

# STARTING & CHARGING SYSTEM

## SECTION SC

### CONTENTS

<b>PRECAUTIONS</b> .....	2	YOKE CHECK .....	17
Supplemental Restraint System (SRS) "AIR BAG" .....	2	ARMATURE CHECK .....	17
Wiring Diagrams and Trouble Diagnosis .....	2	Assembly .....	18
<b>BATTERY</b> .....	3	PINION PROTRUSION LENGTH ADJUSTMENT .....	18
How to Handle Battery .....	3	<b>CHARGING SYSTEM</b> .....	19
METHODS OF PREVENTING OVER-DISCHARGE .....	3	System Description .....	19
CHECKING ELECTROLYTE LEVEL .....	3	Wiring Diagram - CHARGE - .....	20
SPECIFIC GRAVITY CHECK .....	4	Trouble Diagnoses .....	21
Battery Test and Charging Chart .....	6	WITH IC REGULATOR .....	21
CHART I .....	6	MALFUNCTION INDICATOR .....	21
CHART II .....	7	Construction .....	22
A: SLOW CHARGE .....	8	Removal and Installation .....	22
B: STANDARD CHARGE .....	9	REMOVAL .....	22
C: QUICK CHARGE .....	11	INSTALLATION .....	22
<b>STARTING SYSTEM</b> .....	12	Disassembly .....	23
System Description .....	12	REAR COVER .....	23
M/T MODELS .....	12	REAR BEARING .....	23
A/T MODELS .....	12	Inspection .....	23
Wiring Diagram - START - .....	13	ROTOR CHECK .....	23
Trouble Diagnoses .....	14	BRUSH CHECK .....	23
Construction .....	15	STATOR CHECK .....	24
Removal and Installation .....	15	Assembly .....	24
REMOVAL .....	15	RING FITTING IN REAR BEARING .....	24
INSTALLATION .....	15	REAR COVER INSTALLATION .....	24
Inspection .....	16	<b>SERVICE DATA AND SPECIFICATIONS (SDS)</b> .....	25
MAGNETIC SWITCH CHECK .....	16	Battery .....	25
PINION/CLUTCH CHECK .....	16	Starter .....	25
BRUSH CHECK .....	16	Alternator .....	25

GI

MA

EM

LC

EC

FE

CL

MT

AT

PD

AX

SU

BR

ST

RS

BT

HA

SC

EL

IDX

## PRECAUTIONS

### Supplemental Restraint System (SRS) "AIR BAG"

---

## Supplemental Restraint System (SRS) "AIR BAG"

NMSC0001

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER" used along with a seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. The SRS system composition which is available to NISSAN MODEL S15 is as follows:

The Supplemental Restraint System consists of driver air bag module (located in the center of the steering wheel), front passenger air bag module (located on the instrument panel on passenger side), a diagnosis 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 should 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. For removal of Spiral Cable and Air Bag Module, see the RS section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified with yellow harness connector.

## Wiring Diagrams and Trouble Diagnosis

NMSC0002

When you read wiring diagrams, refer to the following:

- Refer to GI-11, "HOW TO READ WIRING DIAGRAMS"
- Refer to EL-7, "POWER SUPPLY ROUTING" for power distribution circuit

When you perform trouble diagnosis, refer to the following:

- Refer to GI-31, "HOW TO FOLLOW TEST GROUPS IN TROUBLE DIAGNOSES"
- Refer to GI-20, "HOW TO PERFORM EFFICIENT DIAGNOSIS FOR AN ELECTRICAL INCIDENT"

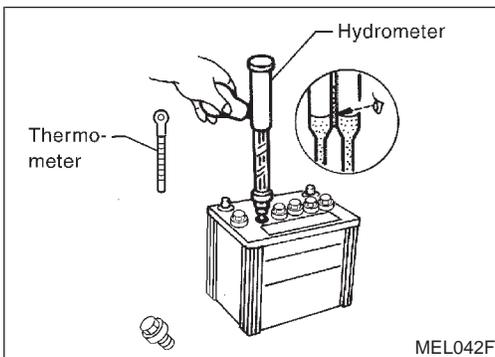
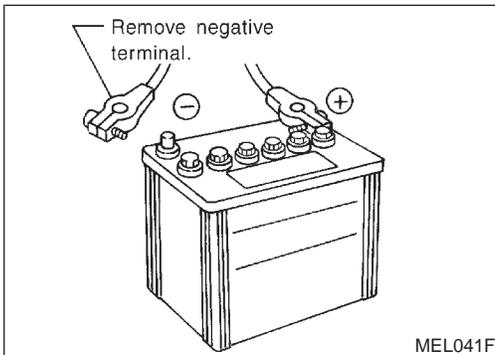
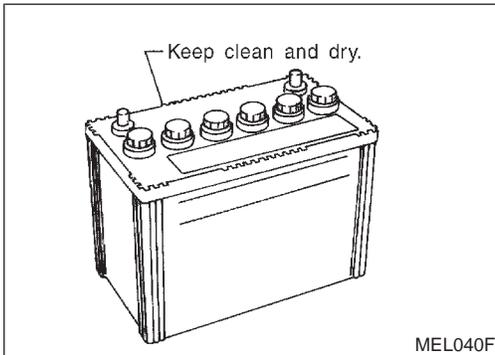
## How to Handle Battery

NMSC0003

### CAUTION:

If it becomes necessary to start the engine with a booster battery and jumper cables,

- 1) Use a 12-volt booster battery.
- 2) After connecting battery cables, ensure that they are tightly clamped to battery terminals for good contact.
- 3) Never add distilled water through the hole used to check specific gravity.



## METHODS OF PREVENTING OVER-DISCHARGE

NMSC0003S01

The following precautions must be taken to prevent over-discharging a battery.

- The battery surface (particularly its top) should always be kept clean and dry.
- The terminal connections should be clean and tight.
- At every routine maintenance, check the electrolyte level. This also applies to batteries designated as "low maintenance" and "maintenance-free".
- When the vehicle is not going to be used over a long period of time, disconnect the negative battery terminal.
- Check the charge condition of the battery. Periodically check the specific gravity of the electrolyte. Keep a close check on charge condition to prevent over-discharge.

## CHECKING ELECTROLYTE LEVEL

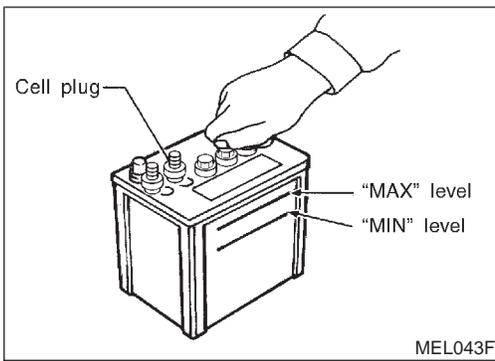
NMSC0003S02

### WARNING:

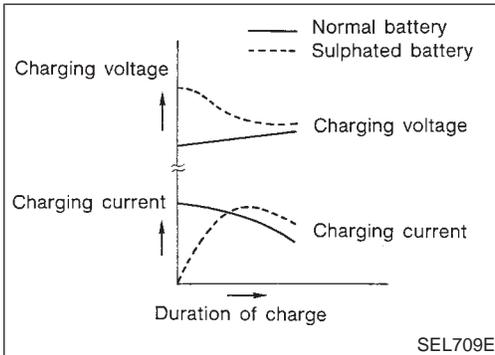
Do not allow battery fluid to come in contact with skin, eyes, fabrics, or painted surfaces. After touching a battery, do not touch or rub your eyes until you have thoroughly washed your hands. If acid contacts eyes, skin or clothing, immediately flush with water for 15 minutes and seek medical attention.

# BATTERY

## How to Handle Battery (Cont'd)



- Remove the cell plug using a suitable tool.
- Add distilled water up to the MAX level.

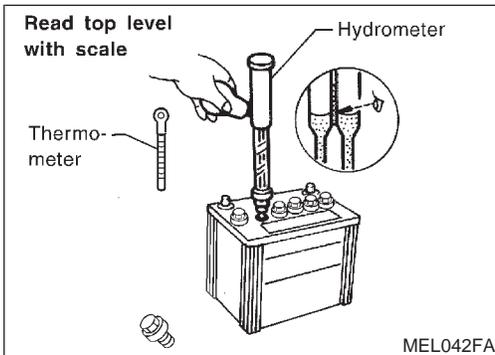


## Sulphation

NMSC0003S0201  
A battery will be completely discharged if it is left unattended for a long time and the specific gravity will become less than 1.100. This may result in sulphation on the cell plates.

To determine if a battery has been "sulphated", note its voltage and current when charging it. As shown in the figure, less current and higher voltage are observed in the initial stage of charging sulphated batteries.

A sulphated battery may sometimes be brought back into service by means of a long, slow charge, 12 hours or more, followed by a battery capacity test.



## SPECIFIC GRAVITY CHECK

1. Read hydrometer and thermometer indications at eye level.  
NMSC0003S03

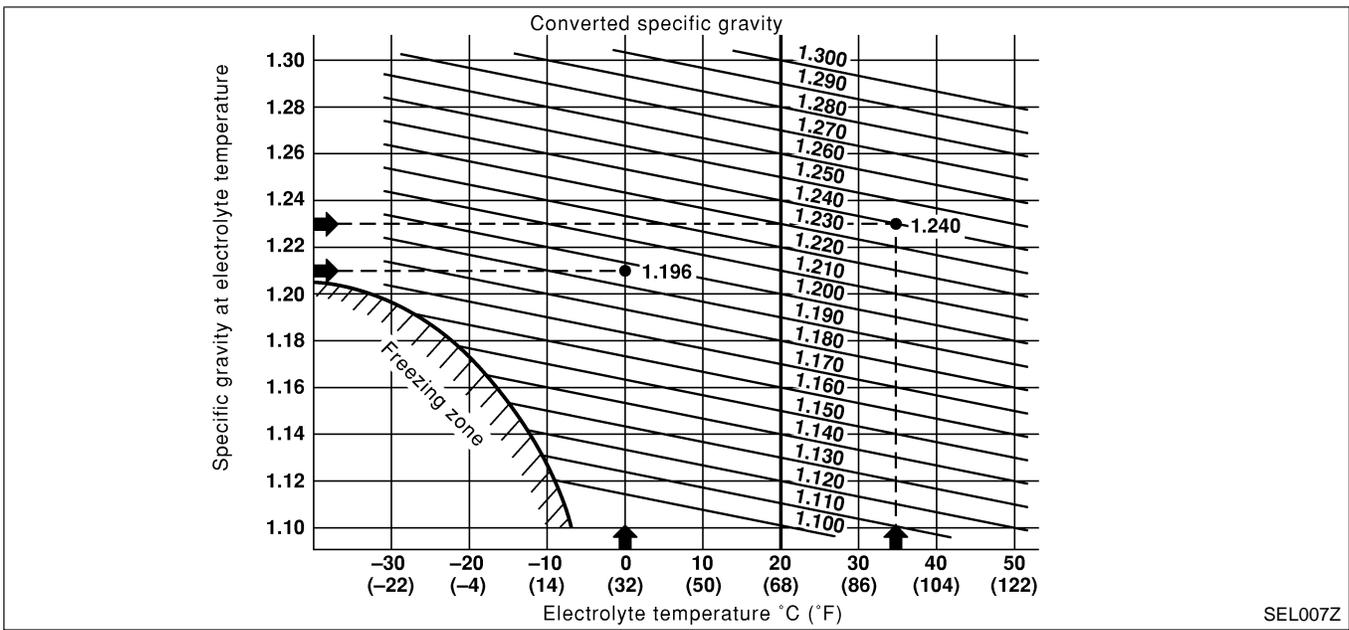
2. Convert into specific gravity at 20°C (68°F).

