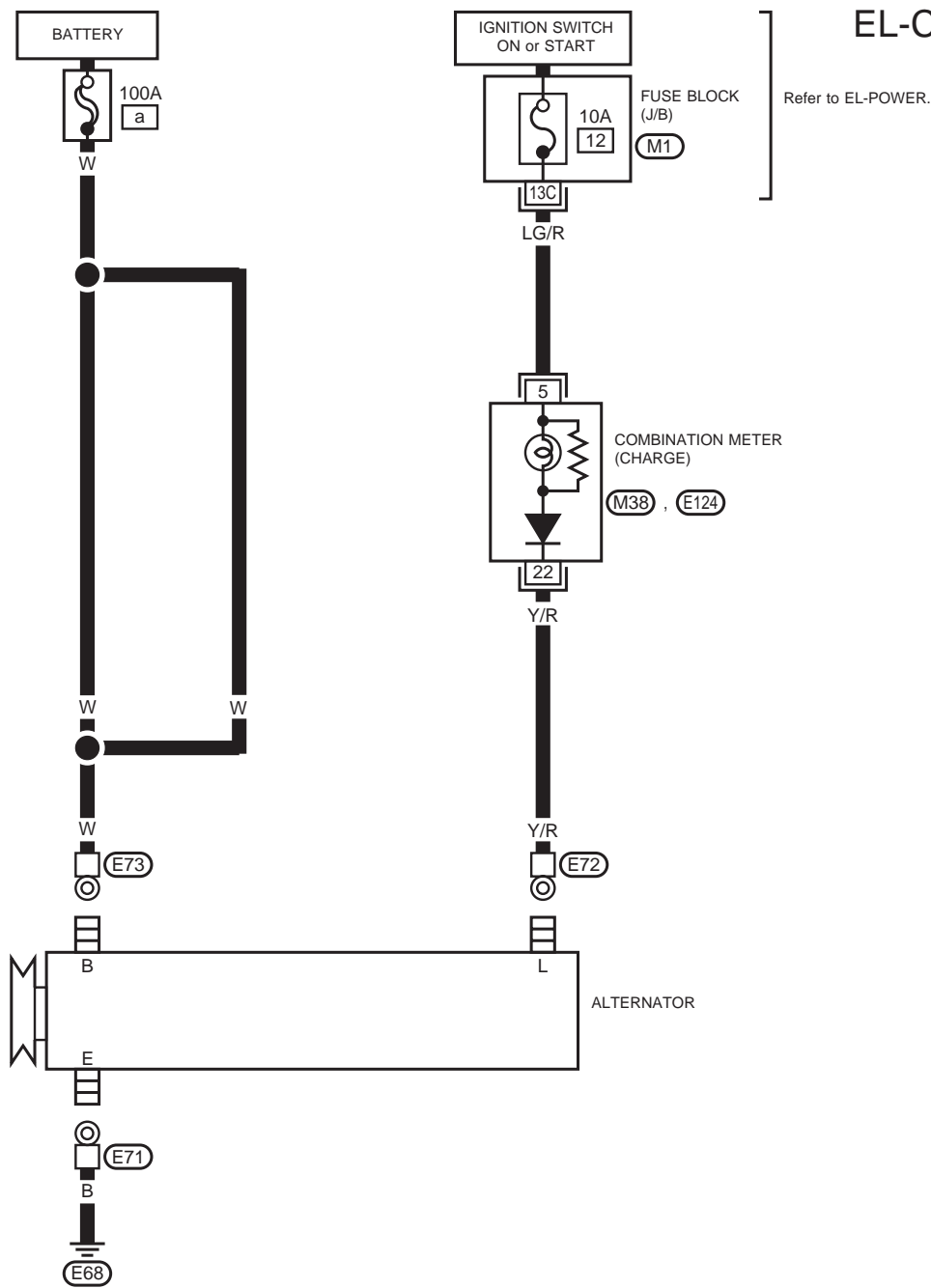


CHARGING SYSTEM

Wiring Diagram — CHARGE —

GA ENGINE MODELS

EL-CHARGE-01



13	14	15	16	17	18	19	20	M38	33	34	35	36	37	38	39	40	E124
1	2	3	4	5	6	7	8	GY	21	22	23	24	25	26	27	28	W

REFER TO THE FOLLOWING

M1 FUSE BLOCK - Junction Box (J/B)

