

2004



NISSAN

TERRANO II model R20 series



SERVICE MANUAL

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NISSAN

TERRANO

MODEL R20 SERIES

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FOREWORD

This manual contains maintenance and repair procedures for NISSAN TERRANO, model R20 series.

In order to assure your safety and the efficient functioning of the vehicle, this manual should be read thoroughly. It is especially important that the PRECAUTIONS in the GI section be completely understood before starting any repair task.

All information in this manual is based on the latest product information at the time of publication. The right is reserved to make changes in specifications and methods at any time without notice.

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 completely satisfy himself that neither his safety nor the vehicle's safety will be jeopardized by the service method selected.



NISSAN EUROPE S.A.S.

Service Engineering Section

Paris, France

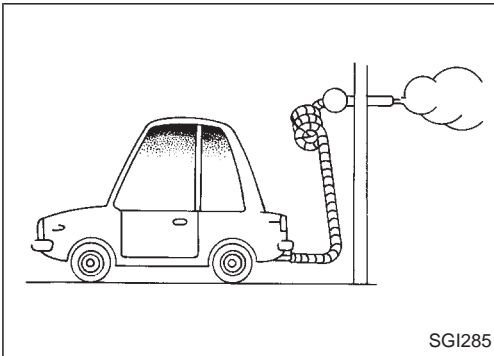
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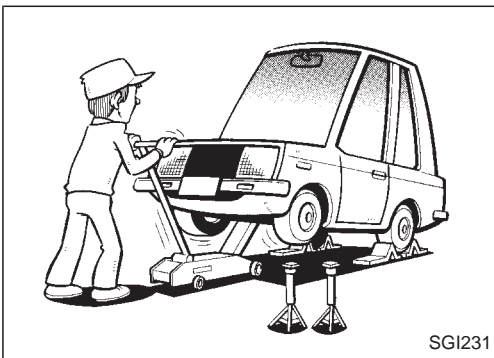
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PRECAUTIONS

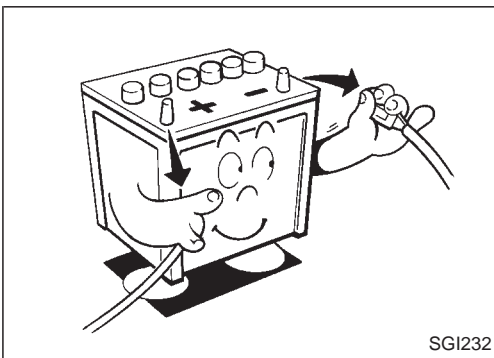
Observe the following precautions to ensure safe and proper servicing. These precautions are not described in each individual section.



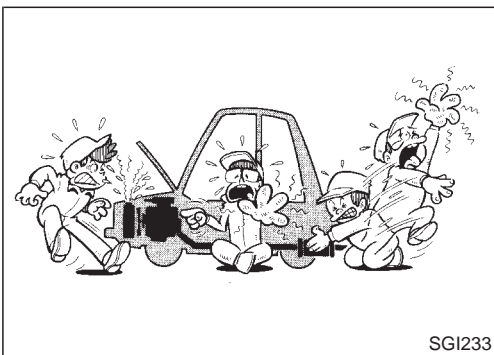
1. Do not operate the engine for an extended period of time without proper exhaust ventilation. Keep the work area well ventilated and free of any inflammable materials. Special care should be taken when handling any inflammable or poisonous materials, such as gasoline, refrigerant gas, etc. When working in a pit or other enclosed area, be sure to properly ventilate the area before working with hazardous materials. Do not smoke while working on the vehicle.



2. Before jacking up the vehicle, apply wheel chocks or other tire blocks to the wheels to prevent the vehicle from moving. After jacking up the vehicle, support the vehicle weight with safety stands at the points designated for proper lifting and towing before working on the vehicle. These operations should be done on a level surface.
3. When removing a heavy component such as the engine or transaxle/transmission, take care not to lose your balance and drop it. Also, do not allow it to strike adjacent parts, especially the brake tubes and master cylinder.

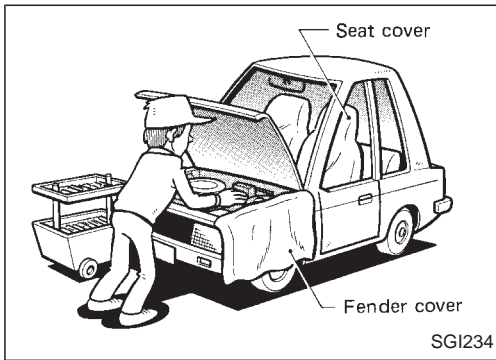


4. Before starting repairs which do not require battery power, always turn off the ignition switch, then disconnect the ground cable from the battery to prevent accidental short circuit.



5. To prevent serious burns, avoid contact with hot metal parts such as the radiator, exhaust manifold, tail pipe and muffler. Do not remove the radiator cap when the engine is hot.

PRECAUTIONS



6. Before servicing the vehicle, protect fenders, upholstery and carpeting with appropriate covers. Take caution that keys, buckles or buttons on your person do not scratch the paint.
7. Clean all disassembled parts in the designated liquid or solvent prior to inspection or assembly.
8. Replace oil seals, gaskets, packings, O-rings, locking washers, cotter pins, self-locking nuts, etc. with new ones.
9. Replace inner and outer races of tapered roller bearings and needle bearings as a set.
10. Arrange the disassembled parts in accordance with their assembled locations and sequence.
11. Do not touch the terminals of electrical components which use microcomputers (such as electronic control units). Static electricity may damage internal electronic components.
12. After disconnecting vacuum or air hoses, attach a tag to indicate the proper connection.
13. Use only the lubricants specified in MA section.
14. Use approved bonding agent, sealants or their equivalents when required.
15. Use tools and recommended special tools where specified for safe and efficient service repairs.
16. When repairing the fuel, oil, water, vacuum or exhaust systems, check all affected lines for leaks.
17. Dispose of drained oil or the solvent used for cleaning parts in an appropriate manner.



