System Description

NFSC0009

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 3 (S) through:

- 120A fusible link (letter **A**, located in the fuse and fusible link box), and
- 10A fuse (No. 70, 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 3 (S) detecting the input voltage. The charging circuit is protected by the 120A fusible link.
The alternator is grounded to the engine block.
With the ignition switch in the ON or START position, power is supplied

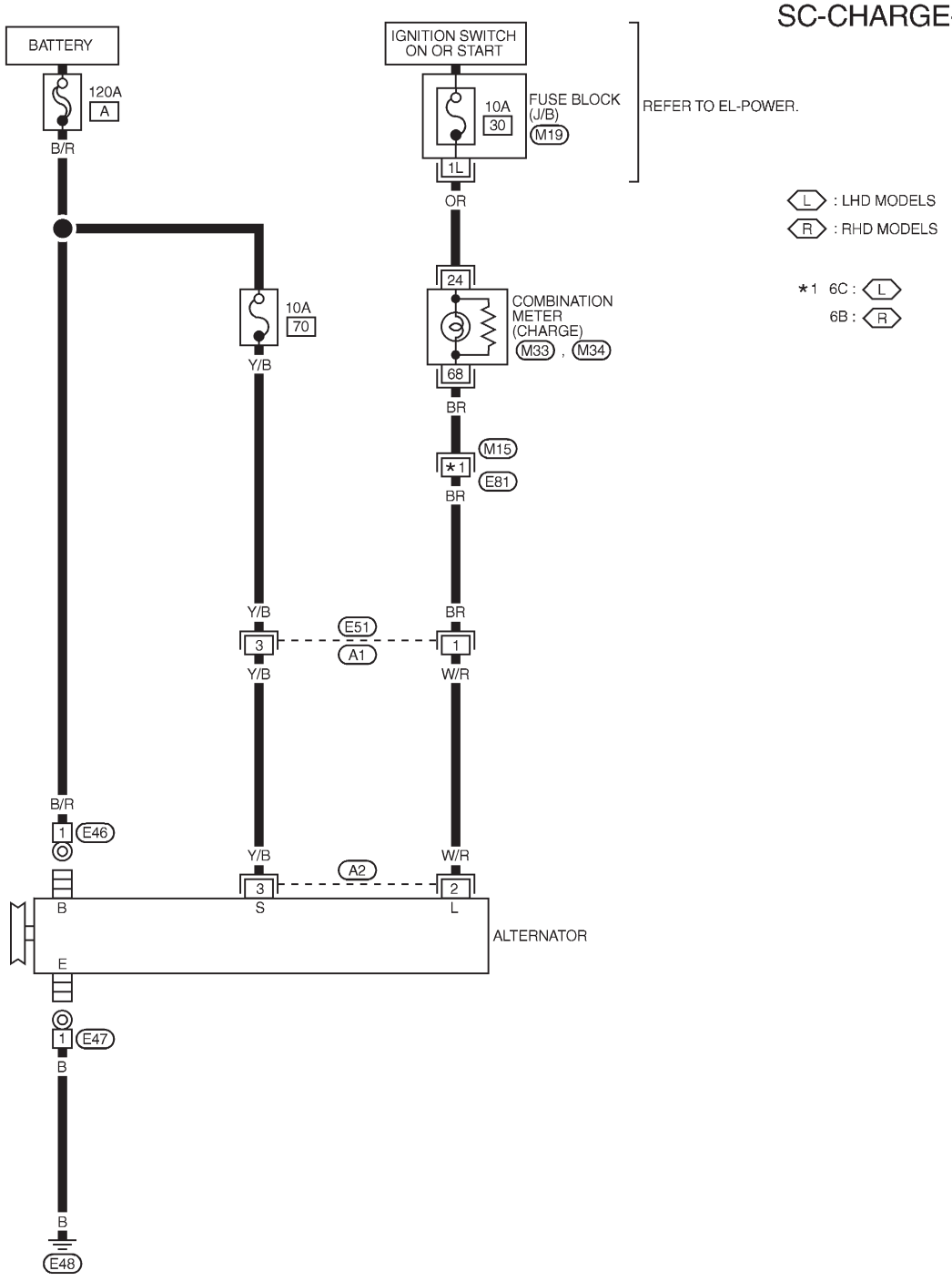
- through 10A fuse [No. 30, located in the fuse block (J/B)]
- to combination meter terminal 24 for the charge warning lamp.