YEL254B

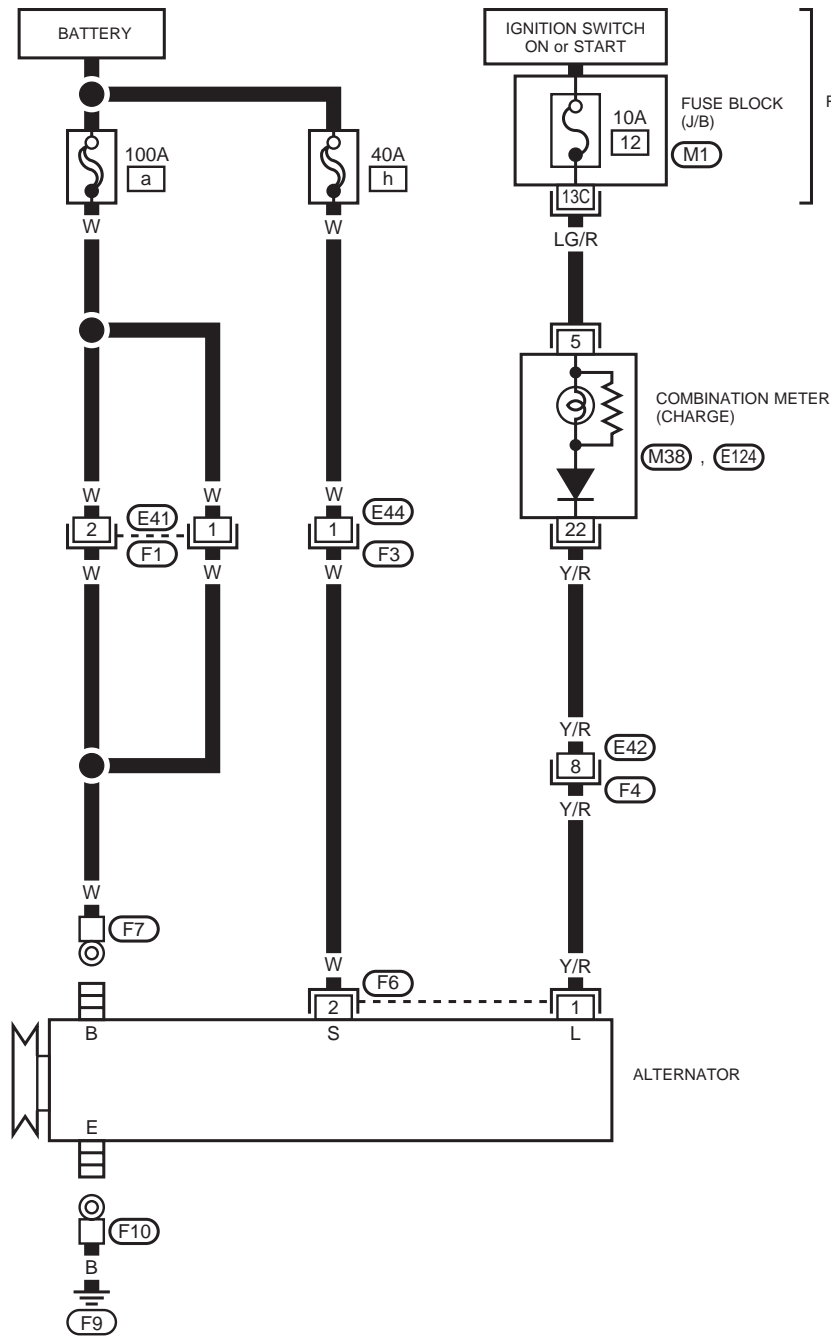
## CHARGING SYSTEM

## Wiring Diagram — CHARGE — (Cont'd)

## SR ENGINE AND QG ENGINE MODELS

EL-CHARGE-02

Refer to EL-POWER.



