# SHOP MANUAL

# NAVI

## A Few Words About Safety

## Service information

The service and repair information contained in this manual is intended for use by qualified, professional technicians.

Attempting service or repairs without the proper training, tools, and equipment could cause injury to you or others. It could also damage the vehicle or create an unsafe condition.

This manual describes the proper methods and procedures for performing service, maintenance, and repairs. Some procedures require the use of specially designed tools and dedicated equipment. Any person who intends to use a replacement part, service procedure or a tool that is not recommended by Honda, must determine the risks to their personal safety and the safe operation of the vehicle.

If you need to replace a part, use genuine Honda parts with the correct part number or an equivalent part. We strongly recommended that you do not use replacement parts of inferior quality.

## For Your Customer's Safety

Proper service and maintenance are essential to the customer's safety and the reliability of the vehicle. Any error or oversight while servicing a vehicle can result in faulty operation, damage to the vehicle, or injury to others.

## For Your Safety

Because this manual is intended for the professional service technician, we do not provide warnings about many basic shop safety practices (e.g,.Hot parts – wear gloves). If you have not received shop safety training or do not feel confident about your knowledge of safe servicing practice, we recommended that you do not attempt to perform the procedures described in this manual.

Some of the most important general service safety precautions are given below. However, we cannot warn you of every conceivable hazard that can arise in performing service and repair procedures. Only you can decide whether or not you should perform a given task.

**⚠ WARNING**

Improper service or repairs can create an unsafe condition that can cause your customer or others to be seriously hurt or killed.

Follow the procedures and precautions in this manual and other service materials carefully.

**⚠ WARNING**

Failure to properly follow instructions and precautions can cause you to be seriously hurt or killed.

Follow the procedures and precautions in this manual carefully.

## Important Safety Precautions

Make sure you have a clear understanding of all basic shop safety practices and that you are wearing appropriate clothing and using safety equipment. When performing any service task, be especially careful of the following:

- Read all of the instructions before you begin, and make sure you have the tools, the replacement or repair parts, and the skills required to perform the tasks safely and completely.
- Protect your eyes by using proper safety glasses, goggles or face shields any time you hammer, drill, grind, pry or work around pressurized air or liquids, and springs or other stored-energy components. If there is any doubt, put on eye protection.
- Use other protective wear when necessary, for example gloves or safety shoes. Handling hot or sharp parts can cause severe burns or cuts. Before you grab something that looks like it can hurt you, stop and put on gloves.
- Protect yourself and others whenever you have the vehicle up in the air. Any time you lift the vehicle, either with a hoist or a jack, make sure that it is always securely supported. Use jack stands.

Make sure the engine is off before you begin any servicing procedures, unless the instruction tells you to do otherwise. This will help eliminate several potential hazards:

- Carbon monoxide poisoning from engine exhaust. Be sure there is adequate ventilation whenever you run the engine.
- Burns from hot parts or coolant. Let the engine and exhaust system cool before working in those areas.
- Injury from moving parts. If the instruction tells you to run the engine, be sure your hands, fingers and clothing are out of the way.

Gasoline vapors and hydrogen gases from batteries are explosive. To reduce the possibility of a fire or explosion, be careful when working around gasoline or batteries.

- Use only  a nonflammable solvent, not gasoline, to clean parts.
- Never drain or store gasoline in an open container.
- Keep all cigarettes sparks and flames away from the battery and all fuel-related parts.

# HOW TO USE THIS MANUAL

This service manual describes the service procedures for the NVA110G.

Follow the Maintenance Schedule (Section 3) recommendations to ensure that the vehicle is in peak operating condition.

Performing the first scheduled maintenance is very important. It compensates for the initial wear that occurs during the break-in period.

Sections 1 and 3 apply to the whole vehicle. Section 2 illustrates procedures for removal/installation of components that may be required to perform service described in the following sections.

Section 4 through 18 describe parts of the vehicle, grouped according to location.

Find the section you want on this page, then turn to the table of contents on the first page of the section.

Most sections start with an assembly or system illustration, service information and troubleshooting for the section. The subsequent pages give detailed procedures.

If you don't know the source of the trouble, go to section 20 Troubleshooting.

Your safety, and the safety of others, is very important. To help you make informed decisions we have provided safety messages and other information throughout this manual. Of course, it is not practical or possible to warn you about all the hazards associated with servicing this vehicle. You must use your own good judgement.

You will find important safety information in a variety of forms including:

- Safety Labels – on the vehicle
- Safety Messages – preceded by a safety alert symbol ⚠ and one of three signal words, DANGER, WARNING, or CAUTION. These signal words mean:

**⚠ DANGER** You WILL be KILLED or SERIOUSLY HURT if you don't follow instructions.

**⚠ WARNING** You CAN be KILLED or SERIOUSLY HURT if you don't follow instructions.

**⚠ CAUTION** You CAN be HURT if you don't follow instructions.

- Instructions– How to service this vehicle correctly and safely.

As you read this manual, you will find information that is preceded by a **NOTICE** symbol. The purpose of this message is to help prevent damage to your vehicle, other property, or the environment.

Some information provided in this manual is applicable for ID type model only.



**Honda Motor Co., Ltd.**
**SERVICE PUBLICATION OFFICE**

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# CONTENTS

# SYMBOLS

The symbols used throughout this manual show specific service procedures. If supplementary information is required pertaining to these symbols, it would be explained specifically in the text without the use of the symbols.

| | |
|---|---|
|  | Replace the part(s) with new one(s) before assembly. |
|  | Use recommended engine oil, unless otherwise specified. |
|  | Use molybdenum oil solution (mixture of the engine oil and molybdenum grease in a ratio of 1:1). |
|  | Use multi-purpose grease (Lithium based multi-purpose grease NLGI #2 or equivalent). |
|  | Use water resistant multi-purpose grease (Shell Alvania EP2 or Excelite EP2 (KYODO YUSHI CO. LTD) or equivalent). |
|  | Use molybdenum disulfide grease (containing more than 3% molybdenum disulfide, NLGI #2 or equivalent).<br>Example: Molykote® BR-2 plus manufactured by Dow corning U.S.A.<br>Multi-purpose M-2 manufactured by Mitsubishi Oil, Japan |
|  | Use molybdenum disulfide paste (containing more than 40% molybdenum disulfide, NLGI #2 or equivalent).<br>Example: Molykote® G-n paste manufactured by Dow Corning, U.S.A.<br>Honda Moly 60 (U.S.A. only)<br>Rocol ASP manufactured by Rocol Limited, U.K.<br>Rocol Paste manufactured by Sumico Lubricant, Japan |
|  | Use silicone grease. |
|  | Apply a locking agent. Use a middle strength locking agent unless otherwise specified. |
|  | Apply sealant. |
|  | Use DOT 3 or DOT 4 brake fluid. Use the recommended brake fluid unless otherwise specified. |
|  | Use Fork or Suspension Fluid. |
|  | Use Lithoplex -2 |

# 1. GENERAL INFORMATION





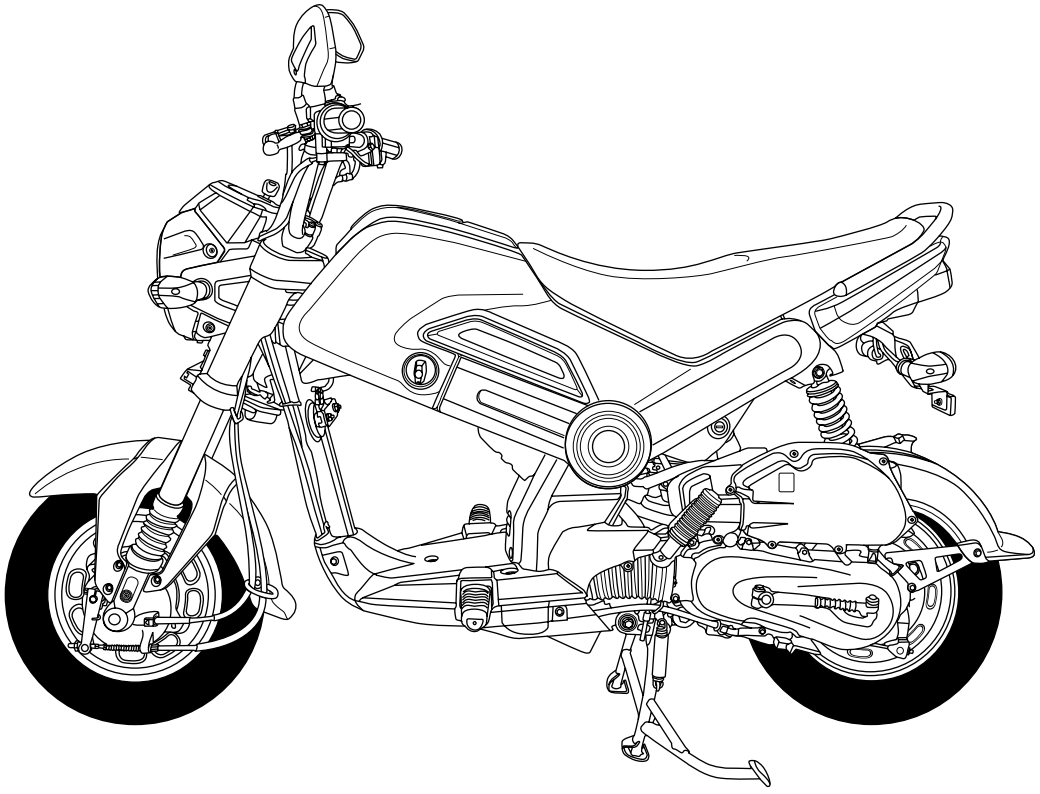
## SERVICE RULES

1. Use genuine Honda or Honda-recommended parts and lubricants or their equivalents. Parts that do not meet Honda's design specifications may cause damage to the vehicle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing this vehicle. Metric bolts, nuts and screws are not interchangeable with english fasteners.
4. Install new gaskets, O-rings, cotter pins, and lock plates while reassembling.
5. When tightening bolts or nuts, begin with the larger diameter of inner bolts first. Then tighten to the specified torque diagonally in incremental steps unless a particular sequence is specified.
6. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
7. After reassembly, check all parts for proper installation and operation.
8. Route all cables, electrical wires and wiring harness as shown in pages 1-13 to 1-18, Cable and Harness Routing.

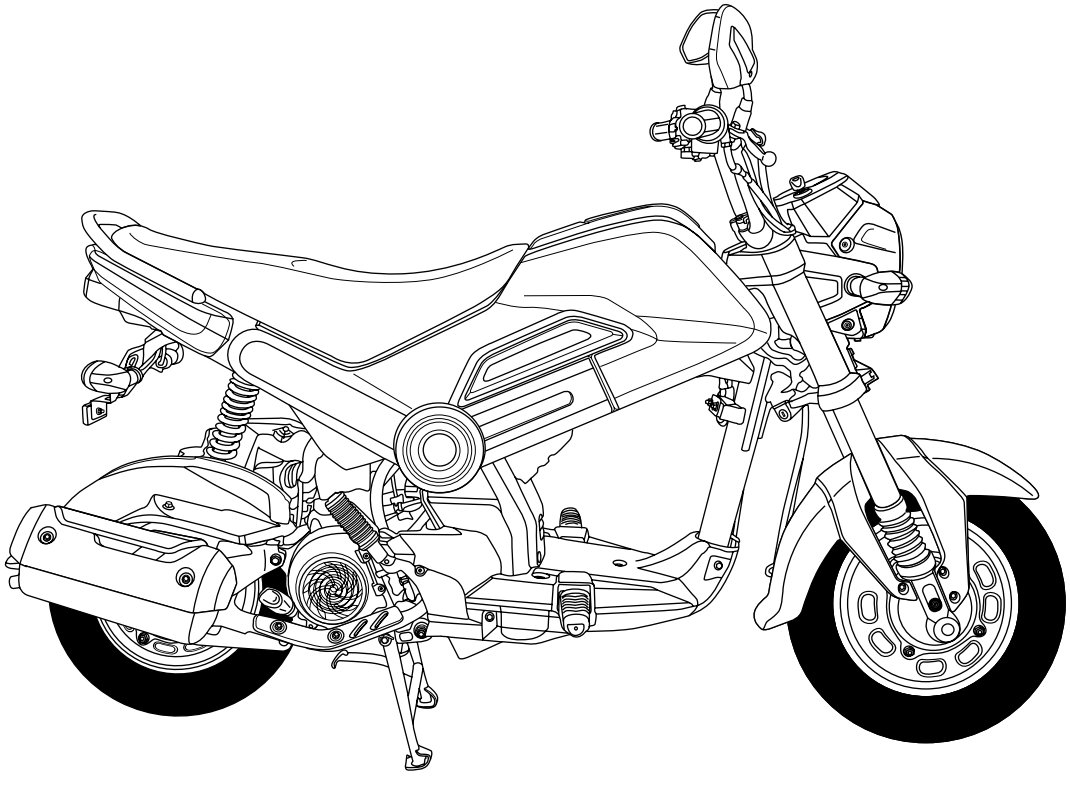
# MODEL IDENTIFICATION

This manual covers NVA110G model

**Left side view**



**Right side view**

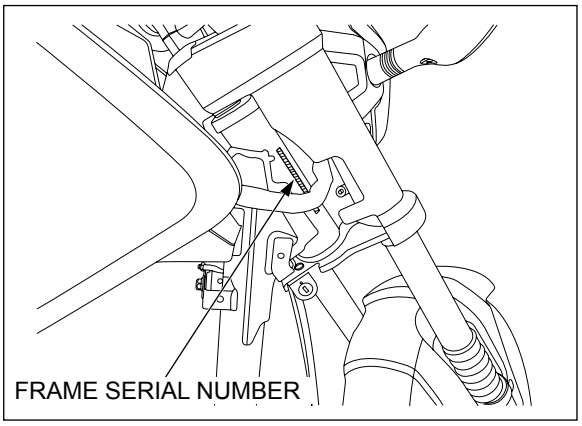


# SERIAL NUMBERS

## Frame serial number

The Vehicle Identification Number (V.I.N.) is stamped other right side of the steering head.

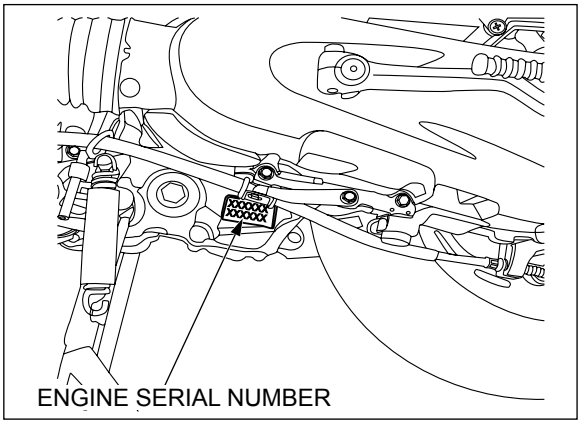
**Vehicle identification number: ME4JF65**1KFXXXXXXX




## Engine serial number

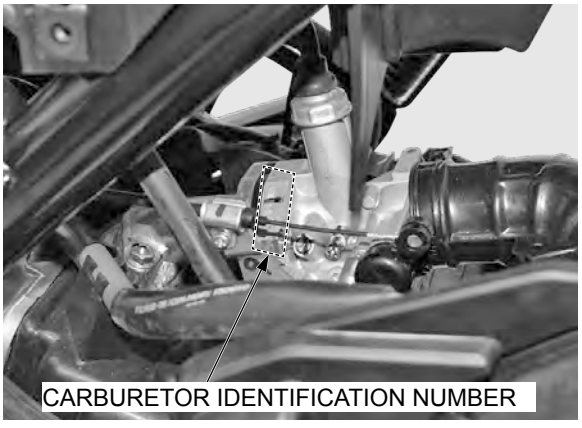
The Engine Serial Number is stamped on the lower left side of the crankcase.

**Engine serial number: JF65E – X – XXXXXXX**




## Carburetor serial number

The carburetor identification number is stamped on the left side of the carburetor body.



# GENERAL SPECIFICATIONS

| | ITEM | | SPECIFICATION | Page NO. |
|---|---|---|---|---|
| DIMENSIONS | Overall length | | 1805 mm (71 in) | – |
| | Overall width | | 748 mm (29.4 in) | – |
| | Overall height | | 1039 mm (40.9 in) | – |
| | Wheelbase | | 1286 mm (50.6 in) | – |
| | Seat height | | 765 mm (30.1 in) | – |
| | Foot peg height | | 296 mm (11.7 in) | – |
| | Ground clearance | | 156 mm (6.1 in) | – |
| | Dry weight | (STD) | 96.4 kg (212.5 lbs) | – |
| | Curb weight | (STD) | 101 kg (222.6 lbs) | – |
| | Maximum weight capacity | | 153 kg (337.3 lbs) | – |
| FRAME | Frame type | | Under Born Type (Steel) | – |
| | Front suspension | | Telescopic fork | Page 3-17 |
| | Front axle travel | | 89 mm (3.5 in) | – |
| | Rear suspension | | Other | Page 3-17 |
| | Rear axle travel | | 70 mm (2.7 in) | – |
| | Front tyre | Size | 90/90-12 54J | – |
| | | Brand | MRF, TVS,CEAT | – |
| | Rear tyre | Size | 90/100-10 53J | – |
| | | Brand | MRF, TVS,CEAT | – |
| | Front brake | Drum Type | Mechanical Leading Trailing | – |
| | Rear brake | Drum Type | Mechanical Leading Trailing | – |
| | Caster angle | | $27^0$ 30 | – |
| | Trail length | | 81.5 mm (3.2 in) | – |
| | Fuel tank capacity | | 3.8 litre (1.0 US gal, 0.84 Imp gal) | – |
| | Fuel tank reserve capacity | | 0.9 litre (0.23 US gal, 0.19 Imp gal) | – |
| ENGINE | Type | | Gasoline, air-cooled 4-stroke | – |
| | Cylinder arrangement | | Single cylinder inclined 80° from vertical | – |
| | Bore and stroke | | 50.0 x 55.609 mm (1.97 x 2.19 in) | – |
| | Displacement | | 109.19 $cm^3$ | – |
| | Compression ratio | | 9.5 : 1 | – |
| | Valve train | | Chain driven, SOHC | – |
| | Intake valve | Opens at 1 mm (0.04 in) lift | 10° BTDC | – |
| | | Closes at 1 mm (0.04 in) lift | 35° ABDC | – |
| | Exhaust valve | Opens at 1 mm (0.04 in) lift | 25° BBDC | – |
| | | Closes at 1 mm (0.04 in) lift | 0° ATDC | – |
| | Lubrication system | | Pressing/ Spray | – |
| | Oil pump type | | Trochoid | – |
| | Cooling system | | Fan cooled | – |
| | Air filtration | | Viscous paper filter | – |
| | Engine dry weight | | 25.7 kg (56.7 lbs) | – |
| CARBURETOR | Carburetor type | | Piston type | – |
| | Throttle bore | | 16 mm (0.63 in) | – |
| DRIVE TRAIN | Clutch system | | Automatic centrifugal clutch (Dry type) | – |
| | Final reduction | | 10.117 (51T/19T x 49T/13T) | – |
| | CVT ratio | | 2.55:1 ~ 0.8:1 | – |
| ELECTRICAL | Battery capacity | | 12V, 3Ah | Page 15-3 |
| | Ignition system | | Full Transsisterized | Page 16-1 |
| | Starting system | | Self & Kick / Decomp | – |
| | Charging system | | Single phase output alternator | Page 15-1 |
| | Regulator/ Rectifier | | SCR Shorted, Single phase half wave | Page 15-8 |

# LUBRICATION SYSTEM SPECIFICATIONS

Unit: mm (in)

| ITEM | | STANDARD | SERVICE LIMIT | Page NO. |
|---|---|---|---|---|
| Engine oil capacity | At draining | 0.7 liters (0.7 US qt, 0.6 lmp qt) | – | Page 3-10 |
| | At disassembly | 0.8 liters (0.8 US qt, 0.7 lmp qt) | – | Page 3-10 |
| Recommended engine oil | | Honda 4-stroke oil or equivalent motor oil<br>API service classification: MA<br>Viscosity: SAE 10W-30 | – | Page 3-9 |
| Oil pump rotor | Tip clearance | 0.15 (0.006) | 0.20 (0.008) | Page 4-3 |
| | Body clearance | 0.15 – 0.21 (0.006 – 0.008) | 0.35 (0.014) | Page 4-3 |
| | Side clearance | 0.05 – 0.10 (0.002 – 0.004) | 0.12 (0.005) | Page 4-3 |

# FUEL SYSTEM SPECIFICATIONS

Unit: mm (in)

| ITEM | SPECIFICATIONS | Page NO. |
|---|---|---|
| Carburetor identification number | PB5TH | Page 1-3 |
| Venturi diameter | 16 mm (0.63 in) | – |
| Main jet | #85 | Page 5-7 |
| Slow jet | #35 x #35 | Page 5-7 |
| Float level | 11.7 ± 0.5 mm (0.46 ± 0.02 in) | Page 5-7 |
| Air screw initial opening | 1 3/4 turns out | Page 5-9 |
| Engine idle speed | 1,700 ± 100 $min^{-1}$ (RPM) | Page 5-10 |
| PAIR control valve specified vacuum | 460 mmHg (18.11 in Hg) | Page 5-10 |

# CYLINDER HEAD/VALVES SPECIFICATIONS

Unit: mm (in)

| ITEM | | | STANDARD | SERVICE LIMIT | Page NO. |
|---|---|---|---|---|---|
| Cylinder compression at 600 $min^{-1}$ (rpm) | | | 0.98 MPa (9.99 $kgf/cm^2$, 142 psi) | – | Page 7-3 |
| Valve clearance | | IN | 0.16 mm (0.006 in) | – | Page 3-8 |
| | | EX | 0.16 mm (0.006 in) | – | Page 3-8 |
| Camshaft | Height | IN | 32.1087 - 32.1527 | 32.084 (1.2631) | Page 7-20 |
| | | EX | 31.94 - 31.85 | 31.80 (1.23) | Page 7-20 |
| Cylinder head warpage | | | – | 0.05 (0.002) | Page 7-20 |
| Rocker arm | Arm I.D. | IN/EX | 10.000 – 10.015 (0.3937 – 0.3943) | 10.10 (0.398) | Page 7-7 |
| | Shaft O.D. | IN/EX | 9.972 – 9.987 (0.3926 – 0.3932) | 9.91 (0.390) | Page 7-7 |
| | Arm to shaft clearance | IN/EX | 0.013 – 0.043 (0.0005 – 0.0017) | 0.10 (0.004) | Page 7-9 |
| Valve, valve guide | Stem O.D. | IN | 4.975 – 4.990 (0.1959 – 0.1964) | 4.90 (0.193) | Page 7-8 |
| | | EX | 4.955 – 4.970 (0.1955 – 0.1956) | 4.90 (0.193) | Page 7-8 |
| | Guide I.D. | IN/EX | 5.000 – 5.012 (0.1969 – 0.1973) | 5.03 (0.198) | Page 7-9 |
| | Stem-to-guide clearance | IN | 0.010 – 0.037 (0.0004 – 0.0015) | 0.08 (0.003) | Page 7-9 |
| | | EX | 0.030 – 0.057 (0.0012 – 0.0022) | 0.10 (0.004) | Page 7-9 |
| Valve spring | Free length | | 29.78 (1.17) | 27.87 (1.1) | Page 7-9 |
| Valve seat width | | IN/EX | 0.7 (0.027) | – | – |

# CYLINDER/PISTON SPECIFICATIONS

Unit: mm (in)

| ITEM | | | STANDARD | SERVICE LIMIT | Page NO. |
|---|---|---|---|---|---|
| Cylinder | I.D. | | 50.005 – 50.015 (1.9686 – 1.9690) | 50.1 (1.972) | Page 8-2 |
| | Out-of-round | | – | 0.05 (0.002) | Page 8-3 |
| | Taper | | – | 0.05 (0.002) | Page 8-3 |
| | Warpage | | – | 0.05 (0.002) | Page 8-3 |
| Piston, piston pin, piston ring | Piston O.D. at 5 (0.2) from bottom | | 49.980 – 49.995 (1.9677 – 1.9683) | 49.9 (1.964) | Page 8-4 |
| | Piston pin hole I.D. | | 12.002 – 12.008 (0.4725 – 0.4727) | 12.04 (0.474) | Page 8-4 |
| | Piston pin O.D. | | 11.994 – 12.000 (0.4722 – 0.4724) | 11.98 (0.471) | Page 8-4 |
| | Piston-to-piston pin clearance | | 0.002 – 0.014 (0.0001 – 0.0006) | 0.02 (0.001) | Page 8-4 |
| | Piston ring-to-ring groove clearance | Top<br>Second | 0.010 – 0.025 (0.0004 - 0.0010)<br>0.020 – 0.070 (0.0008 - 0.0028) | 0.45 (0.018) | Page 8-3 |
| | Piston ring end gap | Top/ Second | 0.15 – 0.45 (0.0006 – 0.0015) | 0.08 (0.03) | Page 8-4 |
| | | Oil (side rail) | | – | – |
| Cylinder-to-piston clearance | | | 0.010 – 0.035 (0.0004 - 0.0013) | 0.10 (0.004) | Page 8-2 |
| Connecting rod small end I.D. | | | 12.010 – 12.028 (0.4728 - 0.4735) | 12.05 (0.474) | Page 8-4 |
| Connecting rod-to-piston pin clearance | | | 0.010 – 0.034 (0.0003 - 0.0013) | 0.05 (0.002) | Page 8-4 |

# KICKSTARTER/DRIVE & DRIVEN PULLEY/CLUTCH SPECIFICATIONS

Unit: mm (in)

| ITEM | | | | SERVICE LIMIT | Page NO. |
|---|---|---|---|---|---|
| Drive belt width | | 19.5 (0.76) | | 19.2 (0.75) | Page 9-14 |
| Movable drive face | Busing I.D. | 22.035 – 22.085 (0.8675 – 0.8695) | | 22.60 (0.889) | Page 9-11 |
| | Boss O.D. | 21.4 – 21.6 (0.8665 – 0.8671) | | 21.0 (0.826) | Page 9-11 |
| | Weight roller O. D. | 19.92 – 20.08 (0.705 – 0.712) | | 19.40 (0.763) | Page 9-11 |
| Clutch | Outer I.D. | 125.0 – 125.2 (4.921 – 4.929) | | 125.5 (4.941) | Page 9-15 |
| | Lining thickness | 4.0 (0.12) | | 2.0 (0.08) | Page 9-15 |
| Driven pulley | Face spring free length | FCC | 99.6 (3.921) | 85.4 (3.36) | Page 9-15 |
| | | EXEDY | 101.3 (3.99) | 92.2 (3.62) | Page 9-15 |
| | Driven face O.D. | 33.965 – 33.985 (1.3372 – 1.3380) | | 33.94 (1.336) | Page 9-15 |
| | Movable driven face I.D. | 34.000 – 34.025 (1.3386 – 1.3396) | | 34.06 (1.341) | Page 9-16 |

# FINAL REDUCTION SPECIFICATIONS

Unit: mm (in)

| ITEM | | STANDARD | Page NO. |
|---|---|---|---|
| Final reduction oil capacity | At disassembly | 0.12 liter (0.13 US qt, 0.11 lmp qt) | Page 10-8 |
| | At draining | 0.10 liter (0.11 US qt, 0.09 lmp qt) | Page 10-8 |
| Recommended final reduction oil | | Honda 4-stroke oil or equivalent motor oil<br>API service classification: MA<br>Viscosity: SAE 10W-30 | Page 10-8 |

# CRANKCASE/CRANKSHAFT SPECIFICATIONS

Unit: mm (in)

| | ITEM | STANDARD | SERVICE LIMIT | Page NO. |
|---|---|---|---|---|
| Crankshaft | Connecting rod big end side clearance | 0.10 – 0.35 (0.004 – 0.014) | 0.55 (0.022) | Page 12-3 |
| | Connecting rod big end radial clearance | 0.004 – 0.016 (0.0001 – 0.0006) | 0.04 (0.002) | Page 12-4 |
| | Crankshaft runout | – | 0.1 (0.04) | Page 12-4 |

# ELECTRIC STARTER SPECIFICATION

Unit: mm (in)

| ITEM | STANDARD | SERVICE LIMIT | Page NO. |
|---|---|---|---|
| Starter motor brush length | 9.0 (0.35) | 3.5 (0.14) | Page 17-3 |

# FRONT WHEEL/BRAKE/SUSPENSION/STEERING SPECIFICATIONS

Unit: mm (in)

| ITEM | | STANDARD | SERVICE LIMIT | Page NO. |
|---|---|---|---|---|
| Cold tyre pressure | Driver only | 150 kPa (1.50 kgf/cm², 22 psi) | – | Page 3-18 |
| | Driver and passenger | 150 kPa (1.50 kgf/cm², 22 psi) | – | Page 3-18 |
| Rim size | | 12 x 2.15 in | | – |
| Front axle runout | | – | 0.1 (0.003) | Page 13-5 |
| Front wheel rim runout | Radial | – | 1.0 (0.03) | Page 13-5 |
| | Axial | – | 1.0 (0.03) | Page 13-5 |
| Front brake drum I.D. | | 130 (5.12) | 131 (5.16) | Page 13-8 |

# REAR WHEEL/BRAKE/SUSPENSION SPECIFICATIONS

Unit: mm (in)

| ITEM | | STANDARD | SERVICE LIMIT | Page NO. |
|---|---|---|---|---|
| Cold tyre pressure | Driver only | 200 kPa (2.00 kgf/cm², 29 psi) | – | Page 3-18 |
| | Driver and passenger | 250 kPa (2.50 kgf/cm², 36 psi) | – | Page 3-18 |
| Rim size | | 10 x 2.15 in | | |
| Rear wheel rim runout | Radial | – | 1.0 (0.03) | Page 14-3 |
| | Axial | – | 1.0 (0.03) | Page 14-3 |
| Rear brake drum I.D. | | 130 (5.11) | 131 (5.16) | Page 14-4 |

# BATTERY/CHARGING SYSTEM SPECIFICATIONS

Unit: mm (in)

| ITEM | | | SPECIFICATION | Page NO. |
|---|---|---|---|---|
| Battery | Capacity | | 12 V – 3 Ah | Page 15-3 |
| | Current leakage | | 0.26 mA max. | Page 15-8 |
| Rectifier comp. Regulator | Regulated voltage | Charging | 13.9 – 14.7 V/5,000 min$^{-1}$ (rpm) | – |
| | | Lighting | 12.7 – 13.7 V/5,000 min$^{-1}$ (rpm) | – |
| Alternator coil resistance at 20°C (68°F) | | Charging coil | 0.2 – 1.0 Ω | Page 15-8 |

# IGNITION SYSTEM SPECIFICATIONS

Unit: mm (in)

| ITEM | | SPECIFICATION | Page NO. |
|---|---|---|---|
| Spark plug | Standard | NGK MR7C-9N | Page 3-7 |
| Spark plug gap | | 0.8~0.9 | Page 3-7 |
| Ignition primary peak voltage | | 100 V minimum | Page 16-3 |
| Ignition pulse generator peak voltage | | 0.7 V minimum | Page 16-4 |
| Ignition timing (“F” mark) | | 15° BTDC at 1,700 rpm | – |
| Maximum timing (Advance) | | 34° BTDC at 2,700 rpm | – |

# LIGHTS/METER/SWITCHES SPECIFICATIONS

Unit: mm (in)

| ITEM | | | SPECIFICATION | Page NO. |
|---|---|---|---|---|
| Bulb | Headlight | Hi beam | 12 V – 35 W | – |
| | | Low beam | 12 V – 35 W | – |
| | Tail/Brake Light | | 12 V – 5/21 W | – |
| | Front turn signal light | | 12 V – 10 W x 2 | – |
| | Rear turn signal light | | 12 V – 10 W x 2 | – |
| | Meter light | | 1.7 W x 1 | – |
| | Position light | | 5 W x 1 | – |
| | High beam indicator | | 1.7W x 1 | – |
| | Turn signal indicator | | 1.7W x 1 | – |
| Fuse | | Main Fuse | 10A | – |

# STANDARD TORQUE VALUES

| FASTENER TYPE | TORQUE N·m (kgf·m, lbf·ft) | | FASTENER TYPE | TORQUE N·m (kgf·m, lbf·ft) |
|---|---|---|---|---|
| 5 mm bolt and nut | 5 (0.5, 3.6) | | 5 mm screw | 4 (0.4, 2.9) |
| 6 mm bolt and nut | 10 (1.0, 7) | | 6 mm screw | 9 (0.9, 6.5) |
| 8 mm bolt and nut | 22 (2.2, 16) | | 6 mm flange bolt | 12 (1.2, 9) |
| 10 mm bolt and nut | 34 (3.5, 25) | | 8 mm flange bolt and nut | 26 (2.7, 19) |
| 12 mm bolt and nut | 54 (5.5, 40) | | 10 mm flange bolt and nut | 39 (4.0, 28) |

# FRAME & ENGINE TORQUE VALUES

- Torque specifications listed below are for important fasteners.
- Others should be tightened to standard torque values listed above.

## FRAME

| ITEM | QTY | THREAD DIA. (mm) | TORQUE N·m (kgf·m, lbf·ft) | REMARKS | PAGE NO. |
|---|---|---|---|---|---|
| **FRAME/BODY PANELS/EXHAUST SYSTEM** | | | | | |
| Muffler mounting bolt | 2 | 10 | 49 (5.0, 36) | | Page 2-10 |
| Muffler protector mounting bolt | 2 | 6 | 14 (1.4, 10.3) | | Page 2-9 |
| Exhaust, pipe nut | 2 | 7 | 29 (2.9, 21.4) | | Page 2-10 |
| Exhaust pipe protector bolt | 2 | 6 | 14 (1.4, 10.3) | | Page 2-9 |
| Floor set washer-bolt | 1 | 6 | 10 (1.0, 7.3) | | – |
| **FRONT WHEEL/BRAKE/SUSPENSION/STEERING** | | | | | |
| Fr. axle nut | 1 | 12 | 59 (6.0, 43) | PT Nut | Page 13-7 |
| Fr. hub nut | 4 | 8 | 23 (2.3, 16.96) | PT Nut | Page 13-6 |
| Fr. brake arm nut | 1 | 6 | 10 (1.0, 7.3) | | Page 13-13 |
| Handlebar lower holder nut | 2 | 10 | 39 (4.0, 29) | PT Nut | Page 13-23 |
| Handlebar upper holder bolt | 4 | 6 | 12 (1.2, 8.8) | | Page 13-16 |
| Fork top bridge bolt | 2 | 8 | 30 (3.0, 22.1) | | Page 13-23 |
| Steering stem nut | 1 | 24 | 74 (7.5, 55) | | Page 13-24 |
| Nut handle lever | 2 | 6 | 5.9 (0.6, 4.35) | | – |
| **REAR WHEEL/BRAKE/SUSPENSION** | | | | | |
| Rr. axle nut | 1 | 16 | 118 (12.0, 87) | PT Nut | Page 14-4 |
| Rr. hub nut | 4 | 10 | 49 (5.0, 36.1) | PT Nut | Page 14-4 |
| Rr. brake arm bolt | 1 | 6 | 10 (1.0, 7.3) | | Page 14-6 |
| Rr. cushion (upper side) bolt | 1 | 10 | 39 (4.0, 29) | | Page 14-7 |
| Rr. cushion (lower side) bolt | 1 | 8 | 22 (2.2, 16) | | Page 14-7 |
| **FUEL TANK/SIDE STAND** | | | | | |
| Fuel cock assy. | 1 | 16 | 18 (1.8, 13.27) | | – |
| Tank bolt | 4 | 6 | 10 (1.0, 7.3) | | – |
| Side stand pivot bolt | 1 | 10 | 10 (1.0, 7.3) | | – |
| Side stand pivot nut | 2 | 10 | 30 (3.0, 22.1) | | – |
| **ENGINE HANGER** | | | | | |
| Frame side - hanger bolt | 1 | 10 | – | | Page 6-3 |
| - hanger nut | 1 | 10 | 69 (7.0, 51) | | Page 6-3 |
| Engine side - hanger bolt | 1 | 10 | – | | Page 6-4 |
| - hanger nut | 1 | 10 | 49 (5.0, 36) | | Page 6-4 |
| **LIGHTS** | | | | | |
| Light assy. head bolt adjusting | 1 | 4 | 2 (0.2, 1.5) | | – |
| Light assy. tail screw | 6 | 4 | 1 (0.10, 0.73) | | – |
| Speedometer assy screw | 3 | 4 | 0.8 (0.08, 0.59) | | – |

## ENGINE

| ITEM | QTY | THREAD DIA. (mm) | TORQUE N·m (kgf·m, lbf·ft) | REMARKS | PAGE NO. |
|---|---|---|---|---|---|
| **MAINTENANCE** | | | | | |
| Spark plug | 1 | 10 | 16 (1.6, 12) | | Page 3-7 |
| Nut, tappet adjusting | 2 | 5 | 10 (1.0, 7.3) | Apply eng. oil | Page 3-9 |
| Bolt, plug drain | 1 | 12 | 24 (2.4, 17.7) | | Page 3-10 |
| Cap, oil filter | 1 | 30 | 20 (2.0, 14.7) | | Page 3-11 |
| Final drive oil bolt | 2 | 8 | 12 (1.3, 9.5) | Mission oil check and drain | Page 3-13 |
| **LUBRICATION SYSTEM** | | | | | |
| Oil pump assy. bolt | 2 | 6 | 10 (1.0, 7.3) | | Page 4-4 |
| Plate, oil pump screw | 1 | 4 | 3 (0.3, 2.2) | | Page 4-4 |
| Oil pump cover bolt | 1 | 6 | 10 (1.0, 7.3) | | Page 4-5 |
| | 1 | 6 | 10 (1.0, 7.3) | | Page 4-5 |
| **FUEL SYSTEM** | | | | | |
| Carburetor mounting bolt | 2 | 6 | 10 (1.0, 7.3) | | Page 5-8 |
| **CYLINDER HEAD/VALVES** | | | | | |
| Bolt, head cover | 2 | 6 | 12 (1.2, 8.8) | | Page 7-18 |
| Cyl. head comp stud bolt | 2 | 6 | 6 (0.6, 4.4) | | – |
| Lifter assy., tensioner screw | 1 | 6 | 4 (0.4, 2.9) | Apply eng. oil | Page 7-18 |
| Sprocket, cam bolt | 2 | 5 | 9 (0.9, 6.6) | Apply eng. oil | Page 7-17 |
| Head, cylinder nut | 4 | 7 | 18 (1.8, 13.2) | Head Side | Page 7-17 |
| Plate, breather separator screw | 3 | 5 | 3 (0.3, 2.2) | | Page 7-13 |
| Shroud, exhaust bolt | 1 | 10 | 7 (0.7, 5.1) | | Page 7-4 |
| **KICKSTARTER/DRIVE AND DRIVEN PULLEYS/CLUTCH** | | | | | |
| Plate, L. cover screw | 5 | 4 | 3 (0.3, 2.2) | | Page 9-7 |
| Kick starter pedal bolt | 1 | 8 | 29 (2.9, 22) | | Page 9-7 |
| Face comp., drive nut | 1 | 14 | 93 (9.3, 68.5) | Apply eng. oil | Page 9-19 |
| Outer comp., clutch nut | 1 | 12 | 49 (4.9, 36.1) | | Page 9-18 |
| Plate assy., drive nut | 1 | 28 | 54 (5.4, 39.8) | | Page 9-17 |
| **ALTERNATOR** | | | | | |
| Fan cover screw | 2 | 5 | 4 (0.4, 2.9) | | – |
| Fan cover bolt | 2 | 10 | 7 (0.7, 5.1) | | Page 11-4 |
| Fan comp., cooling bolt | 3 | 6 | 10 (1.0, 7.3) | | Page 11-4 |
| Flywheel comp. bolt | 1 | 10 | 39 (3.9, 28.7) | | Page 11-4 |
| Pulsar coil assy.(stator comp.) bolt | 2 | 5 | 6 (0.6, 4.4) | | Page 11-3 |
| Stator holding bolt | 2 | 6 | 10 (1.0, 7.3) | | Page 11-3 |
| Clamper, wire harness bolt | 1 | 6 | 12 (1.2, 8.8) | | Page 11-3 |
| **CRANKCASE** | | | | | |
| Pivot cam chain tensioner | 1 | 6 | 10 (1.0, 7.3) | | Page 12-6 |
| R Crank case stud bolt | 2 | 7 | 7 (0.7, 5.1) | | – |
| L Crank case stud bolt | 2 | 7 | 7 (0.7, 5.1) | | – |
| Cover crankcase comp. left bolts | 7 | 12 | 13 (1.3, 9.5) | NOTE 1 | Page 10-8 |
| **OTHERS** | | | | | |
| Bolt Main stand spring | 1 | 8 | 22 (2.2, 16) | | – |
| Stay comp. fuel tank nut | 1 | 8 | 20 (2.0, 14) | | – |

# TOOLS

| DESCRIPTION | TOOL NUMBER | REFERENCE SECTION |
|---|---|---|
| Float level gauge | 070MJ – 001 – I110 | 5 |
| Clutch center holder | 070MB – KPL – I200 | 9 |
| Universal holder | 070MB – KPL – I100 | 9, 11 |
| Fly wheel puller | 070MC – KPL – I200 | 11 |
| Bearing remover weight | 070MC – KPL – I300 | 9, 10 |
| Attachment, 32 x 35 mm | 070GD – 002 – I140 | 10, 13 |
| Attachment, 37 x 40 mm | 070GD – 002 – I150 | 10 |
| Attachment, 42 x 47 mm | 070GD – 002 – I160 | 10 |
| Attachment, 24 x 26 mm | 070GD – 002 – I120 | 9 |
| Attachment, 30 mm I.D. | 070GD – 003 – I120 | 13 |
| Pilot, 12 mm | 070GD – 004 – I130 | 10, 13 |
| Pilot, 17 mm | 070GD – 004 – I150 | 10 |
| Pilot, 20 mm | 070GD – 004 – I160 | 10 |
| Bearing remover shaft | 070GD – 005 – I100 | 13 |
| Bearing remover head, 12 mm | 070MD – 005 – I130 | 13 |
| Remover shaft | 070GC – 001 – I120 | 13 |
| Adjusting remover head | 070GC – 001 – I110 | 13 |
| Driver | 070GD – 001 – I100 | 9, 10, 13 |
| Valve spring compressor | 070GE – 001 – I100 | 7 |
| Seat cutter, 27.5 mm (45° EX) | 070MF – 003 – I180 | 7 |
| Seat cutter, 22 mm (45° IN) | 070MH – 003 – I150 | 7 |
| Flat cutter, 28 mm (32° EX) | 070MH – 002 – I120 | 7 |
| Flat cutter, 24 mm (32° IN) | 070MH – 002 – I180 | 7 |
| Interior cutter, 26 mm (60° IN/EX) | 070MF – 004 – I150 | 7 |
| Cutter holder | 070MH – 005 – I150 | 7 |
| Valve adjusting wrench | 070MA – 001 – I110 | 3 |
| Lock nut wrench | 070MA – KPL – I200 | 13 |
| Lock nut wrench, 45.5 mm | 070MA – KPL – I100 | 13 |
| Bearing remover head, 12 mm | 070MC – KPL – I400 | 10 |
| Bearing remover shaft, 12 mm | 070MC – KPL – I410 | 10 |
| Bearing remover head, 17 mm | 070MC – KPL – I520 | 10 |
| Bearing remover head, 15 mm | 070MC – KPL – I500 | 10 |
| Bearing remover shaft, 15 mm | 070MC – KPL – I510 | 10 |
| Valve guide driver | 070ND – 006 – I150 | 7 |
| Attachment, 44 x 49.5 mm | 070MD – KPL – I210 | 13 |
| Bearing driver | 070MD – KPL – I100 | 9 |
| Crankcase assembly collar | 070MF – KWP – 110 | 10 |
| Assembly collar attachment | 070MF – KWP – 120 | 10 |
| Crankcase assembly shaft | 070MF – KWP – 130 | 10 |
| Valve guide reamer | 070MH – 001 – I160 | 7 |
| Socket wrench, 39 x 41 mm | 070MA – KPL – I300 | 9 |
| Peak voltage adaptor | 070GJ – 002 – I110 | 16 |
| Clutch spring compressor | 070ME – KWP – 110 | 9 |
| Bearing remover (Driven face) | 070MC – KWP – 410 | 9 |
| Bearing installer (Driven face) | 070NC – KWP – 410 | 9 |
| Case/driven gear puller | 070MC – KPL – I100 | 10 |
| Slider base piston | 070SRT – KSP – 008 | 8 |
| Snap ring plier | 07914 – SA50 – 001 | 9 |
| Remover bearing 15 mm shaft | 070MC – KPL – I500 | 13 |
| Remover bearing 15 mm head | 070MC – KPL – I510 | 13 |
| Rear engine foundation bush remover | 07008 – KPL – 900 | 13 |
| Washer, 10.3 mm | 90521 – KSP – 900 | 13 |
| Drive shaft bearing remover | 07008 – DBR – 900 | 10 |
| Circlip plier | 07914 – SA50001 | 13 |
| Tensioner lifter stopper | 070MG – 0010100 | 7 |
| Pinion Speedometer tool | 07000 – PST – 900 | 13 |

# LUBRICATION AND SEAL POINTS SPECIFICATIONS

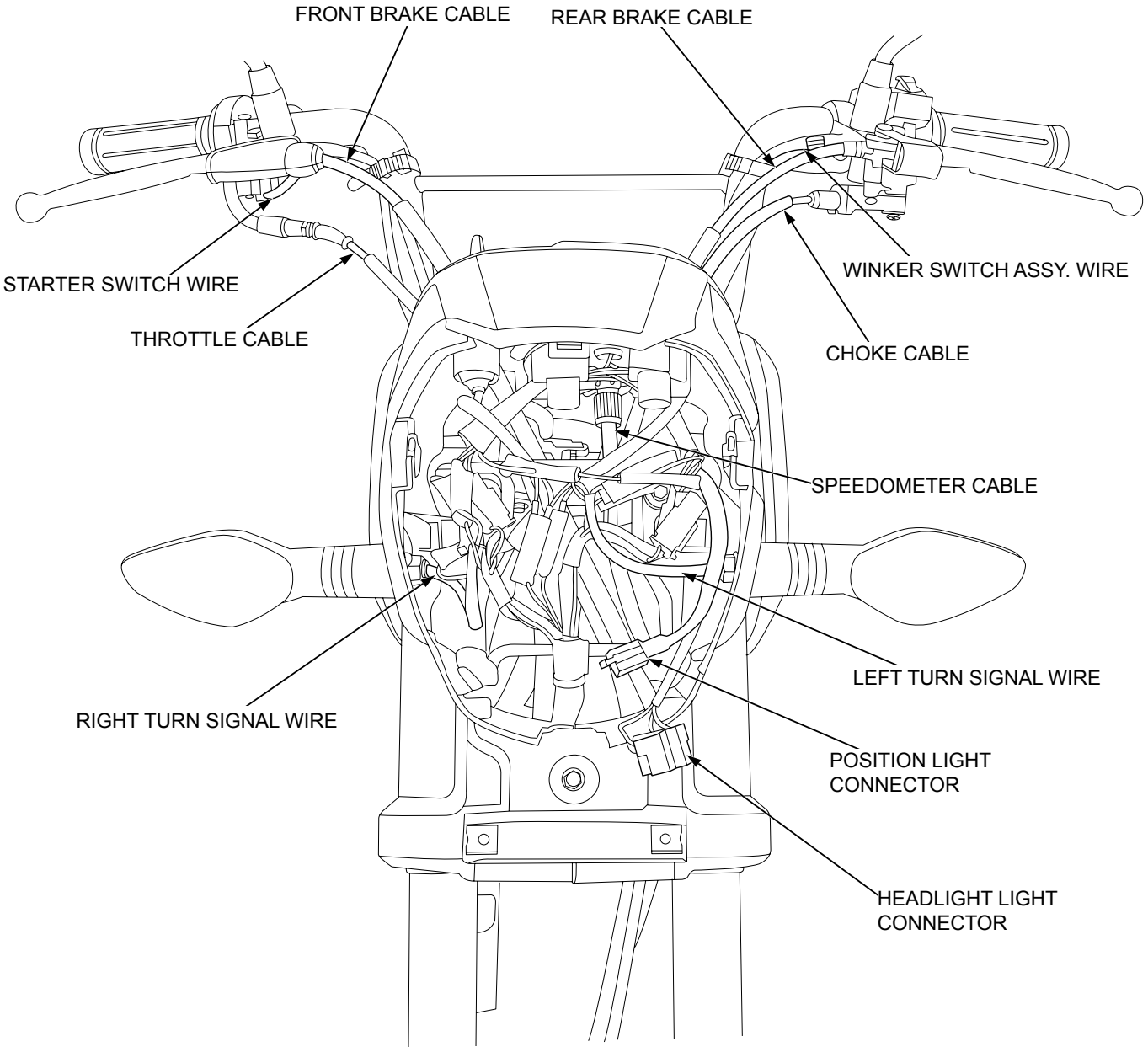
## ENGINE

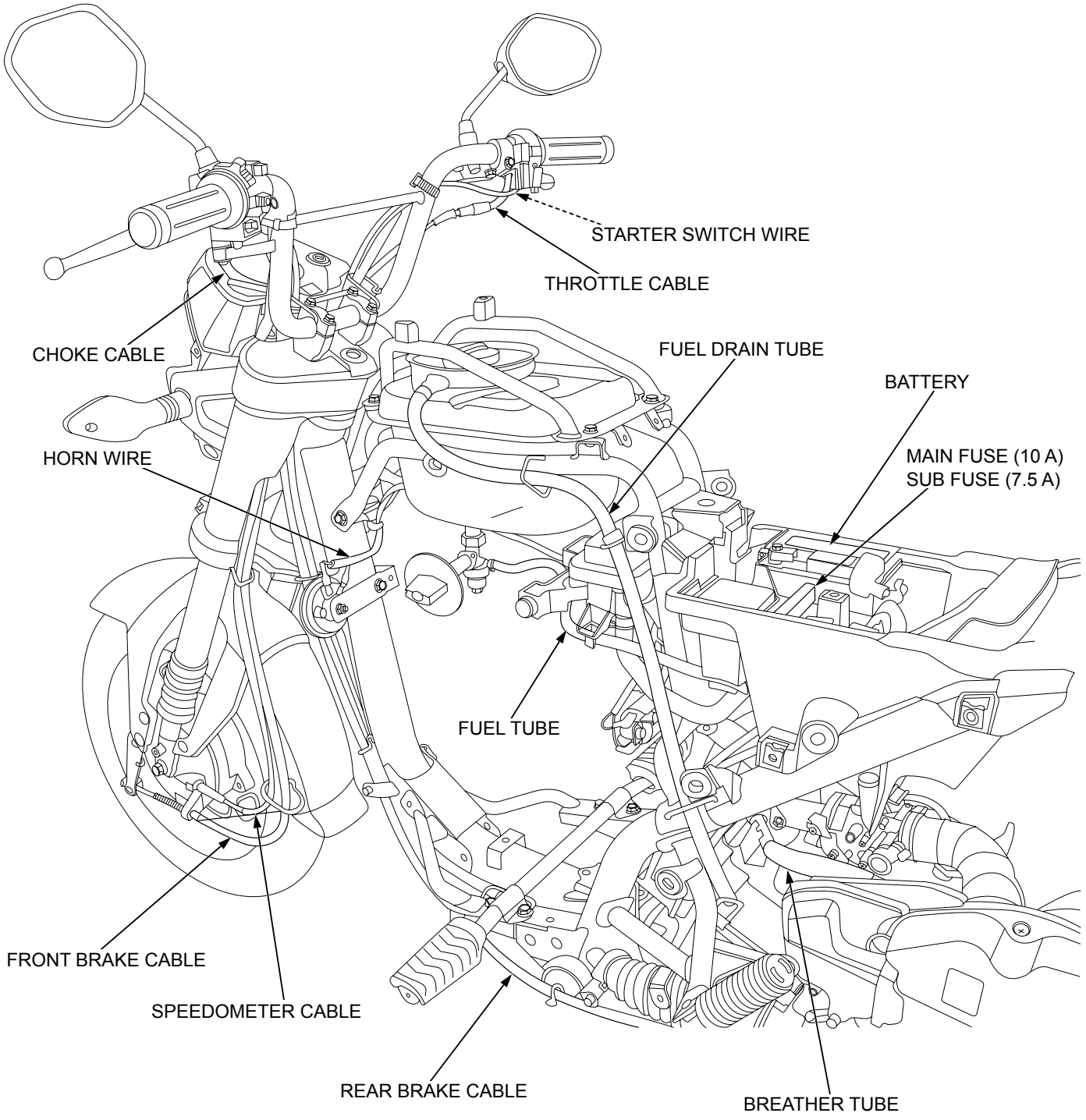
| LOCATION | MATERIAL | REMARKS |
|---|---|---|
| Camshaft cam lobes | Molybdenum oil solution (Mixture of the engine oil and molybdenum grease in a ratio of 1 : 1) | |
| Oil pump rotor<br>Oil pump driven gear teeth<br>Stem seal fitting surface<br>Cylinder stud bolt threads<br>Camshaft holder nut threads and seating surface<br>Camshaft bearing rotating area<br>Cam sprocket teeth<br>Cam sprocket bolt threads and seating surface<br>Cam chain<br>Rocker arm slipper and sliding surface<br>Valve adjusting screw lock nut whole surface<br>Rocker arm shaft sliding surface<br>Valve stem sliding surface<br>Cylinder wall<br>Piston outer surface and piston pin hole<br>Piston pin outer surface<br>Piston ring whole surface<br>Drive pulley face nut threads and seating surface<br>Connecting rod big end<br>Connecting rod small end<br>Crankshaft bearing rotating area<br>Timing sprocket teeth of crankshaft<br>Oil pump drive sprocket teeth of crankshaft<br>Each bearing rotating area<br>Each O-ring<br>Each oil seal lip and circumference | Engine oil | |
| Bearing hole in oil pump cover<br>Oil pump driven gear shaft journal<br>Kickstarter driven gear shaft journal<br>Kickstarter driven gear friction spring sliding area<br>Kickstarter spindle journal<br>Starter pinion shaft journal<br>Driven face boss inner surface<br>Driven face ball bearing cavities<br>Driven face needle bearing rollers | Multi-purpose grease | <br><br>Apply 0.2 – 0.3 g<br><br>Apply 0.1 – 0.3 g<br>Apply 0.1 – 0.3 g<br>Apply 5.0 – 5.5 g |

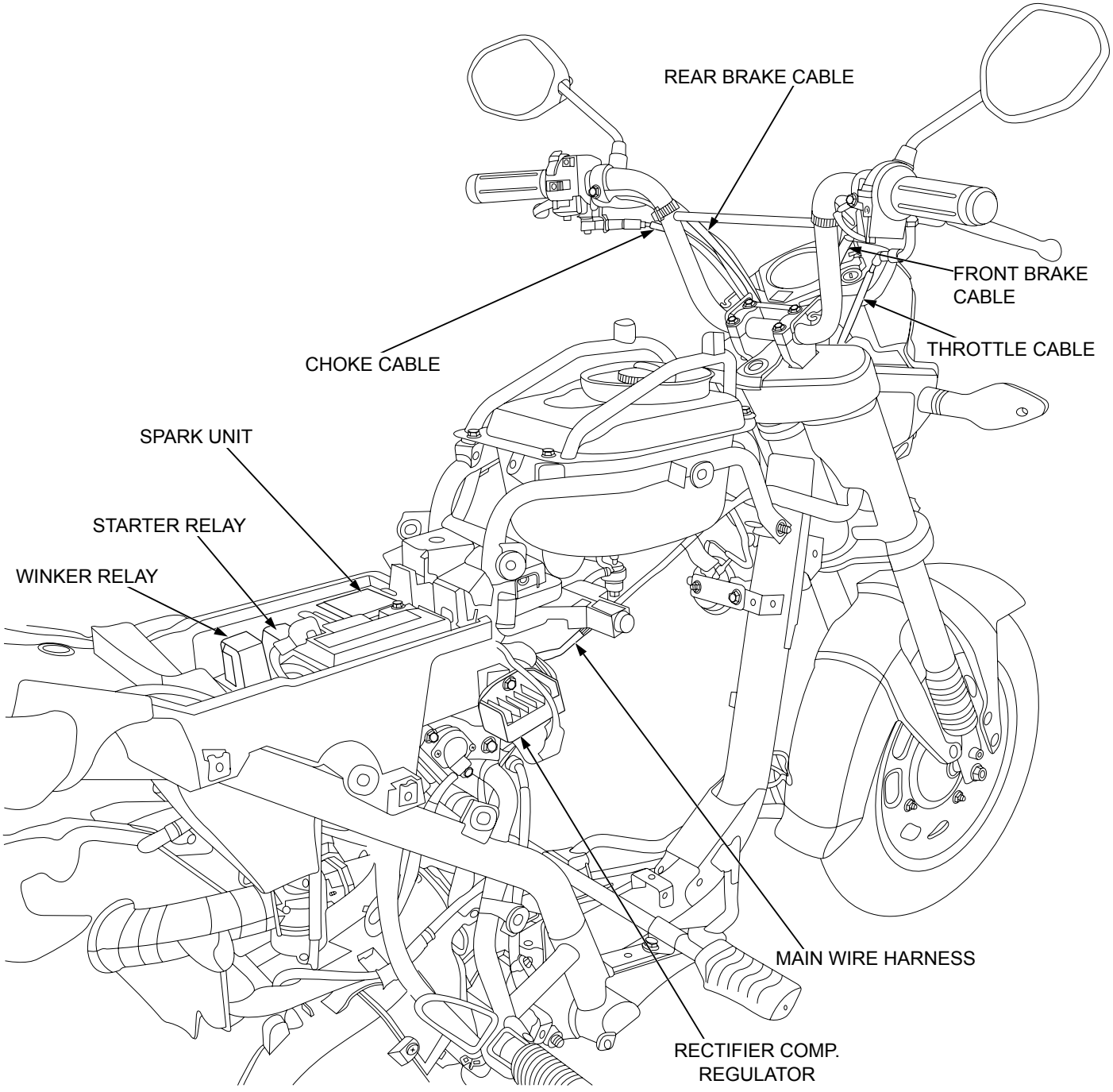
## FRAME

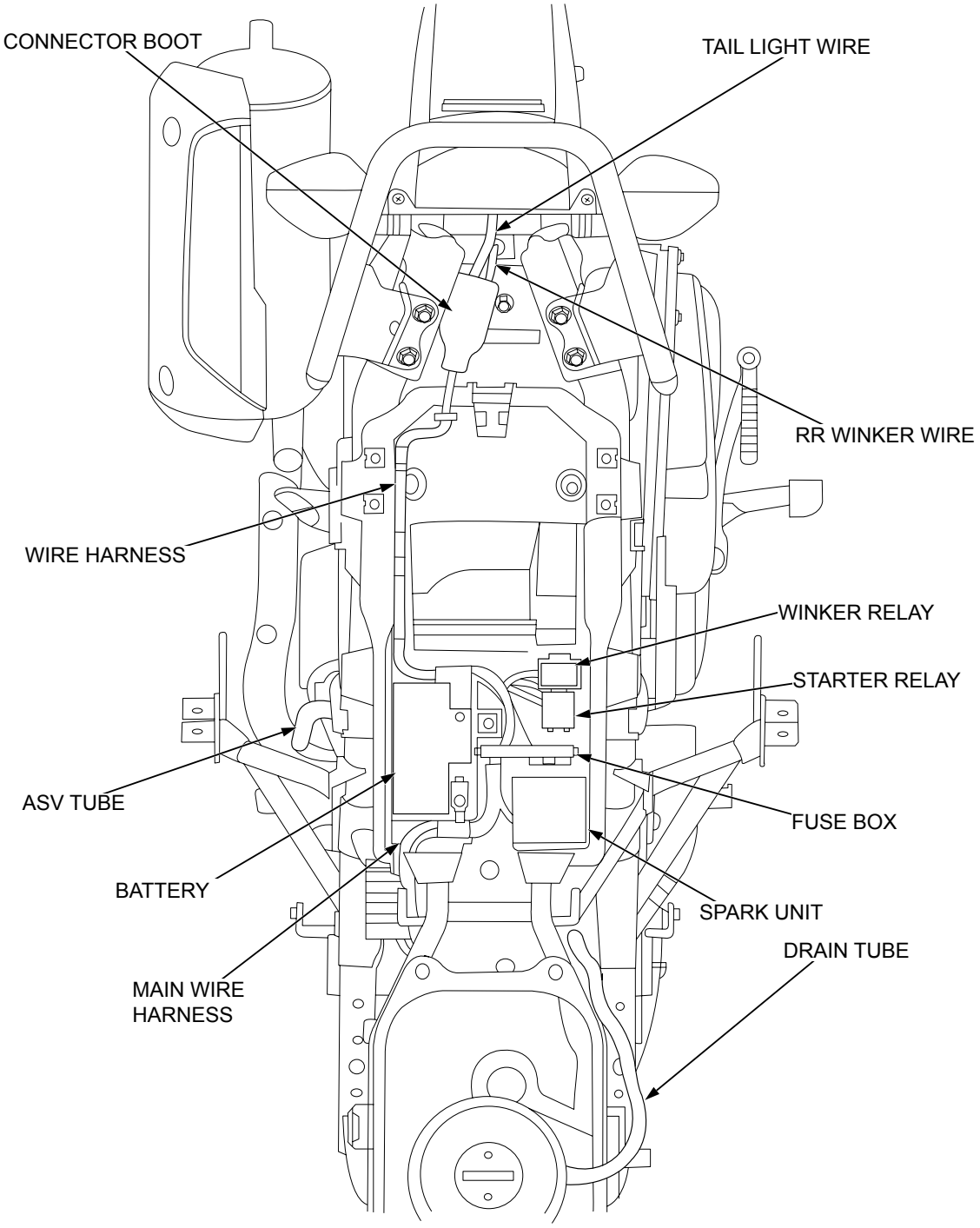
| LOCATION | MATERIAL | REMARKS |
|---|---|---|
| Front wheel dust seal lip<br>Speedometer gear teeth and sliding surface<br>Front brake cam pivot and shoe contacting area (Drum)<br>Front brake panel anchor pin shoe contacting area (Drum)<br>Front brake cam dust seal sliding surface (Drum)<br>Front brake panel dust seal lip (Drum)<br>Speedometer pinion teeth and sliding surface<br>Speedometer pinion dust seal lip<br>Rear brake cam pivot and shoe contacting area<br>Rear brake panel anchor pin shoe contacting area<br>Rear brake dust seal lip<br>Front wheel hub nut thread and seating surface (Drum)<br>Rear wheel hub nut thread and seating surface<br>Center stand pivot<br>Front cushion upper bolt<br>Brake master cylinder push rod contacting area<br>Brake caliper pin boot inner surface<br>Brake caliper pin sliding surface<br>Each dust seal lips<br>Each O-ring<br>Throttle grip | Multi-purpose grease | Do not contaminate the brake lining surfaces. |
| Front brake lever pivot<br>Rear brake lever pivot<br>Inside of front brake cable boot (Drum)<br>Inside of rear brake cable boot<br>Inside of throttle cable boot<br>Inside of speedometer cable<br>Seat catch wire and bracket connecting area<br>Speedometer cable<br>Throttle cable<br>Front brake cable (Drum)<br>Rear brake cable | Silicone grease | |
| Front wheel hub stud bolt (Drum)<br>Rear wheel hub stud bolt<br>Fork socket bolt thread | Locking agent | |
| Rear axle nut threads and seating surface<br>Handlebar post threads | Engine oil | |
| Air cleaner connecting tube seating surface<br>Handlebar grip inside surface | Cemedine #540 or equivalent | |
| Steering head bearing steel ball and race | Use Water resistant multi–purpose grease (Shell Alvania EP2 or Excelite EP2<br>(KYODO YUSHI CO. LTD)<br>or equivalent) | Apply Min 3g |

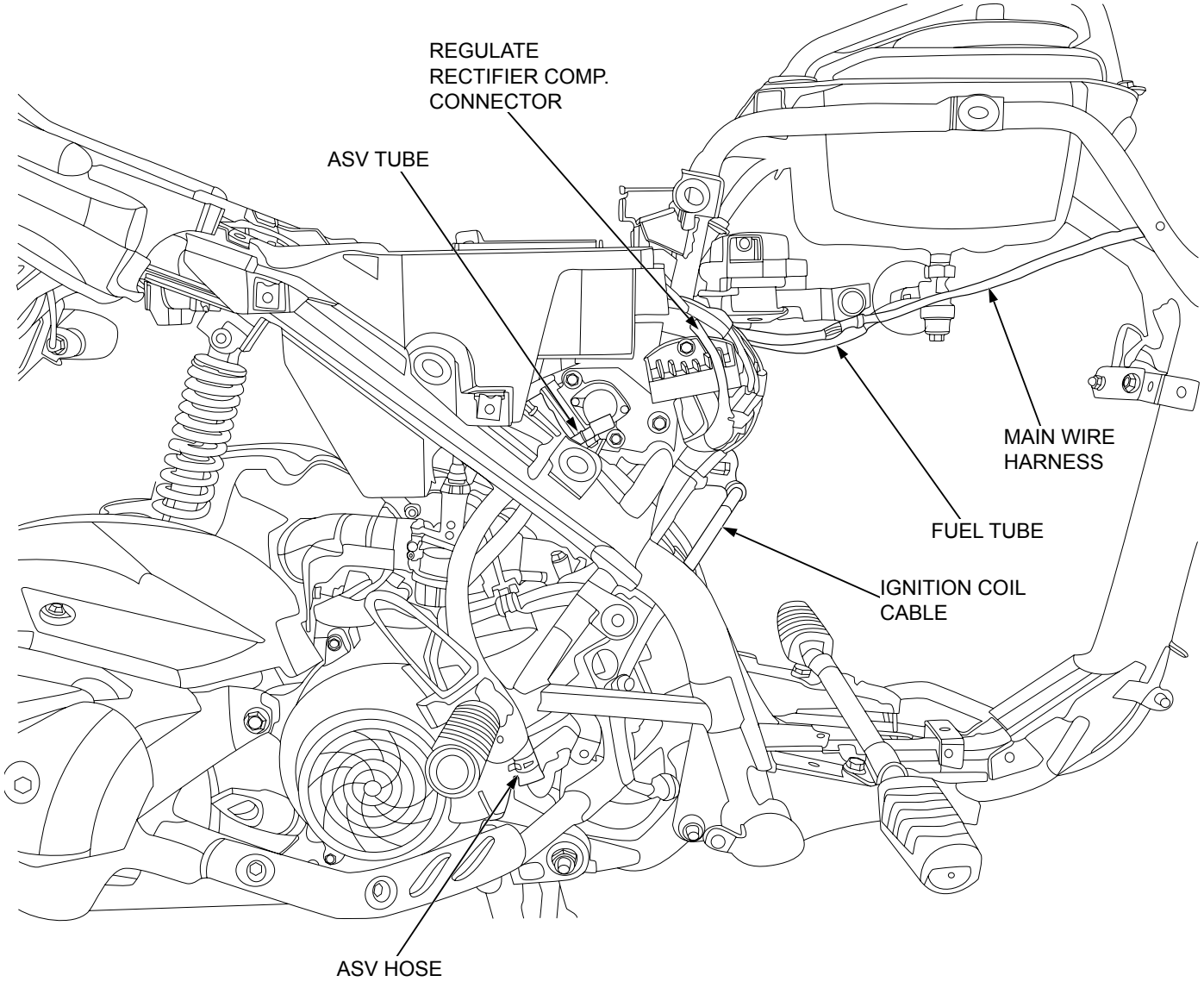
# CABLE & HARNESS ROUTING

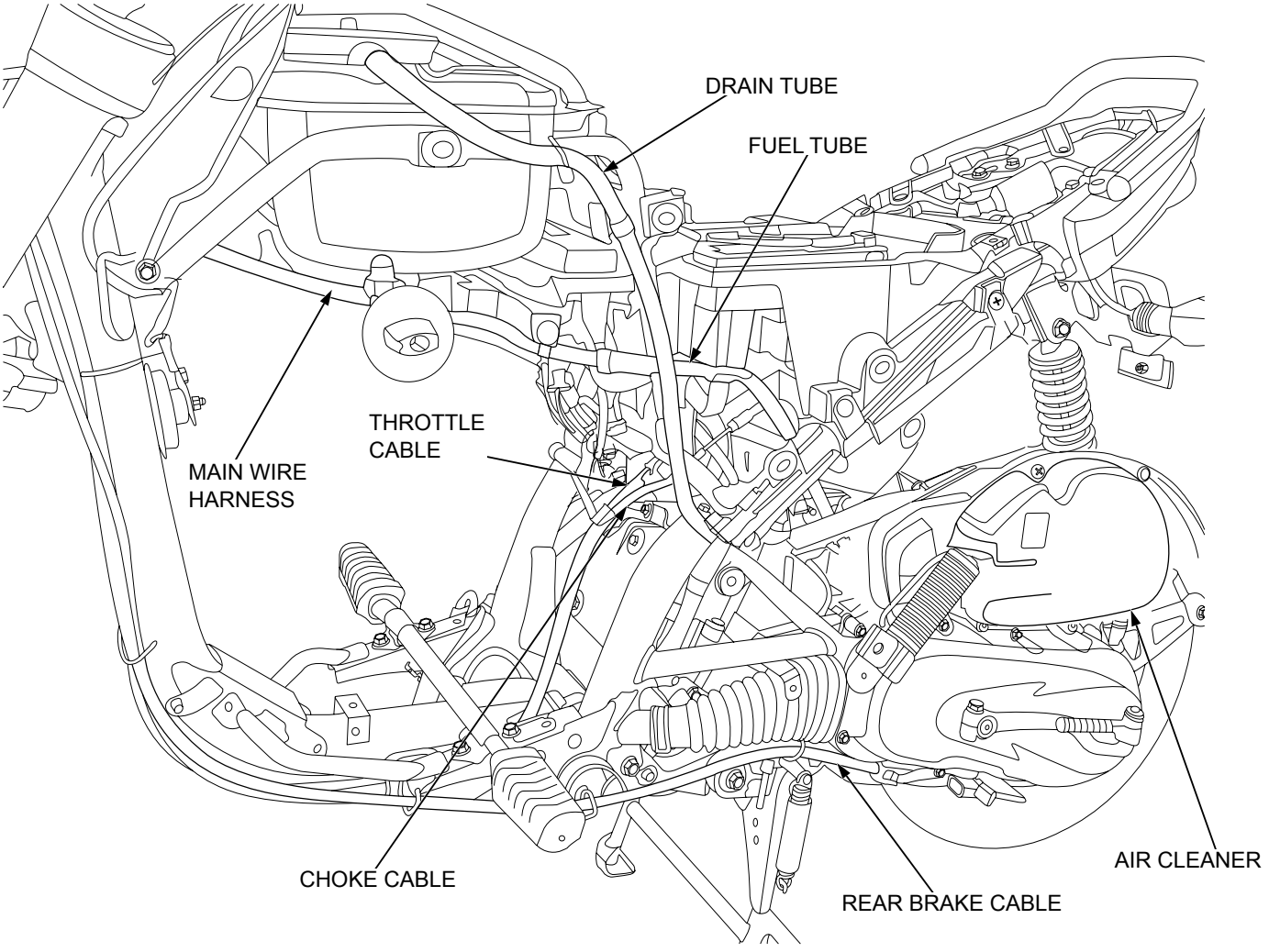



STARTER SWITCH WIRE
THROTTLE CABLE
CHOKE CABLE
FUEL DRAIN TUBE
BATTERY
HORN WIRE
MAIN FUSE (10 A)
SUB FUSE (7.5 A)
FUEL TUBE
FRONT BRAKE CABLE
SPEEDOMETER CABLE
REAR BRAKE CABLE
BREATHER TUBE


REAR BRAKE CABLE
FRONT BRAKE CABLE
THROTTLE CABLE
CHOKE CABLE
SPARK UNIT
STARTER RELAY
WINKER RELAY
MAIN WIRE HARNESS
RECTIFIER COMP. REGULATOR


CONNECTOR BOOT
TAIL LIGHT WIRE
RR WINKER WIRE
WIRE HARNESS
WINKER RELAY
STARTER RELAY
ASV TUBE
FUSE BOX
BATTERY
SPARK UNIT
DRAIN TUBE
MAIN WIRE HARNESS


REGULATE
RECTIFIER COMP.
CONNECTOR
ASV TUBE
MAIN WIRE
HARNESS
FUEL TUBE
IGNITION COIL
CABLE
ASV HOSE


DRAIN TUBE
FUEL TUBE
THROTTLE CABLE
MAIN WIRE HARNESS
CHOKE CABLE
REAR BRAKE CABLE
AIR CLEANER

# EMISSION CONTROL SYSTEMS

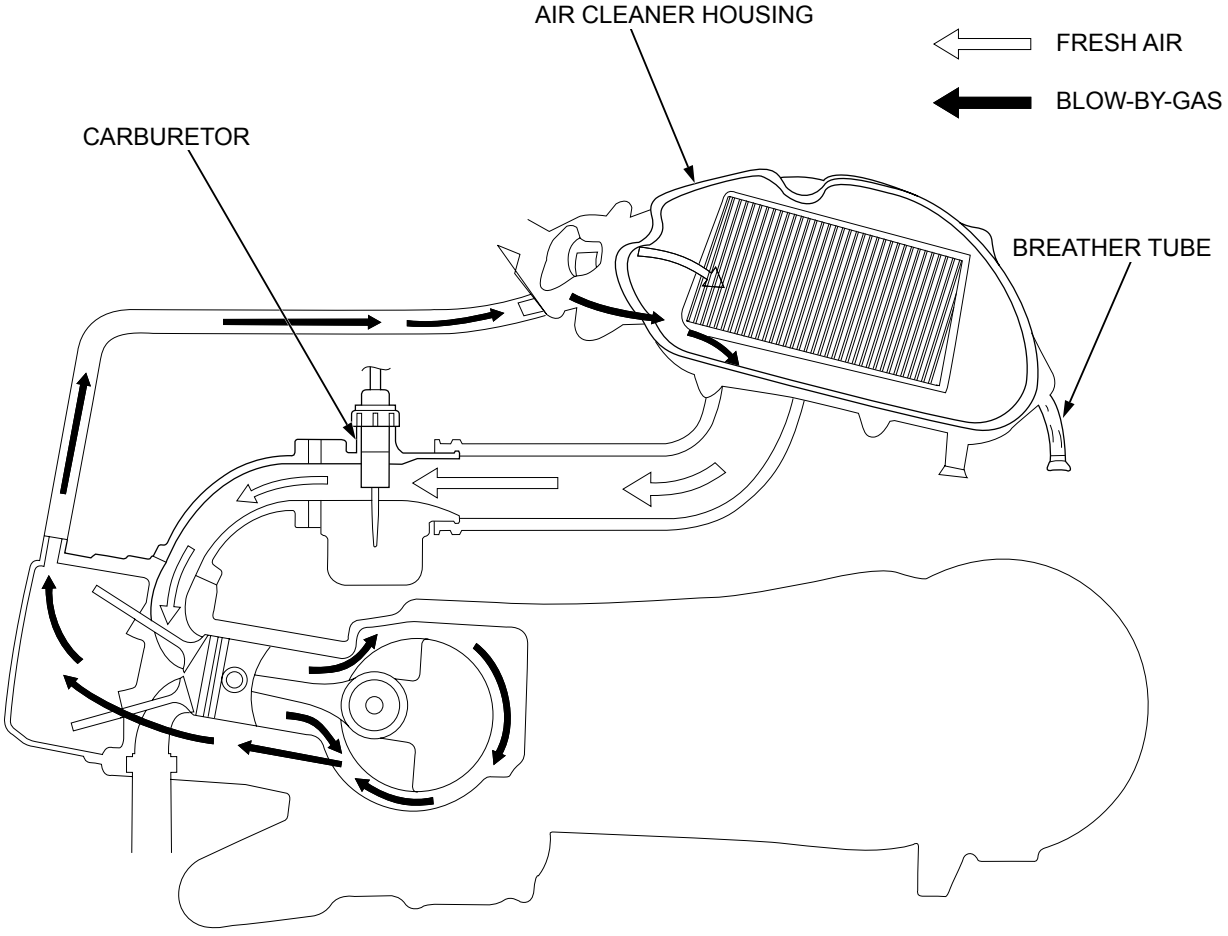
## SOURCE OF EMISSIONS

The combustion process produces carbon monoxide (CO), oxides of nitrogen (NOx) and hydrocarbons (HC). Control of carbon monoxide, oxides of nitrogen and hydrocarbons is very important because, under certain conditions, they react to form photochemical smog when subjected to sunlight. Carbon monoxide does not react in the same way, but it is toxic.