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

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.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to do so in this Service Manual. SRS wiring harnesses are covered with yellow

PRECAUTIONS

Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER” (Dual Air Bag System) (Cont’d)

insulation (either just before the harness connectors or for the complete harness), for easy identification.



Precautions for NATS

NATS (Nissan Anti-Theft System)

NATS will immobilize the engine if someone tries to start it without the registered key of NATS.

Both of the originally supplied ignition key IDs have been NATS registered.

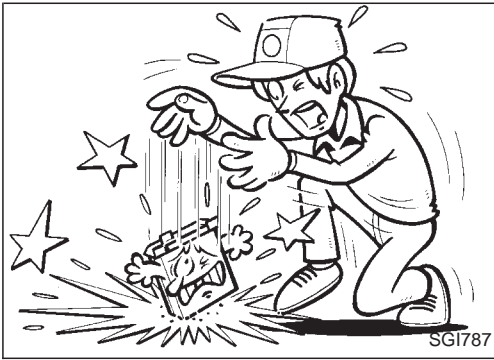
The NATS security indicator is located on the instrument panel. The indicator blinks when the ignition switch is in “OFF” or “ACC” position. Therefore, NATS warns outsiders that the vehicle is equipped with the anti-theft system.

- 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.
- If the malfunction indicator lamp comes on while the engine is running, return the vehicle to the workshop before turning the ignition switch “OFF”.
Once the ignition switch is turned “OFF”, the engine can not be started.
- When servicing NATS (trouble diagnoses, system initialization and additional registration of other NATS ignition key IDs) CONSULT-II hardware and CONSULT-II NATS software is necessary.
Regarding the procedures of NATS initialization and NATS ignition key ID registration, refer to CONSULT-II operation manual, NATS.

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

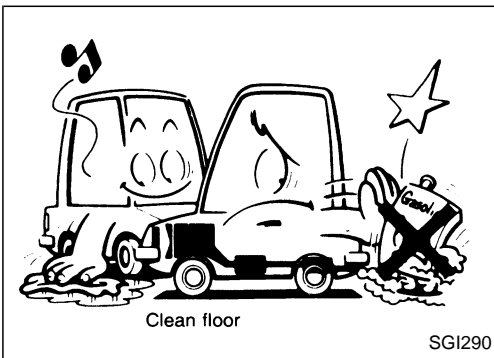
- When servicing NATS (trouble diagnoses, system initialization and additional registration of other NATS ignition key IDs), it may be necessary to re-register original key identification. Therefore, be sure to receive all keys from vehicle owner. A maximum of five key IDs can be registered into NATS.
- When failing to start the engine first-time using the key of NATS, starts 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.

PRECAUTIONS



Precautions for Multiport Fuel Injection System or Engine Control System

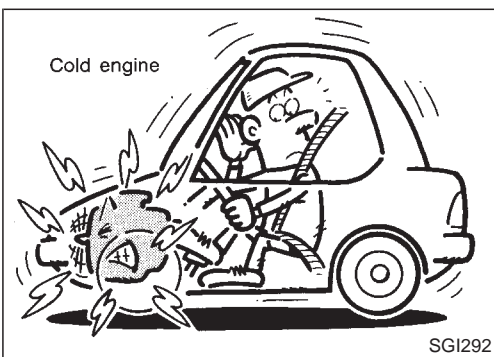
1. Before connecting or disconnecting any harness connector for the multiport fuel injection system or ECM (Engine Control Module):
Turn ignition switch to "OFF" position.
Disconnect negative battery terminal.
Otherwise, there may be damage to ECM.
2. Before disconnecting pressurized fuel line from fuel pump to injectors, be sure to release fuel pressure to eliminate danger.
3. Be careful not to jar components such as control unit and air flow meter.



Precautions for Catalyst

If a large amount of unburned fuel enters the converter, the converter temperature will rise to excessively high values. To prevent this, follow the procedure below:

1. Use unleaded gasoline only. Leaded gasoline will seriously damage the catalytic converter.
2. When checking for ignition spark or measuring engine compression, perform tests quickly and only when necessary.
3. Do not run engine when the fuel tank level is low, as a result the engine may misfire causing damage to the converter.
4. Do not place the vehicle on inflammable material. Keep inflammable material off the exhaust pipe.



Precautions for Turbocharger

The turbocharger turbine revolves at extremely high speeds and becomes very hot. Therefore, it is essential to maintain a clean supply of oil flowing through the turbocharger and to follow all required maintenance instructions and operating procedures.

For proper operation of the system, follow the procedure below:

1. Always use the recommended oil. Follow the instructions for proper time to change the oil and proper oil level.
2. Avoid accelerating engine to a high rpm immediately after starting.
3. If engine had been operating at high rpm for an extended period of time, let it idle for a few minutes prior to shutting it off.

GI-5

PRECAUTIONS

Precautions for Fuel

DIESEL ENGINE*:

Diesel fuel of at least 50 cetane for ZD30DDTi engine.

* If two types of diesel fuel are available, use summer or winter fuel properly according to the following temperature conditions.

- Above -7°C (20°F) ... Summer type diesel fuel.
- Below -7°C (20°F) ... Winter type diesel fuel.

CAUTION:

- **Do not use home heating oil, gasoline, or other alternate fuels in your diesel engine. The use of those can cause engine damage.**
- **Do not use summer fuel at temperature below -7°C (20°F). The cold temperature will cause wax to form in the fuel. As a result, it may prevent the engine from running smoothly.**
- **Do not add gasoline or other alternate fuels to diesel fuel.**

Precautions for Engine Oils

Prolonged and repeated contact with mineral oil will result in the removal of natural fats from the skin, leading to dryness, irritation and dermatitis. In addition, used engine oil contains potentially harmful contaminants which may cause skin cancer. Adequate means of skin protection and washing facilities must be provided.

