



1. PRECAUTIONS IN DISASSEMBLY AND REASSEMBLY

Describes procedures and precautions for disassembly and reassembly. The **bold** numerals in [] denote the numbers in the G 13SE or G 12SE Parts List.

1-1. Disassembly of the Armature Ass'y

- (1) Open the Lever [33], loosen the M5 x 25 Machine Screw [34], and remove the Wheel Guard Ass'y [37].
- (2) Loosen the two D4 x 35L Tapping Screws [50] and the D4 x 20L Tapping Screw [53], and remove Tail Covers A and B [58] [49].
- (3) Remove the two Carbon Brushes [54] from the Brush Holders [55].
- (4) Remove the four D5 x 25 Tapping Screws [2].

The Armature Ass'y [13] can then be taken out simultaneously with the Gear Cover Ass'y [4].
Packing Gland [27], and related parts.

- (5) Remove the four M5 x 16L Seal Lock Screws [28].
- (6) After removing the three M4 x 10 Seal Lock Screws [1], the Armature [13] can be extracted together with the Bearing Cover [12], and related parts.
- (7) Carefully wrap the Armature Ass'y [13] with a soft, clean rag to protect it from being damaged, and clamp it securely in a vise. Then, remove the M7 Special Nut [5], and extract the Pinion [6].
- (8) For the models indicated under Fig. 4, the Ball Bearing [9] can be removed from the Armature [13] by utilizing a J-204 Bearing Puller (special repair tool, Code No. 970982) as illustrated. After the Ball Bearing has been removed, the Bearing Cover [12] can be easily taken off.

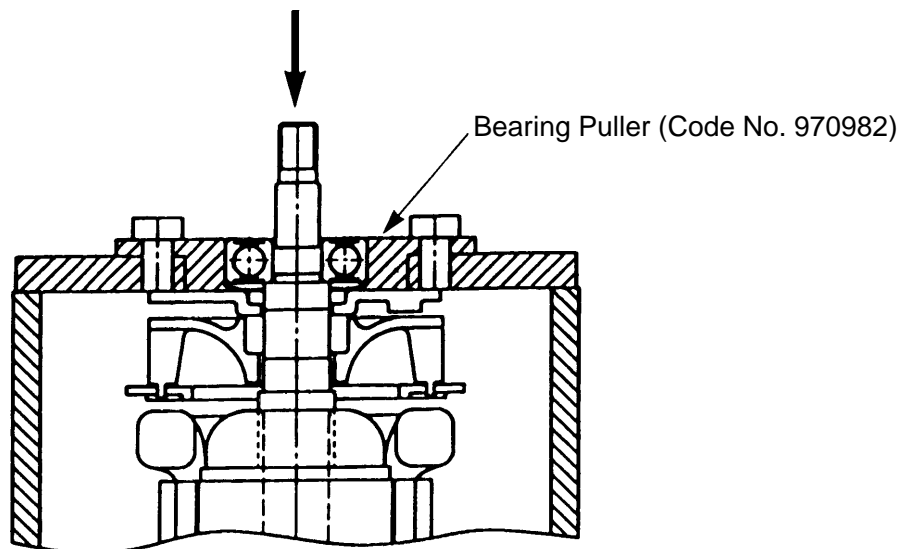


Fig. 4

1-2. Disassembly of the Stator Ass'y:

- (1) After removing the Armature Ass'y [13] and Switch Box [46], disconnect the lead wires connected to the Brush Holders [55].
- (2) Loosen the two D4 x 70L Hex. Hd. Tapping Screws [15] and remove the Stator Ass'y [16] from the Housing [43]. If the Stator Ass'y [16] cannot be easily removed from the Housing [43], disassembly can be facilitated by heating the Housing [43] to a temperature of approximately 60°C (140°F) with an appropriate heating device.

1-3. Disassembly of the Gear:

- (1) Loosen the four M5 x 16L Seal Lock Screws [28], and remove the Packing Gland [27] together with the Spindle [30], and Gear [21] from the Gear Cover Ass'y [4] in a single body.
- (2) When it is necessary to remove the Gear [21] from the Spindle [30], it is highly recommended that the special repair tools described below be utilized.