Honda Motor Co., Ltd. utilizes appropriate carburetor settings as well as other systems, to reduce carbon monoxide and hydrocarbons.

## CRANKCASE EMISSION CONTROL SYSTEM

The engine is equipped with a closed crankcase system to prevent discharging crankcase emissions into the atmosphere. Blow–by gas is returned to the combustion chamber through the air cleaner and carburetor. Residual oil is collected in the breather pipe.

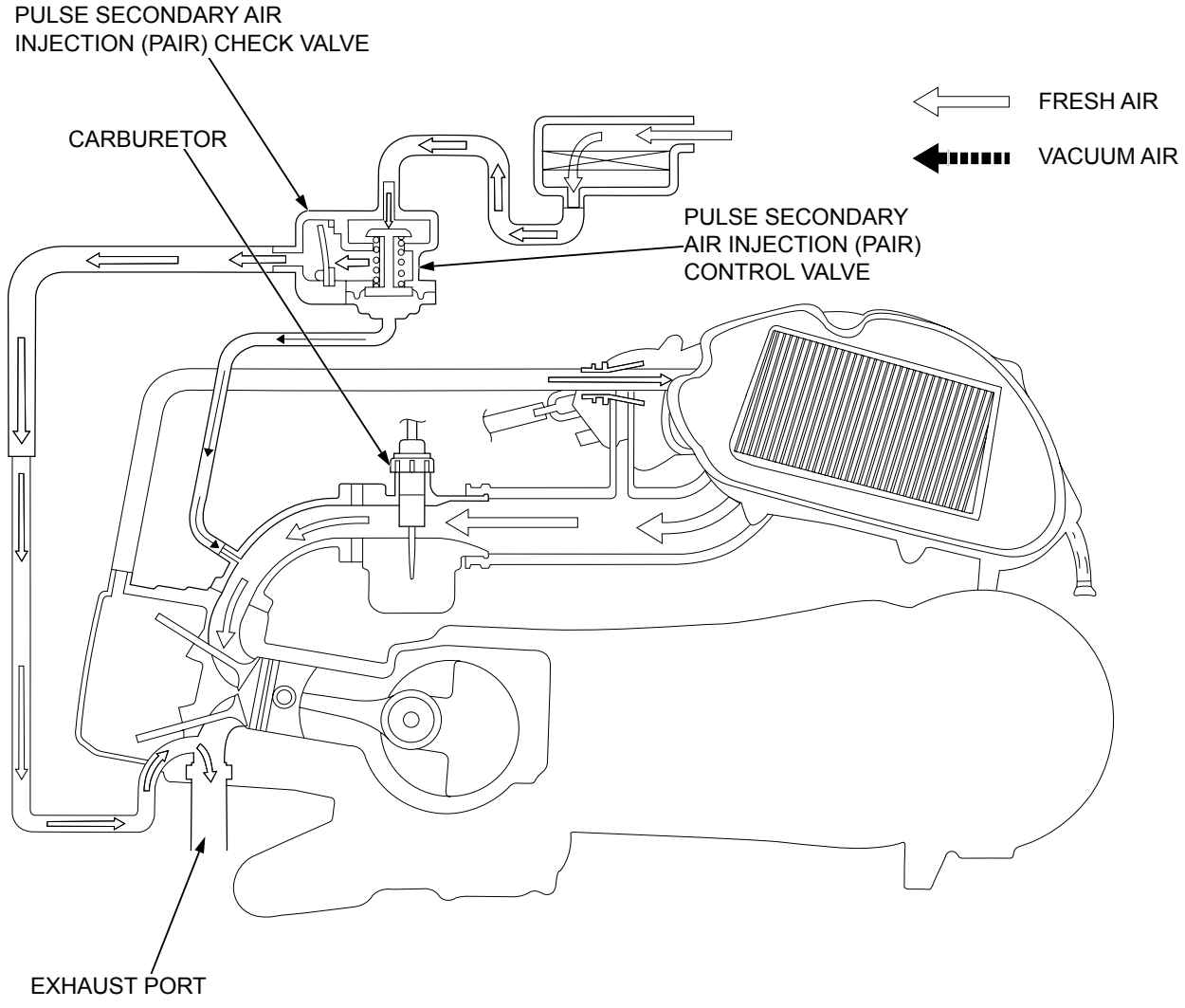


## EXHAUST EMISSION CONTROL SYSTEM (PULSE SECONDARY AIR INJECTION SYSTEM)

The exhaust emission control system consists of a pulse secondary air injection system which introduces filtered air into the exhaust gases at the exhaust port. Fresh air is drawn into the exhaust port whenever there is a negative pressure pulse in the exhaust system. This charge of fresh air promotes burning of the unburned exhaust gases and changes a considerable amount of hydrocarbons and carbon monoxide into relatively harmless carbon dioxide and water vapour.

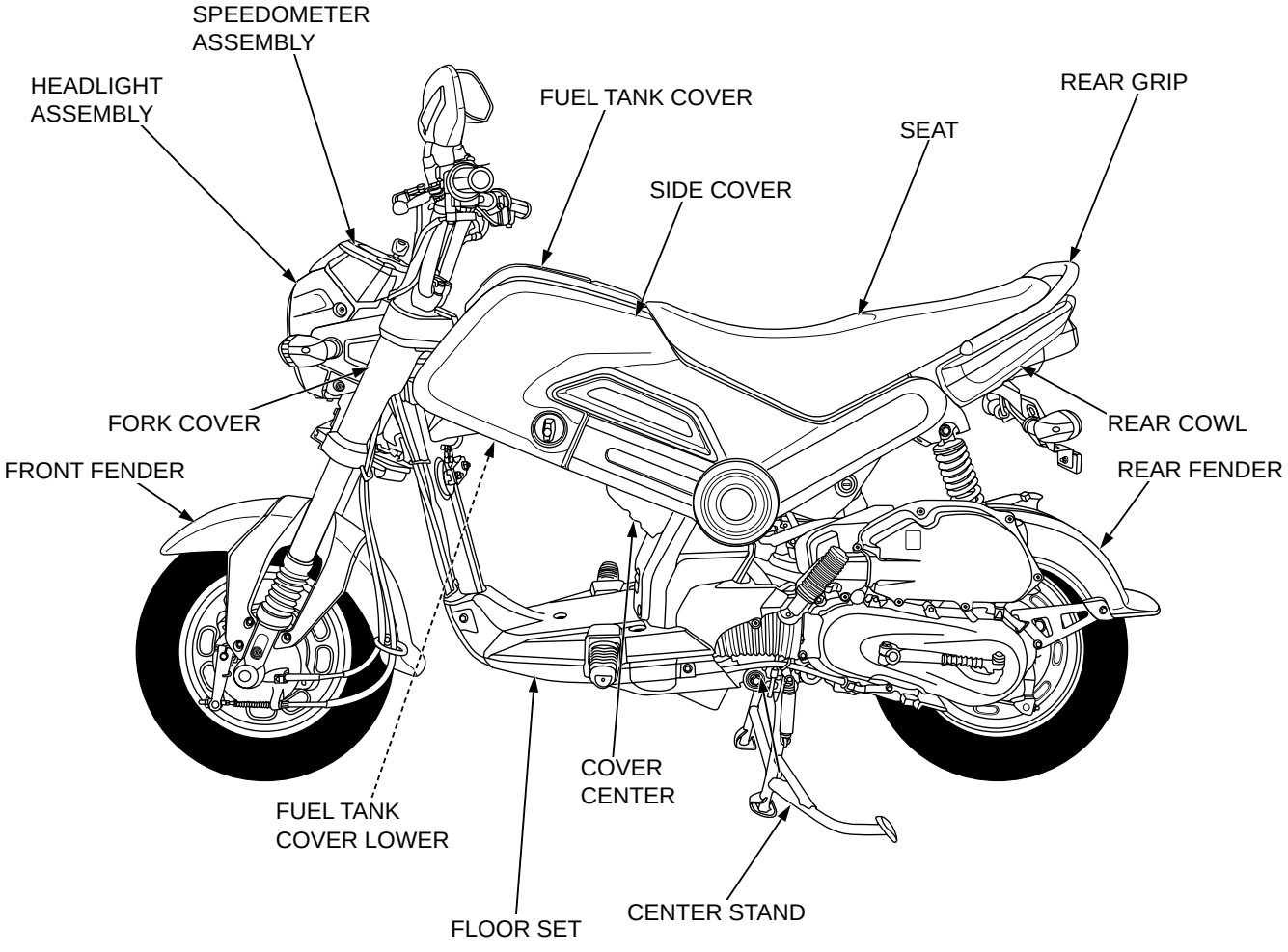
This model has the pulse secondary air injection (PAIR) control valve and PAIR check valve. PAIR check valve prevents reverse air flow through the system. The PAIR control valve reacts to high intake manifold vacuum and will cut off the supply of fresh air during engine deceleration, thereby preventing after burn in the exhaust system.

No adjustment to the pulse secondary air injection system should be made, although periodic inspection of the components is recommended.



**MEMO**

# BODY PARTS LOCATION



# 2. FRAME/BODY PANELS/EXHAUST SYSTEM





## SERVICE INFORMATION

### GENERAL

- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where the gasoline is stored can cause a fire or explosion.
- This section covers removal and installation of the body panels, fuel tank and exhaust system.
- Serious burns may result if the exhaust system is not allowed to cool before components are removed or serviced.
- Always replace the exhaust pipe gasket with a new one after loosening or removing the exhaust pipe joint nuts.
- When installing the exhaust system, loosely install all of the exhaust pipe/muffler fasteners, always tighten the exhaust pipe joint nuts first, then tighten the mounting bolt and nut, if you tighten the mounting bolt and nut first, the exhaust pipe may not seat properly.
- Always inspect the exhaust system for leaks after installation.

### TORQUE VALUES

| ITEM | QTY | THREAD DIA. (mm) | TORQUE N·m (kgf·m, lbf·ft) | REMARKS | PAGE NO. |
|---|---|---|---|---|---|
| Muffler mounting bolt | 2 | 10 | 49 (5.0, 36) | | Page 2-10 |
| Muffler protector mounting bolt | 2 | 6 | 14 (1.4, 10.3) | | Page 2-9 |
| Exhaust, pipe nut | 2 | 7 | 29 (2.9, 21.4) | | Page 2-10 |
| Exhaust pipe protector bolt | 2 | 6 | 14 (1.4, 10.3) | | Page 2-9 |
| Floor set washer-bolt | 1 | 6 | 10 (1.0, 7.3) | | – |

## TROUBLESHOOTING

**Excessive exhaust noise**
- Broken exhaust system
- Exhaust gas leak

**Poor performance**
- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler

# HEADLIGHT ASSEMBLY

## REMOVAL/INSTALLATION

Remove the pan screws (4 nos.).

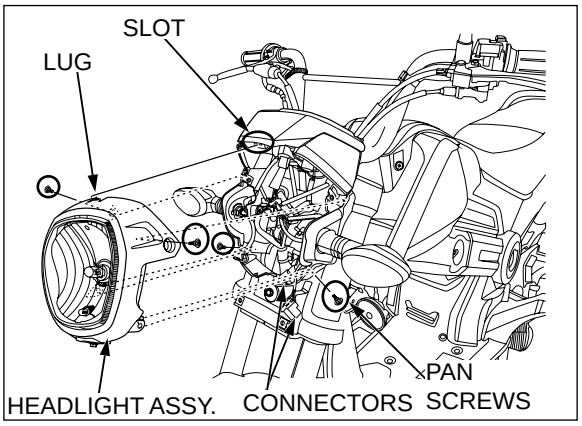
Remove the headlight by holding it and carefully disengage the headlight lug from the slot provided in meter cover set.

Disconnect 3P black connector (Headlight) and 2P black coupler (Position light).

Installation is in the reverse order of removal.

**NOTICE**

***While removing:*** *Be careful while removing the headlight assy. from the upper side to avoid any damage to the lugs.*




# HEADLIGHT COVER DISASSEMBLY

## REMOVAL/INSTALLATION

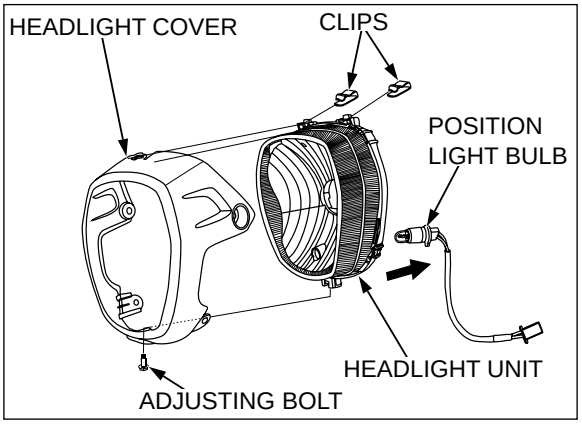
Remove the headlight assy. (page 2-2).

Remove the headlight bulb (page 18-2).

Remove the position light bulb by pulling it.

Remove the headlight aim adjusting bolt (1 no.) and headlight mounting clips (2 nos.) and remove the headlight cover.

Installation is in the reverse order of removal.




# SPEEDOMETER ASSEMBLY

## REMOVAL/INSTALLATION

Remove the headlight assy. (page 2-2).

Disconnect all connectors from the wiring harness and speedometer cable from combination meter assembly.

Remove the plug blind.

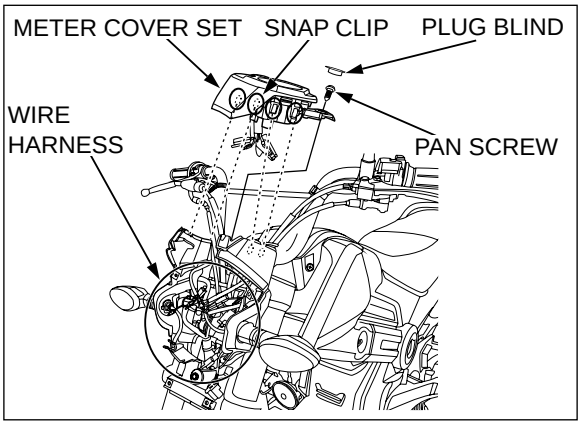
Remove the pan screw (1 no.) from the meter cover set.

Release the combination meter assembly snap clip (4 nos.) from mounting poins.

**⚠ CAUTION**

Snap clips provided on lugs, so carefully remove combination meter assembly to avoid any damage.

Installation is in the reverse order of removal.




# FORK COVER (L SIDE & R SIDE)

## REMOVAL/INSTALLATION

Remove the speedometer assembly (page 2-2).

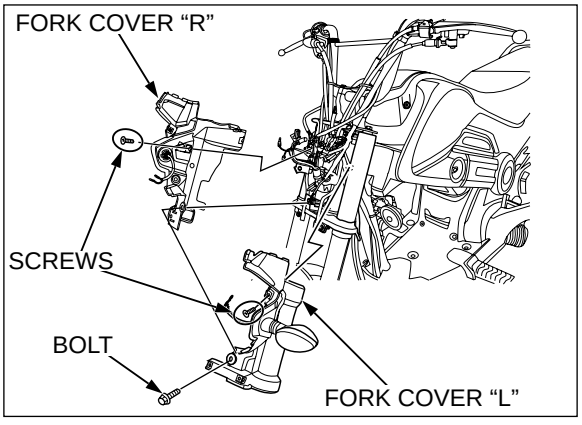
Disconnect the front L & R winker connectors.

Remove the fork cover bolt (1 no.) and screws (2 nos.).

Remove the left fork cover first then right fork cover carefully.

Installation is in the reverse order of removal.

*Both fork cover are engaged with front no. plate stay, so disengage left fork cover first.*



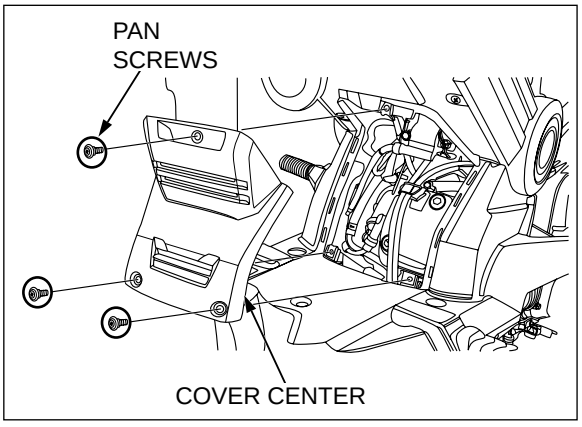
# COVER CENTER

## REMOVAL/INSTALLATION

Remove the pan screws (3 nos.) from the cover center.

Carefully release cover center from the body frame locking tabs.

Installation is in the reverse order of removal.




# FUEL TANK COVER LOWER

## REMOVAL/INSTALLATION

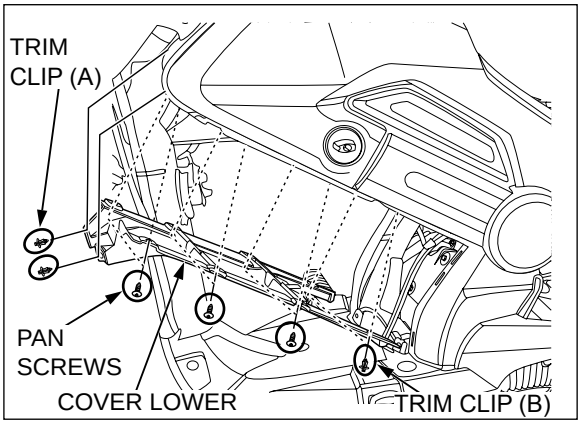
Remove the cover center (page 2-3).

Remove the trim clip A (2 nos.) and trim clip B (2 nos.) from fuel tank cover lower.

Remove the pan screws (6 nos.) from fuel tank cover lower.

Carefully remove the fuel tank cover lower from the body frame.

Installation is in the reverse order of removal.



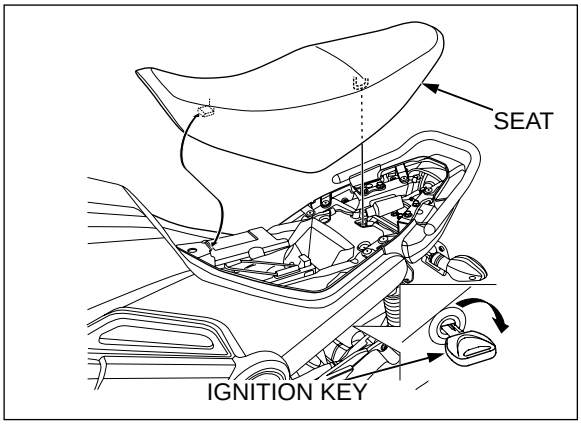

# SEAT

## REMOVAL/INSTALLATION

Insert the ignition key into the seat lock and turn it clockwise.

Slide seat backward and remove the seat.

Install the seat, while aligning its hook with the bracket on the frame and press it to lock.




# FUEL TANK COVER

## REMOVAL/INSTALLATION

Remove the seat (page 2-3).

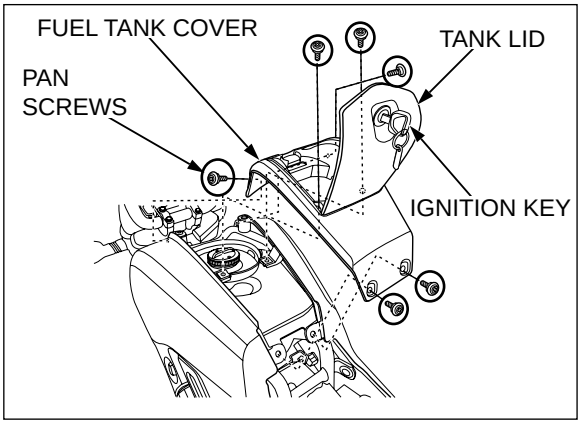
Remove the pan screws (2 nos.) from front side and pan screws (2 nos.) from rear side.

Insert the ignition key into the fuel tank lid and turn it clockwise to open it.

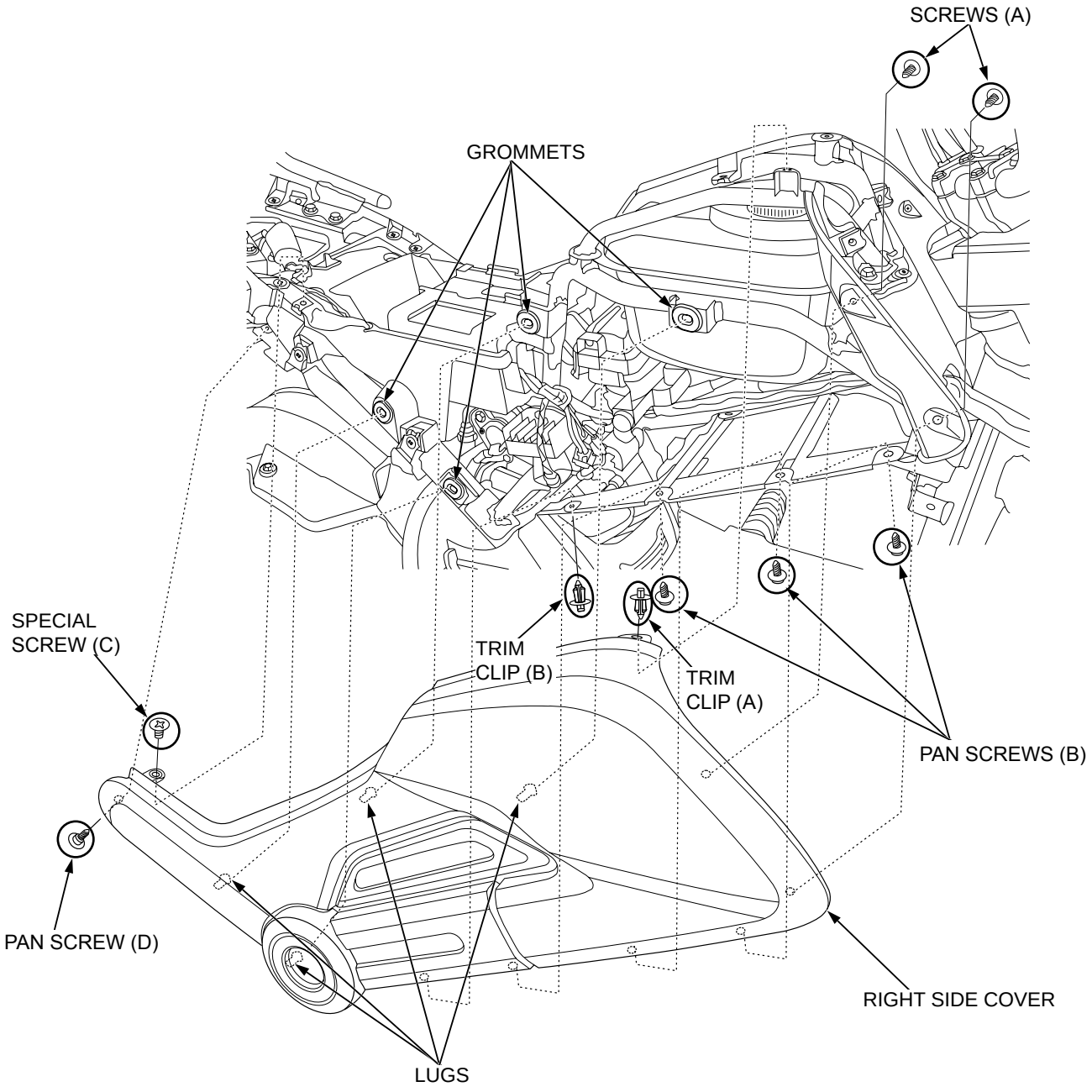
Remove the screws (2 nos.) from inside of the fuel tank cover and release the fuel tank cover.

Remove the fuel tank cover.

Installation is in the reverse order of removal.



# RIGHT SIDE COVER




## REMOVAL/INSTALLATION

Remove the fuel tank cover (page 2-3).

Remove the trim clip (A) from top of fuel tank area and trim clip (B) from the right rear side of fuel tank lower cover.

Remove the screws A (2 nos.) from fuel tank center cover, pan screws B (3 nos.) from fuel tank lower cover, special screw C from rear upper side, pan screw D from the body cover under right side.

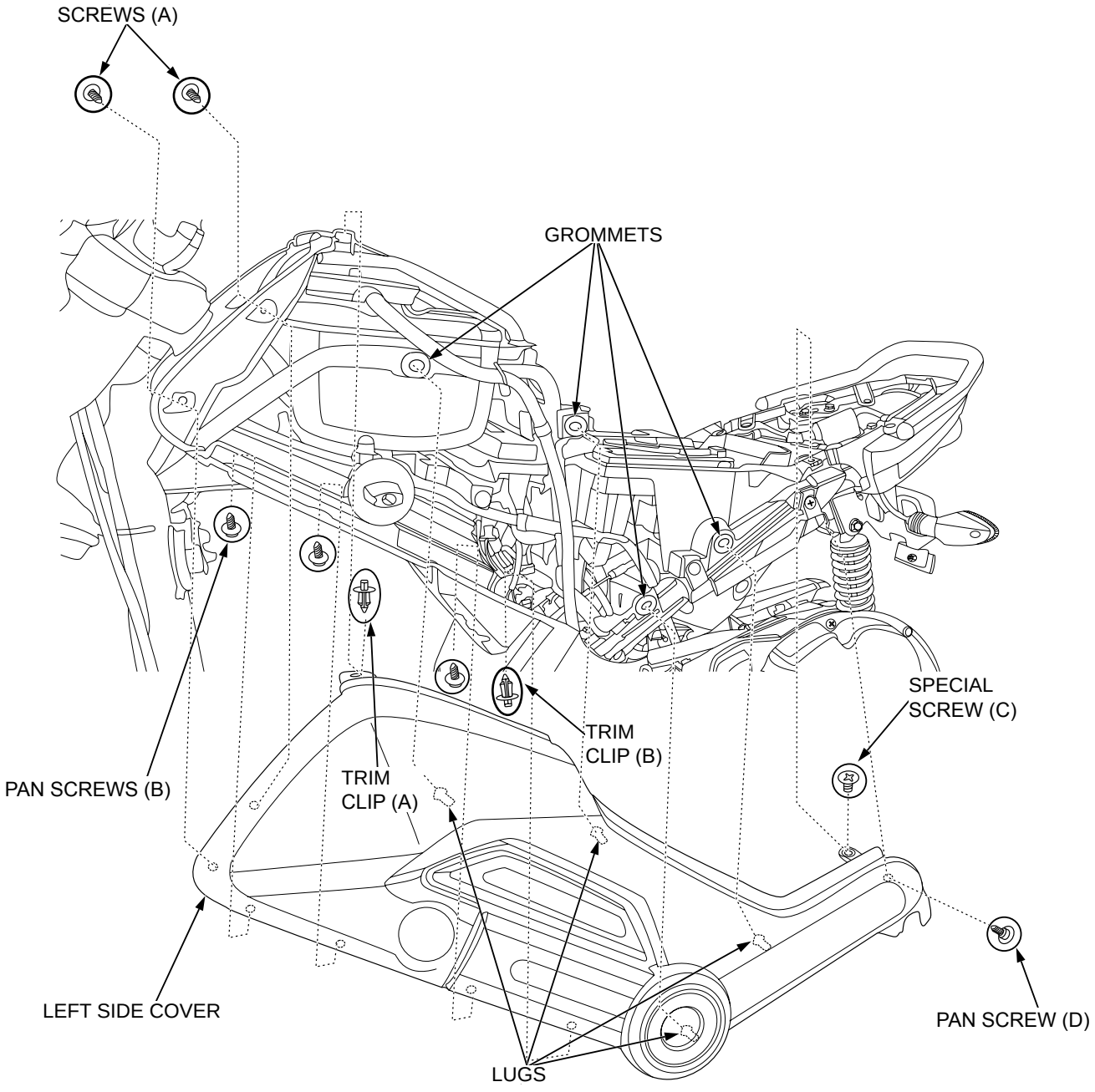
*Be careful not to damage the side cover lugs.*

Disengage the right side cover lugs (4 nos.) from the grommets carefully.

Remove the right side cover.

Installation can be done in the reverse order of removal.

# LEFT SIDE COVER




## REMOVAL/INSTALLATION

Remove the fuel tank cover (page 2-3).

Remove the trim clip (A) from top of fuel tank area and trim clip (B) from the left rear side of fuel tank lower cover.

Remove the screws A (2 nos.) from fuel tank center cover, pan screws B (3 nos.) from fuel tank lower cover, special screw C from rear upper side, pan screw D from the body cover under left side.

*Be careful not to damage the side cover lugs.*

Disengage the left side cover lugs (4 nos.) from the grommets carefully.

Remove the left side cover.

Installation can be done in the reverse order of removal.

# TANK COVER CENTER

## REMOVAL/INSTALLATION

Remove the fuel tank cover (page 2-3)

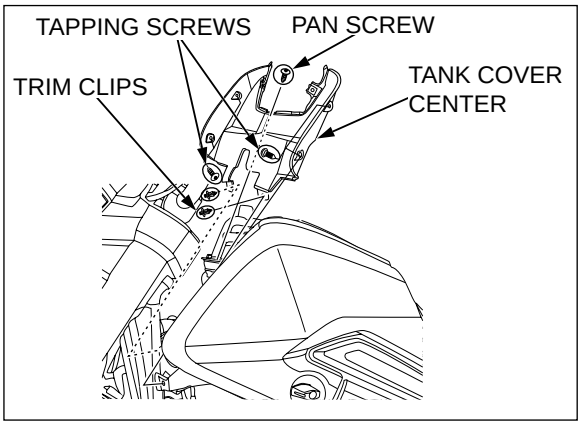
Remove the tapping screws (4 nos.) from the both side (left and right side) covers.

Remove the pan screw (1 no.).

Remove the trim clips (2 nos.) installed in front of fuel tank cover lower left and right side.

Remove the tank cover center.

Installation can be done in the reverse order of removal.




# FUEL TANK

## REMOVAL/INSTALLATION

Remove the following:

– Right side cover (page 2-4)
– Left side cover (page 2-5)
– Tank cover center (page 2-6)

Disconnect the fuel tube from fuel cock.

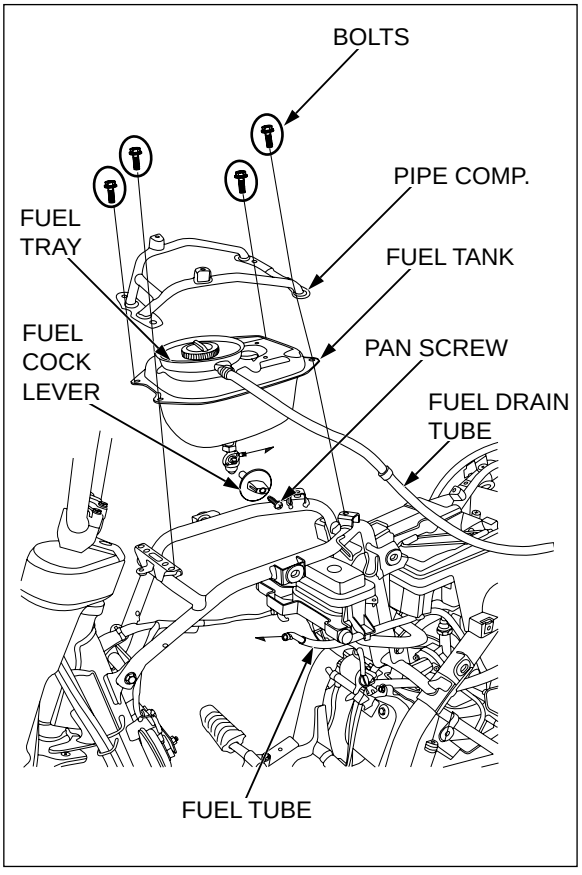
Remove the fuel cock lever by removing the pan screw.

Disengage the fuel drain tube from fuel tray.

Remove the bolts (4 nos.) from the pipe comp.

Remove the pipe comp. first then remove fuel tank from the body frame.

Installation is in the reverse order of removal.




# BATTERY COVER

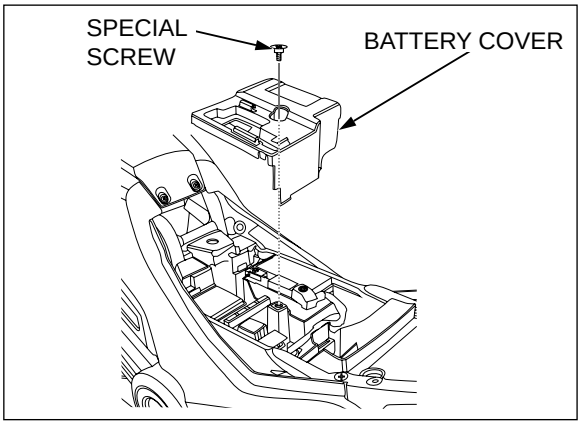
## REMOVAL/INSTALLATION

Remove the seat (page 2-3)

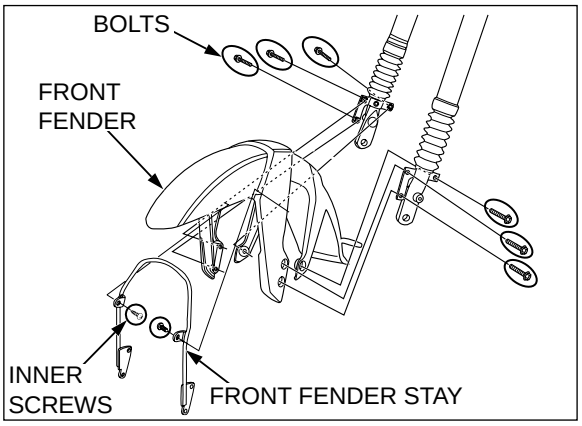
Remove the special screw (1 no.).

Remove the battery cover.

Installation can be done in the reverse order of removal.



# FRONT FENDER




## REMOVAL/INSTALLATION

Remove the front wheel (page 13-3).

Disengage the front brake and speedometer cable from the front fendor.

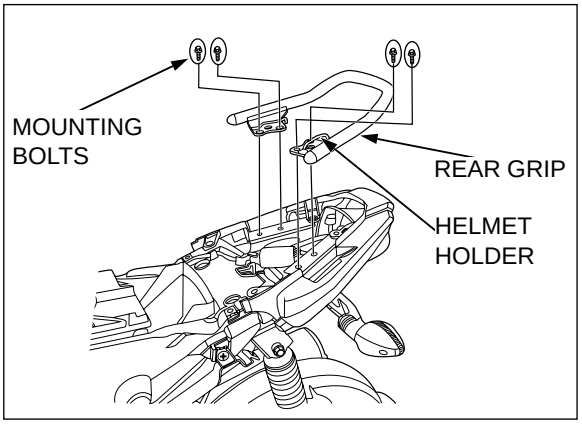
Remove the bolts (6 nos.) from the front fender mounted on the forks.

Remove the front fender carefully.

Remove the inner screws (2 nos.) to remove the front fender stay from front fender.

Installation is in the reverse order of removal.

# REAR GRIP




## REMOVAL/INSTALLATION

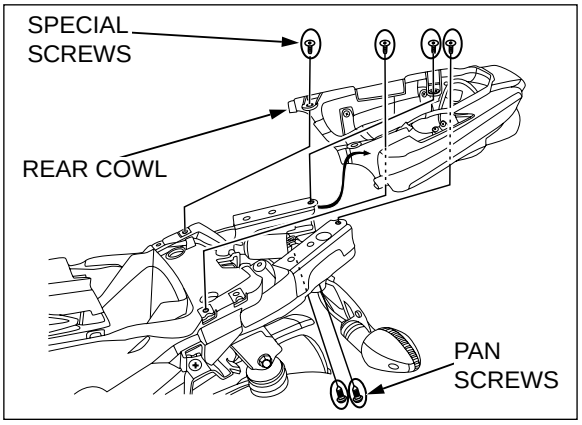
Remove the seat (page 2-3).

Remove the mounting bolts (4 nos.).

Remove the rear grip.

Installation is in the reverse order of removal.

# REAR COWL




## REMOVAL/INSTALLATION

Remove the rear grip (page 2-7).

Remove the mounting special screws (4 nos.) from the rear cowl upper side.

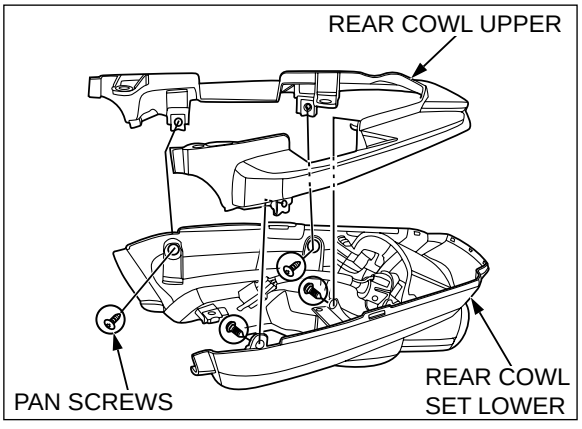
Remove the pan screws (2 nos.) from the bottom side of the rear cowl.

Carefully disconnect the rear tail/ brake light 3P coupler (page 18-3).

Remove the rear cowl assembly.

Installation is in the reverse order of removal.

## DISASSEMBLY/ASSEMBLY




*While installing the rear cowl route the wire harness properly (page 1-13).*

Remove pan screws (4 nos.) from the inside of the rear cowl and carefully separate the rear cowl upper and rear cowl set lower.

Assembly is in the reverse order of disassembly.

# TAIL LIGHT

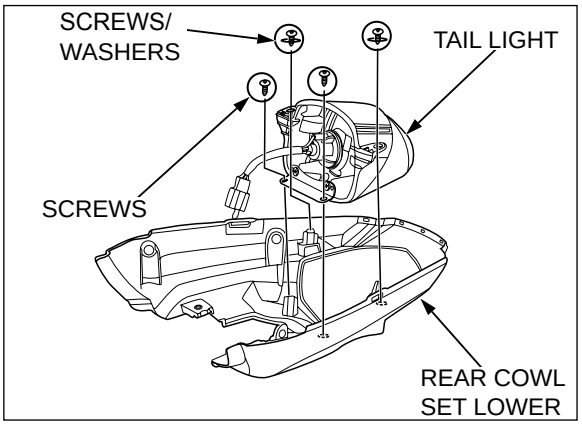
## REMOVAL/INSTALLATION

Remove the rear cowl (page 2-7).

Disassemble the rear cowl (page 2-7).

Remove the screws & washers (2 nos.) from the upper mounting of tail light and screws (2 nos.) from the lower mounting of the tail light.

Installation is in the reverse order of removal.




# REAR COWL COVER

## REMOVAL/INSTALLATION

Remove the right side cover (page 2-4).

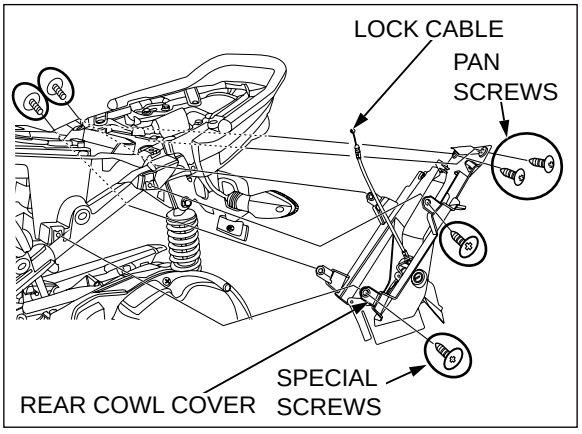
Remove the left side cover (page 2-5).

Disengage the seat lock cable from the seat lock.

Remove the pan screws (2 nos.) from the under side of rear cowl cover and special screws (4 nos.) from left and right side.

Remove the rear cowl cover.

Installation is in the reverse order of removal.




# BATTERY CASE

## REMOVAL/INSTALLATION

Remove the following:

– Right side cover (page 2-4)
– Left side cover (page 2-5)
– Rear cowl (page 2-7)
– Rear cowl cover (page 2-8)
– Battery (page 3-13)

Disengage the wire harness, fuel tube and lugs from the battery case.

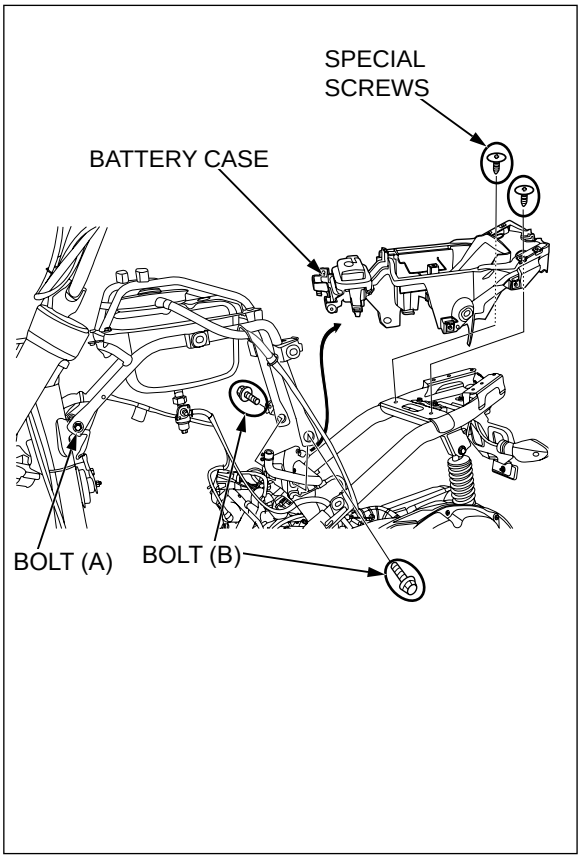
Release the CDI, Starter relay, Turn signal relay and fuse box from the battery case.

Remove the special screws (2 nos.).

Loosen the bolt A.

Remove the bolts B (2 nos.), slightly move upward fuel tank stay and remove the battery case.

Installation is in the reverse order of removal.



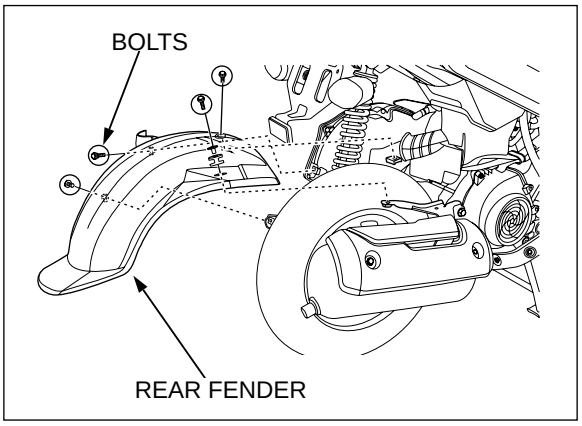
# REAR FENDER

## REMOVAL/INSTALLATION

Remove the bolts (4 nos.) from rear fender.

Remove the rear fender.

Installation is in the reverse order of removal.




# MUFFLER & EX. PIPE PROTECTOR

## REMOVAL/INSTALLATION

*The muffler protector can be serviced with the muffler installed on the engine.*

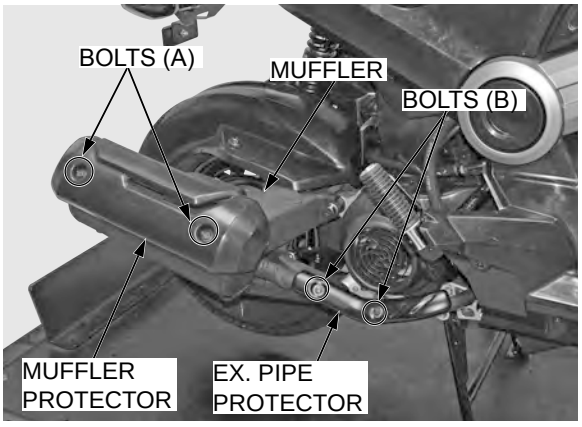
Remove the bolts A (2 nos.) of muffler protector and slide muffler protector towards engine to take it out.

Remove the bolts B (2 nos.) of ex. pipe protector and remove it.

Installation is in the reverse order of removal.

Tighten the Muffler protector bolts A (2 nos.) and bolts B (2 no.) of ex. pipe protector to the specified torque.

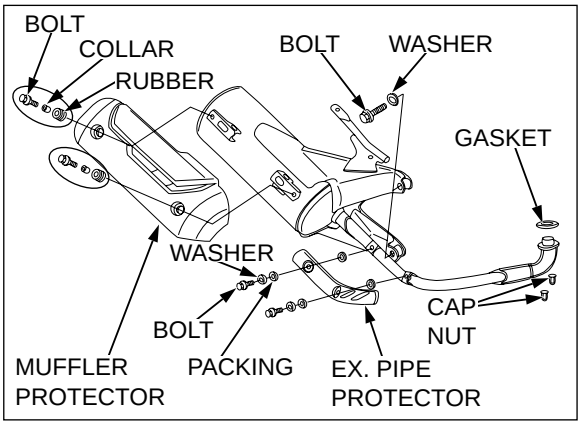
**TORQUE: 14 N·m (1.4 kgf·m, 10.3 lbf·ft)**




## ASSEMBLY OF MUFFLER

*Always check for the condition of the rubber grommets on the muffler protector.*

Installation is in the reverse order of removal.



# EXHAUST PIPE /MUFFLER

Remove the following:

– Exhaust pipe cap nuts
– Muffler mounting bolts and washers
– Exhaust pipe/muffler
– Gasket

*Always replace the exhaust pipe gasket with a new one when remove the exhaust pipe from the engine.*

Install a new gasket into the exhaust port.

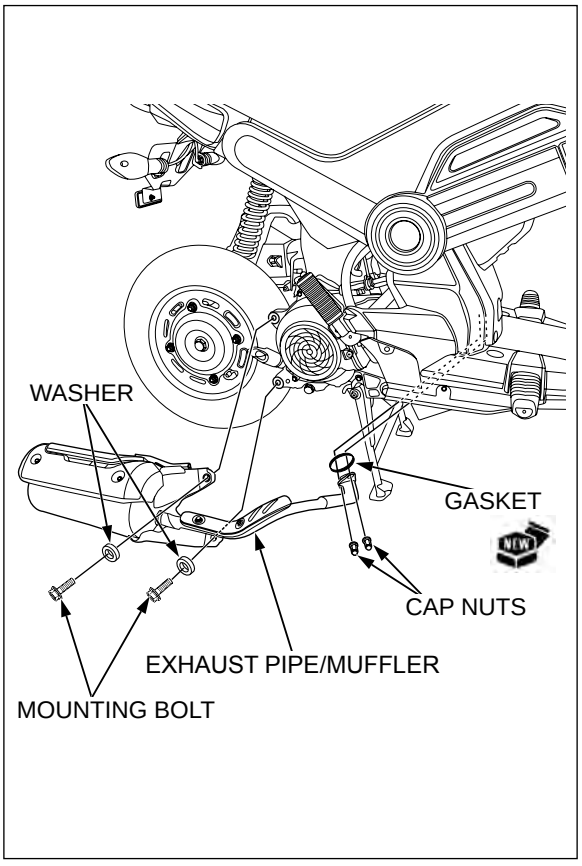
Install the exhaust pipe/muffler, then temporarily install the exhaust pipe cap nuts, muffler mounting washers and bolts.

Tighten the muffler mounting bolt to the specified torque.

**TORQUE: 49 N·m (5.0 kgf·m, 36 lbf·ft)**

Tighten the exhaust pipe cap nuts securely to the specified torque.

**TORQUE: 29 N·m (2.9 kgf·m, 21.4 lbf·ft)**



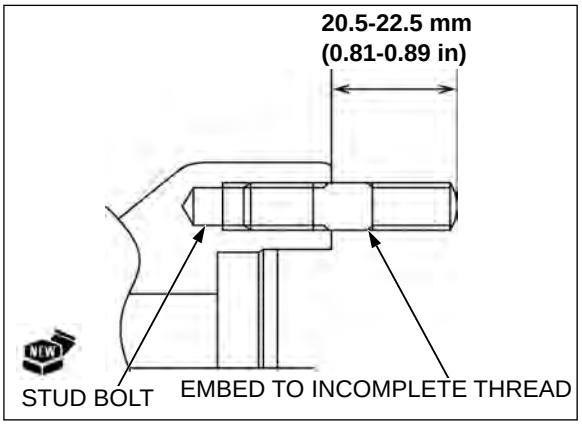

## STUD BOLT REPLACEMENT

Thread two nuts onto the stud, and tighten them together, then use a wrench on them to turn the stud bolt out.

Install new stud bolts into the cylinder head as shown.

**TORQUE: 11 N·m (1.1 kgf·m, 8 lbf·ft)**

After installing the stud bolts, check that the length from the bolt head to the cylinder head surface is within specification.



# FLOOR SET

## REMOVAL/INSTALLATION

Remove the following :

– Remove right side cover (page 2-4)
– Remove left side cover (page 2-5)
– Remove the cover center (page 2-3)
– Remove the fuel tank cover lower (page 2-3).

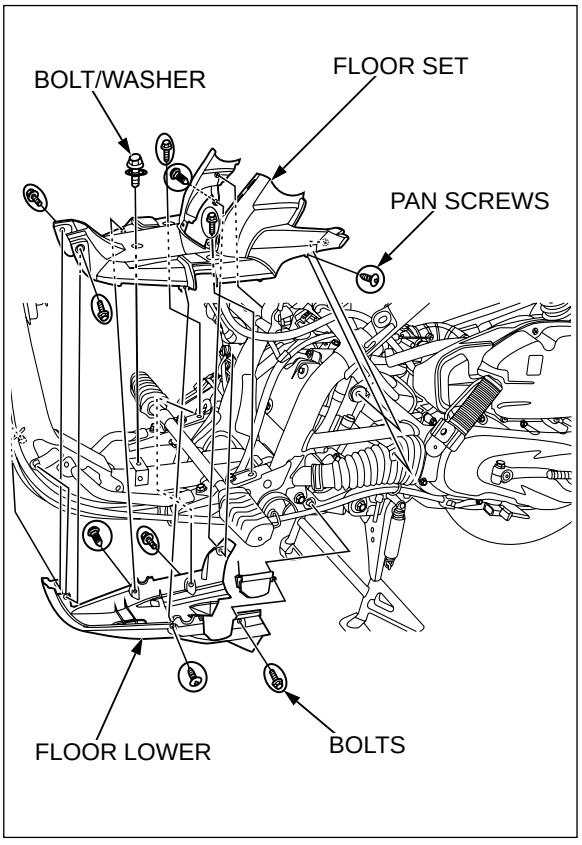
Remove the pan screws (4 nos.).

Remove the bolt/washer (1 no.) and flange bolts (4 nos.) from upper floor set.

Carefully disengage the floor set from the lugs and remove it.

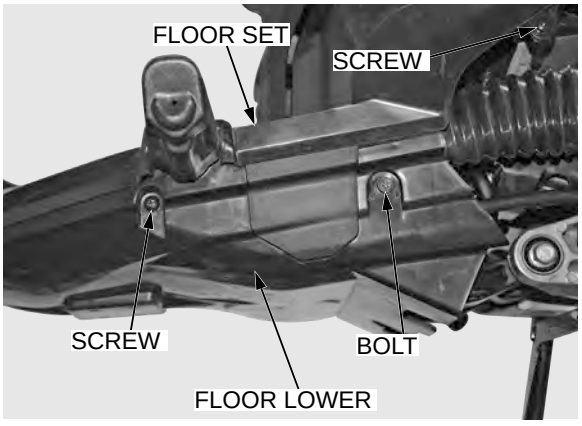
Remove the bolts (2 nos.) from lower floor set and remove it.

Installation can be done in the reverse order of removal.



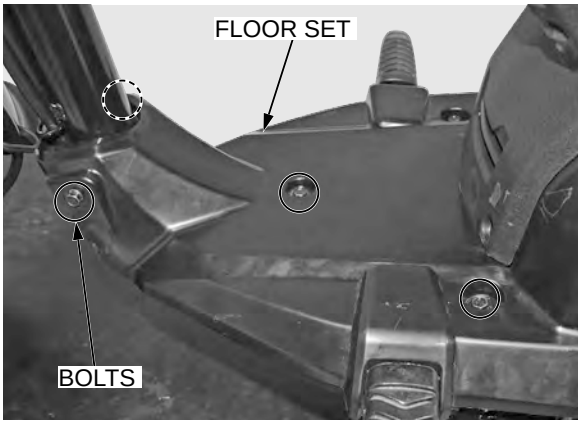

# SIDE STAND

Remove the bolt (1 no.) and screw (2 nos.) one from floor lower and other from floor set.



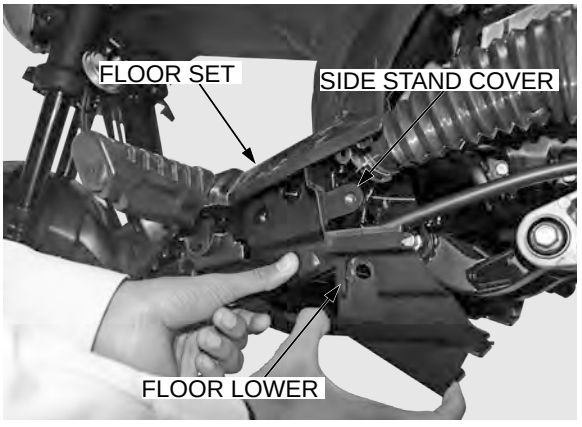

Remove the screw (1 no.) from floor lower lid which is installed in floor lower and remove the floor lower lid.

Remove the floor set bolts (4 nos.).

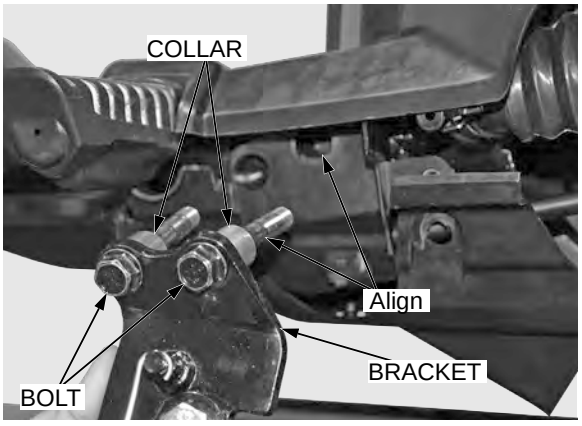



Tilt the floor lower cover down ward and floor set upward.

Align and install the side stand cover.

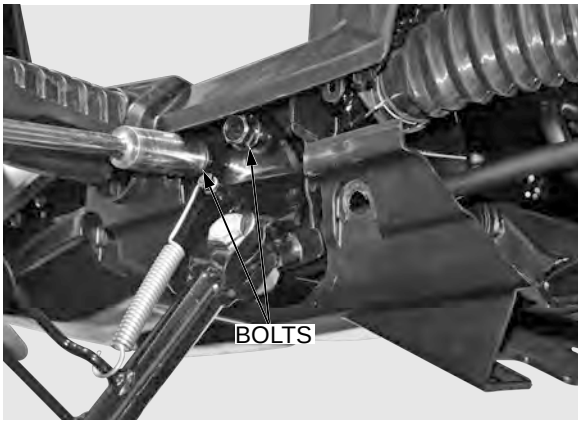



Align the side stand bracket along with mounting bolts and collars with the holes in the frame.

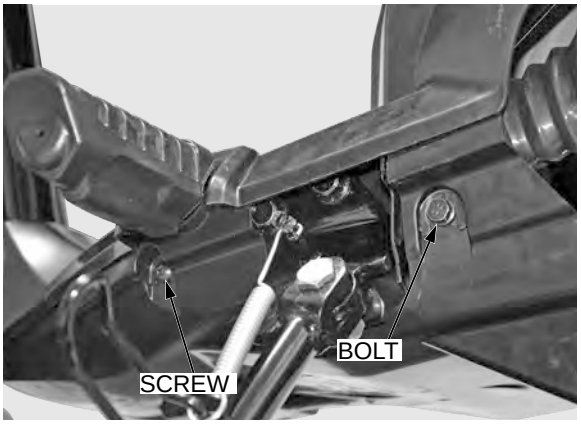



Tighten the bracket bolts (2 nos.) to the specified torque.

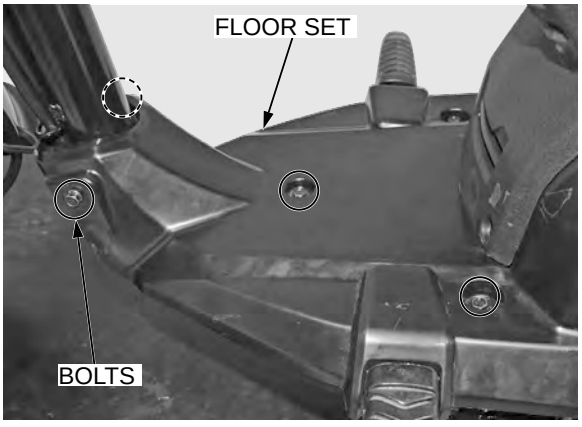
**TORQUE: 39 N·m (4.0 kgf·m, 28 lbf·ft)**



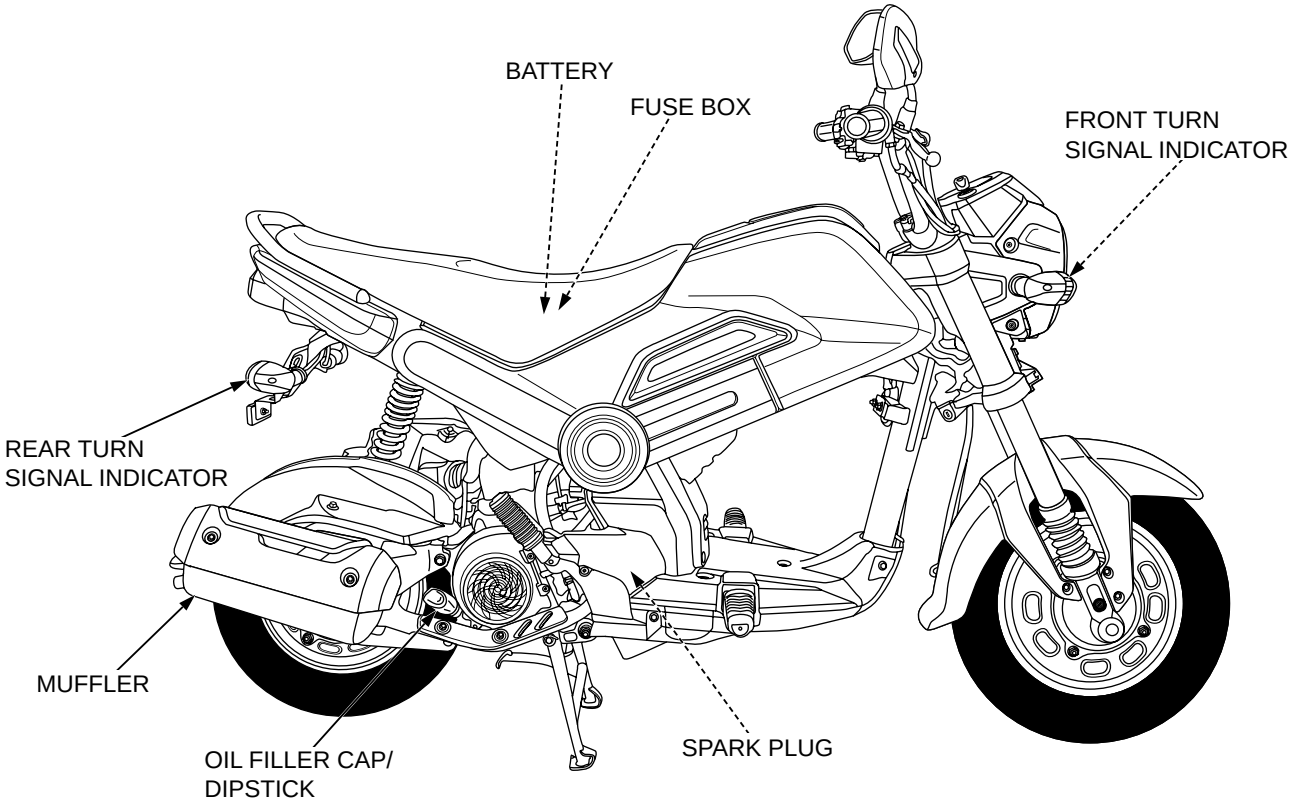
Install the bolt (1 no.) and screw (2 nos.) from floor lower and floor set.

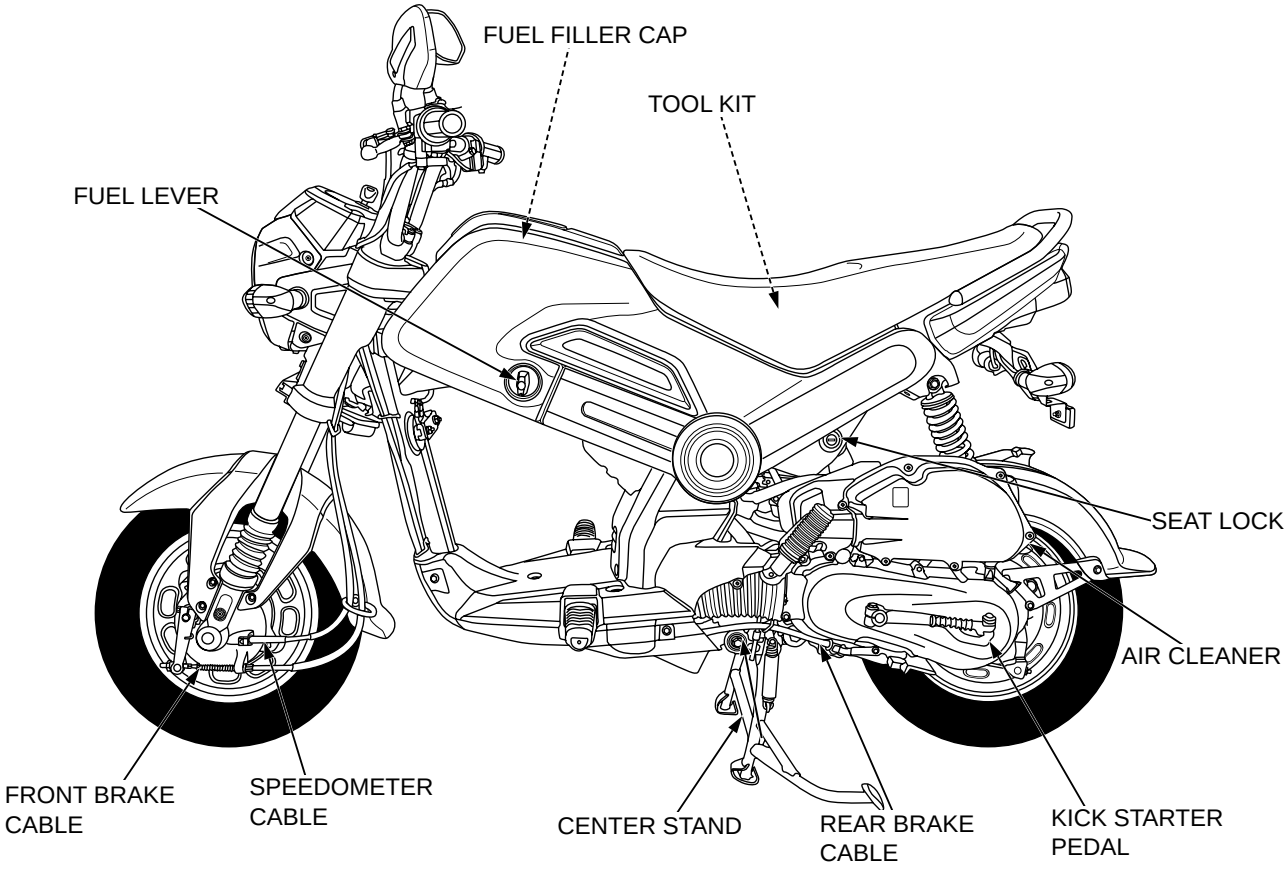



Install and tighten the floor set bolts (4 nos.).



# COMPONENT LOCATION



# SERVICE INFORMATION

## GENERAL

- Support the vehicle on a level surface before starting any work.
- Gasoline is extremely flammable and is explosive under certain conditions.
- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where the gasoline is stored can cause a fire or explosion.
- If the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in an enclosed area.
- The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and may lead to death.Run the engine in an open area or with an exhaust evacuation system in an enclosed area.

## SPECIFICATIONS

Unit: mm (in)

| ITEM | | | SPECIFICATIONS | PAGE NO. |
|---|---|---|---|---|
| Throttle grip free play | | | 2 – 6 mm (1/12 – 1/4 in) | Page 3-5 |
| Spark plug | | Standard | NGK MR7C-9N | Page 3-7 |
| Spark plug gap | | | 0.8 – 0.9 mm (0.031 – 0.035) | Page 3-7 |
| Valve clearance | | INTAKE/ EXHAUST | 0.16 mm (0.006 ± 0.001 in) | Page 3-8 |
| Engine oil capacity | | At draining | 0.7 liter (0.7 US qt, 0.6 Imp qt) | Page 3-10 |
| | | At disassembly | 0.8 liter (0.8 US qt, 0.7 Imp qt) | Page 3-10 |
| Recommended engine oil | | | Honda 4-stroke oil or equivalent motor oil<br>API service classification: MA<br>Viscosity: SAE 10W-30 | Page 3-9 |
| Engine Idle speed | | | 1,700 ± 100 $min^{-1}$ (rpm) | Page 3-11 |
| Drive belt width | | | 19.5 mm (0.76 in) | Page 3-13 |
| Recommended final reduction oil | | | Honda 4-stroke oil or equivalent motor oil<br>API service classification: MA<br>Viscosity: SAE 10W-30 | Page 3-13 |
| Final reduction oil capacity | | At draining | 0.10 liter (0.11 US qt, 0.09 Imp qt) | Page 3-13 |
| | | At disassembly | 0.12 liter (0.13 US qt, 0.11 Imp qt) | Page 3-13 |
| Front brake lever free play | | | 10 – 20 mm (3/8 – 3/4 in) | Page 3-15 |
| Rear brake lever free play | | | 10 – 20 mm (3/8 – 3/4 in) | Page 3-15 |
| Cold tyre pressure | Driver only | Front | 150 kPa (1.50 $kgf/cm^2$, 22 psi) | Page 3-18 |
| | | Rear | 200 kPa (2.00 $kgf/cm^2$, 29 psi) | Page 3-18 |
| | Driver and passenger | Front | 150 kPa (1.50 $kgf/cm^2$, 22 psi) | Page 3-18 |
| | | Rear | 250 kPa (2.50 $kgf/cm^2$, 36 psi) | Page 3-18 |
| Tyre size | | Front | 90/90 – 12 54J | – |
| | | Rear | 90/100 – 10 53J | – |
| Tyre brand | | Front | NYLOGRIP ZAPPER (MRF, TVS, CEAT) | – |
| | | Rear | NYLOGRIP ZAPPER (MRF, TVS, CEAT) | – |

## TORQUE VALUES

| ITEM | QTY | THREAD DIA. (mm) | TORQUE N·m (kgf·m, lbf·ft) | REMARKS | PAGE NO. |
|---|---|---|---|---|---|
| Spark Plug | 1 | 10 | 16 (1.6, 12) | | Page 3-7 |
| Nut, Tappet Adjusting | 2 | 5 | 10 (1.0, 7.3) | Apply eng. oil | Page 3-9 |
| Bolt, Plug Drain 12 mm | 1 | 12 | 24 (2.4, 17.7) | | Page 3-10 |
| Cap, Oil Filter | 1 | 30 | 20 (2.0, 14.7) | | Page 3-11 |
| Final Drive Oil Bolt | 1 | 8 | 12 (1.2, 8.8) | Mission oil check and drain | Page 3-13 |

## TOOLS

Valve adjusting wrench 070MA – 001I110

# MAINTENANCE SCHEDULE

Perform the Pre-ride Inspection in the Owner's Manual at each scheduled maintenance period.
I: Inspect and Clean, Adjust, Lubricate or Replace if necessary.
C: Clean R: Replace A: Adjust L: Lubricate.

The following items require some mechanical knowledge. Certain items (particularly those marked * and **) may require more technical information and tools. Consult your Honda dealer.

| | FREQUENCY / ITEM | NOTE | PRE-RIDE CHECK | ODOMETER READING (NOTE 1) | | | | | | | | ANNUAL CHECK | REGULAR REPLACE | REFER TO PAGE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | X1000KM | 1 | 4 | 8 | 12 | 16 | 20 | 24 | | | |
| | | | | X1000MI | 0.6 | 2.5 | 5 | 7.5 | 10 | 12.5 | 15 | | | |
| | | | | MONTHS | 1 | 4 | 8 | 12 | 16 | 20 | 24 | | | |
| * | FUEL LINE | | | | | I | I | I | I | I | I | I | | 3-4 |
| | FUEL LEVEL | | I | | | | | | | | | | | – |
| * | FUEL STRAINER SCREEN | | | | | C | C | C | C | C | C | | | – |
| * | THROTTLE OPERATION | | I | | | I | I | I | I | I | I | I | | 3-5 |
| * | CHOKE OPERATION | | | | | I | I | I | I | I | I | I | | 3-5 |
| * | AIR CLEANER | NOTE (2) | | | | | | | R | | | | | 3-6 |
| | CRANKCASE BREATHER | NOTE (3) | | | | C | C | C | C | C | C | C | | 3-6 |
| | SPARK PLUG | | | | | I | R | I | R | I | R | | | 3-7 |
| * | VALVE CLEARANCE | | | | I | I | I | I | I | I | I | | | 3-8 |
| | ENGINE OIL | | I | | R | R | R | R | R | R | R | R | | 3-9 |
| | ENGINE OIL STRAINER SCREEN | | | | C | | | C | | | C | | | 3-11 |
| * | ENGINE IDLE SPEED | | | | I | I | I | I | I | I | I | I | | 3-11 |
| * | SECONDARY AIR SUPPLY SYSTEM | | | | | | | I | | | I | I | | 3-12 |
| * | SECONDARY AIR SUPPLY SYSTEM AIR FILTER | NOTE (2) | | | | | | C | | | C | | | 3-12 |
| * | DRIVE BELT | | | | | | I | | I | | R | | | 3-13 |
| * | FINAL DRIVE OIL | NOTE (4) | | | | | | | | | | | 2 YEARS | 3-13 |
| | BRAKE SHOES WEAR | | I | | | I | I | I | I | I | I | I | | 3-14 |
| | BRAKE SYSTEM | | I | | I | I | I | I | I | I | I | I | | 3-15 |
| * | BRAKE LOCK OPERATION | | | | I | I | I | I | I | I | I | | | 3-16 |
| | BATTERY VOLTAGE | | I | | I | I | I | I | I | I | I | I | | 3-13 |
| | HEAD LIGHT AIM | | | | | I | I | I | I | I | I | I | | 3-16 |
| | LIGHTS/HORN | | I | | | | | | | | | | | – |
| ** | CLUTCH SHOES WEAR | | | | | | I | | I | | I | | | 3-16 |
| * | SUSPENSION | | | | | I | I | I | I | I | I | I | | 3-17 |
| * | NUTS, BOLTS, FASTENERS | | | | I | | I | | I | | I | I | | 3-18 |
| ** | WHEELS/TYRES | | I | | | I | I | I | I | I | I | I | | 3-18 |
| ** | STEERING HEAD BEARINGS | | | | I | | | I | | | I | I | | 3-18 |

* Should be serviced by an authorized Honda dealer, unless the owner has proper tools and service data and is mechanically qualified. Refer to the official Honda Shop Manual

** In the interest of safety, we recommended these items be serviced only by your Honda dealer.

**Notes:**

1. At higher odometer readings, repeat at the frequency interval established here.
2. Service more frequently if the vehicle is ridden in unusually wet or dusty areas.
3. Service more frequently when riding in rain or at full throttle.
4. Replacement requires mechanical skills.

# FUEL LINE

Remove the fuel cover lower (page 2-3).

Replace the fuel tube if it is cracked, damaged or leaking. Inspect the fuel tube routing, kinks and bends which can restrict the fuel flow. Also inspect the position of clips used for locking. Check fuel tube and fuel strainer for blockage.

Install the fuel tank cover lower (page 2–3).

Install the cover center (page 2–3).

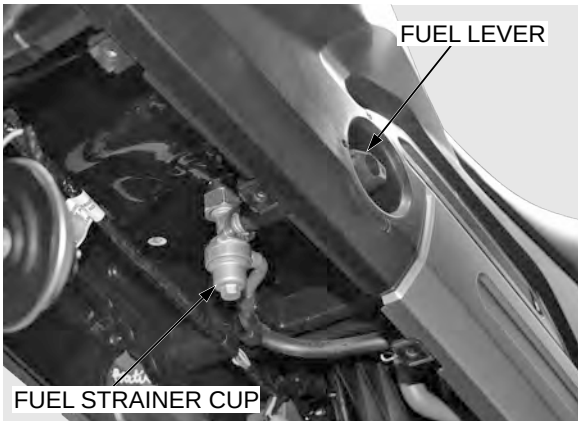

# FUEL STRAINER SCREEN

*Wipe the spilled gasoline off at once*

Remove the fuel tank cover lower (page 2-3).

Turn the fuel lever “OFF”.

Remove the fuel strainer cup and drain the contents of the cup into a suitable container.




Remove the O-ring and strainer screen.

Wash the strainer screen and cup in clean non-flammable high flash point solvent.

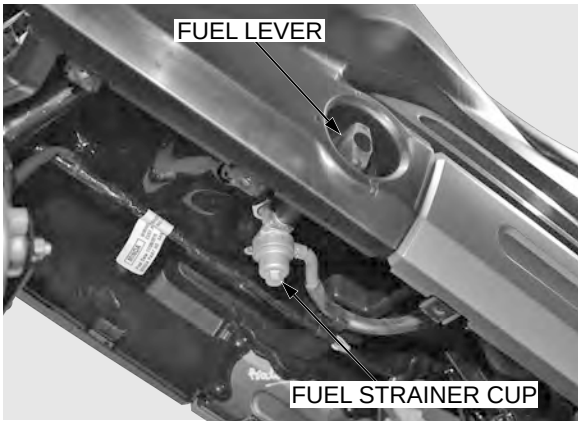
Carefully install the strainer screen, new O-ring and fuel strainer cup in the fuel cock body, making sure that the O-ring is in place.


Tighten the fuel strainer cup.

Turn the fuel lever “ON” and be sure there are no fuel leaks.

Install the fuel tank cover lower (page 2-3).