Example:

- When electrolyte temperature is 35°C (95°F) and specific gravity of electrolyte is 1.230, converted specific gravity at 20°C (68°F) is 1.240.
- When electrolyte temperature is 0°C (32°F) and specific gravity of electrolyte is 1.210, converted specific gravity at 20°C (68°F) is 1.196.

# BATTERY

How to Handle Battery (Cont'd)



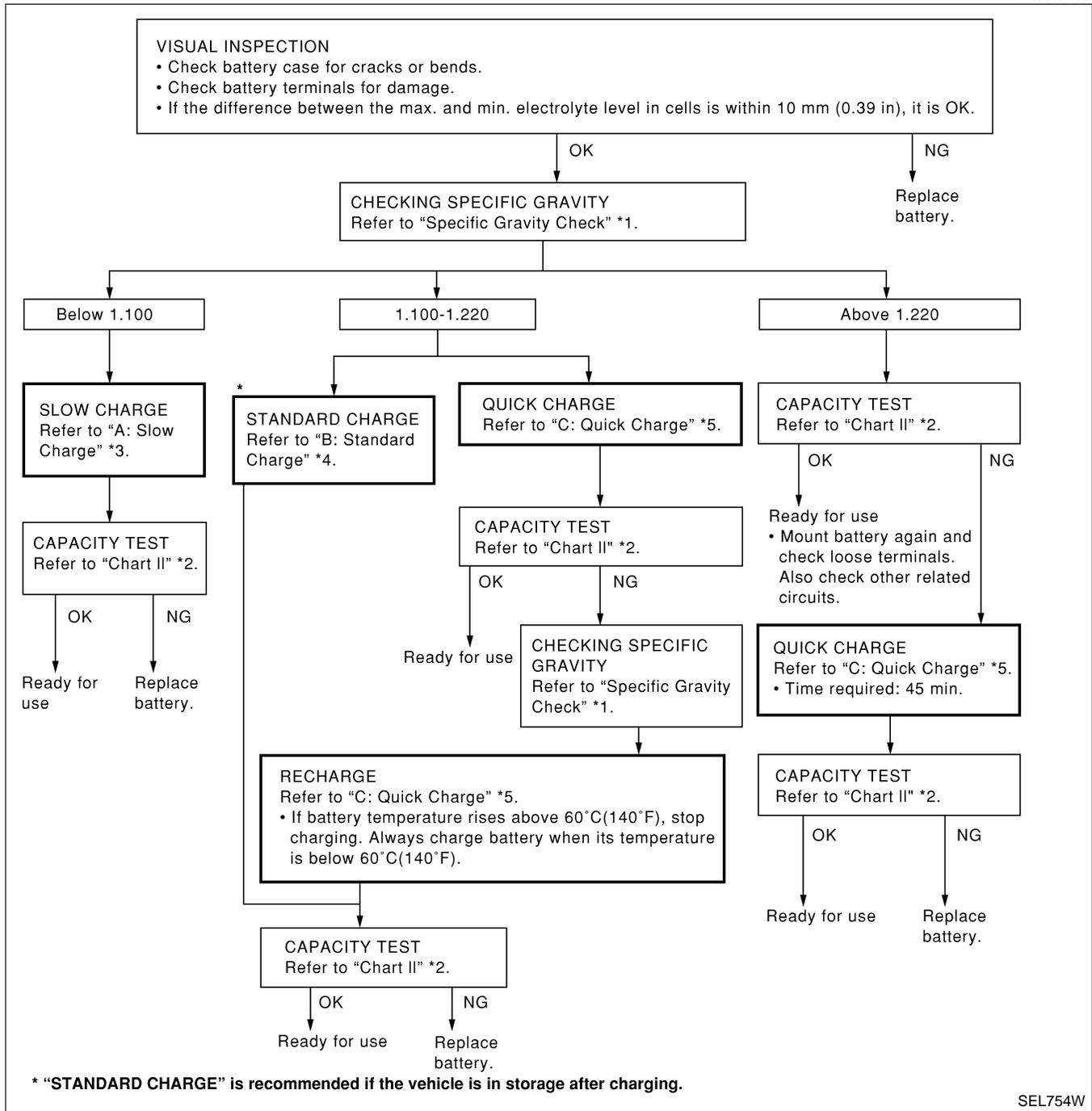
SEL007Z

GI  
MA  
EM  
LC  
EC  
FE  
CL  
MT  
AT  
PD  
AX  
SU  
BR  
ST  
RS  
BT  
HA  
SC  
EL  
IDX

# BATTERY

## Battery Test and Charging Chart

### CHART I



\*1: SC-4  
\*2: SC-7

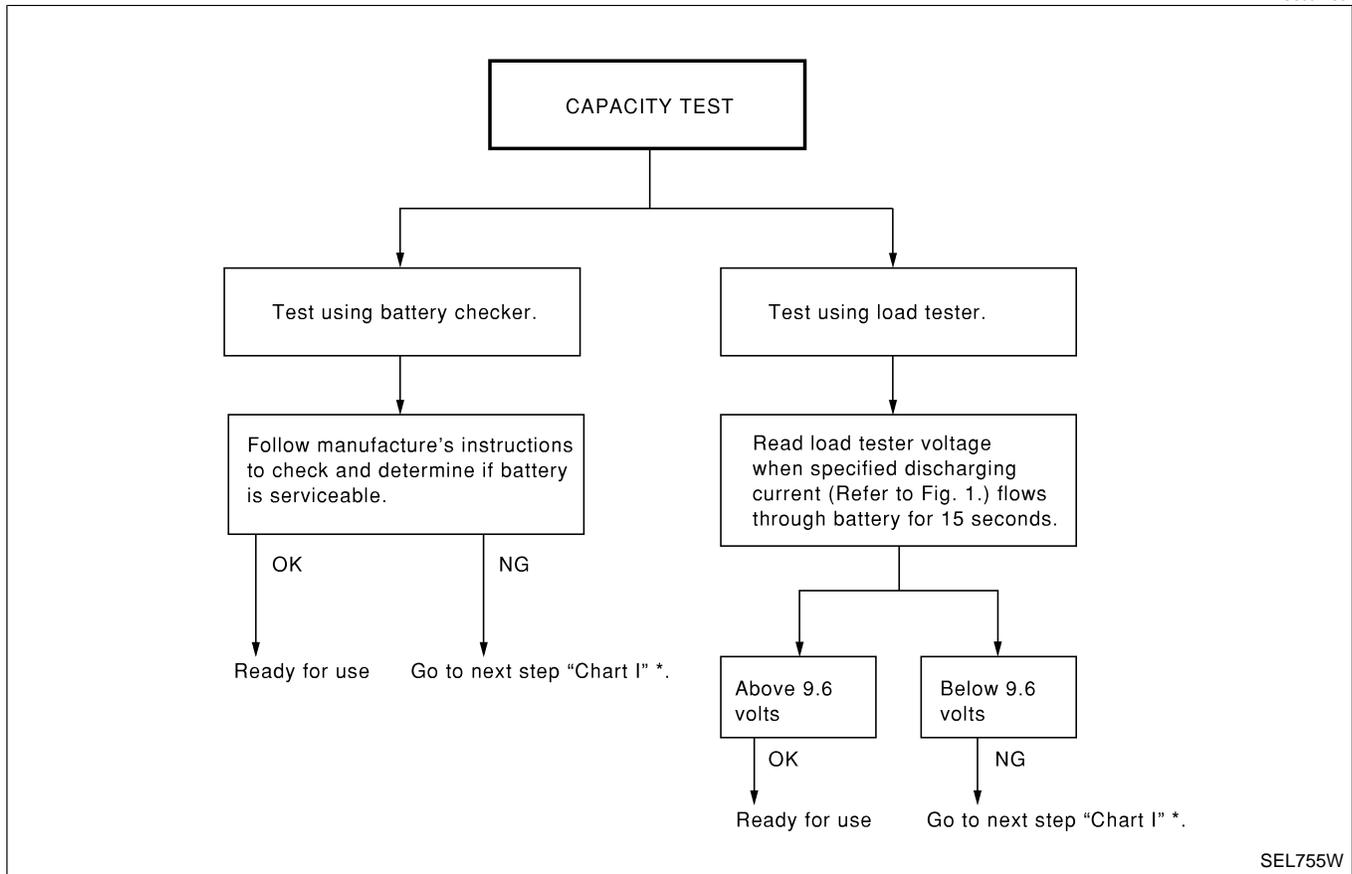
\*3: SC-8  
\*4: SC-9

\*5: SC-11

# BATTERY

## CHART II

NMSC0017S02



SEL755W

\*: SC-6

- Check battery type and determine the specified current using the following table.