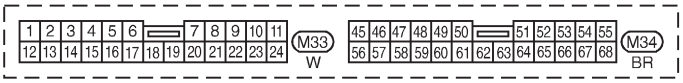
Ground is supplied to terminal 68 of the combination meter through terminal 2 (L) of the alternator. With power and ground supplied, the charge warning lamp will illuminate. When the alternator is providing sufficient voltage with the engine running, the ground is opened and the charge warning lamp will go off.
If the charge warning lamp illuminates with the engine running, a fault is indicated.

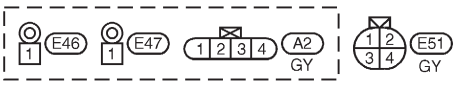
Wiring Diagram — CHARGE —

NFSC0010

SC-CHARGE-01







REFER TO THE FOLLOWING.
M15 -SUPER MULTIPLE JUNCTION(SMJ)
M19 -FUSE BLOCK-JUNCTION BOX(J/B)

MEL890K

Trouble Diagnoses

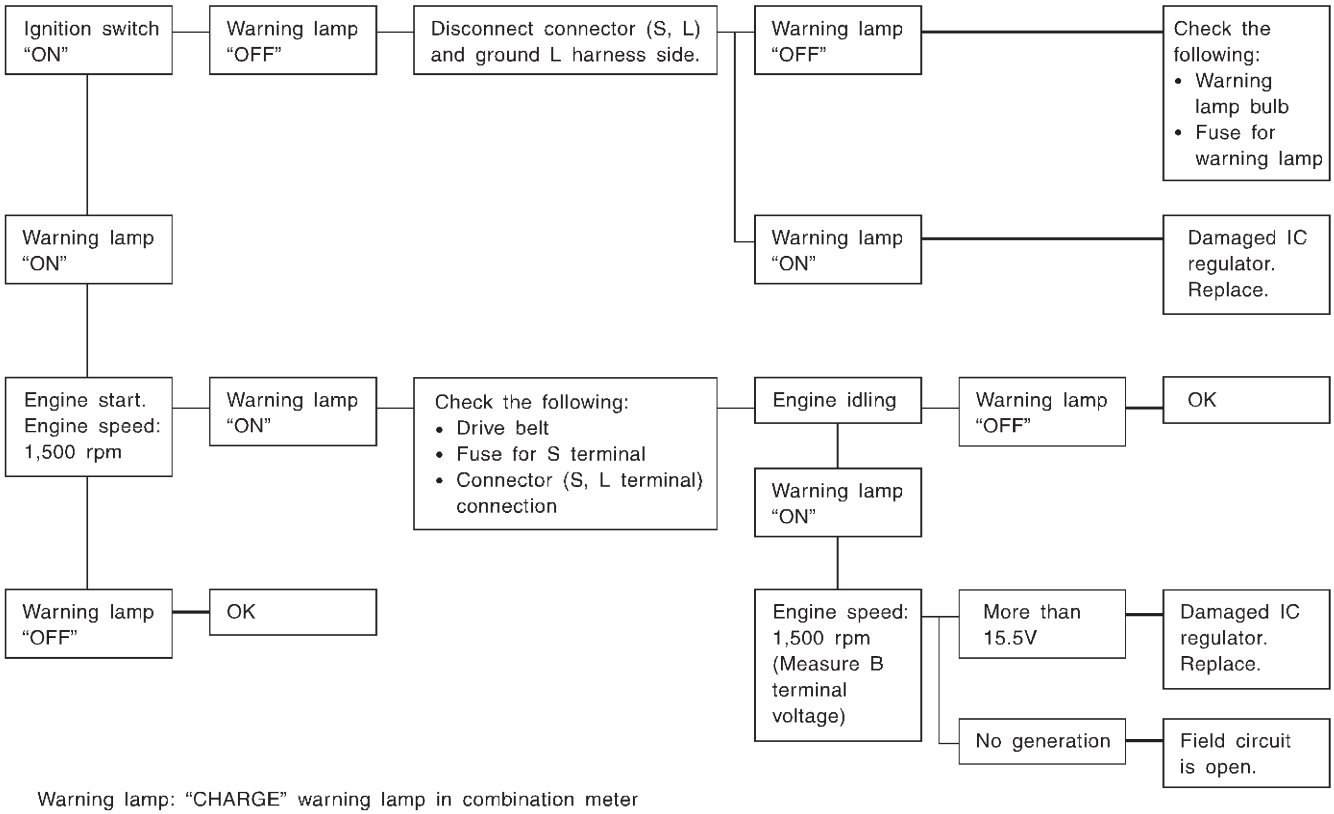
NFSC0011

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

NFSC0011S01



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

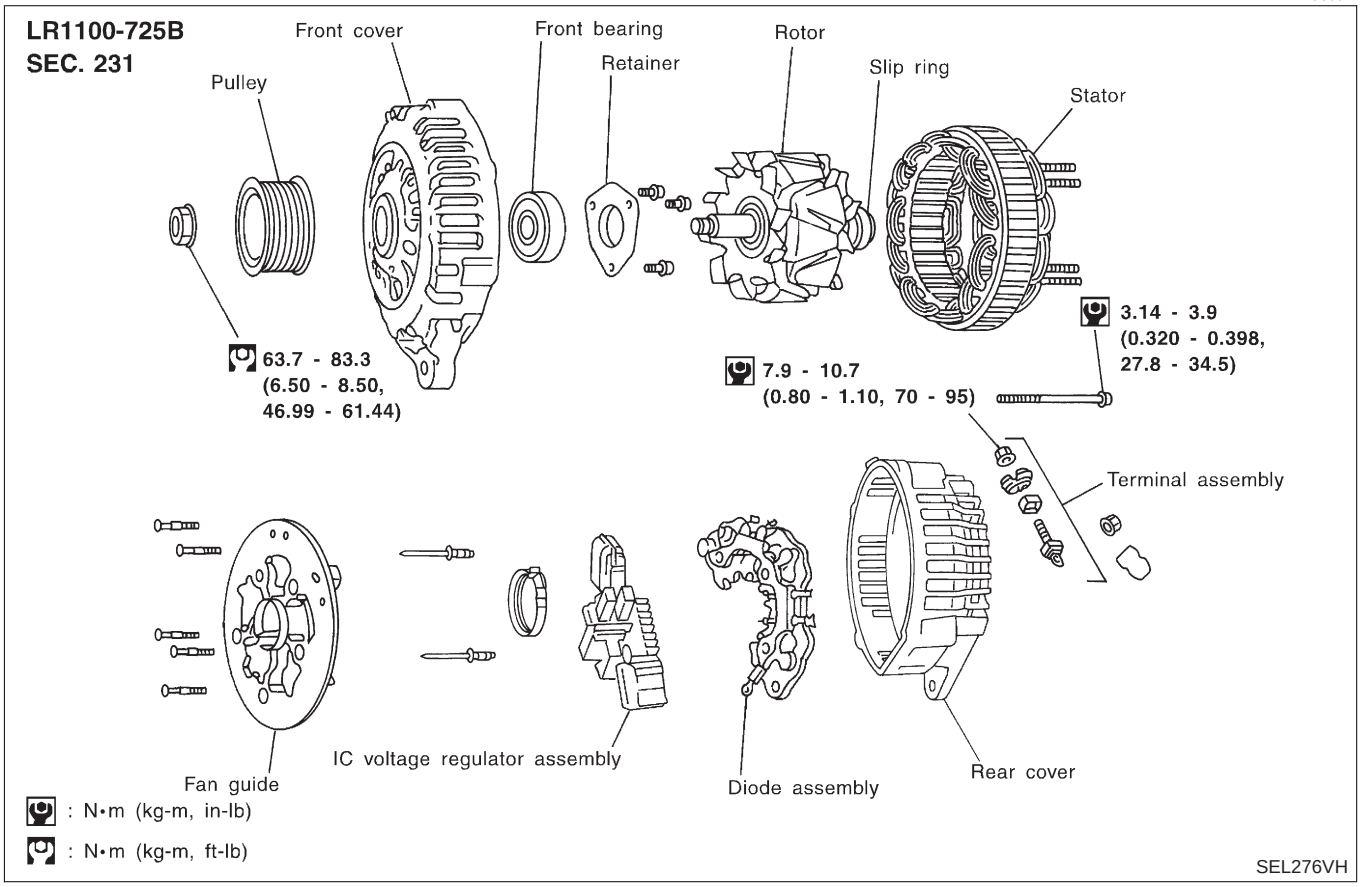
NFSC0011S02

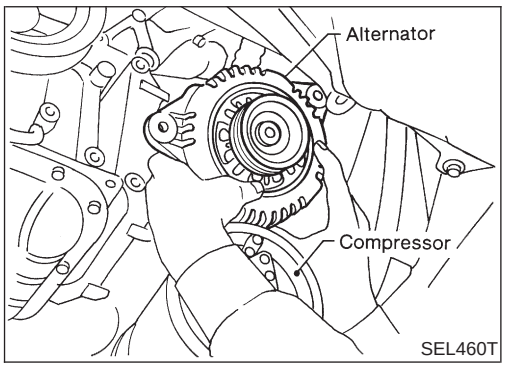
The IC regulator warning function activates to illuminate "CHARGE" warning lamp, if any of the following symptoms occur while alternator is operating:

