑫ and ground.
Voltage:
6 sec. after turning ignition switch "ON"
Approx. 4.5 - 5V

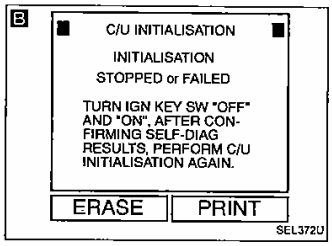
NG → Replace IMMU.
Ref. part No. A

Perform initialisation with CONSULT.
For the operation of initialisation, refer to "CONSULT operation manual NATS V2.0".

OK

NATS antenna amp. is malfunctioning.
When replacing the amp. hold on to amp. body. Take care not to pull on amp. harness.





DIAGNOSTIC PROCEDURE 6

Self-diagnostic results:
"ID DISCORD, IMM-ECM" displayed on CONSULT screen

A

Confirm SELF-DIAGNOSTIC RESULTS "ID DISCORD, IMM-ECM*" displayed on CONSULT screen.

* "ID DISCORD, IMM-ECM": Registered ID of IMMU is in discord with that of ECM.

Perform initialisation with CONSULT.
Re-register all NATS ignition key IDs.
For the operation of initialisation, refer to "CONSULT operation manual NATS V2.0".

Initialisation incompleted or failed with CONSULT → B

ECM is malfunctioning.
Replace ECM.
Ref. part No. F

Initialisation completed

Start engine.

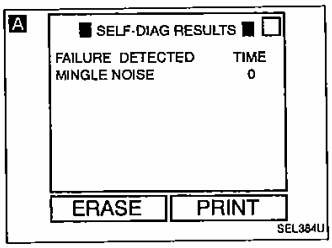
END
Ref. part No. F

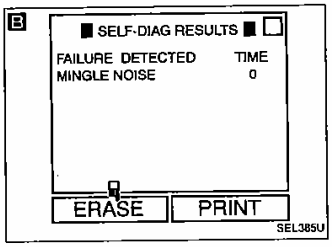
Perform initialisation with CONSULT.
For the operation of initialisation, refer to "CONSULT operation manual NATS V2.0".

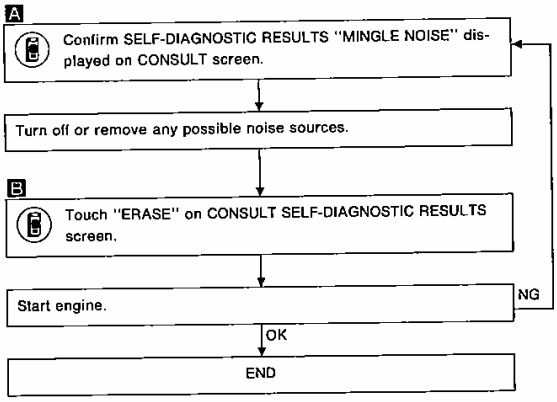
Trouble Diagnoses (Cont'd)

DIAGNOSTIC PROCEDURE 7

Self-diagnostic results:
"MINGLE NOISE" displayed on CONSULT screen

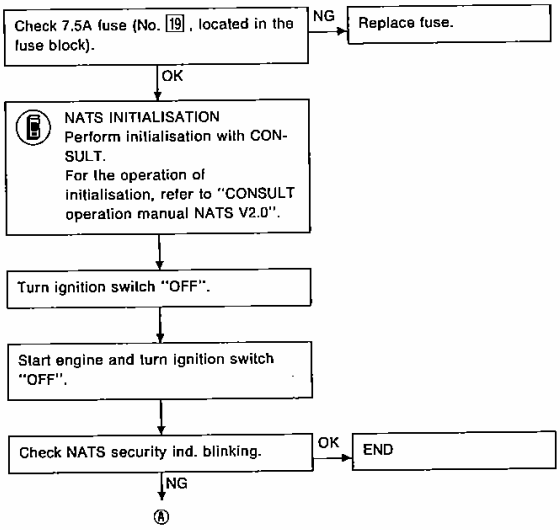






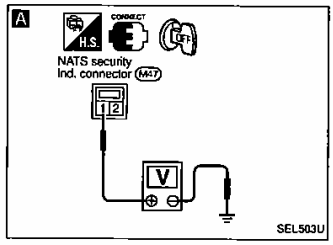
DIAGNOSTIC PROCEDURE 8

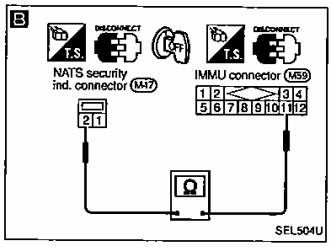
"NATS SECURITY IND. DOES NOT LIGHT UP"

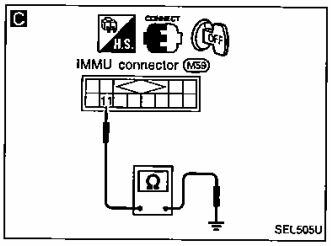


EL

Trouble Diagnoses (Cont'd)







Ⓐ

A

Check voltage between NATS security ind. connector terminal ① and ground.
Voltage : Battery voltage

NG → Check harness continuity between fuse and NATS security ind. connector (M47).
If NG, repair harness or connector.

OK ↓

B

CHECK NATS SECURITY IND. CIRCUIT.
1) Disconnect NATS IMMU connector.
2) Check harness continuity between NATS security ind. connector terminal ② and NATS IMMU connector terminal ⑪.
Continuity should exist.

NG → Repair harness.

OK ↓

C

CHECK NATS IMMU FUNCTION
1) Connect NATS IMMU connector.
2) Disconnect NATS security ind. connector.
3) Check continuity between NATS IMMU terminal ⑪ and ground.
Continuity should exist intermittently.

NG → NATS IMMU is malfunctioning. Replace IMMU.

Perform initialisation with CONSULT.
For the operation of initialisation, refer to "CONSULT operation manual NATS V2.0".

OK ↓

NATS security ind. is malfunctioning.
Pull out NATS security ind. with harness and connector.
Check harness connection

NG → Repair harness.