**Fig. 1 Discharging Current (Load Tester)**

NMSC0017S0201

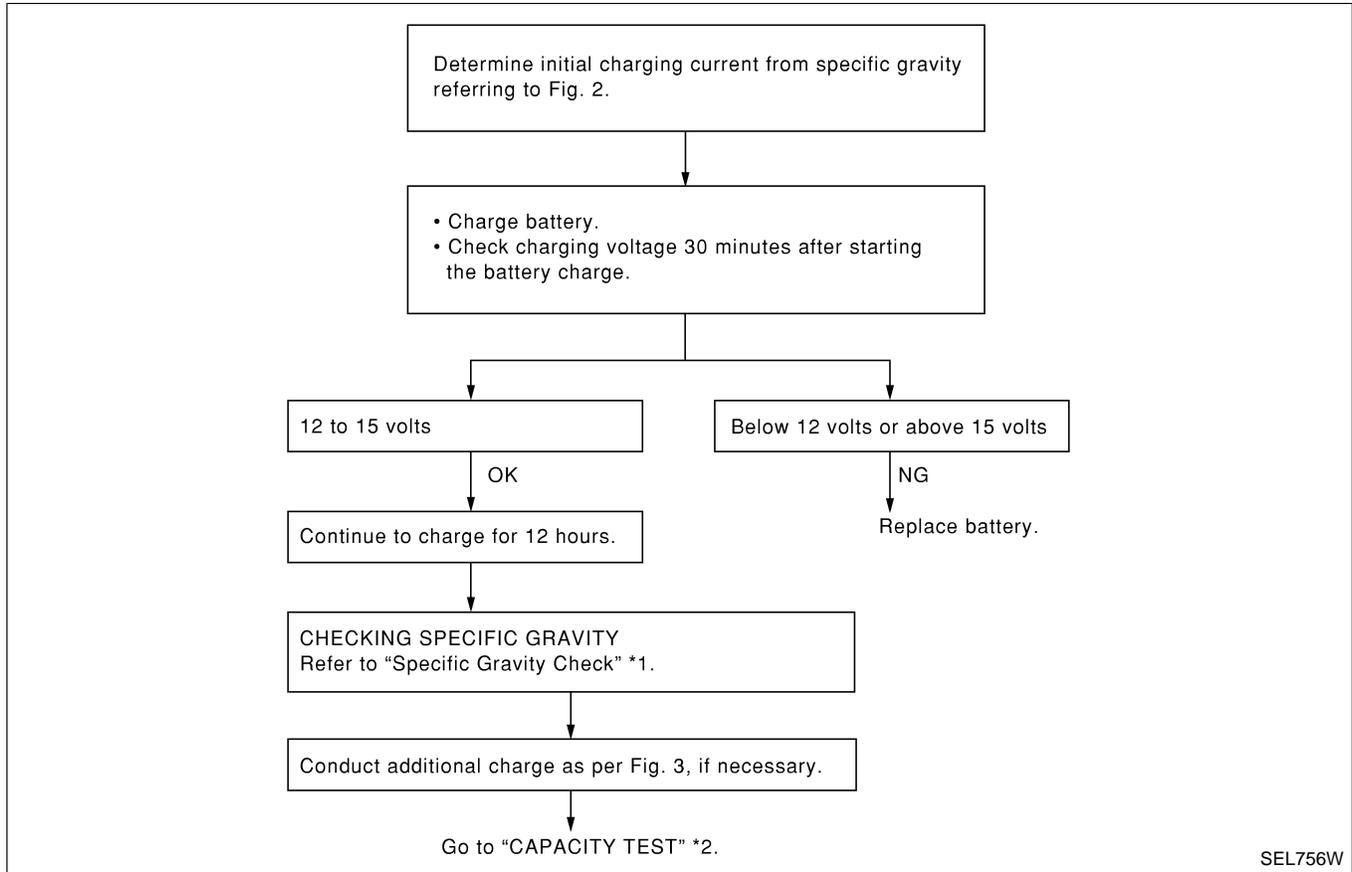
Type	Current (A)
28B19R(L)	90
34B19R(L)	99
46B24R(L)	135
55B24R(L)	135
50D23R(L)	150
55D23R(L)	180
65D26R(L)	195
80D26R(L)	195
75D31R(L)	210
95D31R(L)	240
115D31R(L)	240
95E41R(L)	300
130E41R(L)	330

# BATTERY

Battery Test and Charging Chart (Cont'd)

## A: SLOW CHARGE

NMSC0017S03



SEL756W

\*1: SC-4

\*2: SC-7

**Fig. 2 Initial Charging Current Setting (Slow Charge)**

NMSC0017S0301

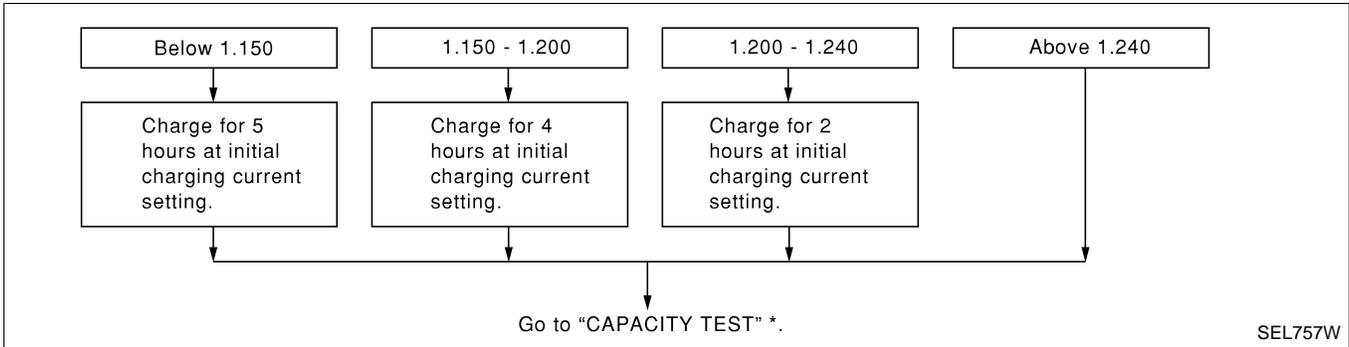
CON-VERTED SPECIFIC GRAVITY	BATTERY TYPE												
	28B19R(L)	34B19R(L)	46B24R(L)	55B24R(L)	50D23R(L)	55D23R(L)	65D26R(L)	80D26R(L)	75D31R(L)	95D31R(L)	115D31R(L)	95E41R(L)	130E41R(L)
Below 1.100	4.0 (A)		5.0 (A)		7.0 (A)		8.0 (A)		9.0 (A)	10.0 (A)			14.0 (A)

- Check battery type and determine the specified current using the table shown above.
- After starting charging, adjustment of charging current is not necessary.

# BATTERY

**Fig. 3 Additional Charge (Slow Charge)**

=NMSC0017S0302



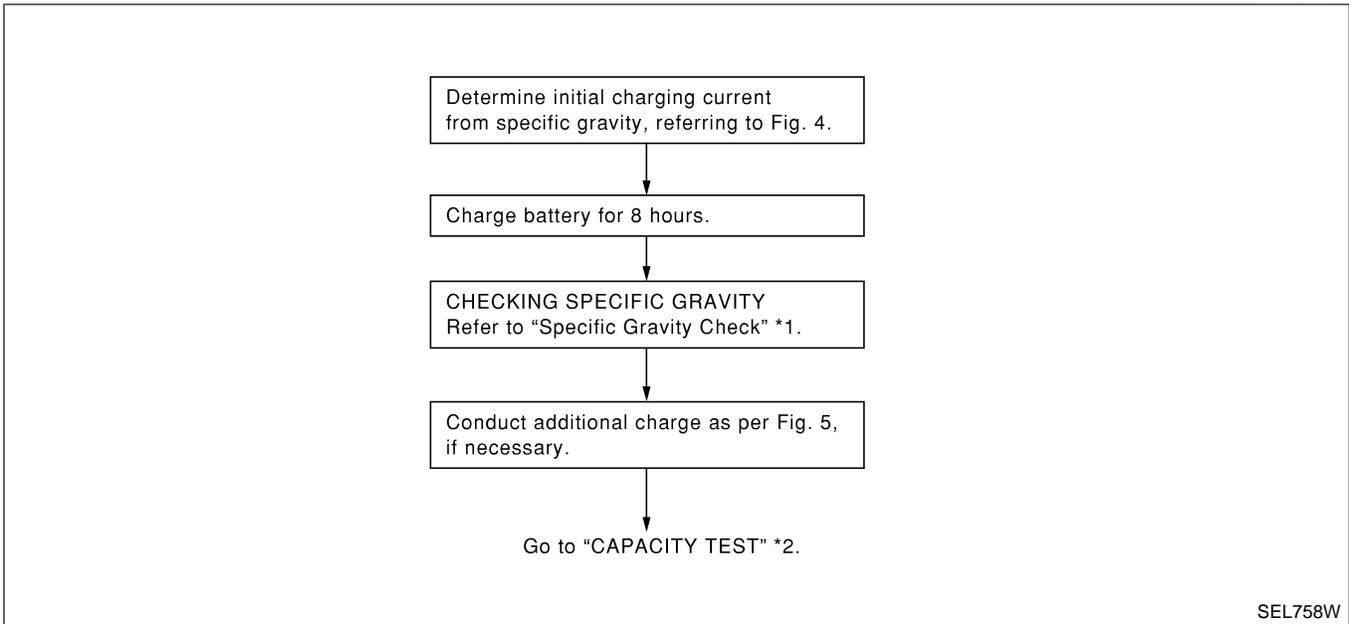
\*: SC-7

**CAUTION:**

- Set charging current to value specified in Fig. 2. If charger is not capable of producing specified current value, set its charging current as close to that value as possible.
- Keep battery away from open flame while it is being charged.
- When connecting charger, connect leads first, then turn on charger. Do not turn on charger first, as this may cause a spark.
- If battery temperature rises above 60°C (140°F), stop charging. Always charge battery when its temperature is below 60°C (140°F).

**B: STANDARD CHARGE**

NMSC0017S04



\*1: SC-4

\*2: SC-7

GI  
MA  
EM  
LC  
EC  
FE  
CL  
MT  
AT  
PD  
AX  
SU  
BR  
ST  
RS  
BT  
HA  
SC  
EL  
IDX

# BATTERY

Battery Test and Charging Chart (Cont'd)

**Fig. 4 Initial Charging Current Setting (Standard Charge)**

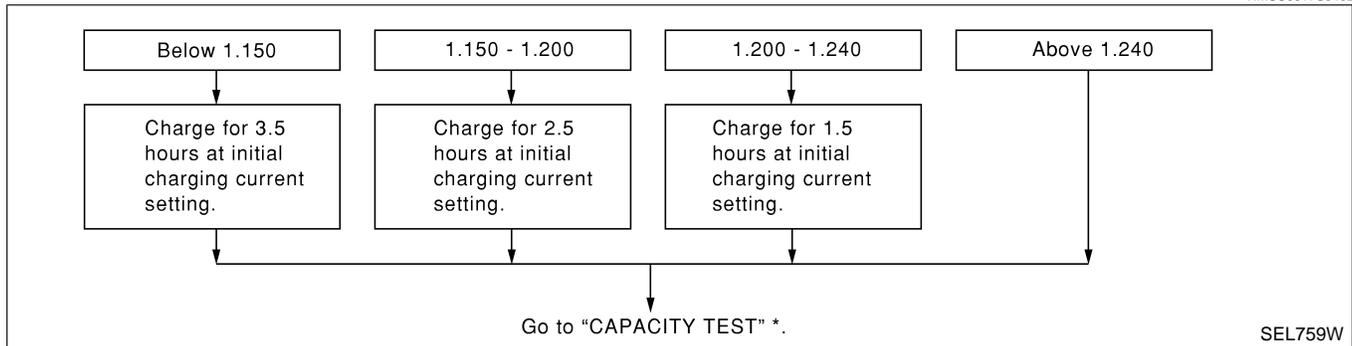
=NMSC0017S0401

CON-VERTED SPECIFIC GRAVITY	BATTERY TYPE												
	28B19R(L)	34B19R(L)	46B24R(L)	55B24R(L)	50D23R(L)	55D23R(L)	65D26R(L)	80D26R(L)	75D31R(L)	95D31R(L)	115D31R(L)	95E41R(L)	130E41R(L)
1.100 - 1.130	4.0 (A)		5.0 (A)		6.0 (A)		7.0 (A)		8.0 (A)	9.0 (A)			13.0 (A)
1.130 - 1.160	3.0 (A)		4.0 (A)		5.0 (A)		6.0 (A)		7.0 (A)	8.0 (A)			11.0 (A)
1.160 - 1.190	2.0 (A)		3.0 (A)		4.0 (A)		5.0 (A)		6.0 (A)	7.0 (A)			9.0 (A)
1.190 - 1.220	2.0 (A)		2.0 (A)		3.0 (A)		4.0 (A)		5.0 (A)	5.0 (A)			7.0 (A)

- Check battery type and determine the specified current using the table shown above.
- After starting charging, adjustment of charging current is not necessary.