HEALTH PROTECTION PRECAUTIONS

1. Avoid prolonged and repeated contact with oils, particularly used engine oils.
2. Wear protective clothing, including impervious gloves where practicable.
3. Do not put oily rags in pockets.
4. Avoid contaminating clothes, particularly underwear, with oil.
5. Heavily soiled clothing and oil-impregnated footwear should not be worn. Overalls must be cleaned regularly.
6. First Aid treatment should be obtained immediately for open cuts and wounds.
7. Use barrier creams, applying them before each work period, to help the removal of oil from the skin.
8. Wash with soap and water to ensure all oil is removed (skin cleansers and nail brushes will help). Preparations containing lanolin replace the natural skin oils which have been removed.
9. Do not use petrol, kerosine, diesel fuel, gas oil, thinners or solvents for cleaning skin.
10. If skin disorders develop, obtain medical advice without delay.
11. Where practicable, degrease components prior to handling.
12. Where there is a risk of eye contact, eye protection should be worn, for example, chemical goggles or face shields; in addition an eye wash facility should be provided.

(For the United Kingdom, see also HSE Cautionary Notice SHW 397 "Effects of Mineral Oil on the Skin".)

ENVIRONMENTAL PROTECTION PRECAUTIONS

Burning used engine oil in small space heaters or boilers can be recommended only for units of approved design. The heating system must meet the requirements of HM Inspectorate of Pollution for small burners of less than 0.4 MW. If in doubt check with the appropriate local authority and/or manufacturer of the approved appliance.

PRECAUTIONS

Precautions for Engine Oils (Cont'd)

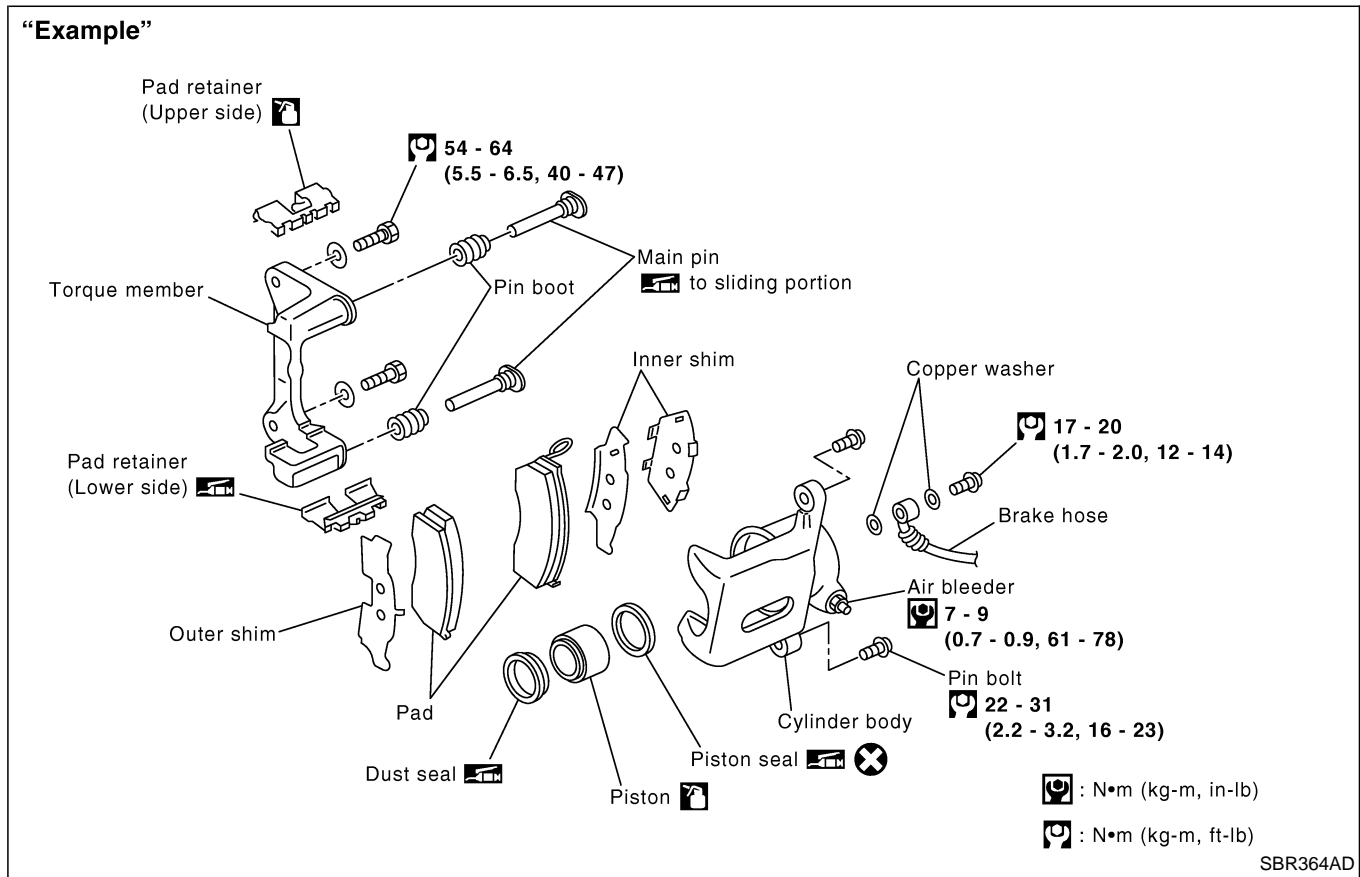
Dispose of used oil and used oil filters through authorized waste disposal contractors to licensed waste disposal sites, or to the waste oil reclamation trade. If in doubt, contact the local authority for advice on disposal facilities.

