# SERVICE DATA

## CHAIN SAW

# CS-3000 CS-3050
# CS-3400 CS-3450

### INTRODUCTION

We are constantly working on technical improvement of our products. For this reason, technical data, equipment and design are subject to change without notice. All specifications, illustrations and directions in this SERVICE DATA are based on the latest products information available at the time of publication.

For further information to service these models, please refer to ECHO SERVICE MANUAL Ord. No. 401-20.

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**Remarks:**
Please use this revised edition (Reference No. 00-30A-03) and discard all previous issues.

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KIORITZ CORPORATION

Printed in Japan

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## 1 SERVICE INFORMATION

### 1-1 Specifications

| Model | | | CS-3000 | CS-3050 | CS-3400 | CS-3450 |
|---|---|---|---|---|---|---|
| Dimensions | Length* | mm(in) | 260 (10.2) | 380 (15.0) | 260 (10.2) | 380 (15.0) |
| | Width | mm(in) | 230 (9.1) | 230 (9.1) | 230 (9.1) | 230 (9.1) |
| | Height | mm(in) | 220 (8.7) | 245 (9.6) | 220 (8.7) | 245 (9.6) |
| Dry weight* | | kg(lb) | 3.2 (7.1) | 3.3 (7.3) | 3.3 (7.3) | 3.4 (7.5) |
| Engine | Type | | KIORITZ, air-cooled, two-stroke, single cylinder Two-piece casting, Reed valve | | | |
| | Rotation | | Clockwise as viewed from the output (PTO) end | | | |
| | Displacement | $cm^3(in^3)$ | 30.1 (1.836) | | 33.4 (2.037) | |
| | Bore | mm(in) | 37.0 (1.457) | | 39.0 (1.535) | |
| | Stroke | mm(in) | 28.0 (1.102) | | 28.0 (1.102) | |
| | Compression ratio | | 7.0 : 1 | | 7.0 : 1 | |
| Carburetor | Type | | Diaphragm (Walbro WT type) | | | |
| Ignition | Type | | CDI (Capacitor discharge ignition) system in a single integrated piece | | | |
| | Spark plug | | BPMR7A, BPM7A, CJ-7Y | | | |
| Starter | Type | | Automatic rewind | | | |
| | Rope diameter x length | mm(in) | 3.0 x 850 (0.12 x 33.5) | | | |
| Fuel | Type | | Premixed two-stroke fuel (Refer to operator's manual.) | | | |
| | Tank capacity | $cm^3$(U.S.fl.oz.) | 250 (8.5) | | | |
| Clutch | Type | | Centrifugal, 3-shoe slide | | | |
| Guide bar / Saw chain lubrication type | | | Automatic with volume adjuster | | | |
| | Tank capacity, oil | $cm^3$(U.S.fl.oz.) | 150 (5.0) | | | |
| Handles | Location | | Front / Top | Front / Rear | Front / Top | Front / Rear |
| Sprocket | Type | | Spur | | | |
| | Number of teeth | | 6 | | | |
| | Pitch | in | 3/8 | | | |

| **Cutting devices** | | | North America | | |
|---|---|---|---|---|---|
| Guide bar | Type | | 12A0CD3745 | 14A0CD3752 | 16A0CD3757 |
| | Called length | in | 12 | 14 | 16 |
| | Gauge | in | 0.050 | | |
| Saw chain | Type | | 91SG-45X | 91SG-52X | 91SG-57X |
| | Pitch | in | 3/8 Low profile | | |
| | Gauge | in | 0.050 | | |

| **Cutting devices** | | | Other than North America | | |
|---|---|---|---|---|---|
| Guide bar | Type | | 30RC50-3/8 | 35RC50-3/8 | 40RC50-3/8 |
| | Called length | cm | 30 | 35 | 40 |
| | Gauge | in | 0.050 | | |
| Saw chain | Number of drive links | | 47 | 53 | 58 |
| | Pitch | in | 3/8 Low profile | | |
| | Gauge | in | 0.050 | | |

*Without guide bar and saw chain.