**Fig. 5 Additional Charge (Standard Charge)**

NMSC0017S0402



SEL759W

\*: SC-7

**CAUTION:**

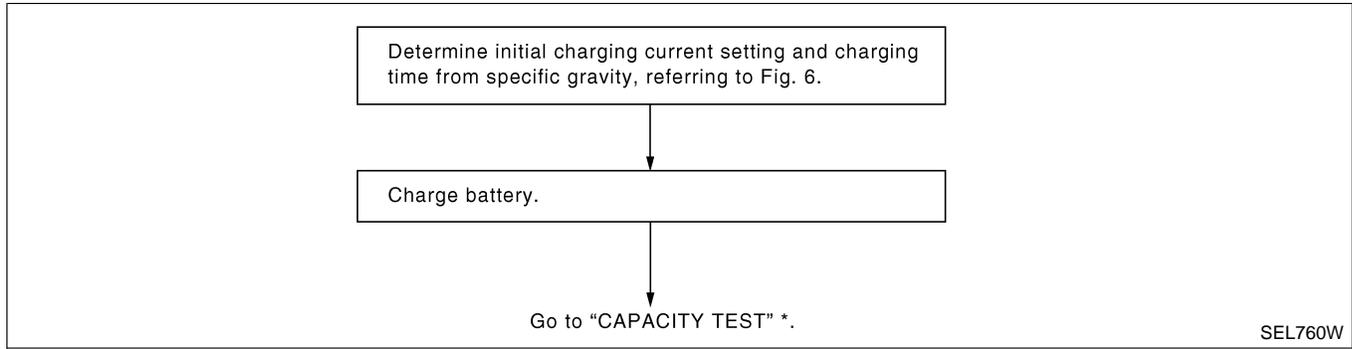
- Do not use standard charge method on a battery whose specific gravity is less than 1.100.
- Set charging current to value specified in Fig. 4. If charger is not capable of producing specified current value, set its charging current as close to that value as possible.
- Keep battery away from open flame while it is being charged.
- When connecting charger, connect leads first, then turn on charger. Do not turn on charger first, as this may cause a spark.
- If battery temperature rises above 60°C (140°F), stop charging. Always charge battery when its temperature is below 60°C (140°F).

# BATTERY

Battery Test and Charging Chart (Cont'd)

## C: QUICK CHARGE

=NMSC0017S05



\*: SC-7

**Fig. 6 Initial Charging Current Setting and Charging Time (Quick Charge)**

NMSC0017S0501

BATTERY TYPE	28B19R(L)	34B19R(L)	46B24R(L)	55B24R(L)	50D23R(L)	55D23R(L)	65D26R(L)	80D26R(L)	75D31R(L)	95D31R(L)	115D31R(L)	95E41R(L)	130E41R(L)
	10 (A)		15 (A)			20 (A)			30 (A)			40 (A)	
CONVERTED SPECIFIC GRAVITY	1.100 - 1.130	2.5 hours											
	1.130 - 1.160	2.0 hours											
	1.160 - 1.190	1.5 hours											
	1.190 - 1.220	1.0 hours											
	Above 1.220	0.75 hours (45 min.)											

- Check battery type and determine the specified current using the table shown above.
- After starting charging, adjustment of charging current is not necessary.

**CAUTION:**

- Do not use quick charge method on a battery whose specific gravity is less than 1.100.
- Set initial charging current to value specified in Fig. 6. If charger is not capable of producing specified current value, set its charging current as close to that value as possible.
- Keep battery away from open flame while it is being charged.
- When connecting charger, connect leads first, then turn on charger. Do not turn on charger first, as this may cause a spark.
- Be careful of a rise in battery temperature because a large current flow is required during quick-charge operation.  
If battery temperature rises above 60°C (140°F), stop charging. Always charge battery when its temperature is below 60°C (140°F).
- Do not exceed the charging time specified in Fig. 6, because charging battery over the charging time can cause deterioration of the battery.

# STARTING SYSTEM

System Description

## System Description

NMSC0004

NMSC0004S01

### M/T MODELS

Power is supplied at all times

- to ignition switch terminal 1
- through 30A fusible link (letter **J**, located in the fuse and fusible link box) and

With the ignition switch in the START position, power is supplied

- from ignition switch terminal 4
- to starter motor harness connector terminal 1.

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

### A/T MODELS

NMSC0004S02

Power is supplied at all times

- to ignition switch terminal 1
- through 30A fusible link (letter **J**, located in the fuse and fusible link box).

With the ignition switch in the ON or START position, power is supplied through 10A fuse [No. 12, located in the fuse block (J/B)]

- to starter relay terminal 2.

Also, with the ignition switch in the START position, power is supplied

- from ignition switch terminal 4
- to starter relay terminal 3.

With the selector lever in the P or N position, ground is supplied

- to starter relay terminal 1 through the park/neutral position switch terminals 2 and 1
- from body grounds, E43 and E57.

Then starter relay is energized and power is supplied

- from starter relay terminal 5
- to starter motor harness connector terminal 1.

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

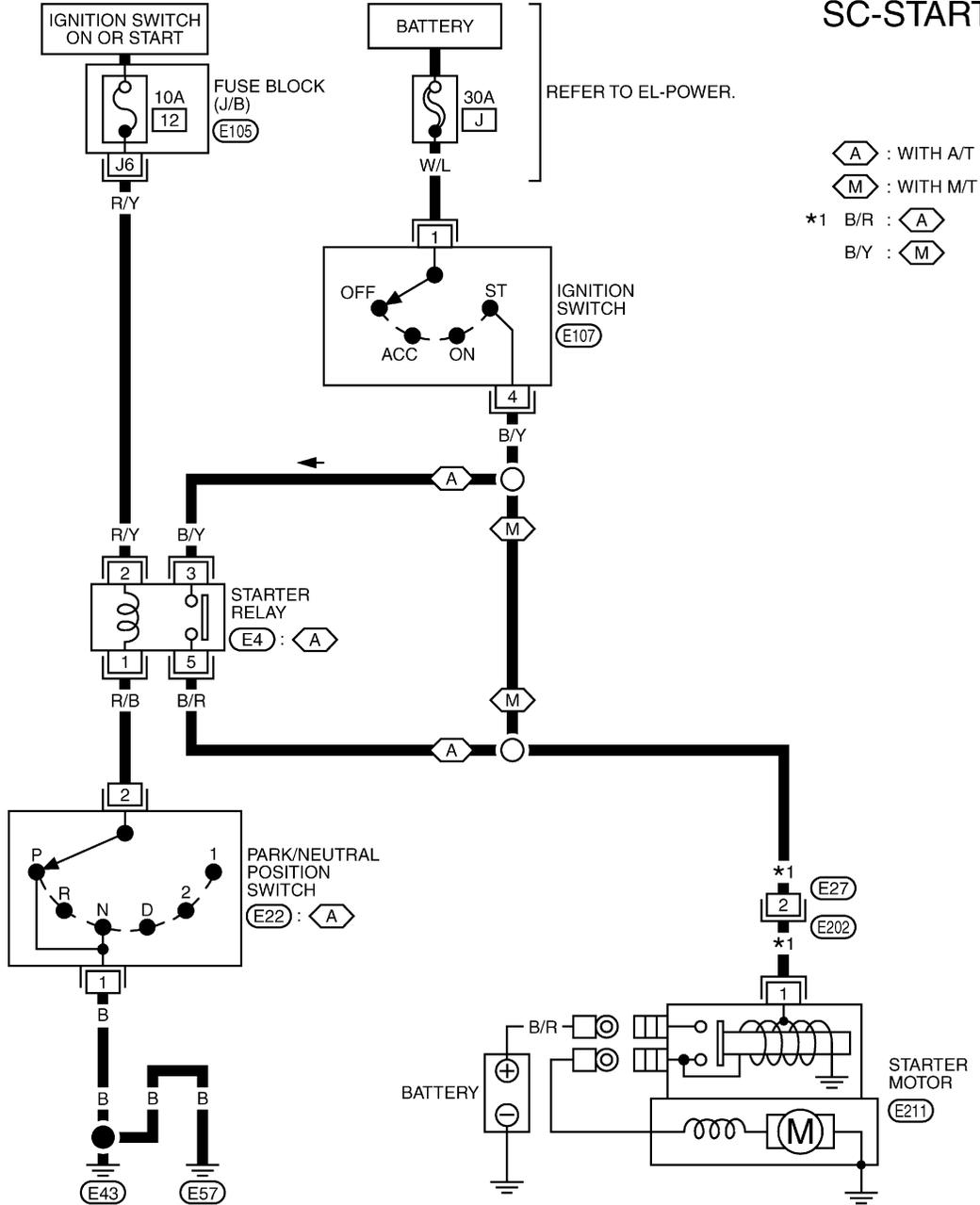
# STARTING SYSTEM

Wiring Diagram — START —

## Wiring Diagram — START —

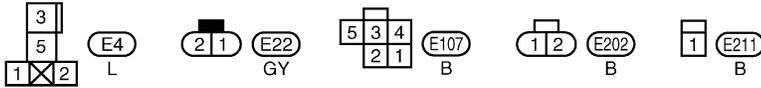
NMSC0005

### SC-START-01



- A : WITH A/T
- M : WITH M/T
- \*1 B/R : A
- B/Y : M

GI  
MA  
EM  
LC  
EC  
FE  
CL  
MT  
AT  
PD  
AX  
SU  
BR  
ST  
RS



REFER TO THE FOLLOWING.  
E105 - FUSE BLOCK-JUNCTION BOX (J/B)