It is illegal to pour used oil on to the ground, down sewers or drains, or into water courses.

The regulations concerning the pollution of the environment will vary from country to country.

HOW TO USE THIS MANUAL









1. **A QUICK REFERENCE INDEX**, a black tab (e.g. **BR**) is provided on the first page. You can quickly find the first page of each section by mating it to the section's black tab.
2. **THE CONTENTS** are listed on the first page of each section.
3. **THE TITLE** is indicated on the upper portion of each page and shows the part or system.
4. **THE PAGE NUMBER** of each section consists of two letters which designate the particular section and a number (e.g. "BR-5").
5. **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**.



6. **THE SMALL ILLUSTRATIONS** show the important steps such as inspection, use of special tools, knacks of work and hidden or tricky steps which are not shown in the previous large illustrations. Assembly, inspection and adjustment procedures for the complicated units such as the automatic transaxle or transmission, etc. are presented in a step-by-step format where necessary.

HOW TO USE THIS MANUAL

7. The following **SYMBOLS AND ABBREVIATIONS** are used:

	: Tightening torque	 (P)	: Apply petroleum jelly.
	: Should be lubricated with grease. Unless otherwise indicated, use recommended multi-purpose grease.	 (ATF)	: Apply A.T.F.
	: Should be lubricated with oil.	A.T.F.	: Automatic Transmission Fluid
	: Sealing point	★	: Select with proper thickness.
	: Checking point	☆	: Adjustment is required.
	: Always replace after every disassembly.	M/T	: Manual Transaxle/Transmission
L.H., R.H.:	Left-Hand, Right-Hand	A/C	: Air Conditioner
FR, RR	: Front, Rear	P/S	: Power Steering
2WD	: 2-Wheel Drive	S.S.T.	: Special Service Tools
4WD	: 4-Wheel Drive	S.D.S.	: Service Data and Specifications
		SAE	: Society of Automotive Engineers, Inc.
		L.H.D.	: Left-Hand Drive
		R.H.D.	: Right-Hand Drive

8. The **UNITS** given in this manual are primarily expressed as the SI UNIT (International System of Unit), and alternatively expressed in the metric system and in the yard/pound system.

“Example”

Tightening torque:

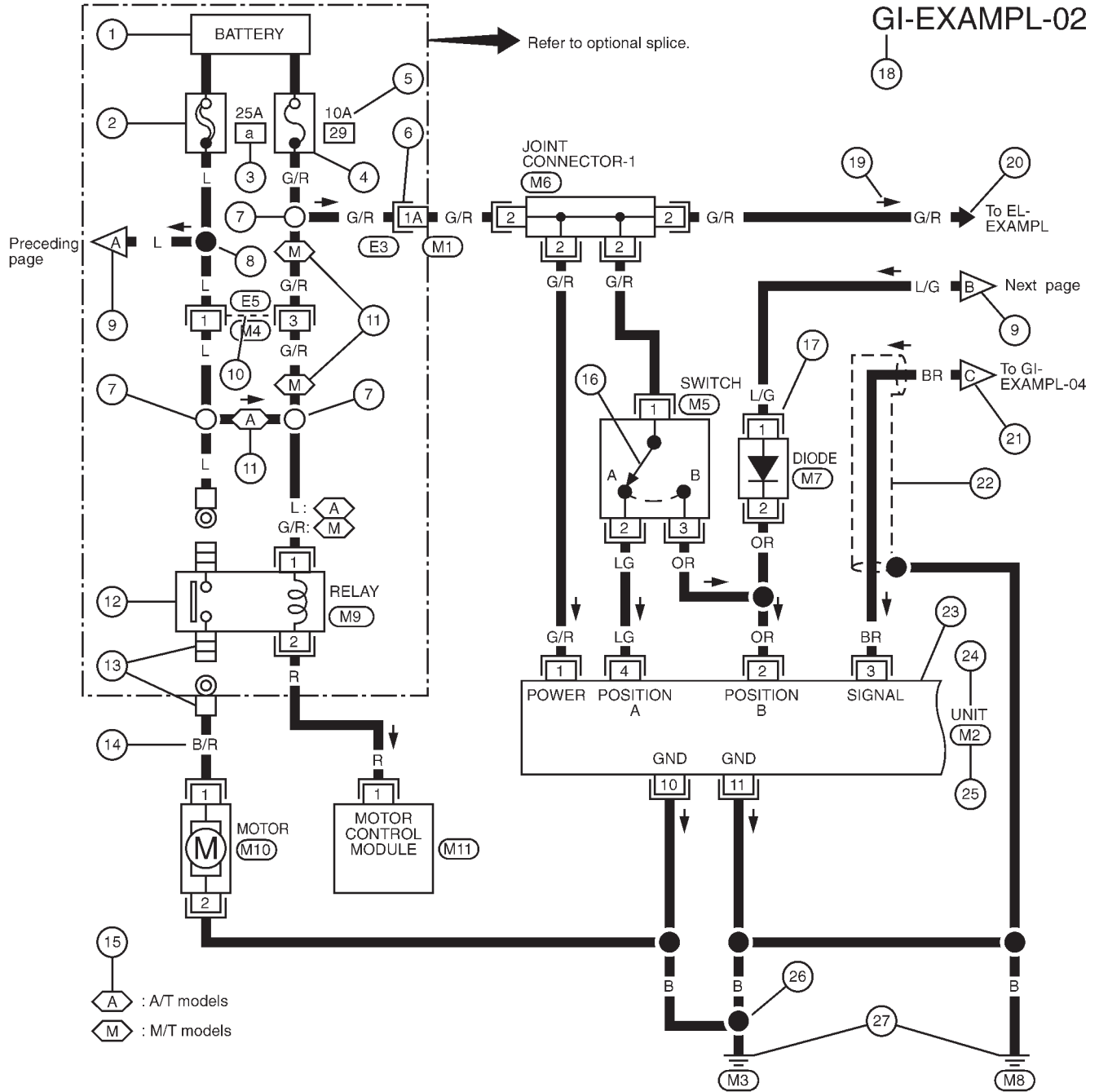
59 - 78 N·m (6.0 - 8.0 kg-m, 43 - 58 ft-lb)