**1-2 Technical data**

| Model | | CS-3000 CS-3050 | CS-3400 CS-3450 | | |
|---|---|---|---|---|---|
| Engine | | | | | |
| Idling speed | rpm | 2700 - 3300 | | | |
| Operating speed | rpm | 6500 - 9000 | | | |
| High speed (No load full throttle)* | rpm | 11000 - 12000 | | | |
| Clutch-in speed | rpm | 4100 - 4300 | | | |
| Compression pressure, standard | kgf/cm²(psi) | 8 (115) | | | |
| Ignition system | | | | | |
| Spark plug gap | mm(in) | 0.6 - 0.7 (0.024 - 0.028) | | | |
| Minimum secondary voltage | kV | 15 | | | |
| Secondary coil resistance | kΩ | ( 1.0 - 1.5 ) 1.2 - 1.8 | ( 1.0 - 1.5 ) 1.2 - 1.8 | | |
| Pole shoe air gaps | mm(in) | 0.3 - 0.4 (0.012 - 0.016) | 0.3 - 0.4 (0.012 - 0.016) | | |
| Ignition timing at 1500 rpm | °BTDC | ( 27 ) 29 | ( 27 ) | 11 | 15 |
| at 3000 rpm | °BTDC | ( 27 ) 29 | ( 27 ) | 12.5 | 16.5 |
| at 7500 rpm | °BTDC | ( 27 ) 29 | ( 27 ) | 26 | 30 |
| Chain oil discharge volume at 7000 rpm | cm³/min(U.S.fl.oz./min) | 1.5 - 13 (0.05 - 0.45) adjustable | | | |

BTDC: Before top dead center.
*With guide bar and saw chain.

**1-3 Carburetor data**

| Carburetor Model | | WT-248 | WT-254 | WT-261 | WT-271 | WT-381 | WT-385 | WT-385A |
|---|---|---|---|---|---|---|---|---|
| Supplier & Type | | Walbro Diaphragm horizontal-draught | | | | | | |
| Venturi Size | mm(in) | 9.53 (3/8) | | 11.11 (3/8) | | 9.53 (3/8) | | |
| Throttle Bore | mm(in) | 15.85 (5/8) | | 15.85 (5/8) | | 14.3 (9/16) | | |
| Idle speed screw initial setting | turn in | 2 | | 2 | | 2 | | |
| H needle initial setting | turn back | 1 1/4 | | 1 1/8 | | 1 1/4 | | |
| L needle initial setting | turn back | 1 1/4 | | 1 1/8 | | 1 | | |
| Test Pressure, minimum | kgf/cm²(psi) | 0.5 (7.0) | | | | | | |
| Metering lever height | mm(in) | 1.65 ((0.65) lower than diaphragm seat | | | | | | |
| Applicable model | | CS-3000 | CS-3050 | CS-3450 | CS-3400 | CS-3050<br>CS-3450 | CS-3000<br>CS-3400 | CS-3000<br>CS-3050<br>CS-3400<br>CS-3450 |

H needle: High speed needle.
L needle: Idle needle.

**1-4 Torque limits**

| Descriptions | Size | kgf•cm | in•lbf |
|---|---|---|---|
| Crankcase | M 5 | 30 - 40 | 25 - 35 |
| Engine mount | M 5 | 80 - 90 | 70 - 80 |
| Carburetor | M 5 | 35 - 45 | 30 - 40 |
| Insulator | M 5 | 40 - 50 | 35 - 45 |
| Reed valve | M 3 | 8 - 12 | 7 - 10 |
| Clutch hub | LM 8 | 200 - 230 | 175 - 200 |
| Flywheel | M 8 | 120 - 140 | 105 - 120 |
| Ignition coil (CDI module) | M 5† | 30 - 40 | 25 - 35 |
| Ignition switch | M10 | 20 - 30 | 17 - 25 |
| Spark plug | M14 | 150 - 170 | 130 - 150 |
| Starter pawl | M 5† | 30 - 40 | 25 - 35 |
| Starter case | M 4* | 25 - 35 | 20 - 30 |
| Muffler | M 5 | 60 - 70 | 50 - 60 |
| Isolator Front | M 4* | 20 - 30 | 17 - 25 |
| | M 5 | 35 - 45 | 30 - 40 |
| Rear | M 4 | 25 - 35 | 20 - 30 |
| Auto-oiler | M 5 | 30 - 40 | 25 - 35 |
| Throttle latch | M10 | 6 - 8 | 5 - 7 |
| Front handle top | M 5 | 30 - 40 | 25 - 35 |
| Brake lever** (hand guard) | M 5 | 30 - 40 | 25 - 35 |
| Guide bar | M 6 | 90 - 110 | 80 - 95 |
| Regular bolt, nut, and screw | M 3 | 6 - 10 | 5 - 9 |
| | M 4 | 15 - 25 | 13 - 22 |
| | M 5 | 25 - 45 | 22 - 40 |
| | M 6 | 45 - 75 | 40 - 65 |

LM: Left-hand thread.