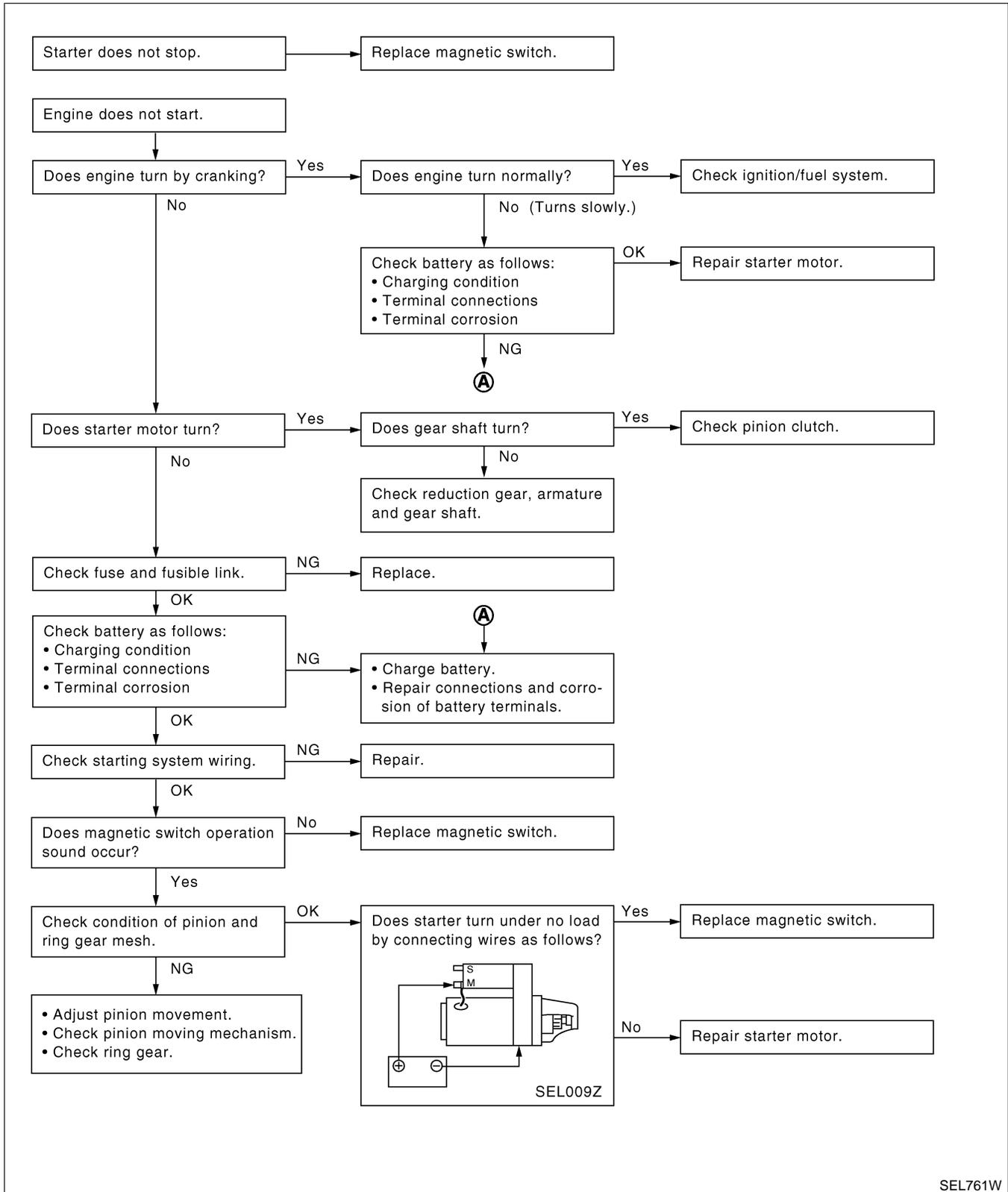
BT  
HA  
SC  
EL  
IDX

TSC007

# STARTING SYSTEM

## Trouble Diagnoses

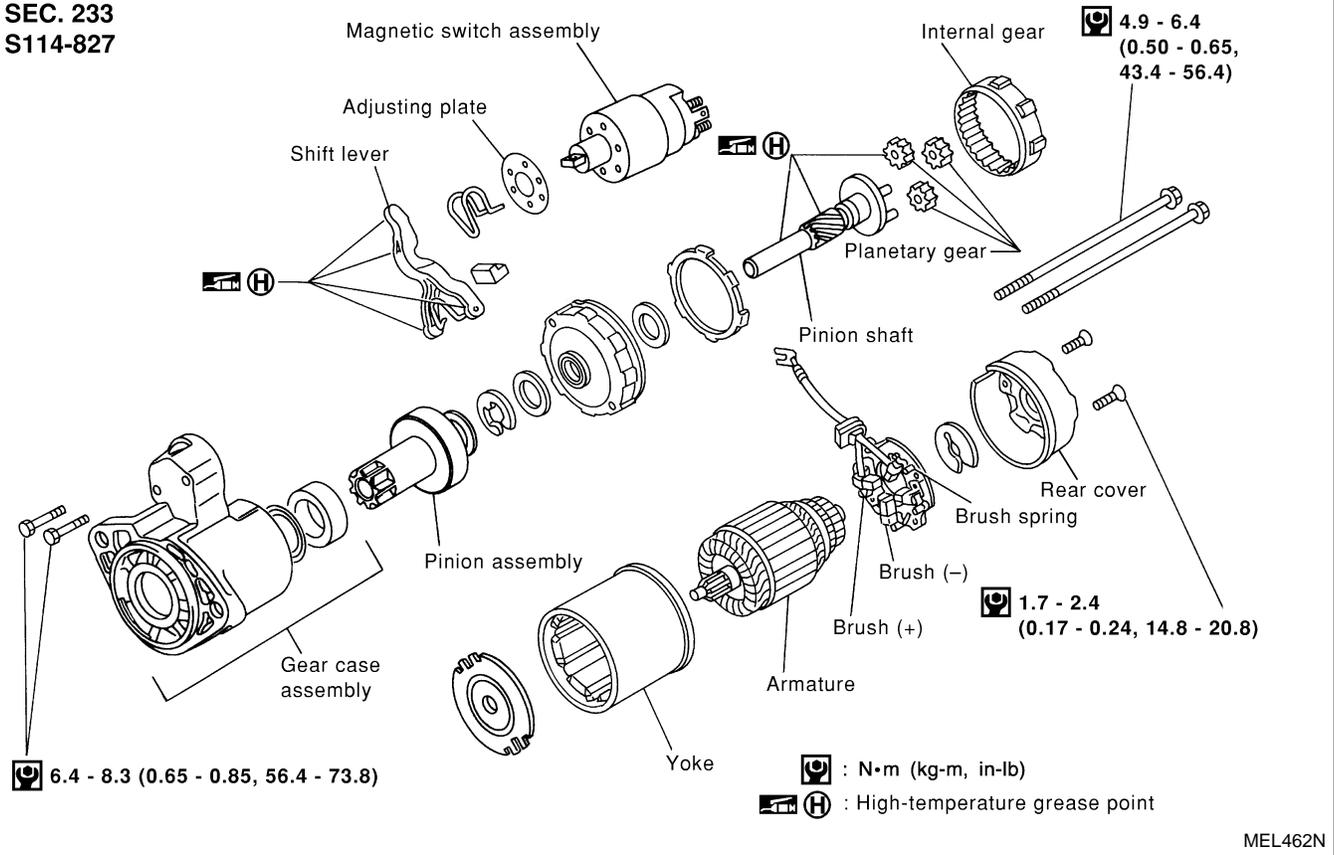
If any abnormality is found, immediately disconnect battery negative terminal.



## Construction

NMSC0006

SEC. 233  
S114-827



MEL462N

GI

MA

EM

LC

EC

FE

CL

MT

AT

PD

AX

SU

BR

ST

RS

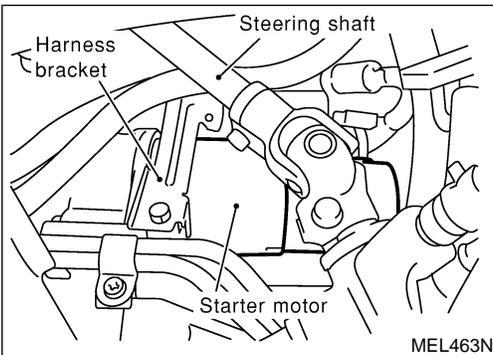
BT

HA

SC

EL

IDX



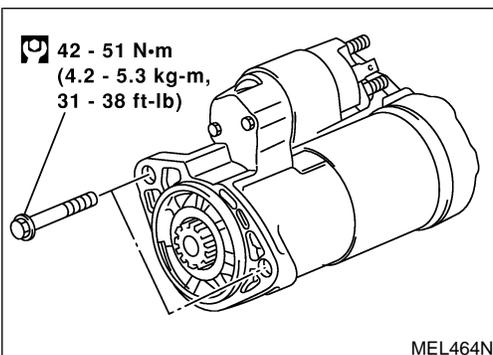
## Removal and Installation

### REMOVAL

1. Remove harness bracket from transmission harness.
2. Disconnect starter harness.
3. Remove starter bolts (two).
4. Remove starter.

NMSC0007

NMSC0007S01



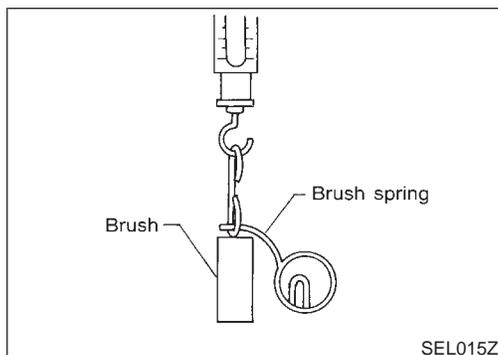
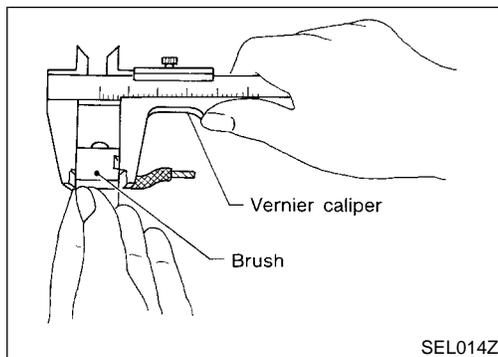
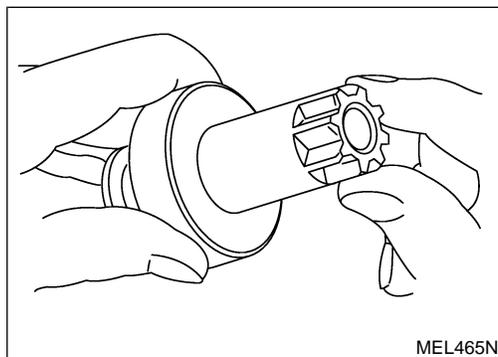
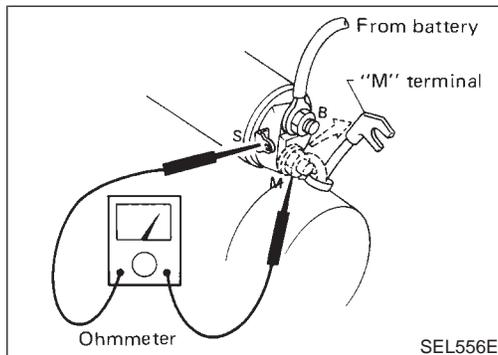
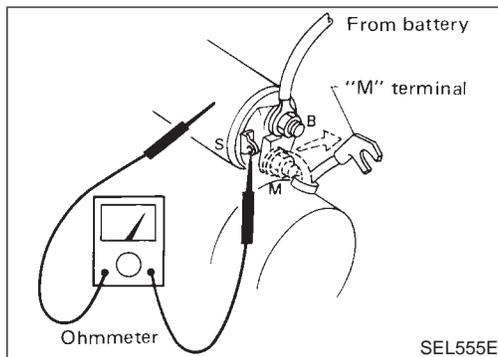
### INSTALLATION

To install, reverse the removal procedure.