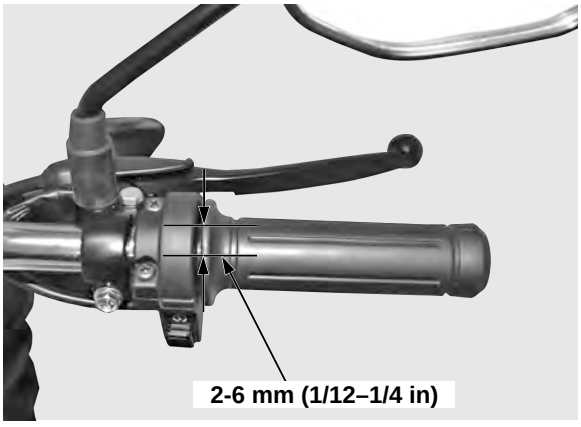
Install the cover center (page 2–3).



# THROTTLE OPERATION

Check for any deterioration or damage to the throttle cable. Check the throttle grip for smooth operation. Check that the throttle opens and automatically closes in all steering positions.

If the throttle grip does not return properly, change the throttle cable.




**⚠ WARNING**

Reusing a damaged or abnormally bent or kinked throttle cable can prevent proper throttle slide operation and may lead to a loss of throttle control while riding.

With the engine idling, turn the handlebar all the way to the right and left to ensure that the idle speed does not change. If idle speed increases, check the throttle grip free play and the throttle cable connection.

Measure the free play at the throttle grip flange.

**FREE PLAY: 2 – 6 mm (0.08 – 0.24 in)**

Adjustments are made with the upper adjuster.

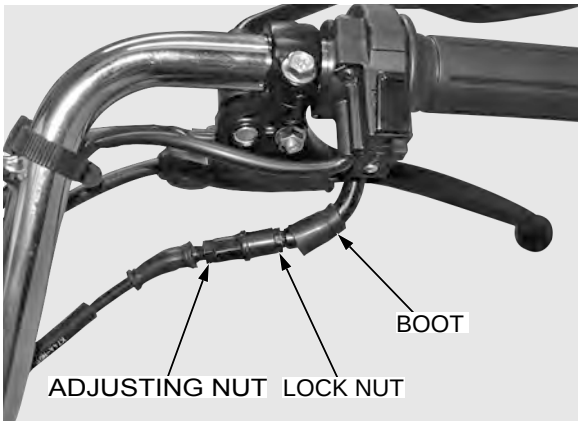
Slide the boot off the upper adjuster.

Loosen the lock nut and turn the adjuster as required.

After adjustment, tighten the lock nut and install the boot over the adjuster properly.

Recheck the throttle operation.

Replace any damage parts, if necessary.



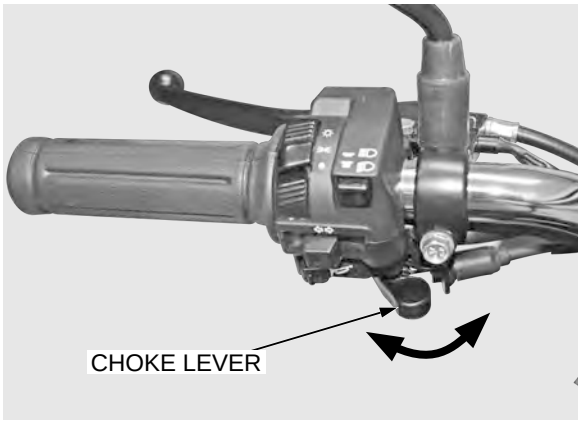

# CHOKE OPERATION

Check for smooth operation of the choke lever.

Lubricate the choke cable if the operation is not smooth.

Inspect the cable casing for cracks which could allow moisture to enter.

Replace the cable if necessary.



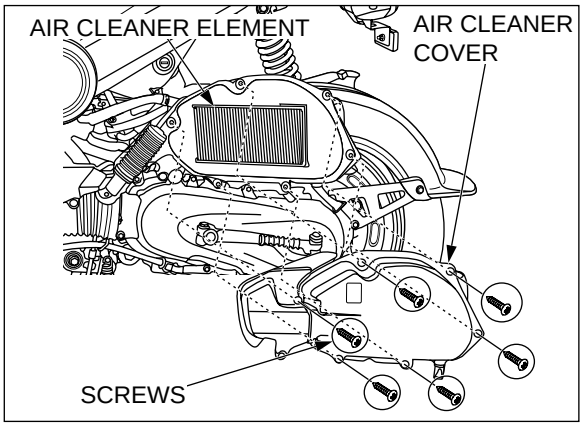
# AIR CLEANER

Support the vehicle on its center stand.

Remove the screws (6 nos.) and the air cleaner cover.

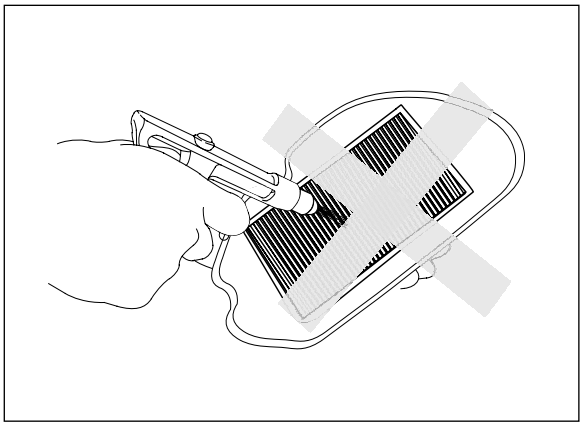
**NOTE:**

Clean the air cleaner cover surrounding area with compressed air or soft cloth before removing the air cleaner, If the vehicle is used in wet or dusty areas, more frequent inspections are required.




Remove the air cleaner element assembly from the air cleaner housing. Replace the air cleaner element as per maintenance schedule.

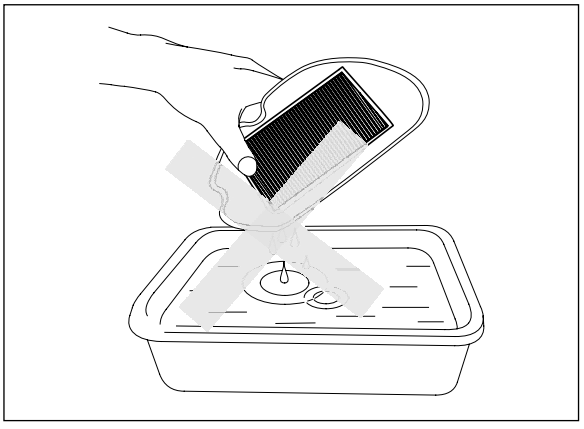
Do not clean with solvent to remove dust and also do not use forced air on it. The special oil will be lost and filter becomes dry. As the base filter paper is coarse, it cannot block fine dust when it becomes dry.



**NOTICE**

*Replace the air cleaner if it is excessively dirty, torn or damage.*

Do not place filter horizontally on any surface as dust can stick to the filter due to oil present. If necessary place vertically. Install immediately after inspection.



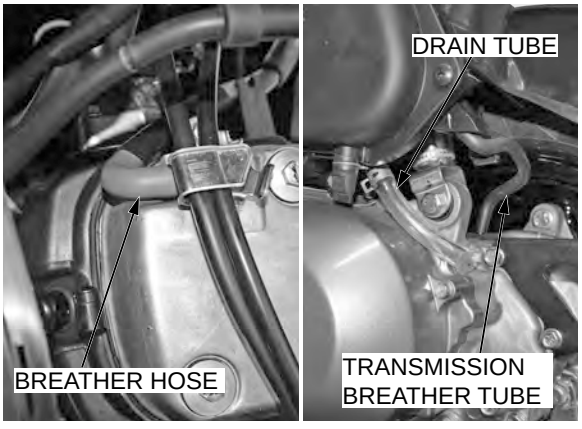
# CRANKCASE BREATHER

Remove the clamp from the drain tube and drain the deposits into a suitable container, then install the clamp securely.

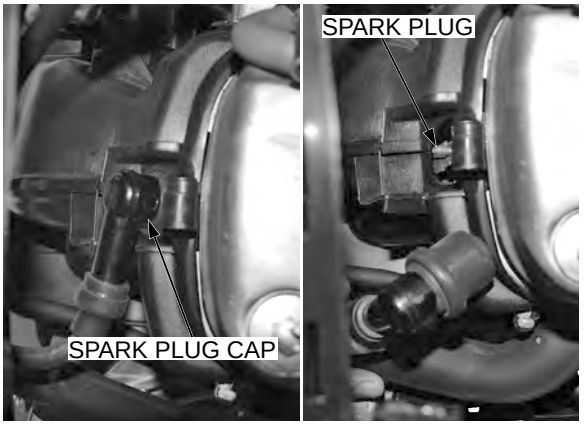
Inspect the breather hose and transmission breather tube for any damage.

**NOTE:**

Service more frequently when ridden in rain, at full throttle, or after the vehicle is overturned. Service if the deposits level can be seen in the drain tube.



# SPARK PLUG




Support the vehicle on its center stand.

Remove the cover center (page 2-3).

Remove the spark plug cap and clean around the spark plug base.

**NOTE:**

Clean around the spark plug base with compressed air before removing the plug, and be sure that no debris is allowed to enter the combustion chamber.

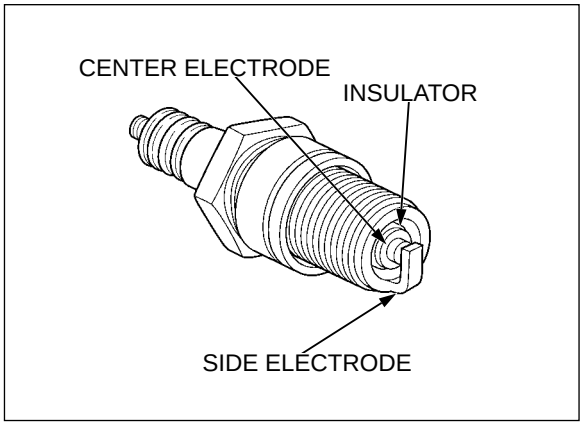
Remove the spark plug.

Check the insulator for cracks or damage and the electrodes for wear, fouling or discoloration.

If the electrode is corroded with carbon deposits, clean the electrode using the wire brush or spark plug cleaner.

Replace the plug if necessary.

| | |
|---|---|
| Standard | NGK MR7C-9N |




**RECOMMENDED SPARK PLUG:**

Measure the spark plug gap between the center and ground electrodes with a wire gauge.

**SPARK PLUG GAP: 0.8 – 0.9 mm (0.031 – 0.035 in)**

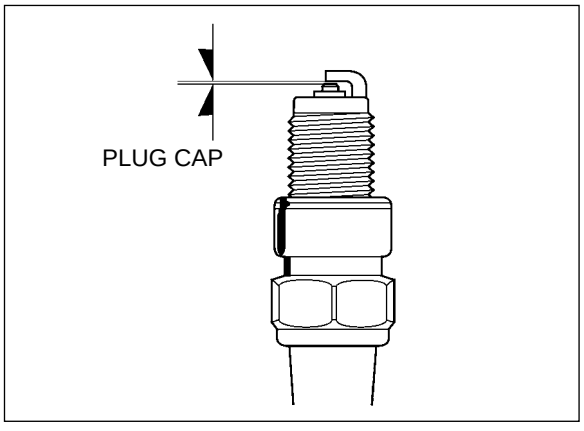
If necessary, adjust the gap by carefully bending the ground electrode.

Thread the spark plug in by hand to prevent cross-threading then tighten it to the specified torque.

**TORQUE: 16 N·m (1.6 kgf·m, 12 lbf·ft)**

Install the spark plug cap.

Install the cover center (page 2-3).



# VALVE CLEARANCE

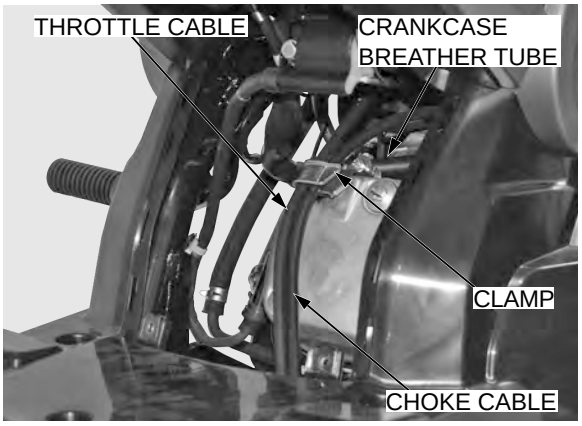
**NOTE:**

Inspect and adjust the valve clearance when the engine is cold (below 35°C/95°F).

Remove the cover center (page 2-3).

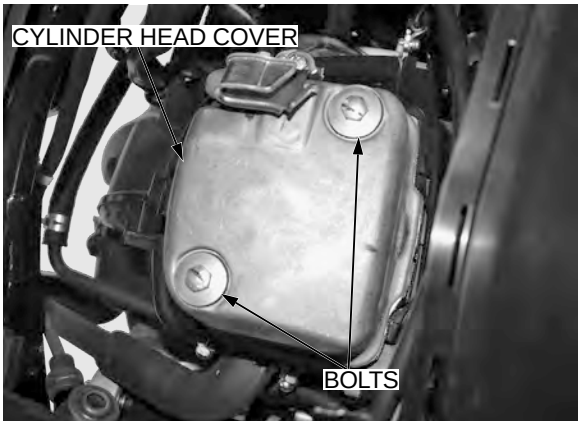
Disconnect the breather tube from the cylinder head cover.

Release throttle cable and choke cable from the head cover clamp.




Remove the spark plug (page 3-7).

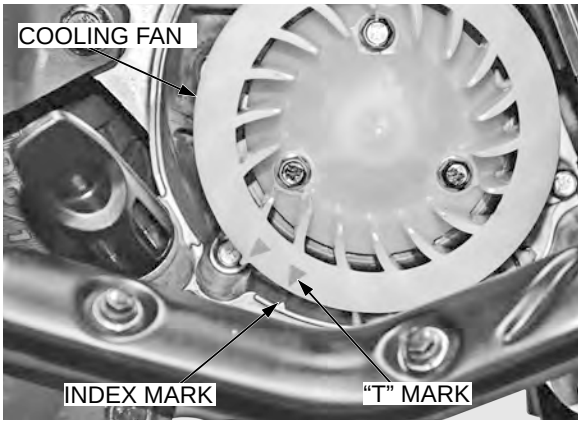
Remove the bolts (2 nos.) and cylinder head cover.




Turn the crankshaft clockwise and align the “T” mark on the cooling fan with the index mark on the right crankcase.

Make sure that the piston is at TDC (Top Dead Center) on the compression stroke.

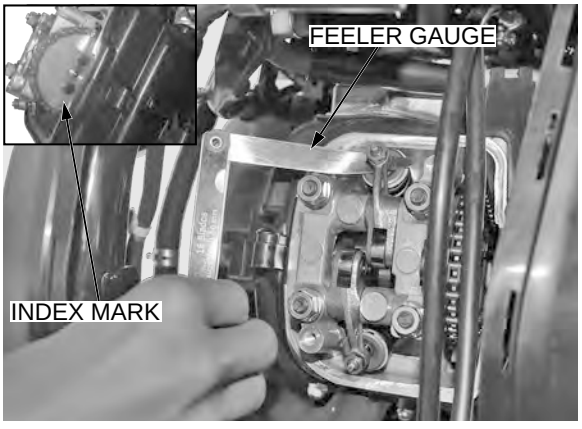
Rocker arms should be slightly loose. If the rocker arms are tight, turn the crankshaft clockwise 360° (one full turn) and align the “T” mark with the index mark.




Check the valve clearance by inserting a feeler gauge between the valve adjusting screw and valve stem.

**VALVE CLEARANCE:**

**IN/EX: 0.16 mm (0.006 ± 0.001 in)**



If the valve clearance is incorrect, loosen the valve adjusting screw lock nut and adjust the valve clearance by turning the adjusting screw until there is a slight drag on the feeler gauge.

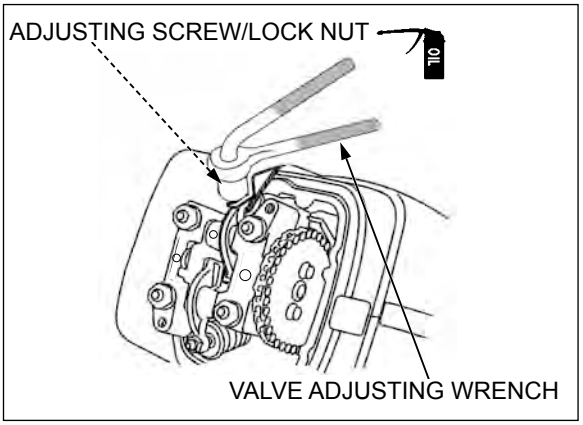
Hold the adjusting screw and tighten the lock nut.

**TOOLS:**

**Valve adjusting wrench 070MA – 001I110**

**TORQUE: 10 N·m (1.0 kgf·m, 7.3 lbf·ft)**

Recheck the valve clearance.

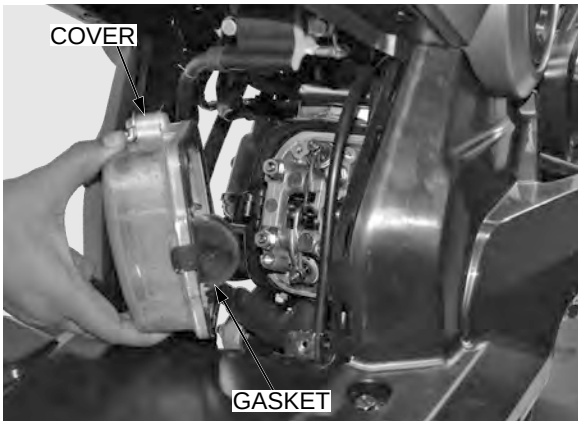



Check that the cylinder head cover gasket is in good condition and replace it with a new one if necessary.

Install the cylinder head cover and two bolts.

Connect the crankcase breather tube to the cylinder head cover.

Install the removed parts in the reverse order of removal.




# ENGINE OIL

## ENGINE OIL LEVEL CHECK

Place the vehicle on its center stand on level ground.

Start the engine, let it idle for 2 – 3 minutes.

Stop the engine and wait for 2 – 3 minutes.

Remove the oil filler cap/dipstick, wipe it and insert it without screwing it in.

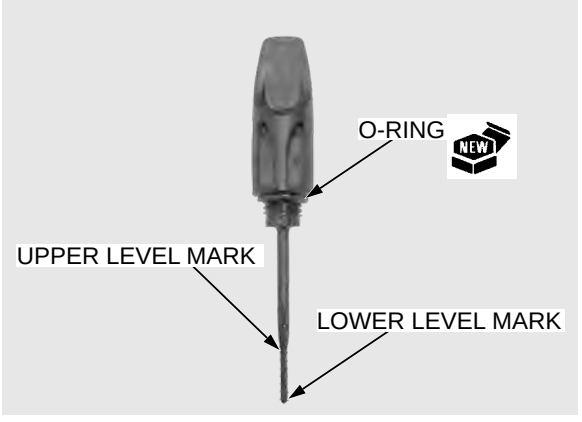

Remove the oil filler cap/dipstick and check the oil level.

The oil level should be between the upper and lower level marks on the dipstick.

If the oil level is below or near the lower level mark, add the recommended engine oil to the upper level mark.

**RECOMMENDED ENGINE OIL:**

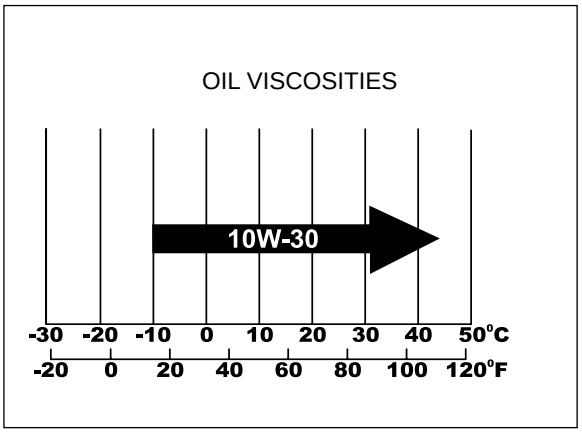
**Honda 4-stroke oil or equivalent motor oil**
**API service classification: MA**
**Viscosity: SAE 10W-30**



**NOTE:**

Other viscosities shown in the chart may be used when the average temperature in your riding area is within the indicated range.

Reinstall and tighten the oil filler cap/dipstick securely.




## ENGINE OIL CHANGE

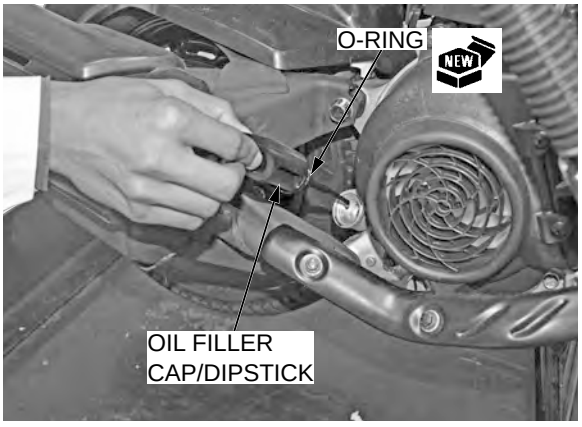
Place the vehicle on its main stand.

*Drain the engine oil while the engine is warm. This ensures complete and rapid draining.*

Remove the oil filler cap/dipstick.

Place oil drain pan under the engine to collect the oil, then remove the oil drain bolt.

After draining the oil completely check that the sealing washer on the drain bolt is in good condition and replace if necessary.




Install and tighten the drain bolt.

**TORQUE: 24 N·m (2.4 kgf·m, 18 lbf·ft)**

**NOTE:**

If the maintenance for the engine oil strainer screen is scheduled, perform it before filling the crankcase with engine oil (page 3-10).

Fill the crankcase with the recommended engine oil (page 3-9).

**ENGINE OIL CAPACITY:**

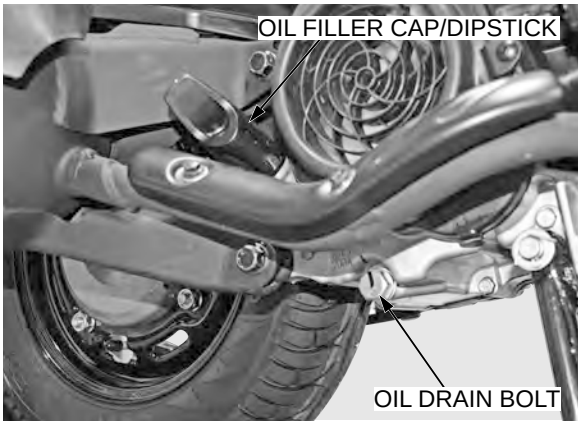
**0.7 liter (0.7 US qt, 0.6 Imp qt) at oil change**

**0.8 liter (0.8 US qt, 0.7 Imp qt) at disassembly**

Install the oil filler cap/dipstick.

Check the oil level.

Make sure that there are no oil leaks.



# ENGINE OIL STRAINER SCREEN

Drain the engine oil (page 3-10).

Remove the oil strainer screen cap, spring and oil strainer screen.

Clean the oil strainer screen thoroughly.

Check the screen for damage and the O-ring for damage or deterioration.

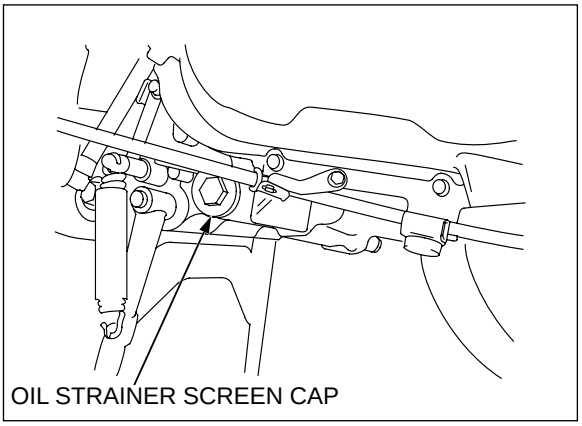
Replace the oil strainer screen if necessary.

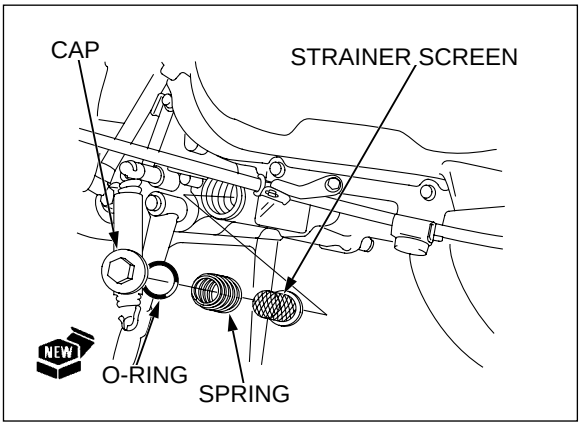
Install the oil strainer screen, spring, new O-ring and cap.

Tighten the oil strainer screen cap.

**TORQUE: 20 N·m (2.0 kgf·m, 14 lbf·ft)**

Fill the crankcase with the recommended engine oil (page 3-9).




# ENGINE IDLE SPEED

**NOTE:**

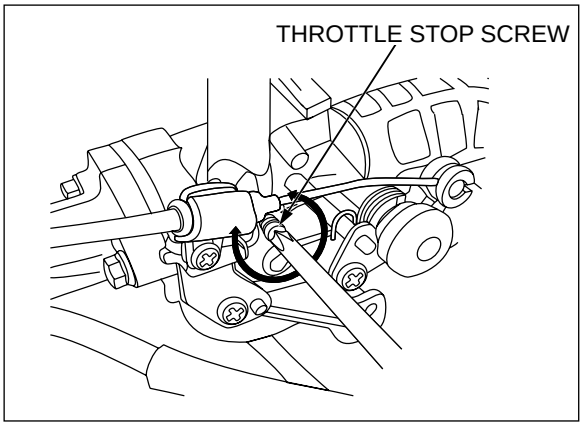
- Inspect and adjust the idle speed after all other engine adjustments are within specifications.
- The engine must be warm for accurate inspection and adjustment.

Warm up the engine to normal operating temperature. Stop the engine and place the vehicle on its center stand on level ground.

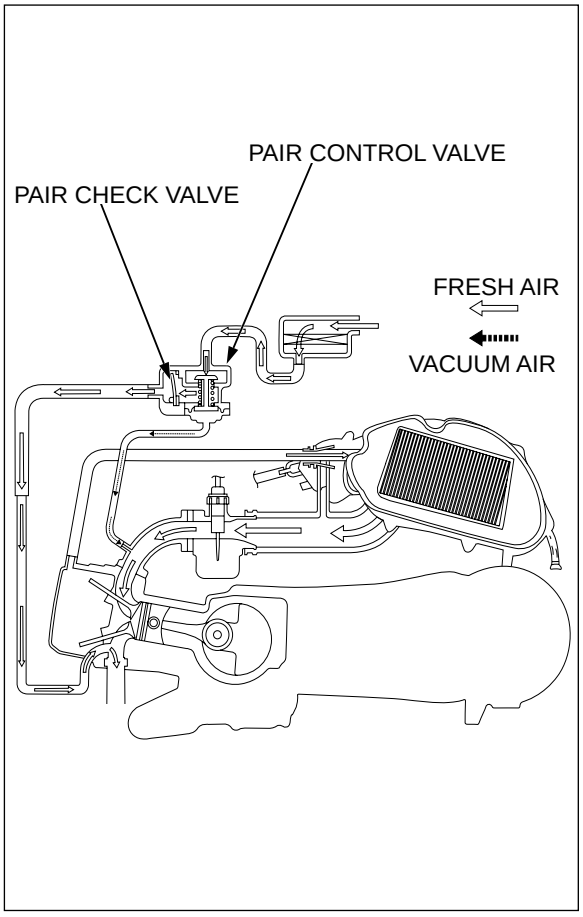
Connect a tachometer with spark plug cable.

Start the engine, check the idle speed and adjust by turning the throttle stop screw if necessary.

**IDLE SPEED: 1,700 ± 100 min$^{-1}$ (rpm)**

# SECONDARY AIR SUPPLY SYSTEM




**NOTE:**

The secondary air supply system introduces fresh filtered air into the exhaust port. The secondary air is drawn into the exhaust port whenever there is negative pressure pulse in the exhaust system. This charged secondary air promotes burning of the unburned exhaust gases and changes a considerable amount of hydrocarbons and carbon monoxide into relatively harmless water and carbon dioxide respectively.

Remove the right side cover (page 2-4).

Check the air injection hoses between the pulse secondary air injection PAIR control valve and cylinder head cover for deterioration, damage or loose connections. Make sure that the hoses are not cracked.

**NOTE:**

If the hoses show any signs of heat damage, inspect the PAIR check valve in the PAIR control valve for damage.

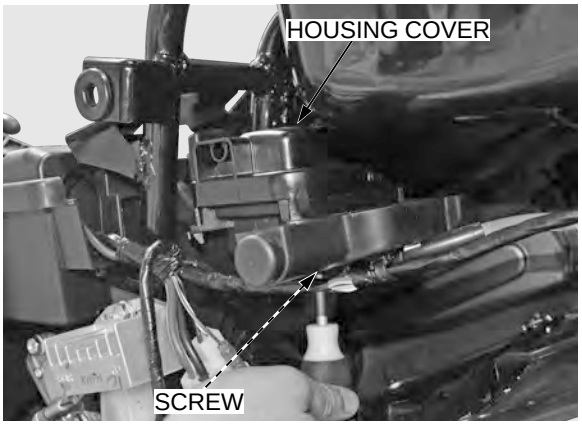
Check the air suction hose between the air filter and PAIR control valve for deterioration, damage or loose connections. Make sure that the hoses are not kinked, pinched or cracked.

## SECONDARY AIR SUPPLY SYSTEM (AIR CLEANER)

## REMOVAL/INSTALLATION

Remove the right side cover (page 2-4).

Remove the screw and housing cover from the secondary air cleaner.




Remove and clean the secondary air cleaner element as per maintenance schedule.


Wash the element in non-flammable or high flash point solvent and let it dry thoroughly.

Never use gasoline or low flash point solvent for cleaning the element. A fire or explosion could result.

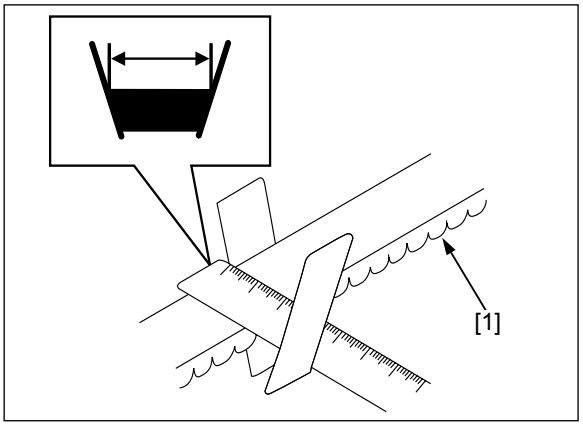
Soak the element in engine oil (SAE 10W–30) equivalent and squeeze out any excess oil.

Installation is in the reverse order of removal.

**⚠ CAUTION**

Do not rinse the filter element with both hands.

# DRIVE BELT




Remove the left crankcase cover (page 9-3).

Remove the drive belt (page 9-10).

Check the drive belt for cracks, separation or abnormal or excessive wear.

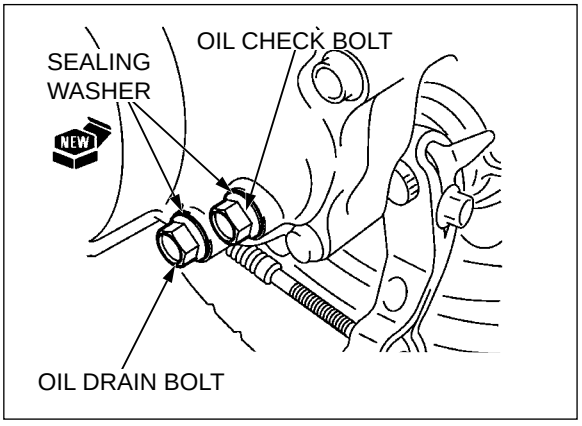
Measure the drive belt width.

**SERVICE LIMIT: 19.2 mm (0.76 in)**

Install the drive belt (page 9-18).

Install the crankcase cover (page 9-8).

# FINAL DRIVE OIL




Remove the oil level check bolt.

Remove the oil drain bolt, slowly turn the rear wheel and drain the oil.

**NOTE:**

Replace the final drive oil as per maintenance schedule.

After the oil is completely drained, install the oil drain bolt with a new sealing washer and tighten it.

**TORQUE: 12 N·m (1.2 kgf·m, 8.8 lbf·ft)**

Fill the transmission case with recommended oil through the check bolt hole up to the bottom edge of the check bolt hole.

**RECOMMENDED OIL:**

**Honda 4-stroke oil or equivalent motor oil API service classification: MA**
**Viscosity: SAE 10W-30**

**OIL CAPACITY:**

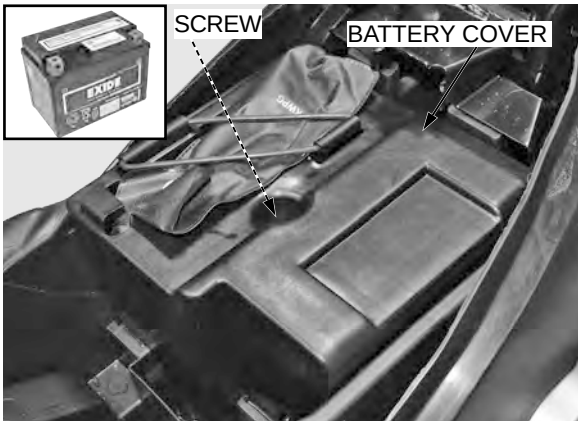
**0.10 liter (0.11 US qt, 0.09 Imp qt) at oil change**

**0.12 liter (0.13 US qt, 0.11 Imp qt) at disassembly**

Install the oil level check bolt with a new sealing washer and tighten it.

**TORQUE: 12 N·m (1.2 kgf·m, 8.8 lbf·ft)**

# BATTERY




*Battery is maintenance free battery means can be permanently damaged if the cap strip is removed*

Place the vehicle on its center stand on level ground.

Remove the seat (page 2-3).

Remove the screw (1 no.) and battery cover.

Remove the battery from battery case (page 15-3).

Check for the rusting to the terminals and physical damage of terminals and battery.

Check the battery voltage (page 15-3).

Install the battery and battery cover (page 15-3).

# FUSE BOX

## REMOVAL

Remove the battery cover (page 2-6).

Unlock the fuse box by pulling the fuse box lock in upward direction and pull it outside.

**⚠ CAUTION**

Don't pull the fuse box lock with excessive force, it may damage the lock permanently.

## INSTALLATION

Insert the fuse box into the fuse box installation stay.

Make sure that top of fuse box installation stay is aligned with top surface of fuse box.

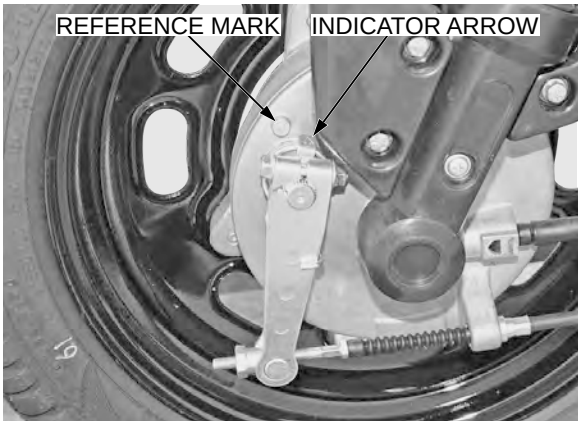
Install the battery cover (page 2-6).

Install the seat (page 2-3).

**⚠ CAUTION**

Ensure the proper fitment of fuse box by slightly pulling it upwards from center.

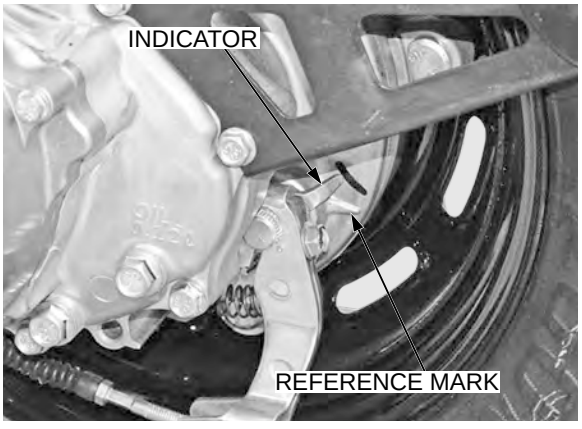
# BRAKE SHOES WEAR




## FRONT BRAKE

Replace the front brake shoes if the indicator arrow on the brake arm aligns with the reference mark "D" on the brake panel when the front brake is fully applied.

Refer to (page 13-8) for front brake shoe replacement and brake drum inspection.




## REAR BRAKE

Replace the rear brake shoes if the indicator of the brake arm aligns with the reference mark on the transmission case when the rear brake is fully applied.

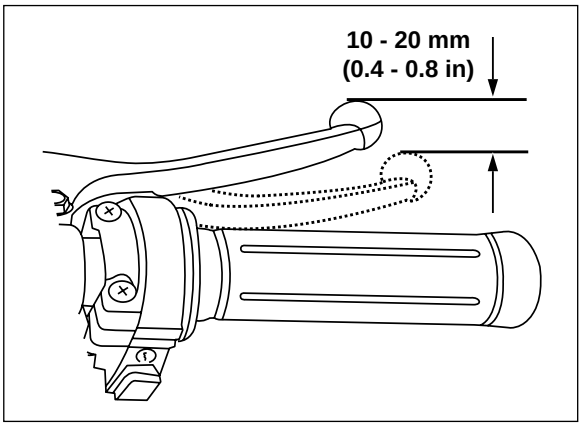
Refer to (page 14-4) for rear brake shoe replacement and brake drum inspection.

# BRAKE SYSTEM

Check the cable and brake lever for loose connections, excessive play, or other damage.

Replace or repair if necessary.

Inspect the brake cable for kinks or damage, and lubricate the cable.




## FRONT BRAKE

Measure the front brake lever free play at the tip of the brake lever.

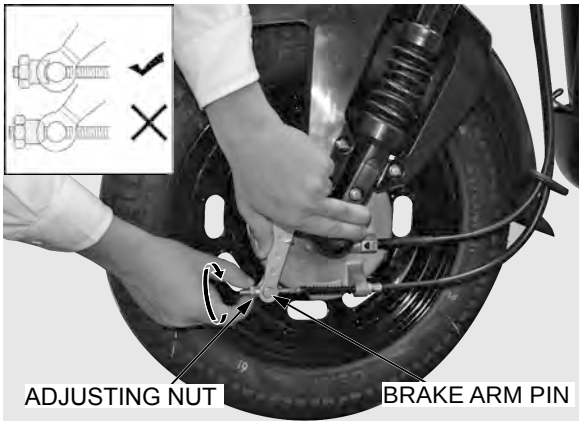
**FREE PLAY: 10 – 20 mm (0.4 – 0.8 in)**

Push the brake arm by hand, turn the adjusting nut in clockwise direction till you cannot turn by hand.

Check that free play of right lever is 10-20 mm. If required than further turn adjuster nut.

Again check the free play and confirm the value within the specified limit.

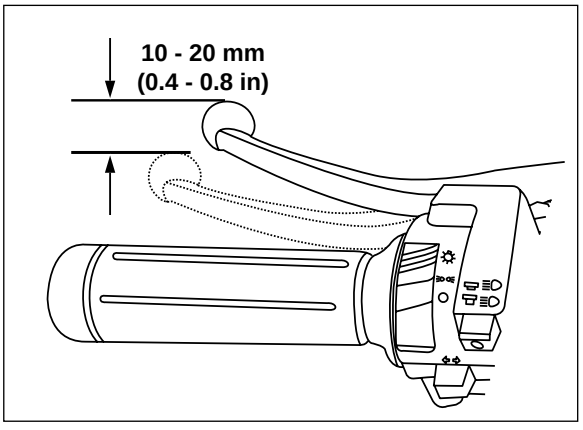
Check the front wheel for the free movement.




## REAR BRAKE

Measure the rear brake lever free play at the tip of the brake lever.

**FREE PLAY: 10 – 20 mm (0.4 – 0.8 in)**

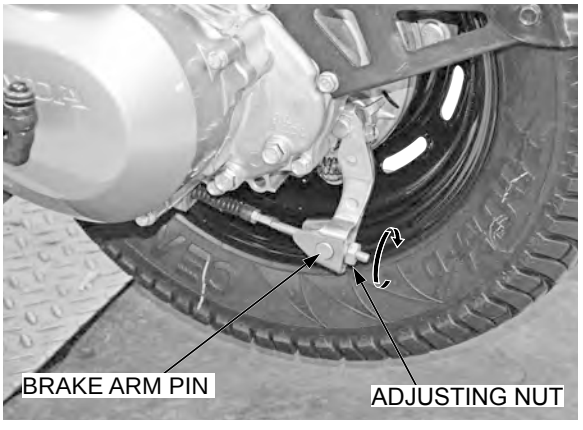



If adjustment is necessary, turn the rear brake adjusting nut.

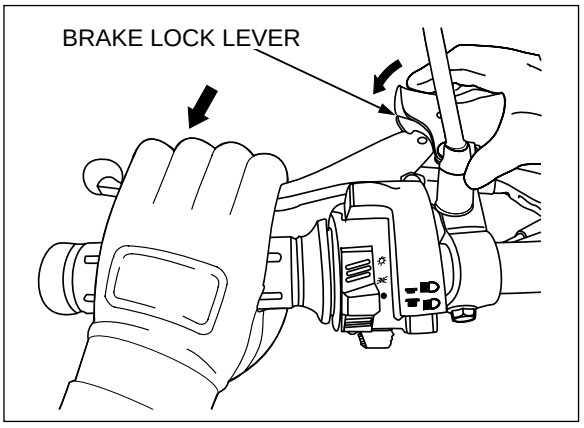
Check the brake cable for kinks or other damage.

Check that the brake arm, spring and fasteners are in good condition.

Check the rear wheel for the free movement.



### BRAKE LOCK OPERATION




**NOTE:**

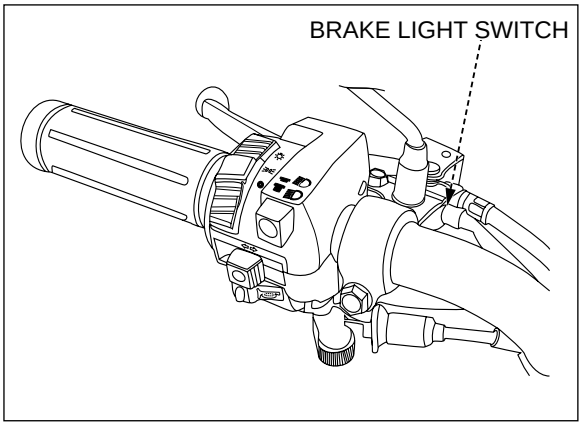
Check the brake lock operation after the rear brake lever free play check and adjusted.

Squeeze the rear brake lever and set the lock lever.

Check that the rear wheel is locked completely.

Again press the brake lever to release the lock lever.

## BRAKE LIGHT SWITCH

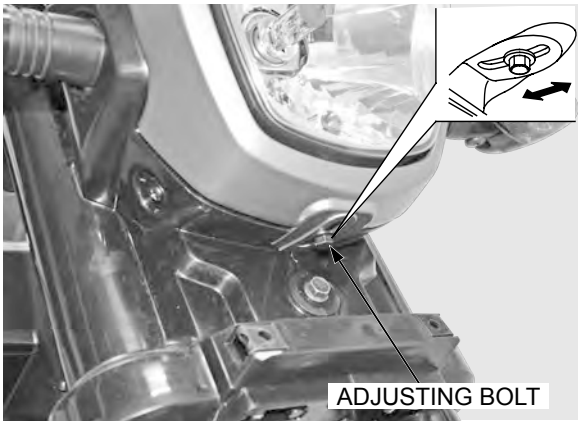



**NOTICE**

*The brake light switch at the brake lever cannot be adjusted. If the brake light switch actuation and brake engagement are off, either replace the switch unit or the malfunctioning parts of the system.*

Check that the brake light comes on when the brake lever (left, right or both) is pressed and the front-rear brake engagement begins.

## HEAD LIGHT AIM



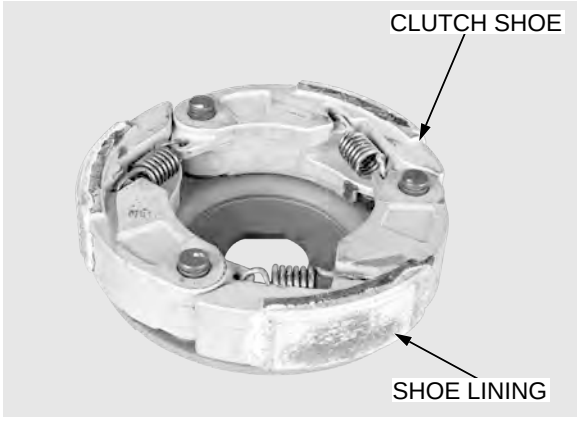

**NOTE:**

Adjust headlight beam as specified by local laws and regulations.

Support the vehicle on its center stand.

Adjust the head light beam vertically by loosening the headlight adjusting bolt.

## CLUTCH SHOES WEAR




Remove the clutch shoes (page 9-12).

Check the clutch shoe for wear or damage.

Refer to (page 9-15), for clutch shoe lining inspection.

Installation is in the reverse order of removal.

# SUSPENSION

**⚠ WARNING**

Loose, worn or damaged suspension parts impair vehicle stability and control. Repair or replace any damaged components before riding. Riding a vehicle with faulty suspension increases your risk of an accident and possible injury.

## FRONT

**NOTE:**

Remove the vehicle from the main/side stand.

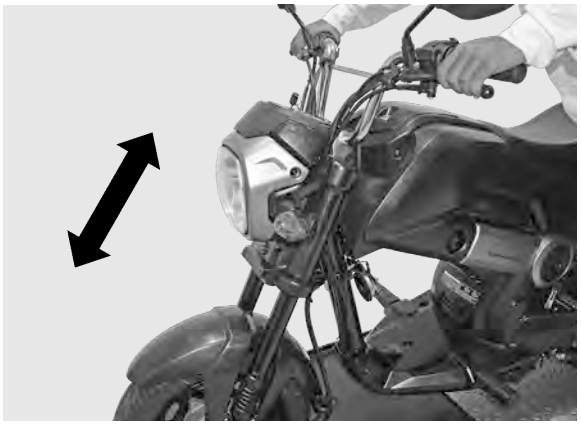
Check the action of the front suspension by applying the front brake and compressing the forks several times.

Check the entire assembly for signs of leaks, damage or loose fasteners.

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

Refer section 13 for fork service.



## REAR

**NOTE:**

Remove the vehicle from the main/side stand.

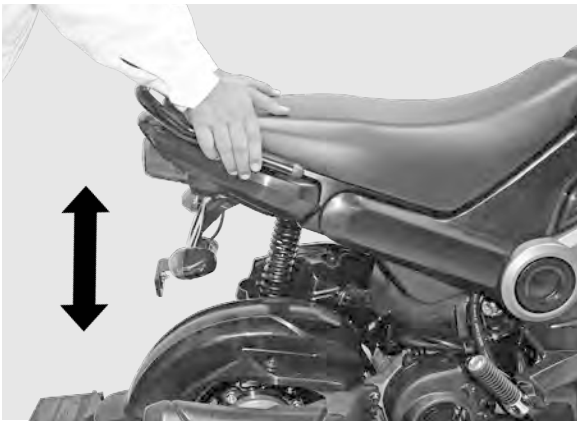
Check the action of the rear shock absorber by compressing it several times.

Check the entire shock absorber assembly for signs of leaks, damage or loose fasteners.

Replace damaged components which cannot be repaired.

Tighten all nuts and bolts.

Refer section 14 for shock absorber service.



Raise the rear wheel off the ground by placing the vehicle on its center stand.

Check for worn engine mounting bushings by grabbing the rear wheel and attempting to move the wheel side to side.

Replace the bushings if any looseness is noted (section 14).

# NUTS, BOLTS, FASTENERS

Check that all chassis nuts and bolts are tightened to the specified torque values (page 1-8).

Check that all cotter pin, safety clips, hose clamps and cable stays are in place and properly secured.

# WHEELS/TYRES

**NOTE:**

Tyre pressure should be checked when the tyres are COLD.

Check the tyre pressure with the tyre pressure gauge.

**RECOMMENDED TYRE PRESSURE:**

**Driver only:**

| | |
|---|---|
| **Front:** | **150 kPa (1.50 kgf/cm², 22 psi)** |
| **Rear:** | **200 kPa (2.00 kgf/cm², 29 psi)** |

**Driver and passenger:**

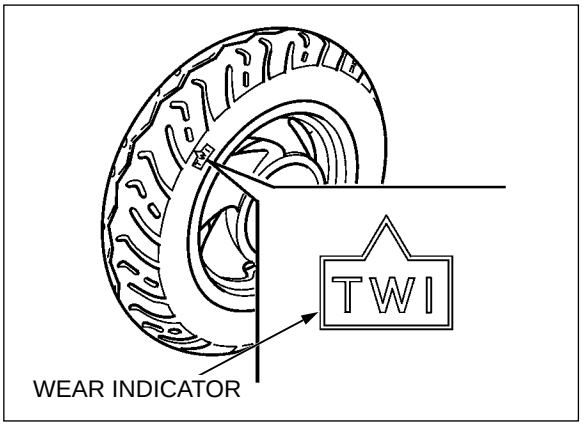
| | |
|---|---|
| **Front:** | **150 kPa (1.50 kgf/cm², 22 psi)** |
| **Rear:** | **250 kPa (2.50 kgf/cm², 36 psi)** |

Check the tyres for cuts, embedded nails or other damage.

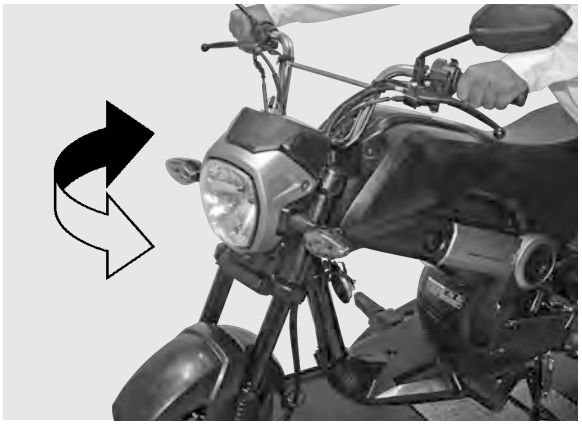
Check the front and rear wheels for trueness.

Check the tread wear indicator for insufficient tread depth.

If the tread wear indicator is invisible, the tyre should be replaced.




# STEERING HEAD BEARINGS



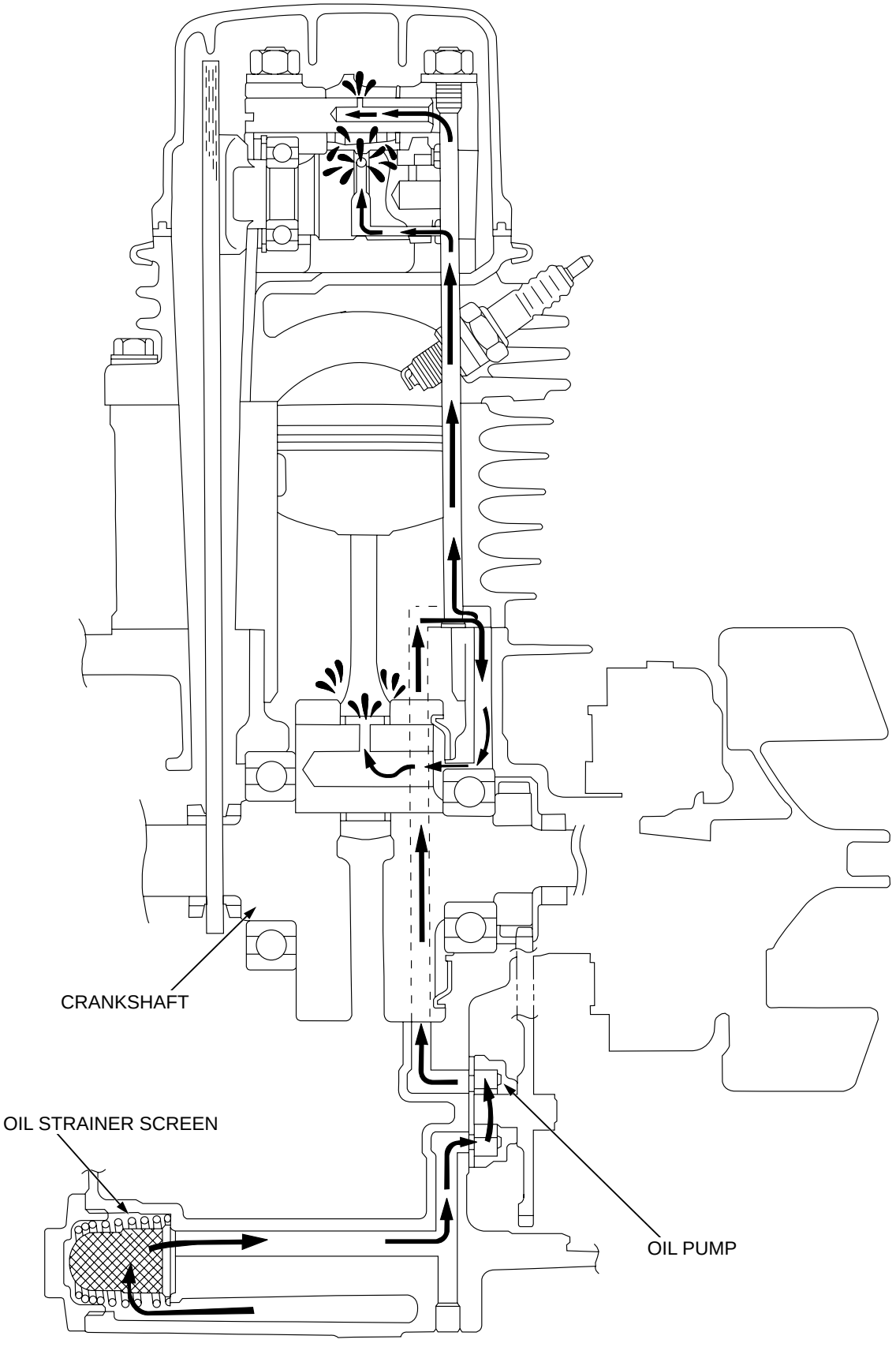
Support the vehicle on its center stand, and raise the front wheel off the ground.

Check that the control cables do not interfere with the handlebar rotation.

Check that the handlebar moves freely from side to side. If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (section 13).

**MEMO**

# LUBRICATION SYSTEM DIAGRAM



# 4. LUBRICATION SYSTEM



## SERVICE INFORMATION

### GENERAL

**⚠ WARNING**

Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil. KEEP OUT OF REACH OF CHILDREN.



- When removing and installing the oil pump, use care not to allow dust or dirt to enter the engine.

### SPECIFICATIONS

Unit: mm (in)

| ITEM | | STANDARD | SERVICE LIMIT | Page NO. |
|---|---|---|---|---|
| Engine oil capacity | At draining | 0.7 liters (0.7 US qt, 0.6 lmp qt) | – | Page 3-10 |
| | At disassembly | 0.8 liters (0.8 US qt, 0.7 lmp qt) | – | Page 3-10 |
| Recommended engine oil | | Honda 4-stroke oil or equivalent motor oil<br>API service classification: MA<br>Viscosity: SAE 10W-30 | – | Page 3-9 |
| Oil pump rotor | Tip clearance | 0.15 (0.006) | 0.20 (0.008) | Page 4-3 |
| | Body clearance | 0.15 – 0.21 (0.006 – 0.008) | 0.35 (0.014) | Page 4-3 |
| | Side clearance | 0.05 – 0.10 (0.002 – 0.004) | 0.12 (0.005) | Page 4-3 |

### TORQUE VALUES

| ITEM | QTY | THREAD DIA. (mm) | TORQUE N·m (kgf·m, lbf·ft) | REMARKS | PAGE NO. |
|---|---|---|---|---|---|
| Oil pump assy. bolt | 2 | 6 | 10 (1.0, 7.3) | | Page 4-4 |
| Plate, oil pump screw | 1 | 4 | 3 (0.3, 2.2) | | Page 4-4 |
| Oil pump cover bolt | 1 | 6 | 10 (1.0, 7.3) | | Page 4-5 |
| | 1 | 6 | 10 (1.0, 7.3) | | Page 4-5 |

## TROUBLESHOOTING

**Oil level too low**

- External oil leaks
- Worn valve guide or seal
- Worn piston rings or incorrect piston ring installation
- Worn cylinder
- Oil not added frequently enough

**Oil contamination**

- Oil not changed often enough
- Worn piston rings

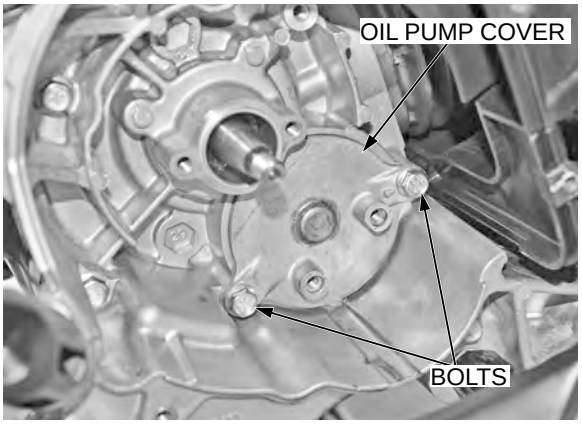
# OIL PUMP

## REMOVAL

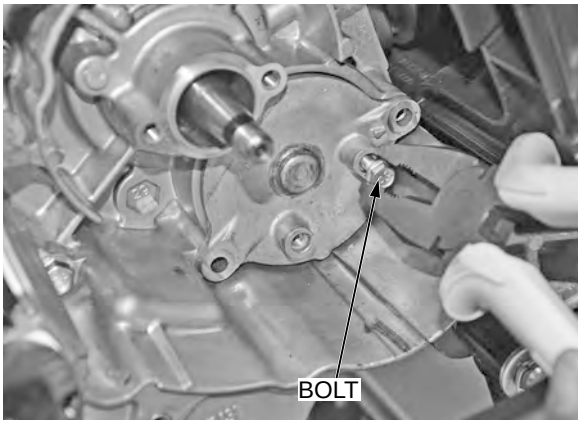
Drain the engine oil (page 3-10).

Remove the alternator assembly (page 11-2).

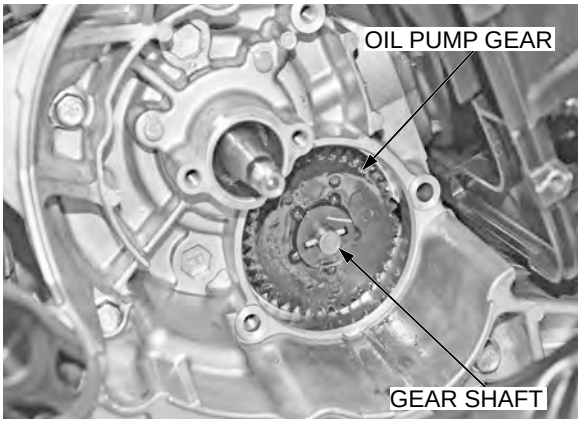
Remove the oil pump cover bolts (2 nos.).



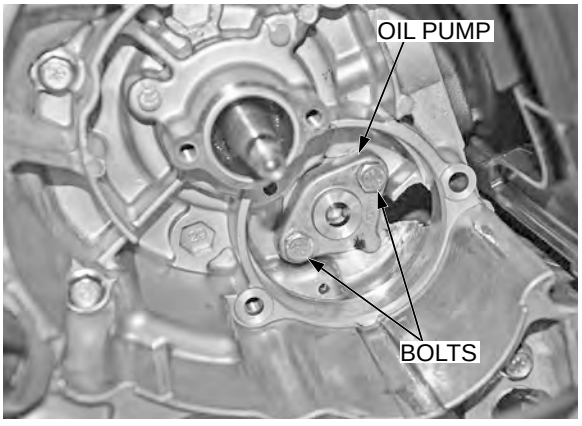

Screw the (5 mm thread dia) bolt into the threaded hole in the oil pump cover and pull the cover out by the help of plier from the right crankcase.




Remove the oil pump gear shaft and gear.



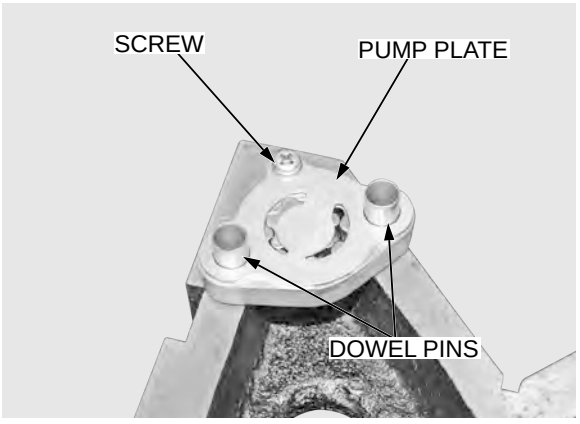

Remove the oil pump mounting bolts (2 nos.) and the oil pump assembly.



## DISASSEMBLY

Remove the dowel pins (2 nos.).

Remove the oil pump plate attaching screw (1 no.) and pump plate.

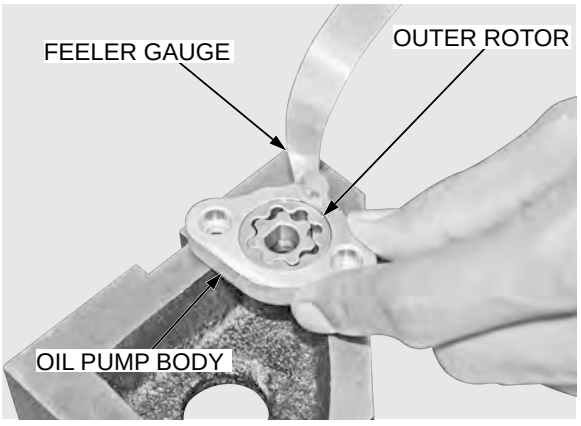



## INSPECTION

Check oil pump body for any damage/worn-out teeth.

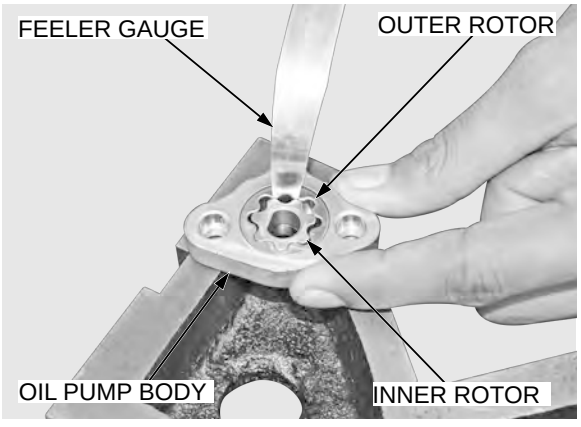
Measure the outer rotor-to-body clearance.

**SERVICE LIMIT: 0.35 mm (0.014 in)**




Measure the rotor tip clearance between inner rotor and outer rotor.

**SERVICE LIMIT: 0.20 mm (0.008 in)**

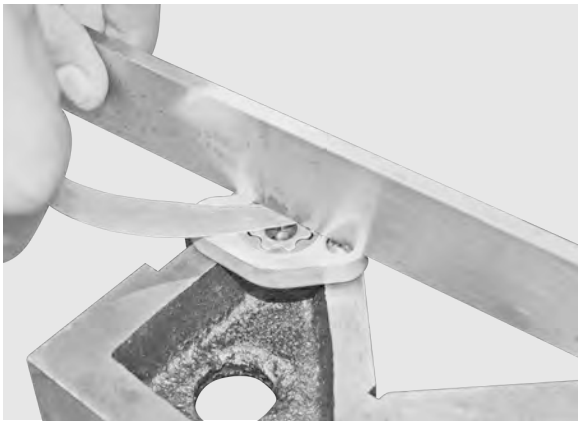



Measure the pump end clearance.

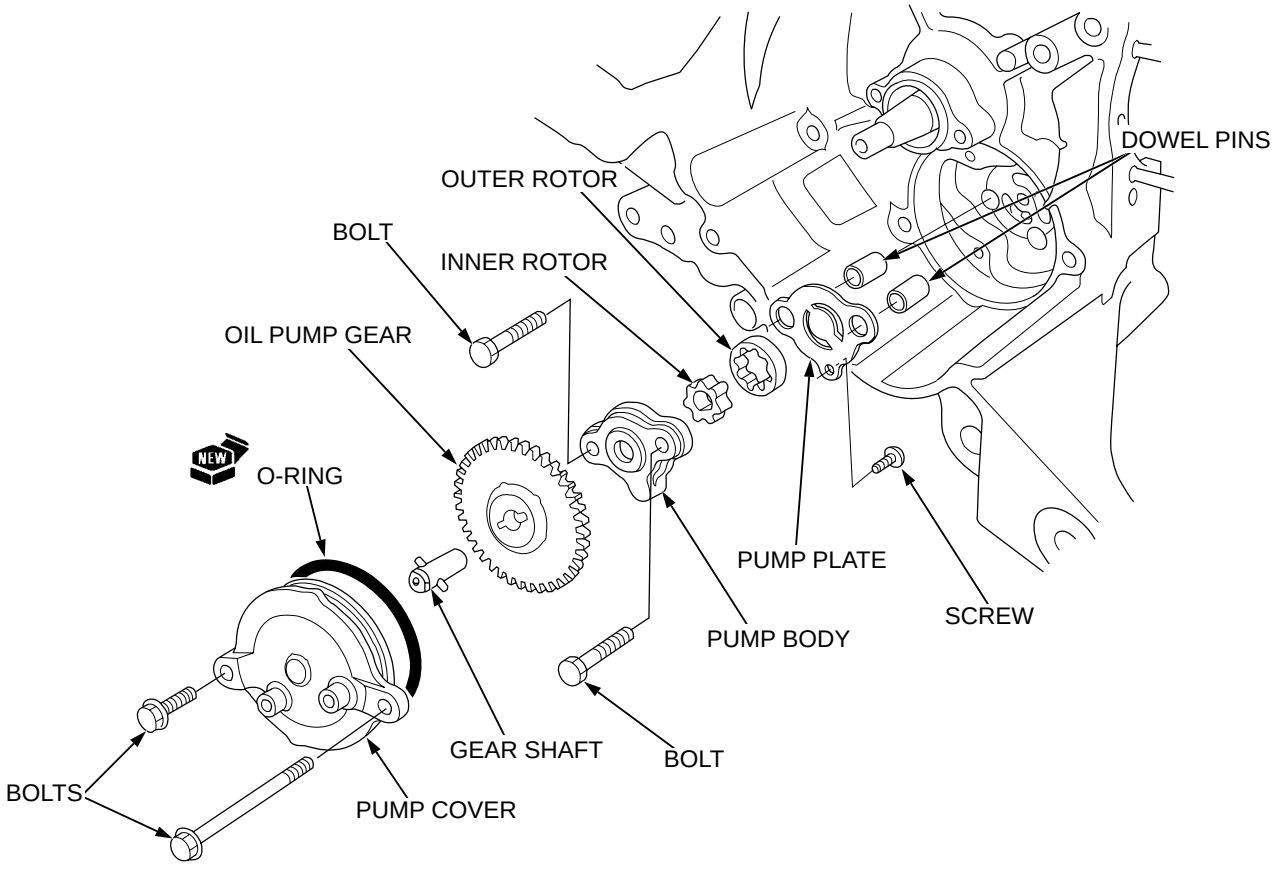
**SERVICE LIMIT: 0.12 mm (0.005 in)**

Remove the inner and outer rotors from the pump body.

Clean the all disassembled parts thoroughly.



## OIL PUMP ASSEMBLY




Install the outer and inner rotors into the pump body.

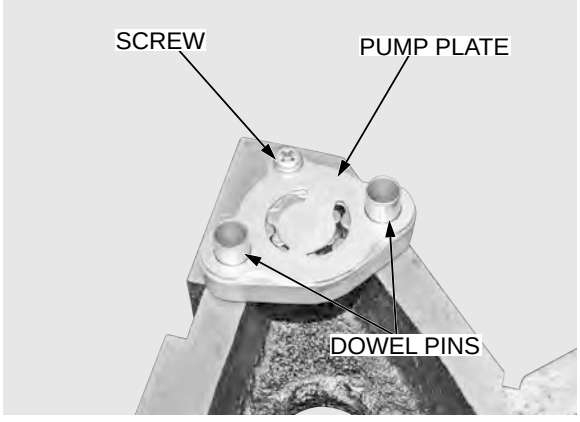
Install the two dowel pins.

Install the pump plate by aligning the holes in the pump plate with the two dowel pins.

Install and tighten the pump plate attaching screw.

**TORQUE: 3 N·m (0.3 kgf·m, 2.2 lbf·ft)**

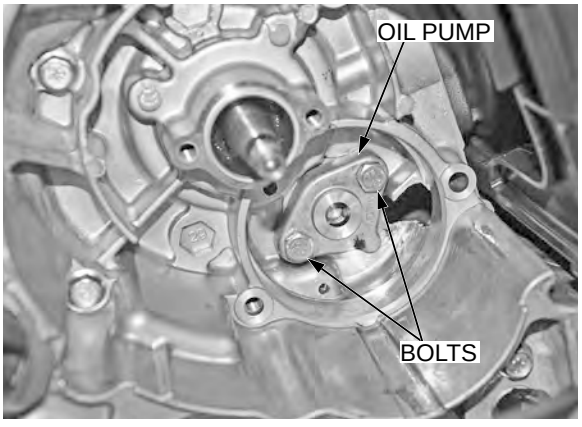
Check that the oil pump rotates smoothly with the oil pump gear.



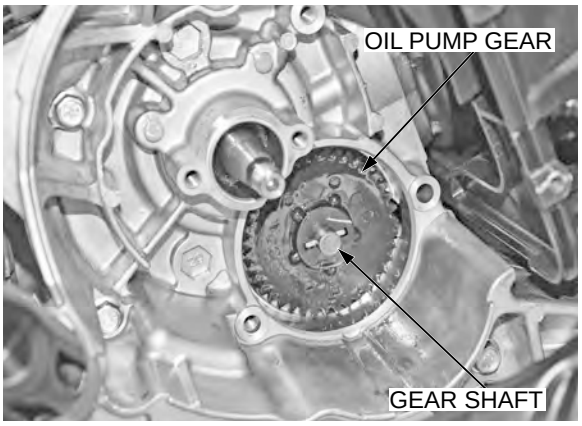

## INSTALLATION

Install the oil pump assembly onto the right crankcase and tighten the mounting bolts (2 nos.).

**TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)**



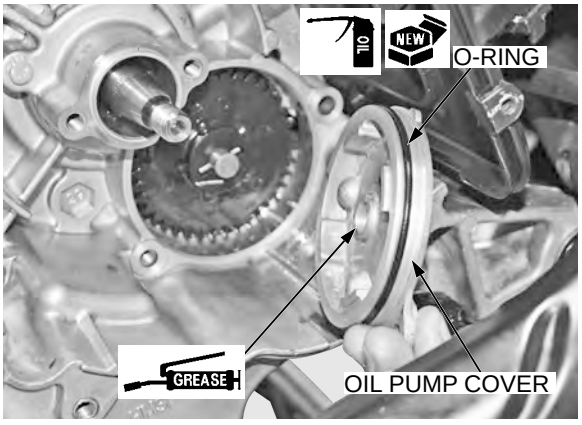
Install the oil pump gear and gear shaft into the oil pump.




Apply grease to the oil pump gear shaft hole in the oil pump cover.

Coat a new O-ring with oil and install it onto the oil pump cover.

Install the oil pump cover into the right crankcase.

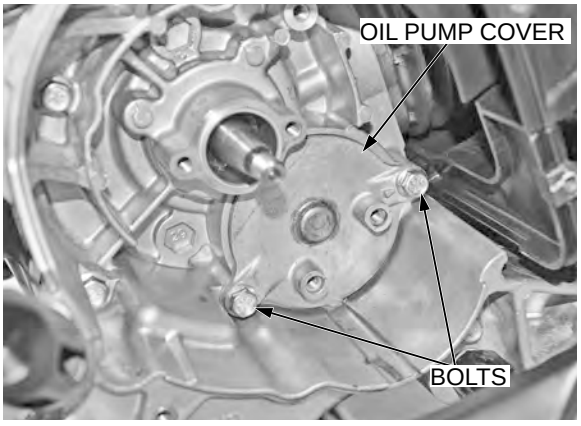



Install and tighten the oil pump cover bolts (2 nos.).

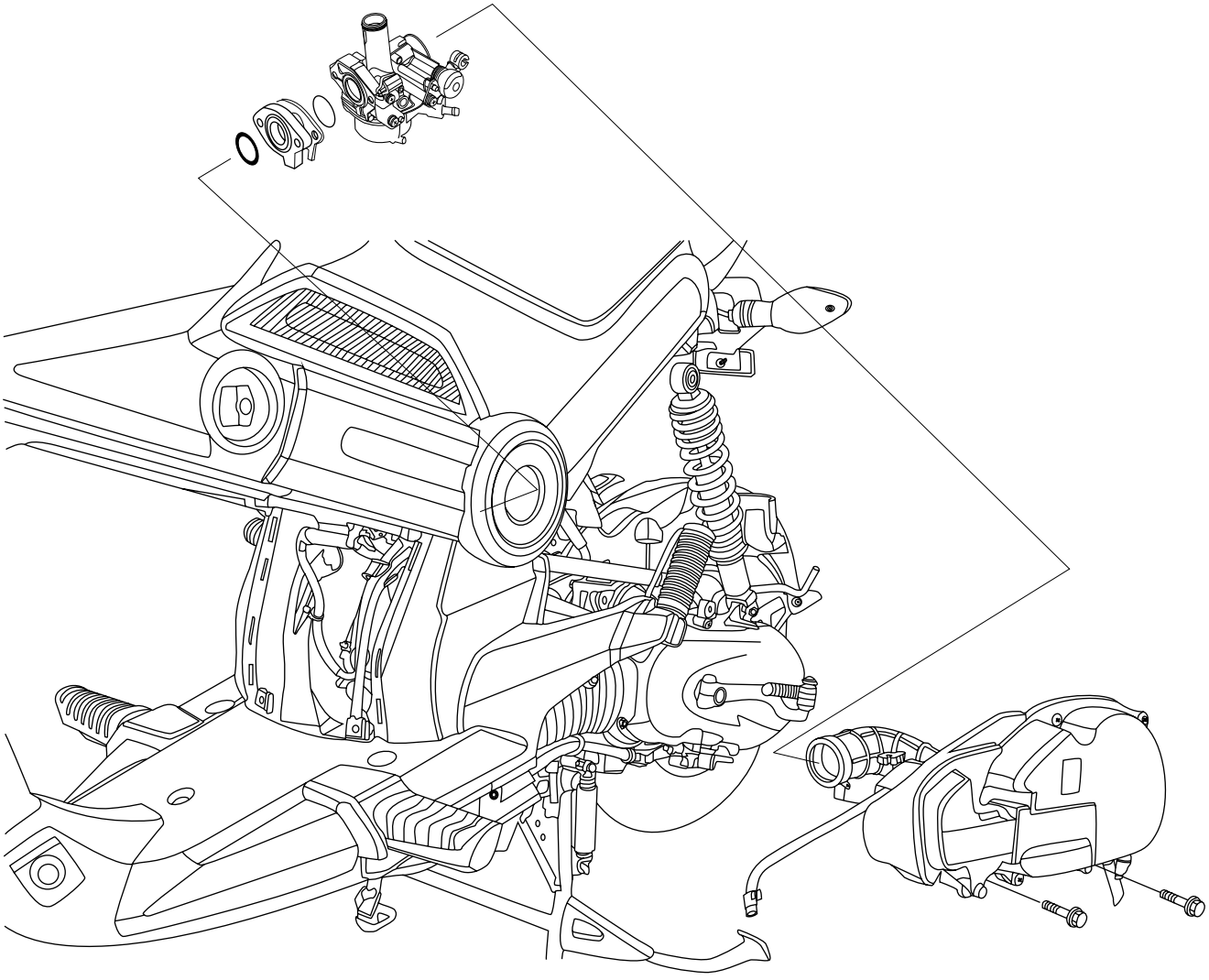
**TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)**

Install the alternator assembly (page 11-3).