* Tapping screw.

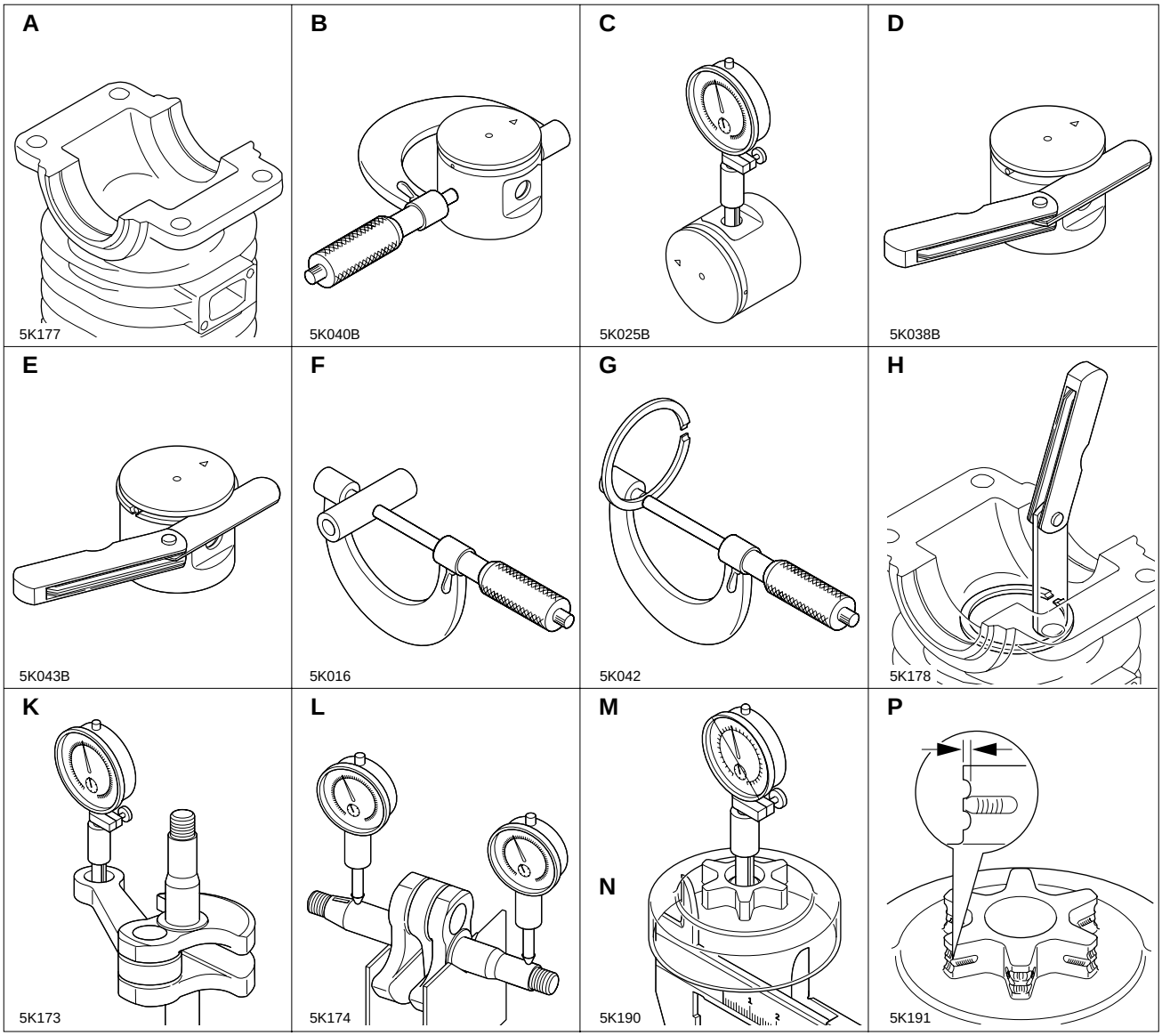
** See "2-4 Replacing brake lever fasteners" on page 8.

† Apply thread locking sealant.