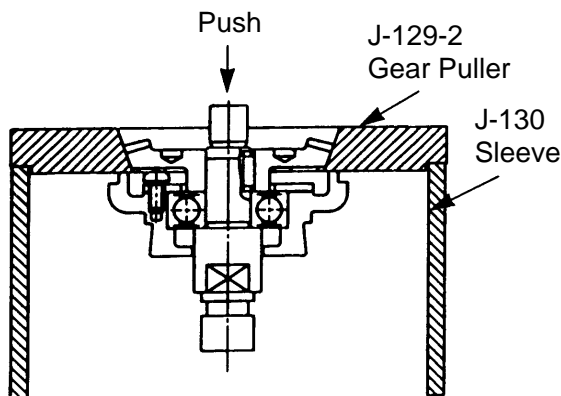


Fig. 5

As illustrated in Fig. 5, support the angled surface of the Gear [21] with a J-129-2 Gear Puller (special repair tool, Code No. 970906), rest the J-129-2 Gear Puller on a J-130 Sleeve (special repair tool, Code No. 970907), and push down on the tip of the Spindle [30] with a hand press to remove the Gear [21].

1-4. Reassembly:

Reassembly can be accomplished by following the disassembly procedures in reverse. However, special attention should be given to the following items.

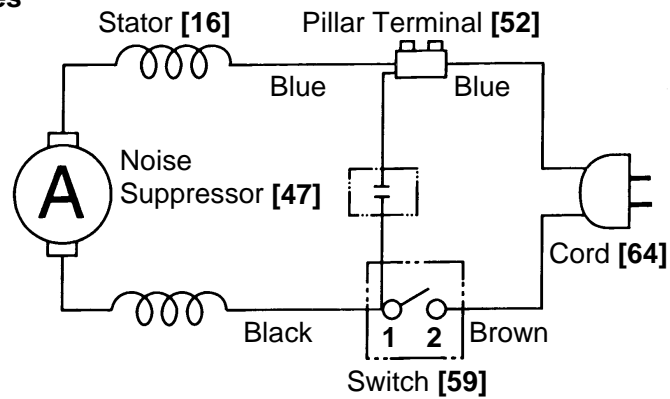
- (1) After disassembly, thoroughly remove old grease from the inside of the Gear Cover Ass'y [4], and insert 18 g of new grease (Nippeco JF-375, Code No. 930036, is recommended) prior to reassembly. When inserting grease, apply it to the Pinion Gear tooth surfaces, and to the Needle Bearing inside the Gear Cover.
- (2) When replacing the Ball Bearing on the commutator side of the Armature, be very careful to ensure that the Dust Seal (A) [18] is assembled in the proper direction. The Dust Seal (A) [18] plays an important role in dustproofing of the Ball Bearing, and must be replaced with a new one if disassembled. Do not forget to insert the Thrust Washer [17] on the Armature side of the Dust Seal (A) [18].
- (3) Apply Three Bond TB 1406 Screw Locking Agent to the following screws.
 - Three M4 x 10 Seal Lock Screws [1] which fix Bearing Cover [12] in place.
 - Three M4 x 8 Seal Lock Screws [22] which fix Bearing Cover (B) [23] in place.
 - Four M5 x 16 Seal Lock Screws [28] which fix Packing Gland [27] in place.

1-5. Tightening Torque of Each Screw:

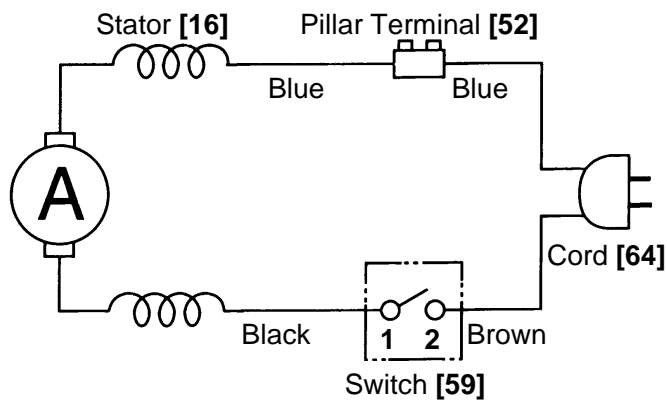
| | |
|-------------------------------------------------------------------------------|----------------------------------------------------|
| D3 Tapping Screw [56] | 0.74 ± 0.15 N·m (7.5 ± 1.5kgf-cm, 0.5 ± 0.4 ft-lb) |
| D4 Tapping Screw (W/Flange) [50] [53] [60] and D4 Hex. Hd. Tapping Screw [15] | 1.96 ± 0.49 N·m (20 ± 5kgf-cm, 1.4 ± 0.4 ft-lb) |
| D5 Tapping Screw [2] | 2.94 ± 0.49 N·m (30 ± 5kgf-cm, 2.2 ± 0.4 ft-lb) |
| M4 Seal Lock Screw (W/Sp. Washer) [1] [22] | 1.76 ± 0.39 N·m (18 ± 4kgf-cm, 1.3 ± 0.3 ft-lb) |
| M5 Seal Lock Screw (W/Sp. Washer) [28] | 3.43 ± 0.96 N·m (35 ± 7kgf-cm, 2.5 ± 0.5 ft-lb) |
| M7 Special Nut [5] | 5.88 ± 0.98 N·m (60 ± 10kgf-cm, 3.6 ± 0.7 ft-lb) |