Fill the crankcase with recommended engine oil (page 3-9).



# COMPONENT LOCATION



# SERVICE INFORMATION

## GENERAL



**⚠ WARNING**

- Gasoline is extremely flammable and is explosive under certain conditions. KEEP OUT OF REACH OF CHILDREN.
- If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and lead to death. Run the engine in an open area or with an exhaust evacuation system in an enclosed area.
- Bending or twisting the control cables will impair smooth operation and could cause the cables to stick or bind, resulting in loss of vehicle control.

- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.
- If the vehicle is to be stored for more than one month, drain the float bowl. Fuel left in the float bowl may cause clogged jets resulting in hard starting or poor drive ability.
- Before removing the carburetor, place an approved fuel container under the carburetor drain tube, loosen the drain screw and drain the carburetor.
- When disassembling fuel system parts, note the locations of the O-rings. Replace them with new ones on reassembly.
- After removing the carburetor, wrap the intake port of the engine with a shop towel or cover it with a piece of tape to prevent any foreign material from dropping into the engine.

## SPECIFICATIONS

| ITEM | SPECIFICATIONS | Page NO. |
|---|---|---|
| Carburetor identification number | PB5TH | Page 1-3 |
| Venturi diameter | 16 mm (0.63 in) | – |
| Main jet | #85 | Page 5-7 |
| Slow jet | #35 x #35 | Page 5-7 |
| Float level | 11.7 ± 0.5 mm (0.46 ± 0.02 in) | Page 5-7 |
| Air screw initial opening | 1 3/4 turns out | Page 5-9 |
| Engine Idle speed | 1,700 ± 100 $min^{-1}$ (RPM) | Page 5-10 |
| PAIR control valve specified vacuum | 460 mmHg (18.11 in Hg) | Page 5-10 |

## TORQUE VALUES

| ITEM | QTY | THREAD DIA. (mm) | TORQUE N·m (kgf·m, lbf·ft) | REMARKS | PAGE NO. |
|---|---|---|---|---|---|
| Carburetor mounting bolts | 2 | 6 | 10(1.0, 7.3) | | Page 5-8 |

## TOOLS

Carburetor float level gauge 070MJ-001-I110

# TROUBLESHOOTING

**Engine won't start**

- No fuel in fuel tank
- No fuel to carburetor
  - Fuel stainer clogged
  - Fuel tube clogged
  - Fuel valve vacuum tube clogged
  - Float valve stuck
  - Float level miss adjusted
  - Fuel tank cap breather hole clogged

**Poor performance**

- Deformed exhaust system
- Exhaust gas leak
- Clogged muffler
- Too much fuel getting into the carburettor
  - Air cleaner clogged
  - Flooded carburetor
  - Float valve worn out
  - Deposition on float valve seat
  - Fuel tank cap breather hole block
  - Intake air leak
- Fuel cock stuck
- Bad fuel quality
- Fuel jet clogged
- Fuel contaminated/deteriorated
- By-starter valve faulty
- Ignition system faulty (section 15)

**Engine stalls, hard to start, rough idling**

- Fuel mixture too lean/rich
- Fuel contaminated/deteriorated
- Intake air leak
- Idle speed misadjusted
- Air screw misadjusted
- Float level misadjusted
- Carburetor clogged
- Compression too low
- Ignition system faulty (section 16)
- Flooded carburetor
- Improper carburetor tuning
- Bad quality of fuel
- Fuel tank cap breather hole block
- Air filter chocked
- Fuel line restricted

**Backfiring or misfiring during acceleration**

- Fuel mixture too lean
- Ignition system faulty (section 16)
- Lean mixture in slow circuit
- Faulty PAIR control valve
- Faulty PAIR check valve
- Clogged hose of the PAIR system

**Lean mixture**

- Fuel jets clogged
- Float valve faulty
- Float level too low
- Fuel tank cap breather hole clogged
- Fuel strainer clogged
- Fuel tube restricted
- Intake air leak
- Throttle valve faulty
- Carburetor tuning

**Rich mixture**

- Float valve faulty
- Choke valve in close position
- Float level too high
- Air passage clogged
- Air jets clogged
- Air cleaner contaminated
- Choke valve faulty
- Ignition timing improper

# AIR CLEANER HOUSING

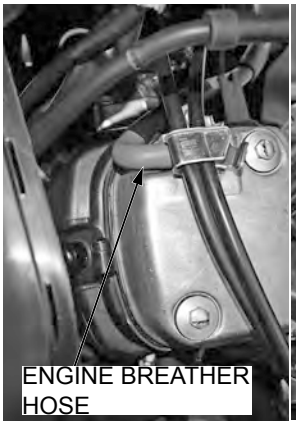
For air cleaner housing cover removal and element replacement (page 3-6).

## REMOVAL

Remove the cover centre (page 2-3).

Disconnect the engine breather hose from the cylinder head cover and release the hose from clamp.

Loosen the air cleaner connecting guide band screw.





Disconnect the transmission case breather tube from the air cleaner housing.


Remove the mounting bolt (2 nos.) and air cleaner housing.


## INSTALLATION

Install the air cleaner housing in the reverse order of removal.

Route the breather tubes properly (page 1-13).

Install the cover centre (page 2-3).

# CARBURETOR REMOVAL

## THROTTLE VALVE

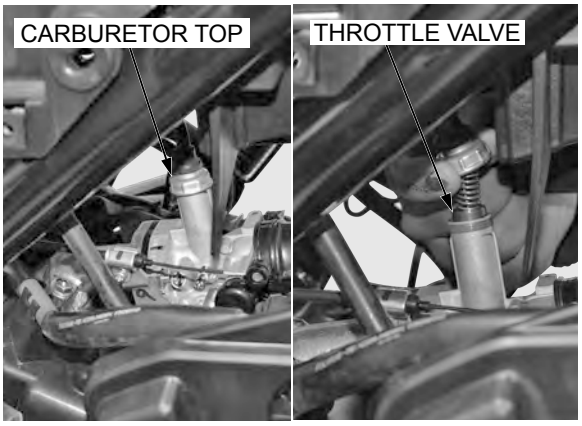
**⚠ CAUTION**

Fuel knob should be in OFF position.

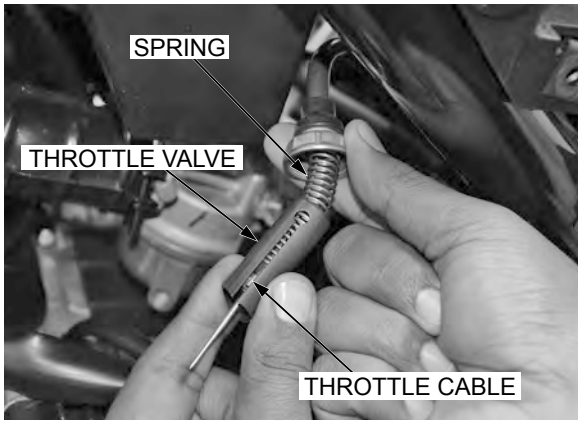
Remove the  cover centre (page 2-3).

Loosen the carburetor top.

Remove the carburetor top and throttle valve from the carburetor.

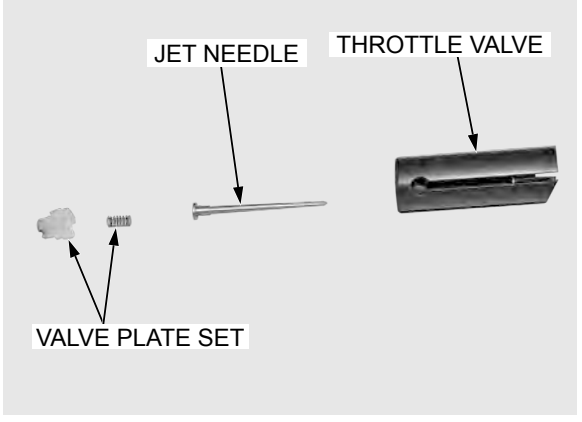



Remove the throttle cable from the throttle valve while compressing the throttle valve spring.




Remove the valve plate set and jet needle.

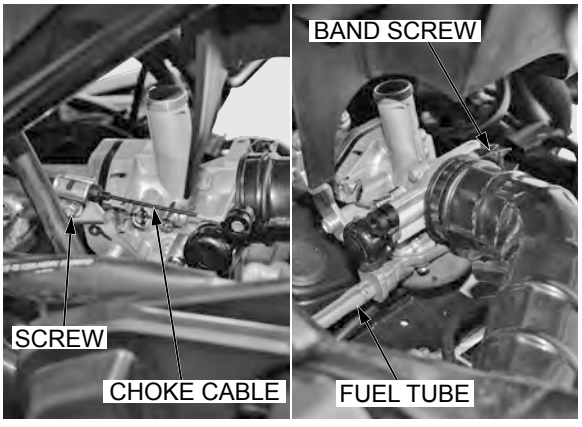
Check the throttle valve and jet needle for scratch, wear or damage.




Remove the choke cable.

Disconnect the fuel tube from the carburetor.

Loosen the air cleaner connection guide band screw.

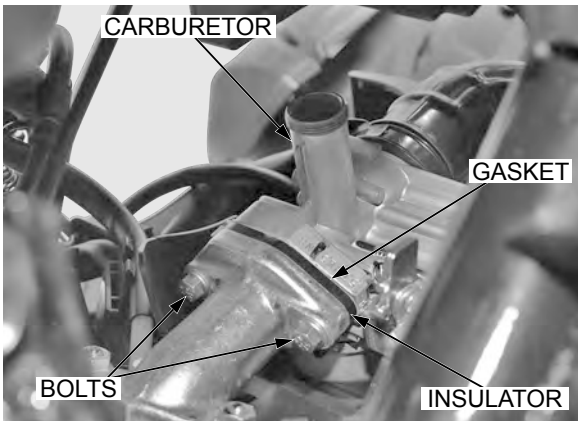


## CARBURETOR BODY

**⚠ WARNING**

Gasoline is extremely flammable and explosive under certain conditions. Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.

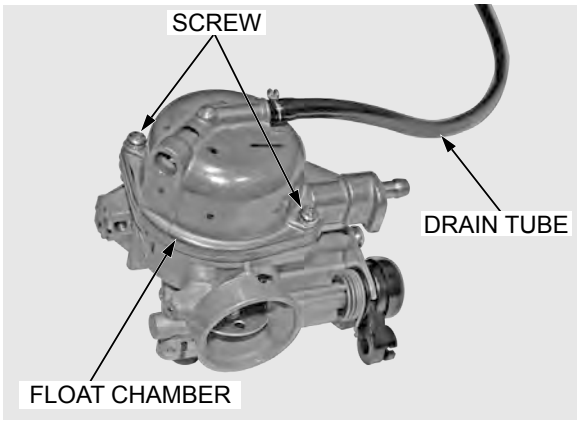
Remove the carburetor mounting bolts (2 nos.), insulator, gasket and carburetor.




## DISASSEMBLY

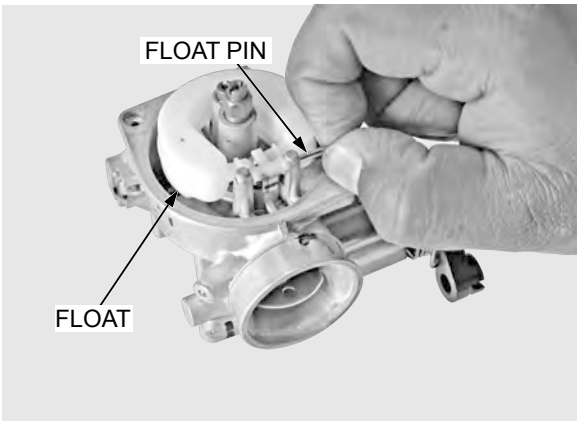
Remove the drain tube.

Remove the float chamber screws (2 nos.) and float chamber.



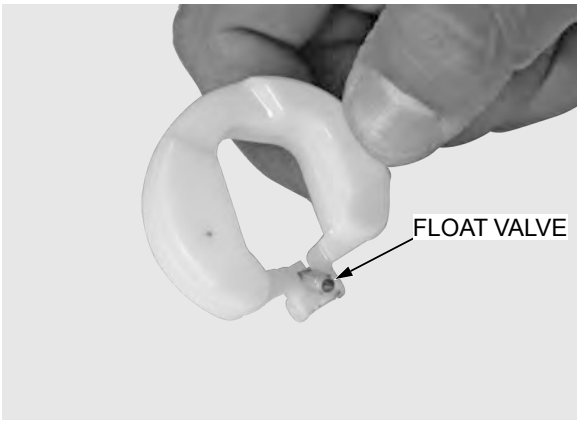

Pull out the float pin and remove the float and float valve.

Inspect the float valve and float for wear or damage.




Replace the float valve if it is damaged.

If the seat is damaged, replace the carburetor body.



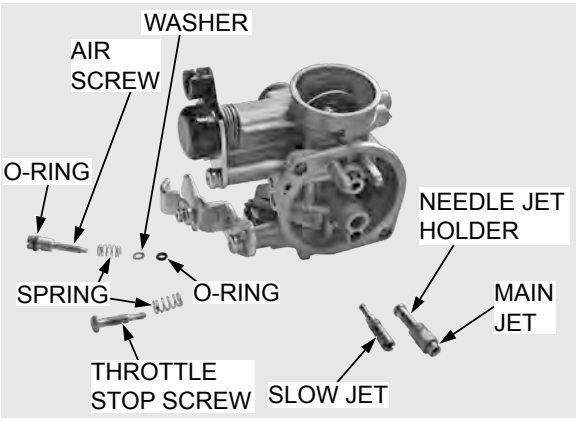
Remove the following:

– Main jet
– Needle jet holder
– Slow jet
– Air screw/ Spring/ Washer
– Throttle stop screw/ spring

NOTE:

Handle the jets with care. They can easily be scored or scratched.

Turn the air screw in and carefully count the number of turns until it seats lightly. Make a note of this to use as a reference when reinstalling the air screw.

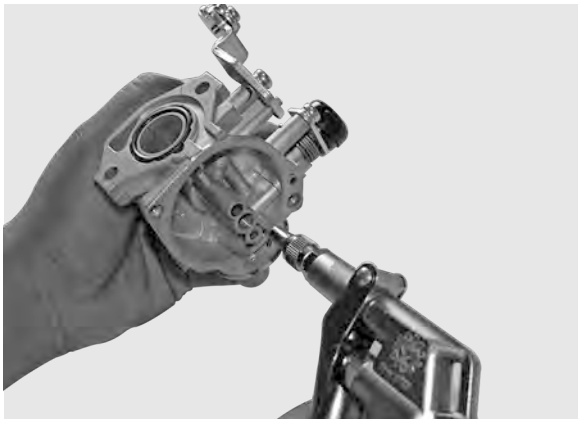



**NOTICE**

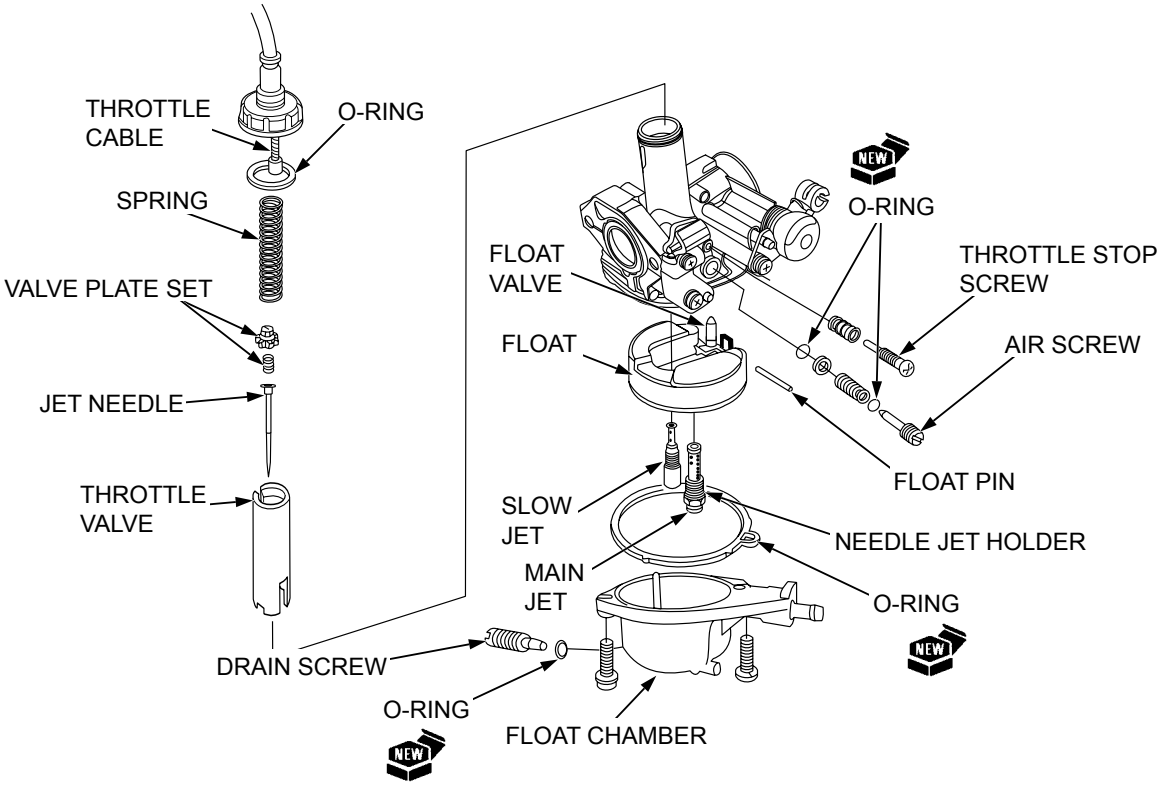
*If the air screw is over tightened against the seat, air screw seat will get damaged.*

Blow open each air and fuel passages in the carburetor body with compressed air.

Check each part for wear or damage and replace them if necessary.



**CARBURETOR ASSEMBLY**



Install the following:

– Throttle stop screw & spring
– Air screw, Spring & washer
– Slow jet
– Needle jet holder
– Main jet

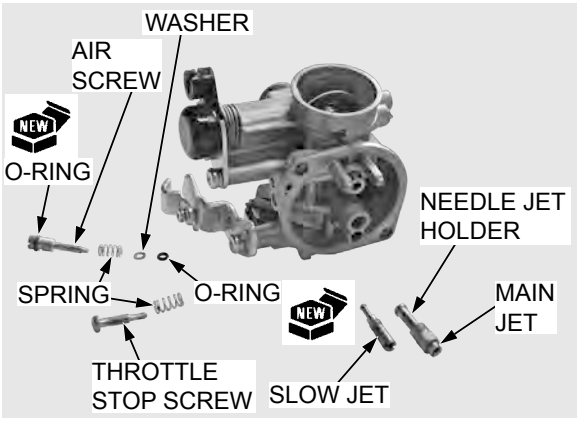
**NOTICE**

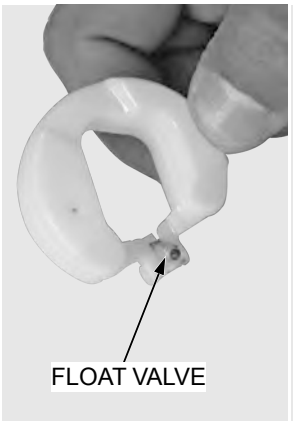
*Handle all jets with care. They can easily be scored or scratched.*

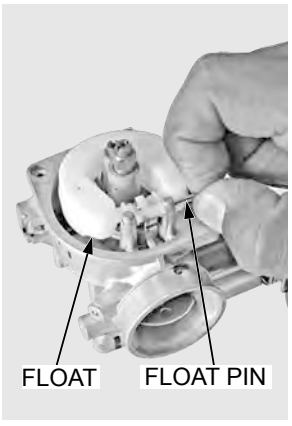
Install the air screw/ spring/ washer/ O-ring and return it to its original position as noted during removal.

Perform the air screw adjustment procedure if a new air screw is installed (page 5-10).

Install the float and float valve in the carburetor body, then install the float pin through the body and float.




## FLOAT LEVEL INSPECTION

With the float valve seated and the float gauge arm just touching the valve, measure the float level with the special tool as shown.

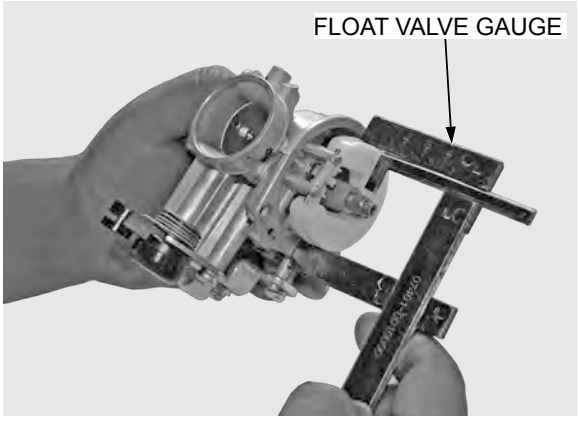
**FLOAT LEVEL: 11.7 ± 0.5 mm (0.46 ± 0.02 in)**

**TOOL:**

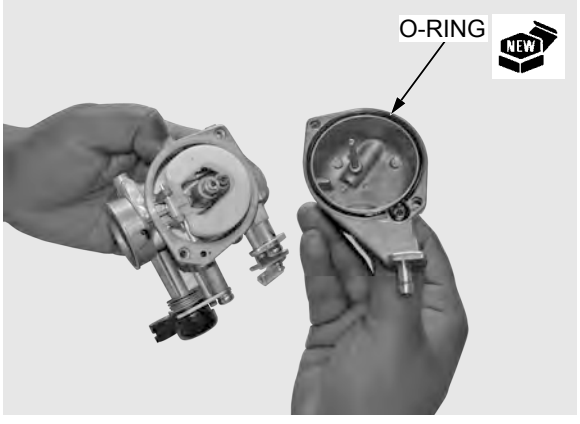
**CARBURETOR FLOAT LEVEL GAUGE**
**070MJ – 001-I110**

The float cannot be adjusted.

Replace the float assembly if it the float level is out of specification.

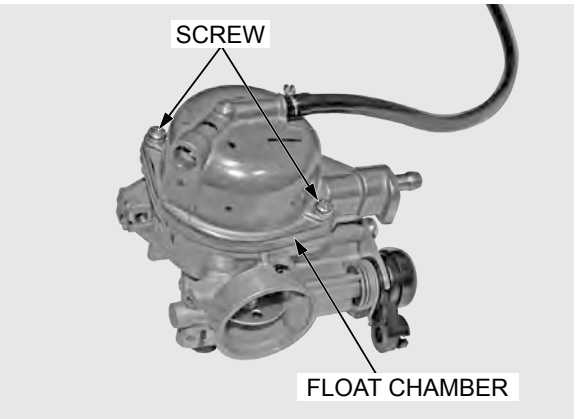



Install a new O-ring into the float chamber groove.



Install the float chamber.

Install and tighten the screws (2 nos.) securely.




# CARBURETOR INSTALLATION

## CARBURETOR BODY

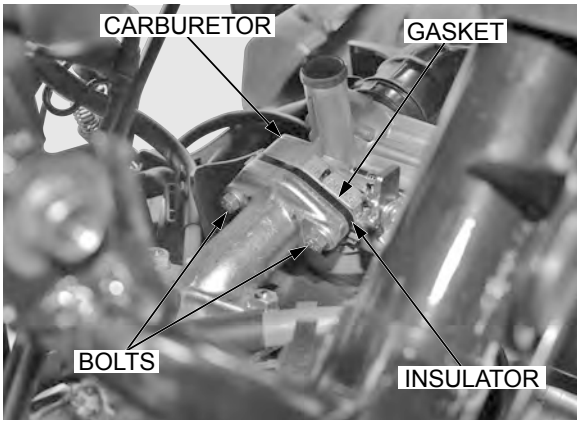
Install the carburetor body with insulator, new gasket between air cleaner connecting housing.

Tighten the carburetor mounting bolts and air cleaner connecting tube band screw.

Install the fuel tube and drain tube.

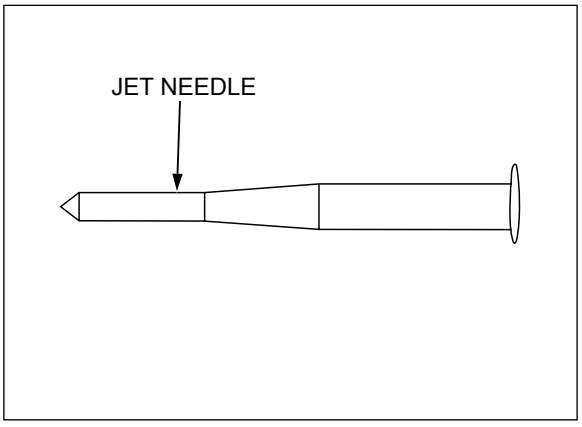
Install the choke cable.

**TORQUE: 10 N·m (1.0 kgf·m, 7.3 lbf·ft)**



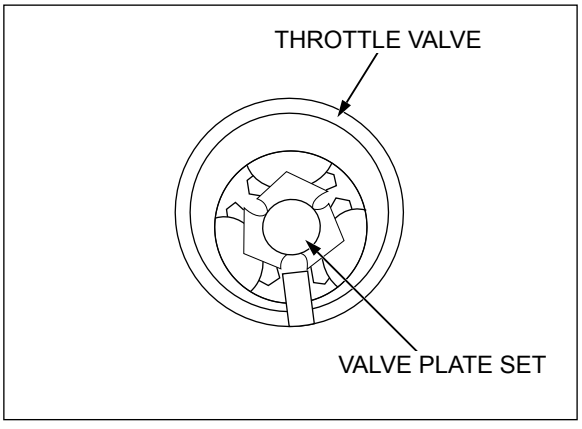

## THROTTLE VALVE

Install the needle clip into the jet needle.



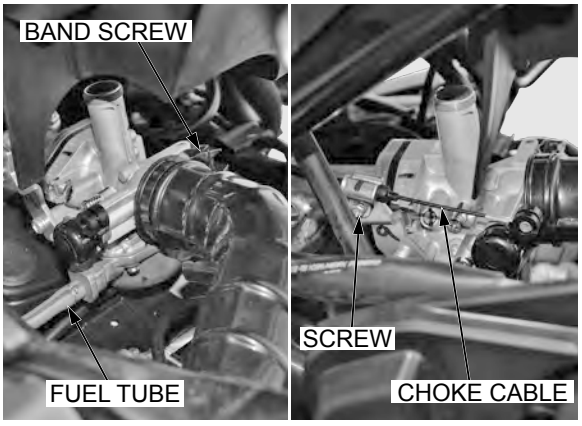

Install the jet needle into the throttle valve.

Install the valve plate set.



Connect the fuel tube to the carburetor.

Install the choke cable and tighten the mounting screw.




Install the throttle valve spring onto the throttle cable.

Connect the throttle cable to the throttle valve while compressing the throttle spring.


Install the throttle valve into the carburetor body.

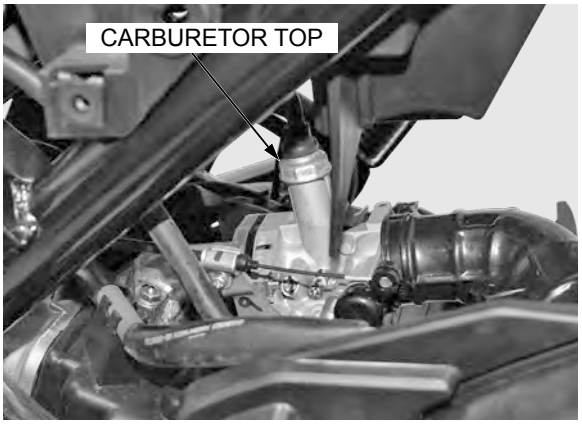
Tighten the carburetor top securely.

After installation check that there is no fuel leaks.

Perform the following adjustment:

– Throttle grip free play (page 3-5)
– Idle speed adjustment

**IDLE SPEED: 1,700 ± 100 min$^{-1}$ (rpm)**




# AIR SCREW ADJUSTMENT

## IDLE DROP PROCEDURE

NOTE:

- The air screw is factory preset and no adjustment is necessary unless the carburetor is overhauled or the air screw is replaced.
- Use a tachometer with graduations of 50 min$^{-1}$ (rpm) or smaller that will accurately indicate a 50 min$^{-1}$ (rpm) change.

1. Turn the air screw until it seats lightly, then back it out to the specification given.

This is an initial setting prior to the final air screw adjustment.

**NOTICE**

*Damage to the air screw seat will occur if the pilot screw is over* tighten against the seat.

**INITIAL OPENING: 1 3/4 turns out**

2. Warm up the engine to operating temperature. Stop and go riding for 10 minutes is sufficient.
3. Stop the engine and connect the tachometer, according to the manufacturer's instructions.
4. Disconnect the PAIR control valve vacuum tube and plug the vacuum port.
5. Start the engine and adjust the idle speed with the throttle stop screw.

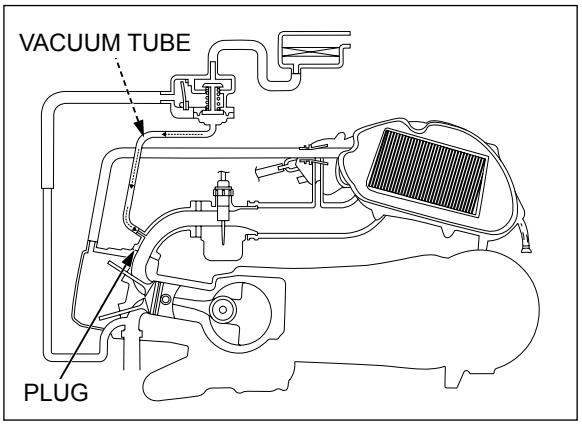
**IDLE SPEED: 1,700 ± 100 min$^{-1}$ (rpm)**

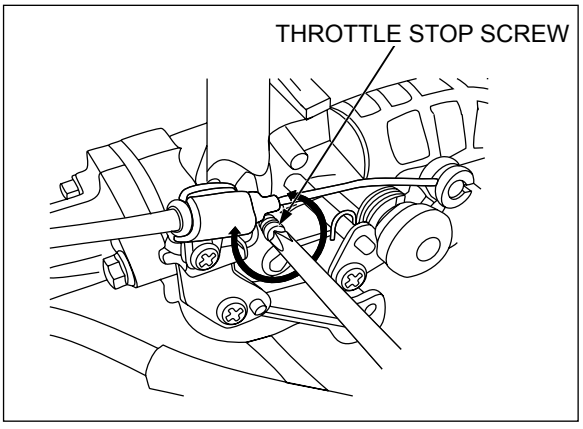
6. Turn the air screw in or out slowly to obtain the highest engine speed.
7. Lightly open the throttle 2 or 3 times, then adjust the idle speed with the throttle stop screw.
8. Turn the air screw in until the engine speed drops by 50 min$^{-1}$ (rpm).

**FINAL OPENING: 1/2 more turn out**

9. Disconnect the plug from the vacuum tube and connect the PAIR control valve vacuum tube.
10. Readjust the idle speed with the throttle stop screw.

**IDLE SPEED: 1,700 ± 100 min$^{-1}$ (rpm)**



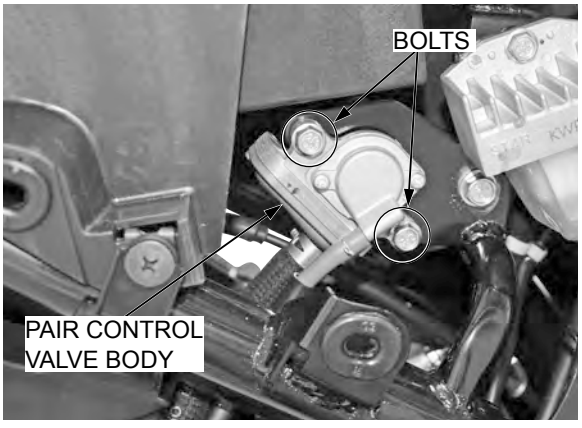




# SECONDARY AIR SUPPLY SYSTEM

## PAIR CONTROL VALVE REMOVAL/ INSTALLATION

Remove the right side cover (page 2-4).

Remove the bolts (2 nos.) of PAIR control valve body from the body frame.




Remove the screws (2 nos.) from one way valve.

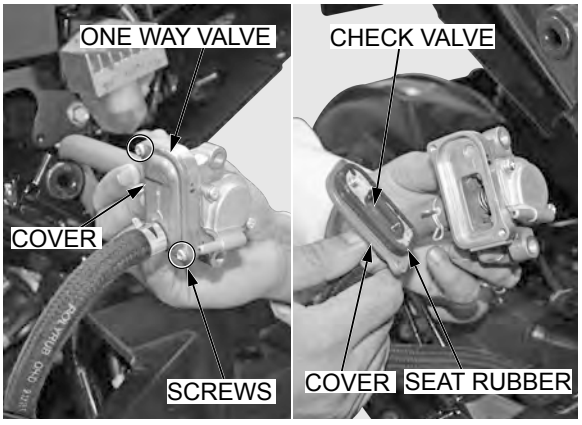
Inspect the one way valve for damage or fatigue. Replace if necessary.

Replace the one way valve if the seat rubber is cracked, Deteriorated or damaged, or if there is clearance between the reed and seat.

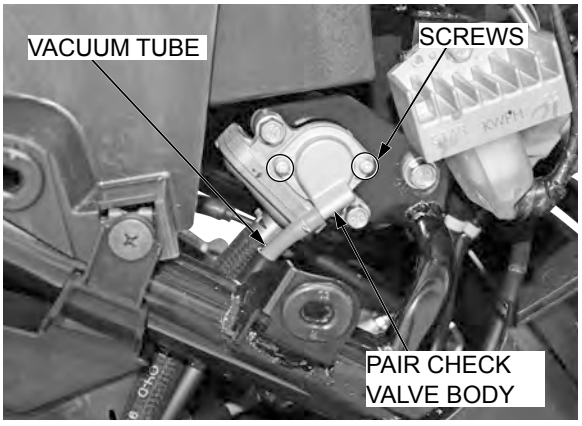
Install the one way valve and cover.

Install and tighten the screws (2 nos.) securely.

Install the bolts (2 nos.) and tighten it.



## PAIR CHECK VALVE REMOVAL/ INSTALLATION




Disconnect the vacuum tube from the PAIR check valve.

Remove the screws (2 nos.) from PAIR check valve.

Disconnect the PAIR air cleaner hose.

Installation is in the reverse order of removal.

## SYSTEM INSPECTION

Start the engine, and warm it up to normal operating temperature, then stop the engine.

Disconnect the air suction hose from the secondary air cleaner housing.

Check the air suction hose port is clean and free carbon deposits.

Check the PAIR check valve if the port is carbon fouled

Disconnect the vacuum hose from the intake pipe, and connect it to the vacuum pump.

Install the plug to the intake pipe.

Start the engine, and open the throttle slightly to be certain that air is sucked in through the air suction hose .

If the air is not drawn in, check the air suction hose for clogging.

With the engine running, gradually apply vacuum to the PAIR control valve vacuum hose.

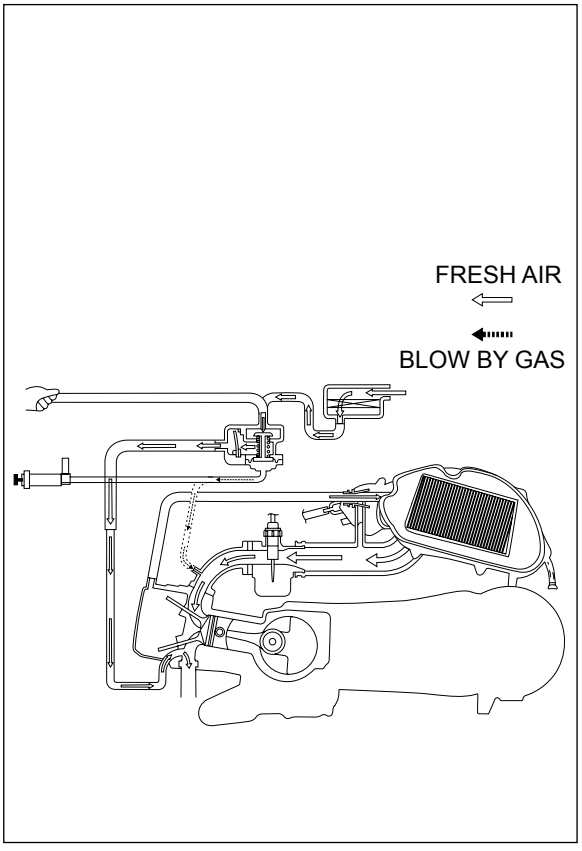
Check that the air suction hose stop drawing air, and that the vacuum does not bleed.

**SPECIFIED VACUUM: 66.7 kPa (500 mmHg)**

If the air is drawn in or if the specified vacuum is not maintained, install a new PAIR control valve.

Remove the plug from the intake pipe.

Disconnect the vacuum hose from the vacuum pump, and connect it to the intake pipe.



# FUEL STRAINER

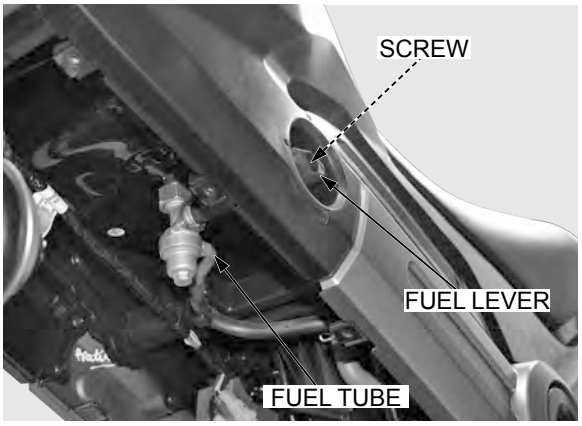
## REMOVAL

Remove the fuel tank cover lower (page 2-3).

Drain the fuel from the fuel tank into the approved gasoline container.

Disconnect the fuel tube from fuel lever.

Remove the screw and fuel lever.

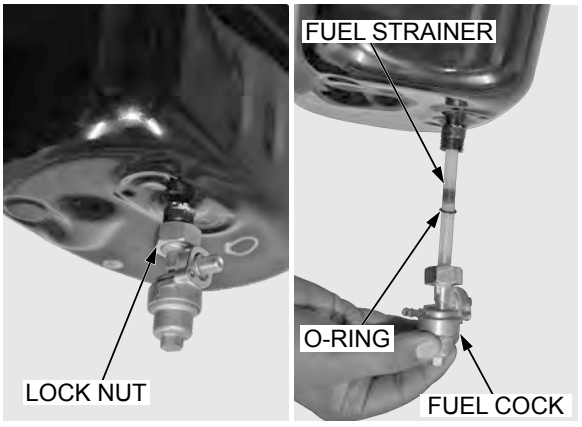



*Make sure not to damage painted surface of fuel tank*

Loosen the fuel cock lock nut.

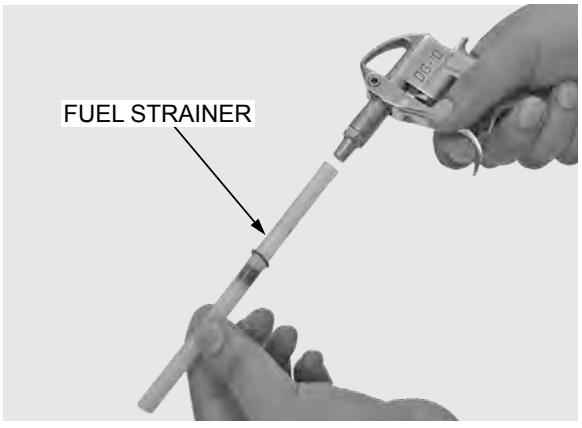
Remove the fuel strainer and fuel cock assembly from the fuel tank.

Remove the fuel strainer and O-ring from the fuel cock.




## CLEANING

Clean the fuel strainer with compressed air.

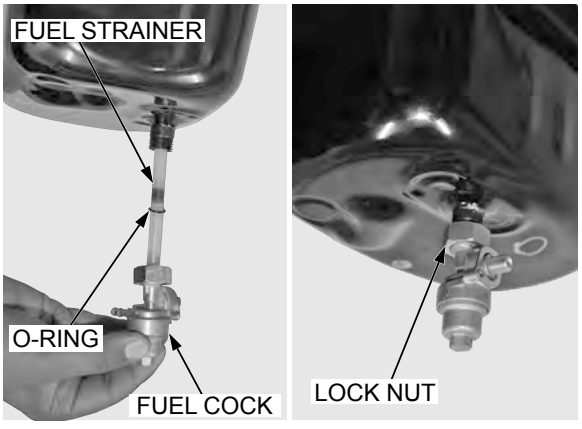



## INSTALLATION

Install a new O-ring onto the fuel strainer, and install the fuel strainer into the fuel cock.

Install the fuel strainer and fuel cock assembly into the fuel tank.

Tighten the fuel cock lock nut.

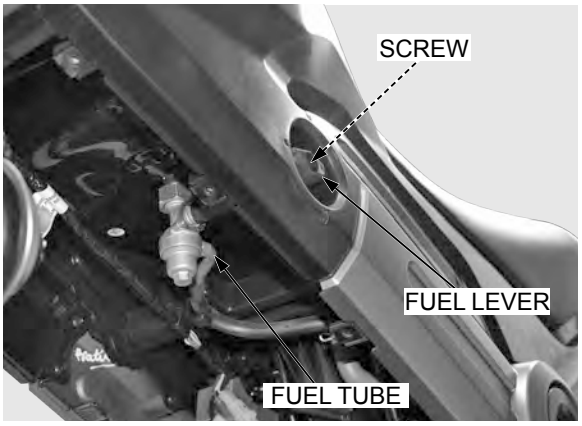


Install the fuel lever while aligning the fuel cock tab with the fuel cock assy. hole.

Connect the fuel tube to the fuel lever.

Install and tighten the screw.

Install the fuel tank cover lower (page 2-3).




# FUEL TANK

## REMOVAL/INSTALLATION

**⚠ WARNING**

Gasoline is extremely flammable and is explosive under certain condition. KEEP OUT OF REACH OF CHILDREN.

Remove the L & R side covers (page 2-5).

Remove bolts (4 nos.) to release tank stay.

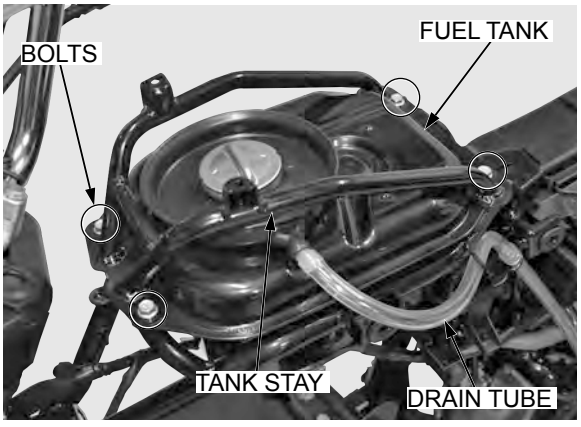
Disconnect the fuel tube (page 3-4).

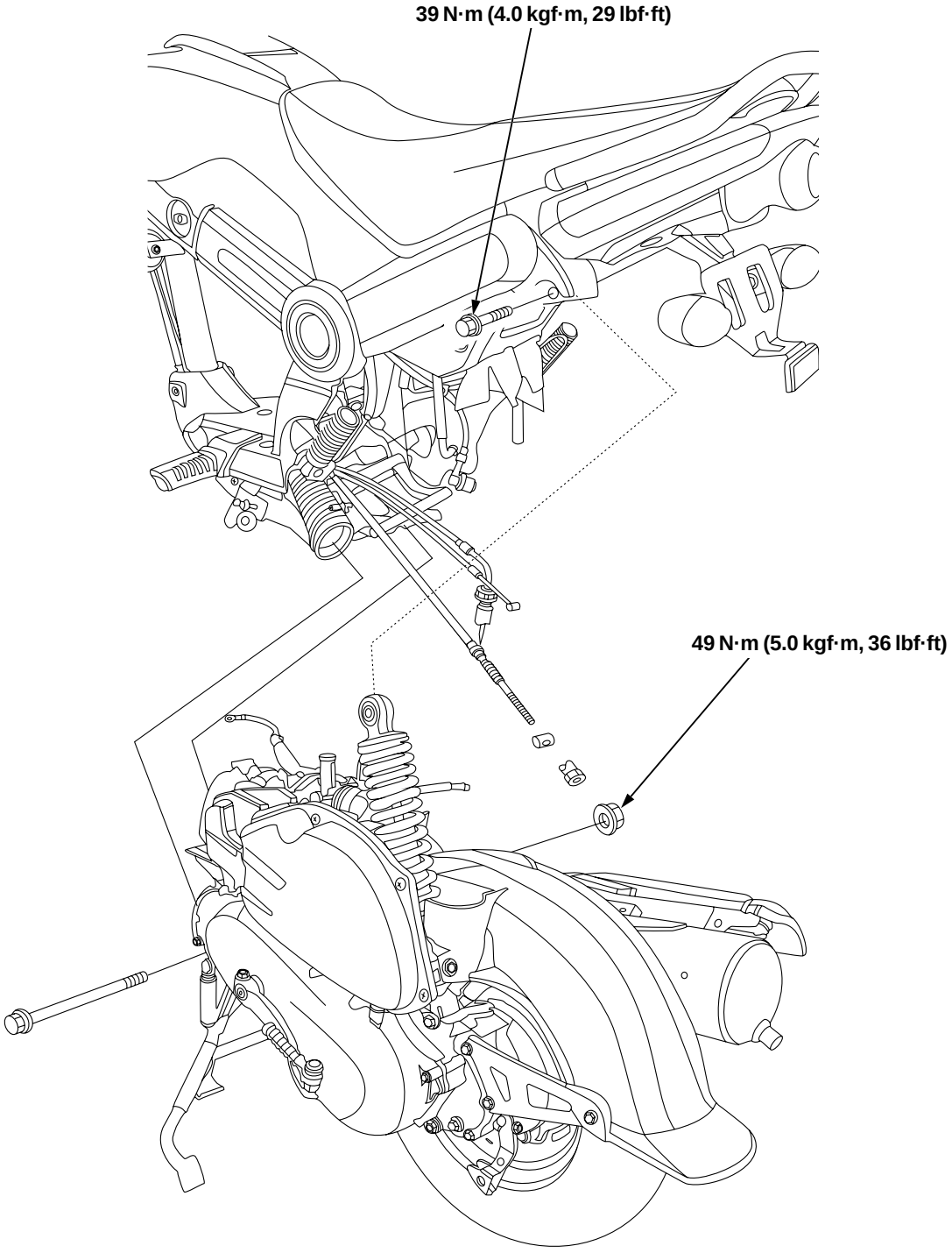
Disconnect the fuel drain tube.

Installation is in the reverse order of removal.

NOTE:

- After installation, check that there are no fuel leaks
- Route the cable, wire and tubes properly (page 1-13).




39 N·m (4.0 kgf·m, 29 lbf·ft)
49 N·m (5.0 kgf·m, 36 lbf·ft)

# 6. ENGINE REMOVAL/INSTALLATION



# SERVICE INFORMATION

## GENERAL

- The following components can be serviced with the engine installed in the frame:
  - Oil pump (section 4)
  - Carburetor (section 5)
  - Drive and driven pulleys/clutch (section 9)
  - Final reduction (section 10)
  - Alternator (section 11)
- The following components require engine removal for servicing:
  - Cylinder head/valves (section 7)
  - Cylinder/piston (section 8)
  - Crankcase/crankshaft (section 12)



## SPECIFICATIONS

| ITEM | | SPECIFICATIONS | |
|---|---|---|---|
| Engine dry weight | | 25.7 kg (56.7 lbs) | – |
| Engine oil capacity | At draining | 0.7 liter (0.7 US qt, 0.6 lmp qt) | Page 3-10 |
| | At disassembly | 0.8 liter (0.8 US qt, 0.7 lmp qt) | Page 3-10 |

## TORQUE VALUES

| ITEM | QTY | THREAD DIA. (mm) | TORQUE N·m (kgf·m, lbf·ft) | REMARKS | PAGE NO. |
|---|---|---|---|---|---|
| Frame side - hanger bolt | 1 | 10 | – | | Page 6-3 |
| - hanger nut | 1 | 10 | 69 (7.0, 51) | | Page 6-3 |
| Engine side - hanger bolt | 1 | 10 | – | | Page 6-4 |
| - hanger nut | 1 | 10 | 49 (5.0, 36) | | Page 6-4 |
| Rr. cushion (upper side) bolt | 1 | 10 | 39 (4.0, 29) | | Page 6-4 |

# ENGINE REMOVAL

Place the vehicle on its centre stand and support the frame securely.

Drain the engine oil if the crankcase is to be serviced (page 3-10).

*Remove the throttle cable before removing the shock absorber mounting bolt.*

Disconnect the following:

– Throttle cable (page 5-4)
– Choke cable (page 5-5)
– Spark plug cap (page 3-7)

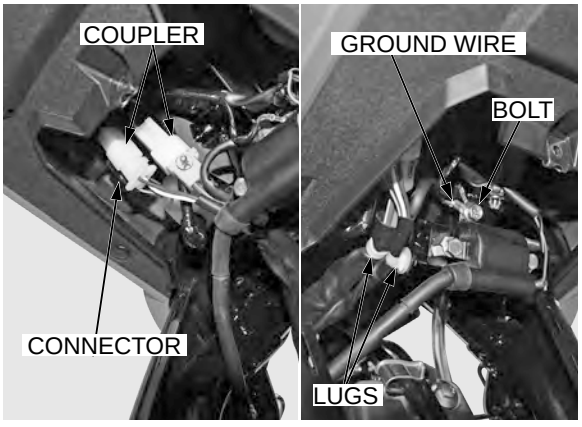
Disconnect the air suction tube.


Disconnect the following:

– Starter motor 2P coupler
– Alternator wire 2P coupler
– Ignition pulse generator wire connector

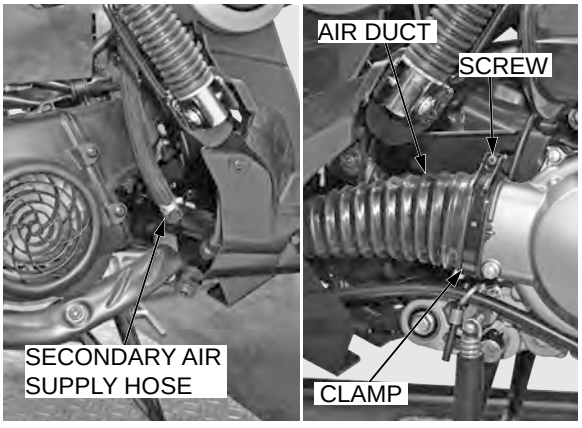
Disconnect the starter motor ground wire from the frame by removing bolt (1 no.).

Release the starter motor and ACG harness lugs from the frame.



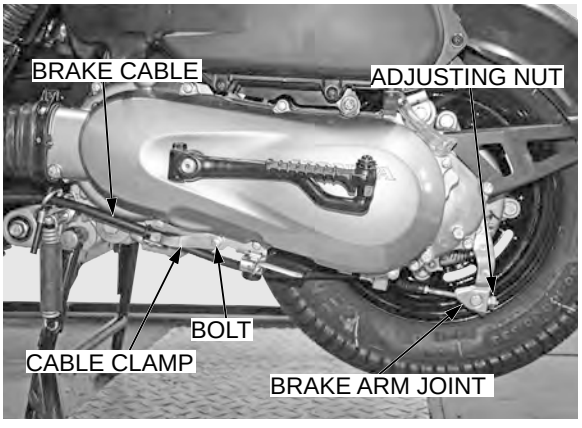

Disconnect the secondary air supply hose.

Disconnect the air duct from the crankcase cover by removing the band screw (1 no).

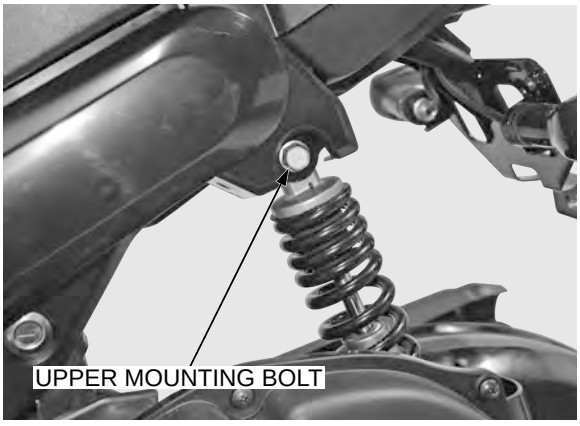



Remove the rear brake adjusting nut, disconnect the brake cable from the brake arm and remove the brake arm joint.

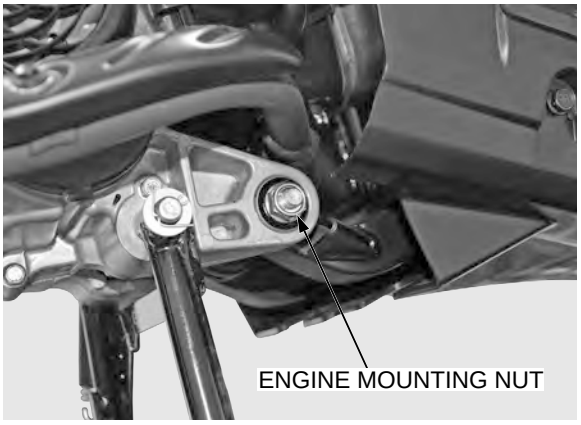
Remove the bolt (1 no.) from cable clamp and release the cable from the crankcase.



Remove the rear shock absorber upper mounting bolt (page 14-7).




Remove the engine mounting nut and pull out the mounting bolt from the left side.




Remove the engine from the frame.

**⚠ CAUTION**

Support the frame securely to prevent it from turning over.

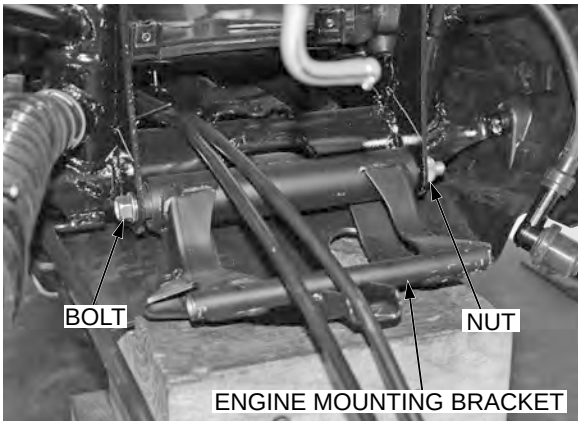
Check the engine mounting bracket for damage or deterioration and replace if necessary.

If you want to remove the engine mounting bracket, remove the engine mounting bracket nut and pull out the mounting bolt from the left side.

Install the engine mounting bracket and mounting bolt.

Install and tighten the nut.

**TORQUE: 69 N·m (7.0 kgf·m, 51 lbf·ft)**



# ENGINE INSTALLATION

**NOTICE**

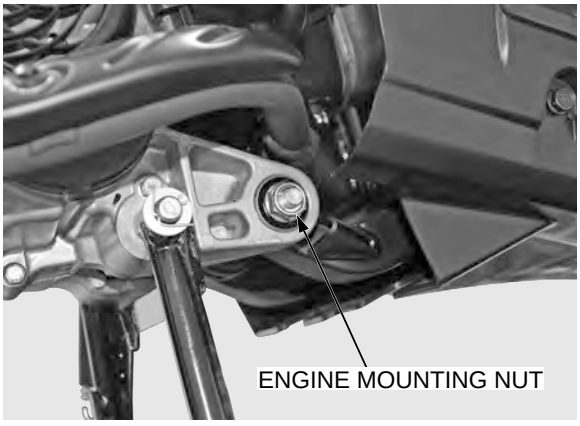
*Route the wires, tubes and cables properly (page 1-13).*

Install the engine into the frame.

Insert the engine mounting bolt from the left side.

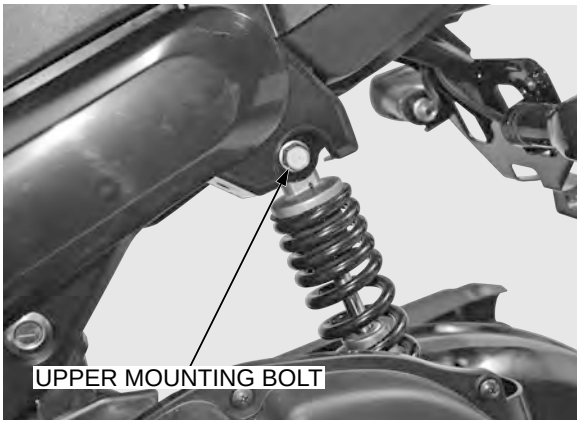
Install and tighten the nut.

**TORQUE: 49 N·m (5.0 kgf·m, 36 lbf·ft)**




Install rear shock absorber upper mount bolt.

**TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)**

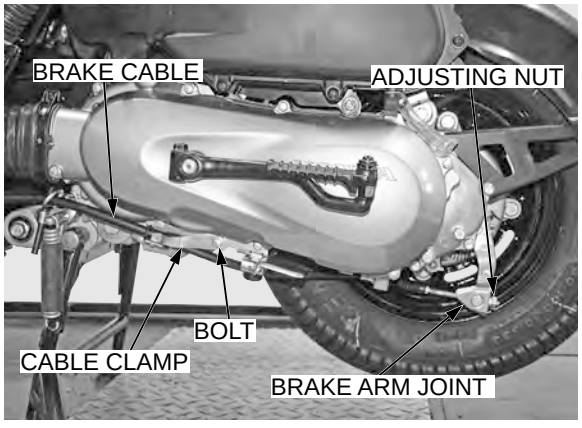



Install the brake cable to the crank case and cable clamp and tighten the bolt (1 no.) to the cable clamp.

Install the brake arm joint and connect the brake cable.

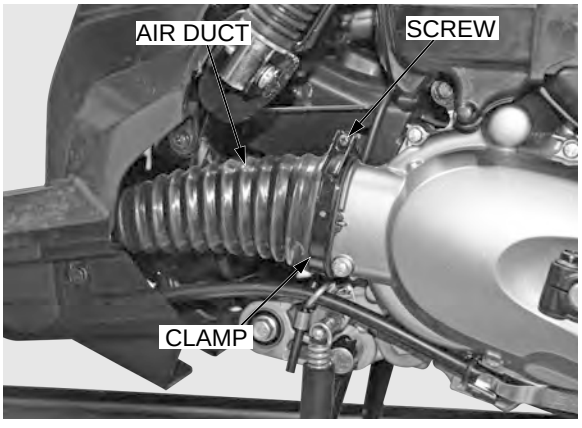
Install the rear brake adjusting nut.

Adjust the rear brake lever free play (page 3-15).




Connect the air duct to the crankcase cover.

Clamp the air duct band from the crankcase cover and tighten the band screw.



Connect the secondary air supply hose.

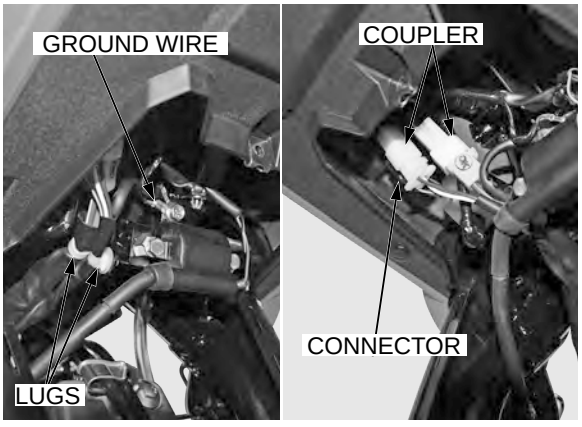

Connect the starter motor ground wire from frame.

Connect the following:

– Starter motor 2P coupler
– Alternator wire 2P coupler
– Ignition pulse generator.

Connect the starter motor and ACG harness lugs to the frame.

Connect the vacuum tubes and fuel tube in carburetor (page 5-9).



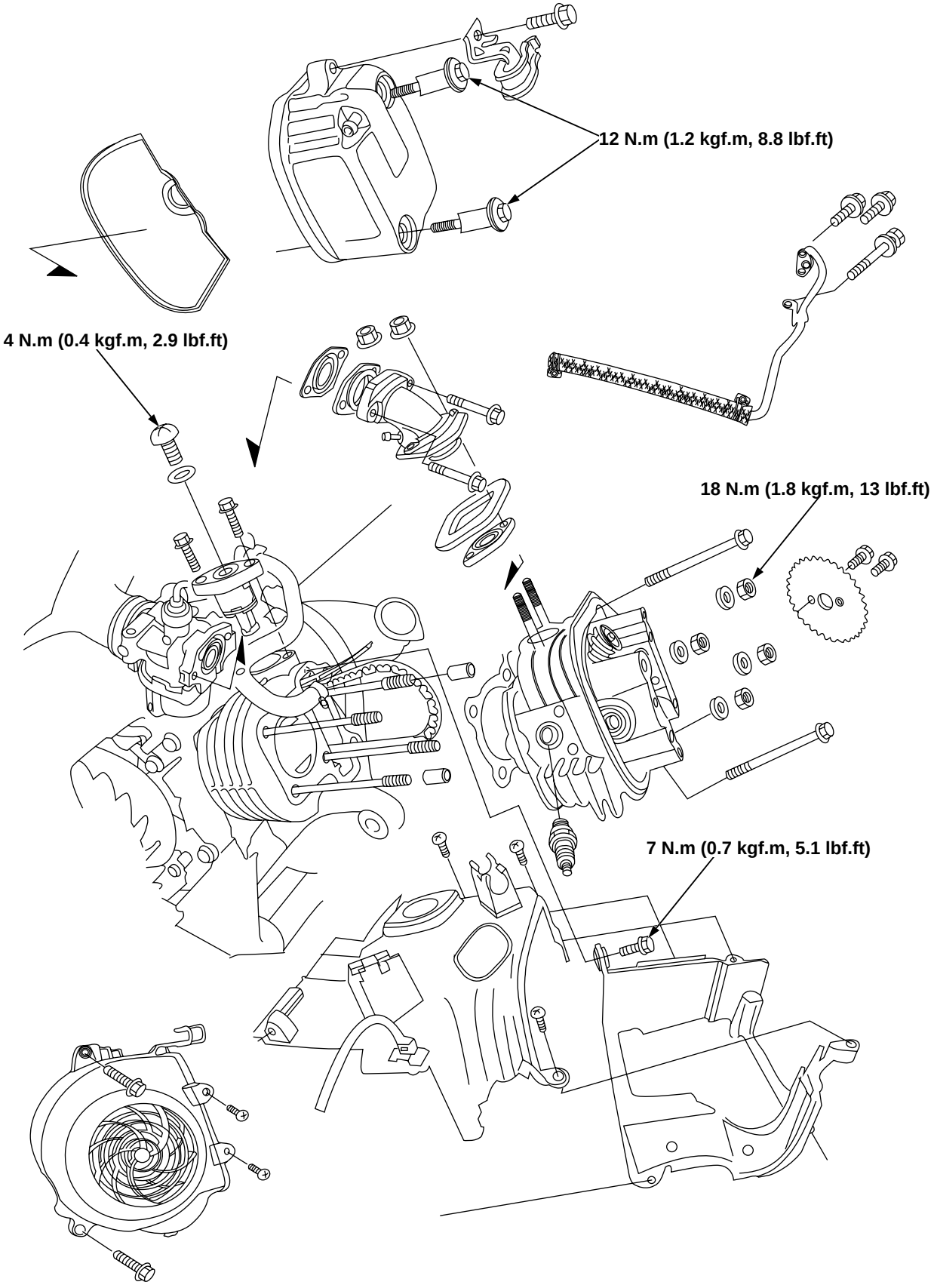

Connect the air suction tube.

Install the following:

– Throttle valve (page 5-9)
– Choke cable (page 5-9)
– Spark plug cap (page 3-7).

Adjust the throttle lever free play.

# COMPONENT LOCATION



# 7. CYLINDER HEAD/VALVES



# SERVICE INFORMATION

## GENERAL

- The engine must be removed from the frame to service the rocker arms, camshaft, cylinder head and valves.
- Clean all disassembled parts with cleaning solvent and dry them by blowing them off with compressed air before inspection.
- Camshaft and rocker arm lubricating oil is fed through the oil passages in the cylinder head. Clean the oil passage before as sembling the cylinder head.



## SPECIFICATIONS

Unit: mm (in)

| ITEM | | | STANDARD | SERVICE LIMIT | Page NO. |
|---|---|---|---|---|---|
| Cylinder compression at 600 $min^{-1}$ (rpm) | | | 0.98 MPa (9.99 $kgf/cm^2$, 142 psi) | – | Page 7-3 |
| Valve clearance | | IN | 0.16 mm (0.006 in) | – | Page 3-8 |
| | | EX | 0.16 mm (0.006 in) | – | Page 3-8 |
| Camshaft | height | IN | 32.1087 - 32.1527 | 32.08 (1.263) | Page 7-20 |
| | | EX | 31.94 - 31.85 | 31.80 (1.23) | Page 7-20 |
| Cylinder head warpage | | | – | 0.05 (0.002) | Page 7-20 |
| Rocker arm | Arm I.D. | IN/EX | 10.000 – 10.015 (0.3937 – 0.3943) | 10.10 (0.398) | Page 7-7 |
| | Shaft O.D. | IN/EX | 9.972 – 9.987 (0.3926 – 0.3932) | 9.91 (0.390) | Page 7-7 |
| | Arm to shaft clearance | IN/EX | 0.013 – 0.043 (0.0005 – 0.0017) | 0.10 (0.004) | Page 7-9 |
| Valve, valve guide | Stem O.D. | IN | 4.975 – 4.990 (0.1959 – 0.1964) | 4.90 (0.193) | Page 7-8 |
| | | EX | 4.955 – 4.970 (0.1955 – 0.1956) | 4.90 (0.193) | Page 7-8 |
| | Guide I.D. | IN/EX | 5.000 – 5.012 (0.1969 – 0.1973) | 5.03 (0.198) | Page 7-9 |
| | Stem-to-guide clearance | IN | 0.010 – 0.037 (0.0004 – 0.0015) | 0.08 (0.003) | Page 7-9 |
| | | EX | 0.030 – 0.057 (0.0012 – 0.0022) | 0.10 (0.004) | Page 7-9 |
| Valve spring | Free length | | 29.78 (1.17) | 27.87 (1.1) | Page 7-9 |
| Valve seat width | | IN/EX | 0.7 (0.027) | – | – |

## TORQUE VALUES

| ITEM | QTY | THREAD DIA. (mm) | TORQUE N·m (kgf·m, lbf·ft) | REMARKS | PAGE NO. |
|---|---|---|---|---|---|
| Bolt, head cover | 2 | 6 | 12 (1.2, 8.8) | | Page 7-18 |
| Cyl. head comp stud bolt | 2 | 6 | 6 (0.6, 4.4) | | – |
| Lifter assy., tensioner screw | 1 | 6 | 4 (0.4, 2.9) | Apply eng. oil | Page 7-18 |
| Sprocket, cam bolt | 2 | 5 | 9 (0.9, 6.6) | Apply eng. oil | Page 7-17 |
| Head, cylinder nut | 4 | 7 | 18 (1.8, 13.2) | Head Side | Page 7-17 |
| Plate, breather separator screw | 3 | 5 | 3 (0.3, 2.2) | | Page 7-13 |
| Shroud, exhaust bolt | 1 | 10 | 7 (0.7, 5.1) | | Page 7-4 |

## TOOLS

| | |
|---|---|
| Valve spring compressor | 070GE – 001-I100 |
| Valve guide reamer | 070MH – 001-I160 |
| Valve guide driver | 070ND – 006-I150 |
| Seat cutter, 22 mm (45° IN) | 070MH – 003-I150 |
| Seat cutter, 27.5 mm (45° EX) | 070MF – 003-I180 |
| Flat cutter, 24 mm (32° IN) | 070MH – 002-I180 |
| Flat cutter, 28 mm (32° EX) | 070MH – 002-I120 |
| Interior cutter, 26 mm (60° EX) | 070MF – 004-I150 |
| Cutter holder | 070MH – 005-I150 |
| Tensioner lifter stopper | 070MG – 0010100 |

# TROUBLESHOOTING

Engine top-end problems usually affect engine performance. These can be diagnosed by a compression test, or by tracing top-end noises with a sounding rod or stethoscope.

**Compression too low, hard starting or poor performance at low speed.**

- Valves
  - Incorrect valve clearance
  - Burned or bent valve
  - Incorrect valve timing
  - Broken valve spring
  - Uneven valve seating
- Cylinder head
  - Leaking or damaged cylinder head gasket
  - Warped or cracked cylinder head
  - Loose spark plug
- Faulty cylinder or piston (section 8)

**Compression too high**

- Excessive carbon built-up on piston or combustion chamber

**Excessive smoke**

- Worn valve stem or valve guide
- Damaged stem seal
- Faulty cylinder or piston (section 8)

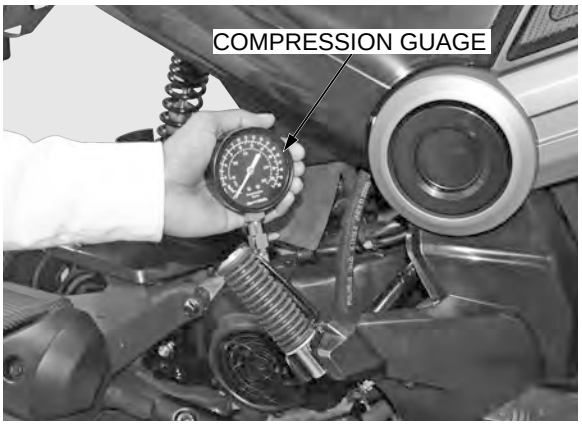
**Excessive noise**

- Incorrect valve clearance
- Sticking valve or broken valve spring
- Worn or damaged camshaft
- Worn or damaged rocker arm and/or shaft
- Worn or damaged cam sprocket teeth
- Loose or worn cam chain
- Worn or damaged cam chain tensioner
- Loose spark plug
- Faulty connecting rod or crankshaft (section 12)
- Worn,damaged or pitted ball bearing.

**Rough idle**

- Low cylinder compression

# CYLINDER COMPRESSION




**⚠ WARNING**

If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area.

Warm up the engine to normal operating temperature.

Stop the engine.

Disconnect the spark plug cap and remove the spark plug.

Install the compression gauge attachment in a spark plug hole.

Connect the compression gauge to the attachment.

Open the throttle all the way and crank the engine with the starter motor or apply kick 5-6 times and check the gauge reading.

**NOTICE**

*Crank the engine until the gauge reading stops rising. The maximum reading is usually reached within 4 – 7 seconds.*

**STANDARD: 980 KPa (9.99 kgf/cm$^2$, 142 psi) at 600 min$^{-1}$ (rpm)**

If compression is high, it indicates that carbon deposits have accumulated on the combustion chamber and/or the piston crown.

If compression is low, pour 3 – 5 cc (0.1 – 0.2 oz) of clean engine oil into the cylinder through the spark plug hole and recheck the compression.

If the compression increases from the previous value, check the cylinder, piston and piston rings.

- Worn piston ring
- Worn cylinder and piston

If compression is the same as the previous valve, check the valves for leakage, cylinder head bolt looseness.

# INTAKE/EXHAUST SHROUDS

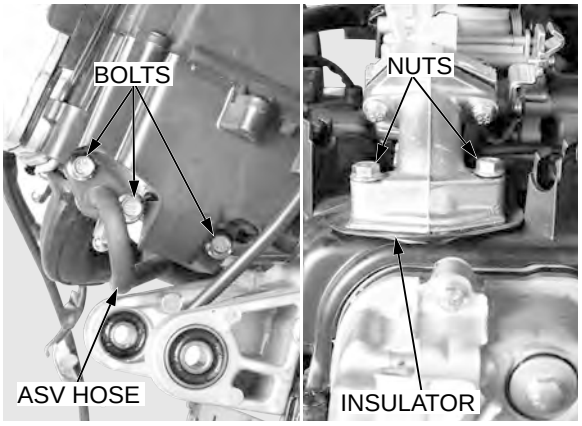
## REMOVAL

Remove the bolts (3 nos.), gasket and ASV hose from the head assembly.

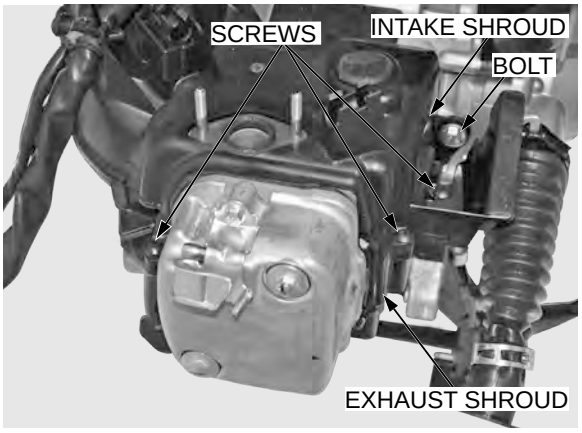
Remove the following:

– Carburetor (page 5-4)
– Cooling fan cover (page 11-2)
– Muffler assembly (page 2-9)

Remove the nuts (2 nos.) and insulator.




Remove the screws (3 nos.), bolt (1 no.), intake shroud and exhaust shroud.



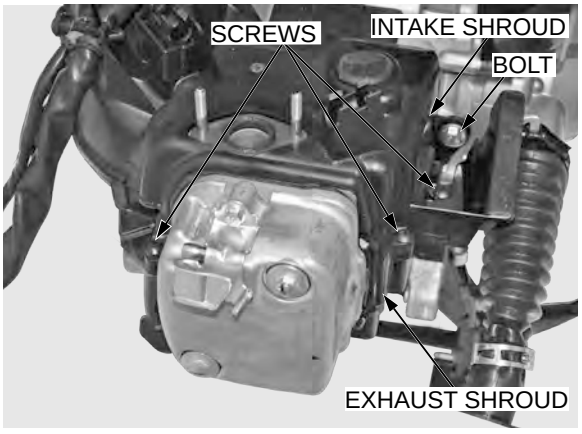

## INSTALLATION

Install the intake shroud and exhaust shroud.

Install and tighten the screws (3 nos.).

Install and tighten the bolt (1 no.) to the specified torque.