**1-5 Special repairing materials**

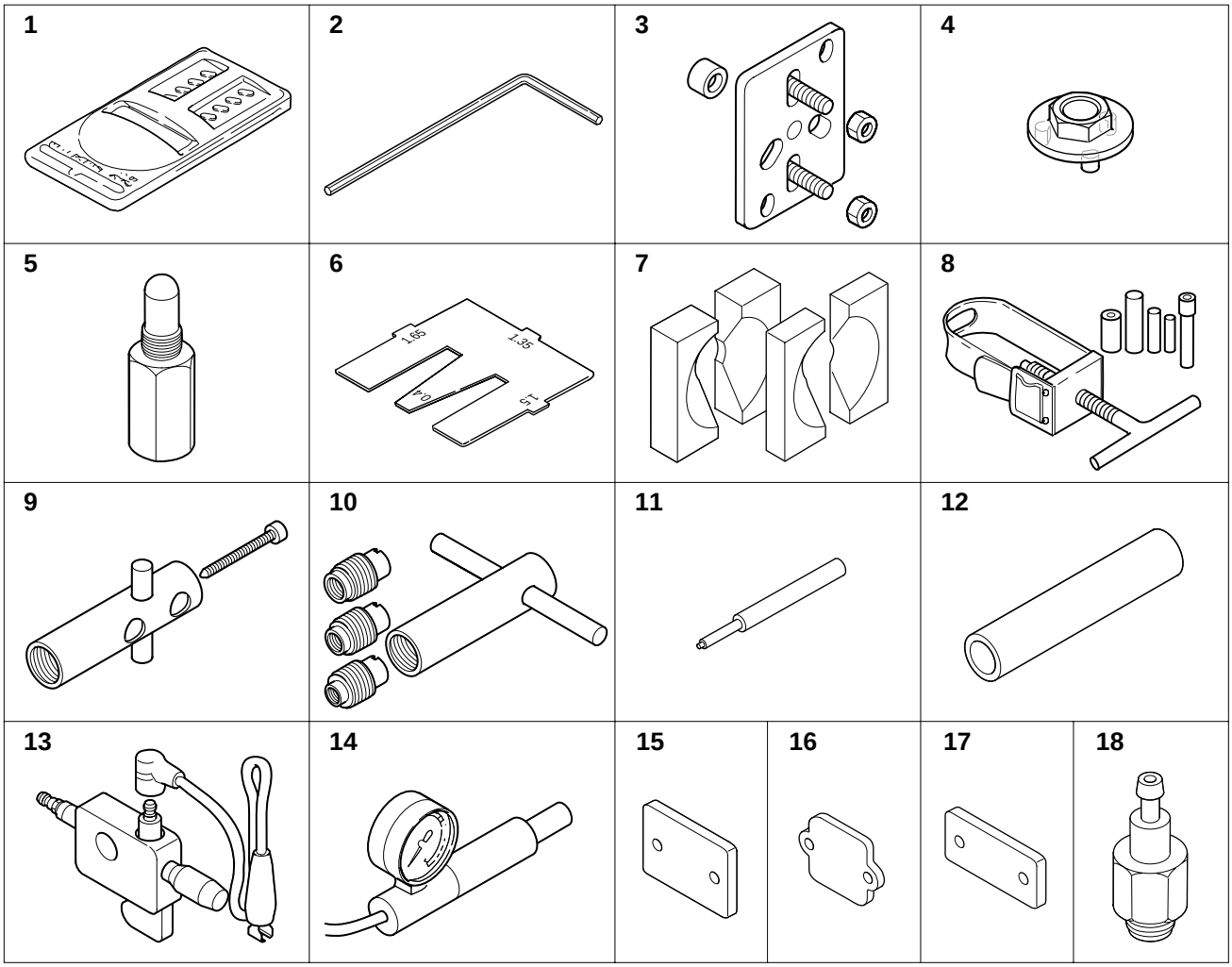
| Material | Location | Remarks |
|---|---|---|
| Adhesive | Ball bearing outer / crankcase | Loctite Retaining Compound #675 or equivalent |
| | Oil pipe grommet | Loctite Instant Adhesive #424 or equivalent |
| Grease | Auto-oiler worm | Lithium based grease |
| | Clutch needle bearing | |
| | Rewind spring | |
| | Brake band seal | |
| | Chain brake (metal contact part) | Molybdenum grease (approx. 1 gram) |
| Liquid gasket | Crankcase seams | Loctite #518 or equivalent |
| Thread locking sealant | Starter pawl screws | Loctite #222 or equivalent |
| | Ignition coil (CDI module) screws | |
| | Auto-oiler screw | |