REFER TO THE FOLLOWING

**(M1) FUSE BLOCK - Junction Box (J/B)**

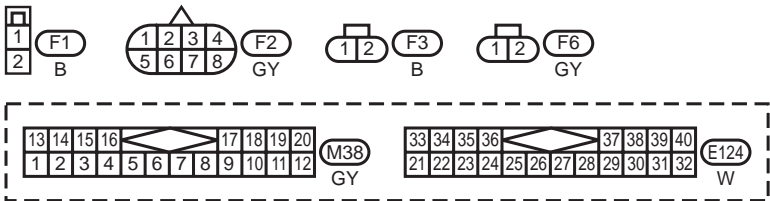
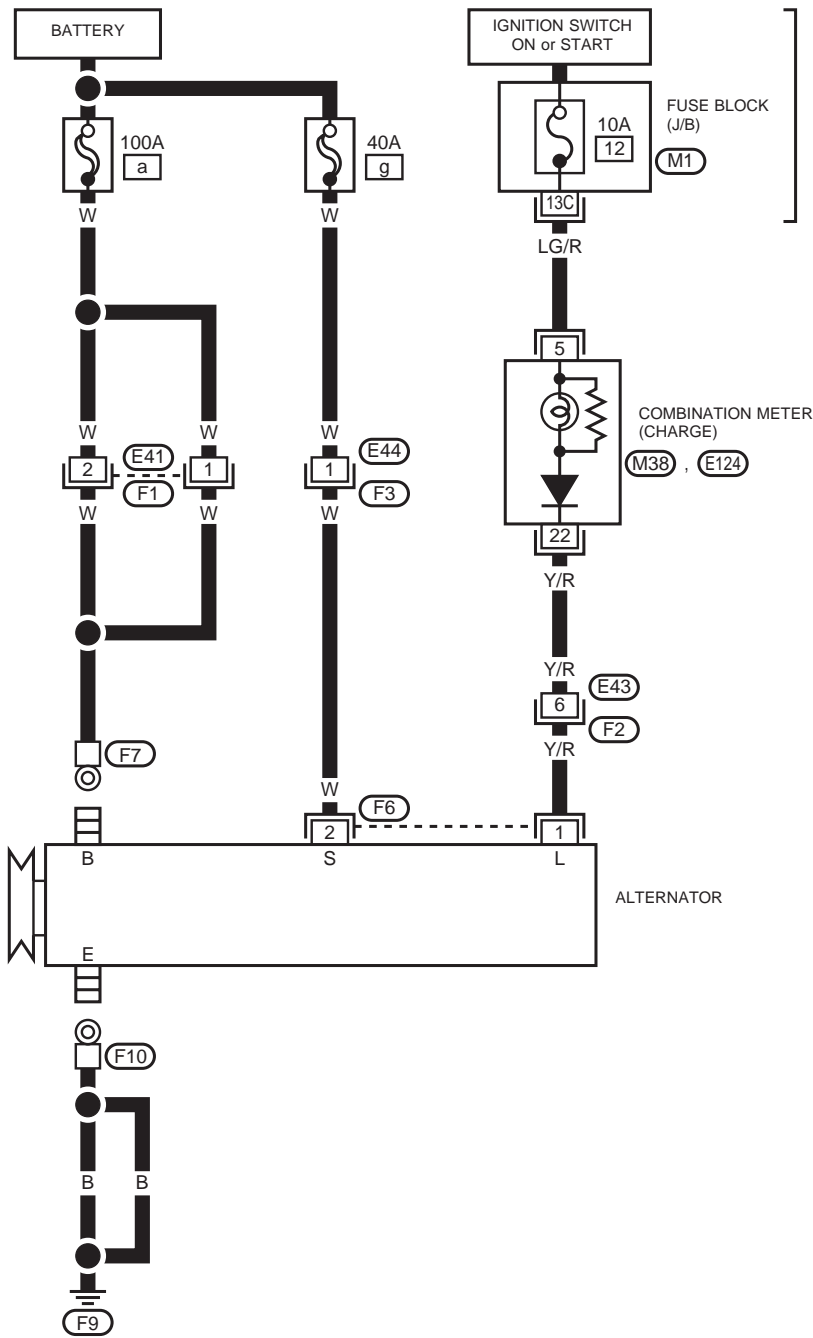
CHARGING SYSTEM

Wiring Diagram — CHARGE — (Cont'd)

DIESEL ENGINE MODELS

EL-CHARGE-03

Refer to EL-POWER.



REFER TO THE FOLLOWING  
(M1) FUSE BLOCK - Junction Box (J/B)