**TORQUE: 7 N·m (0.7 kgf·m, 5.1 lbf·ft)**

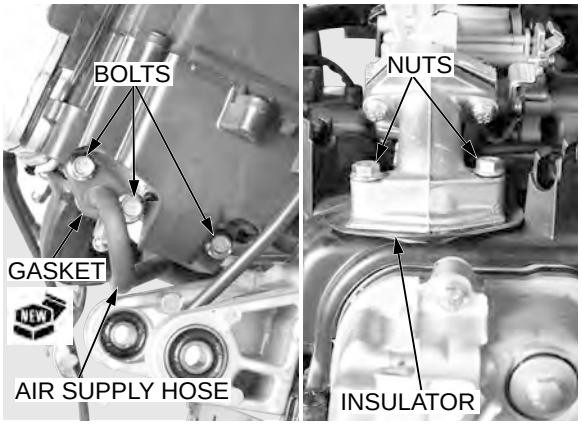



Install the insulator and tighten the nuts.

Install the new gasket, air supply hose and tighten the bolts (3 nos.) securely.

Install the following:

– Muffler assembly (page 2-9)
– Cooling fan cover (page 11-4)
– Carburetor (page 5-8)



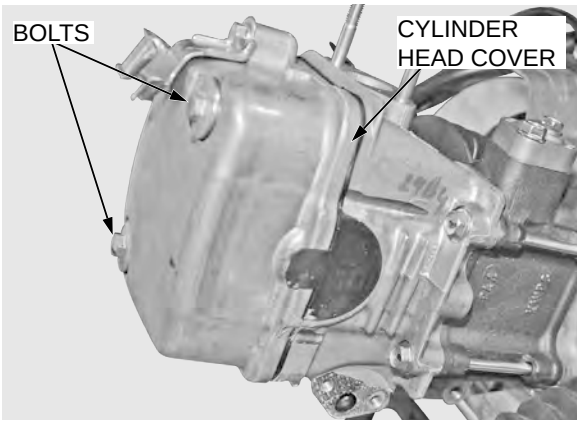
# CYLINDER HEAD REMOVAL

Remove the following:

– Engine (page 6-2)
– Intake/Exhaust shrouds and seal (page 7-4)
– Cooling fan cover (page 11-2)
– Spark plug (page 3-7)
– Muffler assembly (page 2-9)

Disconnect crankcase breather pipe from cylinder head cover (page 3-6).

Remove the bolts (2 nos.) and cylinder head cover.

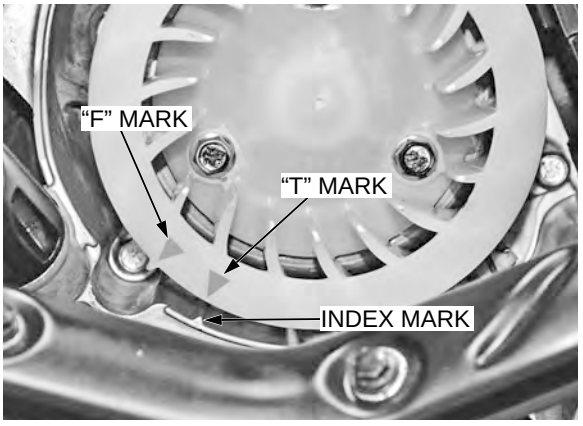



Rotate the cooling fan clockwise and align the “T” mark on the cooling fan with the index mark of the right crankcase.

Make sure that the piston is at TDC (Top Dead Center) on the compression stroke.

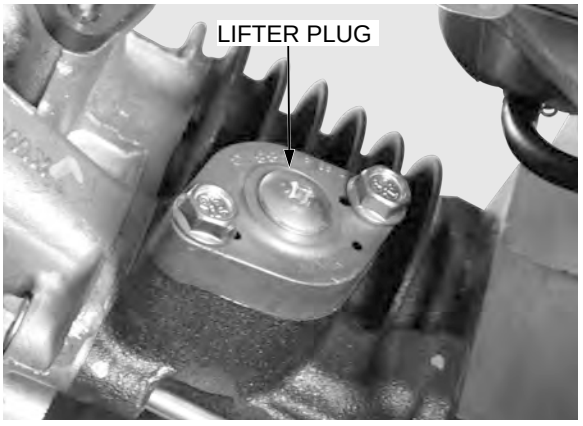
The rocker arms should be loose.

If the rocker arms are tight, rotate the crankshaft one turn and realign the “T” mark with the index mark.




Remove the cam chain tensioner lifter plug.

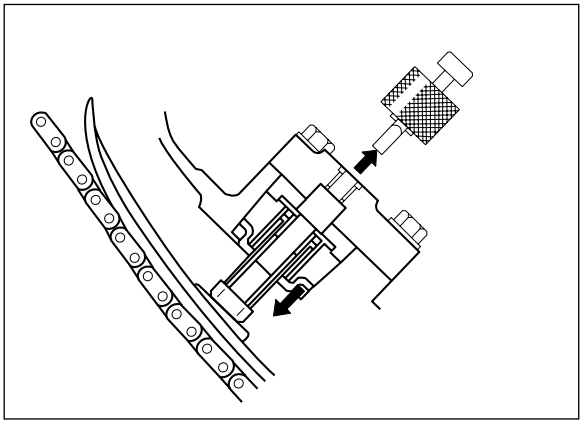
Install the stopper tool to the cam chain tensioner lifter.




Turn the tensioner shaft clockwise with the stopper tool to retract the tensioner, then insert the stopper fully to hold the tensioner in the fully retracted position.

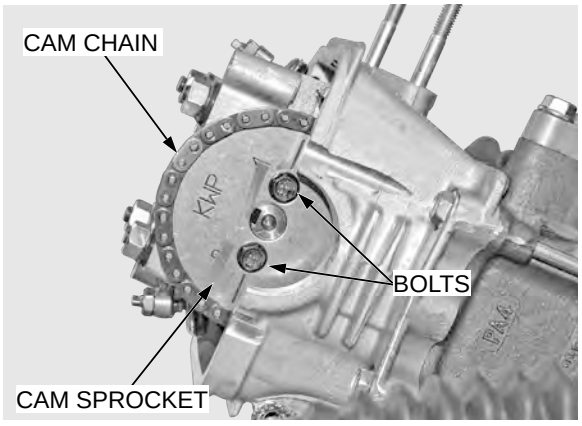
**TOOL:**

**Tensioner lifter stopper 070MG-0010100**

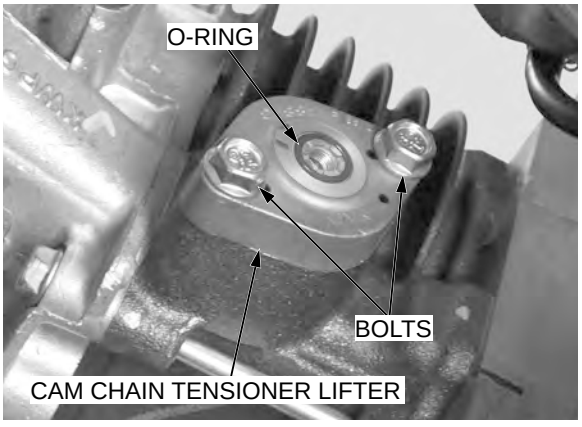


Remove the cam sprocket bolts (2 nos.) while holding the crankshaft. Remove the cam sprocket from the camshaft and the cam chain from the sprocket.

Suspend the cam chain with a piece of wire to prevent it from falling into the crankcase.

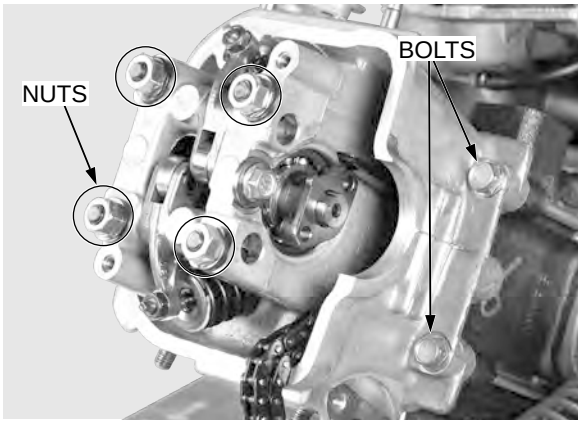



Remove the tensioner shaft stopper tool, O-ring, bolts (2 nos.), tensioner lifter and gasket.




Remove the nuts (4 nos.).

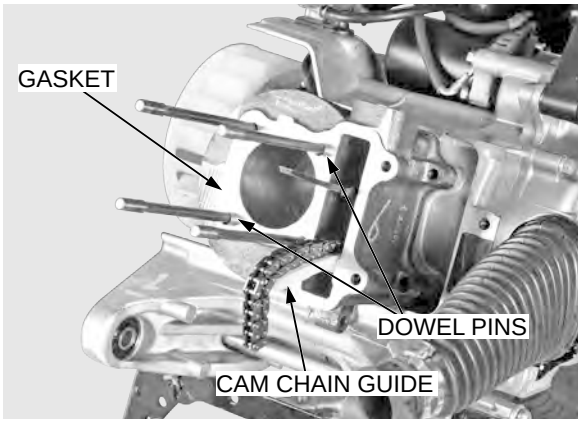
Remove the bolts (2 nos.) and cylinder head.




Remove the cylinder head gasket and dowel pins.

Remove the cam chain guide from the cylinder.

Check the cam chain guide for excessive wear or damage.



# CYLINDER HEAD DISASSEMBLY

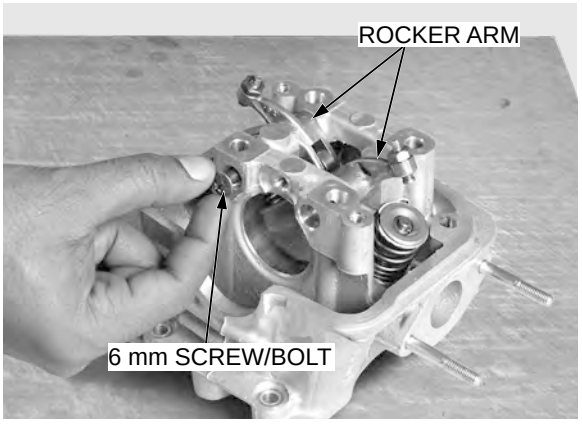
Remove the camshaft (page 7-19).

Screw 6 mm screw/bolt (1 no.) into the threaded hole in the rocker arm shaft and pull the shaft out of the camshaft holder.

Remove the rocker arm.

Remove the other rocker arm shaft and rocker arm.

Remove the insulator carburetor.




## INSPECTION

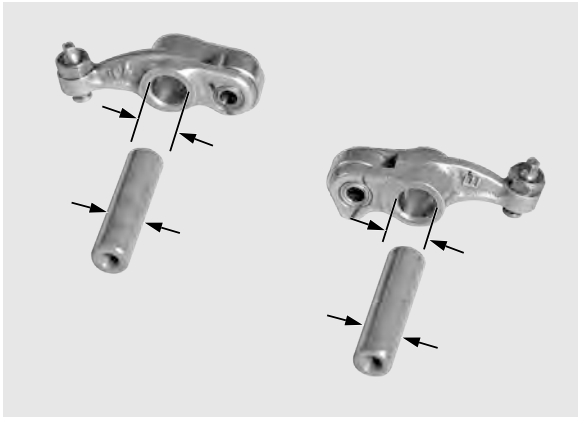
Inspect the rocker arms and shafts for wear, damage or clogged oil hole.

Measure the rocker arm I.D.

**SERVICE LIMIT: 10.10 mm (0.398 in)**

Measure the rocker arm shaft O.D.

**SERVICE LIMIT: 9.91 mm (0.390 in)**



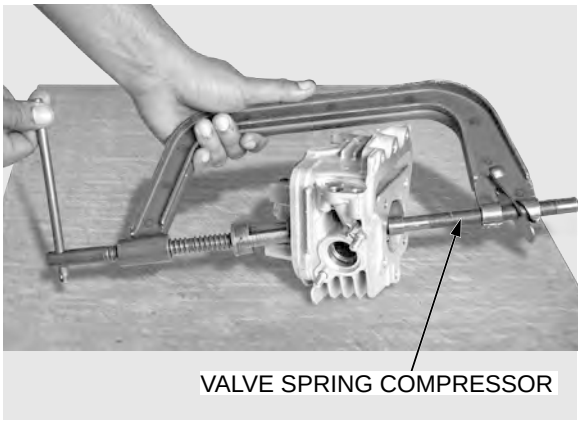
Compress the valve springs using the valve spring compressor, and remove the valve cotters.

**TOOLS:**

**Valve spring compressor 070GE – 001-I100**

**⚠ CAUTION**

To prevent loss of tension, do not compress the valve springs more than necessary to remove the cotters.

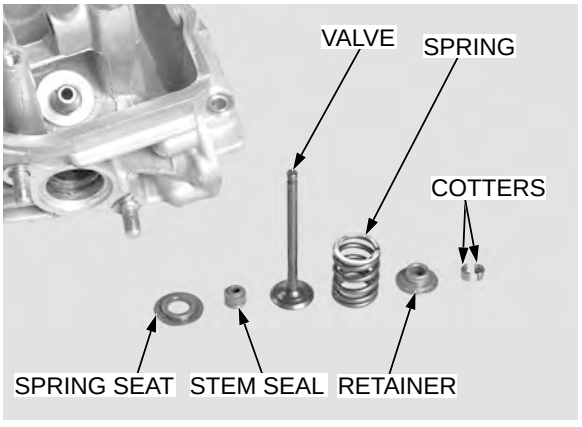



Remove the valve spring compressor, then remove the retainer, spring and valve.

Remove the stem seals and spring seat. Do not reuse the old stem seals.

**NOTICE**

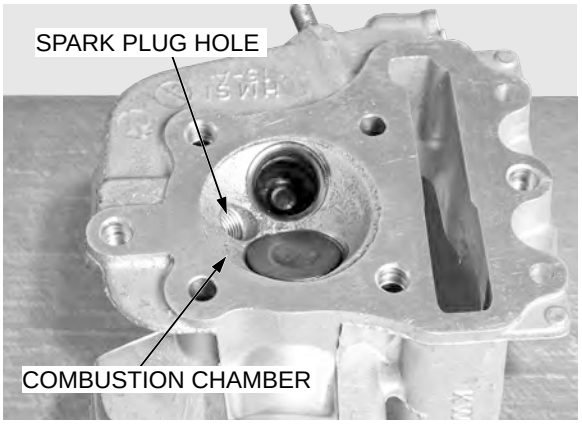
*Mark all parts during disassembly so they can be placed back in their original locations.*



# CYLINDER HEAD INSPECTION

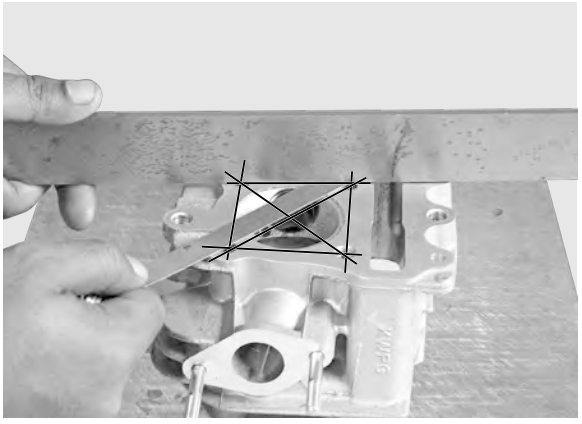
Remove the carbon deposits from the combustion chamber and clean off the head gasket surfaces.

Check the spark plug hole and valve areas of the combustion chamber for cracks.



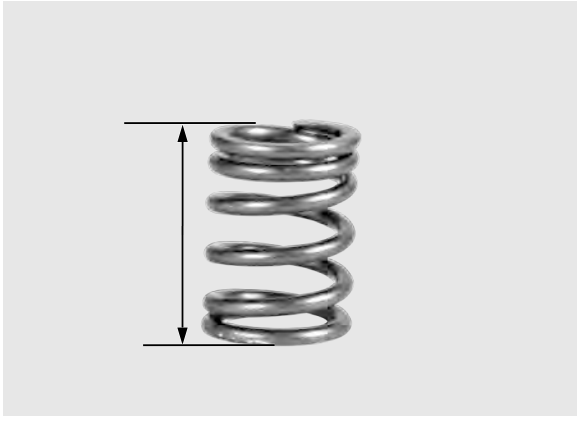

Check the cylinder head for warpage with a straight edge and feeler gauge.

**SERVICE LIMIT: 0.05 mm (0.002 in)**



Measure the free length of the valve springs.

**SERVICE LIMITS: 27.87 mm (1.09 in)**



Insert the valve into the guide and check that the valve moves smoothly.

Check each valve for bending, burning, scratches or abnormal stem wear.

Measure and record the valve stem O.D.

**SERVICE LIMIT: 4.90 mm (0.193 in)**

Ream the valve guide to remove any carbon buildup before measuring the guide.

Insert the reamer from the combustion chamber side of the head and always rotate the reamer clockwise.

**TOOL:**

**Valve guide reamer** **070MH – 001I160**

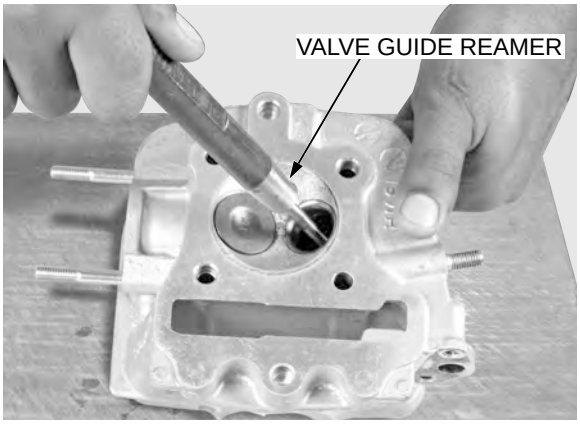
Measure and record each valve guide I.D.

**SERVICE LIMIT:** **5.03 mm (0.198 in)**

Calculate the valve stem-to-guide clearance.

**SERVICE LIMITS:** **Intake: 0.08 mm (0.003 in)**

**Exhaust: 0.10 mm (0.004 in)**

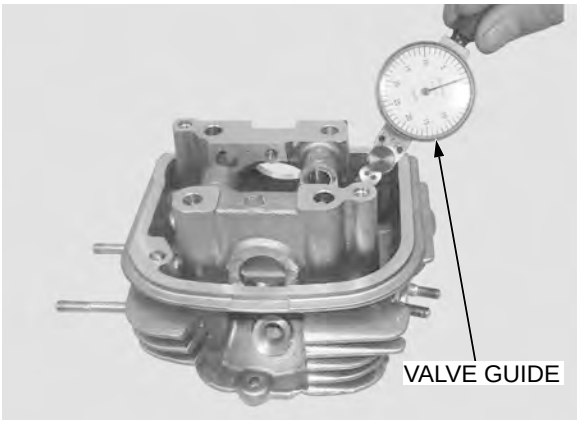



If the stem-to-guide clearance exceeds the service limits, determine if a new guide with standard dimensions would bring the clearance within tolerance. If so, replace any guides as necessary and ream to fit.

If the stem-to-guide clearance exceeds the service limits with new guides, also replace the valve.

**NOTICE**

*Inspect and reface the valve seats whenever the valve guide are replaced (page 7-11).*




# VALVE GUIDE REPLACEMENT

Chill new valve guides in the freezer section of a refrigerator for about an hour.

Heat the cylinder head to 130 – 140°C (275 – 290°F) with a hot plate or oven.

**⚠ CAUTION**

Using a torch to heat the cylinder head may cause warpage.

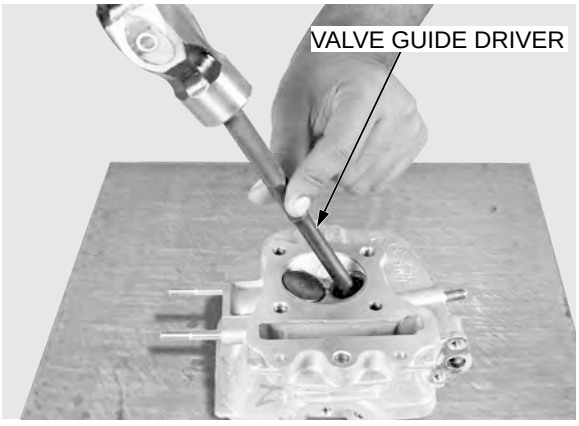
**⚠ WARNING**

Wear heavy gloves to avoid burns when handling the heated cylinder head.

Support the cylinder head and drive the valve guides out of the cylinder head from the combustion chamber side.

**TOOL:**

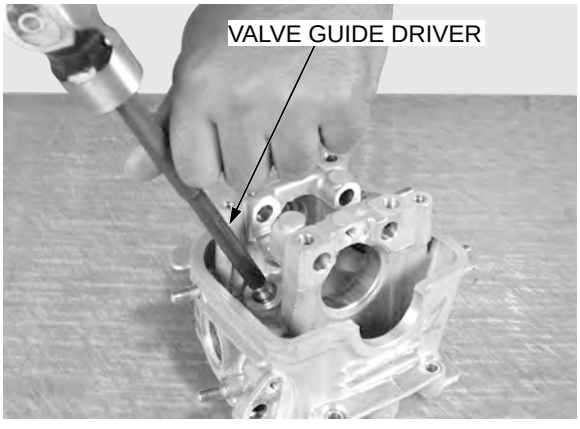
**Valve guide driver** **070ND – 006I150**




Install the new clip to the new valve guide. Drive in the valve guide from the camshaft side of the cylinder head while the cylinder head is still heated.

**TOOL:**

**Valve guide driver** **070ND – 006I150**



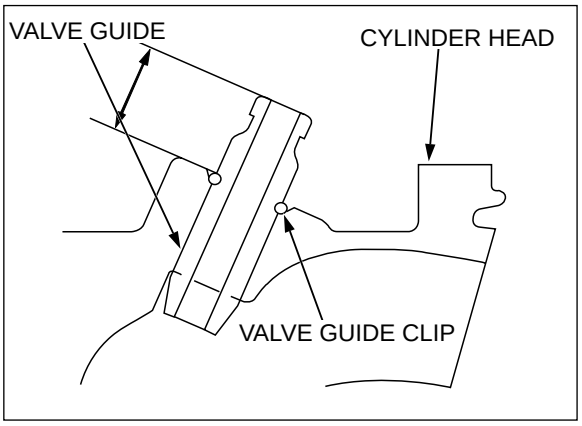
**NOTE:**

Install the valve guide while measuring the valve guide height from the cylinder head.

**SPECIFIED HEIGHT:**

**IN/EX: 9.7 – 9.9 mm (0.382 – 0.389 in)**

Let the cylinder head cool to room temperature.




Ream the new valve guides.

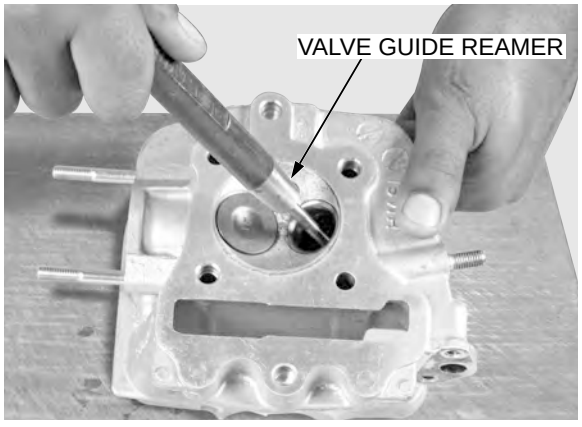
Insert the reamer from the combustion chamber side of the head and always rotate the reamer clockwise.

**TOOL:**

**Valve guide reamer 070MH – 001I160**

- Take care not to tilt or lean the reamer in the guide while reaming.
- Use cutting oil on the reamer during this operation.

Clean the cylinder head thoroughly to remove any metal particles after reaming and reface the valve seat (page 7-11).




# VALVE SEAT INSPECTION/ REFACING

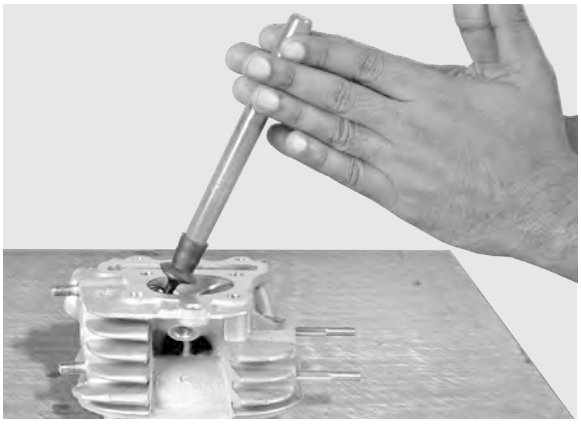
## INSPECTION

Clean all intake and exhaust valves thoroughly to remove carbon deposits.

Apply a light coating of Prussian Blue to each valve face.

Tap the valve against the valve seat several times using a hand-lapping tool, without rotating the valve, to make a clear pattern.

Remove the valve and inspect the valve seat face.



**NOTICE**

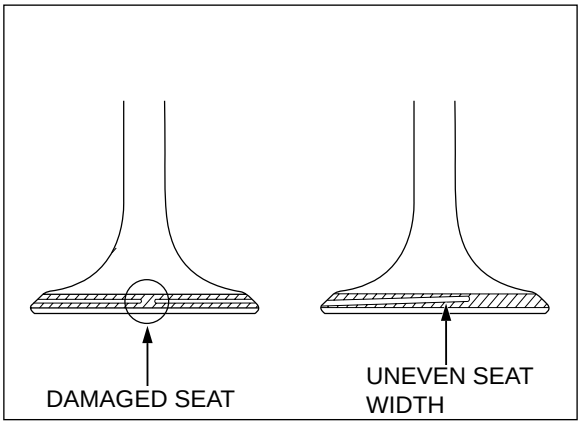
*The valve cannot be ground. If the valve face is burned or badly worn or if it contacts the seat unevenly, replace the valve.*

Inspect the valve seat face for:

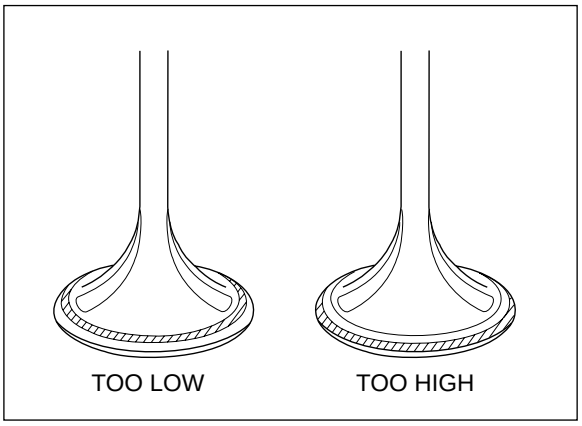
- Uneven seat width:
  - Bent or collapsed valve stem:

Replace the valve and reface the valve seat

- Damaged face:
  - Replace the valve and reface the valve seat



- Contact area (too high or too low area):
  - Reface the valve seat



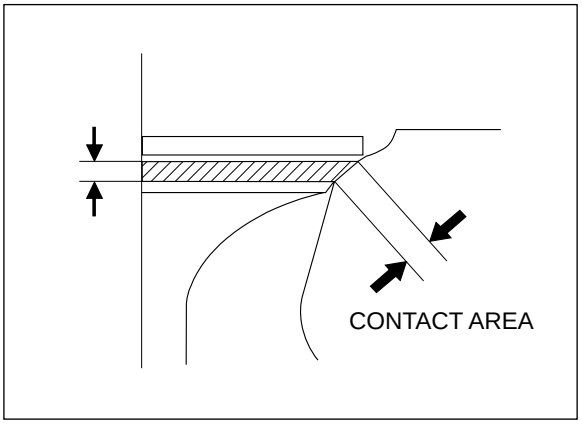

Inspect the width of valve seat.

The valve seat contact should be within the specified width and even all around the circumference.

**STANDARD:** **1.0 mm (0.04 in)**

**SERVICE LIMIT:** **1.5 mm (0.06 in)**

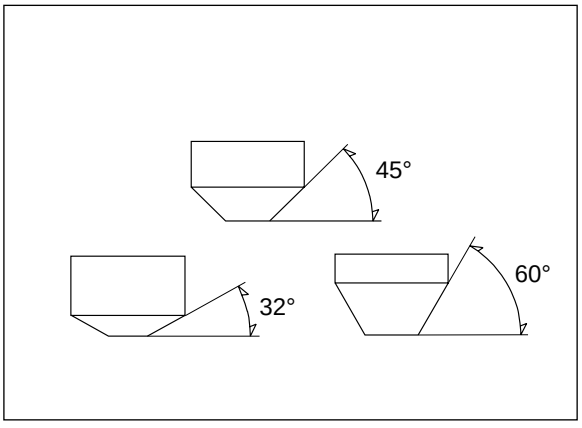
If the valve seat width is not within specification, reface the valve seat (page 7-11).




## VALVE SEAT REFACING

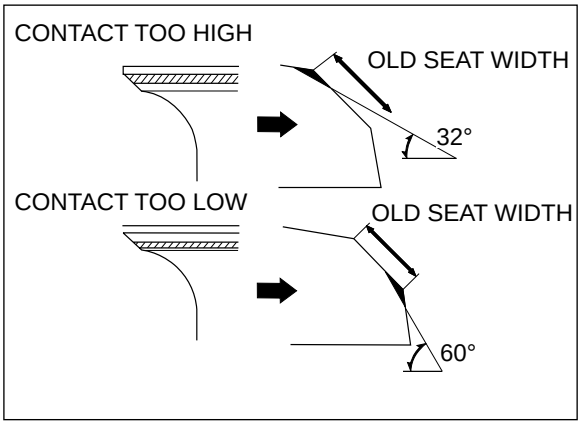
**NOTICE**

- *Follow the reface manufacturer's operating instructions.*
- *Be careful not to grind the seat more than necessary.*




If the contact area is too high on the valve, the seat must be lowered using a 32° flat cutter.

If the contact area is too low on the valve, the seat must be raised using a 60° inner cutter. Refinish the seat to specifications, using a 45° finish cutter.



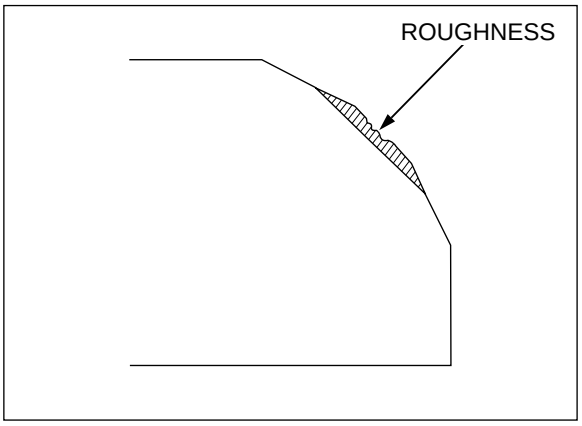
Using a 45° cutter, remove any roughness or irregularities from the seat.

**TOOLS:**

**Valve seat cutter, 22 mm (45° IN)070MH – 003I150**

**Valve seat cutter, 27.5 mm (45° EX)**
**070MF – 003I180**

**Valve seat cutter holder 070MH – 005I150**



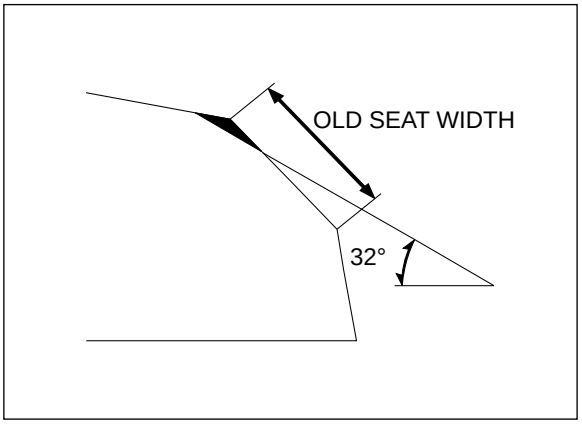

Using a 32° cutter, remove 1/4 of the existing valve seat material.

**TOOLS:**

**Valve seat cutter, 24 mm (32° IN) 07780 – 0012900**

**Valve seat cutter, 28 mm (32° EX) 070MH – 002I120**

**Valve seat cutter holder 070MH – 005I150**

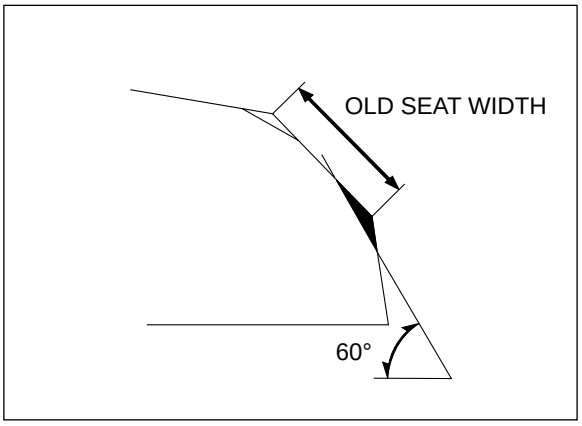



Using a 60° cutter, remove 1/4 of the existing valve seat material.

**TOOLS:**

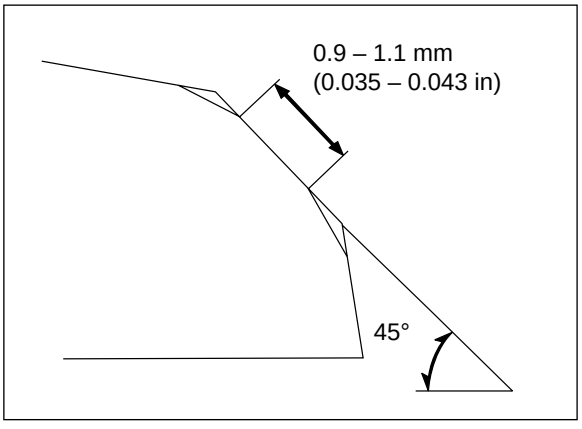
**Valve seat cutter, 30 mm (60° IN/EX) 07780 – 0014000**

**Valve seat cutter holder 070MH – 005I150**

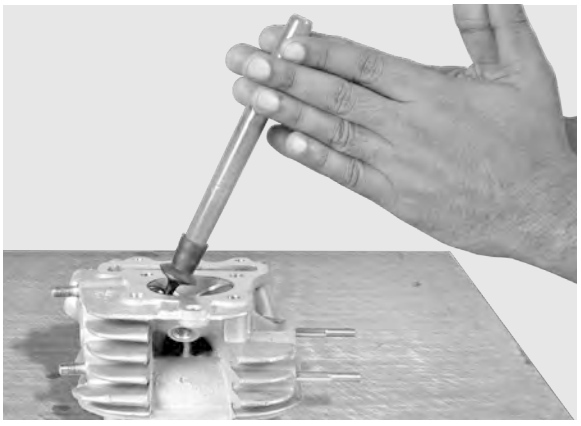



Using a 45° cutter, cut the seat to the proper width.

Make sure that all pitting and irregularities are removed.



After cutting the seat, apply lapping compound to the valve face, and lap the valve using light pressure.



**NOTICE**

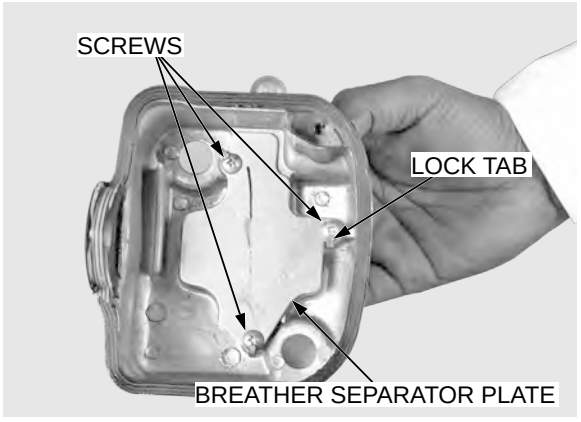
- *Excessive lapping pressure may deform or damage the seat.*
- *Change the angle of lapping tool frequently to prevent uneven seat wear.*
- *Lapping compound can cause damage if it enters between the valve stem and guide.*

After lapping, wash any residual compound off the cylinder head and valve and recheck the seat contact.

## BREATHER SEPARATOR CLEANING

Bend up the lock tabs of the breather separator plate.

Remove the three screws and breather separator plate.




Clean the separator plate and inside of the cylinder head cover thoroughly.

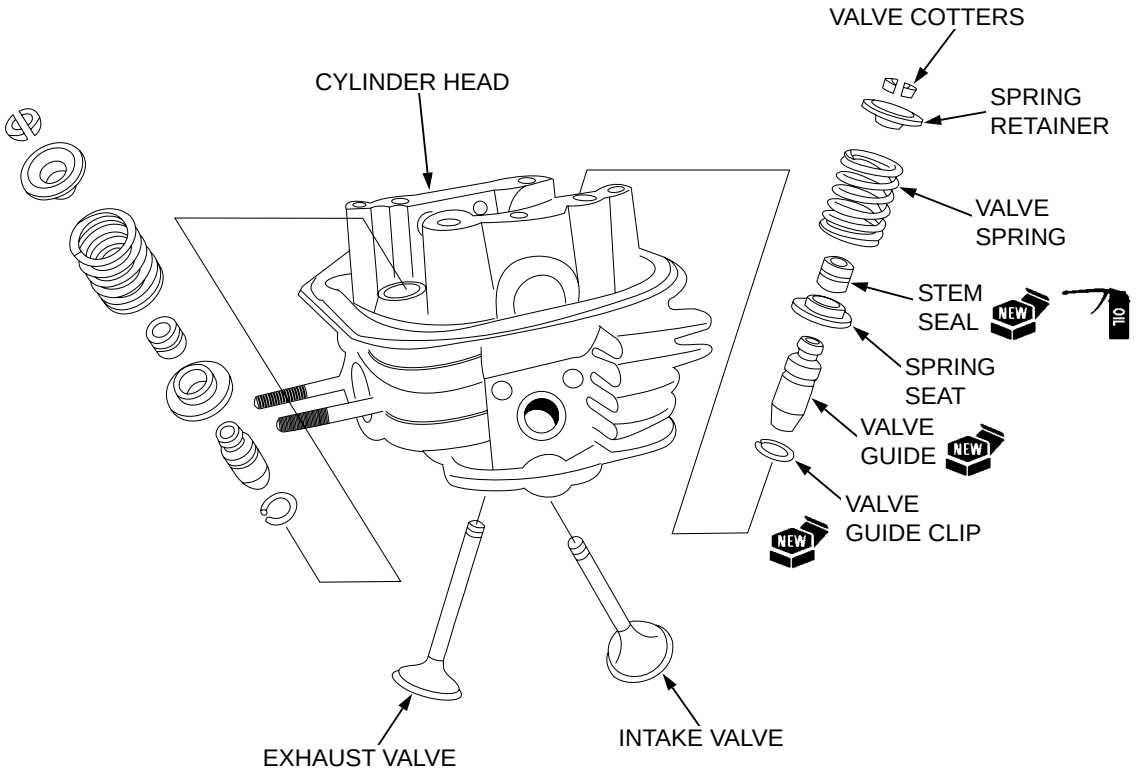
Install the breather separator plate and tighten the screw (3 nos.) to specified torque.

**TORQUE: 3 N·m (0.3 kgf·m, 2.2 lbf·ft)**

Bend the lock tabs of the plate against the screw heads.

Installation is in the reverse order of removal.

## ASSEMBLY



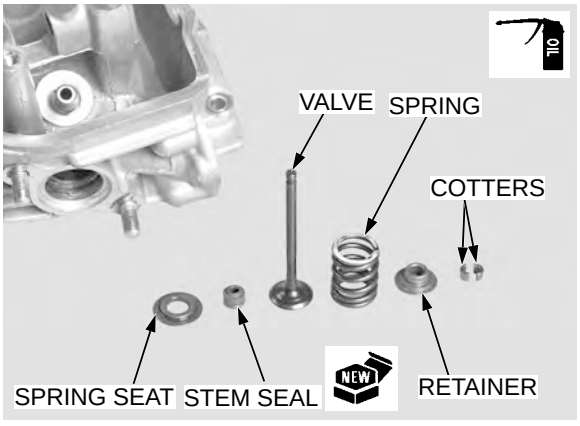

Blow through the oil passage in the cylinder head with compressed air.

Install the spring seats and new stem seals.

Lubricate the valve stems with clean engine oil and insert the valves into the cylinder head.

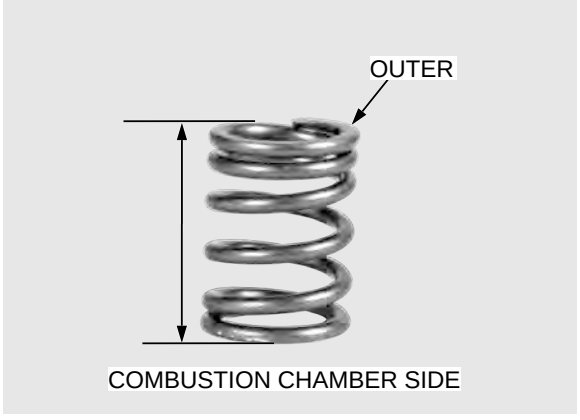
**NOTICE**

*To avoid damage to the stem seal, turn the valve slowly when inserting.*




Install the valve springs with the tightly wound coils facing the cylinder head.

Install the spring retainer.



# CYLINDER HEAD ASSEMBLY

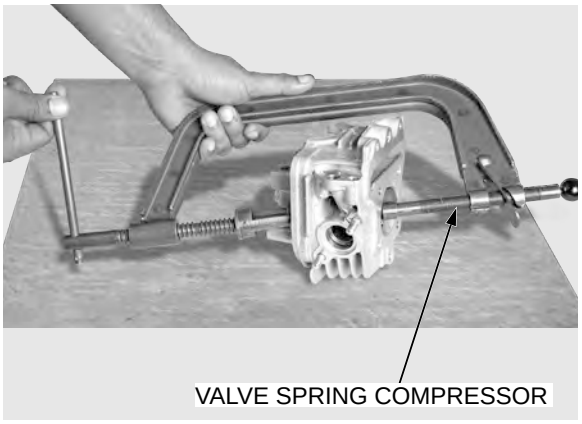
Compress the valve springs and install the valve cotters.

**TOOL:**

**Valve spring compressor 070GE – 001-I100**

**⚠ CAUTION**

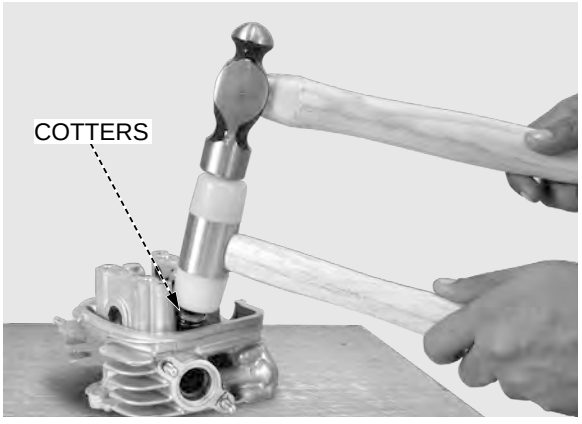
To prevent loss of tension, do not compress the valve springs more than necessary to install the cotters.



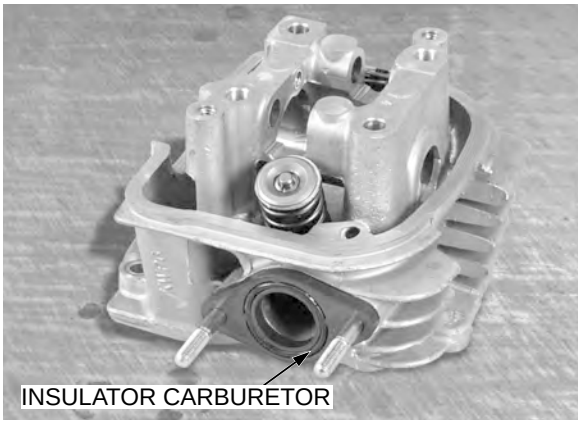

Support the cylinder head so that the valve heads will not contact anything that causes damage.

Seat the cotters firmly using two hammers as shown.

Hold one hammer on the valve stem and gently tap in with the other hammer.



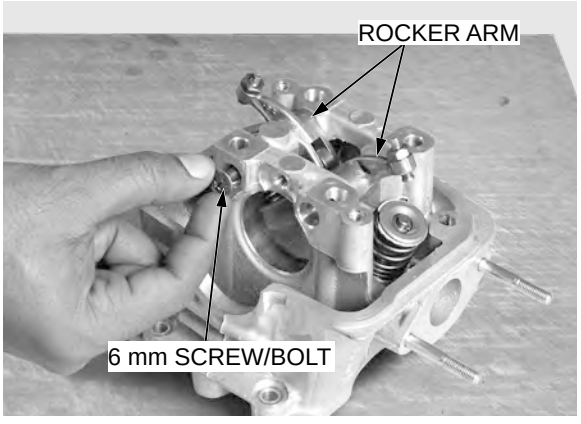

Install the insulator carburettor.




Install the rocker arms and shafts into the holder.

**NOTICE**

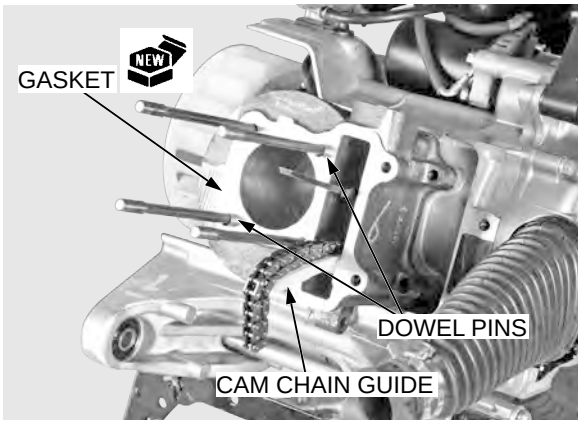
*Install the rocker arm shaft with the threaded side facing out.*



# CYLINDER HEAD INSTALLATION

Install the cam chain guide so that its bosses are placed in the grooves in the cylinder.

Install the dowel pins and a new gasket.

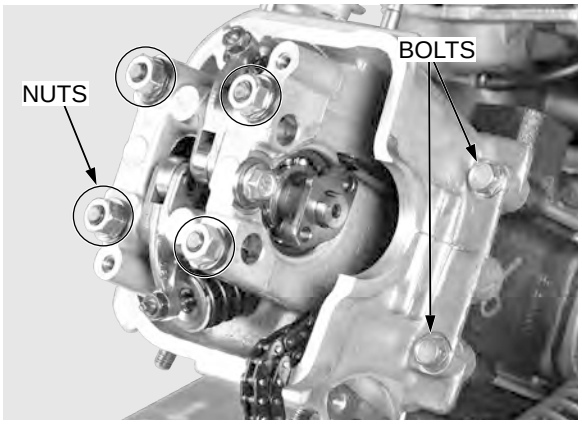



Install the cylinder head.

Suspend the cam chain to keep it from falling into the cylinder.

Install the washers and cylinder head nuts (4 nos.), then loosely tighten the nuts in a crisscross pattern in 2 or 3 steps.

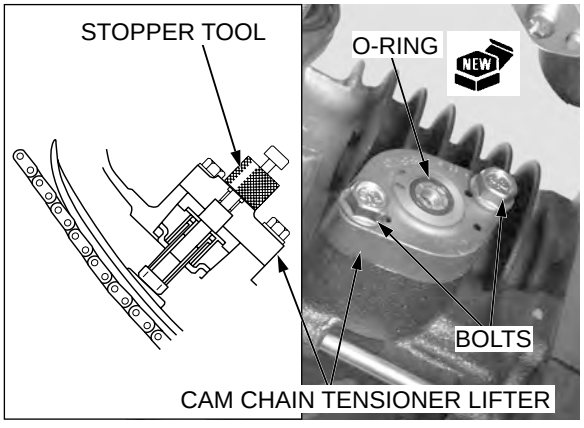
Install the cylinder head side bolt (2 nos.) loosely tighten them.



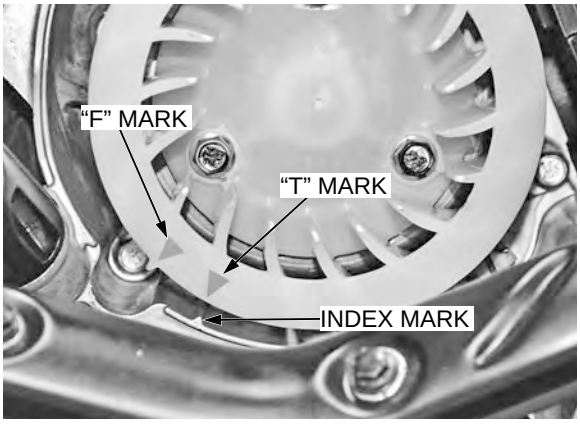

Install the stopper tool to the cam chain tensioner lifter.

Turn the cam chain tensioner lifter shaft clockwise with the stopper tool to retract the cam chain tensioner lifter, then insert the stopper fully to hold the cam chain tensioner lifter.

Install the cam chain tensioner lifter and tighten the bolts securely.




Turn the cooling fan clockwise slowly and align the “T” mark on the cooling fan with the index mark of the right crankcase.

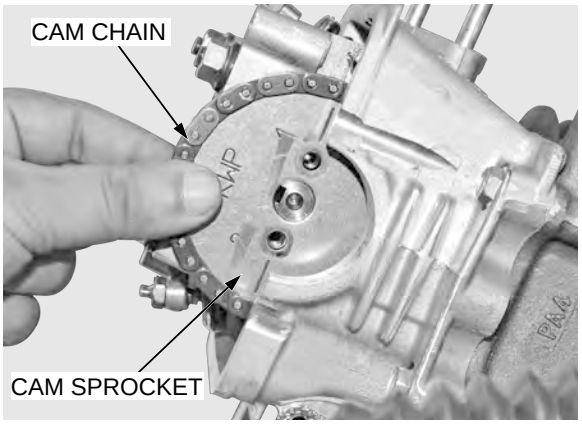


Align the timing mark (index line) on the cam sprocket with the top surface of the cylinder head.

Install the cam chain onto the cam sprocket, then install the cam sprocket onto the camshaft.

Make sure that the timing mark (index line) aligns with the top surface and the “T” mark aligns with the index mark.

Cover the cam chain opening with a shop towel to prevent from the cam sprocket bolts falling into the crankcase.



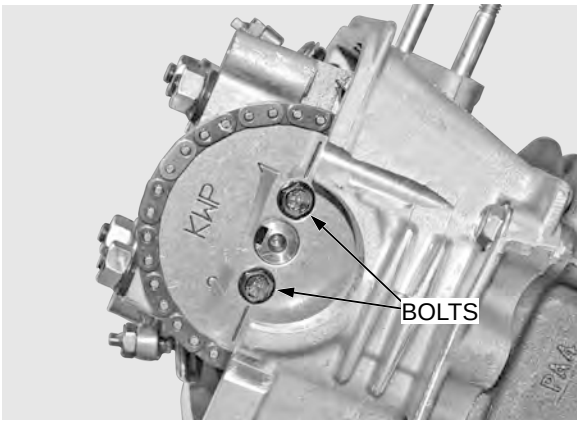

Align the bolt holes in the camshaft and cam sprocket, and install the cam sprocket bolts.

Tighten the cam sprocket bolts while holding the crankshaft.

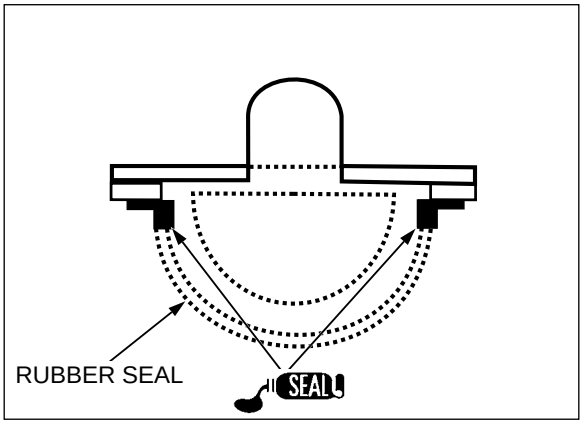
**TORQUE: 9 N·m (0.9 kgf·m, 6.5 lbf·ft)**

Tighten the cylinder head nuts to the specified torque.

**TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)**

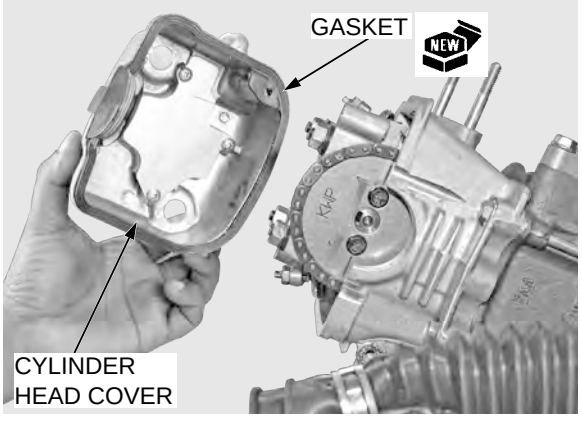



Apply liquid sealant (Three bond 5211C or SHINE SU-SILICON KE45T or Three bond 1215 or equivalent) to the semicircular area of rubber seal as shown.

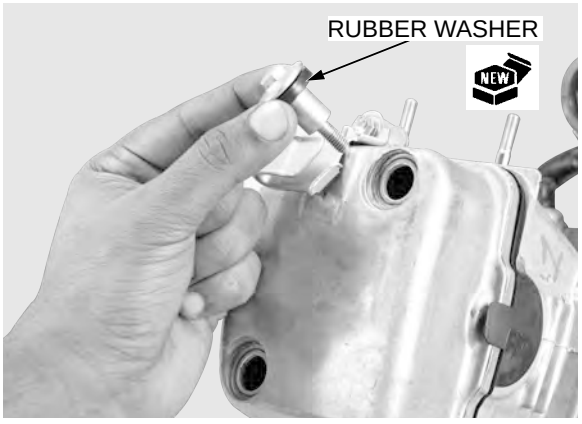



Install a new gasket into the groove in the cylinder head cover.

Install the cylinder head cover on the cylinder head.

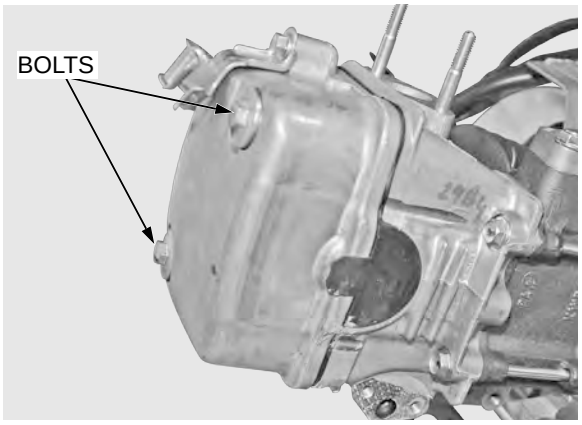


Install new rubber washer to the cylinder head cover bolts.

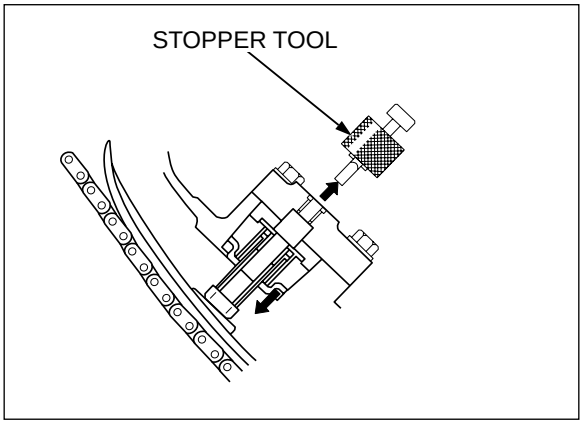



Install and tighten the cylinder head cover bolts.

**TORQUE: 12 N·m (1.2 kgf·m, 9 lbf·ft)**



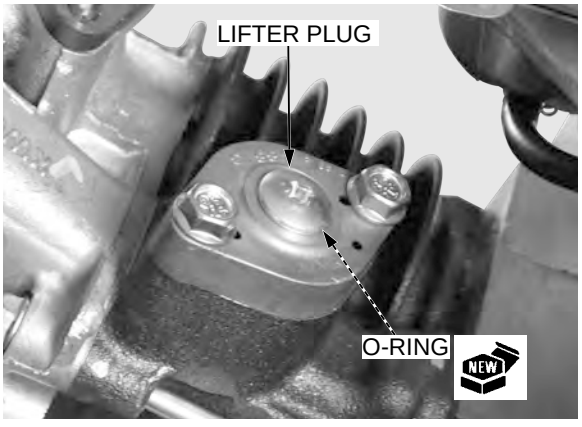

Remove the stopper tool from the tensioner lifter.




Install the plug with a new O-ring and tighten it.

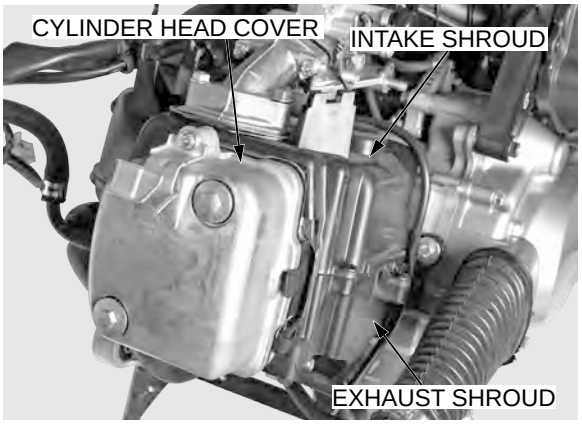
**TORQUE: 4 N·m (0.4 kgf·m, 2.9 lbf·ft)**

Install the cam chain tensioner hole cap.



Install the following:

– Spark plug (page 3-7)
– Muffler assembly (page 2-9)
– Intake/exhaust shroud (page 7-4)
– Cooling fan cover (page 11-4)
– Engine (page 6-4)

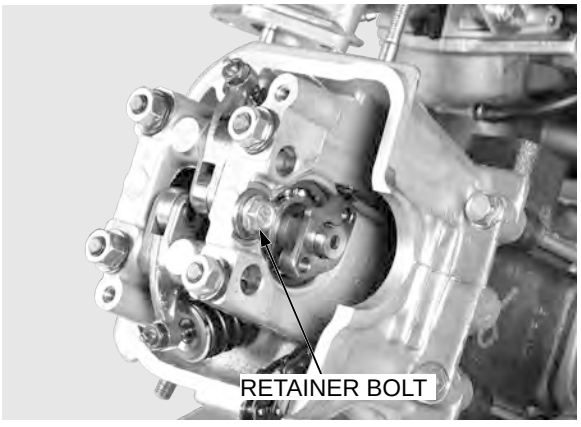



# CAMSHAFT REMOVAL

Remove the following:

– Engine (page 6-2)
– Cooling fan cover (page 11-2)
– Spark plug (page 3-7)
– Cam sprocket (page 7-6)

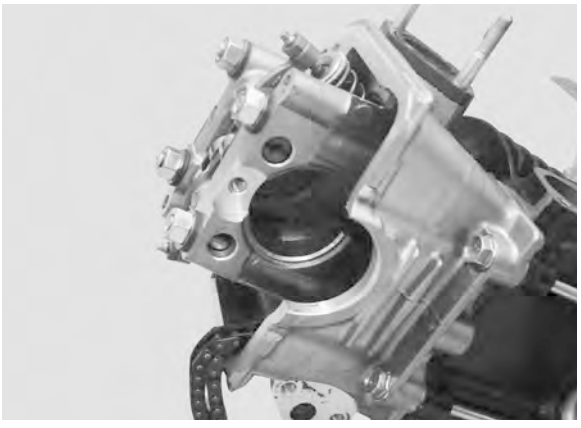
Remove the camshaft retainer bolt (1no.).




Remove the camshaft.

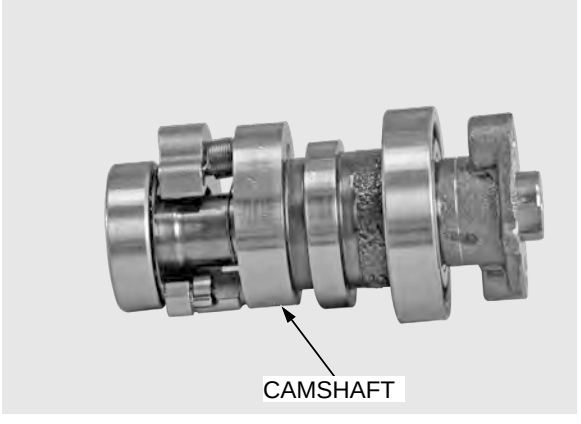
NOTE:

Do not hammer the camshaft out as it can damage the camshaft as well as the spring used for decompression mechanism.



**NOTICE**

*For camshaft removal no need to open cylinder head nut/ bolts.*



## INSPECTION

Check each cam lobe for wear, scratches or scoring.

Measure the cam lobe height.

**SERVICE LIMITS: Intake: 32.084 mm (1.2631 in)**

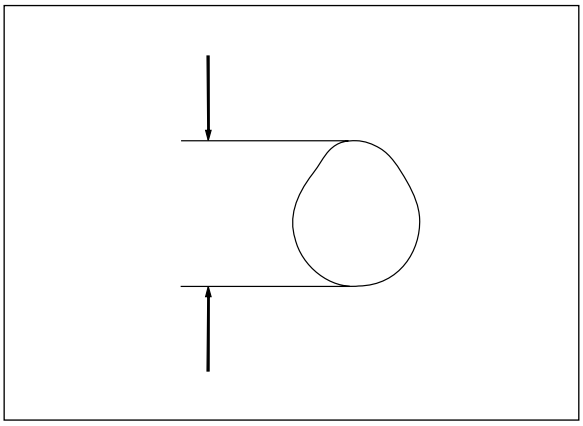
**Exhaust: 31.80 mm (1.23 in)**

Turn the outer race of each camshaft bearing with your finger.

The bearing should turn smoothly and quietly.

Check that the inner race of each bearing fits tightly on the camshaft.

Replace the camshaft assembly if the bearing does not turn smoothly, quietly, or if it fits loosely on the camshaft.

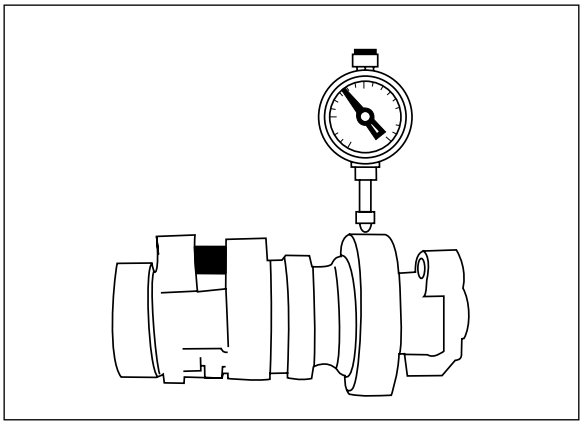


**CAMSHAFT RUNOUT**

Support both ends of the camshaft and check the camshaft runout with a dial indicator.

Actual runout is 1/2 the total indicator reading.

**SERVICE LIMIT: 0.05 mm (0.002 in)**



# CAMSHAFT INSTALLATION

**NOTICE**

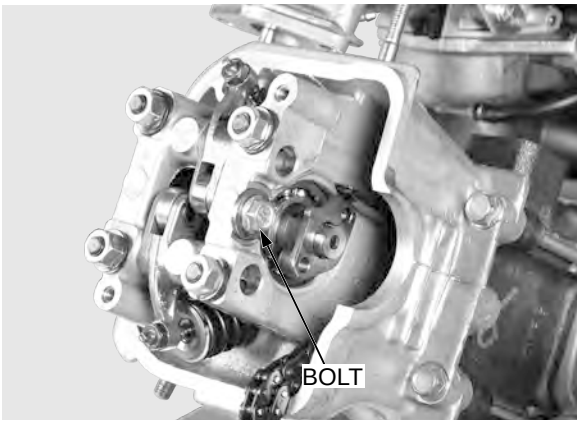
*Clean each parts of the assembly in solvent and lubricate them with clean engine oil.*

Install the camshaft into the cylinder head by aligning the cam lobes with the cutouts in the holder.

Install the retainer bolt (1 no.).

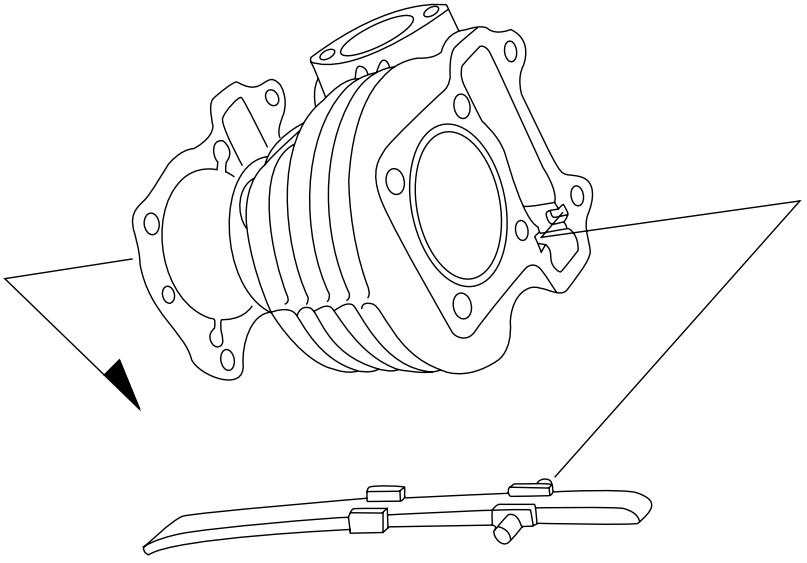
Install the following:

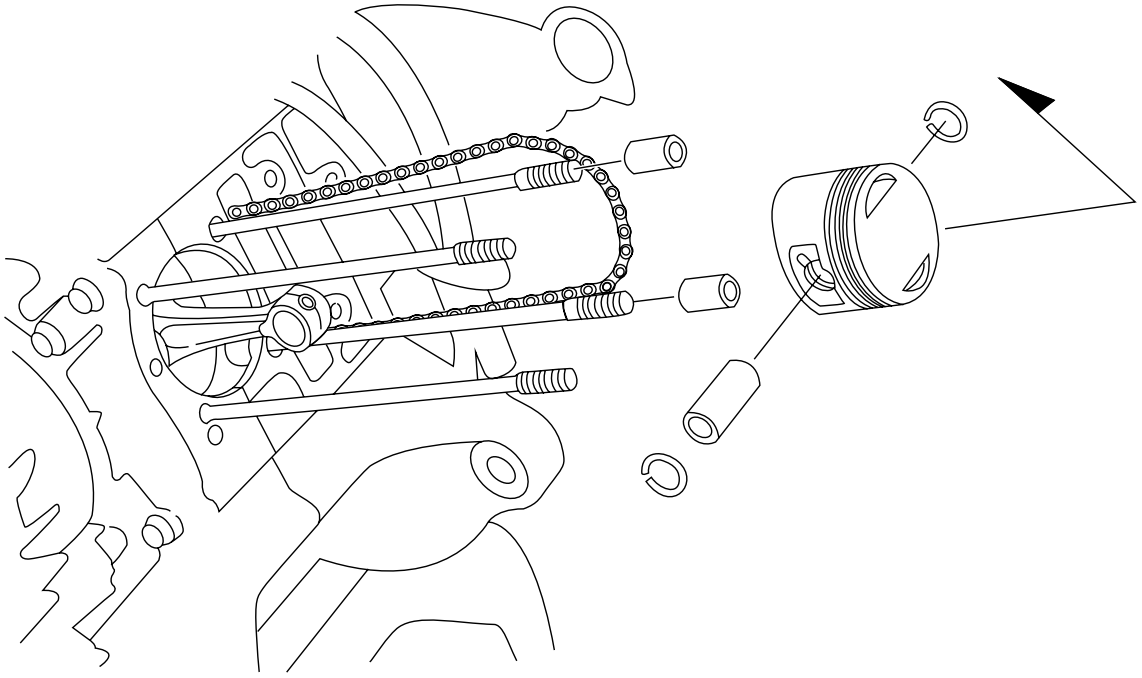
– Cam sprocket (page 7-17).
– Cooling fan cover (page 11-4)
– Engine (page 6-4)



**MEMO**

# COMPONENT LOCATION





# SERVICE INFORMATION

## GENERAL

- To service the cylinder and piston, the engine must be removed from the frame.
- Take care not to damage the cylinder wall and piston.
- Be careful not to damage the mating surfaces when removing the cylinder.

## SPECIFICATIONS

Unit: mm (in)

| ITEM | | | STANDARD | SERVICE LIMIT | Page NO. |
|---|---|---|---|---|---|
| Cylinder | I.D. | | 50.005 – 50.015 (1.9686 – 1.9690) | 50.1 (1.972) | Page 8-2 |
| | Out-of-round | | – | 0.05 (0.002) | Page 8-3 |
| | Taper | | – | 0.05 (0.002) | Page 8-3 |
| | Warpage | | – | 0.05 (0.002) | Page 8-3 |
| Piston, piston pin, piston ring | Piston O.D. at 5 (0.2) from bottom | | 49.980 – 49.995 (1.9677 – 1.9683) | 49.9 (1.964) | Page 8-4 |
| | Piston pin hole I.D. | | 12.002 – 12.008 (0.4725 – 0.4727) | 12.04 (0.474) | Page 8-4 |
| | Piston pin O.D. | | 11.994 – 12.000 (0.4722 – 0.4724) | 11.98 (0.471) | Page 8-4 |
| | Piston-to-piston pin clearance | | 0.002 – 0.014 (0.0001 – 0.0006) | 0.02 (0.001) | Page 8-4 |
| | Piston ring-to-ring groove clearance | Top<br>Second | 0.010 – 0.025 (0.0004 - 0.0010)<br>0.020 – 0.070 (0.0008 - 0.0028) | 0.45 (0.018) | Page 8-3 |
| | Piston ring end gap | Top/ Second | 0.15 – 0.45 (0.0006 – 0.0015) | 0.08 (0.03) | Page 8-4 |
| | | Oil (side rail) | | – | – |
| Cylinder-to-piston clearance | | | 0.010 – 0.035 (0.0004 - 0.0013) | 0.10 (0.004) | Page 8-2 |
| Connecting rod small end I.D. | | | 12.010 – 12.028 (0.4728 - 0.4735) | 12.05 (0.474) | Page 8-4 |
| Connecting rod-to-piston pin clearance | | | 0.010 – 0.034 (0.0003 - 0.0013) | 0.05 (0.002) | Page 8-4 |

# TROUBLESHOOTING

**Compression too low, hard starting or poor performance at low speed**

- Worn, stuck or broken piston ring
- Worn or damaged cylinder or piston

**Excessive smoke**

- Worn cylinder, piston or piston rings
- Improper installation of piston rings
- Scored or scratched piston or cylinder wall

**Abnormal noise**

- Worn piston pin or piston pin hole
- Worn connecting rod small end
- Worn cylinder, piston or piston rings

## TOOLS

Slider base piston 070SRTKSP008

# CYLINDER REMOVAL

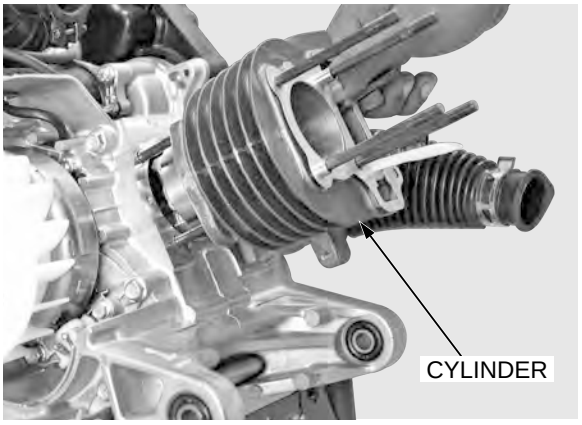
Remove the following:

– Cylinder head (page 7-5)
– Cam chain guide
– Cam chain tensioner (page 7-6)

Check the cam chain guide and cam chain tensioner for excessive wear or damage, replace them if necessary.

**⚠ CAUTION**

Be careful not to damage the sliding surface of the piston and cylinder.



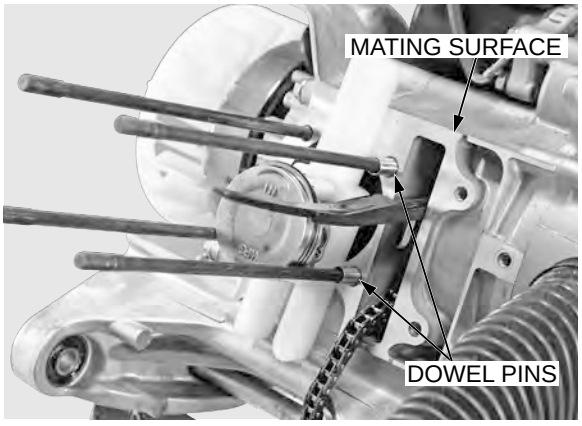

Lift the cylinder, and remove it, be careful not to damage the piston with the stud bolts.

**TOOL:**

**Slider base piston** **070SRTKSP008**

Remove the dowel pins.

Clean any gasket material off the mating surface of the cylinder, be careful not to damage the mating surface.




## INSPECTION

Inspect the cylinder bore for scratch or wear.

Measure the cylinder I.D. at three levels in an X and Y axis.

Take the maximum reading to determine the cylinder wear.

**SERVICE LIMIT: 50.10 mm (1.972 in)**

Calculate the cylinder-to-piston clearance.

Refer to page 8-4 for measurement of the piston O.D.

**SERVICE LIMIT: 0.10 mm (0.004 in)**

Calculate the cylinder taper and out-of-round at three levels in an X and Y axis. Take the maximum reading to determine the taper and out-of-round.

**SERVICE LIMITS: Taper: 0.05 mm (0.002 in)**

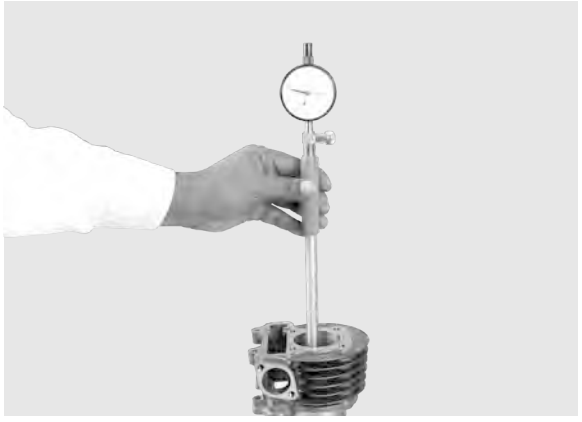
**Out-of-round: 0.05 mm (0.002 in)**

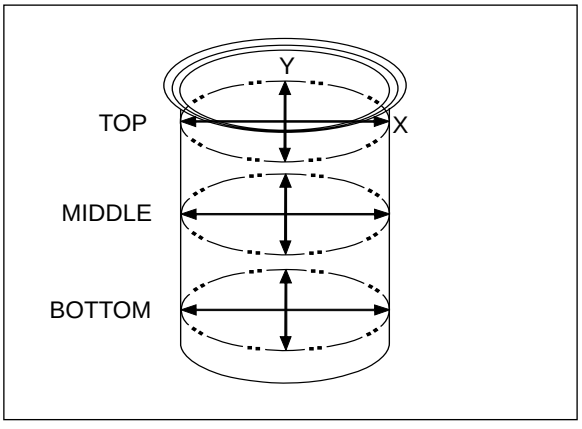
The cylinder must be rebored and an oversize piston fitted if the service limit is exceeded.