9. **TROUBLE DIAGNOSES** are included in sections dealing with complicated components.
10. **SERVICE DATA AND SPECIFICATIONS** are contained at the end of each section for quick reference of data.
11. The captions **WARNING** and **CAUTION** warn you of steps that must be followed to prevent personal injury and/or damage to some part of the vehicle.
- **WARNING** indicates the possibility of personal injury if instructions are not followed.
 - **CAUTION** indicates the possibility of component damage if instructions are not followed.
 - **BOLD TYPED STATEMENTS** except **WARNING** and **CAUTION** give you helpful information.

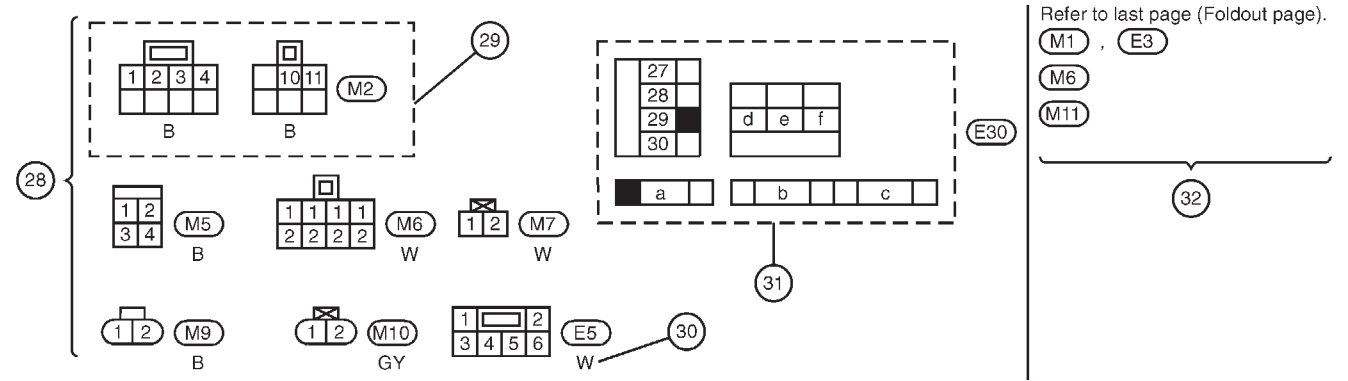
HOW TO READ WIRING DIAGRAMS

Sample/Wiring Diagram — EXAMPL —

- For Description, refer to GI-10.