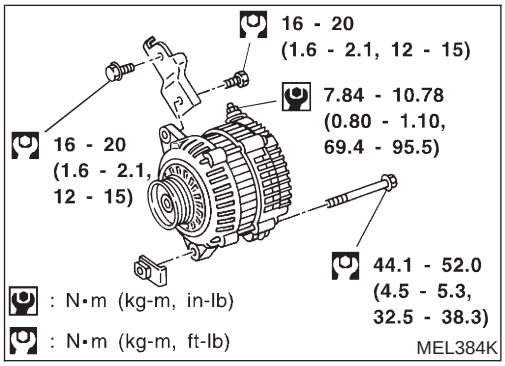
- Excessive voltage is produced.
- No voltage is produced.

Construction

NFSC0012







Removal and Installation

NFSC0013

REMOVAL

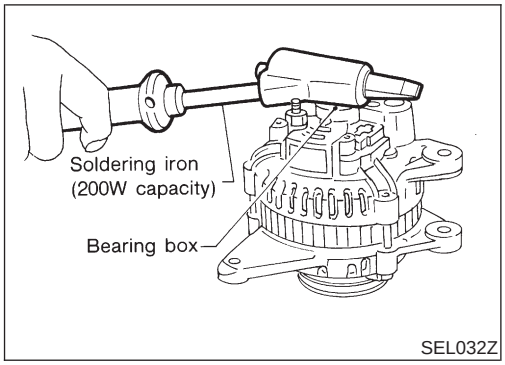
NFSC0013S01

1. Remove engine undercover RH.
2. Remove side inspection cover RH.
3. Loosen belt idler pulley.
4. Remove drive belt.
5. Remove A/C compressor mounting bolts (four).
6. Slide A/C compressor forward.
7. Disconnect alternator harness connector.
8. Remove alternator upper bolt and lower bolt.

INSTALLATION

NFSC0013S02

To install, reverse the removal procedure.



Disassembly

NFSC0021

REAR COVER

NFSC0021S01

CAUTION:

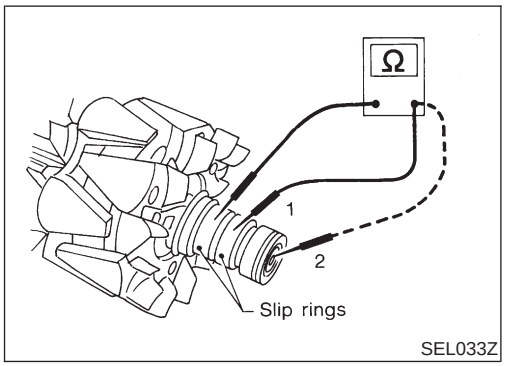
Rear cover may be hard to remove because a ring is used to lock outer race of rear bearing. To facilitate removal of rear cover, heat just bearing box section with a 200W soldering iron.
Do not use a heat gun, as it can damage diode assembly.

REAR BEARING

NFSC0021S02

CAUTION:

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



Inspection

NFSC0022

ROTOR CHECK

NFSC0022S01

1. Resistance test

Resistance: Refer to SDS (SC-26).

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

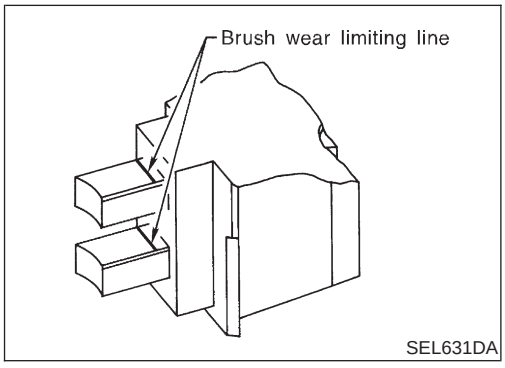
2. Insulator test

- Continuity exists ... Replace rotor.

3. Check slip ring for wear.

Slip ring minimum outer diameter:
Refer to SDS (SC-26).

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



BRUSH CHECK

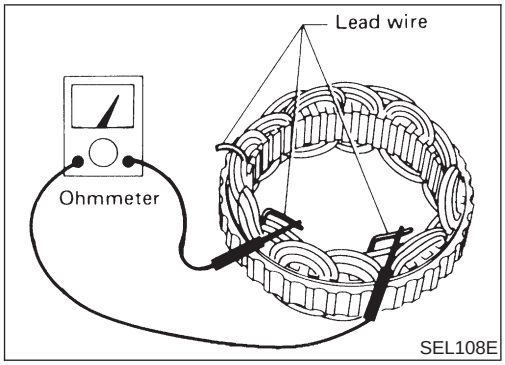
NFSC0022S02

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.