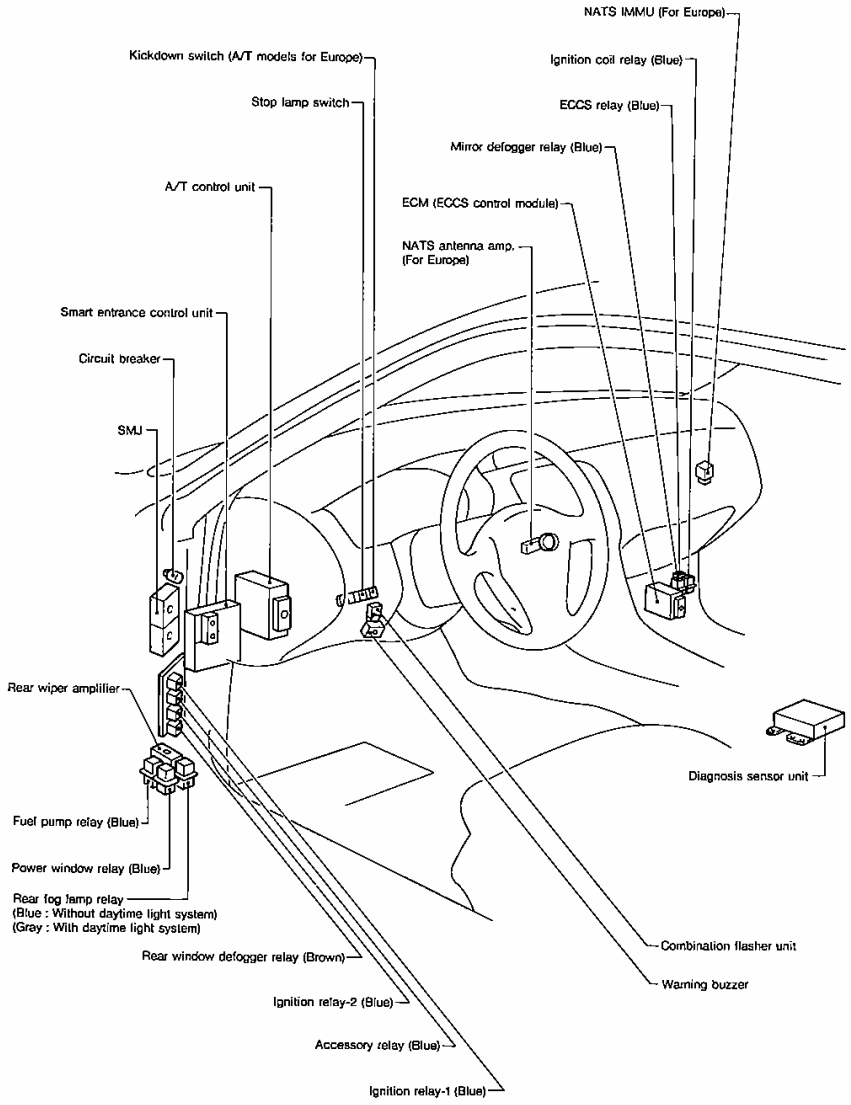
OK ↓

NATS security ind. cell is malfunctioning.
Replace NATS security ind.

NOTE

Passenger Compartment

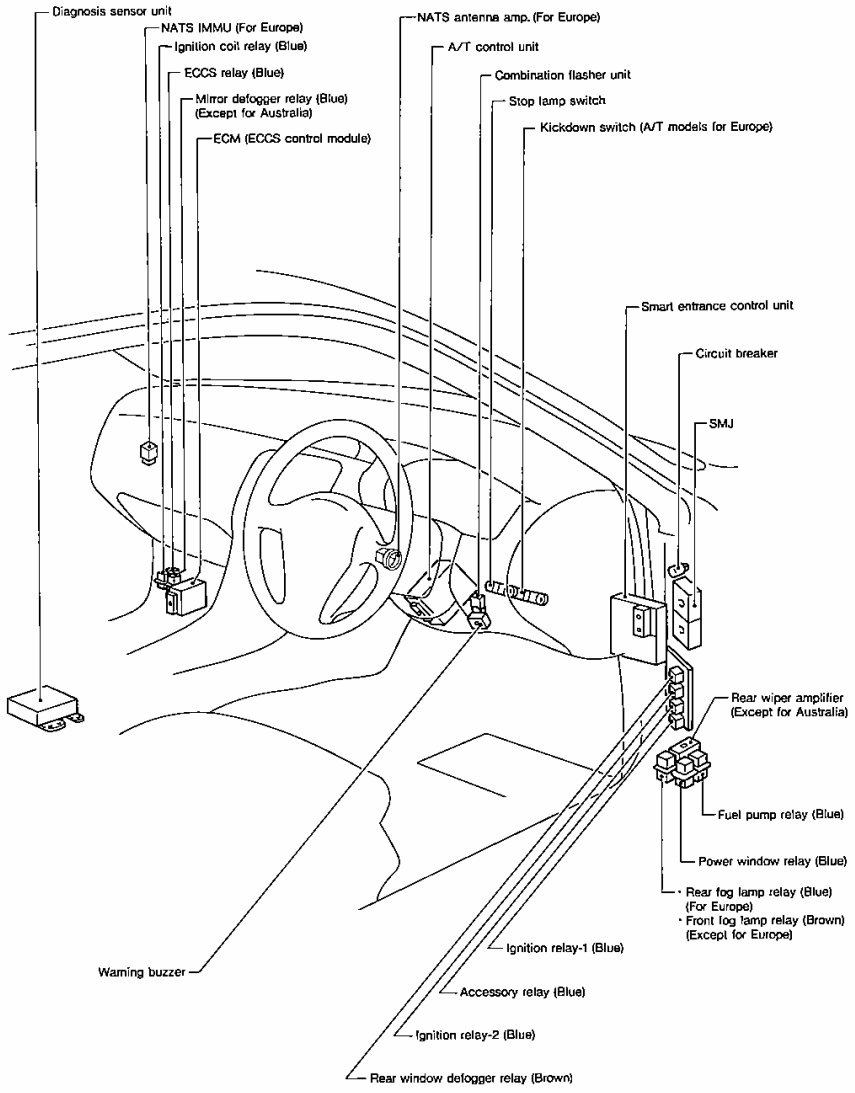
LHD MODELS



HEL248

Passenger Compartment (Cont'd)