YEL256B

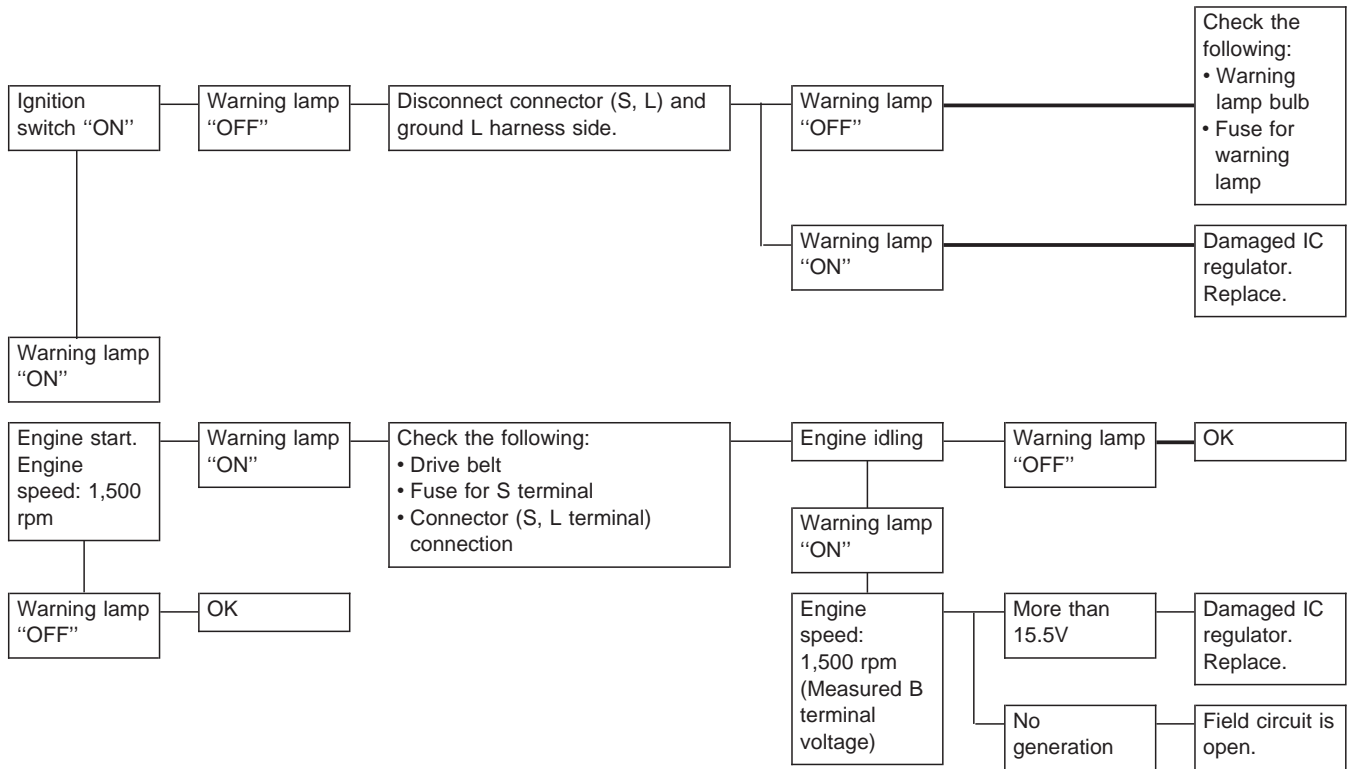
# CHARGING SYSTEM

## Trouble Diagnoses

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



Warning lamp: "CHARGE" warning lamp in combination meter

#### 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

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

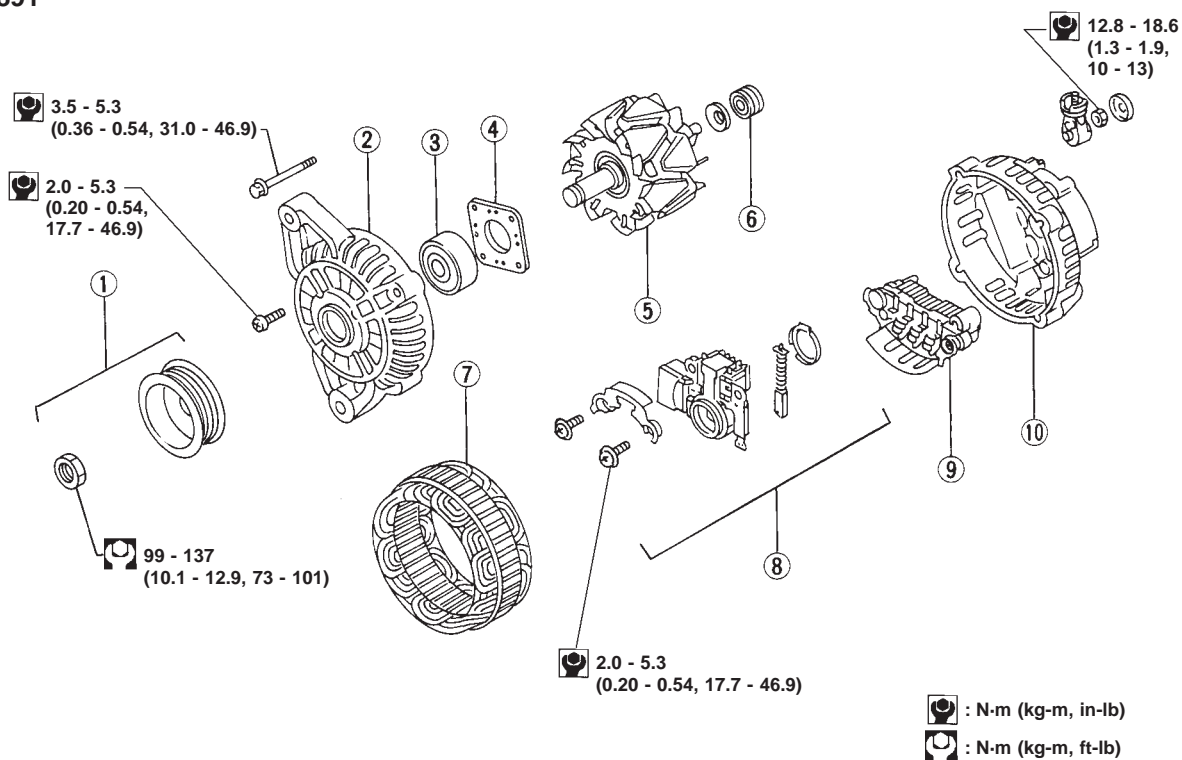
- Excessive voltage is produced.
- No voltage is produced.