1-6. Wiring Diagrams

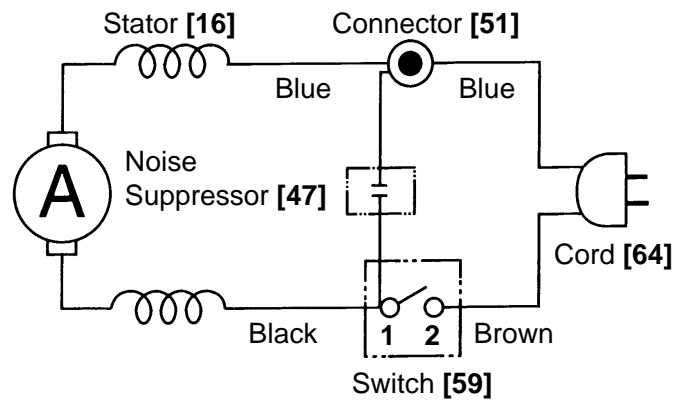
For European countries



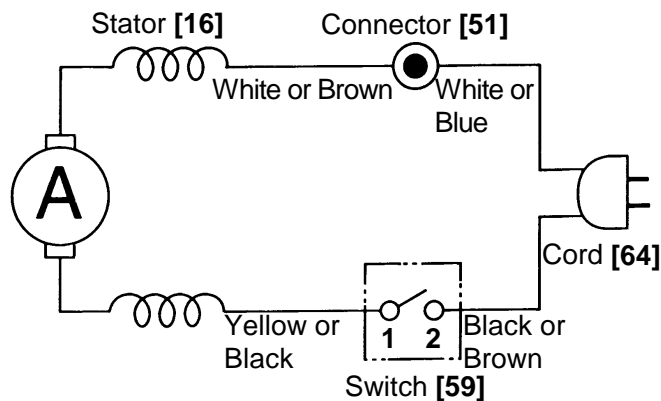
For Asian countries (except Singapore)



For New Zealand



For U.S.A., Canada, Australia and Singapore



1-7. Insulation Tests:

On completion of disassembly and repair, measure the insulation resistance and dielectric strength.

Insulation Resistance: 7 MΩ or more with DC 500 V Megohm Tester.

Dielectric Strength: AC 4000 V for 1 minute, with no abnormalities 220 V - 240 V
(and 110 V for U. K. products)
AC 2500 V for 1 minute, with no abnormalities 110 V -127 V
(except U. K. products)

1-8. Gear Backlash Value:

Gear backlash should be maintained at a value of 2 mm or less measured at the outer edge of a fresh Depressed-Center Wheel.

1-9. No-Load Current Value:

After no-load operation for 30 minutes, the no-load current value should be as follows:

| Voltage | 110 V | 115 V | 220 V | 230 V | 240 V |
|------------------|-------|-------|-------|-------|-------|
| Current (A) Max. | 3 A | 2.5 A | 1.5 A | 1.5 A | 1.5 A |

2. STANDARD REPAIR TIME (UNIT) SCHEDULES

| Model | Variable Fixed | 10 | 20 | 30 | 40 | 50 | 60 |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|----------------|----|----|
| G 12SE G 13SE | <div>General Assembly</div> <div>Fixed Costs</div> <div>Switch</div> <div>Wheel Guard 0 min.</div> <div>Tail Cover (A)</div> <div>Tail Cover (B)</div> <div>Cord 10 min.</div> <div>Other 20 min.</div> | Work Flow | | | | | |
| | | Wheel Guard Ass'y | | | Housing Stator | | |
| | | | Pinion Armature Ass'y Gear Cover Seal Ring (A) Washer (C) Ball Bearing (629T12) Rubber Ring Felt Bearing Cover Dust Seal (A) Ball Bearing (608VVMC2) | | | | |
| | | | Pushing Button Lock Pin Gear Seal Packing | Bearing Cover (B) Ball Bearing (6201DD) Felt Packing Packing Gland Spindle Key (3 x 3 x 8) | | | |
| | | Tail Cover (A) Tail Cover (B) Carbon Brush x 2 pcs. Spring x 2 pcs. Switch Cord Cord Armor Paddle Lever Lock Lever Spring Spring (F) | Switch Box Rubber Ring Brush Holder x 2 pcs. | | | | |