RHD MODELS

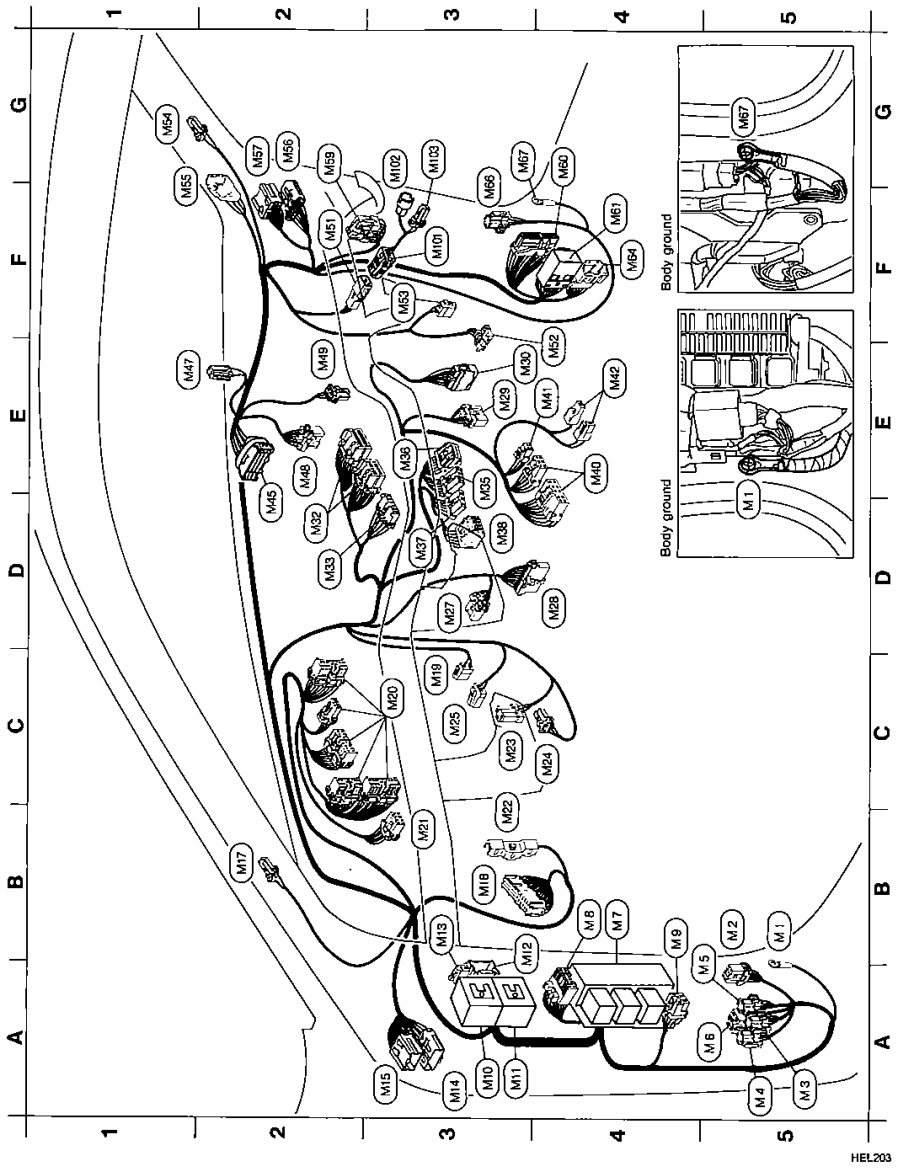


EL

HEL249

Main Harness

LHD MODELS



B5 (M1) : Body ground
B5 (M2) : Rear wiper amplifier
A5 (M3) : Fuel pump relay
A5 (M4) : Power window relay
A5 (M5) : Rear fog lamp relay (Models without daytime light system)
A5 (M6) : Rear fog lamp relay (Models with daytime light system)
B4 (M7) : Fuse block
B4 (M8) : Data link connector for CONSULT
B4 (M9) : Rear window defogger relay
A3 (M10) : To (E10) (SMJ)
A3 (M11) : To (E1) (SMJ)
B3 (M12) : To (E102)
B3 (M13) : Circuit breaker
A3 (M14) : To (D1)
A3 (M15) : To (D2)
B2 (M17) : Pillar speaker LH
B3 (M18) : Smart entrance control unit
C3 (M19) : Kickdown switch (A/T models)
C3 (M20) : Combination meter
B3 (M21) : Illumination control switch
B3 (M22) : A/T control unit (A/T models)
C3 (M23) : Combination flasher unit
C4 (M24) : Buzzer
C3 (M25) : Stop lamp switch
D3 (M27) : Air mix door motor
D4 (M28) : Mode door motor
E3 (M29) : Bi-level door motor
E3 (M30) : To (Z5)
D2 (M32) : Push control unit
D2 (M33) : Fan switch
E3 (M35) : Hazard switch
E3 (M36) : Headlamp washer switch
D3 (M37) : Rear window defogger switch
D3 (M38) : Rear fog lamp switch
E4 (M40) : Radio
E4 (M41) : Not used
E4 (M42) : Cigarette lighter
D2 (M45) : Joint connector
E1 (M47) : NATS security indicator (For Europe)
E2 (M48) : Intake door motor

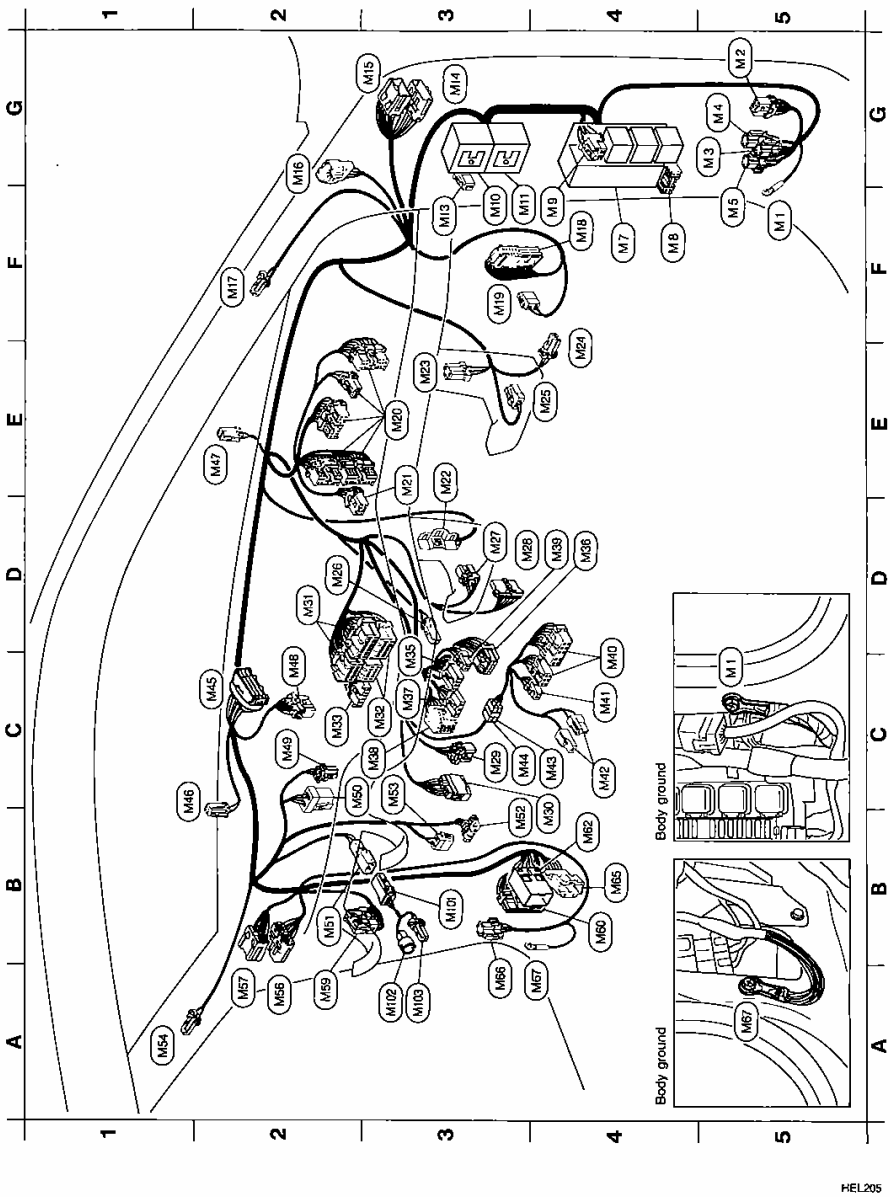
E2 (M49) : Thermo control amplifier
F2 (M51) : To (M10)
E4 (M52) : Fan resistor
F3 (M53) : Blower motor
G1 (M54) : Pillar speaker RH
F1 (M55) : To (R1)
G2 (M56) : To (D10)
G2 (M57) : To (D103)
G2 (M59) : NATS IMMU (For Europe)
G4 (M60) : To (F4)
F4 (M61) : To (F38) (A/T models)
F4 (M64) : To (B62)
F3 (M66) : Mirror defogger relay
G3 (M67) : Body ground

F3 (M101) : To (M51)
G3 (M102) : Glove box lamp
G3 (M103) : Glove box lamp switch

HEL204

Main Harness (Cont'd)