## CHARGING SYSTEM

### Construction (Cont'd)

SEC. 231  
A2TB3691  
A2TB3891



YEL427B

- ① Pulley assembly
- ② Front cover
- ③ Front bearing
- ④ Bearing retainer

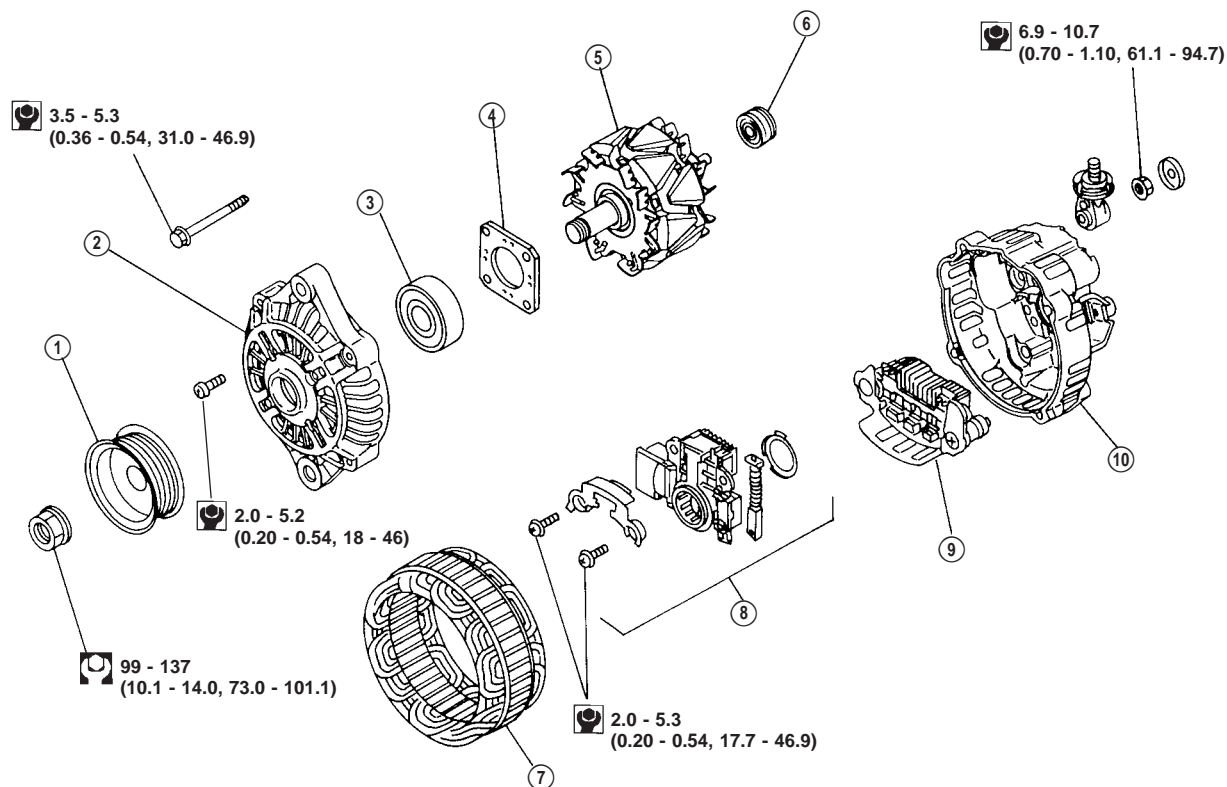
- ⑤ Rotor
- ⑥ Rear bearing
- ⑦ Stator

- ⑧ IC voltage regulator assembly
- ⑨ Diode assembly
- ⑩ Rear cover

## CHARGING SYSTEM

### Construction (Cont'd)

SEC. 231  
A2TB3191



: N-m (kg-m, ft-lb)  
 : N-m (kg-m, in-lb)