The cylinder must be rebored so that the clearance between oversize piston and rebored cylinder should be maintained between 0.010-0.040 mm (0.0004-0016).

NOTE:

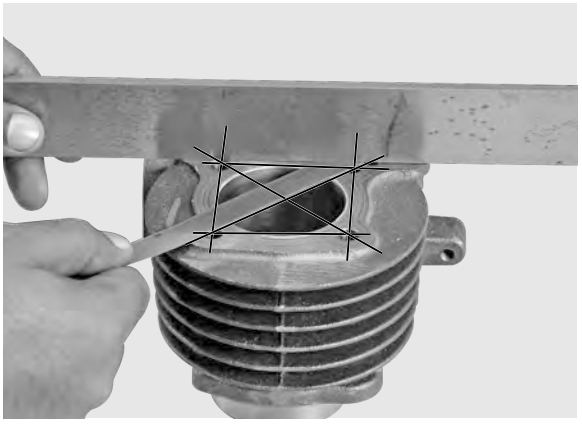
In case of cylinder reboring, use ‘Ring Set, Piston’ & ‘Gasket, Cylinder Head’ as per the size of piston.





Check the top of the cylinder for warpage with a straight edge and feeler gauge.

**SERVICE LIMIT: 0.05 mm (0.002 in)**



# PISTON REMOVAL

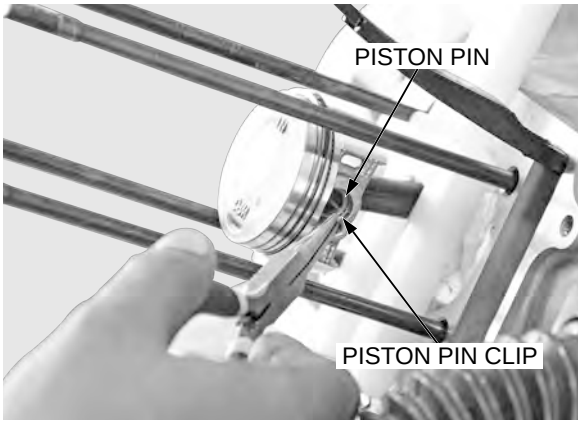
Place a clean shop towel over the crankcase to prevent the clip from falling into the crankcase.

**TOOL:**

**Slider base piston** **070SRTKSP008**

Remove the piston pin clips with the pliers.

Push the piston pin out of the piston and connecting rod, and remove the piston.

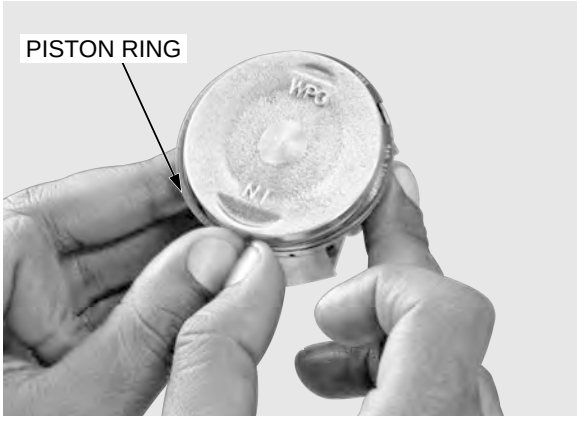



Spread each piston ring and remove it by lifting up at a point opposite the gap.

Clean carbon deposits from the piston.

**⚠ CAUTION**

- Do not damage the piston ring by spreading the ends too far.
- Be careful not to damage the piston when the piston rings are being removed.
- Clean carbon deposits from the ring grooves with a old piston ring. Never use a wire brush; it will scratch the groove.




## INSPECTION

Inspect the piston rings and replace them if they are damaged. Inspect the piston rings for movement by rotating the rings. The rings should be able to move in their grooves without catching.

Push the ring until the outer surface of the piston ring is nearly flush with the piston and measure the ring-to-ring groove clearance.

**SERVICE LIMITS: Top: 0.08 mm (0.003 in)**

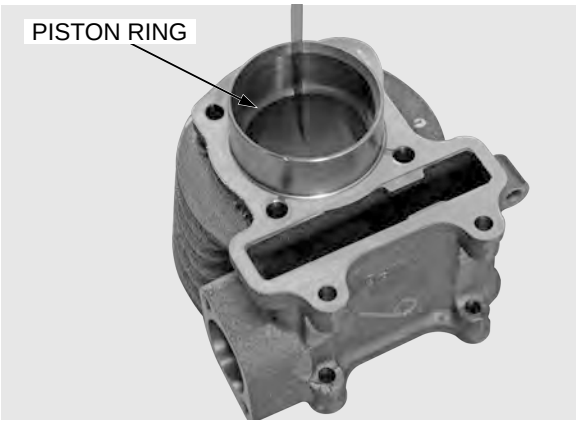
**Second: 0.08 mm (0.003 in)**

Insert each piston ring into the bottom of the cylinder squarely using the piston.

Measure the ring end gap.

**SERVICE LIMITS: Top: 0.45 mm (0.018 in)**

**Second: 0.45 mm (0.018 in)**

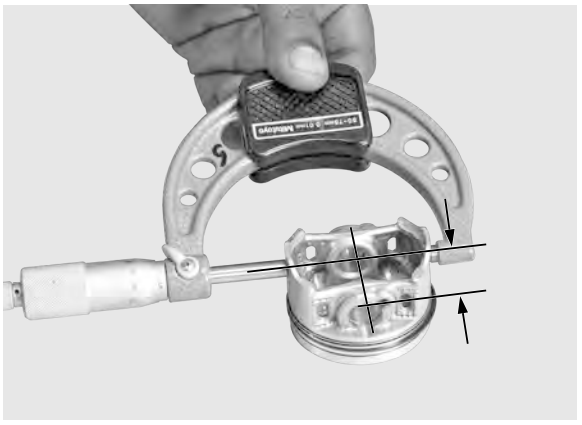



Measure the piston O.D. 90° to the piston pin hole and at point 10 mm (0.4 in) from bottom of the piston skirt.

**SERVICE LIMIT: 49.91 mm (1.966 in)**

Compare this measurement against the maximum cylinder I.D. measurement and calculate the cylinder-to-piston clearance (page 8-2).

**SERVICE LIMIT: 0.10 mm (0.004 in)**



Measure piston pin hole I.D. in an X and Y axis. Take the maximum reading to determine the I.D.

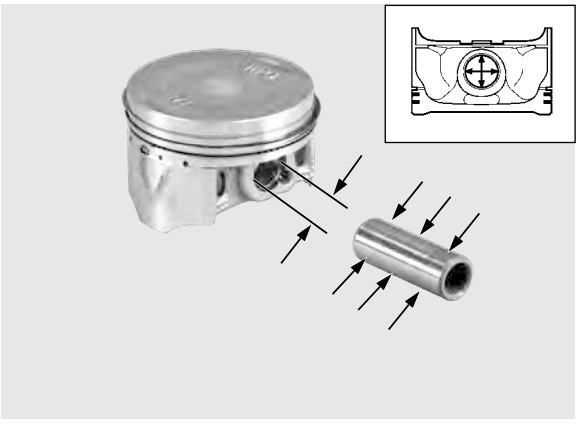
**SERVICE LIMIT: 12.04 mm (0.474 in)**

Measure the piston pin O.D. at three points.

**SERVICE LIMIT: 11.98 mm (0.471 in)**

Calculate the piston-to-piston pin clearance.

**SERVICE LIMIT: 0.02 mm (0.0007 in)**



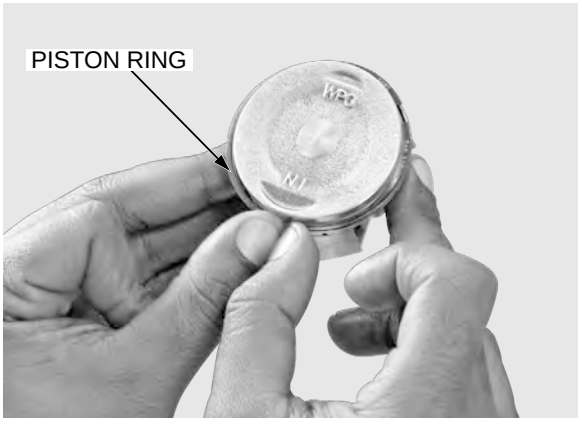
Measure the connecting rod small end I.D.

**SERVICE LIMIT: 12.04 mm (0.474 in)**

Calculate the connecting rod-to-piston pin clearance.

**SERVICE LIMIT: 0.05 mm (0.001 in)**

# PISTON INSTALLATION




Carefully install the piston rings into the piston ring grooves with the markings facing up.

**NOTICE**

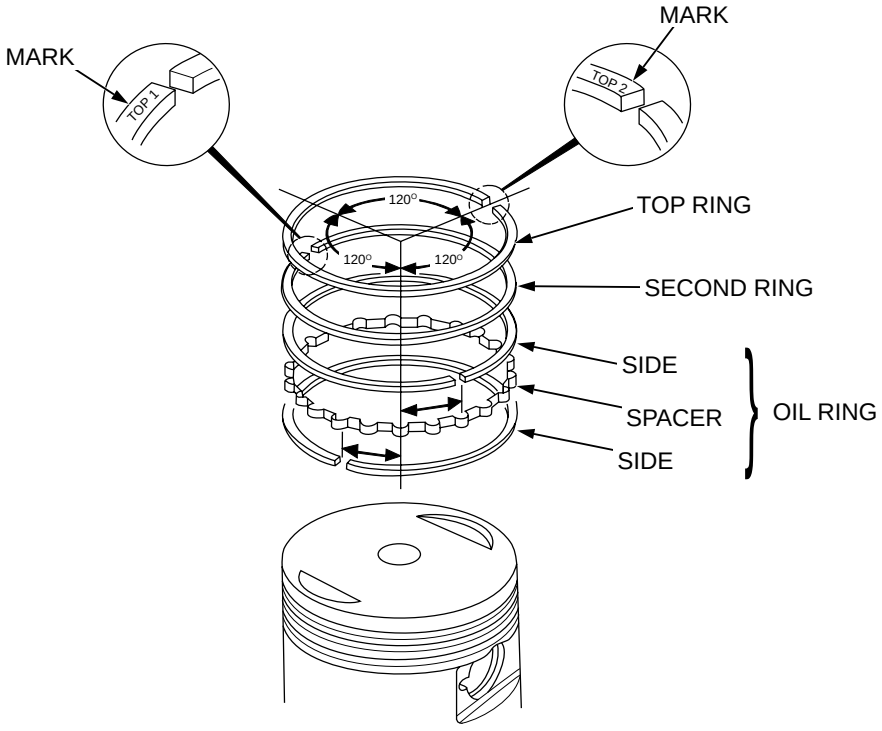
- *Do not damage the piston ring by spreading the ends too far.*
- *Do not confuse the top and second rings.*
- *To install the oil ring, install the spacer first, then install the side rails.*
- *After installing the rings they should rotate freely, without sticking.*

**⚠ CAUTION**

Be careful no to damage the piston and rings during installation.

Stagger the piston ring end gaps 120° degrees apart from each other.

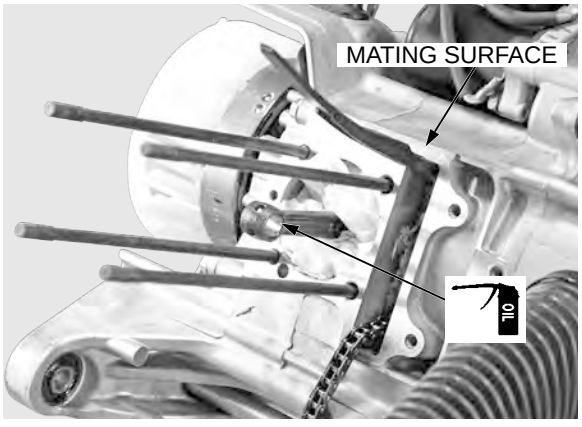
Stagger the side rail end gaps as shown clamp.




Clean any gasket material from the cylinder mating surface of the crankcase.

When cleaning the cylinder mating surface, place a shop towel over the cylinder opening to prevent dust or dirt enter the engine.

Apply engine oil solution to the connecting rod small end inner surface.

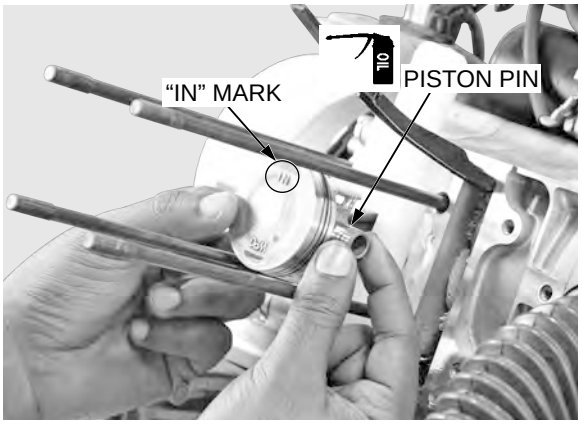


Apply engine oil to the piston pin outer surface.

Install the piston with the “IN” mark toward the intake side and insert the piston pin through the piston and connecting rod.

**TOOL:**

**Slider base piston** **070SRTKSP008**



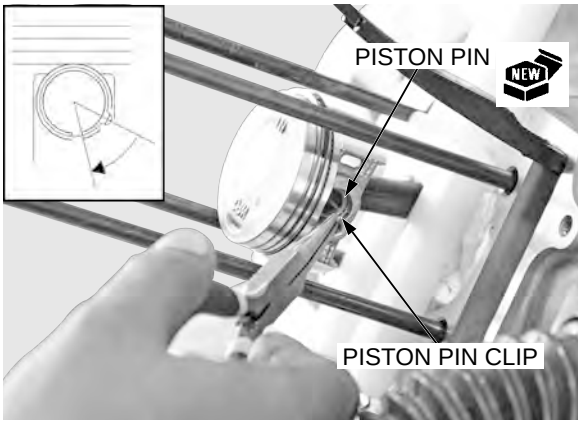

Install new piston pin clips into the grooves of the piston pin hole.

**NOTICE**

*Place a shop towel over the crankcase opening to prevent piston pin clips from falling into the crankcase.*

**⚠ CAUTION**

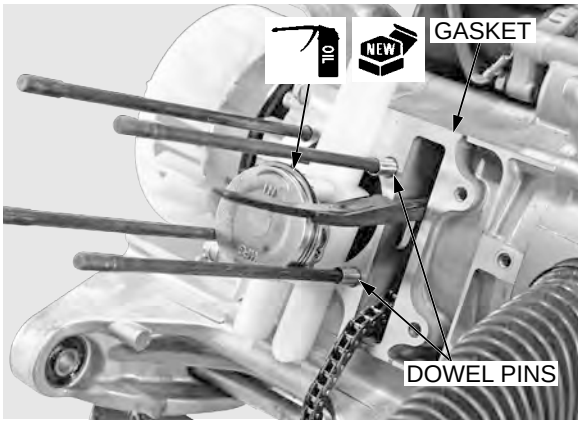
- Make sure that the piston pin clips are seated securely.
- Do not align the piston pin clip end gap with the piston cutout.




# CYLINDER INSTALLATION

Install the dowel pins and a new gasket.

Apply engine oil to the cylinder wall, piston and piston ring outer surfaces.



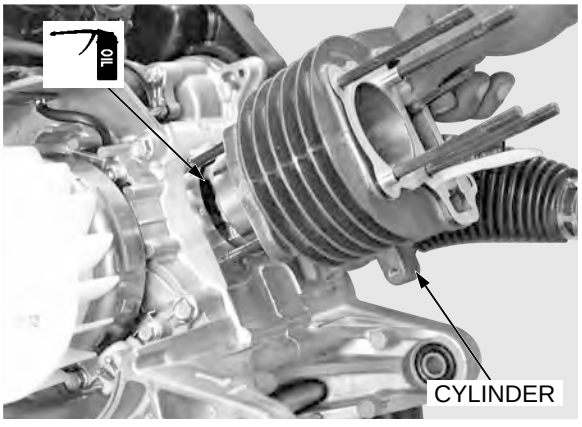

Route the cam chain through the cylinder and install the cylinder over the piston while compressing the piston rings with your fingers.

Install the following:

– Cam chain guide
– Cylinder head (page 7-16)
– Cam chain tensioner (page 7-16).

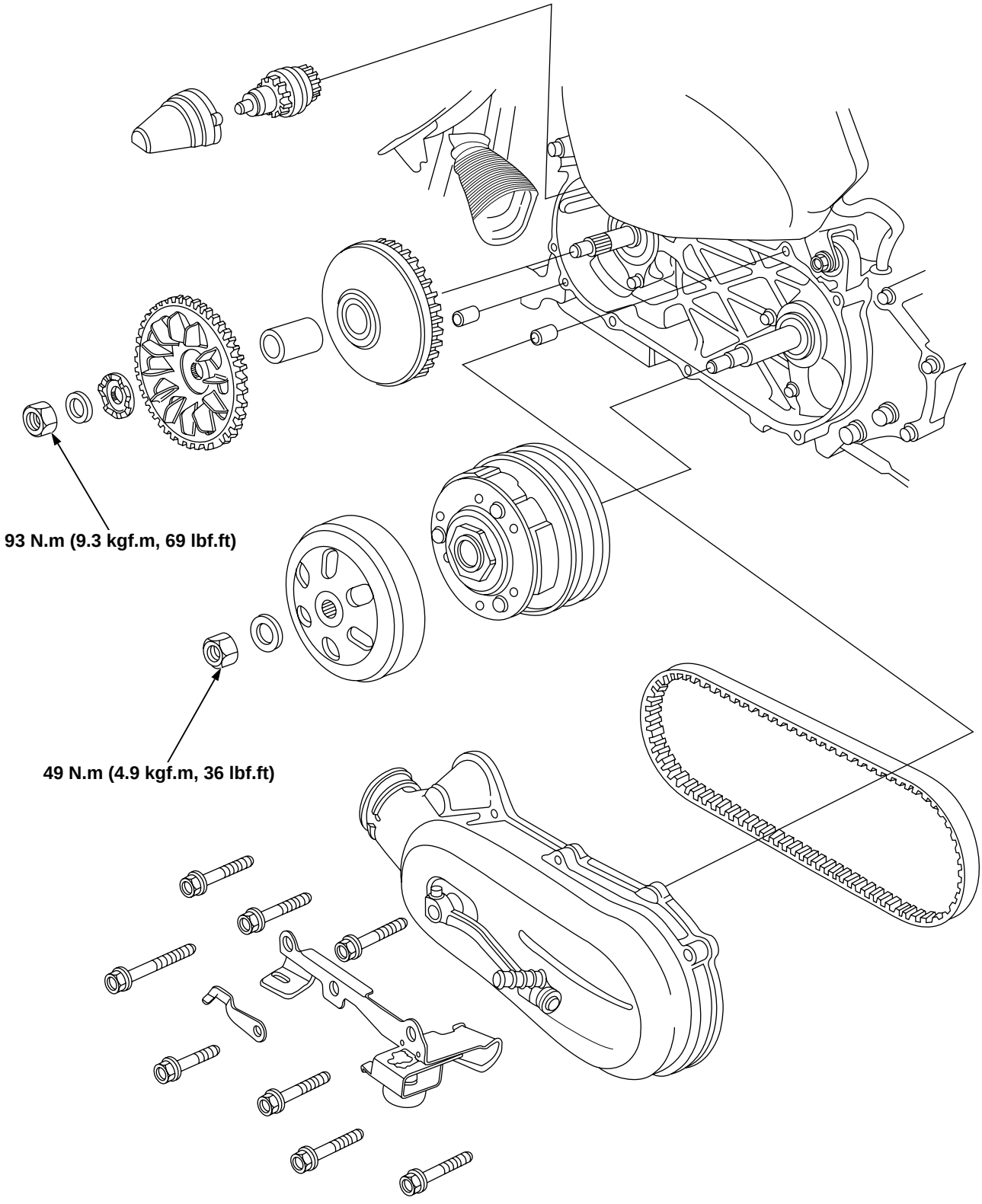
**⚠ CAUTION**

Be careful not to damage the piston rings and cylinder wall.



**MEMO**

# COMPONENT LOCATION



# 9. KICKSTARTER/DRIVE AND DRIVEN PULLEYS/CLUTCH



## SERVICE INFORMATION

### GENERAL

**⚠ WARNING**

Never operate the starter motor with the left crankcase cover removed.

- Avoid getting grease and oil on the V-belt and pulley drive faces in order to prevent belt slippage.
- Do not apply grease to the movable drive face and weight rollers.

### SPECIFICATIONS

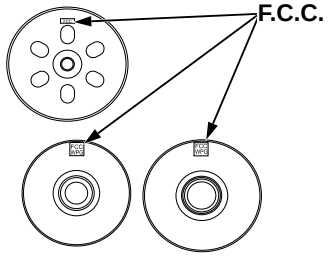
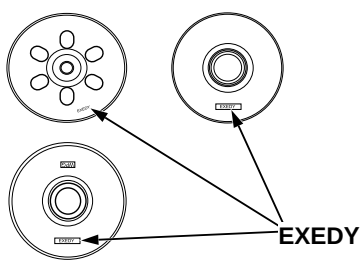
Unit: mm (in)

| ITEM | | STANDARD | | SERVICE LIMIT | Page NO. |
|---|---|---|---|---|---|
| Drive belt width | | 19.5 (0.76) | | 19.2 (0.75) | Page 9-14 |
| Movable drive face | Busing I.D. | 22.035 – 22.085 (0.8675 – 0.8695) | | 22.60 (0.889) | Page 9-11 |
| | Boss O.D. | 21.4 – 21.6 (0.8665 – 0.8671) | | 21.0 (0.826) | Page 9-11 |
| | Weight roller O. D. | 19.92 – 20.08 (0.705 – 0.712) | | 19.40 (0.763) | Page 9-11 |
| Clutch | Outer I.D. | 125.0 – 125.2 (4.921 – 4.929) | | 125.5 (4.941) | Page 9-15 |
| | Lining thickness | 4.0 (0.12) | | 2.0 (0.08) | Page 9-15 |
| Driven pulley | Face spring free length | FCC | 99.6 (3.921) | 85.4 (3.36) | Page 9-15 |
| | | EXEDY | 101.3 (3.99) | 92.2 (3.62) | Page 9-15 |
| | Driven face O.D. | 33.965 – 33.985 (1.3372 – 1.3380) | | 33.94 (1.336) | Page 9-15 |
| | Movable driven face I.D. | 34.000 – 34.025 (1.3386 – 1.3396) | | 34.06 (1.341) | Page 9-16 |

### TORQUE VALUES

| ITEM | QTY | THREAD DIA. (mm) | TORQUE N·m (kgf·m, lbf·ft) | REMARKS | PAGE NO. |
|---|---|---|---|---|---|
| Plate, L. cover screw | 5 | 4 | 3 (0.3, 2.2) | | Page 9-7 |
| Kick starter pedal bolt | 1 | 8 | 29 (2.9, 22) | | Page 9-7 |
| Face comp., drive nut | 1 | 14 | 93 (9.3, 68.5) | Apply eng. oil | Page 9-19 |
| Outer comp., clutch nut | 1 | 12 | 49 (4.9, 36.1) | | Page 9-18 |
| Plate assy., drive nut | 1 | 28 | 54 (5.4, 39.8) | | Page 9-17 |

### MULTIPLE SOURCED COMPONENT: DRIVEN FACE ASSEMBLY

| MAKER | F.C.C. | EXEDY |
|---|---|---|
| IDENTIFICATION MARKS |   |   |

**NOTE:** Parts are not interchangeable with other makers.

**REFERENCE:** For maker wise child part details refer parts catalogue.

## TOOLS

| | |
|---|---|
| Clutch center holder | 070MB – KPL – I200 |
| Universal holder | 070MB – KPL – I100 |
| Socket wrench, 39 x 41 mm | 070MA – KPL – I300 |
| Bearing driver | 070MD – KPL – I100 |
| Bearing remover (Driven face) | 070MC – KWP – 410 |
| Bearing installer (Driven face) | 070NC – KWP – 410 |
| Clutch spring compressor | 070ME – KWP – 110 |

# TROUBLESHOOTING

### Engine starts but vehicle won't move

Excessive carbon built-up on piston or combustion chamber

### Excessive smoke

- Worn drive belt
- Damaged ramp plate
- Worn or damaged clutch shoe
- Broken driven face spring

### Engine stalls or vehicle creeps

- Broken clutch shoe spring

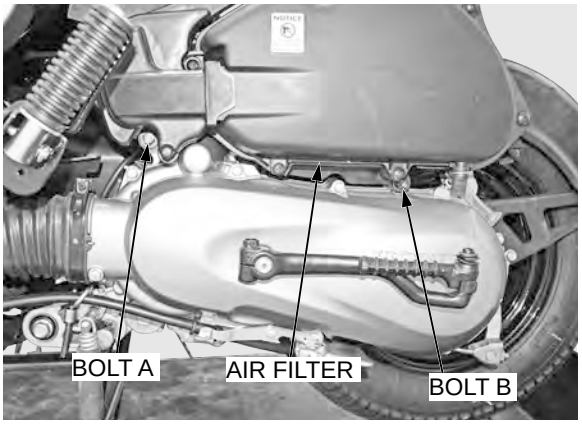
### Poor performance at high speed or lack of power

- Worn drive belt
- Weak driven face spring
- Worn weight rollers
- Contaminated pulley faces

# KICKSTARTER

## LEFT CRANKCASE COVER REMOVAL

Remove the bolt A and loosen the bolt B from the air filter.

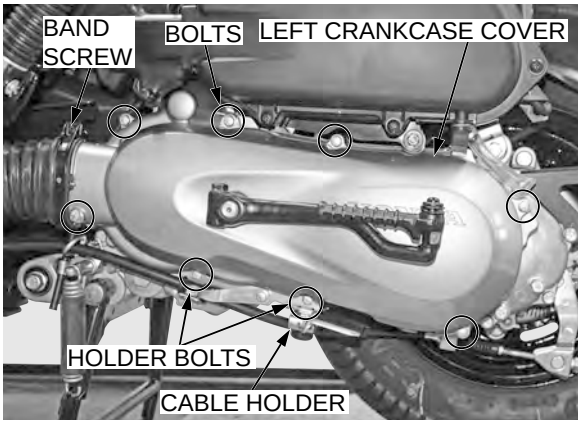



Remove the rear brake cable holder bolts (2 nos.) and remove the cable holder.

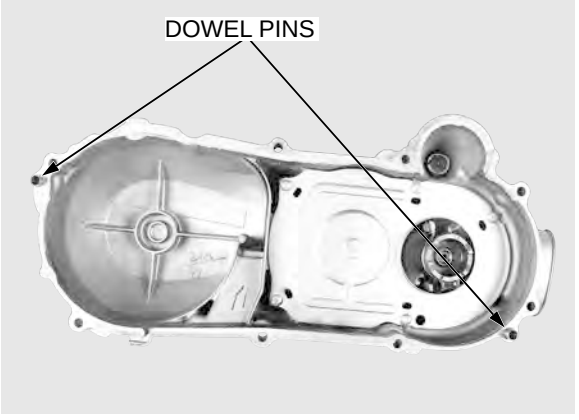
Loosen the air duct band screw and disconnect the air duct from the left crankcase cover.

Remove the left crankcase cover bolts (8 nos.).

Remove the left crankcase cover.



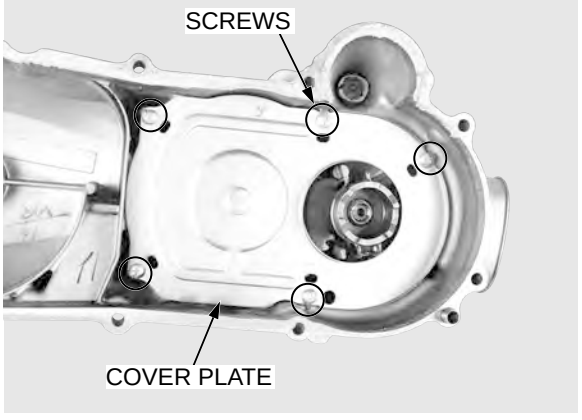

Remove the dowel pins (2 nos.).




## DISASSEMBLY

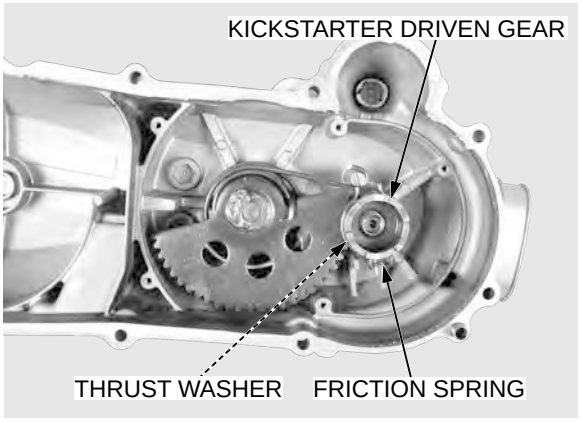
Raise the lock tabs of the left crankcase cover plate.

Remove the screws (5 nos.) and left crankcase cover plate.



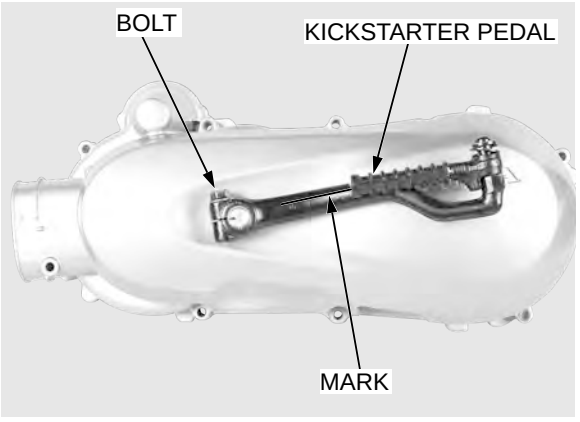
Remove the kickstarter driven gear while turning the kickstarter pedal.

Remove the thrust washer.




Before removing the kickstarter pedal, mark the pedal and spindle for proper installation position.

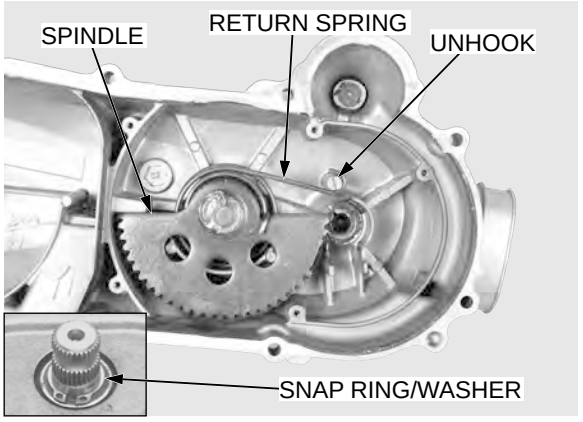
Remove the bolt (1 no.) and the kickstarter pedal.



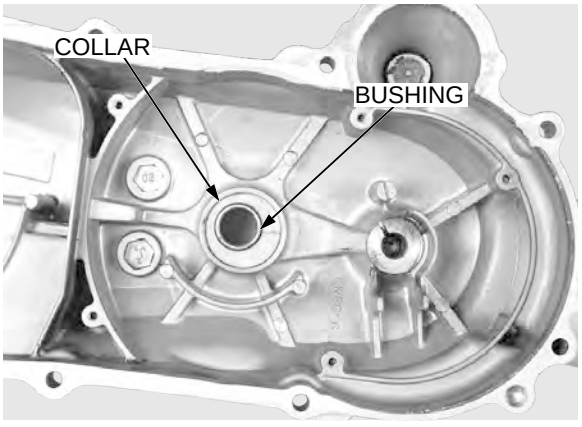

Carefully unhook the return spring from the pin on the crankcase cover.

Remove the snap ring and washer.

Remove the kickstarter spindle and return spring.



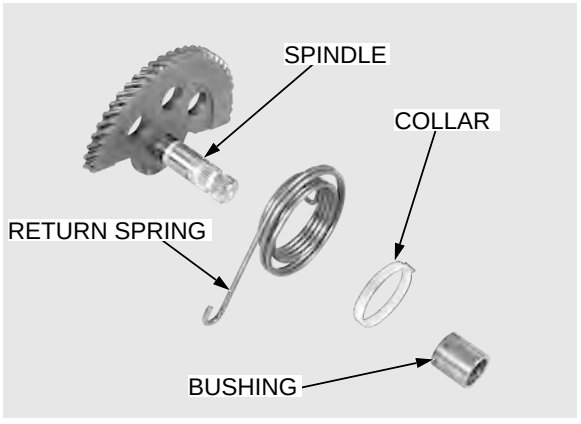

Remove the spindle bushing and collar.



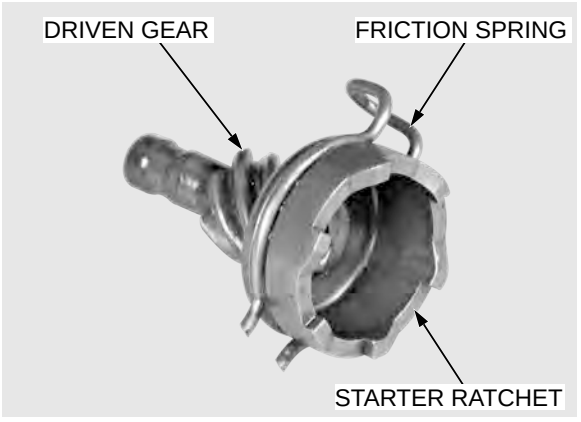
## INSPECTION

Inspect the following:

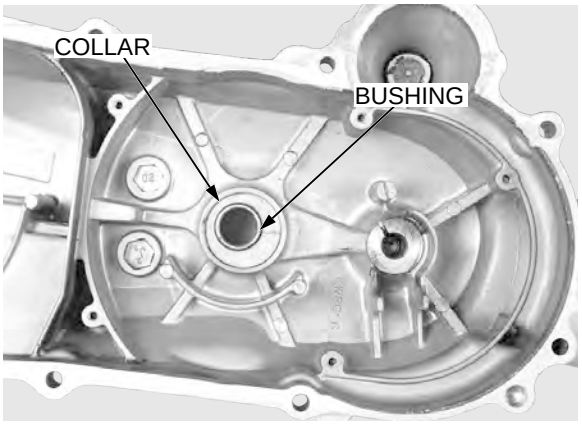
– Spindle for wear or damage
– Gear teeth for wear or damage
– Return spring for weakness or damage
– Bushing for wear or damage



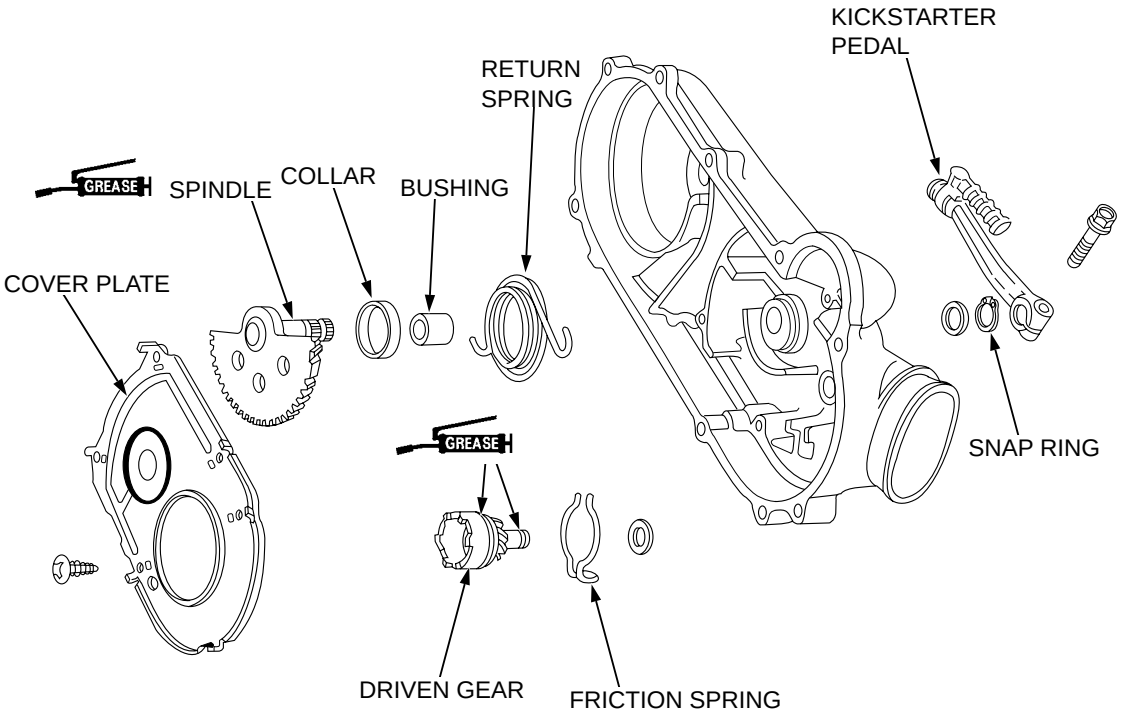

– Driven gear for wear or damage
– Friction spring for weakness or damage
– Starter ratchet teeth of the drive pulley face for wear or damage




– Crankcase cover bearings for wear or damage.

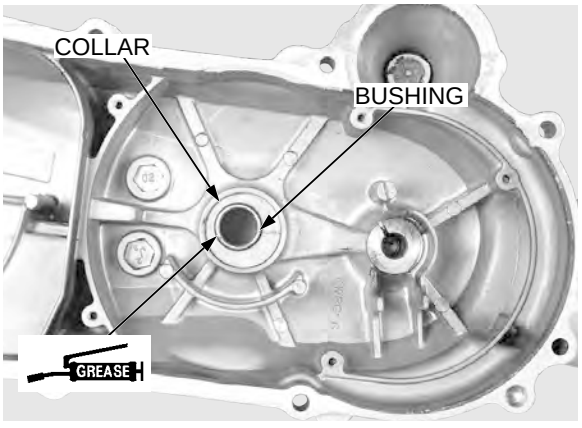


## CRANKCASE COVER ASSEMBLY




Install the bushing and collar into the left crankcase cover.

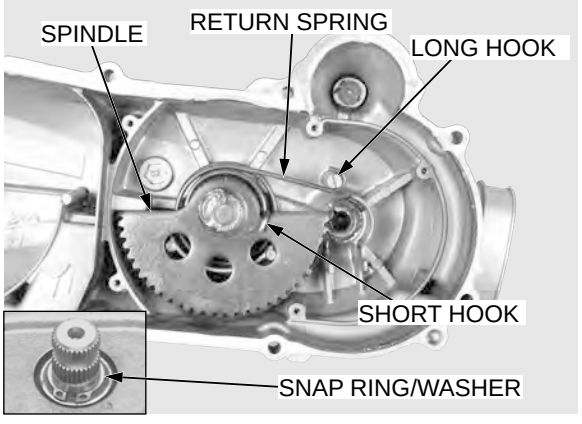
Apply grease (0.1 – 0.3 g) to the kickstarter spindle journal.




Install the spindle and return spring into the crankcase cover and hook the short end of the spring to the spindle groove. (Do not hook the long end of the spring.)

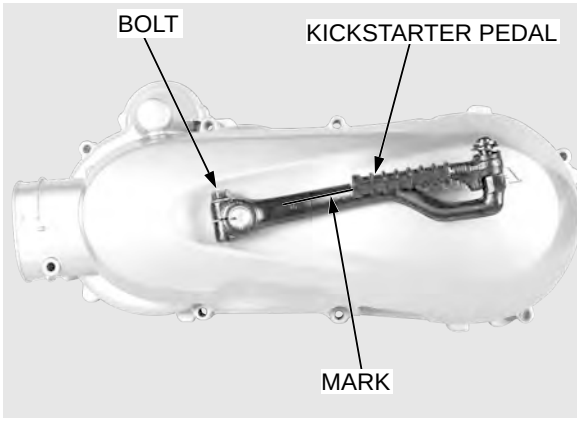
Install the washer and snap ring to secure the spindle.

Make sure that the snap ring is seated into the spindle groove securely, then hook the long end of the return spring to the pin on the crankcase cover.

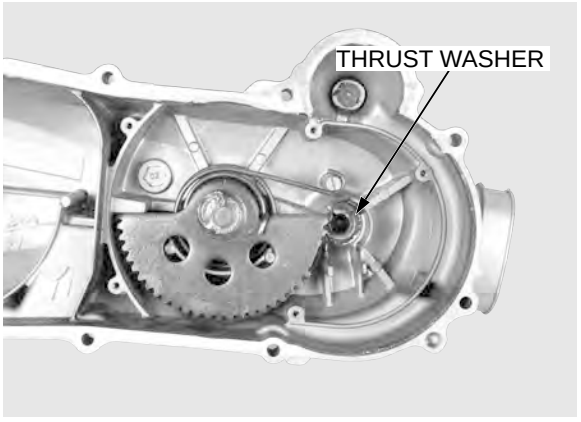


Install the kickstarter pedal in its original position as marked during removal and tighten the bolt (1 no.).

**TORQUE: 29 N·m (3.0 kgf·m, 22 lbf·ft)**



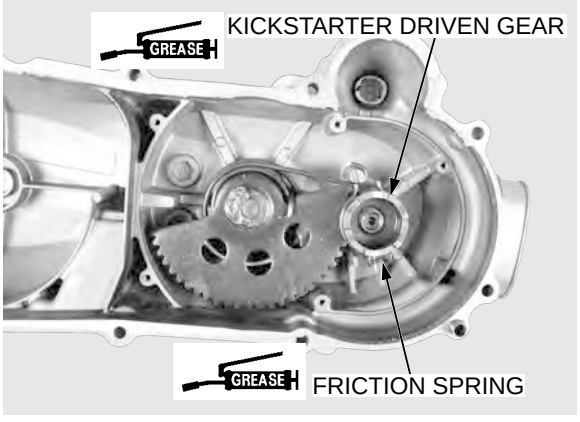

Install the thrust washer onto the crankcase cover.




Apply grease (0.2 – 0.3 g) to the driven gear shaft and friction spring sliding area.

Turn the kickstarter pedal and hold it.

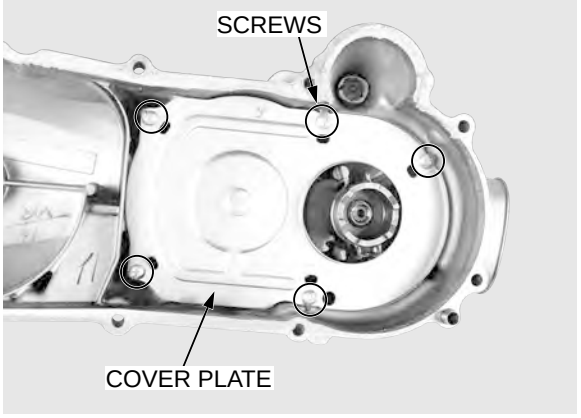
Install the driven gear while aligning the friction spring hook with the groove in the crankcase cover, and return the pedal to engage the driven gear and spindle gear.




Install the left crankcase cover plate and tighten the screws (5 nos.).

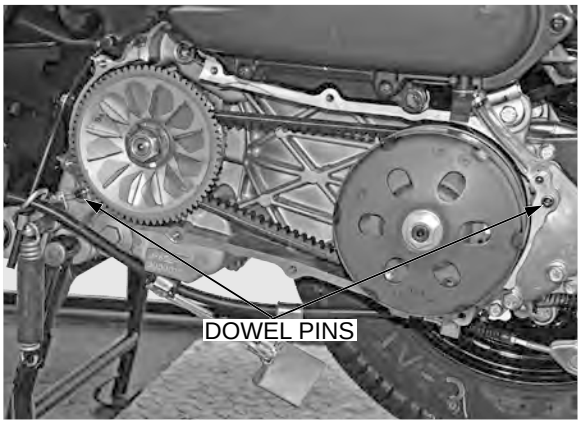
**TORQUE: 3 N·m (0.3 kgf·m, 2.2 lbf·ft)**

Bend the lock tabs of the cover plate against the screw heads.

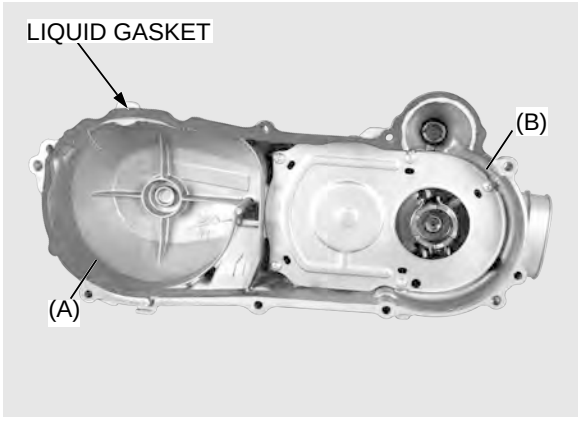


### LEFT CRANKCASE COVER INSTALLATION

Install the dowel pins (2 nos.) in the left crankcase.




Apply liquid gasket only on highlighted surface between mark (A) & (B) on left crankcase cover as shown in below image.



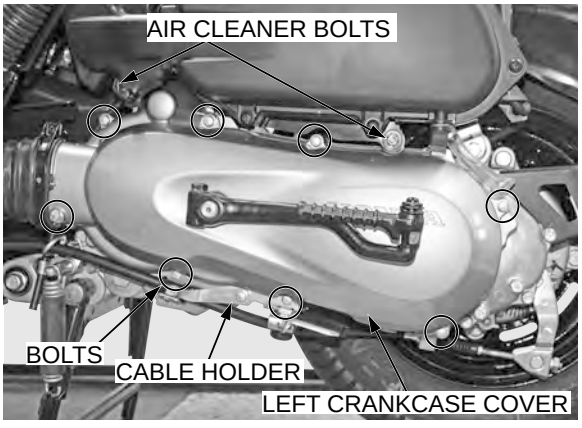

Install the left crankcase cover and cable holder, and tighten the bolts (8 nos.) in a crisscross pattern in 2 or 3 steps.

Install the rear brake cable in to the cable holder.

Connect the air duct to the left crankcase cover and tighten the band screw (1 no.) securely.

After installation, check that the kickstarter pedal operates properly.

Install and tighten the bolt A & bolt B from the air filter.

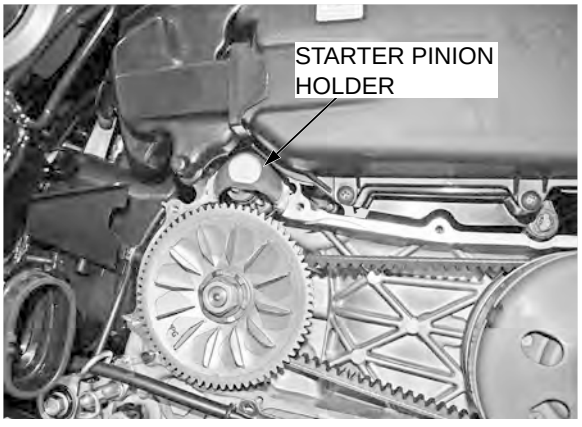



## STARTER PINION

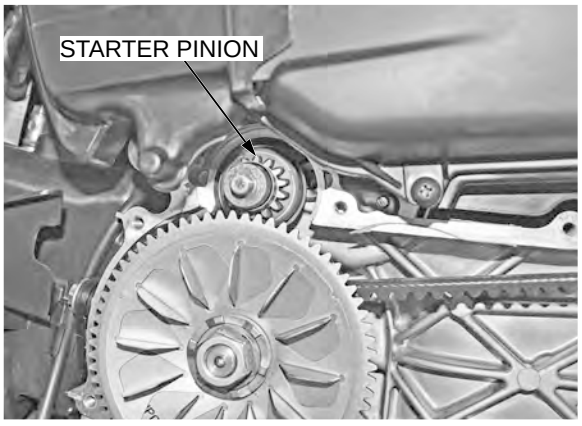
### REMOVAL

Remove the left crankcase cover (page 9-3).

Remove the starter pinion holder.



Remove the starter pinion.

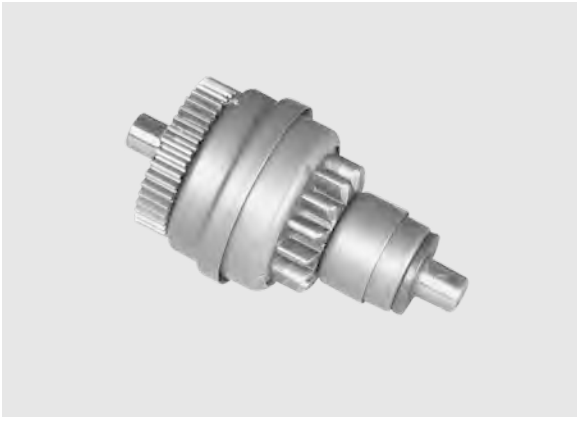



## INSPECTION

Check that the starter pinion operates smoothly.

Check the pinion gear teeth and shaft for wear or damage.

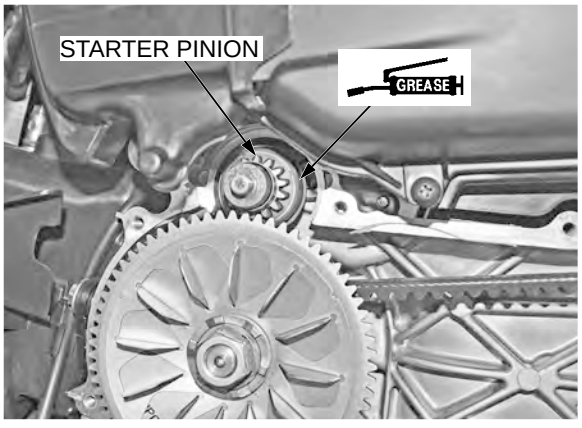
Check the starter driven gear teeth of the drive pulley face for wear of damage.



## INSTALLATION

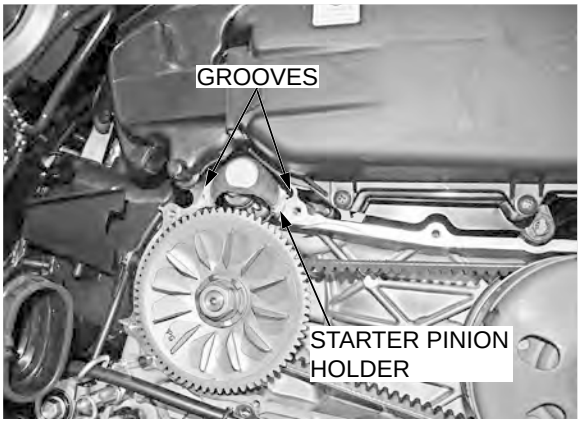
Apply grease (0.1 – 0.3 g) to the starter pinion shaft journal.

Install the starter pinion into the left crankcase.




Install the starter pinion holder by aligning its bosses with the grooves in the left crankcase.

Install the left crankcase cover (page 9-8).



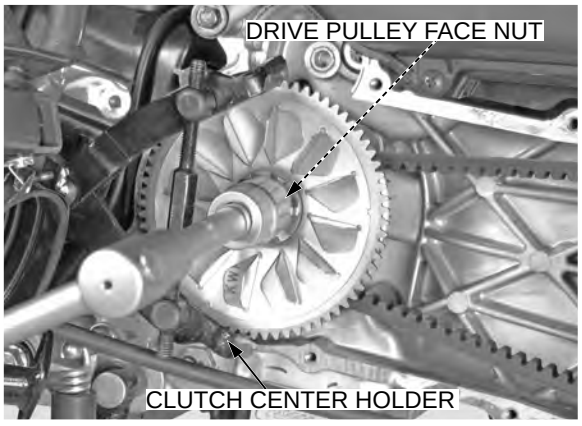
# DRIVE PULLEY REMOVAL

Remove the left crankcase cover (page 9-3).

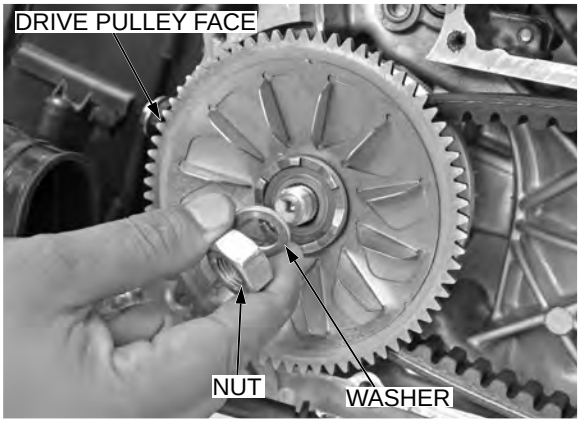
Hold the drive pulley face with the special tool, and remove the drive pulley face nut.

**TOOL:**

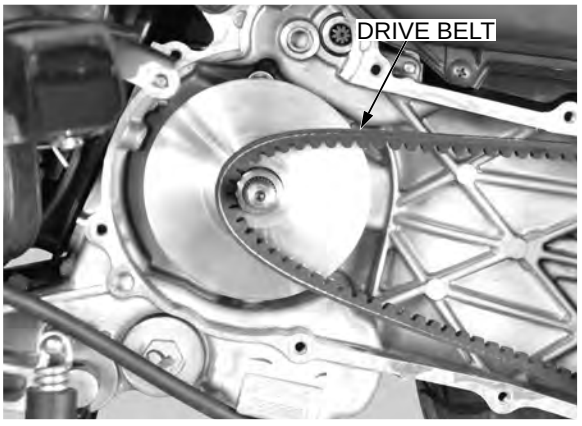
**Clutch center holder 070MB – KPL– I200**



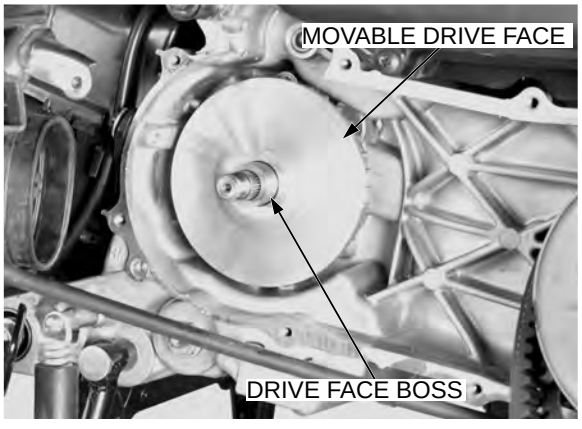

Remove the washer and drive pulley face fin and drive face.




Remove the drive belt from the crankshaft.

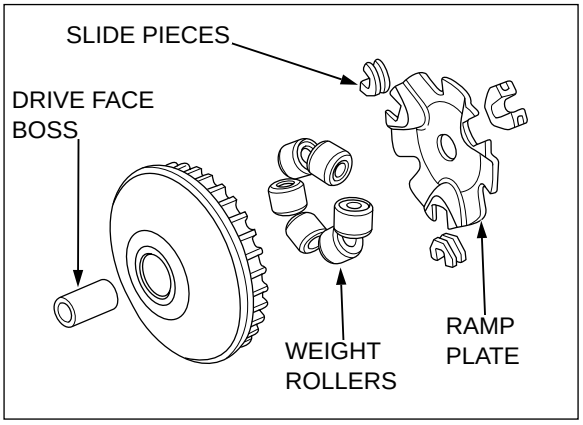



Remove the drive face boss and movable drive face assembly while holding the back of the face (ramp plate).



## DRIVE PULLEY ASSEMBLY

– Drive face boss
– Ramp plate
– Slide pieces
– Weight rollers



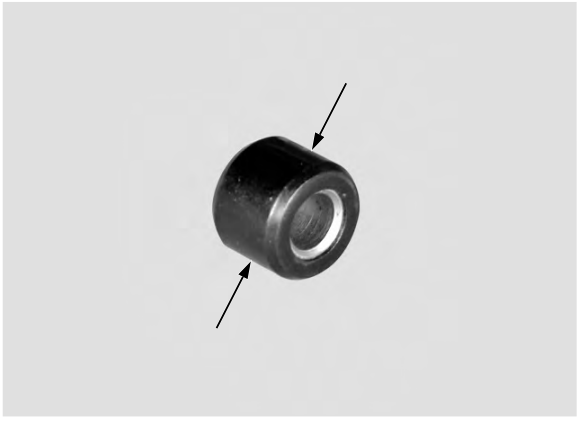

## INSPECTION

**WEIGHT ROLLER**

Check each roller for wear or damage.

Measure the weight roller O.D.

**SERVICE LIMIT: 19.40 mm (0.764 in)**

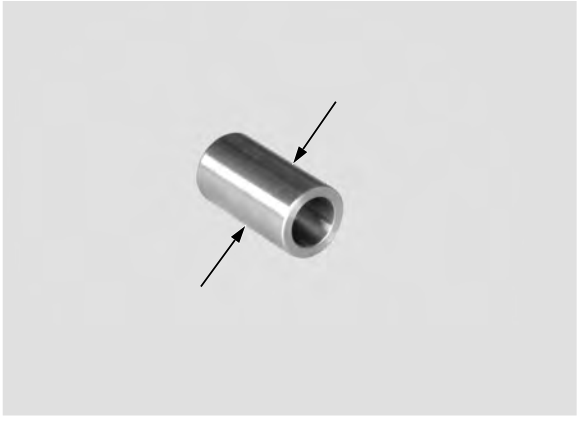


**DRIVE FACE BOSS**

Check the drive face boss for wear or damage.

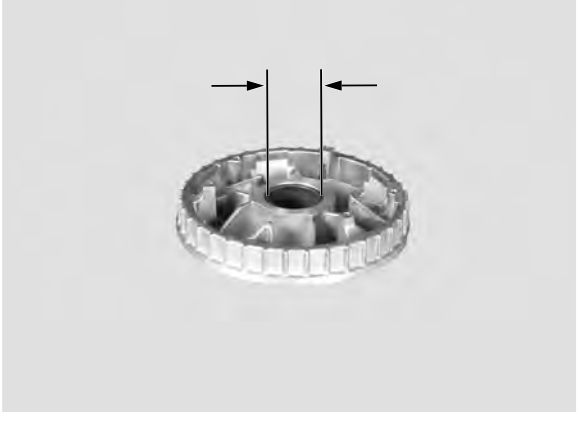
Measure the boss O.D.

**SERVICE LIMITS: 21.0 mm (0.826 in)**



Measure the drive face bushing I.D.

**SERVICE LIMITS: 22.60 mm (0.889 in)**



# CLUTCH/DRIVEN PULLEY REMOVAL

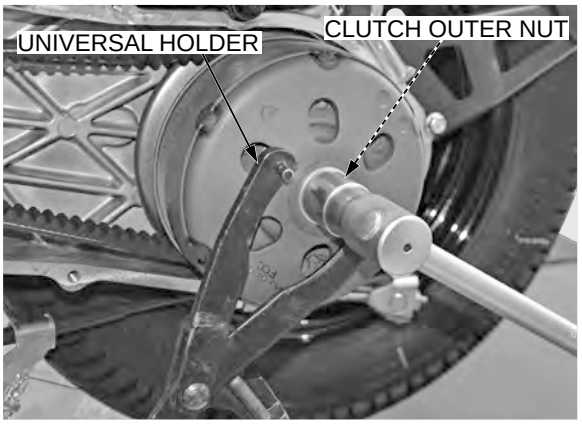
Remove the drive pulley (page 9-10).

Hold the clutch outer with the special tool and remove the clutch outer nut.

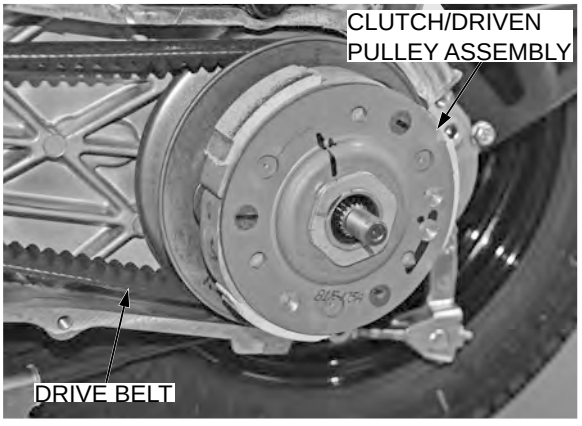
**TOOL:**

**Universal holder 070MB – KPL – I100**

Remove the clutch outer.




Remove the clutch/driven pulley assembly and drive belt.

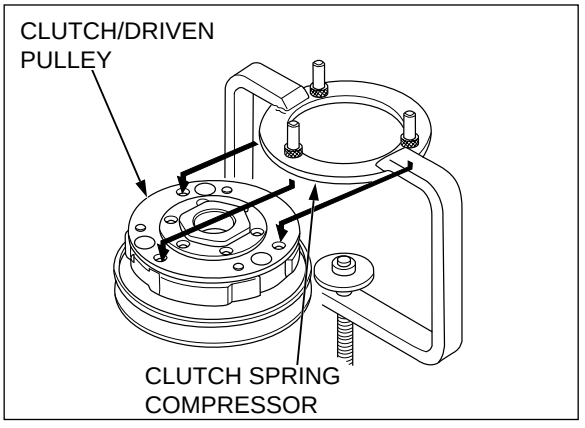



Set the clutch spring compressor onto the clutch/driven pulley, aligning the bosses with the holes in the clutch.

**TOOL:**

**Clutch spring compressor 070ME – KWP – 110**

Hold the clutch spring compressor in a vice.




Remove the clutch/driven pulley nut using the socket wrench.

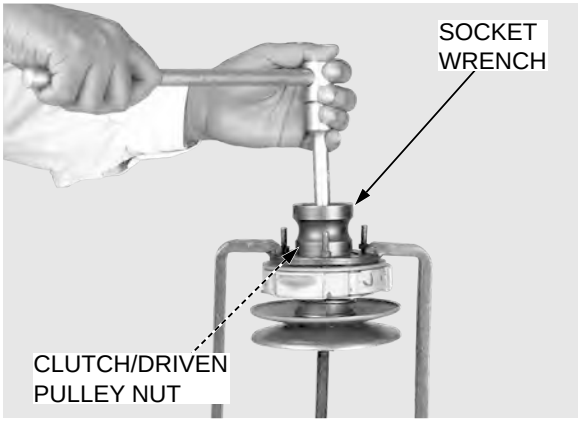
**TOOL:**

**Socket wrench, 39 x 41 mm 070MA – KPL– I300**

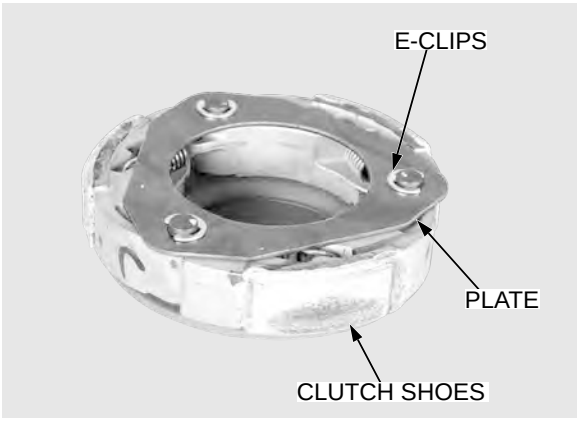
Loosen the spring compressor and remove the following:

– Driven pulley
– Driven face spring
– Spring seat
– Clutch

For clutch outer and clutch shoe lining inspection, refer to (page 9-15).

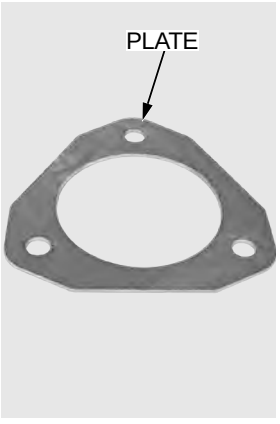


Remove the E-clips (3 nos.) and plate.




Remove the clutch shoe springs and clutch shoes from the clutch drive plate.

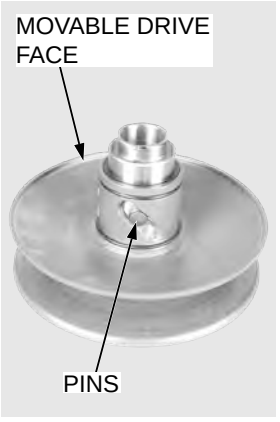
Remove the damper rubbers (3 nos.).

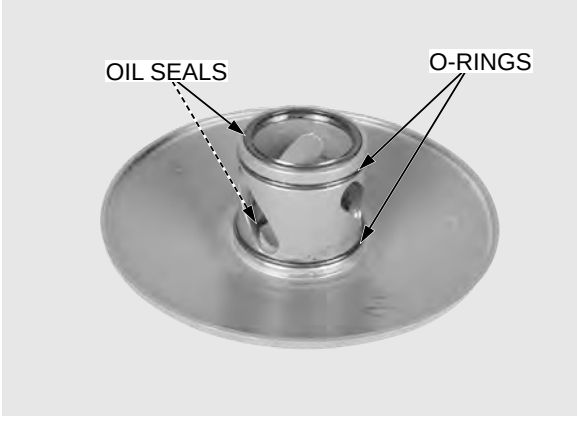

Remove the seal collar.

Pull out the guide roller pins (3 nos.).

Remove the moveable driven face from the driven face.


Remove the oil seals and O-rings.

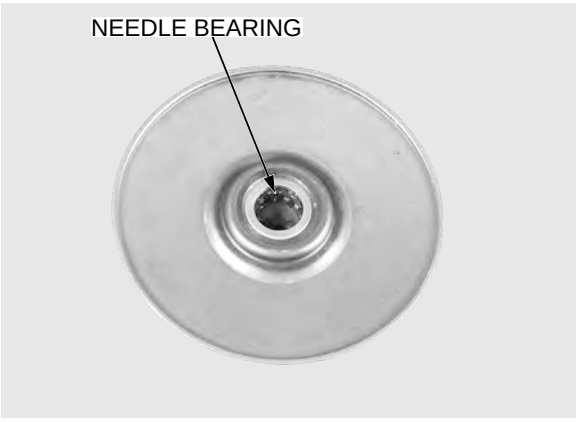


## DRIVEN FACE BEARING REPLACEMENT

Remove the needle bearing using the special tools.

**TOOLS:**

**Bearing remover (Driven face) 070MC – KWP– 410**




Remove the snap ring and drive the ball bearing out of the driven face.

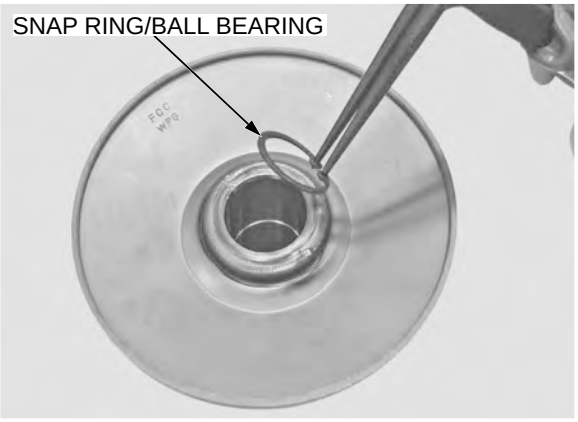
Pack new ball bearing cavities with grease.

Drive the ball bearing into the driven face with the sealed side facing down.

**TOOL:**

**Bearing Driver 070MD – KPL– I100**

Install the snap ring properly into the driven face groove.



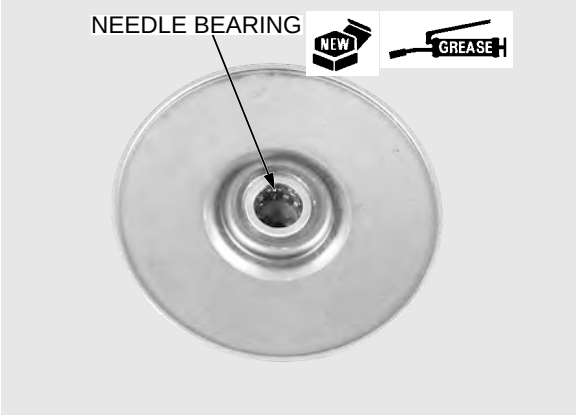

Pack the inside of the driven face with 5.0 – 5.5 g of grease.

Apply grease to a new needle bearing.

Press the needle bearing into the driven face with the markings facing up.

**TOOLS:**

**Bearing installer (Driven face) 070NC–KWP–410**



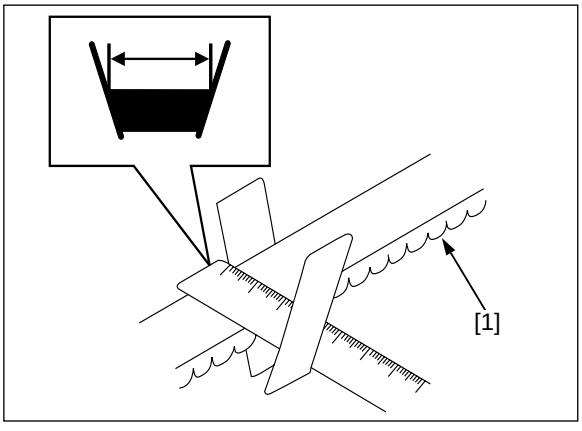

## INSPECTION

**DRIVE BELT**

Check the drive belt for cracks, separation or abnormal or excessive wear.

Measure the drive belt width.

**SERVICE LIMITS: 19.2 mm (0.76 in)**

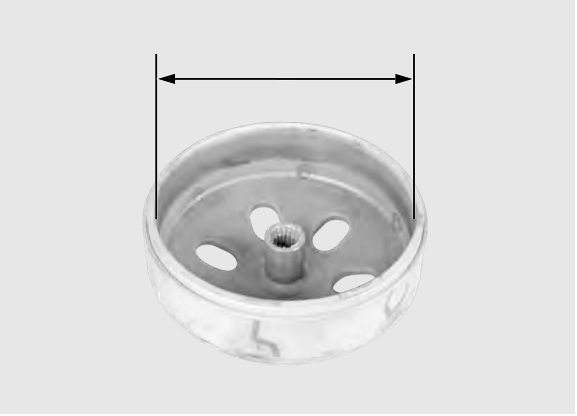


**CLUTCH OUTER**

Check the clutch outer for wear or damage.

Measure the clutch outer I.D.

**SERVICE LIMITS: 125.5 mm (4.941 in)**



**CLUTCH SHOE LINING**

Check the clutch shoe for wear or damage.

Measure the thickness of each shoe.

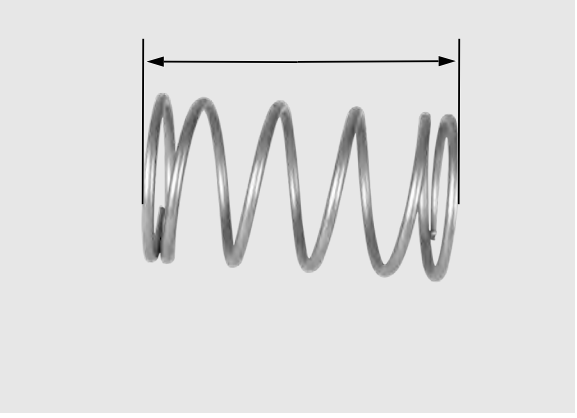
**SERVICE LIMIT: 2.0 mm (0.08 in)**

**DRIVEN FACE SPRING**

Measure the driven face spring free length.

**SERVICE LIMITS: 92.2 mm (3.62 in) (EXEDY)**

**85.4 mm (3.36 in) (F.C.C)**



**DRIVEN FACE**

Check the driven face for wear or damage.

Measure the driven face O.D.

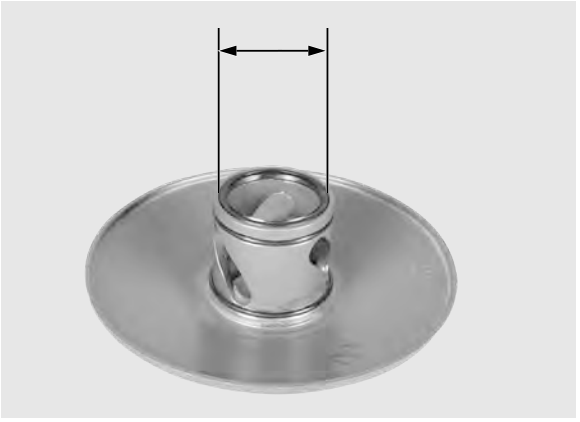
**SERVICE LIMIT: 33.94 mm (1.336 in)**

**MOVABLE DRIVEN FACE**

Check the movable driven face for wear, scratches or damage.

Measure the movable driven face I.D.

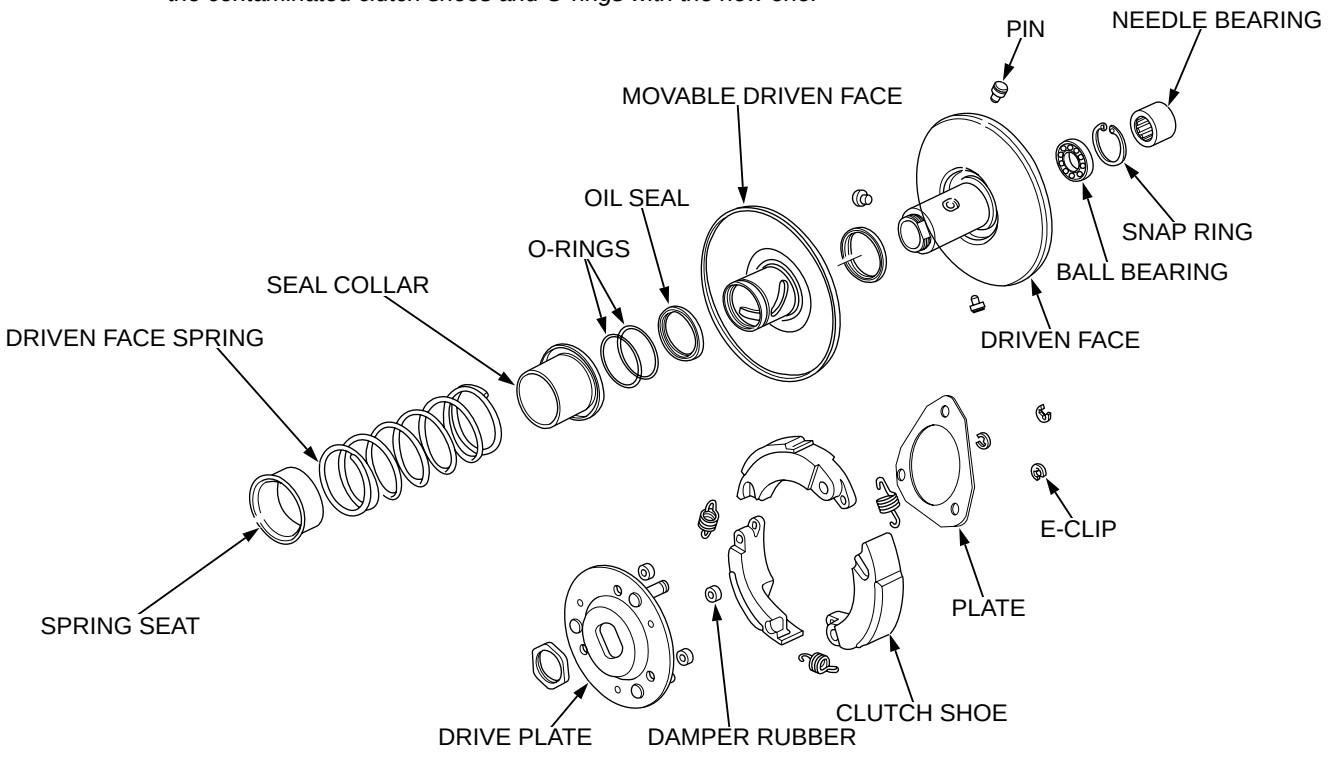
**SERVICE LIMIT: 34.06 mm (1.341 in)**



# CLUTCH/DRIVEN PULLEY INSTALLATION

**NOTICE**

*Clean any oil and grease from the pulley faces and clutch outer. Replace the contaminated clutch shoes and O-rings with the new one.*

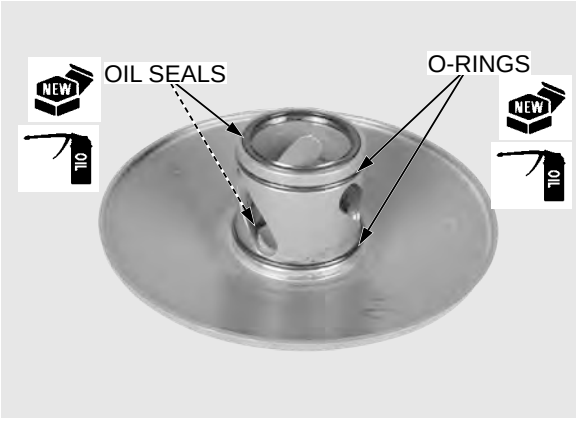



Clean the pulley faces.