RHD MODELS

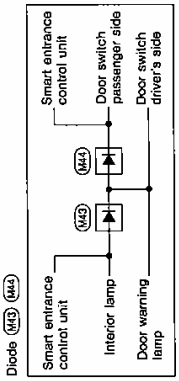


HEL205

F5 (M1) : Body ground
G5 (M2) : Rear wiper amplifier (Except for Australia)
G5 (M3) : Fuel pump relay
G5 (M4) : Power window relay
F5 (M5) : Rear fog lamp relay (For Europe)
F4 (M7) : Fuse block
F4 (M8) : Data link connector for CONSULT
F4 (M9) : Rear window defogger relay
F3 (M10) : To (E100) (SMJ)
F3 (E1) : To (E1) (SMJ)
F3 (M13) : Circuit breaker
G3 (M14) : To (D1)
G3 (M15) : To (D2)
G2 (M16) : To (R1)
F2 (M17) : Pillar speaker RH
F4 (M18) : Smart entrance control unit
F3 (M19) : Kickdown switch (A/T models)
E3 (M20) : Combination meter
E3 (M21) : Illumination control switch
E3 (M22) : A/T control unit (A/T models)
E3 (M23) : Combination flasher unit
E4 (M24) : Buzzer
E4 (M25) : Stop lamp switch
D2 (M26) : In-vehicle sensor (Auto A/C)
D3 (M27) : Air mix door motor
D3 (M28) : Mode door motor
C3 (M29) : Bi-level door motor
B4 (M30) : To (Z5)
D2 (M31) : Auto A/C unit (Auto A/C)
C3 (M32) : Push control unit (Except auto A/C)
C2 (M33) : Fan switch (Except auto A/C)
C3 (M34) : Hazard switch
D4 (M36) : Headlamp washer switch (For Europe)
C3 (M37) : Rear window defogger switch
C3 (M38) : Rear fog lamp switch (For Europe)
D4 (M39) : Security indicator (Except for Europe)
C4 (M40) : Radio
C4 (M41) : Not used
C4 (M42) : Cigarette lighter

C4 (M43) : Diode (Except for Europe)
C3 (M44) : Diode (Except for Europe)
C2 (M45) : Joint connector
B1 (M46) : Sunload sensor (Auto A/C)
E2 (M47) : NATS security indicator (For Europe)
C2 (M48) : Intake door motor
C2 (M49) : Thermo control amplifier
C2 (M50) : Fan control amplifier (Auto A/C)
B2 (M51) : To (M10) (Except for Australia)
B3 (M52) : Fan resistor (Except auto A/C)
C3 (M53) : Blower motor
A1 (M54) : Pillar speaker LH
A2 (M56) : To (D10)
A2 (M57) : To (D102)
A2 (M59) : NATS IMMU (For Europe)
B4 (M60) : To (F4)
B4 (M62) : To (F7) (A/T models)
B4 (M65) : To (B67) (Models with ABS)
A3 (M66) : Mirror defogger relay (Except for Australia)
A4 (M67) : Body ground

B3 (M101) : To (M51)
A3 (M102) : Glove box lamp } (Except for Australia)
A3 (M103) : Glove box lamp switch

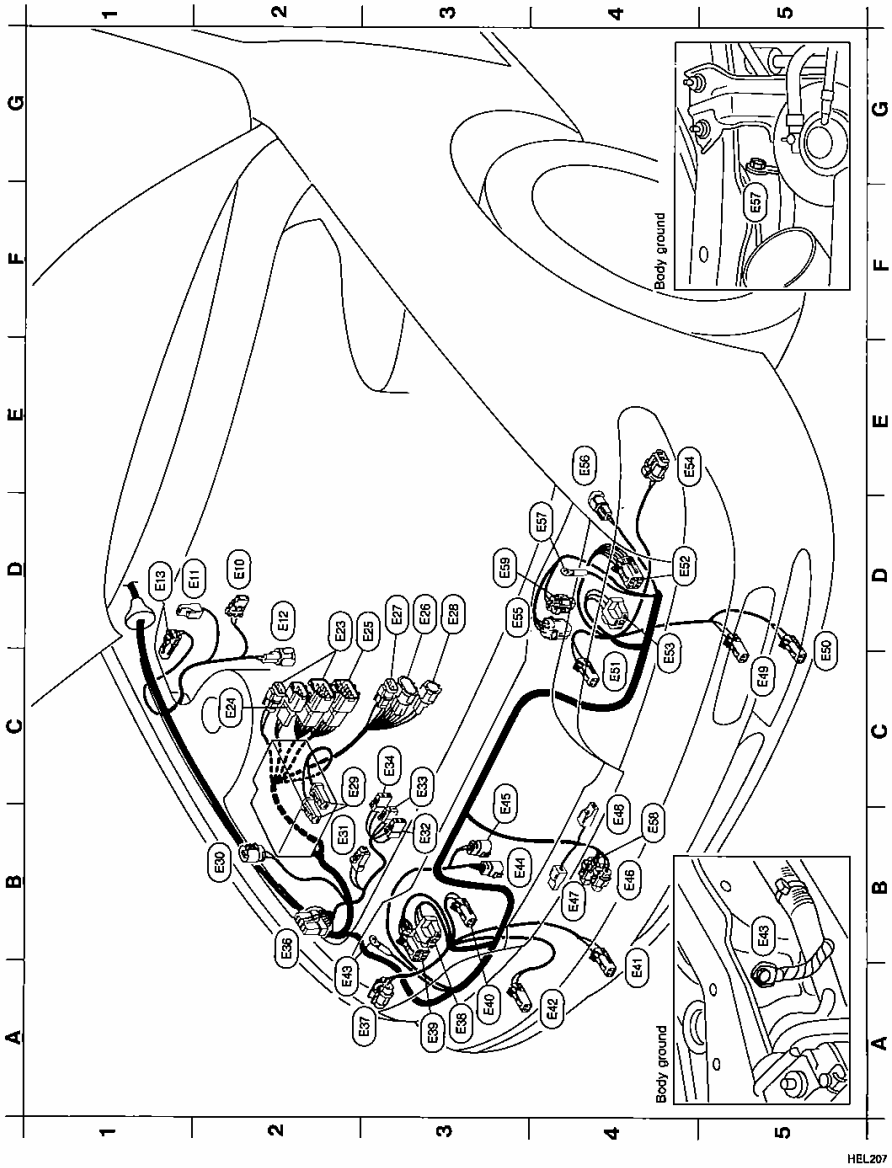


HEL206

EL

Engine Room Harness

ENGINE COMPARTMENT (RHD models)