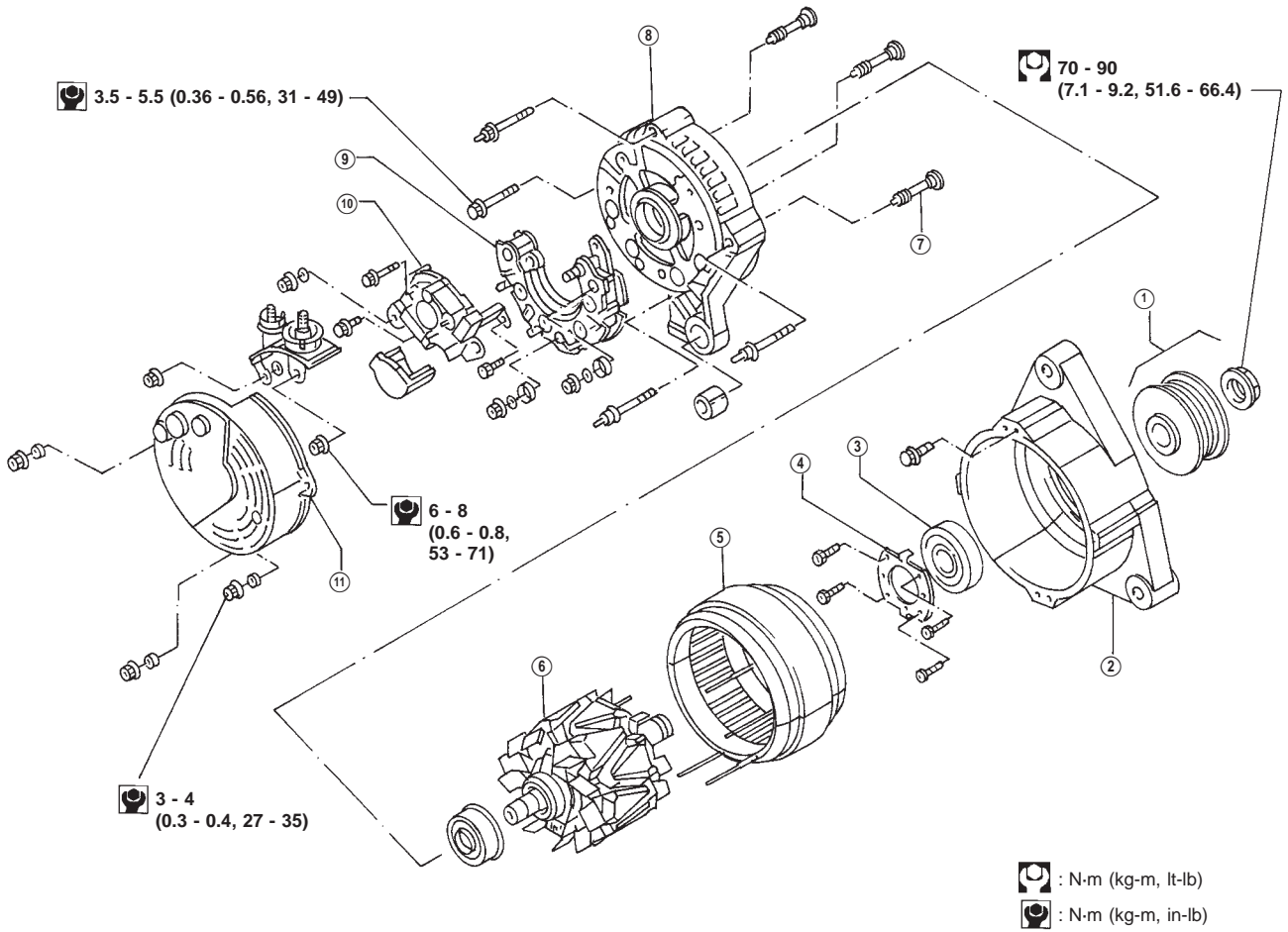
YEL428B

- |                    |                |                                 |
|--------------------|----------------|---------------------------------|
| ① Pulley           | ⑤ Rotor        | ⑧ IC voltage regulator assembly |
| ② Front cover      | ⑥ Rear bearing | ⑨ Diode assembly                |
| ③ Front bearing    | ⑦ Stator       | ⑩ Rear cover                    |
| ④ Bearing retainer |                |                                 |