NMSC0007S02

# STARTING SYSTEM

## Inspection



## Inspection

### MAGNETIC SWITCH CHECK

NMSC0019

NMSC0019S01

- Before starting to check, disconnect battery ground cable.
  - Disconnect "M" terminal of starter motor.
1. Continuity test (between "S" terminal and switch body).
  - No continuity ... Replace.
2. Continuity test (between "S" terminal and "M" terminal).
  - No continuity ... Replace.

### PINION/CLUTCH CHECK

NMSC0019S02

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

### BRUSH CHECK

NMSC0019S03

#### Brush

NMSC0019S0301

Check wear of brush.

**Wear limit length:**

**Refer to SDS (SC-25).**

- Excessive wear ... Replace.

### Brush Spring Check

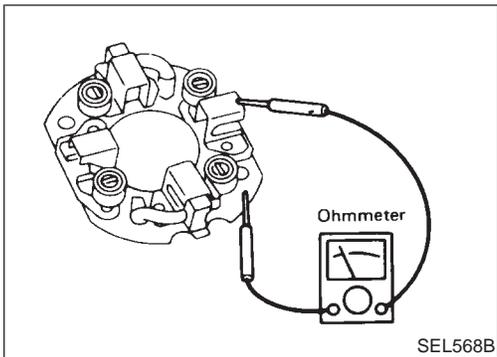
NMSC0019S0302

Check brush spring pressure with brush spring detached from brush.

**Spring pressure (with new brush):**

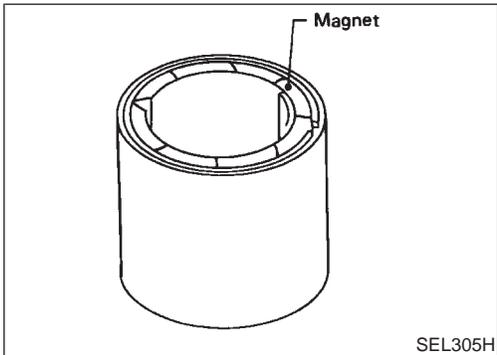
**Refer to SDS (SC-25).**

- Not within the specified values ... Replace.



## Brush Holder

1. Perform insulation test between brush holder (positive side) and its base (negative side).
  - Continuity exists. ... Replace.
2. Check brush to see if it moves smoothly.
  - If brush holder is bent, replace it; if sliding surface is dirty, clean.

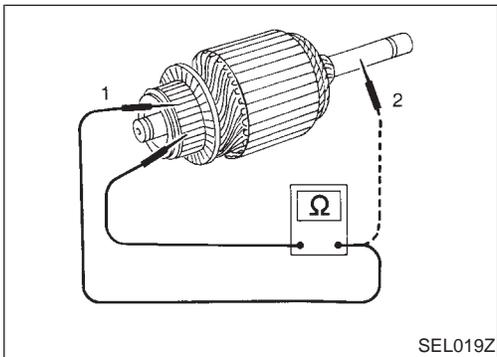


## YOKE CHECK

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

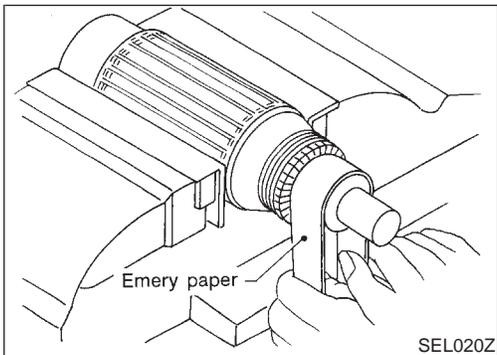
### CAUTION:

**Do not clamp yoke in a vice or strike it with a hammer.**

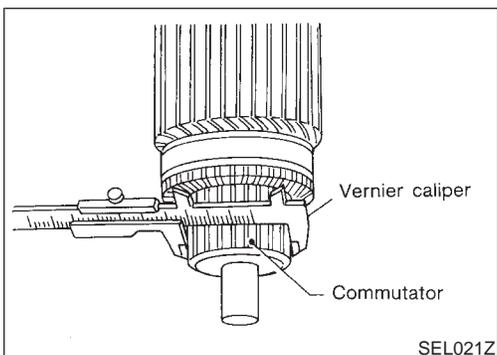


## ARMATURE CHECK

1. Continuity test (between two segments side by side).
  - No continuity ... Replace.
2. Insulation test (between each commutator bar and shaft).
  - Continuity exists. ... Replace.



3. Check commutator surface.
  - Rough ... Sand lightly with No. 500 - 600 emery paper.



4. Check diameter of commutator.
  - **Commutator minimum diameter:**  
**Refer to SDS (SC-25).**
  - Less than specified value ... Replace.

GI

MA

EM

LC

EC

FE

CL

MT

AT

PD

AX

SU

BR

ST

RS

BT

HA

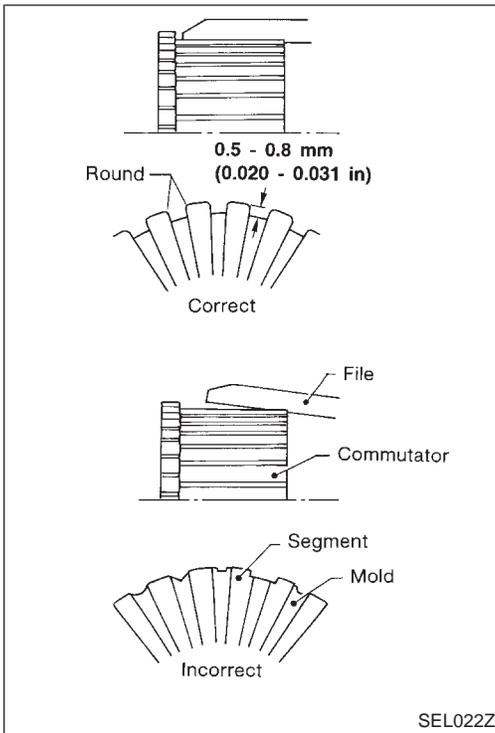
SC

EL

IDX

# STARTING SYSTEM

Inspection (Cont'd)

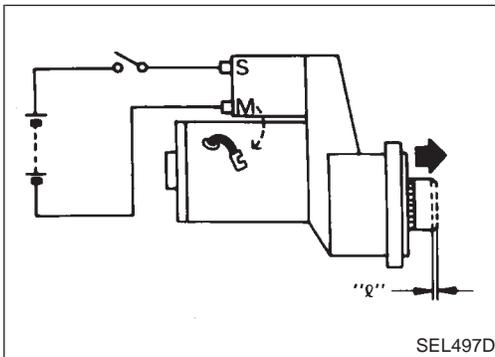


5. Check depth of insulating mold from commutator surface.
  - Less than 0.2 mm (0.008 in) ... Undercut to 0.5 to 0.8 mm (0.020 to 0.031 in)

## Assembly

Apply high-temperature grease to lubricate the bearing, gears and frictional surface when assembling the starter. Carefully observe the following instructions.

NMSC0020



## PINION PROTRUSION LENGTH ADJUSTMENT

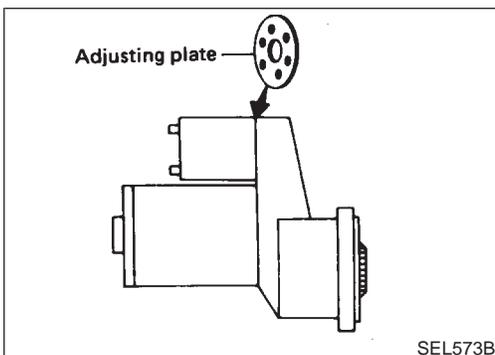
NMSC0020S01

### Reduction Gear Type

NMSC0020S0101

Compare movement "l" in height of pinion when it is pushed out with magnetic switch energized and when it is pulled out by hand until it touches stopper.

**Movement "l":**  
**Refer to SDS.**



- Not in the specified value ... Adjust by adjusting plate.

## System Description

NMSC0009

The alternator provides DC voltage to operate the vehicle's electrical system and to keep the battery charged. The voltage output is controlled by the IC regulator.

Power is supplied at all times to alternator terminal 4 (S) through:

- 100A fusible link (letter **A**, located in the fuse and fusible link box), and
- 10A fuse (No. 40, located in the fuse and fusible link box).

Terminal B supplies power to charge the battery and operate the vehicle's electrical system. Output voltage is controlled by the IC regulator at terminal 4 (S) detecting the input voltage. The charging circuit is protected by the 100A fusible link.

The alternator is grounded to the engine block.

With the ignition switch in the ON or START position, power is supplied

- through 10A fuse [No. 11, located in the fuse block (J/B)]
- to combination meter terminal 12 for the charge warning lamp.

Ground is supplied to terminal 61 of the combination meter through terminal 3 (L) of the alternator. With power and ground supplied, the charge warning lamp will illuminate. When the alternator is providing sufficient voltage with the engine running, the ground is opened and the charge warning lamp will go off.

If the charge warning lamp illuminates with the engine running, a fault is indicated.