### 1-6 Service limits




| Model | | | | CS-3000 CS-3050 | CS-3400 CS-3450 |
|---|---|---|---|---|---|
| A | Cylinder bore | | | When plating is worn and aluminum can be seen | |
| B | Piston outer diameter | mm(in) | Min. | 36.91 (1.453) | 38.91 (1.532) |
| C | Piston pin bore | mm(in) | Max. | 8.030 (0.3161) | |
| D | Piston ring groove | mm(in) | Max. | 1.3 (0.051) | 1.6 (0.063) |
| E | Piston ring side clearance | mm(in) | Max. | 0.15 (0.006) | 0.1 (0.004) |
| F | Piston pin outer diameter | mm(in) | Min. | 7.98 (0.3142) | |
| G | Piston ring width | mm(in) | Min. | 1.15 (0.045) | 1.45 (0.571) |
| H | Piston ring end gap | mm(in) | Max. | 0.5 (0.02) | |
| K | Con-rod small end bore | mm(in) | Max. | 11.025 (0.4341) | |
| L | Crankshaft runout | mm(in) | Max. | 0.05 (0.002) | |
| M | Sprocket bore | mm(in) | Max. | 13.08 (0.5150) | |
| N | Clutch drum bore | mm(in) | Max. | 61.0 (2.40) | |
| P | Sprocket wear limit | mm(in) | Max. | 0.5 (0.02) | |

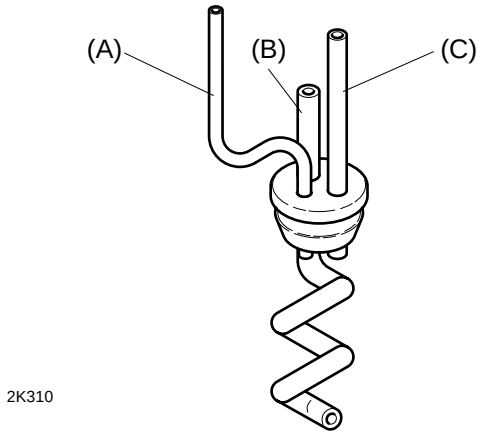
**1-7 Special tools**



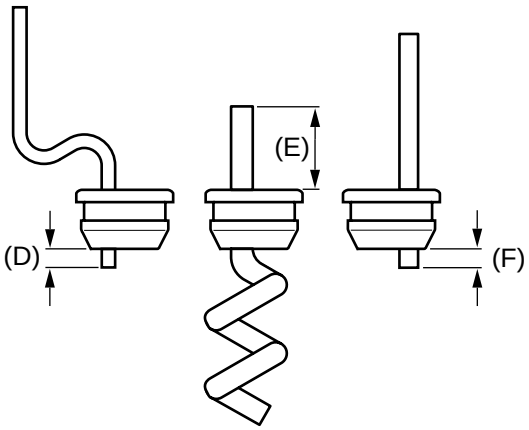

| Key | Part Number | Description | Used for: |
|---|---|---|---|
| 1 | | Tachometer | Measuring engine speed to adjust carburetor |
| 2 | 895610-79920 | L-hex. wrench (4 mm) | Removing and installing hex. socket bolt (M5) |
| 3 | 897501-03938 | Puller | Removing flywheel |
| 4 | 897505-16133 | Clutch tool | Removing and installing clutch assembly |
| 5 | 897537-30130 | Piston stopper | Locking crankshaft rotation |
| 6 | 897563-19830 | Metering lever gauge | Measuring metering lever height on carburetor |
| 7 | 897701-02830 | Bearing wedge | Removing crankshaft ball bearings |
| 8 | 897702-30131 | Piston pin tool | Removing and installing piston pin (Use 8 mm dia. adapter.) |
| 9 | 897708-19834 | Worm remover | Removing worm of auto-oiler |
| 10 | 897708-37532 | Worm inserter | Installing worm of auto-oiler (Use smallest adapter.) |
| 11 | 897724-01361 | Spring pin tool | Removing and installing spring pin (4 mm or 5/32 in dia.) |
| 12 | 897726-09130 | Oil seal tool | Installing ball bearings on crankshaft |
| 13 | 897800-79931 | Spark tester | Checking ignition system |
| 14 | 897803-30130 | Pressure tester | Testing carburetor and crankcase leakages |
| 15 | 897826-16131 | Pressure plug | Plugging intake port to test crankcase / cylinder leakages |
| 16 | 897827-16131 | Pressure plate | Plugging intake port to test crankcase / cylinder leakages |
| 17 | 897828-12330 | Pressure plug | Plugging exhaust port to test crankcase / cylinder leakages |
| 18 | 897835-16131 | Pressure connector | Testing crankcase and cylinder leakages |