## CHARGING SYSTEM

### Construction (Cont'd)

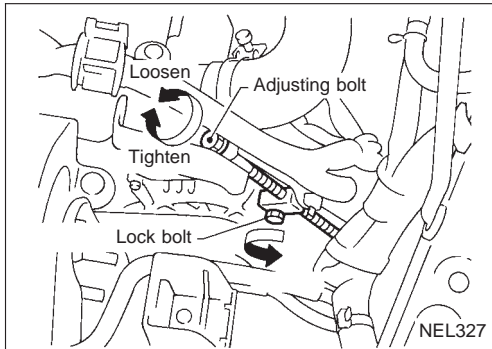
SEC. 231  
A115I-80A



YEL429B

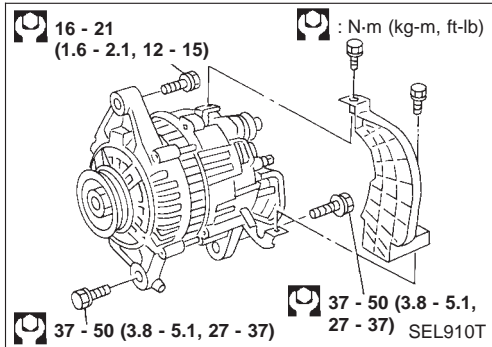
- |                    |                |                  |
|--------------------|----------------|------------------|
| ① Pulley assembly  | ⑤ Stator       | ⑨ Diode assembly |
| ② Front cover      | ⑥ Rotor        | ⑩ Brush holder   |
| ③ Front bearing    | ⑦ Special bolt | ⑪ Dust cover     |
| ④ Bearing retainer | ⑧ Rear cover   |                  |

## CHARGING SYSTEM



### Removal and Installation

1. Loosen lock bolt.
2. Remove RH undertray.
3. Loosen alternator mounting bolt and remove drive belt.
4. Remove lock bolt and adjust.
5. Remove harness connectors.
6. Remove alternator mounting bolt.
7. Support engine with jack, and remove front engine mounting bolt.
8. Remove alternator.



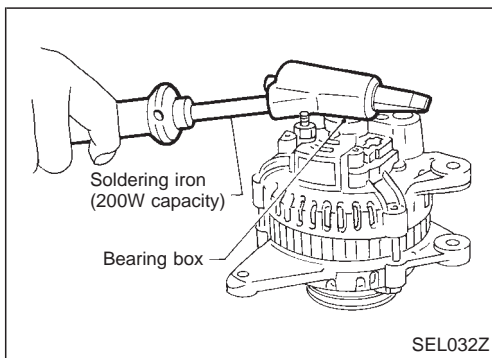
### Disassembly

#### REAR COVER

##### 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 bearing box section with a 200W soldering iron.

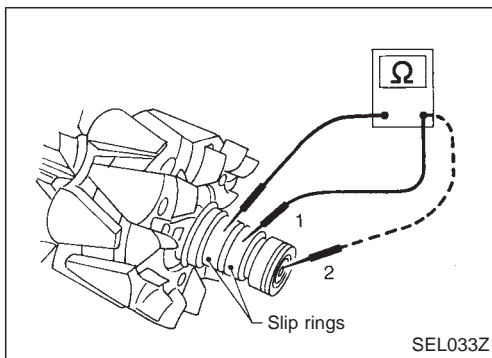
Do not use a heat gun, as it can damage diode assembly.



#### REAR BEARING

##### CAUTION:

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



### Inspection

#### ROTOR CHECK

1. Resistance test  
**Resistance: Refer to SDS (EL-64).**
  - Not within the specified values ... Replace rotor.
2. Insulator test
  - Continuity exists ... Replace rotor.
3. Check slip ring for wear.  
**Slip ring minimum outer diameter: Refer to SDS (EL-64).**
  - Not within the specified values ... Replace rotor.