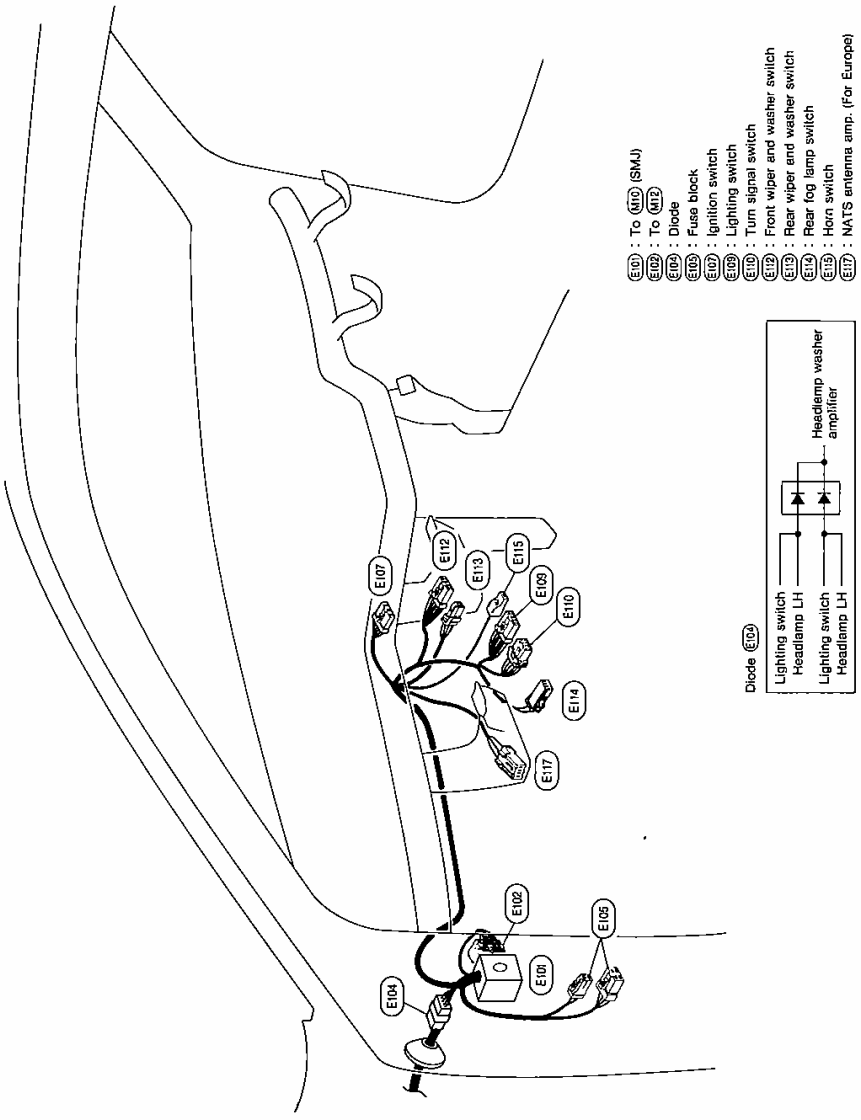


Engine Room Harness (Cont'd)

HEL208

Engine Room Harness (Cont'd)

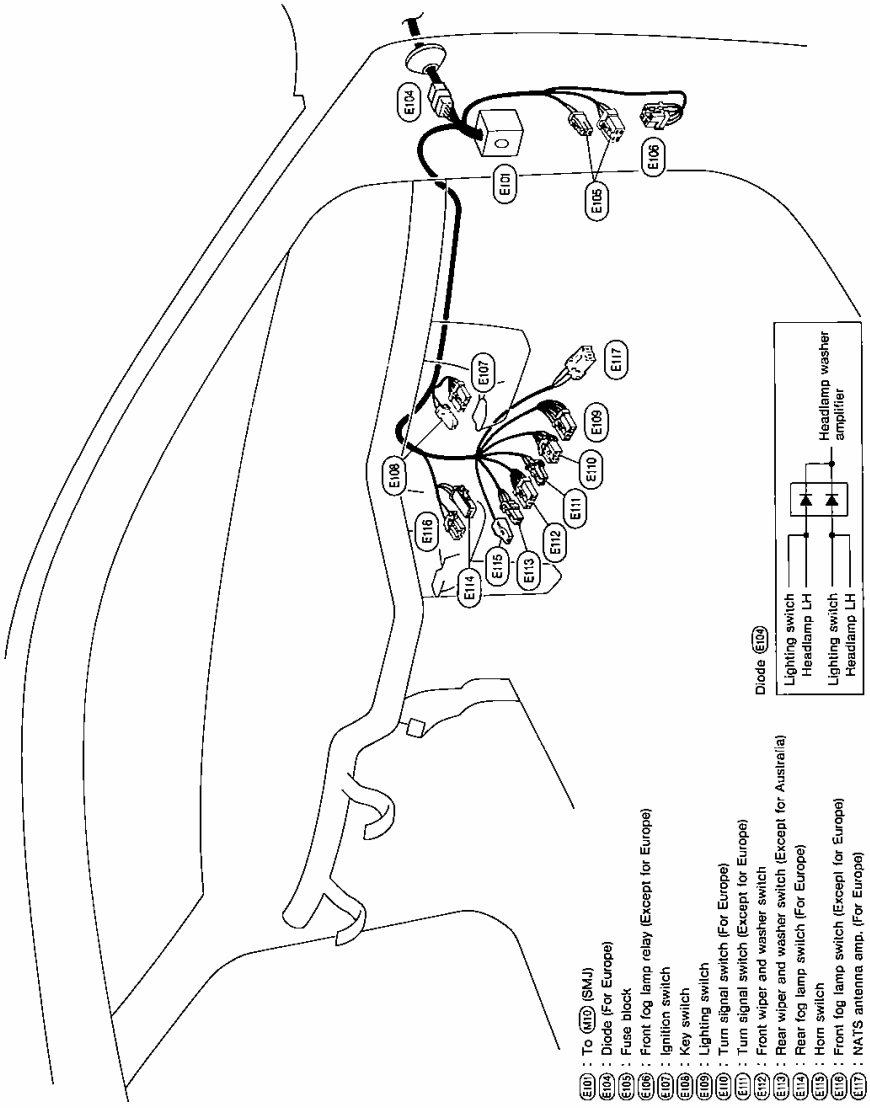
PASSENGER COMPARTMENT (LHD models)



HEL209

Engine Room Harness (Cont'd)

PASSENGER COMPARTMENT (RHD models)