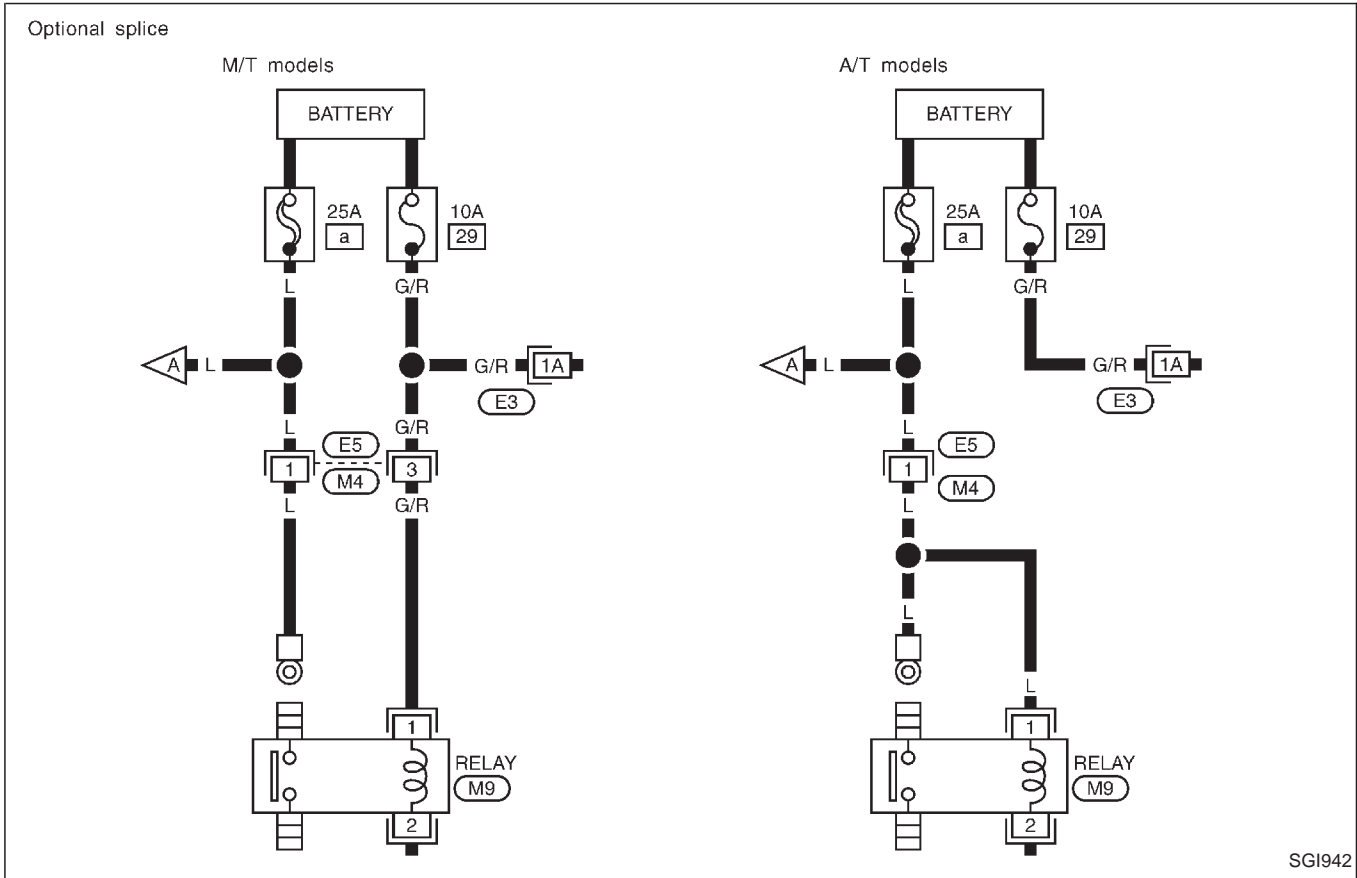


A : A/T models
M : M/T models



HOW TO READ WIRING DIAGRAMS

Sample/Wiring Diagram — EXAMPL — (Cont'd) OPTIONAL SPLICE



HOW TO READ WIRING DIAGRAMS

Description

Number	Item	Description																
①	Power condition	<ul style="list-style-type: none"> This shows the condition when the system receives battery positive voltage (can be operated). 																
②	Fusible link	<ul style="list-style-type: none"> The double line shows that this is a fusible link. The open circle shows current flow in, and the shaded circle shows current flow out. 																
③	Fusible link/fuse location	<ul style="list-style-type: none"> This shows the location of the fusible link or fuse in the fusible link or fuse box. For arrangement, refer to EL section ("POWER SUPPLY ROUTING"). 																
④	Fuse	<ul style="list-style-type: none"> The single line shows that this is a fuse. The open circle shows current flow in, and the shaded circle shows current flow out. 																
⑤	Current rating	<ul style="list-style-type: none"> This shows the current rating of the fusible link or fuse. 																
⑥	Connectors	<ul style="list-style-type: none"> This shows that connector (E3) is female and connector (M1) is male. The G/R wire is located in the 1A terminal of both connectors. Terminal number with an alphabet (1A, 5B, etc.) indicates that the connector is SMJ connector. Refer to GI-18. 																
⑦	Optional splice	<ul style="list-style-type: none"> The open circle shows that the splice is optional depending on vehicle application. 																
⑧	Splice	<ul style="list-style-type: none"> The shaded circle shows that the splice is always on the vehicle. 																
⑨	Page crossing	<ul style="list-style-type: none"> This arrow shows that the circuit continues to an adjacent page. The A will match with the A on the preceding or next page. 																
⑩	Common connector	<ul style="list-style-type: none"> The dotted lines between terminals show that these terminals are part of the same connector. 																
⑪	Option abbreviation	<ul style="list-style-type: none"> This shows that the circuit is optional depending on vehicle application. 																
⑫	Relay	<ul style="list-style-type: none"> This shows an internal representation of the relay. For details, refer to EL section ("STANDARDIZED RELAY"). 																
⑬	Connectors	<ul style="list-style-type: none"> This shows that the connector is connected to the body or a terminal with bolt or nut. 																
⑭	Wire color	<ul style="list-style-type: none"> This shows a code for the color of the wire. <table style="margin-left: 20px;"> <tr> <td>B = Black</td> <td>BR = Brown</td> </tr> <tr> <td>W = White</td> <td>OR = Orange</td> </tr> <tr> <td>R = Red</td> <td>P = Pink</td> </tr> <tr> <td>G = Green</td> <td>PU = Purple</td> </tr> <tr> <td>L = Blue</td> <td>GY = Gray</td> </tr> <tr> <td>Y = Yellow</td> <td>SB = Sky Blue</td> </tr> <tr> <td>LG = Light Green</td> <td>CH = Dark Brown</td> </tr> <tr> <td></td> <td>DG = Dark Green</td> </tr> </table> <p>When the wire color is striped, the base color is given first, followed by the stripe color as shown below: Example: L/W = Blue with White Stripe</p>	B = Black	BR = Brown	W = White	OR = Orange	R = Red	P = Pink	G = Green	PU = Purple	L = Blue	GY = Gray	Y = Yellow	SB = Sky Blue	LG = Light Green	CH = Dark Brown		DG = Dark Green
B = Black	BR = Brown																	
W = White	OR = Orange																	
R = Red	P = Pink																	
G = Green	PU = Purple																	
L = Blue	GY = Gray																	
Y = Yellow	SB = Sky Blue																	
LG = Light Green	CH = Dark Brown																	
	DG = Dark Green																	
⑮	Option description	<ul style="list-style-type: none"> This shows a description of the option abbreviation used on the page. 																
⑯	Switch	<ul style="list-style-type: none"> This shows that continuity exists between terminals 1 and 2 when the switch is in the A position. Continuity exists between terminals 1 and 3 when the switch is in the B position. 																
⑰	Assembly parts	<ul style="list-style-type: none"> Connector terminal in component shows that it is a harness incorporated assembly. 																
⑱	Cell code	<ul style="list-style-type: none"> This identifies each page of the wiring diagram by section, system and wiring diagram page number. 																