GI

MA

EM

LC

EC

FE

CL

MT

AT

PD

AX

SU

BR

ST

RS

BT

HA

**SC**

EL

IDX

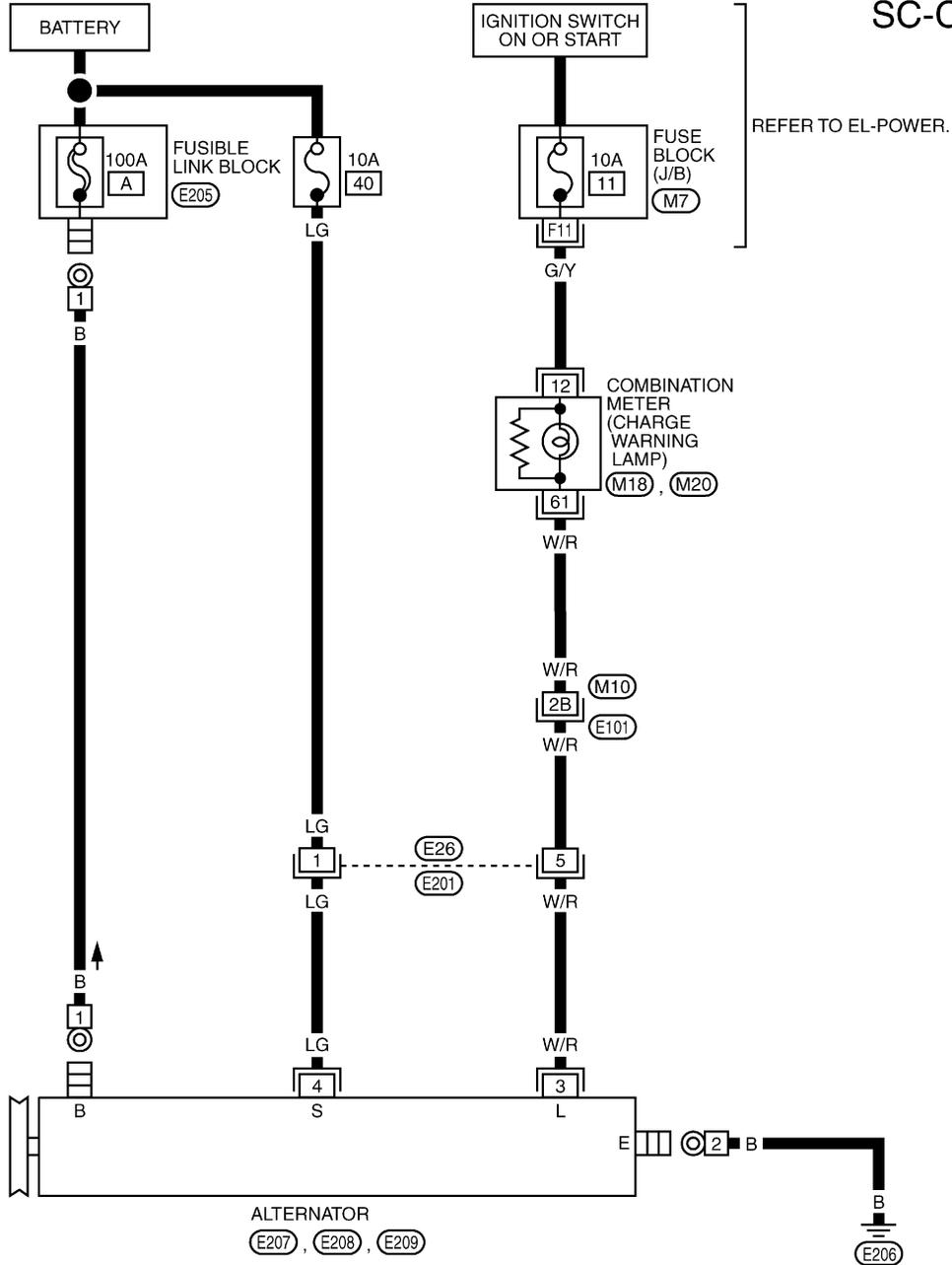
# CHARGING SYSTEM

Wiring Diagram — CHARGE —

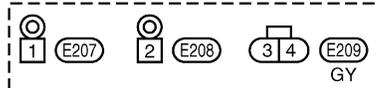
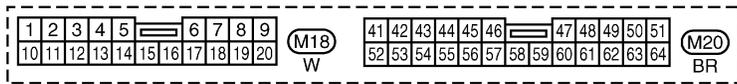
## Wiring Diagram — CHARGE —

NMSC0010

### SC-CHARGE-01



REFER TO EL-POWER.



REFER TO THE FOLLOWING.

- (E101) - SUPER MULTIPLE JUNCTION (SMJ)
- (M7) - FUSE BLOCK-JUNCTION BOX (J/B)

TSC008

## Trouble Diagnoses

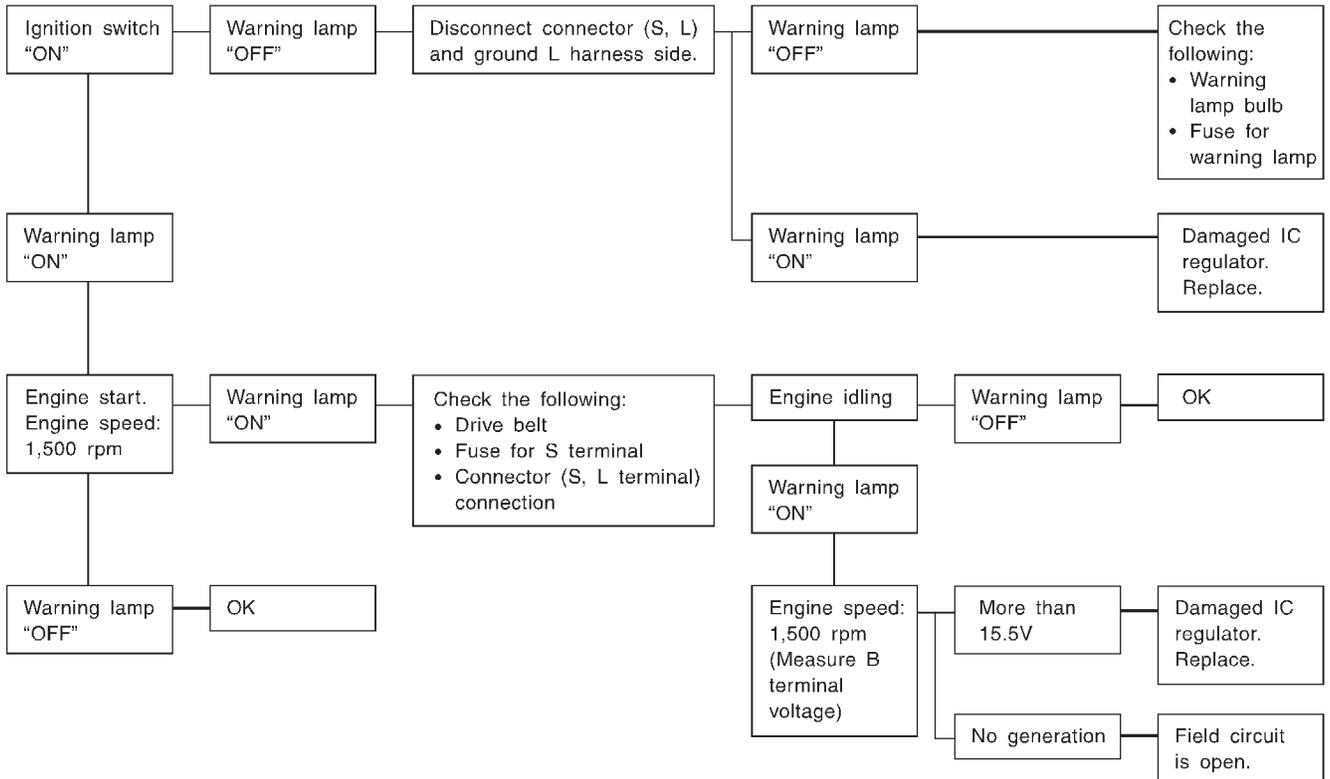
NMSC0011

Before conducting an alternator test, make sure that the battery is fully charged. A 30-volt voltmeter and suitable test probes are necessary for the test. The alternator can be checked easily by referring to the Inspection Table.

- Before starting, inspect the fusible link.
- Use fully charged battery.

### WITH IC REGULATOR

NMSC0011S01



Warning lamp: "CHARGE" warning lamp in combination meter

SEL338V

### NOTE:

- If the inspection result is OK even though the charging system is malfunctioning, check the B terminal connection. (Check the tightening torque.)
- When field circuit is open, check condition of rotor coil, rotor slip ring and brush. If necessary, replace faulty parts with new ones.

### MALFUNCTION INDICATOR

NMSC0011S02

The IC regulator warning function activates to illuminate "CHARGE" warning lamp, if any of the following symptoms occur while alternator is operating:

- Excessive voltage is produced.
- No voltage is produced.