Apply grease to new oil seal lips and install them into the movable driven face.

Coat new O-rings with grease and install them onto the movable driven face.

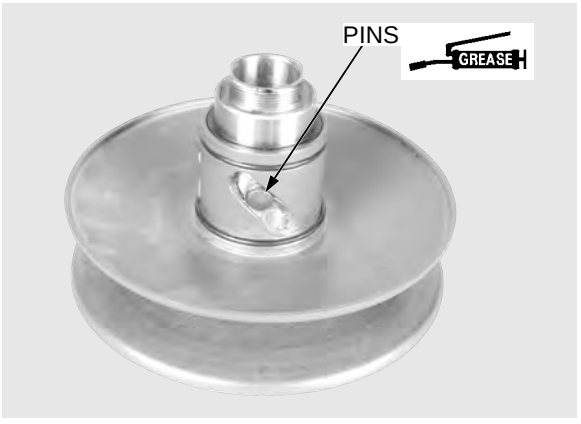
Apply grease to the inside surface the movable driven face.



Install the movable driven face onto the driven face.

Apply grease to the guide pins and install them into the holes in the driven face.

Fill the movable driven face in side with grease (5.0 – 5.5 g).



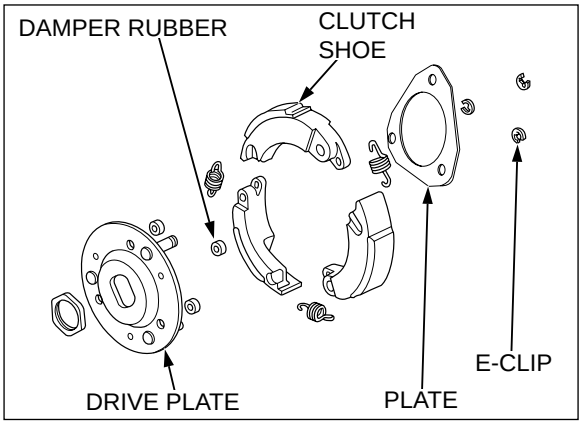

Install the seal collar.


Install the damper rubbers onto the clutch drive plate.

Install the clutch shoe springs onto the shoes.

Install the clutch shoes and springs onto the drive plate.

Install the plate and secure them with E-clips.




Assemble the following:
– Driven pulley
– Driven face spring
– Spring seat
– Clutch

Set the clutch spring compressor over the clutch/driven pulley, aligning the bosses with the holes in the clutch.

**TOOL:**

**Clutch spring compressor 070ME – KWP – 110**

Hold the spring compressor in a vice.

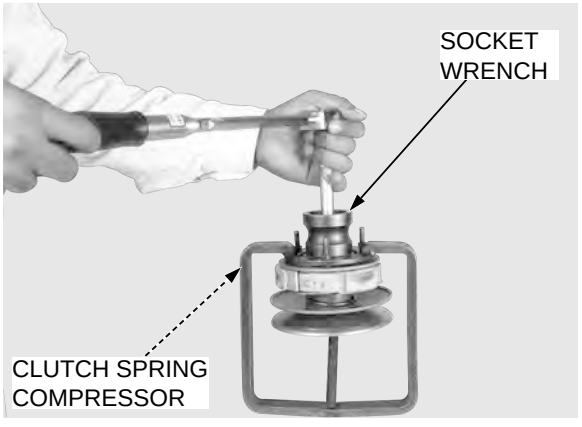
Install the clutch/driven pulley nut and tighten it with the socket wrench.

**TOOL:**

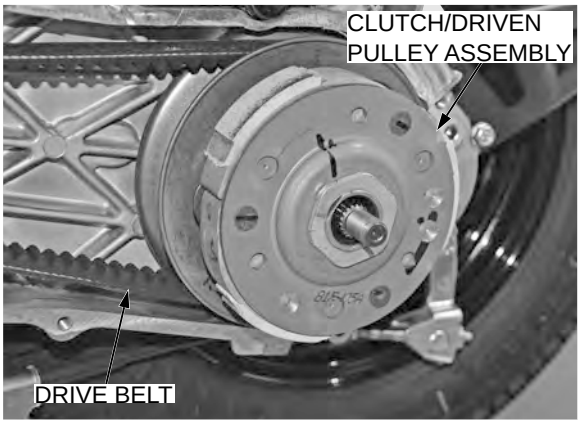
**Socket wrench, 39 x 41 mm 070MA – KPL – I300**

**TORQUE: 54 N·m (5.5 kgf·m, 40 lbf·ft)**

Remove the spring compressor from the clutch/driven pulley assembly after the fitment complete.



Install the drive belt and clutch/driven pulley assembly.




Install the clutch outer and nut.

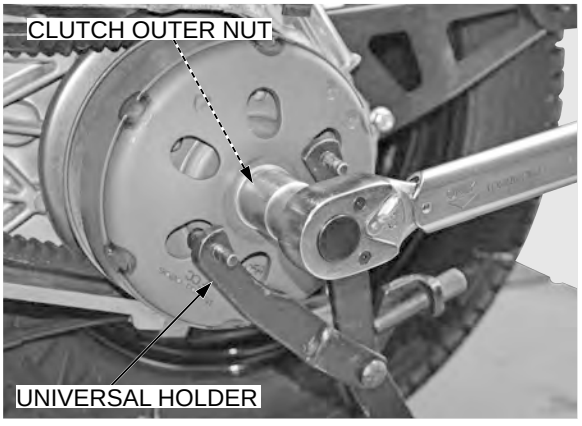
Hold the clutch outer with the special tool and tighten the clutch outer nut.

**TOOL:**

**Universal holder 070MB – KPL– I100**

**TORQUE: 49 N·m (4.9 kgf·m, 36 lbf·ft)**

Install the drive pulley (page 9-18).




# DRIVE PULLEY INSTALLATION

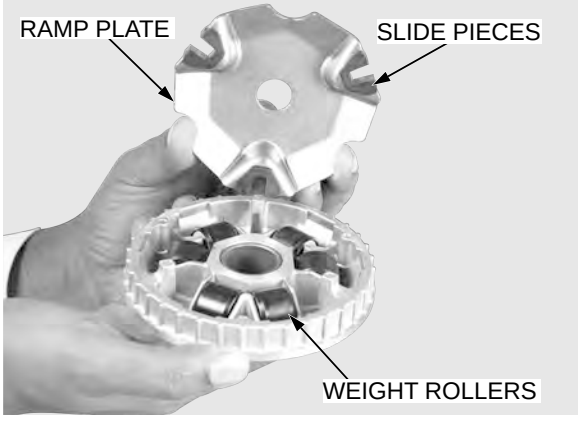
**NOTICE**

- *Clean any oil and grease from the pulley faces. Replace the contaminated drive belt.*
- *Do not apply grease to the movable drive face and weight rollers.*

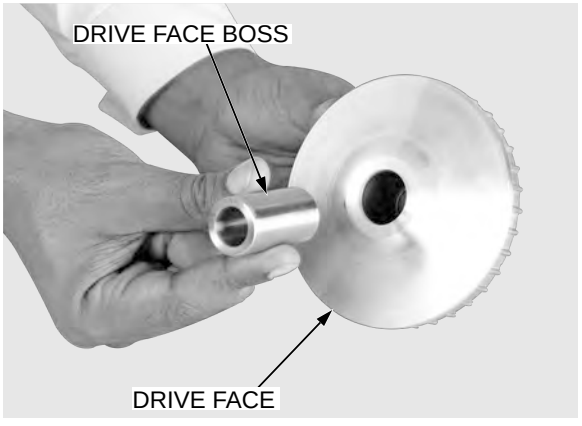
Install the weight rollers into the movable drive face.

Install the slide pieces onto the ramp plate.

Install the ramp plate over the moveable drive face.

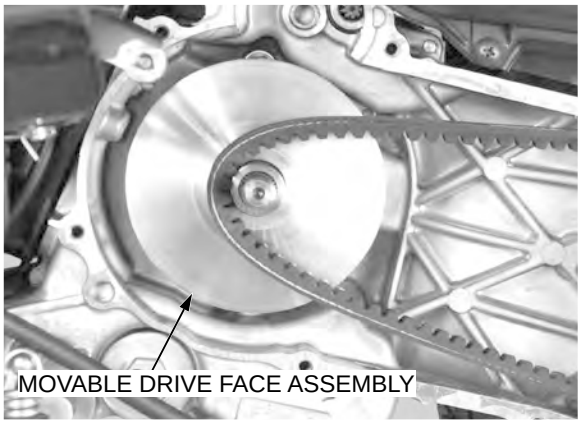



Install the drive face boss into the movable drive face.

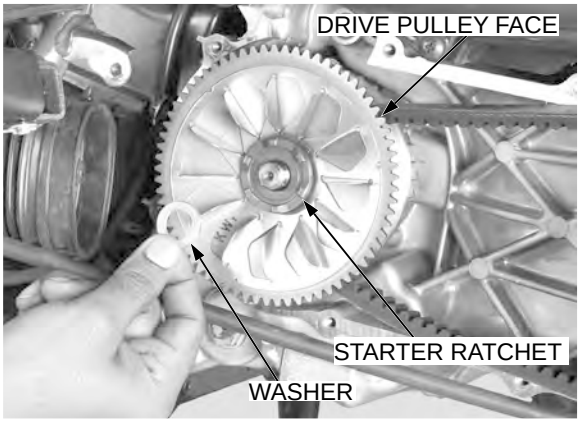


Install the movable drive face assembly onto the crankshaft while holding the ramp plate.

Install the drive belt onto the drive face boss.




Install the drive pulley face, starter ratchet and washer.




Apply oil to the drive pulley face nut threads and seating surface and install it.

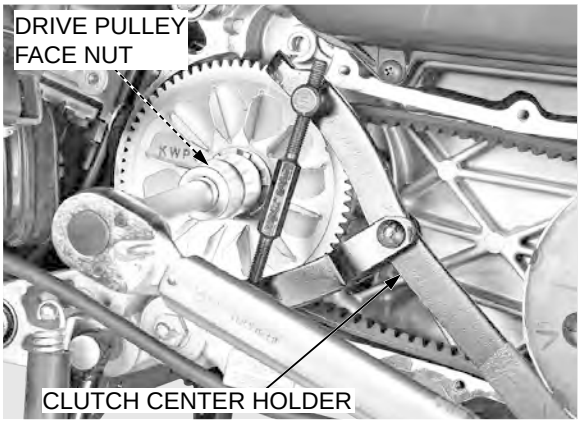
Hold the drive pulley face with the special tool and tighten the drive pulley face nut.

**TOOL:**

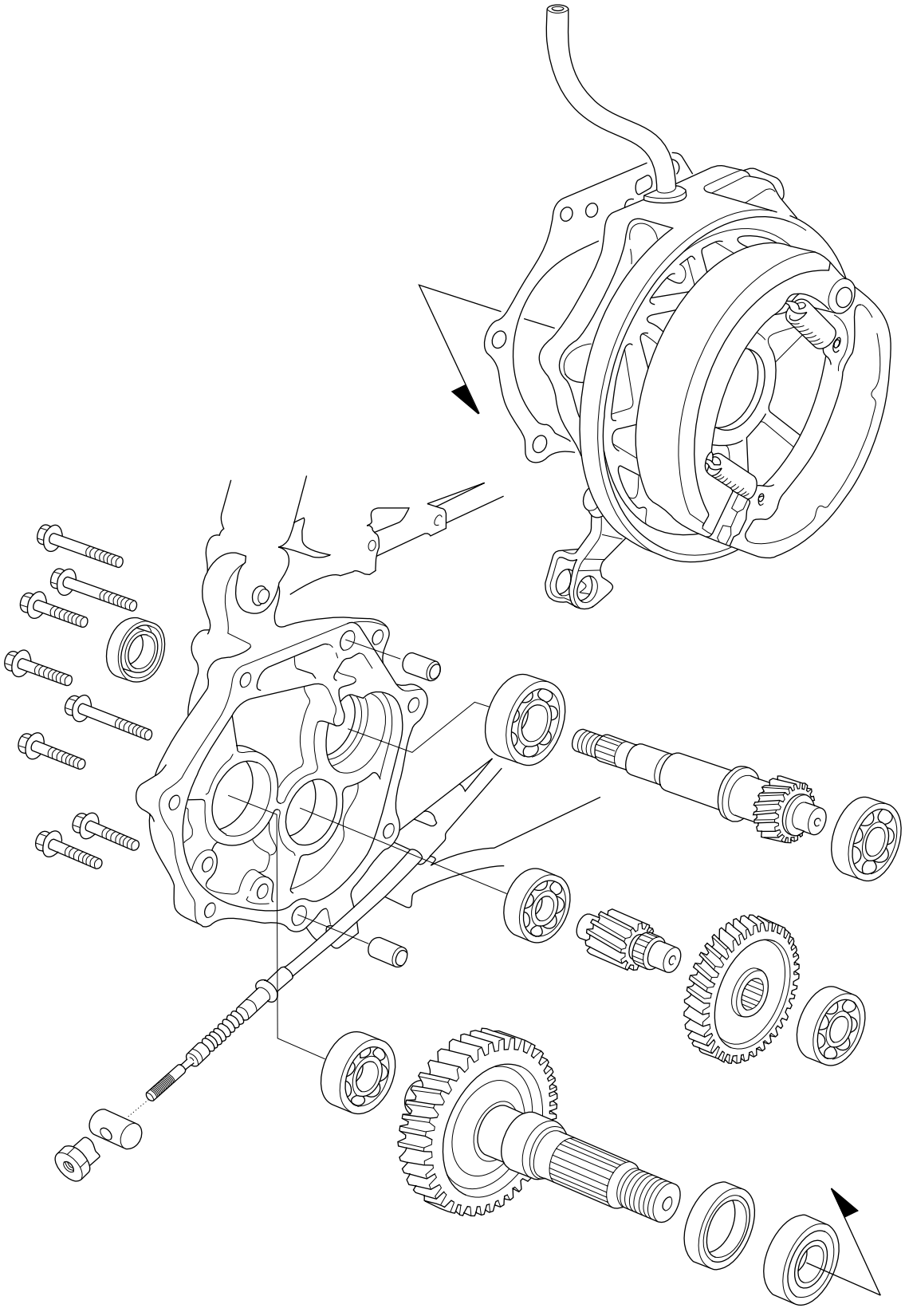
**Clutch center holder 070MB – KPL– I200**

**TORQUE: 93 N·m (9.3 kgf·m, 69 lbf·ft)**

Install the left crankcase cover (page 9-8).



# COMPONENT LOCATION



# 10. FINAL REDUCTION



# SERVICE INFORMATION

## GENERAL

- The final reduction servicing can be performed with the engine installed in the frame.
- When installing the drive shaft, be sure to use the special tool; position the special tool against the bearing inner race and pull the driveshaft into the bearing.

## SPECIFICATIONS

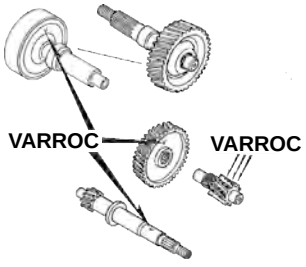
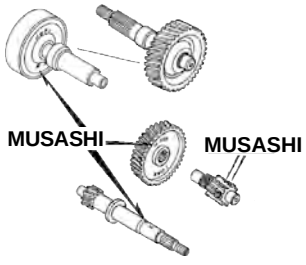
Unit: mm (in)

| ITEM | | STANDARD | Page NO. |
|---|---|---|---|
| Final reduction oil capacity | At disassembly | 0.12 liter (0.13 US qt, 0.11 Imp qt) | Page 10-8 |
| | At draining | 0.10 liter (0.11 US qt, 0.09 Imp qt) | Page 10-8 |
| Recommended final reduction oil | | Honda 4-stroke oil or equivalent motor oil<br>API service classification: MA<br>Viscosity: SAE 10W-30 | Page 10-8 |

## TORQUE VALUES

| ITEM | QTY | THREAD SIZE & TYPE | TORQUE VALUE (N.m (kgf.m) | REMARKS | PAGE NO. |
|---|---|---|---|---|---|
| Cover crankcase comp. left bolts | 7 | 12 | 13 (1.3, 9.5) | NOTE 1 | Page 10-8 |

## MULTIPLE SOURCED COMPONENT: FINAL REDUCTION ASSEMBLY

| MAKER | VARROC | MUSASHI |
|---|---|---|
| IDENTIFICATION MARKS |  |  |

**NOTE:** Parts are not interchangeable with other makers.

**REFERENCE:** For maker wise child part details refer parts catalogue.

## TOOLS

| | |
|---|---|
| Case/driven gear puller | 070MC – KPL–I1001 |
| Bearing remover set, 12 mm | |
| – Bearing remover head, 12 mm | 070MC – KPL–I400 |
| – Bearing remover shaft, 12 mm | 070MC – KPL–I410 |
| – Bearing remover weight | 070MC – KPL-I300 |
| Bearing remover set, 15 mm | |
| – Bearing remover head, 15 mm | 070MC – KPL-I500 |
| – Bearing remover shaft, 15 mm | 070MC – KPL-I510 |
| – Bearing remover weight | 070MC – KPL-I300 |
| Bearing remover set, 17 mm | |
| – Bearing remover head, 17 mm | 070MC – KPL-I520 |
| – Bearing remover shaft, 15 mm | 070MC – KPL-I510 |
| – Bearing remover weight | 070MC – KPL-I300 |
| Crankcase assembly collar | 070MF – KWP-110 |
| Assembly collar attachment | 070MF – KWP-120 |
| Crankcase assembly shaft | 070MF – KWP-130 |
| Attachment, 32 x 35 mm | 070GD – 002-I140 |
| Attachment, 37 x 40 mm | 070GD – 002-I150 |
| Attachment, 42 x 47 mm | 070GD – 002-I160 |
| Pilot, 12 mm | 070GD – 004-I130 |
| Pilot, 17 mm | 070GD – 004-I150 |
| Pilot, 20 mm | 070GD – 004-I160 |
| Driver | 070GD – 001-I100 |
| Drive shaft bearing remover | 07008 – DBR-900 |

# TROUBLESHOOTING

**Engine starts but vehicle won't move**

- Damaged transmission
- Seized transmission
- Faulty drive and driven pulleys/clutch

**Abnormal noise**

- Worn, seized or chipped gears
- Worn or damaged transmission bearing

**Oil leaks**

- Oil level too high
- Worn or damaged oil seal
- Cracked crankcase

# FINAL REDUCTION DISASSEMBLY

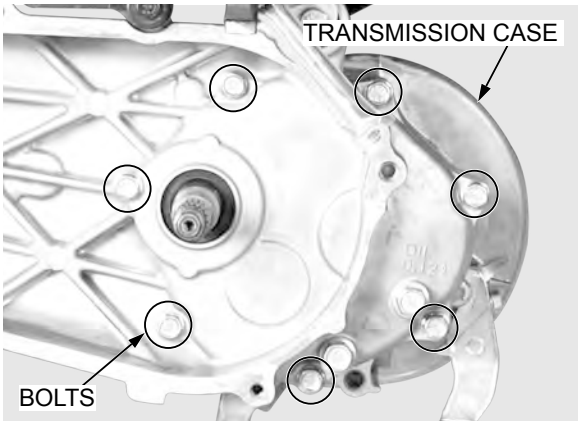
Drain the final reduction oil (page 3-9).

Remove the following:

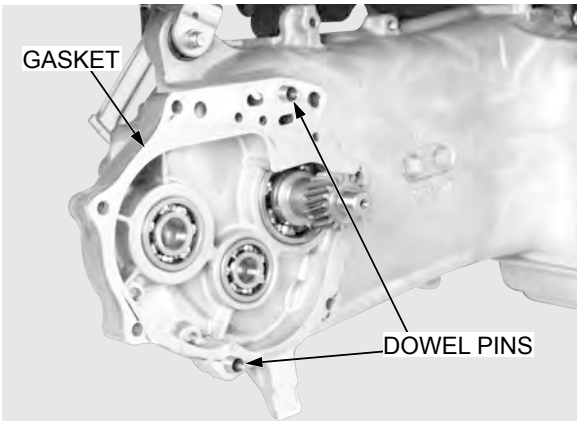
– Rear wheel (page 14-3)
– Rear brake cable (page 14-5)
– Left crankcase cover (page 9-3)
– Clutch/driven pulley (page 9-12)

Disconnect the final reduction breather tube from the air cleaner housing.

Remove the bolts (7 nos.) and the transmission case.

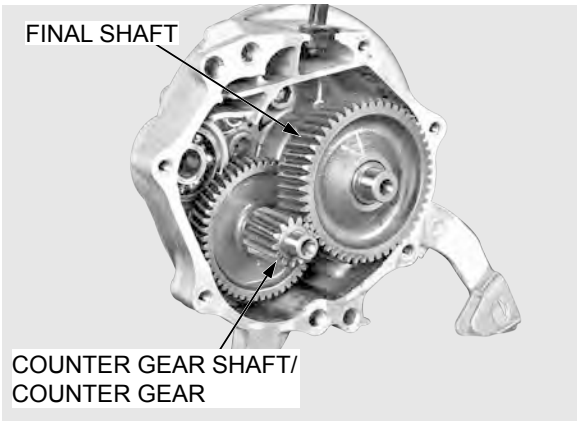



Remove the dowel pins (2 nos.) and gasket.




Remove the final shaft.

Remove the counter gear shaft and counter gear.



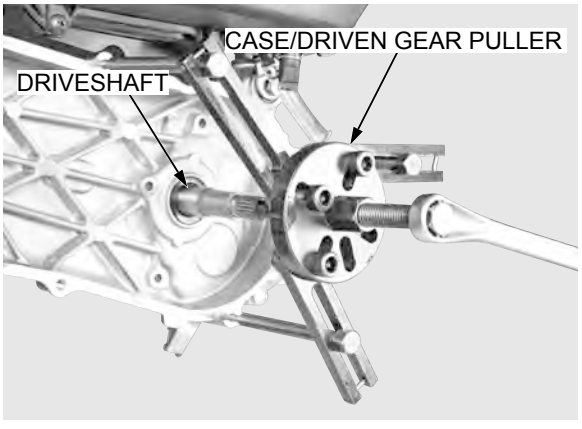

# DRIVESHAFT REMOVAL

Install the case/driven gear puller onto the left crankcase.

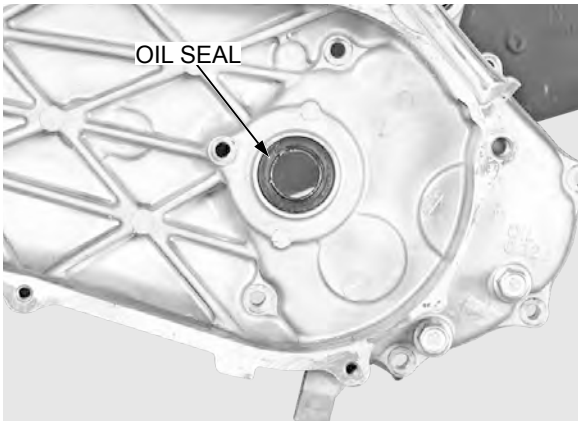
Remove the driveshaft from the crankcase.

**TOOL:**

**Case/driven gear puller 070MC – KPL- I1001**



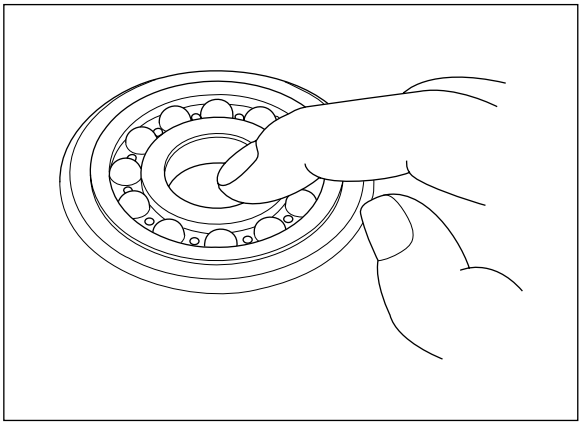
Remove the driveshaft oil seal.




# BEARING REPLACEMENT

## BEARING INSPECTION

Turn the bearings with your finger. The bearings should turn smoothly and quietly. Also check that the inner race fits tightly on the crankcase.



## LEFT CRANKCASE

Remove the muffler (page 2-9)

Remove the final shaft bearing, counter gear shaft bearing and drive shaft bearing using the special tools.

**TOOLS:**

**Counter gear shaft bearing:**

**Bearing remover head, 12 mm 070MC – KPL-I400**
**Bearing remover shaft, 12 mm 070MC – KPL-I410**

**Final shaft bearing:**

**Bearing remover head, 15 mm 070MC – KPL-I500**
**Bearing remover shaft, 15 mm 070MC – KPL-I510**

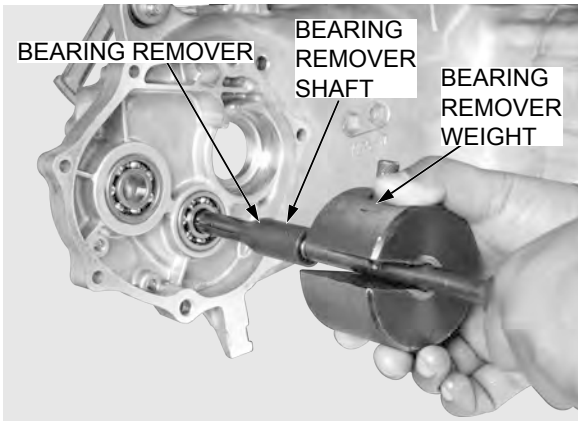
Remove the drive shaft from crankcase (page 10-3).

Remove the drive shaft bearing from drive shaft using the special tool.

**Drive shaft bearing remover 07008 – DBR – 900**

**⚠ CAUTION**

Be careful not to damage the left crankcase and transmission case mating surfaces.




Apply engine oil to new bearing rotating areas.

Drive new bearings into the left crankcase.

**TOOLS:**

**Counter gear shaft bearing:**

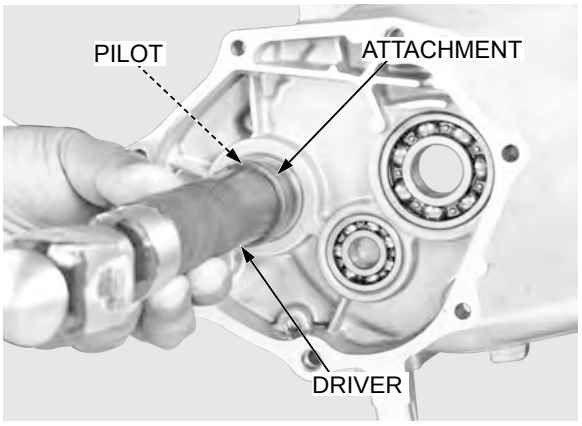
| | |
|---|---|
| **Driver** | **070GD – 001-I100** |
| **Attachment, 32 x 35 mm** | **070GD – 002-I140** |
| **Pilot ,12 mm** | **070GD – 004-I130** |

**Final shaft bearing:**

| | |
|---|---|
| **Driver** | **070GD – 001-I100** |
| **Attachment, 37 x 40 mm** | **070GD – 002-I150** |
| **Pilot, 15 mm** | **070GD – 004-I140** |

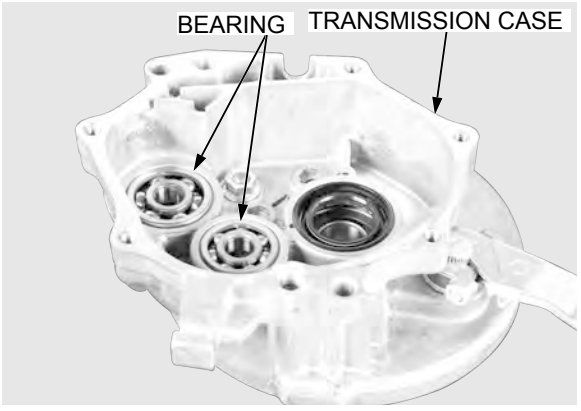
**Driveshaft bearing:**

| | |
|---|---|
| **Driver** | **070GD – 001-I100** |
| **Attachment, 42 x 47 mm** | **070GD – 002-I160** |
| **Pilot, 20 mm** | **070GD – 004-I160** |



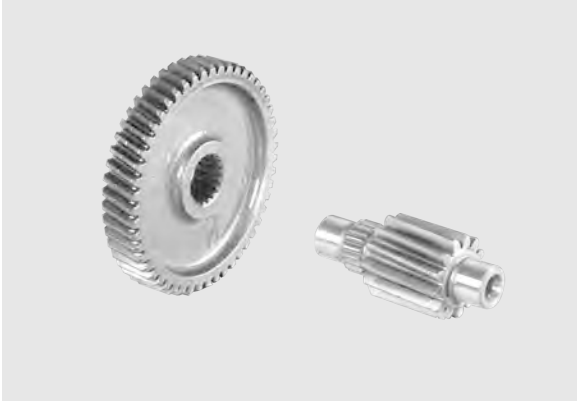

## TRANSMISSION INSPECTION

Check the transmission case bearings for wear or damage.



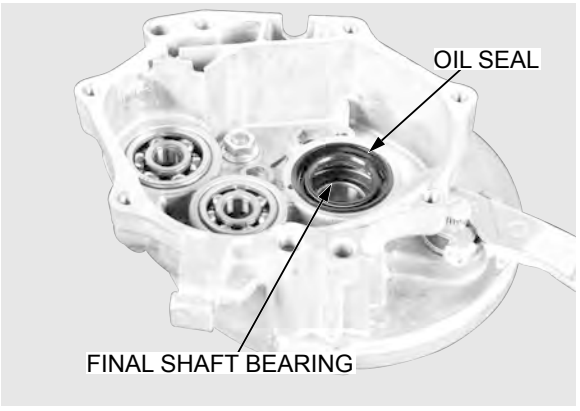

Check the final shaft for excessive wear, damage or signs of seizure.

Check the counter gear shaft and counter gear for excessive wear, damage or signs of seizure.



Remove the final shaft oil seal from the transmission case.

Remove the final shaft bearing from the transmission case.

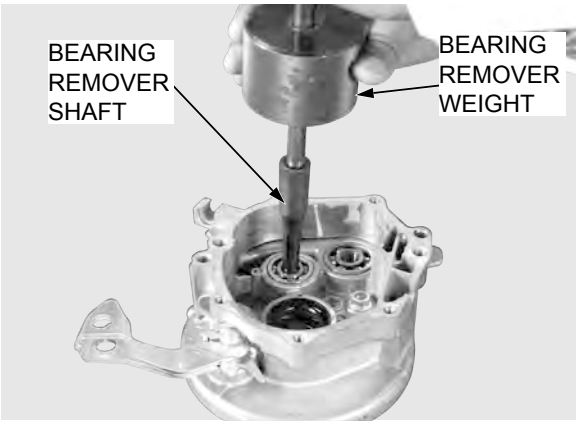



Remove the driveshaft bearing and counter gear shaft bearing using the special tools.

**TOOLS:**

**Bearing remover head, 12 mm 070MC – KPL-I400**
**Bearing remover shaft, 12 mm 070MC – KPL-I410**

Apply engine oil to new bearing rotating areas.




Drive new bearings into the transmission case.

**TOOLS:**

**Driveshaft bearing:**

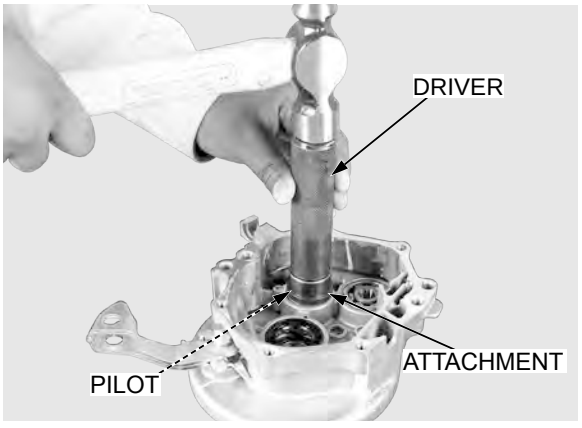
| | |
|---|---|
| **Driver** | **070GD – 001-I100** |
| **Attachment, 37 x 40 mm** | **070GD – 002-I150** |
| **Pilot, 12 mm** | **070GD – 004-I130** |

**Counter gear shaft bearing:**

| | |
|---|---|
| **Driver** | **070GD – 001-I100** |
| **Attachment, 32 x 35 mm** | **070GD – 002-I140** |
| **Pilot, 12 mm** | **070GD – 004-I130** |

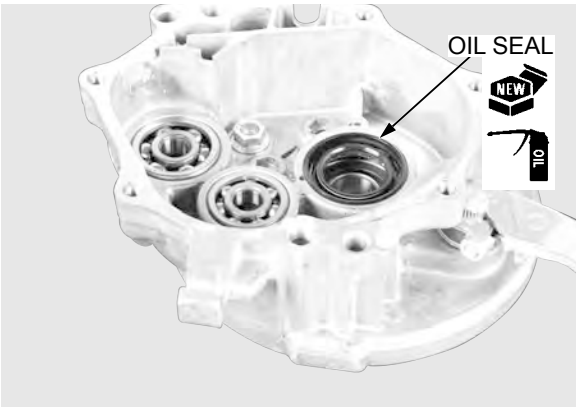
**Final shaft bearing:**

| | |
|---|---|
| **Driver** | **070GD – 001-I100** |
| **Attachment, 42 x 47 mm** | **070GD – 002-I160** |
| **Pilot, 20 mm** | **070GD – 004-I160** |




Coat the circumference and lip of a new final shaft oil seal with engine oil.

Install a new final shaft oil seal.



# DRIVESHAFT INSTALLATION

Install the driveshaft into the transmission cover.

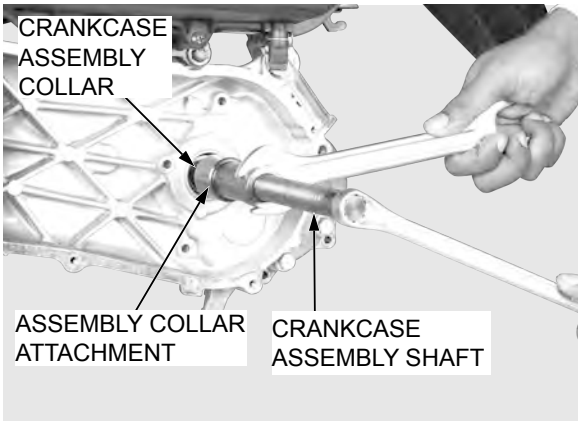
Position the assembly collar against the driveshaft bearing inner race.

Thread the assembly shaft onto the driveshaft.

Hold the shaft and draw the driveshaft into the bearing inner race by turning the nut.

**TOOLS:**

| | |
|---|---|
| **Crankcase assembly collar** | **070MF – KWP-110** |
| **Assembly collar attachment** | **070MF – KWP-120** |
| **Crankcase assembly shaft** | **070MF – KWP-130** |

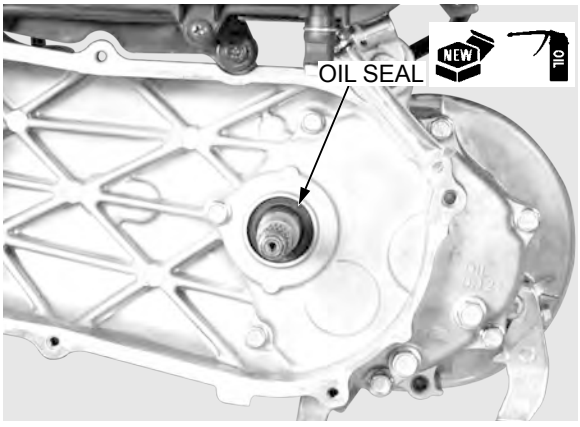



Coat the circumference and lip of a new oil seal with engine oil.

Install the oil seal into the left crankcase until the depth from the crankcase end surface is 0 – 0.5 mm (0 – 0.02 in), using the special tools.

**TOOLS:**

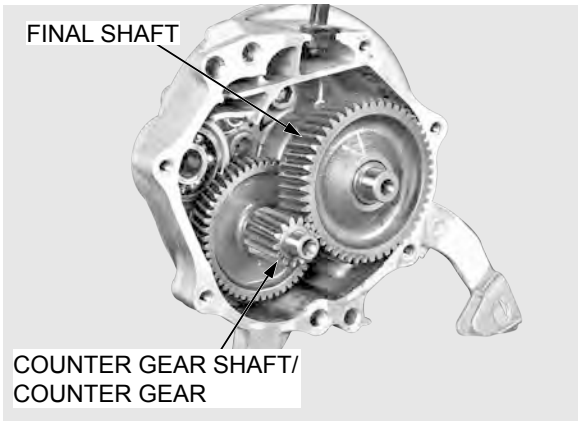
| | |
|---|---|
| **Crankcase assembly collar** | **070MF – KWP-110** |
| **Assembly collar attachment** | **070MF – KWP-120** |
| **Crankcase assembly shaft** | **070MF – KWP-130** |




# FINAL REDUCTION ASSEMBLY

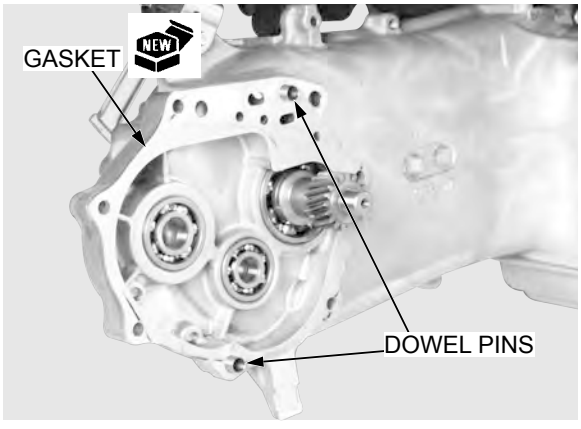
Install the counter gear shaft and counter gear into the transmission case.

Install the final shaft.




Install a new gasket and the dowel pins.

Install the transmission case onto the left crankcase.



Tighten the bolts (7 nos.).

Connect the final reduction breather tube.

Install the following:

– Clutch/driven pulley (9-16)
– Left crankcase cover (9-6)
– Rear wheel (page 14-4)
– Rear brake adjusting nut and brake arm joint (page 14-6).

Fill the transmission case with the recommended oil (page 3-9).

**RECOMMENDED OIL:**

**Honda 4-stroke oil or equivalent motor oil**
**API service classification: MA**
**Viscosity: SAE 10W-30**

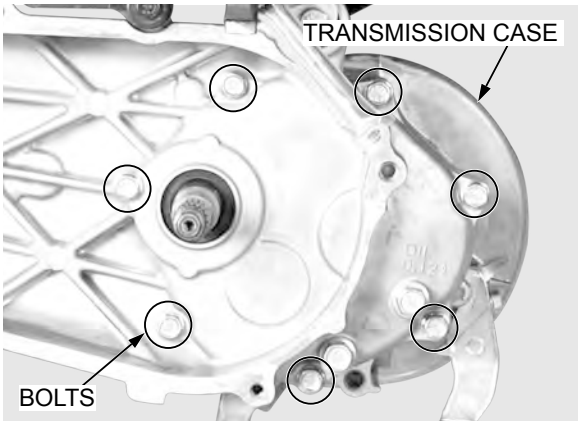
**OIL CAPACITY:**

**0.10 liter (0.11 US qt, 0.09 lmp qt) at oil change**

**0.12 liter (0.13 US qt, 0.11 lmp qt) at disassembly**

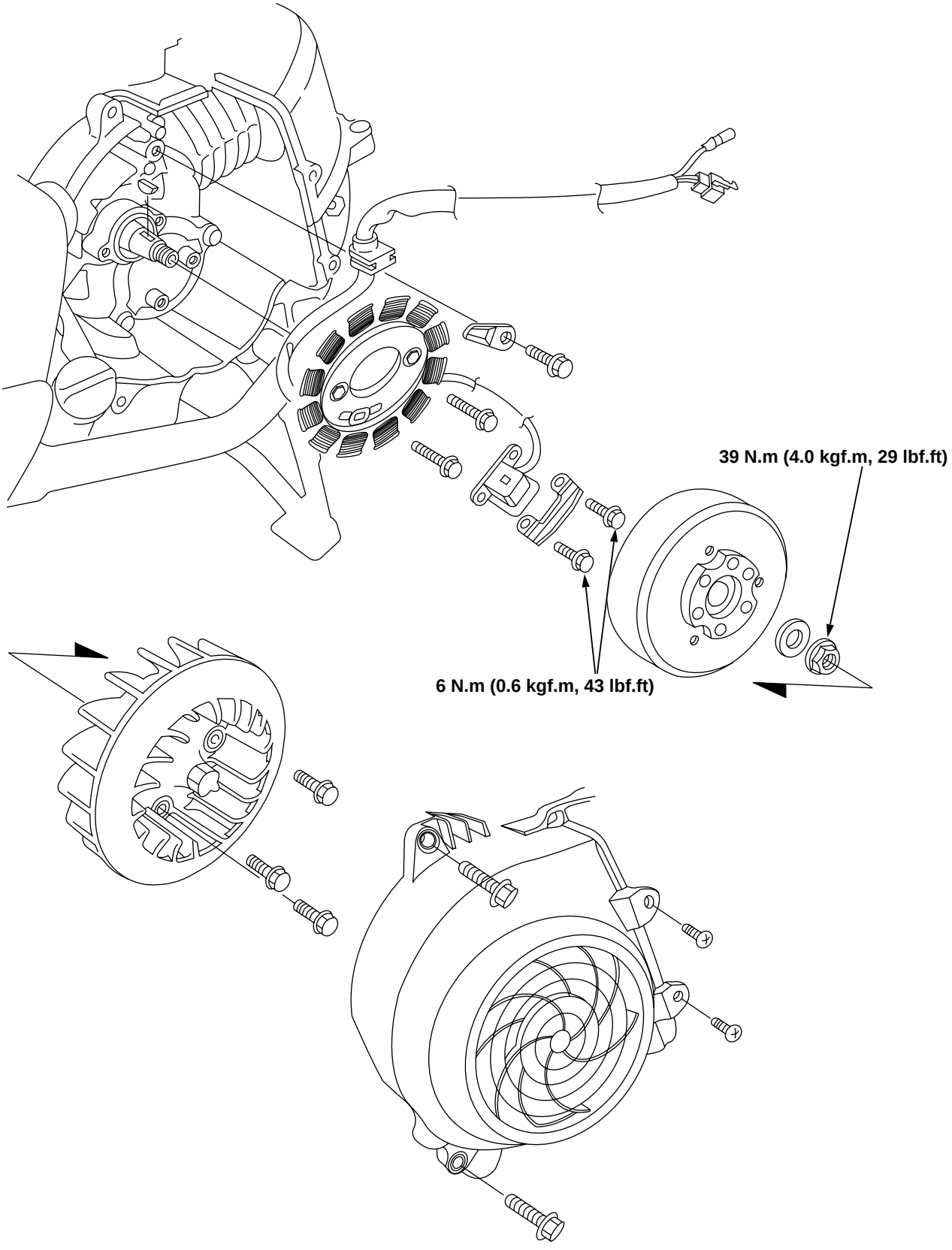
Install the oil level check bolt with a new sealing washer and tighten it.

**TORQUE: 13 N·m (1.3 kgf·m, 9 lbf·ft)**



**MEMO**

# COMPONENT LOCATION



# SERVICE INFORMATION

## GENERAL

- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is ON and current is present.
- This section covers service of the alternator stator, flywheel and the cooling fan. These parts can be removed with the engine installed in the frame.
- Refer to section 15 for alternator stator inspection.

## TORQUE VALUES

| ITEM | QTY | THREAD DIA. (mm) | TORQUE N·m (kgf·m, lbf·ft) | REMARKS | PAGE NO. |
|---|---|---|---|---|---|
| Fan cover screw | 2 | 5 | 4 (0.4, 2.9) | | – |
| Fan cover bolt | 2 | 10 | 7 (0.7, 5.1) | | Page 11-4 |
| Fan comp., cooling bolt | 3 | 6 | 10 (1.0, 7.3) | | Page 11-4 |
| Flywheel comp. bolt | 1 | 10 | 39 (3.9, 28.7) | | Page 11-4 |
| Pulsar coil assy.(stator comp.) bolt | 2 | 5 | 6 (0.6, 4.4) | | Page 11-3 |
| Stator holding bolt | 2 | 6 | 10 (1.0, 7.3) | | Page 11-3 |
| Clamper, wire harness bolt | 1 | 6 | 12 (1.2, 8.8) | | Page 11-3 |

## TOOLS

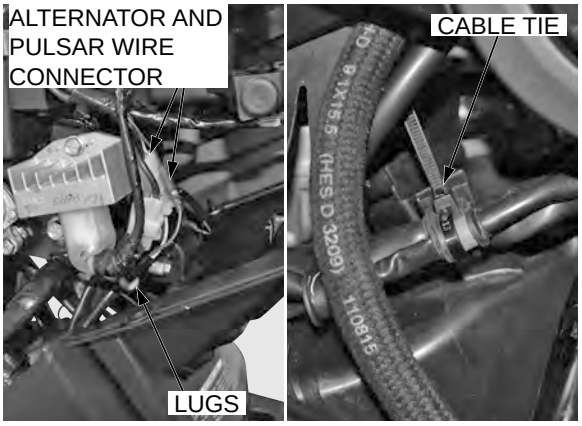
| | |
|---|---|
| Universal holder | 070MB - KPL - I100 |
| Flywheel puller | 070MC - KPL - I200 |

# ALTERNATOR REMOVAL

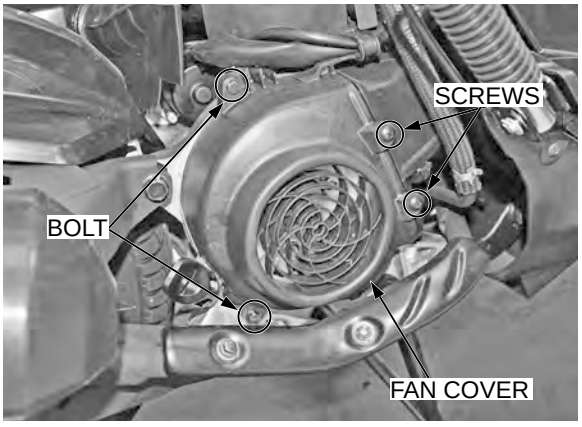
Remove the right side cover (Page 2-4).

Disconnect the alternator and pulsar wire connectors.

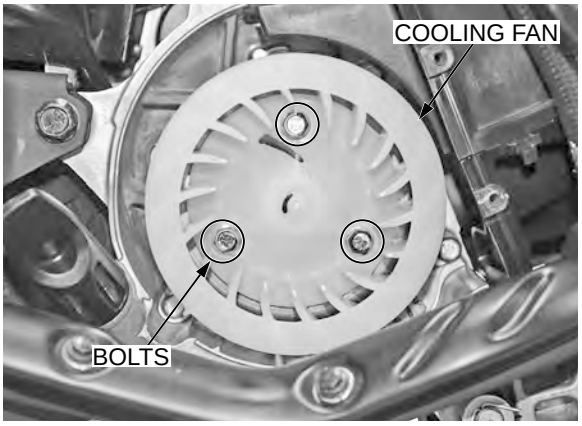
Release the wire lugs from body clamp and cable tie.




Remove the two screws (2 nos.), bolts (2 nos.) and the cooling fan cover.



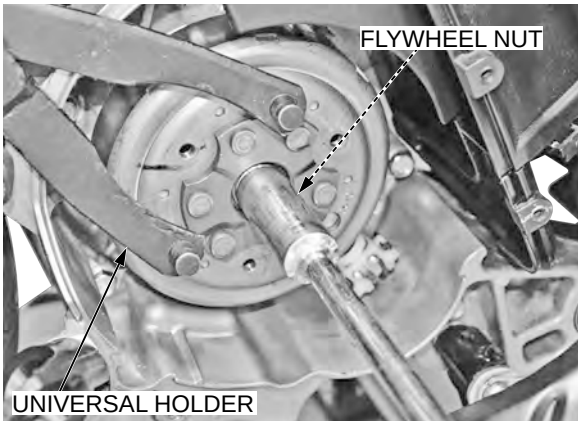

Remove the bolts (3 nos.) and cooling fan.




Hold the flywheel with the universal holder and remove the flywheel nut (1 no.).

**TOOL:**

**Universal holder** **070MB – KPL–I100**

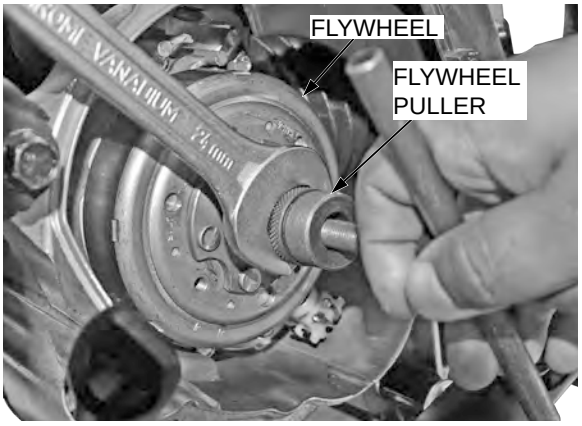


Remove the flywheel with the flywheel puller.

**TOOL:**

**Flywheel puller 070MC – KPL– I200**

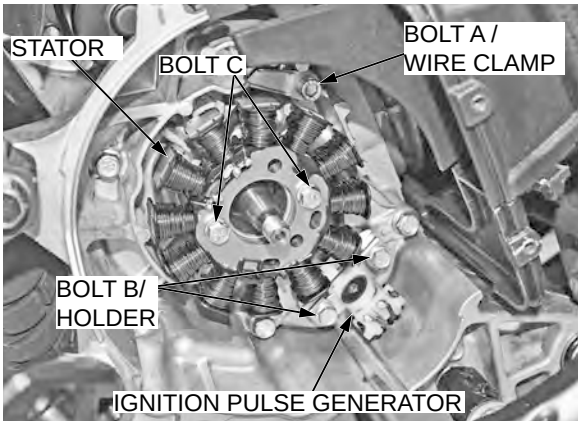
Remove the woodruff key from the crankshaft.




Remove the socket bolt A (1 no.), wire clamp and grommet from the crankcase.

Remove the bolts B (2 nos.) holder and ignition pulse generator.

Remove the bolts C (2 nos.) and alternator stator.




# ALTERNATOR INSTALLATION

Install the stator and tighten the bolts C (2 nos.).

**TORQUE: 10 N·m (1.0 kgf·m, 7.3 lbf·ft)**

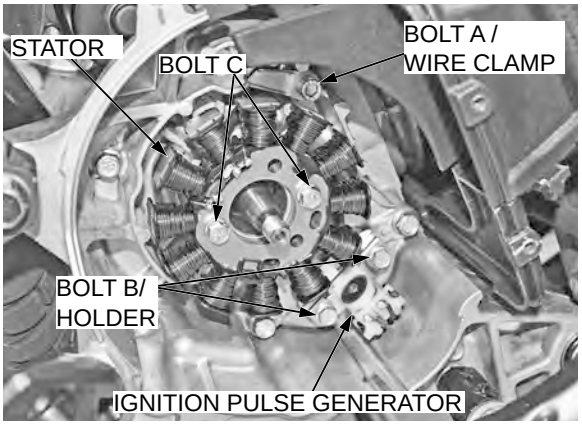
Install the wire clamp and tighten the bolt A (1 no.).

**TORQUE: 12 N·m (1.2 kgf·m, 8.8 lbf·ft)**

Install the grommet into the right crankcase.

Install the ignition pulse generator and holder, and tighten the mounting bolts B (2 nos.).

**TORQUE: 6 N·m (0.6 kgf·m, 4.3 lbf·ft)**




Install the woodruff key into the crankshaft groove.

Clean any oil or grease from the tapered portion of the crankshaft and the tapered hole in the flywheel.

Install the flywheel on the crankshaft by aligning its groove with the woodruff key.

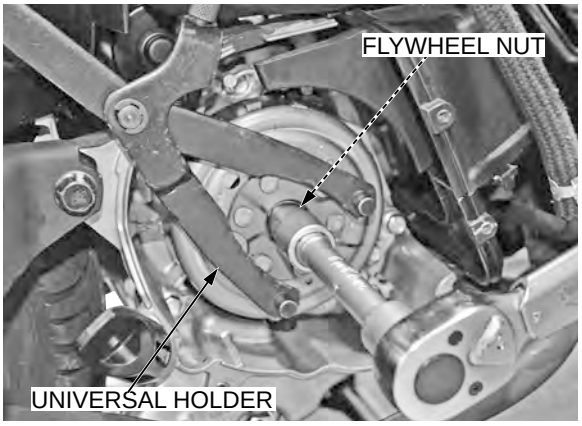
Install the flywheel nut (1 no.).

Hold the flywheel with the universal holder and tighten the nut.

**TOOL:**

**Universal holder 070MB – KPL– I100**

**TORQUE: 39 N·m (4.0 kgf·m, 29 lbf·ft)**



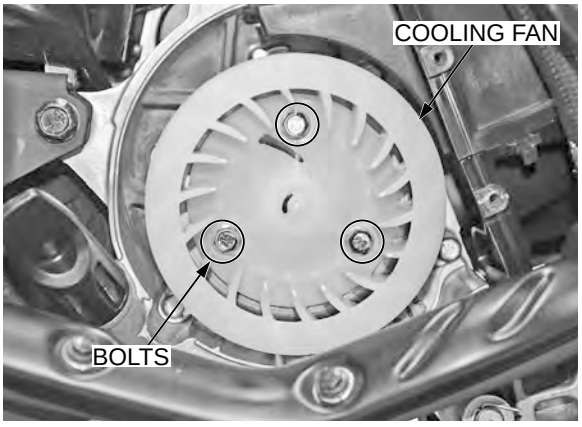

Align the “T” mark on the cooling fan with the “T” mark on the flywheel and Install the cooling fan.

Tighten the bolts (3 nos.) with the specified torque.

**TORQUE:10 N·m (1.0 kgf·m, 7.3 lbf·ft)**

**NOTE:**

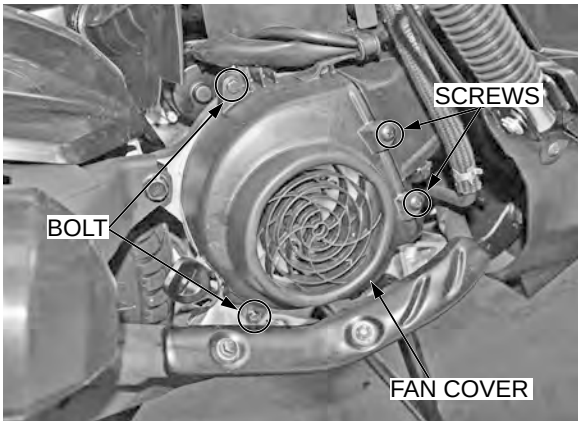
Use specified bolts otherwise it may damage the stator coil winding.




Install the fan cover and tighten the screws (2 nos.).

Install the fan cover bolts (2 nos.) and tighten them.

**TORQUE: 7 N·m (0.7 kgf·m, 5.1 lbf·ft)**




Route the wire properly (page 1-13).

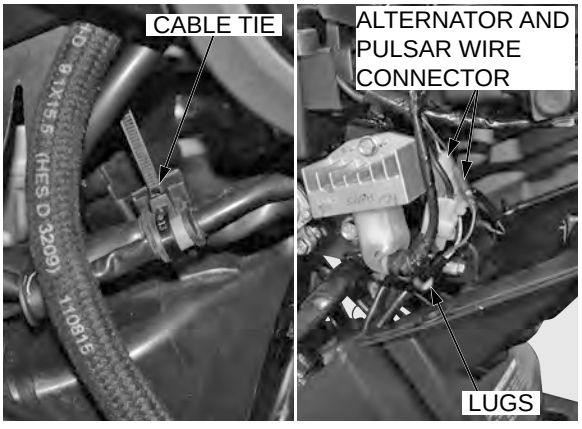
Install the wire lugs to the body clamp and tie the cable with the cable tie at its location.

Connect the alternator and pulsar wire connectors.

Install the right side cover (page 2-4).

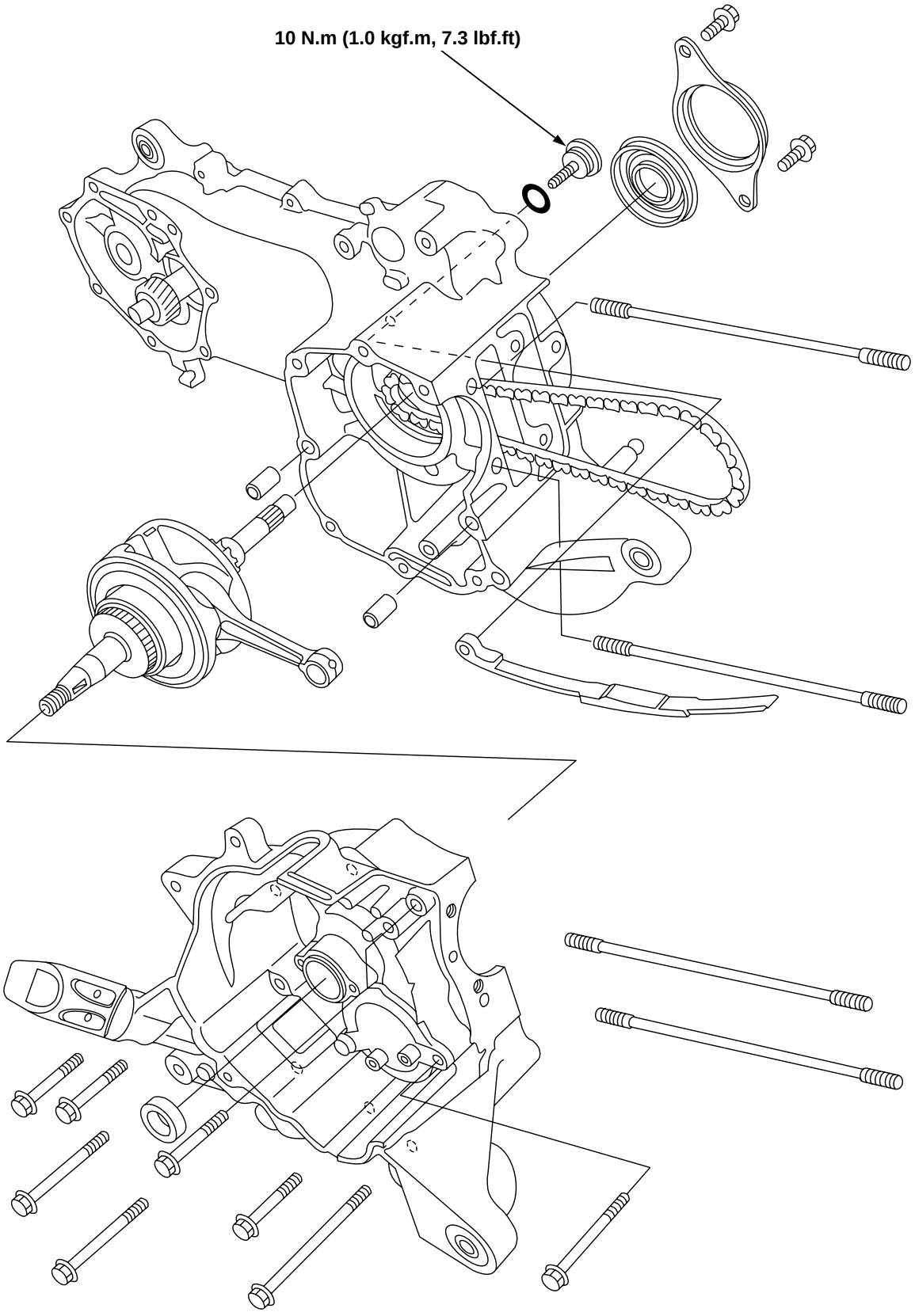
Install the fuel tank cover (page 2-3).

Install the seat (page 2-3).



**MEMO**

# COMPONENT LOCATION



# 12. CRANKCASE/CRANKSHAFT



# SERVICE INFORMATION

## GENERAL

- This section covers the crankcase separation to service the crankshaft.
- The engine must be removed from the frame to separate the crankcase.
- The following parts must be removed before separating the crankcase:
  - air cleaner housing, carburetor (section 5)
  - alternator (section 11)
  - drive pulley, clutch/driven pulley (section 9)
  - cylinder head (section 7)
  - cylinder, piston (section 8)
- In addition to the parts listed above, remove the following parts when the left crankcase half must be replaced:
  - final reduction (section 10)
  - rear brake (section 14)
- Be careful not to damage the crankcase mating surfaces when separating and assembling the crankcase halves.
- The crankcase oil seals must be replaced with new ones when assembling the crankcase halves.

## SPECIFICATIONS

Unit: mm (in)

| | ITEM | STANDARD | SERVICE LIMIT | Page NO. |
|---|---|---|---|---|
| Crankshaft | Connecting rod big end side clearance | 0.10 – 0.35 (0.004 – 0.014) | 0.55 (0.022) | Page 12-3 |
| | Connecting rod big end radial clearance | 0 – 0.012 (0 – 0.0005) | 0.04 (0.002) | Page 12-4 |
| | Crankshaft runout | – | 0.1 (0.04) | Page 12-4 |

## TORQUE VALUES

| ITEM | THREAD DIA. (mm) | TORQUE N·m (kgf·m, lbf·ft) | REMARKS | PAGE NO. |
|---|---|---|---|---|
| Pivot cam chain tensioner | Bolt, Spl. M6x1.0 | 10 (1.0, 7.3) | | Page 12-6 |
| R Crank case stud bolt | Bolt, A Stud 7x200 | 6.5(0.66, 5.0) | | – |
| L Crank case stud bolt | Bolt, A Stud 7x204.5 | 6.5(0.66, 5.0) | | – |

# TROUBLESHOOTING

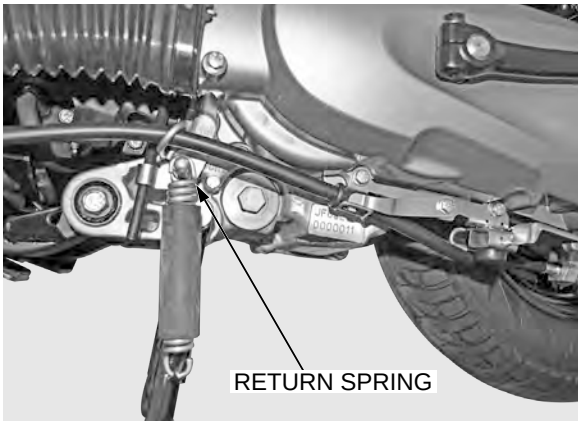
**Abnormal engine noise**

- Worn or damaged connecting rod bearing
- Worn or damaged crankshaft bearings

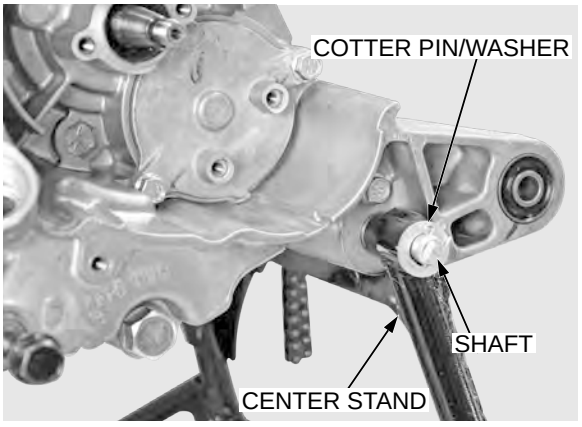
# CRANKCASE / CRANKSHAFT DISASSEMBLY

Remove the parts required for crankcase separation (page 12-1).

Remove the center stand return spring.

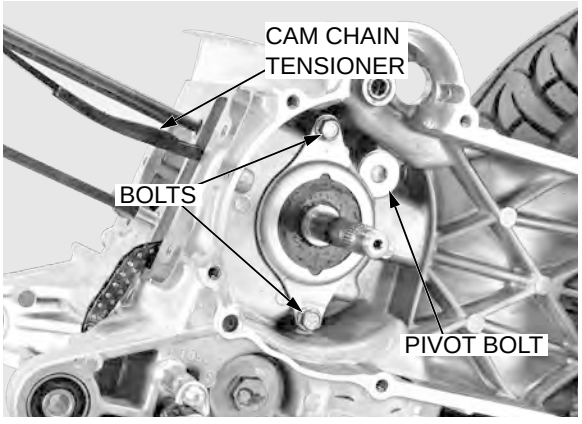



Remove the cotter pin, washer, center stand pivot bolt and center stand.




Remove bolts (2 nos.) and oil seal stopper plate from the left crankcase.

Remove the cam chain tensioner pivot and cam chain tensioner.




Remove the crankcase bolts (8 nos.).

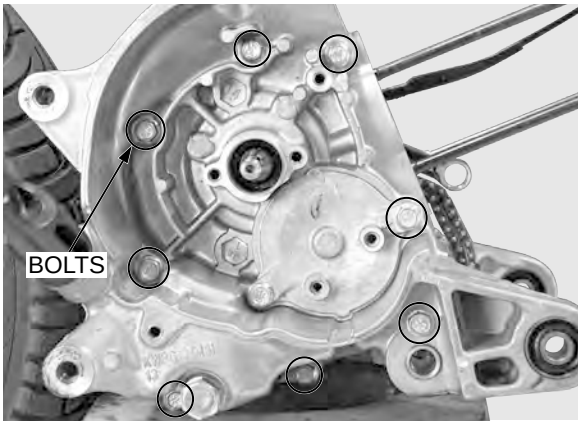
Place the crankcase with the left crankcase down and remove the right crankcase from the left crankcase.

**NOTICE**

*Separate the right crankcase while tapping it at several locations with a soft hammer.*

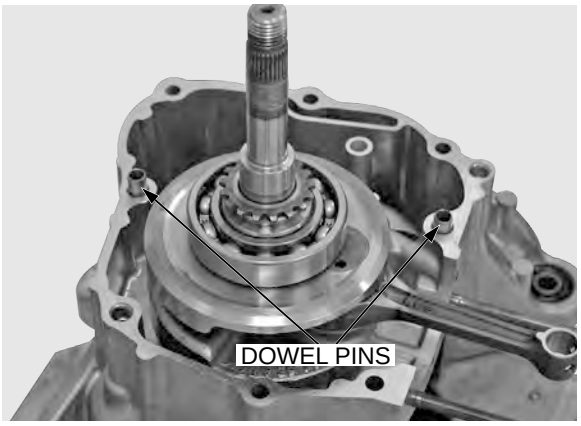
**⚠ CAUTION**

- Be careful not to damage the crankcase mating surface.



Remove dowel pins.

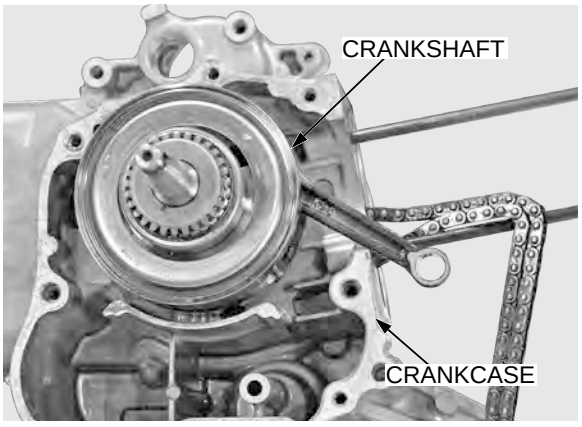
Clean off crankcase mating surface.



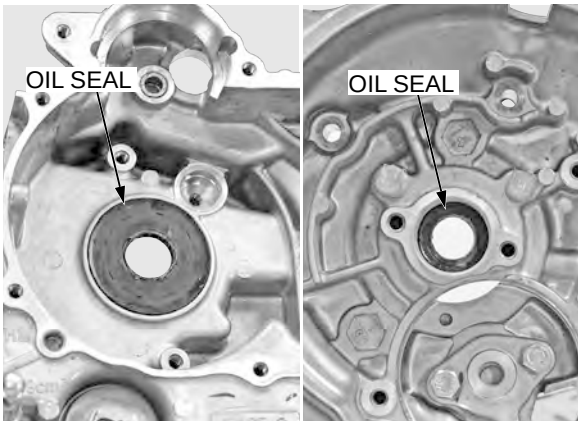

Put the right crankcase on the wooden box.

Remove the crankshaft from the left crankcase.

Remove the cam chain.



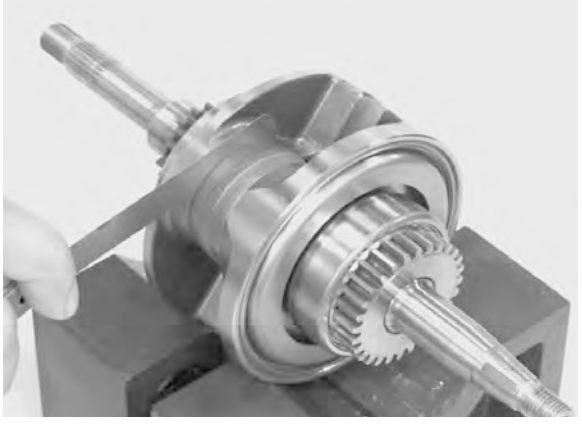

Remove the oil seal from the left and right crankcase.




# CRANKSHAFT INSPECTION

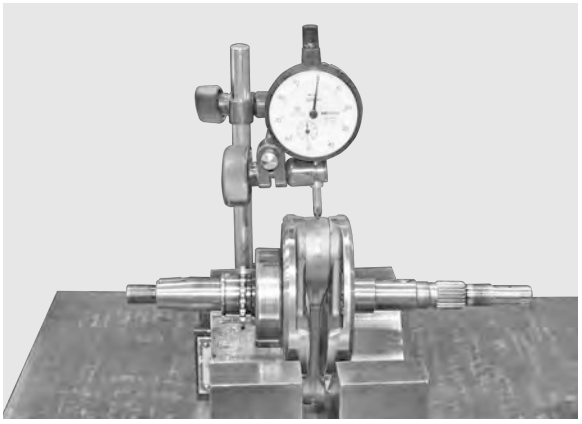
Set the crankshaft on V-blocks and measure the connecting rod big end side clearance with a feeler gauge.

**SERVICE LIMIT: 0.55 mm (0.022 in)**



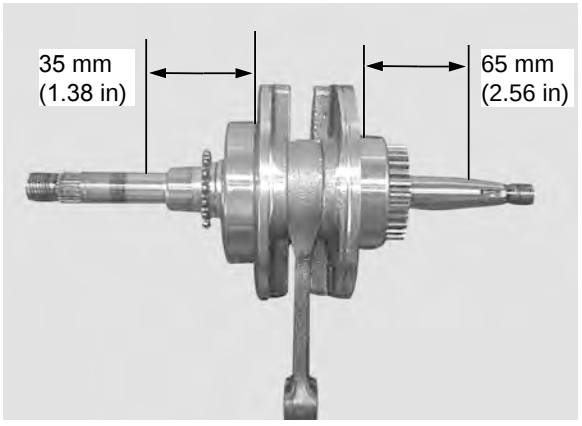
Set the crankshaft on V-blocks and measure the connecting rod big end radial clearance.

**SERVICE LIMIT: 0.04 mm (0.002 in)**



Read the runout using dial indicators. Actual runout is 1/2 of total indicator reading.

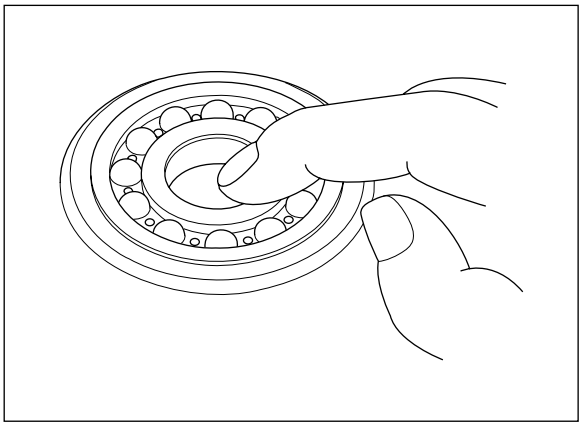
**SERVICE LIMIT: 0.1 mm (0.04 in)**




### BEARING INSPECTION

Turn the bearings with your finger. The bearings should turn smoothly and quietly. Also check that the inner race fits tightly on the crankshaft.

Replace the crankshaft assembly if the races do not turn smoothly, quietly, or if they fit loosely on the crankshaft.



# CRANKSHAFT/CRANKCASE ASSEMBLY

Clean the insides of the crankcases.

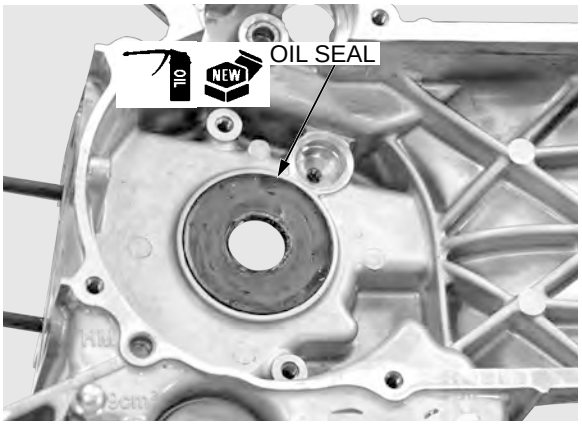
Check the crankcases for cracks or other faults.

Coat the lip and circumference of a new oil seal with engine oil.

Install the oil seal into the right crankcase so that the depth from the inside of the case is 0 – 1 mm (0 – 0.04 in).

Coat the lip and circumference of a new oil seal with engine oil.

Install the oil seal into the left crankcase so that the depth from the outside of the case is 0 – 0.5 mm (0 – 0.02 in).