## 2 SERVICE HINT

### 2-1 Installing fuel pipes and grommet




2K310



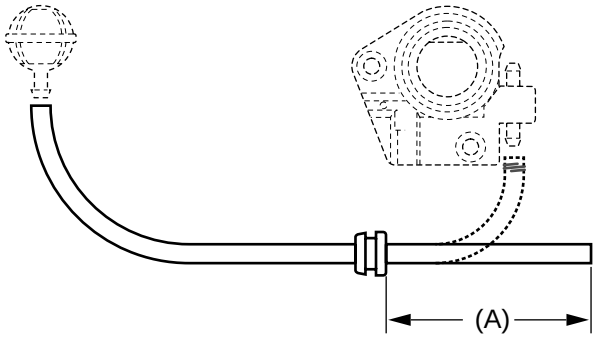

2K311

1. Preassemble fuel return pipe (A), fuel pipe (B), and vent pipe (C) to the grommet as shown .

(D): 5 mm (0.2 in)
(E): 23 mm (0.9 in)
(F): 5 mm (0.2 in)

2. Install the grommet together with pipes so that vent pipe (C) faces rear (engine side).

### 2-2 Installing new oil pipe and grommet



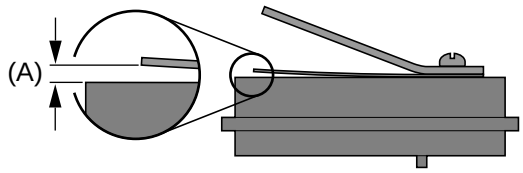

6K270

1. Insert new oil pipe to the grommet as shown.

(A): 62 to 68 mm (2.45 to 2.65 in)

2. Apply an adhesive (Loctite #424 or equivalent adhesive for synthetic rubber) on the grommet bore.

### 2-3 Checking reed valve




2K312

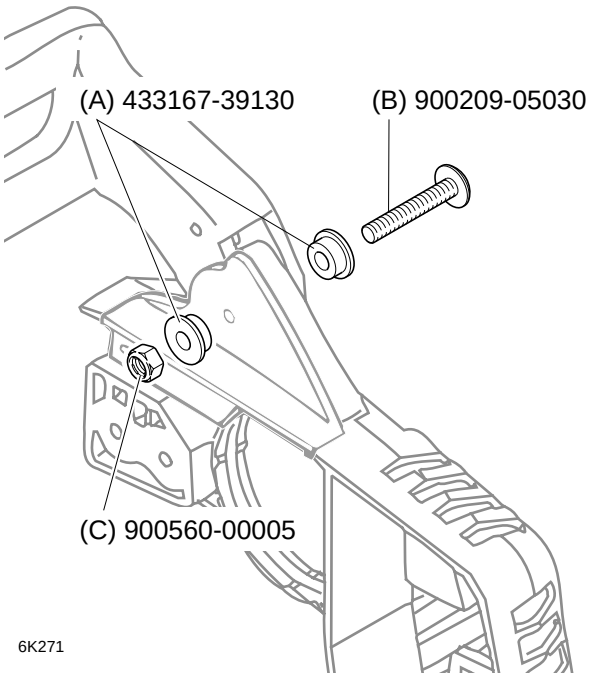
1. Check reed valve for damage, crack, or warp, or if it lifts off from insulator.

2. If the lift is (A) more than 0.3 mm (0.012 in), remove two screws to clean dust or dirt under reed valve.

3. Retighten two screws securing reed valve and the retainer to 8 to 12 kgf•cm (7 to 10 in•lb).

4. Replace insulator and reed valve as a set if defective.

### 2-4 Replacing brake lever fasteners




6K271

**NOTE**: **Always use two spacers (A), screw (B), and lock nut (C) to secure brake lever even if other type fasteners are originally used.**

1. Insert two spacers (A) to both side of brake lever pivot part respectively.

2. Insert screw (B) through the spacers and sprocket guard.

3. Tighten the screw with lock nut (C).

**NOTE**: Fastening torque should be 30 to 40 kgf•cm (25 to 35 in•lbf).