GI

MA

EM

LC

EC

FE

CL

MT

AT

PD

AX

SU

BR

ST

RS

BT

HA

SC

EL

IDX

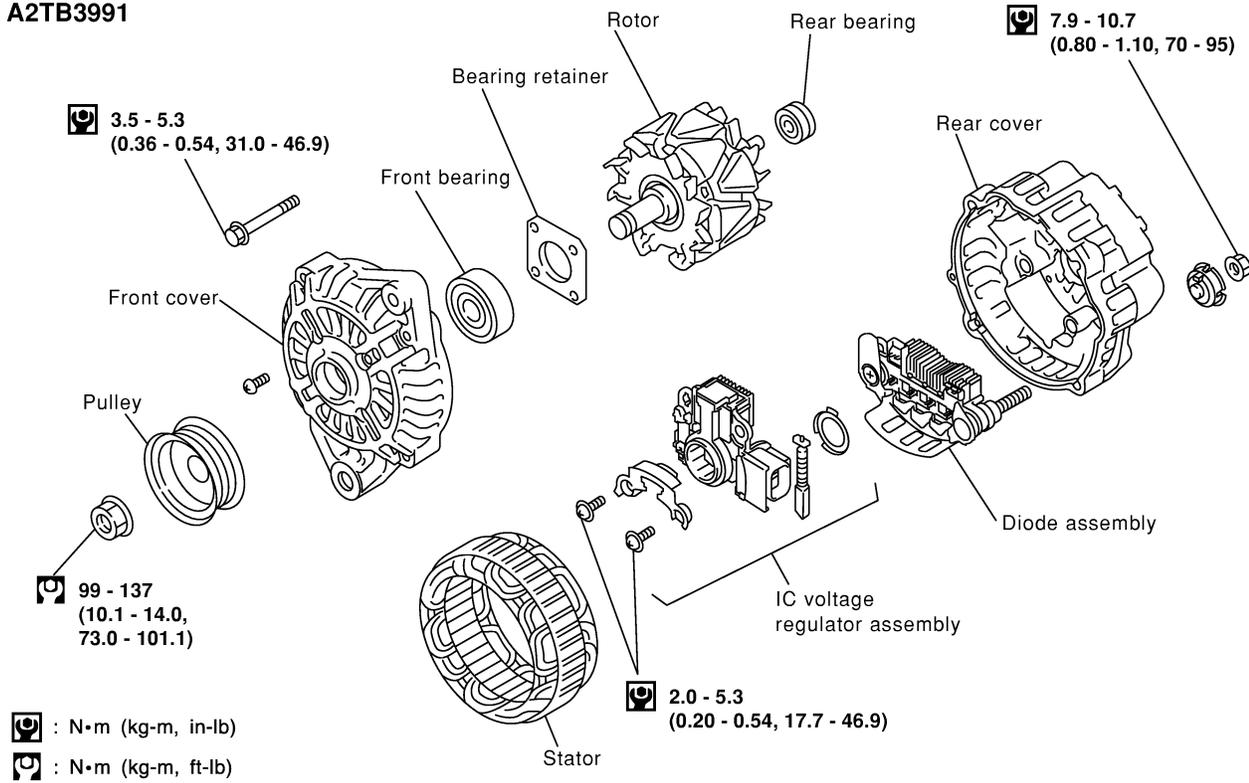
# CHARGING SYSTEM

Construction

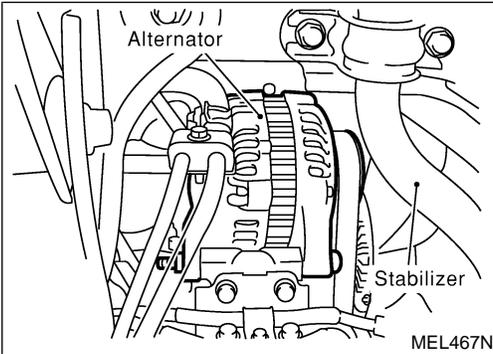
## Construction

NMSC0012

SEC. 231  
A2TB3991



MEL466N



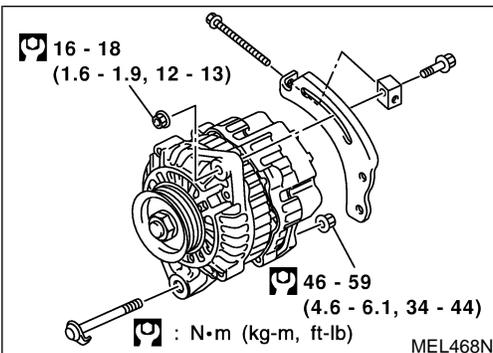
## Removal and Installation

### REMOVAL

1. Remove alternator harness.
2. Loosen alternator upper nut and lower nut.
3. Loosen drive belt.
4. Remove alternator upper nut and lower bolt.
5. Remove alternator.

NMSC0013

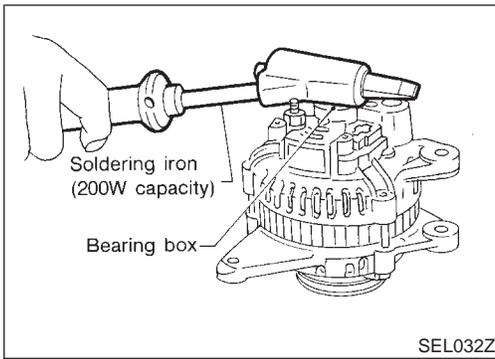
NMSC0013S01



### INSTALLATION

To install, reverse the removal procedure.

NMSC0013S02



## Disassembly

### REAR COVER

NMSC0021

NMSC0021S01

#### CAUTION:

Rear cover may be hard to remove because a ring is used to lock outer race of rear bearing. To facilitate removal of rear cover, heat just bearing box section with a 200W soldering iron.

Do not use a heat gun, as it can damage diode assembly.

GI

MA

EM

LC

### REAR BEARING

NMSC0021S02

#### CAUTION:

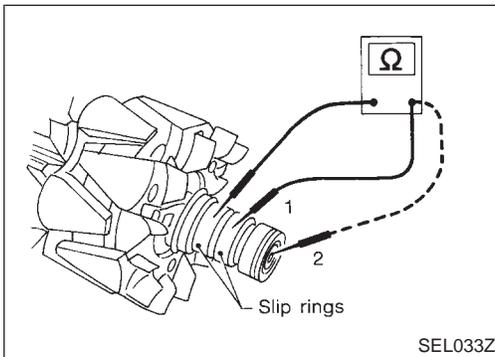
- Do not reuse rear bearing after removal. Replace with a new one.
- Do not lubricate rear bearing outer race.

EC

FE

CL

MT



## Inspection

### ROTOR CHECK

NMSC0022

NMSC0022S01

- Resistance test

**Resistance: Refer to SDS (SC-25).**

- Not within the specified values ... Replace rotor.
- Insulator test
  - Continuity exists ... Replace rotor.
  - Check slip ring for wear.

**Slip ring minimum outer diameter:  
Refer to SDS (SC-25).**

- Not within the specified values ... Replace rotor.

AT

PD

AX

SU

BR

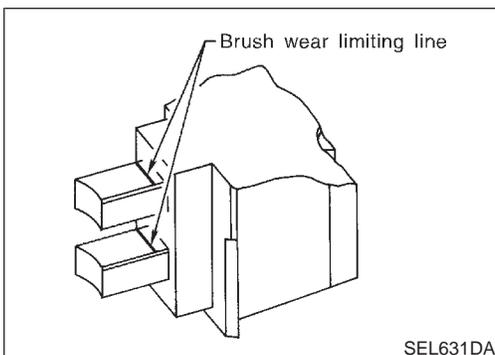
ST

RS

BT

HA

NMSC0022S02



### BRUSH CHECK

- Check smooth movement of brush.
  - Not smooth ... Check brush holder and clean.
- Check brush for wear.
  - Replace brush if it is worn down to the limit line.

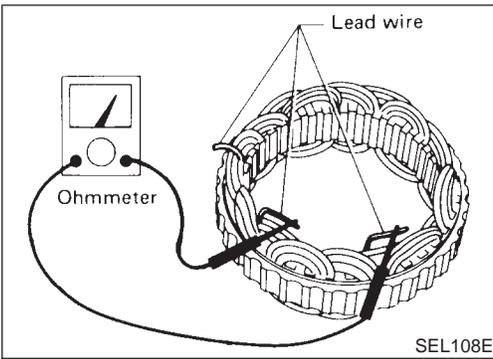
SC

EL

IDX

# CHARGING SYSTEM

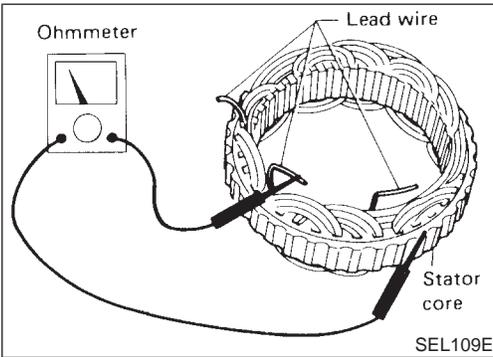
Inspection (Cont'd)



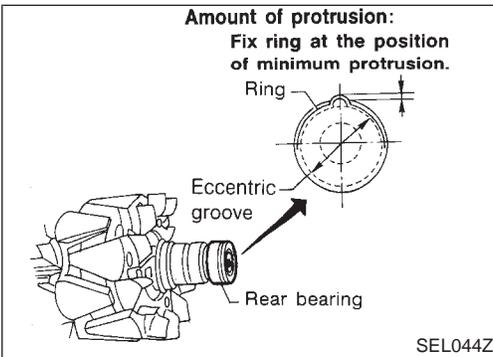
## STATOR CHECK

NMSC0022S03

1. Continuity test
  - No continuity ... Replace stator.



2. Ground test
  - Continuity exists ... Replace stator.



## Assembly

NMSC0023

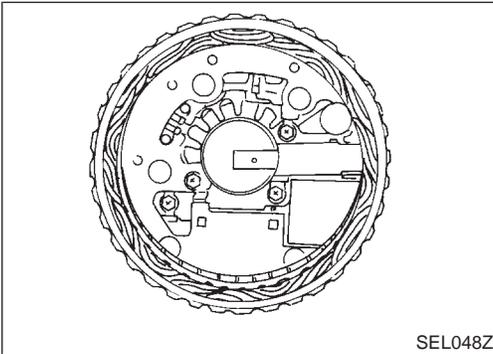
### RING FITTING IN REAR BEARING

NMSC0023S01

- Fix ring into groove in rear bearing so that it is as close to the adjacent area as possible.

#### **CAUTION:**

**Do not reuse rear bearing after removal.**



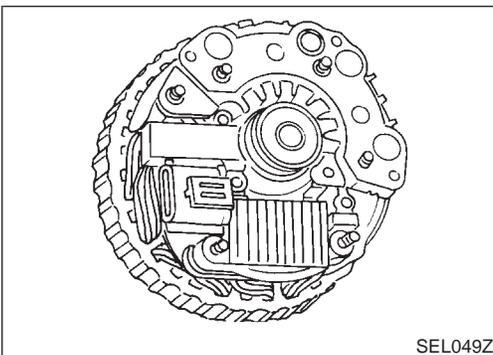
### REAR COVER INSTALLATION

NMSC0023S02

1. Fit brush assembly, diode assembly, regulator assembly and stator.

2. Push brushes up with fingers and install them to rotor.

**Take care not to damage slip ring sliding surface.**



# SERVICE DATA AND SPECIFICATIONS (SDS)

Battery

## Battery

NMSC0014

Applied model	For Australia	GI
	Standard	
Type	46B24R	MA
Capacity V-AH	12-48	

## Starter

NMSC0015

Type	S114-827	LC	
	HITACHI make		
	Reduction gear type		
System voltage	12V	EC	
No-load	Terminal voltage	11.0V	FE
	Current	Less than 90A	
	Revolution	More than 2,700 rpm	CL
Minimum diameter of commutator	28.0 mm (1.102 in)		
Minimum length of brush	10.5 mm (0.413 in)	MT	
Brush spring tension	16.2 N (1.65 kg, 3.64 lb)		
Clearance between bearing metal and armature shaft	0.2 mm (0.008 in)	AT	
Movement "ℓ" in height of pinion assembly	0.3 - 2.5 mm (0.012 - 0.098 in)		

## Alternator

NMSC0016

Type	A2TB3991	AX
	MITSUBISHI make	
Nominal rating	12V-80A	SU
Ground polarity	Negative	
Minimum revolution under no-load (When 13.5V is applied)	Less than 950 rpm	BR
Hot output current (When 13.5V is applied)	More than 23A/1,300 rpm More than 64A/2,500 rpm More than 82A/5,000 rpm	ST
Regulated output voltage	14.1 - 14.7V	
Minimum length of brush	More than 5.0 mm (0.197 in)	RS
Brush spring pressure	4.8 - 6.0 N (490 - 610 g, 17.28 - 21.51 oz)	
Slip ring minimum outer diameter	More than 22.1 mm (0.870 in)	BT
Rotor (Field coil) resistance	2.2 - 2.6Ω	

SC

EL

IDX

## NOTES