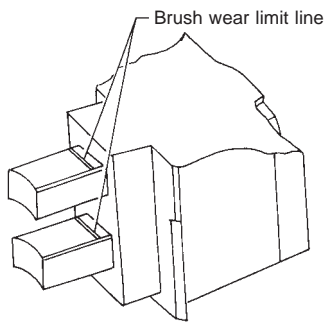
## CHARGING SYSTEM

### Inspection (Cont'd)

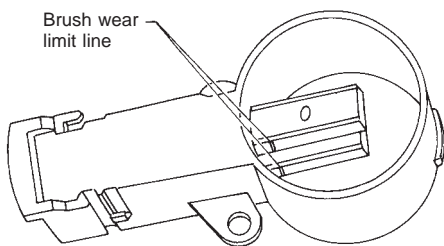
#### BRUSH CHECK

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

Type 1



Type 2

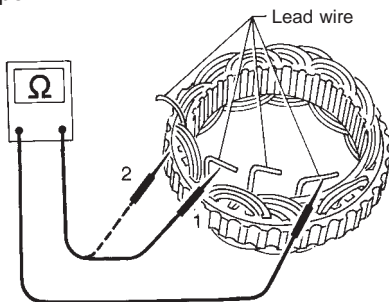


SEL034Z

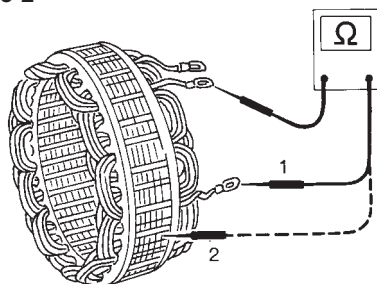
#### STATOR CHECK

1. Continuity test
  - No continuity ... Replace stator.
2. Ground test
  - Continuity exists ... Replace stator.

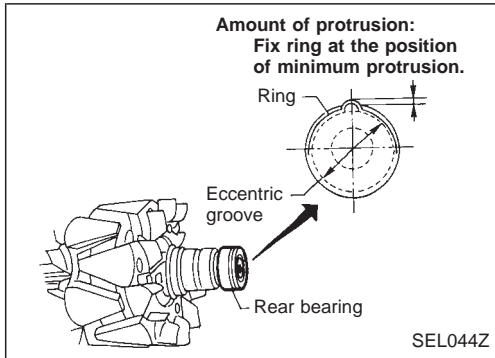
Type 1



Type 2



SEL037Z



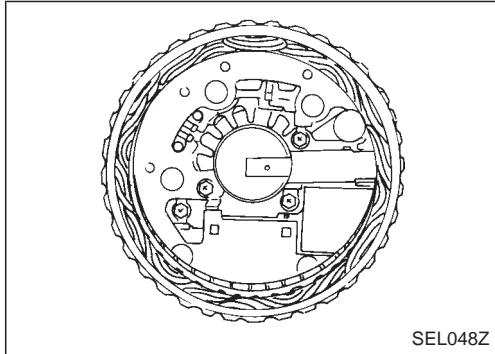
### Assembly

#### RING FITTING IN REAR BEARING

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

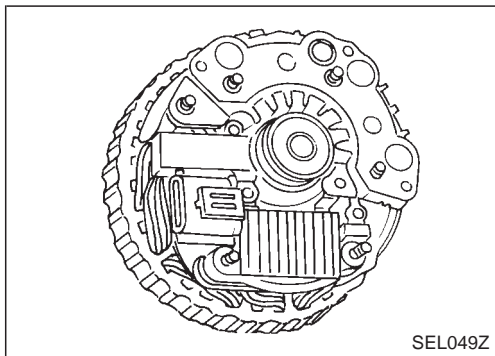
#### **CAUTION:**

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



#### REAR COVER INSTALLATION

- (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.**



## CHARGING SYSTEM

### Service Data and Specifications (SDS)

#### ALTERNATOR

Type	A115I-80A	A2TB3691	A2TB3891	A2TB3191	LR190-734E
	MAGNETI MARELLI	MITSUBISHI			HITACHI
Applied model	GA16	SR20, MT	SR20, CVT	QG18	CD20T
Nominal rating V-A	12-80		12-90	12-80	12-90
Ground polarity	Negative				
Minimum revs under no-load (When 13.5V is applied) rev/min	Less than 1,300				Less than 1,000
Hot output current (when 13.5V is applied) A/rev/min	More than 81/600	More than 23/1,300 More than 64/2,500 More than 82/5,000	More than 22/1,300 More than 64/2,500 More than 85/5,000	More than 20/1,300 More than 62/2,500 More than 81/5,000	More than 32/1,300 More than 54/2,500 More than 87/5,000
Regulated output voltage V	14.1 - 14.7				
Brush minimum length mm (in)	5.0 (0.197)				6.0 (0.236)
Brush spring pressure N (g, oz)	1.1 - 2.7 (112.2 - 275.4, 3.96 - 9.71)	4.8 - 6.0 (490 - 610, 17.28 - 21.51)			1.0 - 3.43 (102 - 350, 3.60 - 12.34)
Slip ring minimum diameter mm (in)	25.4 (1.0)	22.1 (0.870)			26.0 (1.024)
Rotor coil resistance at 20°C (68°F)	—	2.2 - 2.6	1.8 - 2.1	2.2 - 2.6	2.60