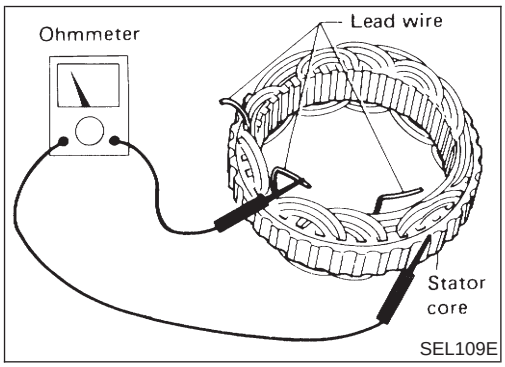


SEL108E

STATOR CHECK

NFSC0022S03

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



SEL109E

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

Assembly

NFSC0023

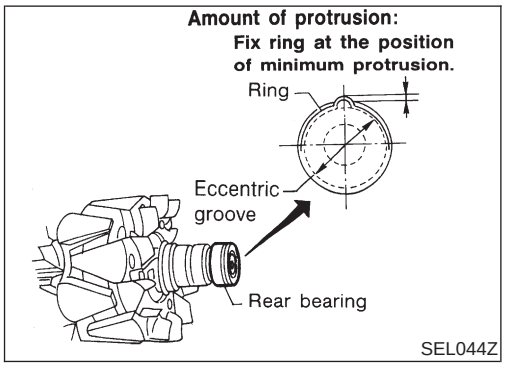
RING FITTING IN REAR BEARING

NFSC0023S01

- 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.



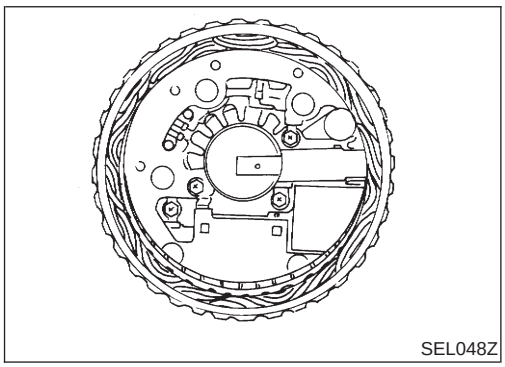
SEL044Z

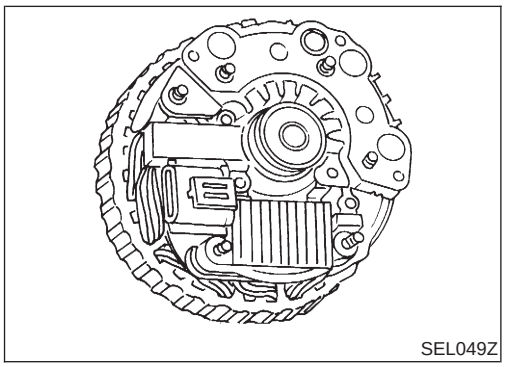
REAR COVER INSTALLATION

NFSC0023S02

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.


SEL048Z


SEL049Z

Battery

NFSC0014

Applied model	VQ20DE		VQ30DE
	Europe and except for Europe		For Europe
Type	55D23L	65D26L	80D26L
Capacity V-AH	12-48	12 - 52	12 - 55

Starter

NFSC0015

Type		S114-801D
		HITACHI make
		Reduction gear type
System voltage		12V
No-load	Terminal voltage	11.0V
	Current	Less than 90A
	Revolution	More than 2,700 rpm
Minimum diameter of commutator		28.0 mm (1.102 in)
Minimum length of brush		10.5 mm (0.413 in)
Brush spring tension		12.7 - 17.7 N (1.3 - 1.8 kg, 2.9 - 4.0 lb)
Clearance "ℓ" between pinion front edge and pinion stopper		0.3 - 2.5 mm (0.012 - 0.098 in)

Alternator

NFSC0016

Type	LR1100-725B
	HITACHI make
Nominal rating	12V-110A
Ground polarity	Negative
Minimum revolution under no-load (When 13.5V is applied)	Less than 950 rpm
Hot output current (When 13.5V is applied)	More than 35A/1,300 rpm More than 83A/2,500 rpm More than 95A/5,000 rpm
Regulated output voltage	14.1 - 14.7V
Minimum length of brush	More than 6.00 mm (0.2362 in)
Brush spring pressure	1.000 - 3.432 N (102 - 350 g, 3.60 - 12.34 oz)
Slip ring minimum outer diameter	More than 26.0 mm (1.024 in)
Rotor (Field coil) resistance	2.31Ω