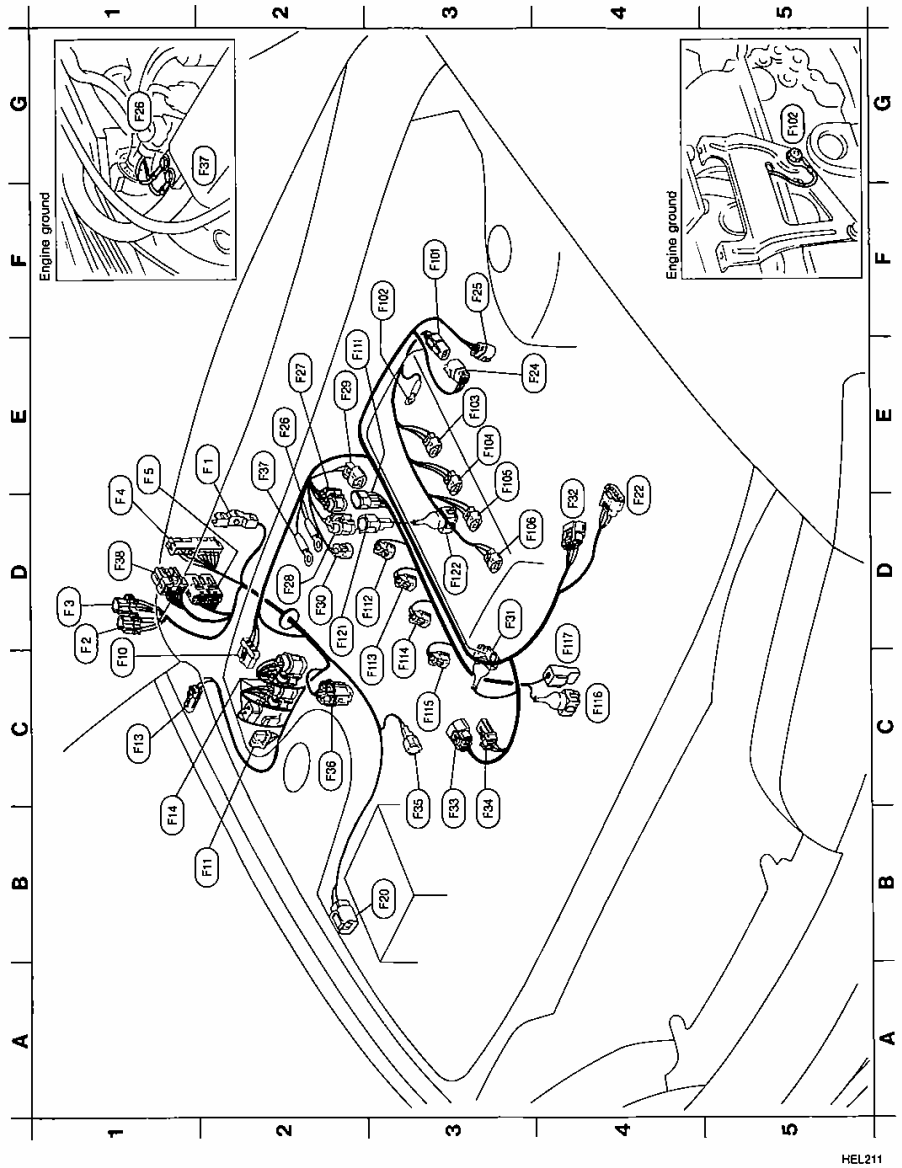


HEL210

EL

Engine Control Harness

LHD MODELS



E2 : ECM (ECCS control module)
D1 : ECCS relay
D1 : Ignition coil relay
D1 : To M60
E1 : To B53
C1 : Front wiper motor
B2 : Front wiper amplifier
C1 : Side turn signal lamp RH
B1 : ABS actuator
B3 : To E56
D4 : Mass air flow sensor
E3 : To F10
F3 : Heated oxygen sensor
E2 : Engine ground
E2 : To F111
D2 : To F121
E2 : IACV-FICD solenoid valve
D2 : ICAV-AAC valve
D3 : VTC solenoid valve
D4 : Camshaft position sensor
B3 : Throttle position sensor (Brown)
B3 : Throttle position switch (Grey) (A/T models)
B3 : Front wheel sensor RH (For ABS)
C2 : Triple-pressure switch
E2 : Engine ground
D1 : To M61 (A/T models)

Sub-harness

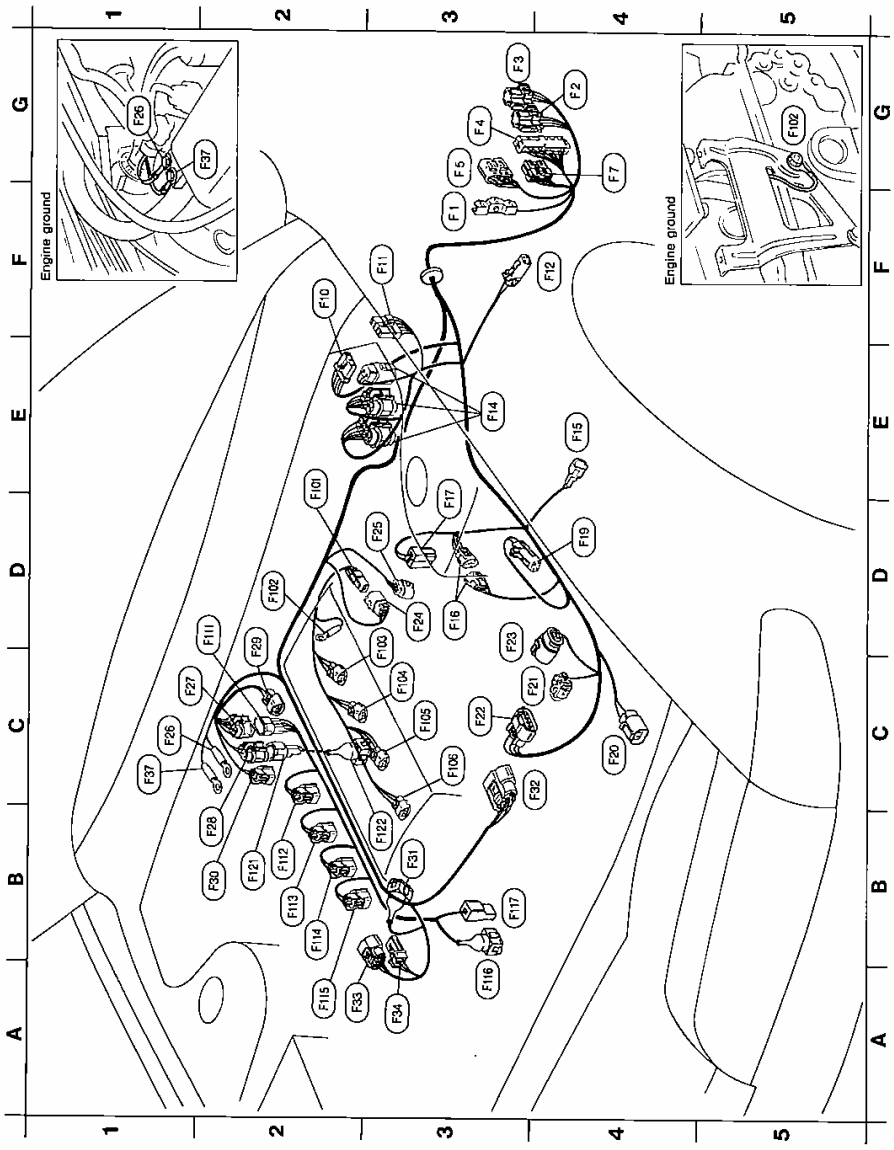
F3 : To F24
F3 : Engine ground
E3 : Ignition coil No.4
E3 : Ignition coil No.3
E3 : Ignition coil No.2
D3 : Ignition coil No.1
E2 : To F27
D3 : Injector No.4
C3 : Injector No.3
C3 : Injector No.2
C3 : Injector No.1
C4 : Engine coolant temperature sensor
C4 : Thermal transmitter
D2 : To F28
D3 : Knock sensor

HEL212

EL

Engine Control Harness (Cont'd)

RHD MODELS



HEL213

F3 (F1) : ECM (ECCS control module)
G4 (F2) : ECCS relay
G3 (F3) : Ignition coil relay
G3 (F4) : To (M69)
G3 (F5) : To (B53) (Model with ABS)
G4 (F7) : To (M62) (A/T models)
F2 (F10) : Front wiper motor
F3 (F11) : Front wiper amplifier
F4 (F12) : Side turn signal lamp LH
E3 (F14) : ABS actuator (For ABS)
E4 (F15) : Front wheel sensor LH (For ABS)
D3 (F16) : Power transistor unit
D3 (F17) : Wastegate valve control solenoid valve
D4 (F18) : Dropping resistor (A/T models)
C4 (F20) : To (E58)
C3 (F21) : Compressor
C3 (F22) : Mass air flow sensor
D3 (F23) : Power steering oil pressure switch
D3 (F24) : To (F101)
D3 (F25) : Heated oxygen sensor
C1 (F26) : Engine ground
C1 (F27) : To (F111)
B2 (F28) : To (F121)
C2 (F29) : IACV-FICD solenoid valve
B2 (F30) : IACV-AAC valve
B3 (F31) : VTC solenoid valve
C4 (F32) : Camshaft position sensor
A2 (F33) : Throttle position sensor (Brown)
A3 (F34) : Throttle position switch (Grey) (A/T models)
C1 (F37) : Engine ground