HOW TO READ WIRING DIAGRAMS

Description (Cont'd)



Number	Item	Description
⑲	Current flow arrow	<ul style="list-style-type: none"> ● Arrow indicates electric current flow, especially where the direction of standard flow (vertically downward or horizontally from left to right) is difficult to follow. ● A double arrow “\longleftrightarrow” shows that current can flow in either direction depending on circuit operation.
⑳	System branch	<ul style="list-style-type: none"> ● This shows that the system branches to another system identified by cell code (section and system).
㉑	Page crossing	<ul style="list-style-type: none"> ● This arrow shows that the circuit continues to another page identified by cell code. ● The C will match with the C on another page within the system other than the next or preceding pages.
㉒	Shielded line	<ul style="list-style-type: none"> ● The line enclosed by broken line circle shows shield wire.
㉓	Component box in wave line	<ul style="list-style-type: none"> ● This shows that another part of the component is also shown on another page (indicated by wave line) within the system.
㉔	Component name	<ul style="list-style-type: none"> ● This shows the name of a component.
㉕	Connector number	<ul style="list-style-type: none"> ● This shows the connector number. ● The letter shows which harness the connector is located in. Example: M: main harness. For detail and to locate the connector, refer to EL section (“Main Harness”, “HARNESS LAYOUT”). A coordinate grid is included for complex harnesses to aid in locating connectors.
㉖	Ground (GND)	<ul style="list-style-type: none"> ● The line spliced and grounded under wire color shows that ground line is spliced at the grounded connector.
㉗	Ground (GND)	<ul style="list-style-type: none"> ● This shows the ground connection.
㉘	Connector views	<ul style="list-style-type: none"> ● This area shows the connector faces of the components in the wiring diagram on the page.
㉙	Common component	<ul style="list-style-type: none"> ● Connectors enclosed in broken line show that these connectors belong to the same component.
㉚	Connector color	<ul style="list-style-type: none"> ● This shows a code for the color of the connector. For code meaning, refer to wire color codes, Number ⑭ of this chart.
㉛	Fusible link and fuse box	<ul style="list-style-type: none"> ● This shows the arrangement of fusible link(s) and fuse(s), used for connector views of “POWER SUPPLY ROUTING” in EL section. The open square shows current flow in, and the shaded square shows current flow out.
㉜	Reference area	<ul style="list-style-type: none"> ● This shows that more information on the Super Multiple Junction (SMJ) and Joint Connectors (J/C) exists on the foldout page. Refer to GI-18 for details.

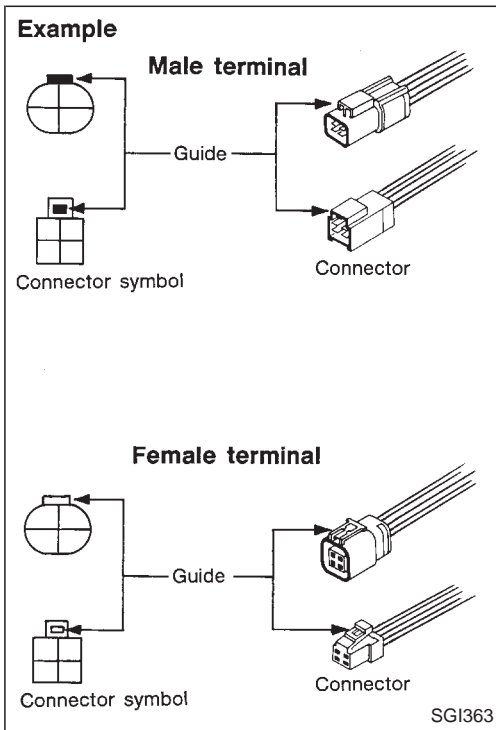
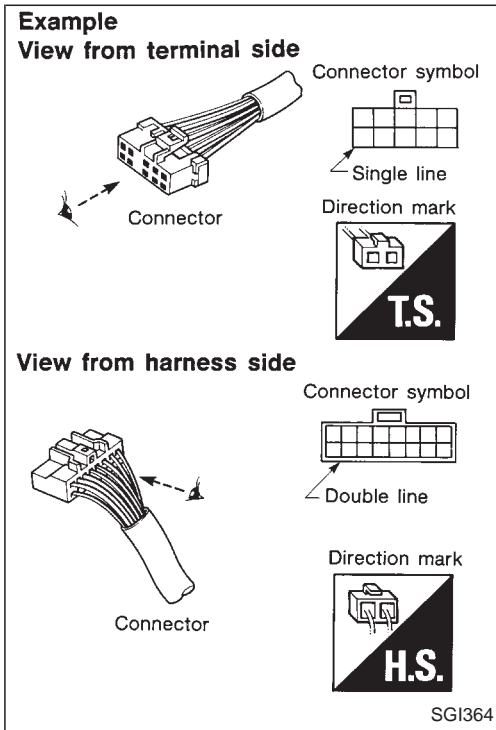
HOW TO READ WIRING DIAGRAMS

Description (Cont'd)

CONNECTOR SYMBOLS

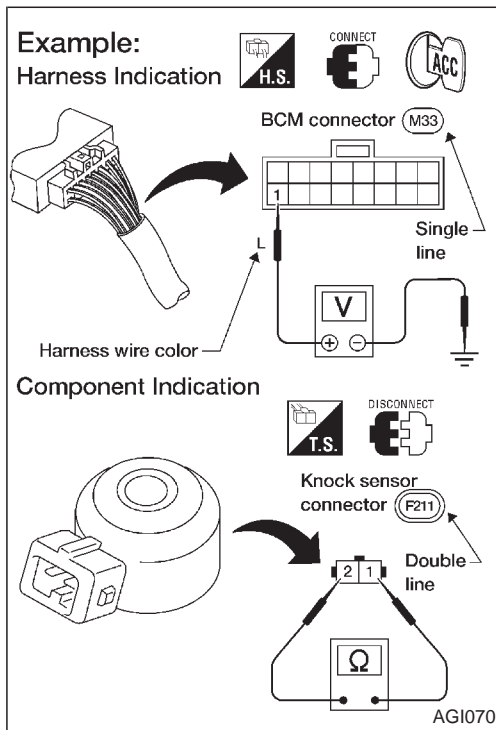
Most of connector symbols in wiring diagrams are shown from the terminal side.

- Connector symbols shown from the terminal side are enclosed by a single line and followed by the direction mark  .
- Connector symbols shown from the harness side are enclosed by a double line and followed by the direction mark  .