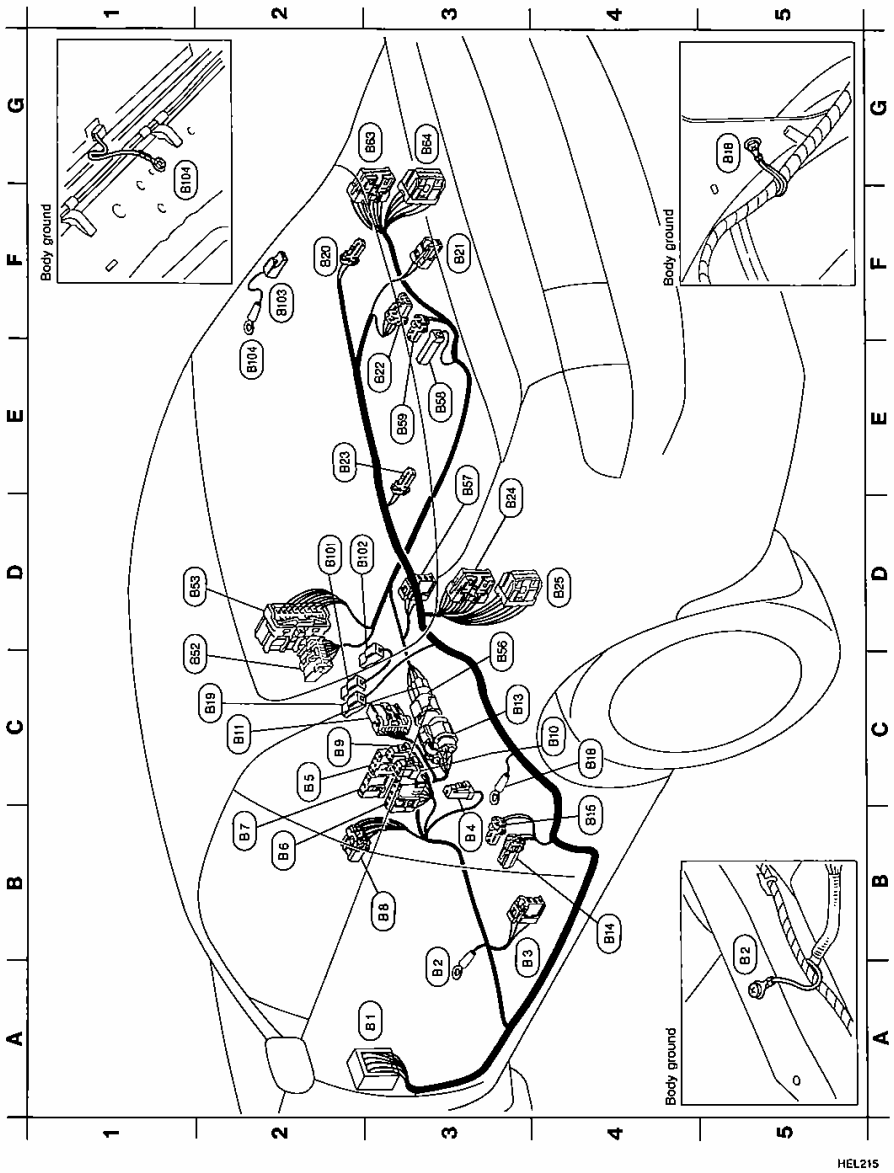
Sub-harness
D2 (F101) : To (F24)
D2 (F102) : Engine ground
C3 (F103) : Ignition coil No.4
C3 (F104) : Ignition coil No.3
C3 (F105) : Ignition coil No.2
C3 (F106) : Ignition coil No.1
D2 (F111) : To (F27)
B2 (F112) : Injector No.4
B2 (F113) : Injector No.3
B2 (F114) : Injector No.2
A2 (F115) : Injector No.1
A3 (F116) : Engine coolant temperature sensor
B3 (F117) : Thermal transmitter
B2 (F121) : To (F28)
B3 (F122) : Knock sensor

EL

IHEL214

Body Harness

LHD MODELS



Body Harness (Cont'd)

A3 (B1) : To (M11)
A3 (B2) : Body ground
B3 (B3) : Heated seat LH
B3 (B4) : Parking brake switch
C2 (B5) : Headlamp aiming switch
B2 (B6) : Door mirror control switch
B2 (B7) : Front fog lamp switch
B3 (B8) : Overdrive switch • A/T illumination
C2 (B9) : Heated seat switch RH
C4 (B10) : Heated seat switch LH
C2 (B11) : To (Z2)
C3 (B13) : To (B56)
B4 (B14) : Door switch (Driver's side)
B4 (B15) : Seat belt pre-tensioner (Driver's side)
C4 (B16) : Body ground
C2 (B19) : Condenser (For rear window defogger)
F2 (B20) : Rear speaker RH
F3 (B21) : Trunk room lamp
E3 (B22) : Rear wiper motor
E2 (B23) : Rear speaker LH
D3 (B24) : To (T1)
D4 (B25) : To (T2)
C2 (B52) : To (M64)
D2 (B53) : To (F5)
C3 (B56) : To (B13)
E3 (B57) : Heated seat RH
E3 (B58) : Door switch (Passenger side)
E3 (B59) : Seat belt pre-tensioner (Passenger side)
G3 (B62) : To (Z26)
G3 (B64) : To (Z27)

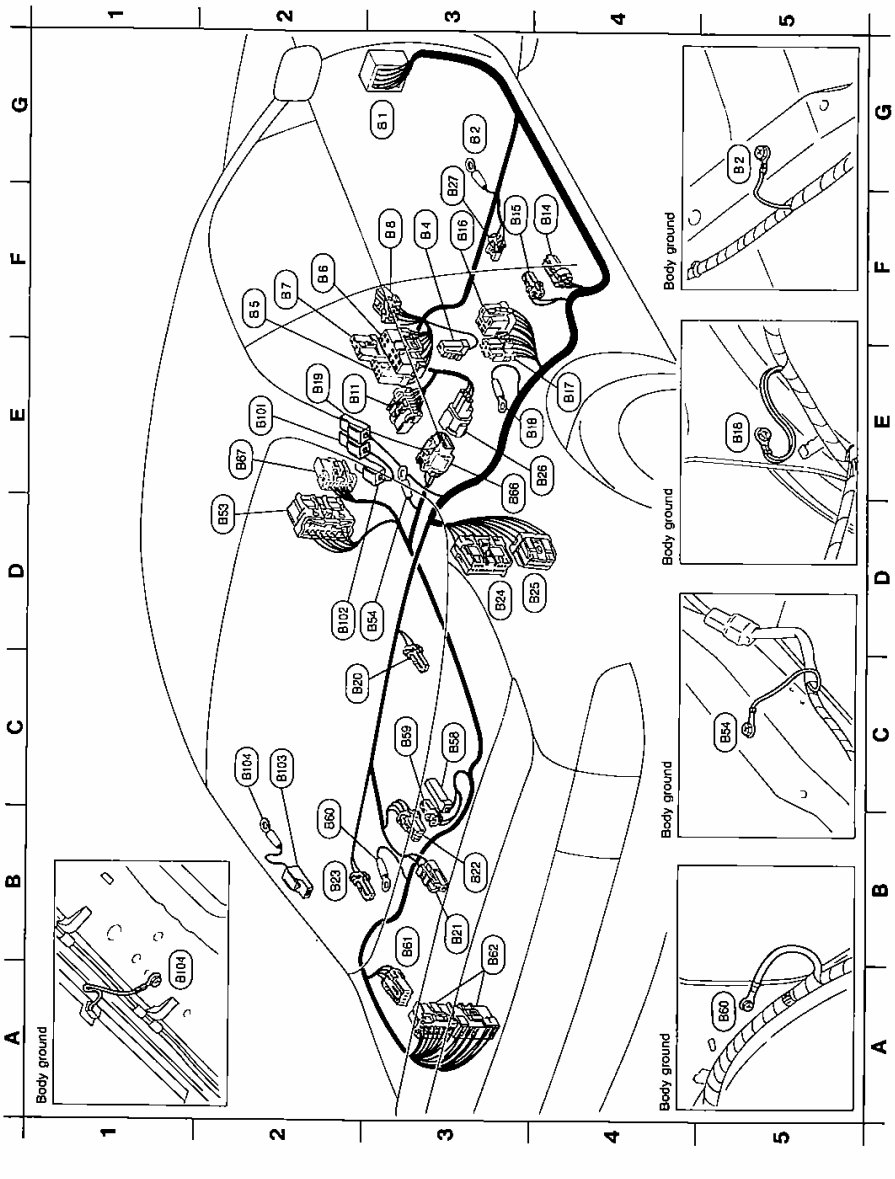
Sub-harness
D2 (B100) : Condenser (For rear window defogger)
D2 (B102) : Rear window defogger (+)
F2 (B103) : Rear window defogger (−)
E2 (B104) : Body ground

EL

HEL216

Body Harness (Cont'd)

RHD MODELS



HEL217

G3 (B1) : To (M1)
G3 (B2) : Body ground
F3 (B4) : Parking brake switch
F2 (B5) : Headlamp aiming switch (For Europe)
F2 (B6) : Door mirror control switch
F2 (B7) : Front fog lamp switch (For Europe)
F3 (B8) : Overdrive switch • A/T illumination
E2 (B11) : To (Z2)
F4 (B14) : Door switch (Driver's side)
F3 (B15) : Seat belt pre-tensioner (Driver's side) (For Europe)
F3 (B16) : Multi-remote control relay-1 (Except for Europe)
E4 (B17) : Multi-remote control relay-2 (Except for Europe)
E3 (B18) : Body ground
E2 (B19) : Condenser (For rear window defogger)
C2 (B20) : Rear speaker RH
B3 (B21) : Trunk room lamp
B3 (B22) : Rear wiper motor (Except for Australia)
B2 (B23) : Rear speaker LH
D3 (B24) : To (T1)
D4 (B25) : To (T2)
E4 (B28) : To (B68)
G3 (B27) : Seat belt switch (For Australia)
D2 (B53) : To (F5) (Models with ABS)
D3 (B54) : Body ground
C3 (B58) : Door switch (Passenger side)
C3 (B60) : Seat belt pre-tensioner (Passenger side) (For Europe)
B2 (B56) : Body ground (Models with ABS)
B3 (B61) : To (T25) (Models with ABS)
B3 (B62) : ABS control unit (For ABS)
E3 (B66) : To (B26)
E2 (B67) : To (M63) (Models with ABS)

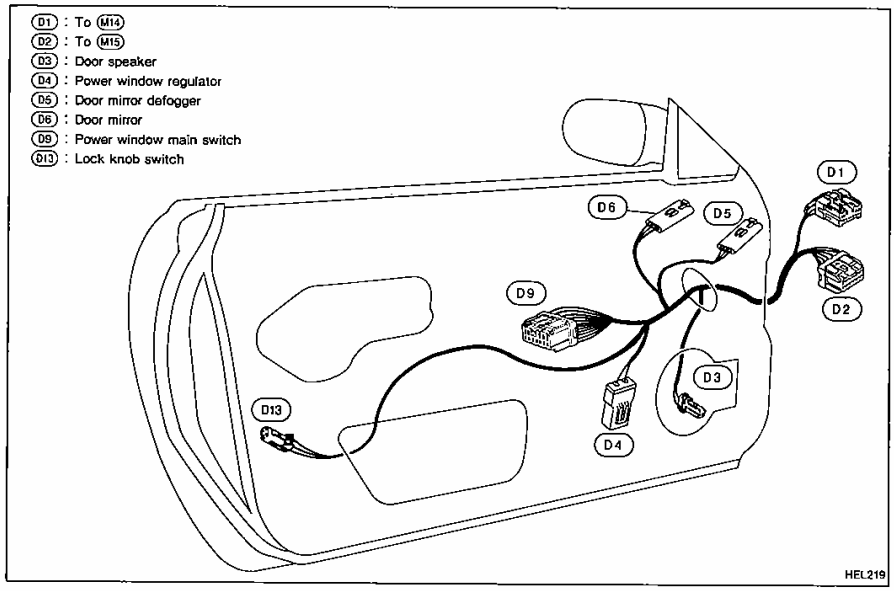
Sub-harness
E2 (B10) : Condenser (For rear window defogger)
D2 (B103) : Rear window defogger (+)
C2 (B103) : Rear window defogger (−)
C2 (B104) : Body ground

EL

HEL218

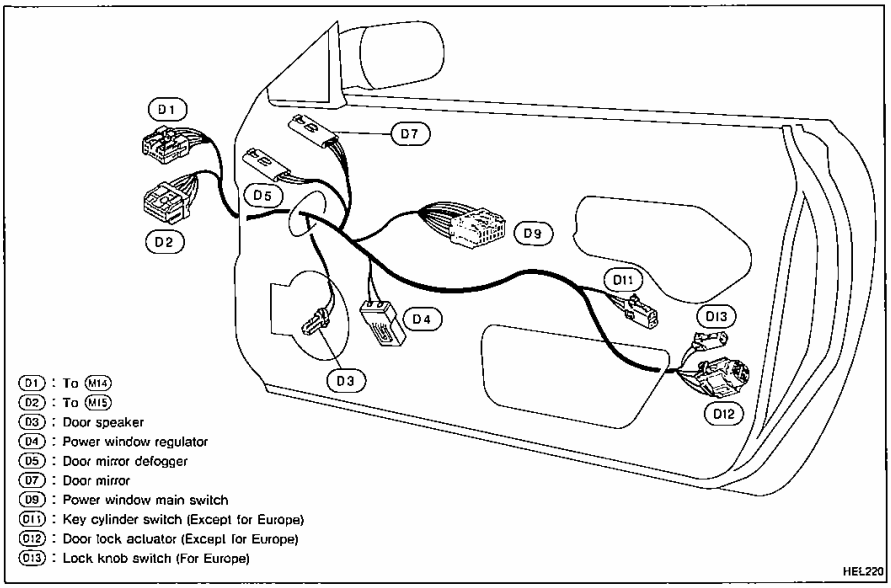
Door Harness (LHD models)

FRONT LH



Door Harness (RHD models)

FRONT RH



EL

NOTE

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