- Male and female terminals
Connector guides for male terminals are shown in black and female terminals in white in wiring diagrams.

HOW TO READ WIRING DIAGRAMS



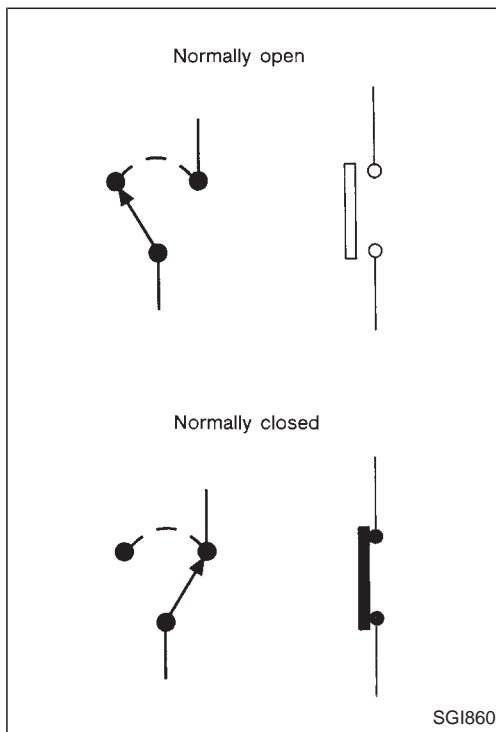
Description (Cont'd)

Harness indication

- Letter designations next to test meter probe indicate harness (connector) wire color.
- Connector numbers in a single circle (M33) indicate harness connectors.

Component indication

- Connector numbers in a double circle indicate component connectors.



SWITCH POSITIONS

Switches are shown in wiring diagrams as if the vehicle is in the "normal" condition.

A vehicle is in the "normal" condition when:

- ignition switch is "OFF",
- doors, hood and trunk lid/back door are closed,
- pedals are not depressed, and
- parking brake is released.

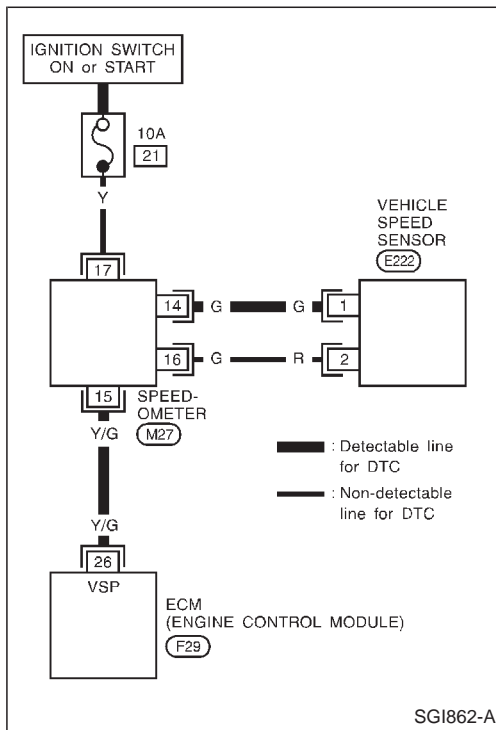
HOW TO READ WIRING DIAGRAMS

Description (Cont'd)

DETECTABLE LINES AND NON-DETECTABLE LINES

In some wiring diagrams, two kinds of lines, representing wires, with different weight are used.

- A line with regular weight (wider line) represents a “detectable line for DTC (Diagnostic Trouble Code)”. A “detectable line for DTC” is a circuit in which ECM (Engine Control Module) can detect its malfunctions with the on board diagnostic system.
- A line with less weight (thinner line) represents a “non-detectable line for DTC”. A “non-detectable line for DTC” is a circuit in which ECM cannot detect its malfunctions with the on board diagnostic system.



HOW TO READ WIRING DIAGRAMS

Description (Cont'd)

MULTIPLE SWITCH

The continuity of multiple switch is described in two ways as shown below.

- The switch chart is used in schematic diagrams.
- The switch diagram is used in wiring diagrams.

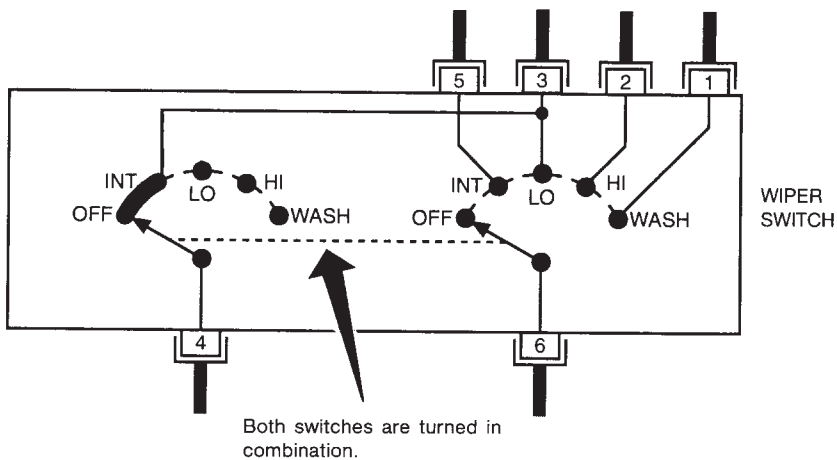
Example

(SWITCH CHART)

WIPER SWITCH

	OFF	INT	LO	HI	WASH
1					○
2				○	
3	○	○	○		
4	○	○			
5		○			
6		○	○	○	○

(SWITCH DIAGRAM)



Continuity circuit of wiper switch

SWITCH POSITION	CONTINUITY CIRCUIT
OFF	3-4
INT	3-4, 5-6
LO	3-6
HI	2-6
WASH	1-6

SGI875