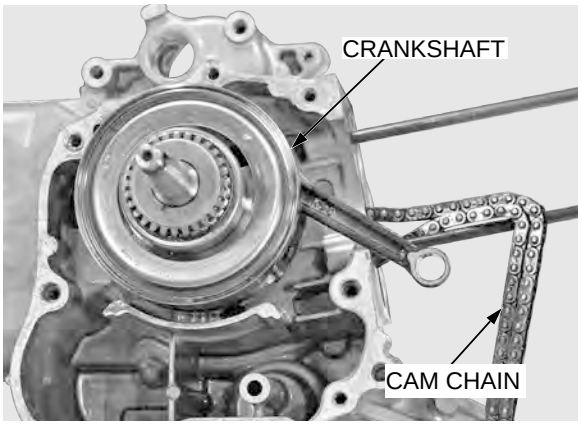



**⚠ CAUTION**

- Be careful not to damage the crankcase mating surfaces.

Install the cam chain into the left crankcase.

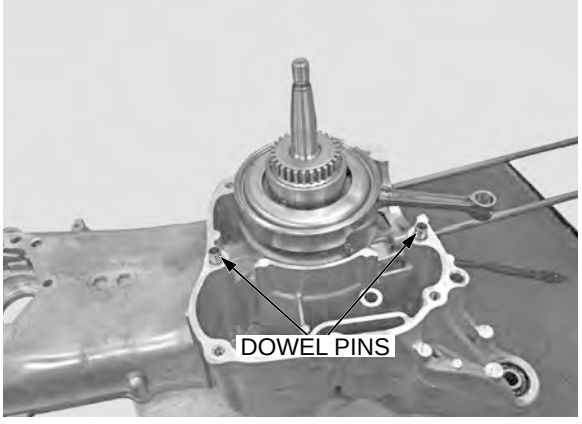
Install the crankshaft into the left crankcase through the cam chain, being careful not to damage the oil seal lip.




**NOTICE**

*Note the connecting rod location when installing the crankshaft.*

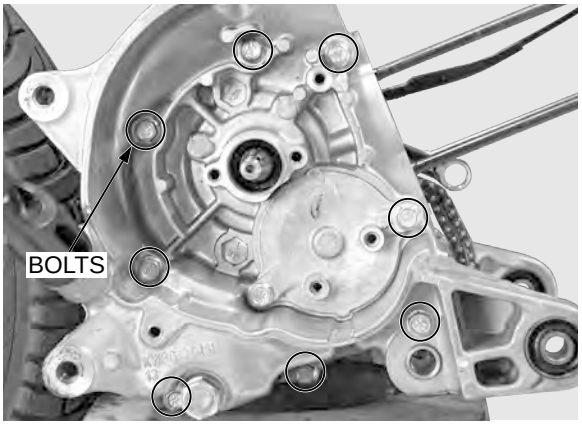
Install the dowel pins and a liquid gasket.




Install the crankcase bolts (8 nos.) and tighten them in a crisscross pattern in 2 or 3 steps and specified torque.

**TORQUE: 6.5 N·m (0.66 kgf·m, 5.0 lbf·ft)**

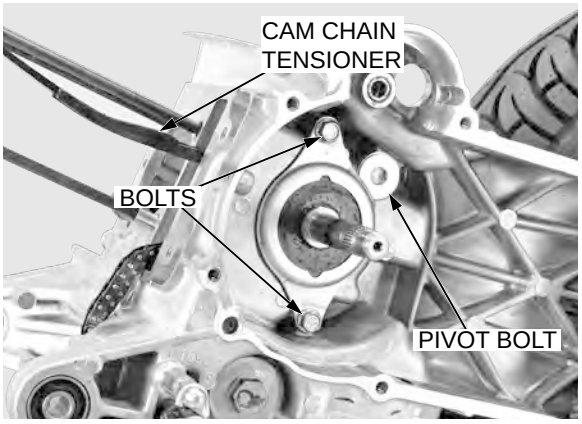
Check that the crankshaft turns smoothly.Install the center



stand onto the crankcase, insert the pivot bolt and secure it with the washer and a new

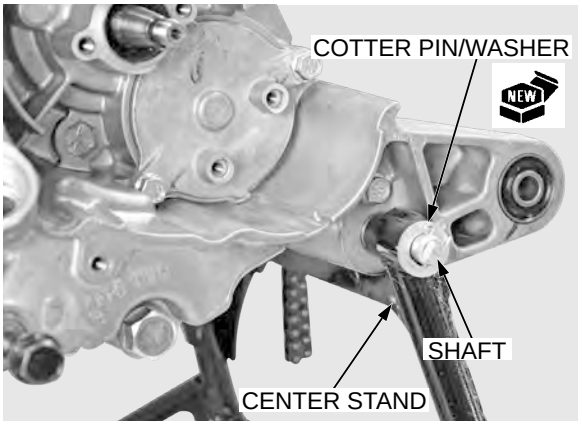
cotter pin.

Hook the center stand return spring to the stand and




spring pin.

Install the following:




— Cylinder/ Piston (section 8)

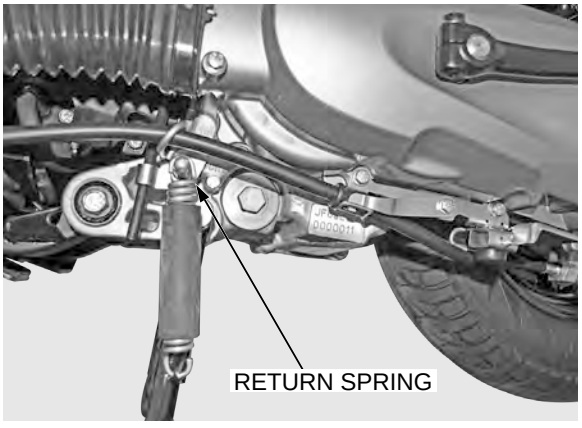
— Cylinder head (section 7)

— Drive pulley, Clutch/ Driven pulley (section 9)

— Alternator (section 11 )

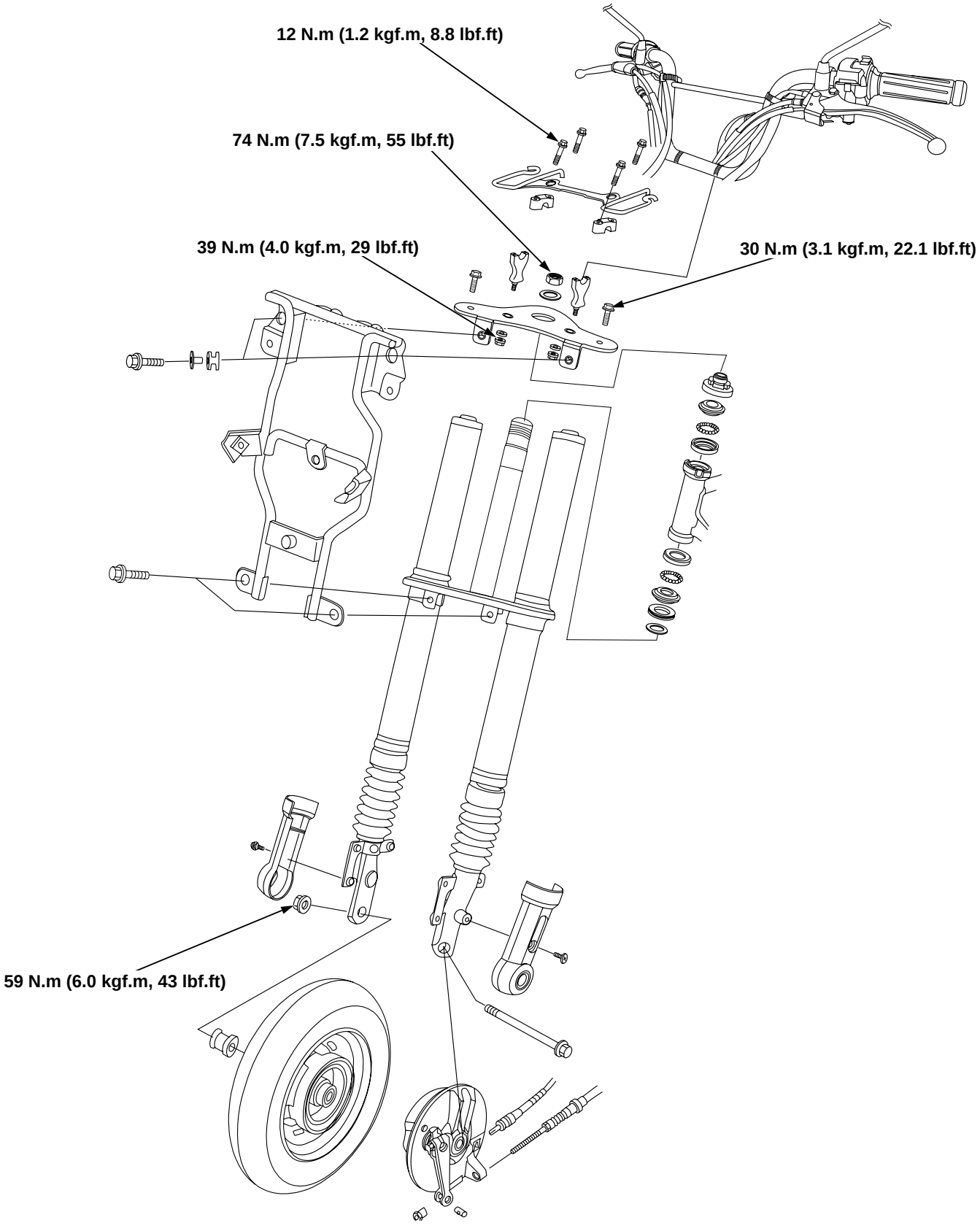
— Carburetor, Air cleaner housing (section 5)

— Engine in the frame



**MEMO**

# COMPONENT LOCATION



# 13. FRONT WHEEL/BRAKE/SUSPENSION/STEERING



## SERVICE INFORMATION

### GENERAL

- Riding on damaged rims impairs safe operation of the vehicle.
- When servicing the front wheel, fork or steering stem, support the vehicle.
- A contaminated brake drum or shoe reduces stopping power. Discard contaminated shoes, and clean a contaminated drum with a high quality brake de-greasing agent.
- Raise the front wheel off the ground by supporting the frame securely when servicing the front wheel and suspension.
- After the front wheel installation, check the brake operation by applying the brake lever.
- Refer to the brake system information (section 13).
- Refer to section 18 for light, meter and switch inspection.

### SPECIFICATIONS

Unit: mm (in)

| ITEM | | STANDARD | SERVICE LIMIT | Page NO. |
|---|---|---|---|---|
| Cold tyre pressure | Driver only | 150 kPa (1.50 kgf/cm$^2$, 22 psi) | – | Page 3-18 |
| | Driver and passenger | 150 kPa (1.50 kgf/cm$^2$, 22 psi) | – | Page 3-18 |
| Rim size | | 12 x 2.15 in | | – |
| Front axle runout | | – | 0.1 (0.003) | Page 13-5 |
| Front wheel rim runout | Radial | – | 1.0 (0.03) | Page 13-5 |
| | Axial | – | 1.0 (0.03) | Page 13-5 |
| Front brake drum I.D. | | 130 (5.12) | 131 (5.16) | Page 13-8 |

13

### TORQUE VALUES

| ITEM | QTY | THREAD SIZE & TYPE | TORQUE VALUE N·m (kgf·m, lbf·ft) | REMARKS | PAGE NO. |
|---|---|---|---|---|---|
| Fr. axle nut | 1 | 12 | 59 (6.0, 43) | PT Nut | Page 13-7 |
| Fr. hub nut | 4 | 8 | 23 (2.3, 16.96) | PT Nut | Page 13-6 |
| Fr. brake arm nut | 1 | 6 | 10 (1.0, 7.3) | | Page 13-13 |
| Handlebar lower holder nut | 2 | 10 | 39 (4.0, 29) | PT Nut | Page 13-23 |
| Handlebar upper holder bolt | 4 | 6 | 12 (1.2, 8.8) | | Page 13-16 |
| Fork top bridge bolt | 2 | 8 | 30 (3.1, 22.1) | | Page 13-23 |
| Steering stem nut | 1 | 24 | 74 (7.5, 55) | | Page 13-24 |
| Nut handle lever | 2 | 6 | 5.9 (0.6, 4.35) | | – |

**NOTE:** Parts are not interchangeable with other makers.

**REFERENCE:** For maker wise child part details refer latest parts catalogue.

## TOOLS

| | |
|---|---|
| Bearing remover head, 12 mm | 070MD – 005 – I130 |
| Bearing remover shaft | 070GD – 005 – I100 |
| Driver | 070GD – 001 – I100 |
| Attachment, 32 x 35 mm | 070GD – 002 – I140 |
| Pilot, 12 mm | 070GD – 004 – I130 |
| Lock nut wrench 45.5 mm | 070MA – KPL – I100 |
| Adjusting remover head | 070GC – 001 – I110 |
| Remover shaft | 070GC – 001 – I120 |
| Remover weight | 070MC – KPL – I300 |
| Attachment 42 x 47 mm | 070GD – 002 – I160 |
| Attachment | 070MD – KPL – I210 |
| Attachment, 30 mm I.D. | 070GD – 003 – I120 |
| Lock nut wrench 42 mm | 070MA – KPL – I200 |
| Steering nut spanner | 07000 – SNS – 900 |
| Steering inner cone remover | 07000 – SCR – 900 |
| Top and bottom cone race installer | 07004 – KPL – 900 |
| Circlip plier | 07914 – SA50001 |
| Pinion Speedometer tool | 07000 – PST – 900 |

# TROUBLESHOOTING

**Hard steering**

- Steering top cone race too tight
- Worn or damaged steering bearings
- Worn or damaged steering bearing races
- Bent steering stem
- Insufficient tyre pressure

**Steers to one side or does not track straight**

- Damaged or loose steering bearings
- Bent fork
- Bent front axle
- Bent frame
- Worn or damaged front wheel bearings

**Front wheel wobbling**

- Bent rim
- Worn or damaged front wheel bearings
- Faulty front tyre
- Unbalanced front tyre and wheel

**Front wheel turns hard**

- Faulty front wheel bearings
- Bent front axle
- Front brake drag

**Hard suspension**

- High tyre pressure

**Soft suspension**

- Weak fork spring
- Low tyre pressure

**Front suspension noise**

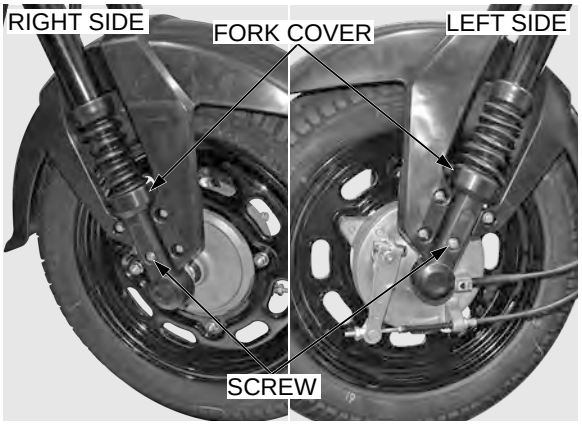
- Loose front suspension fasteners

# FRONT WHEEL

## REMOVAL

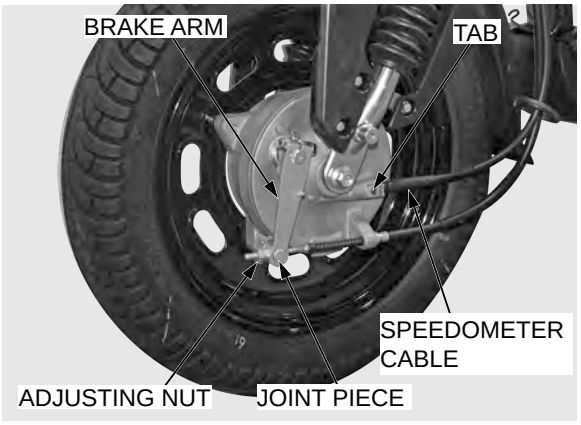
Support the vehicle on its centre stand.

Remove the front fork cover L & R screws (1 no.) from each side and front fork covers.




Remove the front brake adjusting nut, brake cable, brake arm joint.

Push the speedometer cable tab and disconnect the cable.




*Hold the vehicle from rear side with tie down belt.*

Loosen the front axle nut.

Support the frame securely and raise the front wheel off the ground.

Remove the axle nut, axle and front wheel.


## FRONT WHEEL DISASSEMBLY

Remove the brake panel from the left wheel hub.

Remove the distance collar from the right side of wheel hub.


Remove the dust seal from the right side of wheel.


Insert the bearing remover head into the bearing.

From the opposite side install the bearing remover shaft and drive the bearing out of the wheel from both side (left & right side).

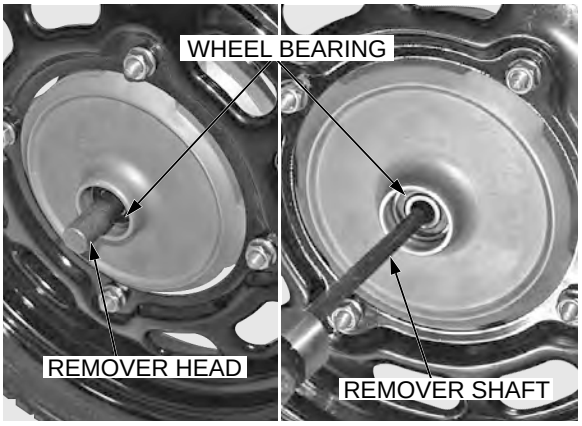
**TOOLS:**

**Bearing remover head, 12 mm 070GD – 005-I130**

**Bearing remover shaft 070GD – 005-I100**

**NOTICE**

*Replace the wheel bearings in pairs.*




Remove the nuts (4 nos.) and wheel hub.

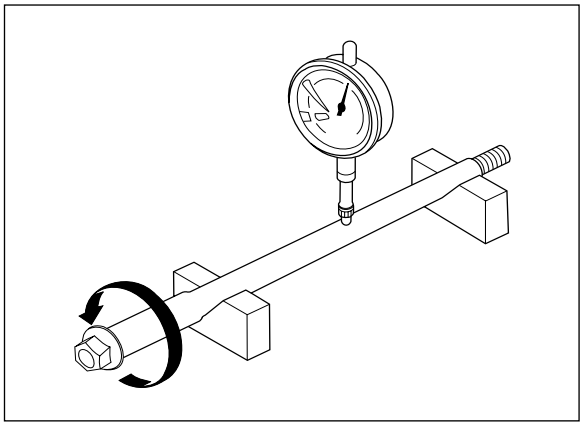
## INSPECTION

**FRONT AXLE**

Set the front axle in V-blocks and measure the runout using a dial indicator.

Actual runout is 1/2 of the total indicator reading.

**SERVICE LIMIT: 0.20 mm (0.008 in)**



## WHEEL RIM

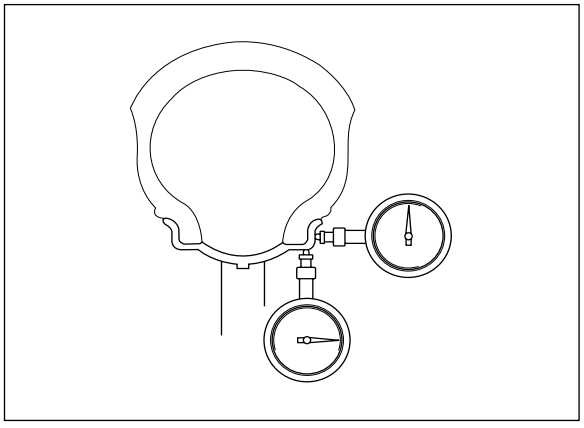
Check the rim runout by placing the wheel on a truing stand.

Spin the wheel slowly and read the runout by using a dial indicator.

Actual runout is 1/2 of the total indicator reading.

**SERVICE LIMITS:** **Radial: 1.0 mm (0.03 in)**

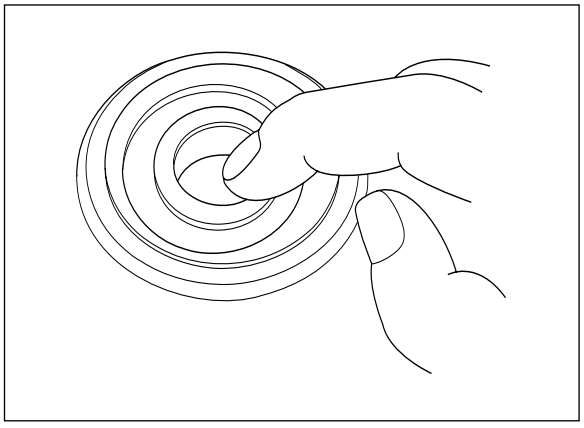
**Axial: 1.0 mm (0.03 in)**



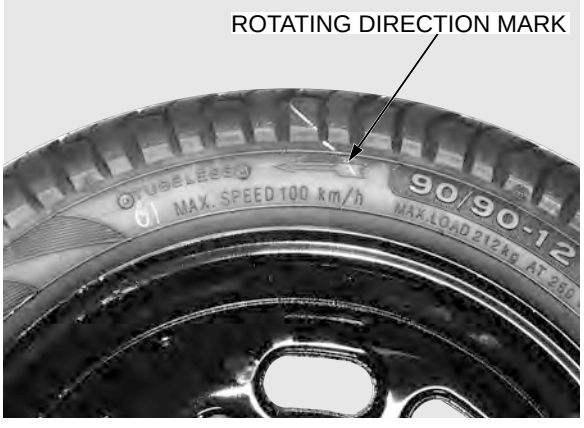
## WHEEL BEARING

Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the hub.

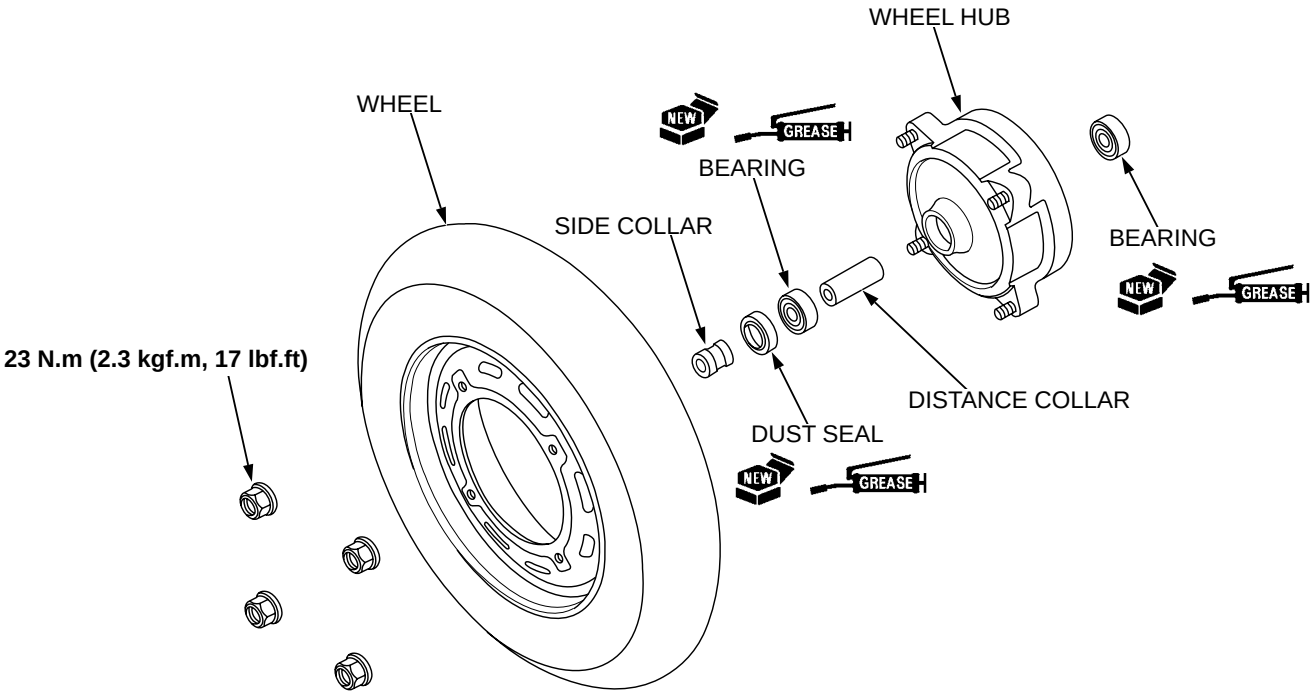
Remove and discard the bearings if the races do not turn smoothly, quietly, or if they fit loosely in the hub.



**NOTE:** The rotating direction mark is available on the tyre, during tyre installation always fit the tyre so that the mark face the same direction of rotation.



## ASSEMBLY OF DRUM BRAKE




Install the front wheel hub and tighten the nuts to the specified torque.

**TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)**

Apply grease on all bearing cavities.

**⚠ CAUTION**

Never reinstall an old bearing, once a bearing has been removed, the bearing must be replaced with a new one.


Drive in a new left side bearing squarely with the sealed side facing up until it is fully seated.

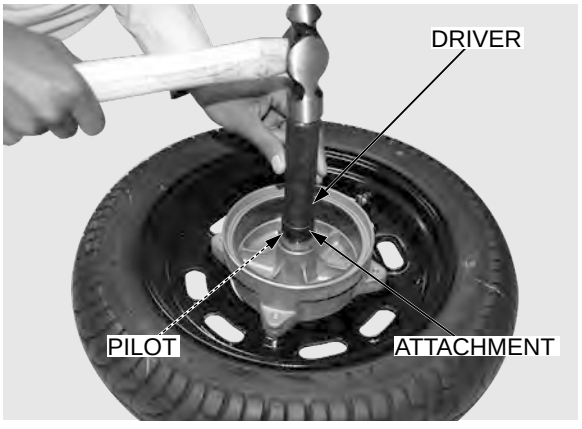
Install the distance collar.
Drive in a new right side bearing squarely with the sealed side facing up until it is fully seated.

**NOTICE**

*Do not let the bearings tilt while driving them in.*

**TOOLS:**

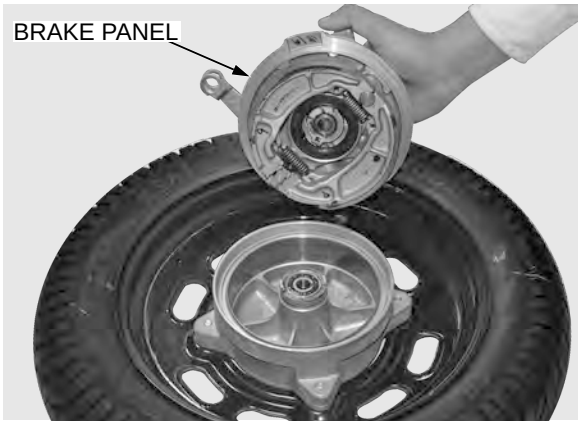
| | |
|---|---|
| **Driver** | **070GD – 001-I100** |
| **Attachment, 32 x 35 mm** | **070GD – 002-I140** |
| **Pilot, 12 mm** | **070GD – 004-I130** |



Apply grease to a new dust seal lip and install it.

Install the side collar from right side of wheel hub.


Install the brake panel assembly from left side of wheel.



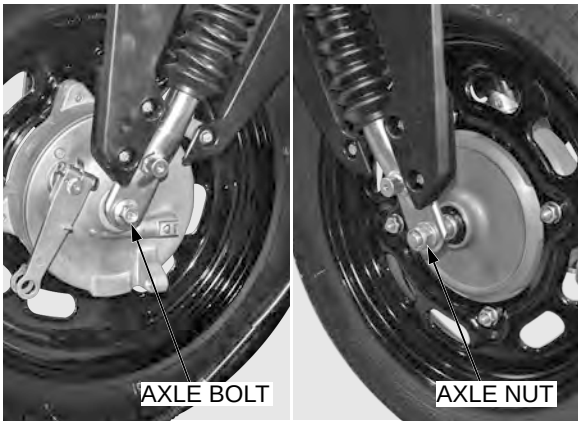

## INSTALLATION

Install the front wheel between the fork legs by aligning the brake panel groove with the boss of the left fork leg.


Apply thin coat of grease to the front axle and insert it from the brake arm side.

Install the axle nut and tighten it to the specified torque.

**TORQUE: 59 N·m (6.0 kgf·m, 43 lbf·ft)**



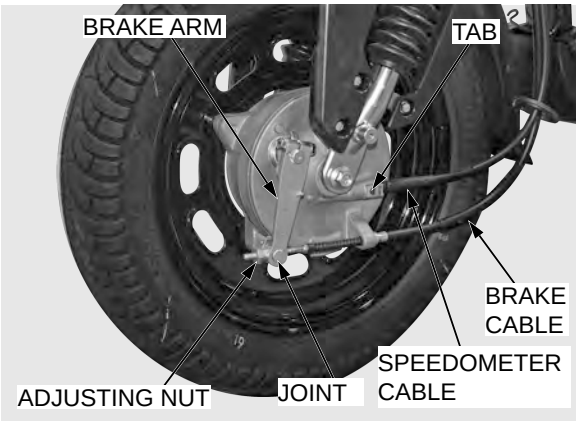
Connect the speedometer cable by aligning its tab with the groove of the speedometer gear box.

Install the brake arm joint into the brake arm.

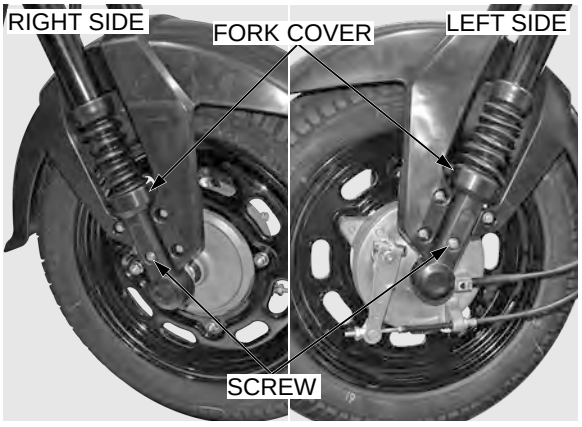
Install the brake cable through the brake panel and to the brake arm.

Install the brake adjusting nut.

Adjust the front brake lever free play (page 3-15).



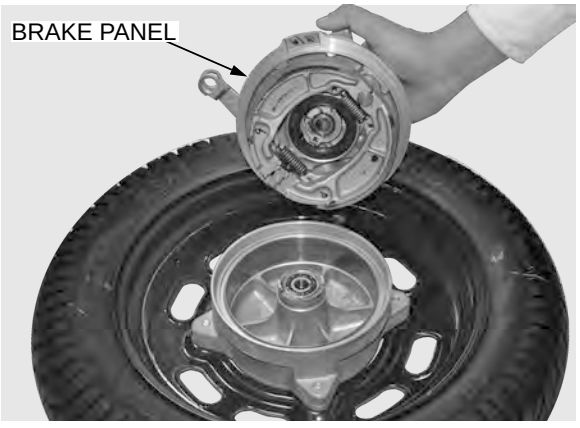

Install the front fork cover of both sides and tighten the screw (1 no.).




# FRONT BRAKE

Remove the front wheel (page 13-3).

Remove the brake panel.




**⚠ WARNING**

- A contaminated brake drum or shoe reduces stopping power. Discard contaminated shoes and clean a contaminated drum with a high quality brake degreasing agent.
- Inhaling of asbestos fibers found to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake assemblies. Use a vacuum cleaner or alternate method to minimize the hazard caused by air borne asbestos fibers.

## INSPECTION

**BRAKE DRUM**

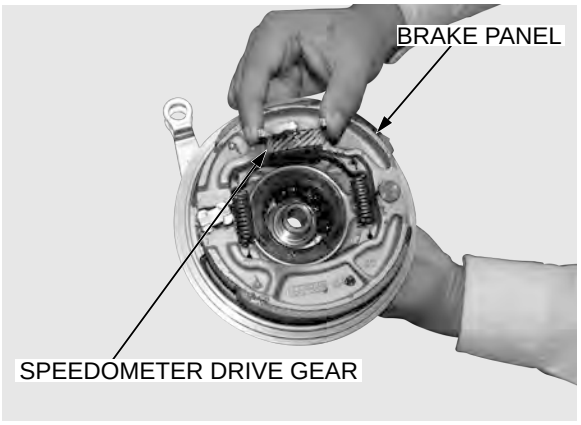
Measure the brake drum I.D.

**SERVICE LIMIT: 131 mm (5.16 in)**

## BRAKE PANEL DISASSEMBLY

Remove the speedometer drive gear from the brake panel.

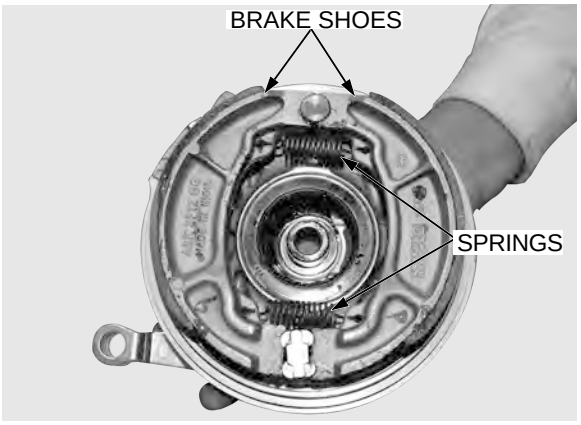
Check for any wear and damage.




Remove the brake shoes and springs.

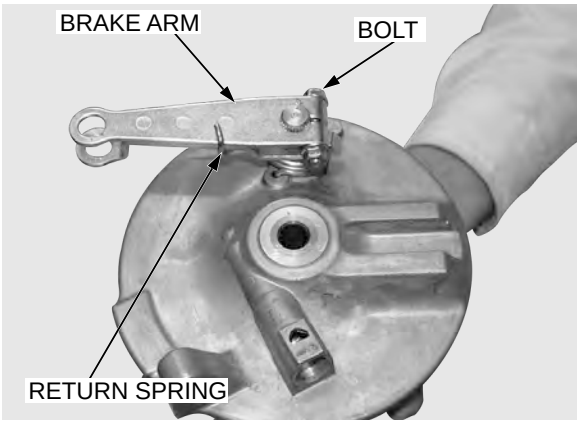
**NOTICE**

- *Replace the brake shoes as a set.*
- *While removal mark the brake shoes to ensure that they are reinstalled on their original position.*

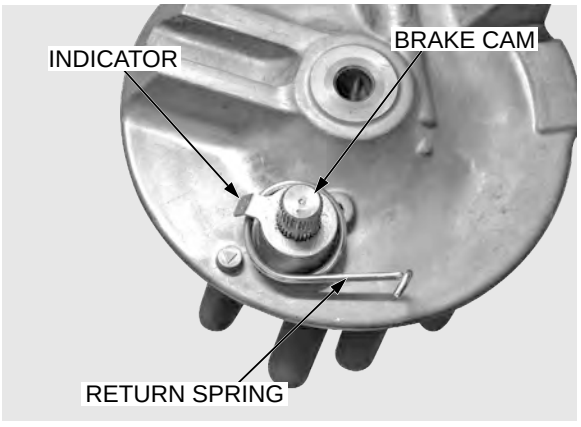



Remove the brake arm bolt (1 no.).

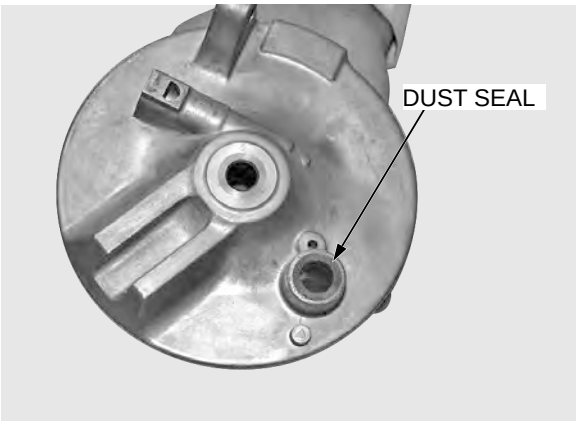
Unhook the return spring from the brake arm.



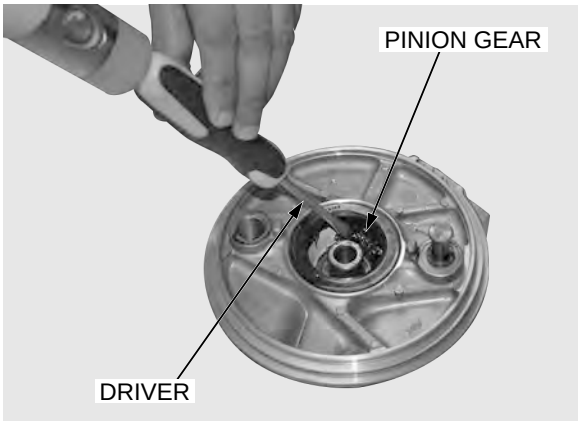

Remove the indicator, return spring and brake cam.



Remove the dust seal.

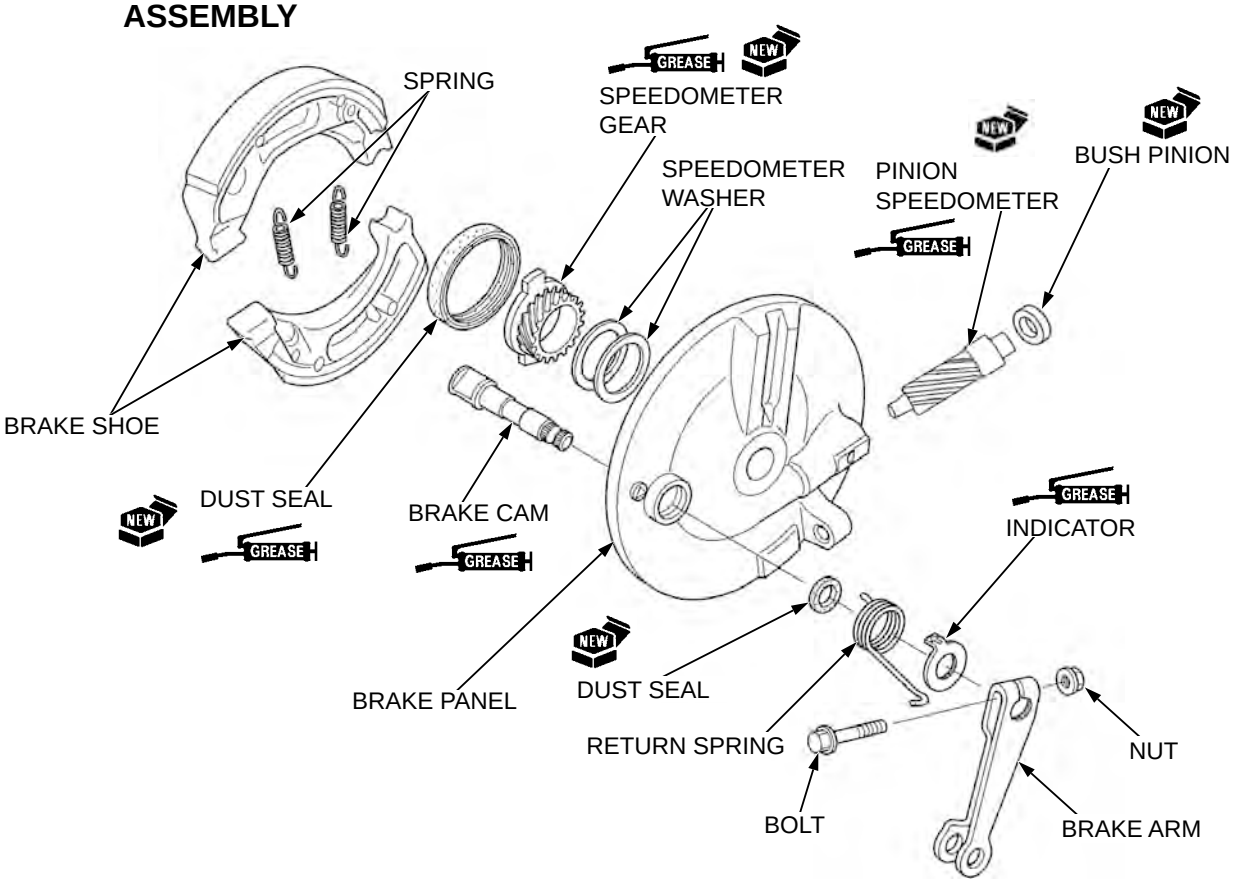



Remove the pinion gear with the help of flat screw driver by using mallet.




Remove the dust seal and washers (2 nos.).

## ASSEMBLY

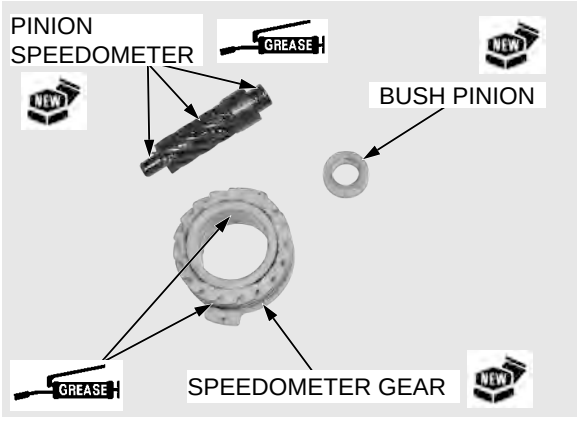



Apply grease to a new dust seal lip and install it into the brake panel.


**NOTE:**

Always install new speedometer gear, new speedometer pinion and new bush pinion as in set.

Apply grease on pinion speedometer and speedometer gear before installation.

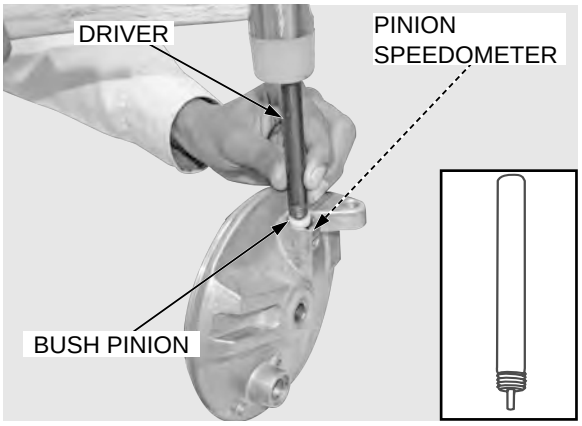


*Be careful, not to damage the Speedo Pinion gear and Bush while pressing.*

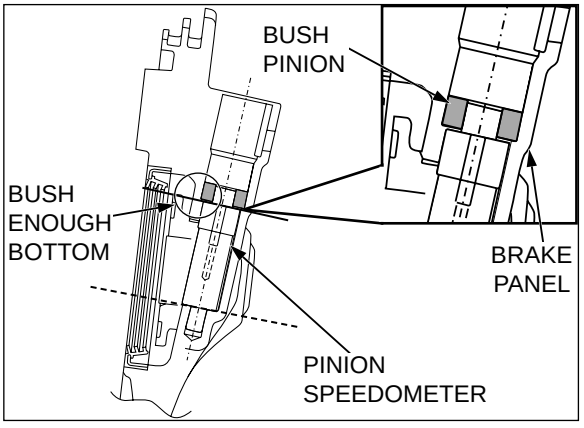
Insert the bush pinion and speedometer pinion in front brake panel by using special tool.

**TOOLS:**

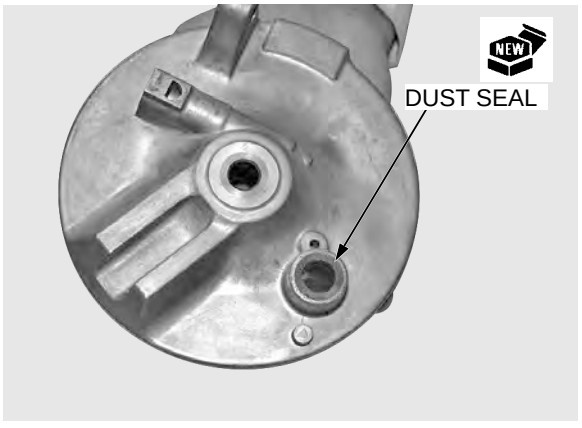
**Pinion speedometer installer** **07000PST900**



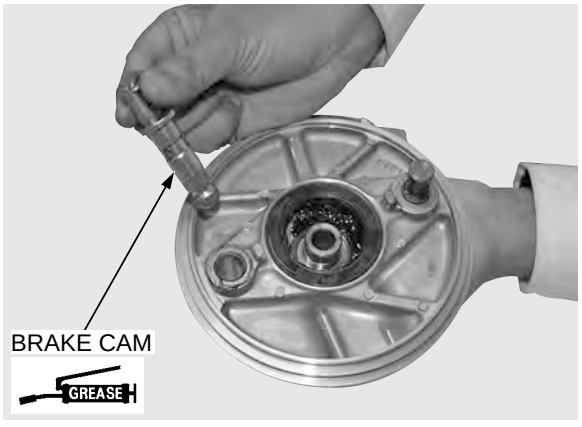

Insert the bush pinion until it hits with brake panel.




Apply grease to the new dust seal and install it into the brake panel.

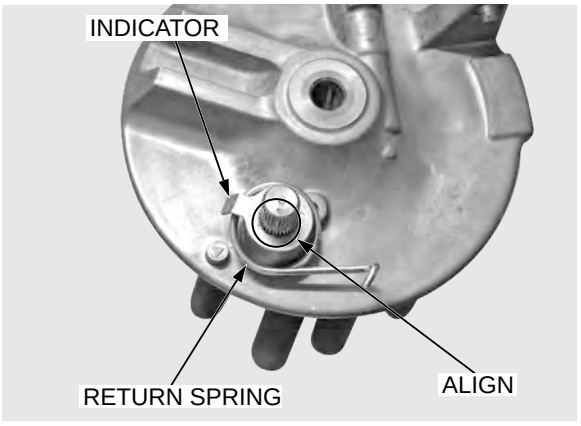



Apply grease to the brake cam sliding surface and install it into the brake panel.



Install the return spring, inserting its end into the hole in the brake panel.

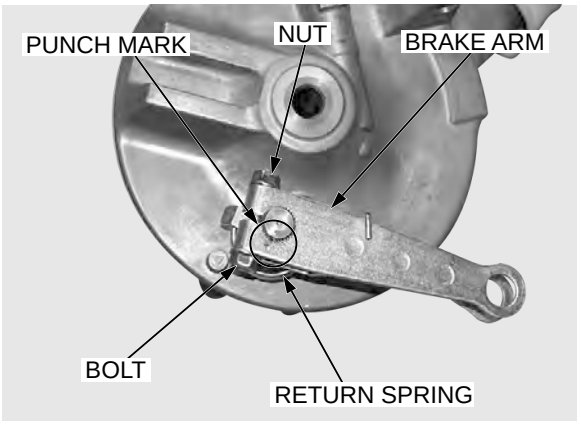
Install the indicator on the brake cam, aligning its wide tooth with the cam's wide groove.




Install the brake arm into the brake cam, aligning the punch marks on the arm and cam.

Install the brake arm bolt and nut, and tighten the nut.

**TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)**

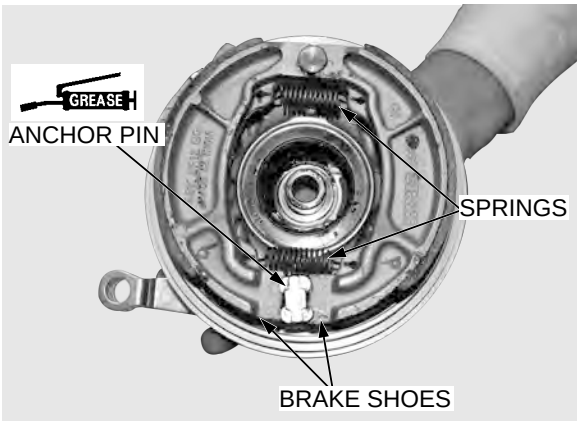



Apply grease to the anchor pin.

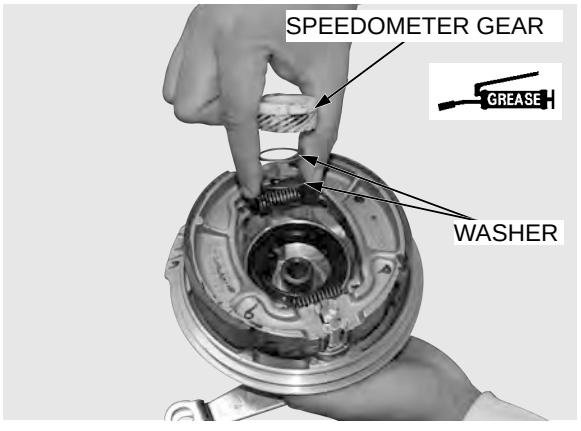
**NOTICE**

- *Wipe any excess grease off the brake cam and anchor pin.*
- *Contaminated brake linings reduce stopping power. Keep grease off the brake linings.*

Install the brake shoes and springs.




Apply grease to the speedometer gear and install it with the washer.



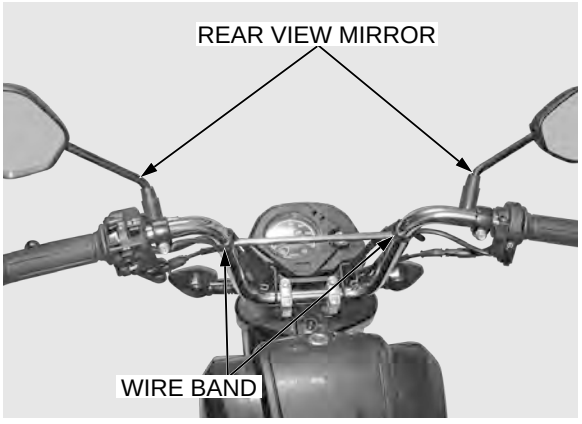
Install the brake panel.

Install the front wheel (page 13-7).

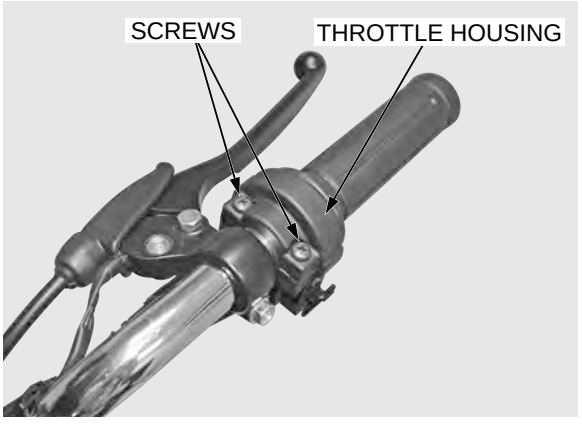

# HANDLEBAR

## REMOVAL

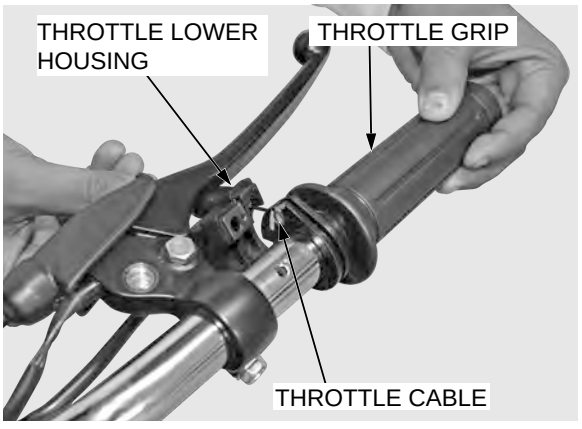
Remove the wire bands and rear-view mirrors.



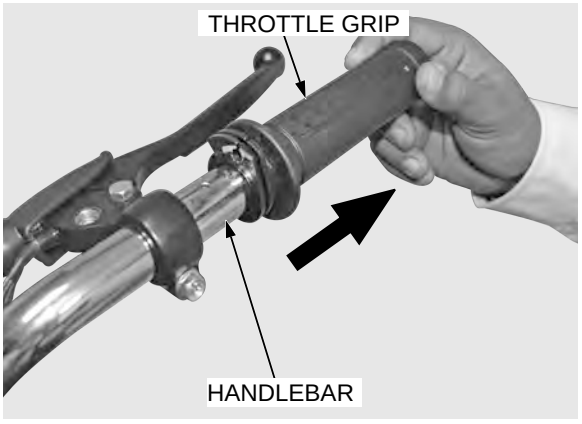

Remove throttle housing screws (2 nos.) from right side of handlebar.




Disconnect the throttle cable from the throttle grip, then remove the throttle lower housing from the handlebar.

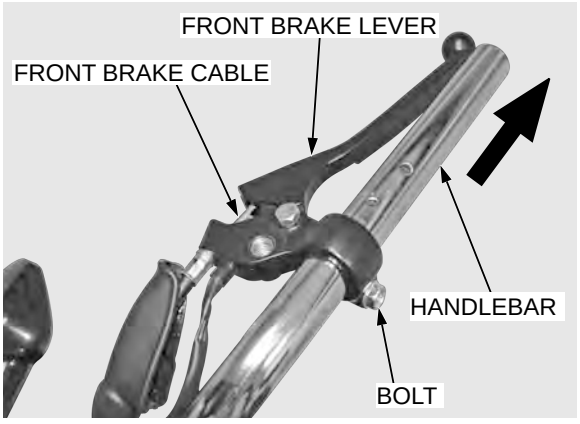


Remove the throttle grip from the handlebar.

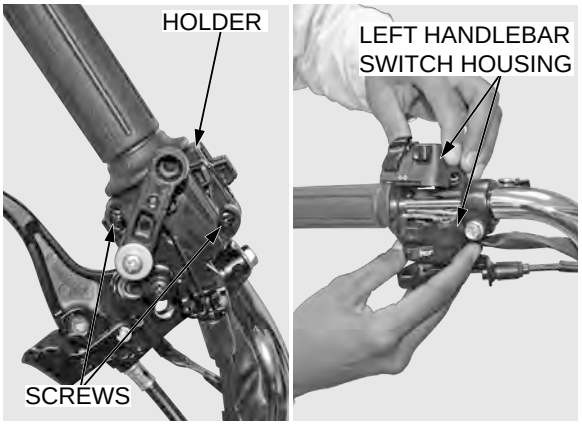



Disconnect the front brake light switch connector (page 18-7).

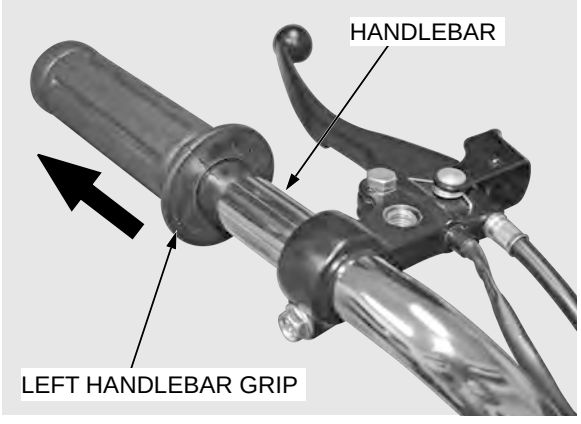
Disconnect the front brake cable, brake lever bracket bolt (1 no.) and remove front brake lever bracket from handlebar.




Remove the screws (2 nos.) and separate the left side of handlebar switch housing.

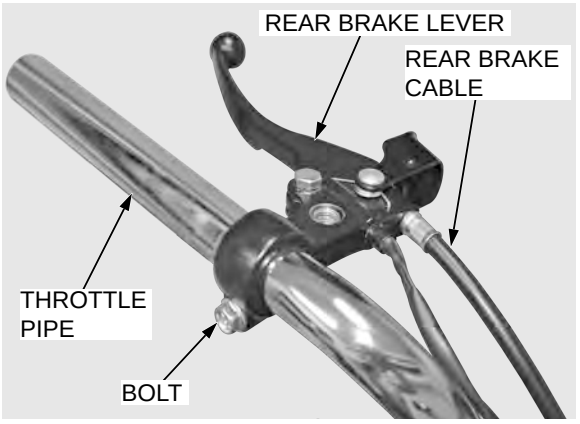



Pull out the left handlebar grip with twisting movement in outward direction from the handlebar.

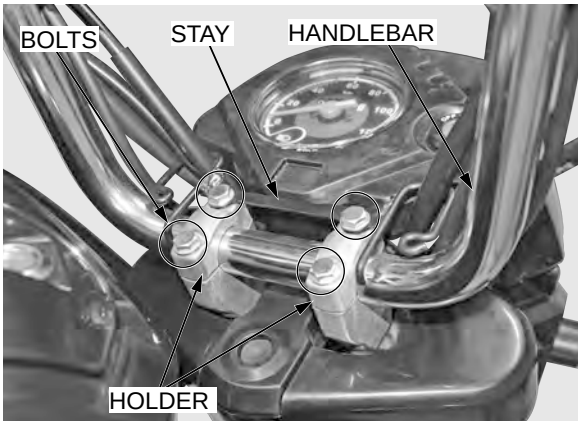


Disconnect the rear brake light switch connector (page 18-8).

Disconnect the rear brake cable, brake lever bracket bolt (1 no.) and remove rear brake lever bracket from handlebar.




Remove the bolts (4 nos.), cable stay, handlebar upper holders (2 nos.) and handlebar from the top bridge.




## INSTALLATION

Route the cables to the stay.

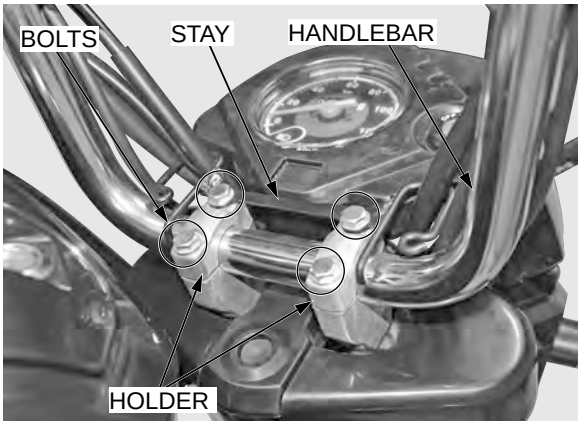
Place the handlebar onto the handlebar lower holders.

Place the handlebar holders with the punch marks facing forward and install the handlebar upper holder bolts.

Align the end of the handlebar lower holder with the punch mark on the handlebar.

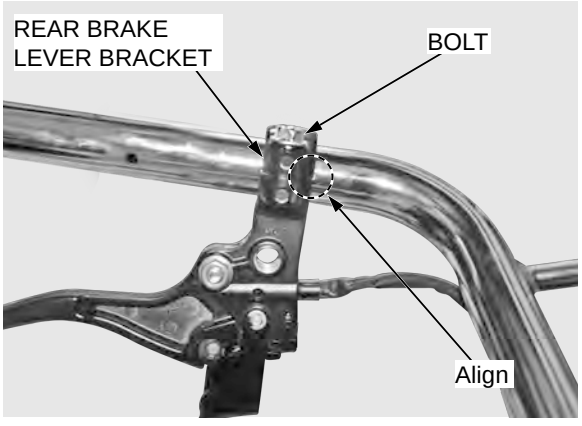
Tighten the front bolts first, then tighten the rear bolts to the specified torque.

**TORQUE: 12 N.m (1.2 kgf.m, 8.8 lbf.ft)**



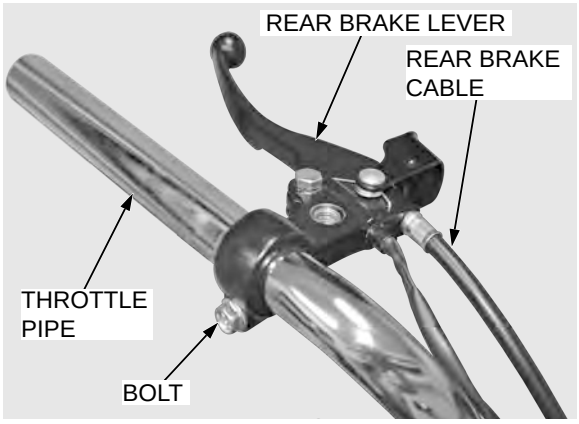

Align the end of the rear brake lever bracket with the punch mark (under side) on the left side of handlebar.

Tighten the rear brake lever bracket bolt.



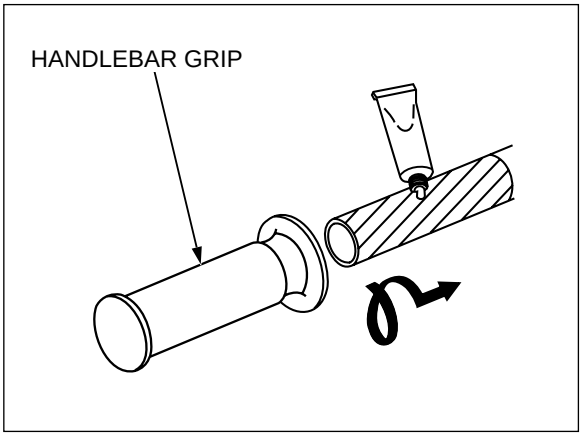
Connect the rear brake light switch connector (page 18-7).

Connect the rear brake cable,



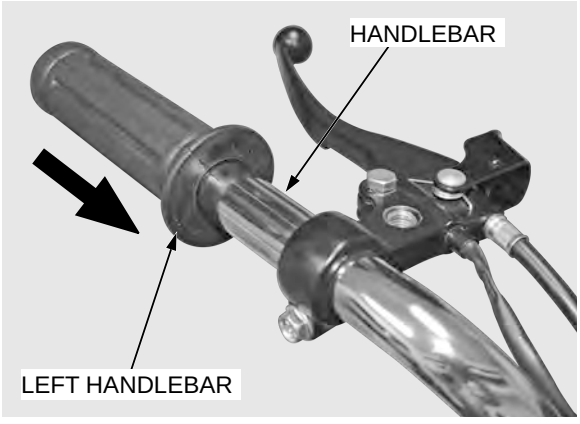

Apply Honda Bond A or its equivalent to the inside surface of the grips and to the clean surface of the left handlebar.

Wait 3-5 minutes and install the grip.

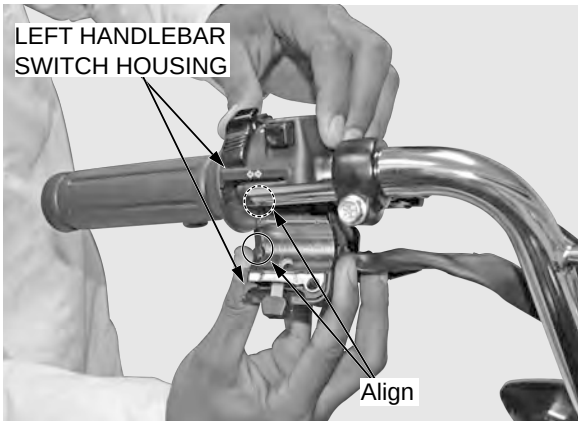



*Allow the adhesive to dry for 1 hour before using.*

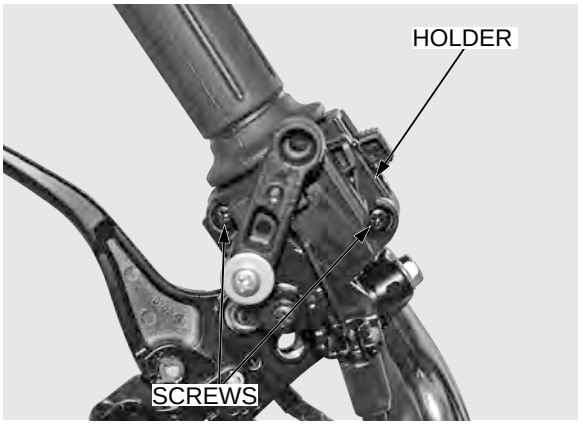
Rotate the grips for even application of the adhesive.




Install the left handlebar switch housing while aligning the locating pin in the housing with the hole in the handle bar.

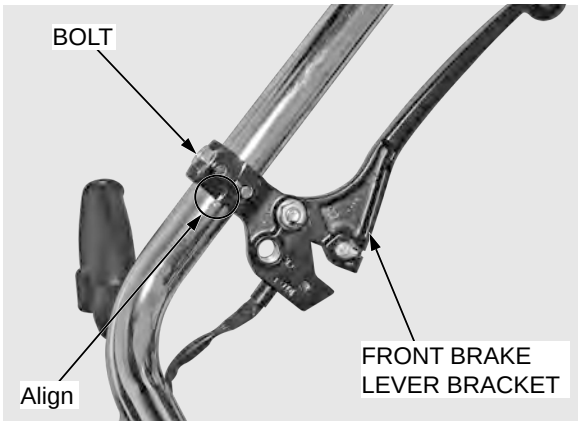


Install the screws (2 nos.) and tighten the forward screw first, then the rear screw.



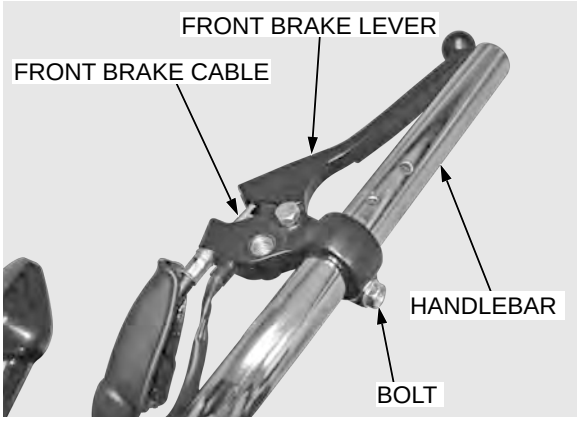

Align the end of the front brake lever bracket with the punch mark (under side) on the right side of handlebar.

Tighten the front brake lever bracket bolt.

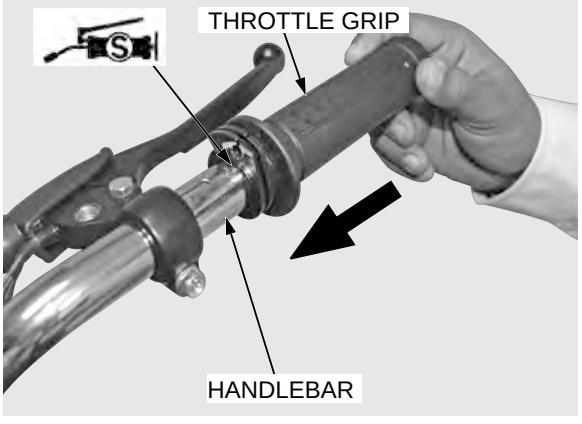



Connect the front brake light switch connector (page 18-7).

Connect the front brake cable (1 no.).

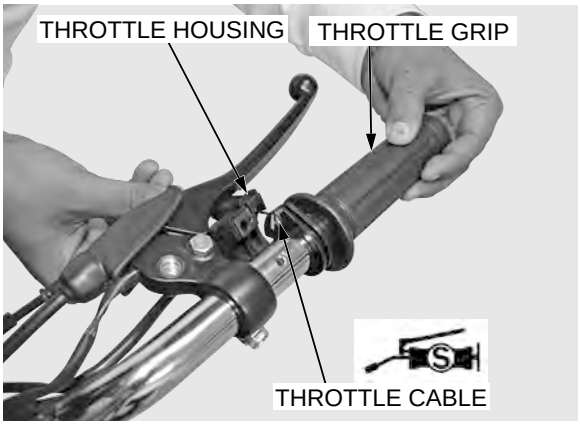



Apply grease to the throttle pipe rotating area of the handlebar and install the throttle grip on the handle bar.

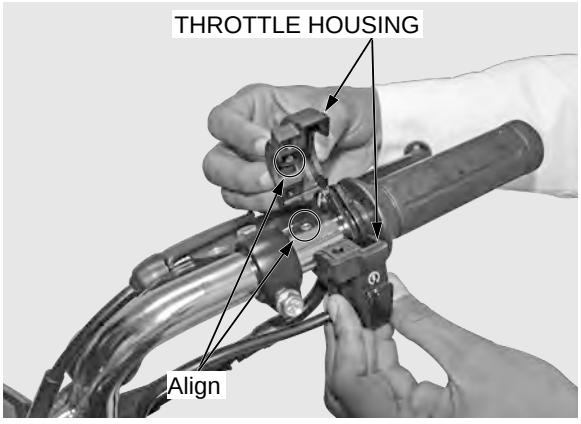


Apply silicon grease to the throttle cable end.

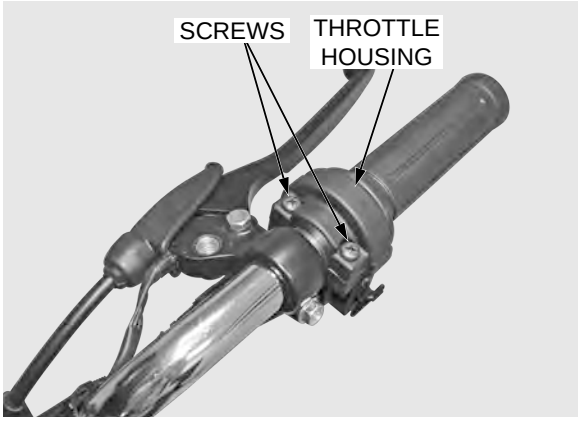
Connect the throttle cable end to the throttle grip.




Install the throttle housing while aligning the locating pin in the housing with the hole in the handle bar.



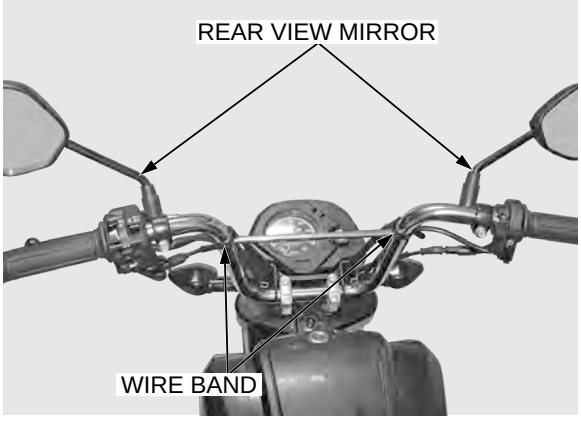

Install the screw and tighten the forward screw first, then the rear screw.




Route the wires and cables properly (page 1-13).

Tighten the rear-view mirrors.

Tie the cables with the wire bands.



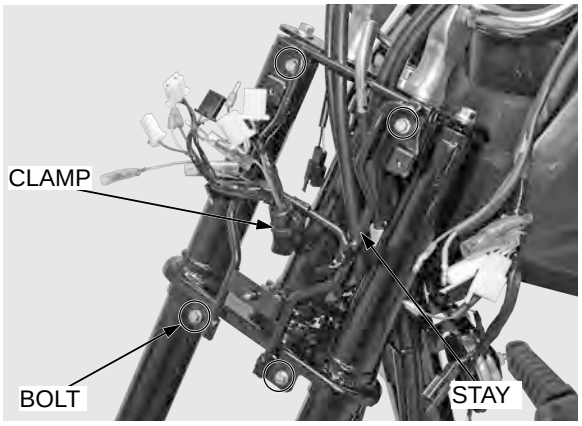
# STEERING STEM

## REMOVAL

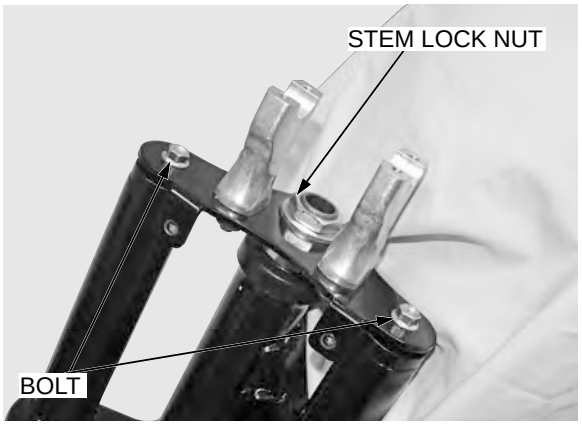
Remove the following:

– Fork cover (left and right ) (page 2-2)
– Handlebar (page 13-14)

Remove the stay by removing bolts (4 nos.)




Remove the steering stem lock nut, bolts (2 nos.) and remove fork top bridge.

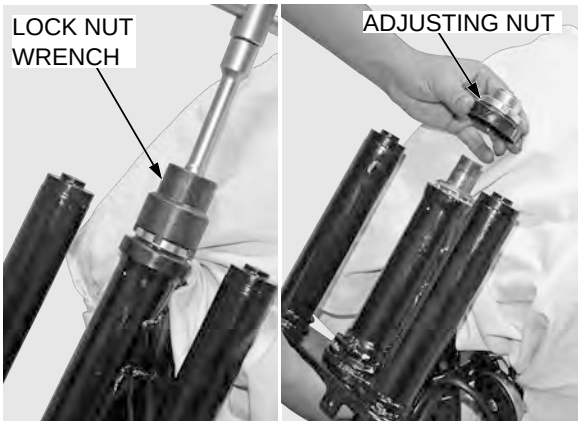



Loosen the adjusting nut using the special tool.

**TOOL:**

**Socket wrench steering** **70SRTKSP004**

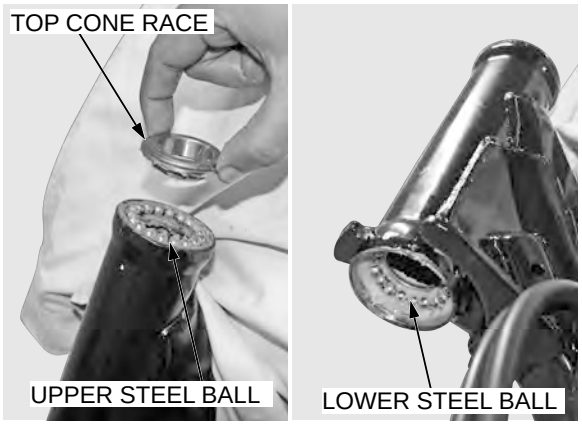
Hold the steering stem and remove the adjusting nut.




Remove the following:

– Top cone race
– Upper steel ball (18)
– Lower steel ball (18)

*Be careful not to loose the steel balls.*

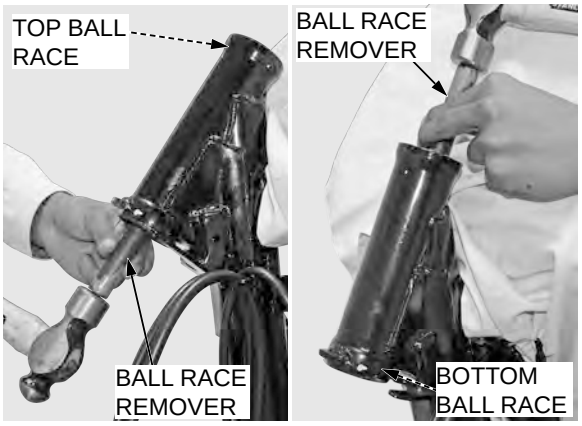


## BALL RACE REPLACEMENT

Remove the ball races using the special tool.

**TOOL:**

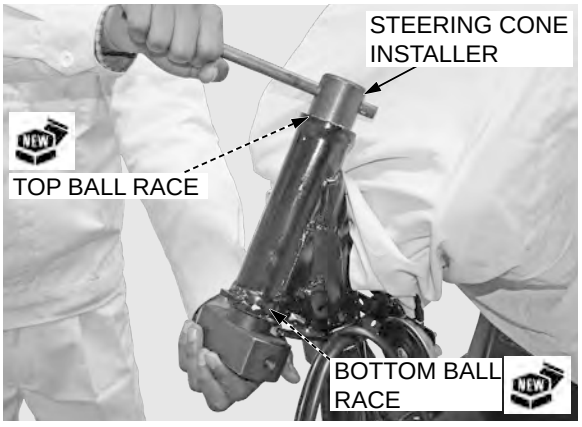
**Ball race remover** **070SRTKSP005**




Install a new top ball race and new bottom ball race using the special tool.

**TOOLS:**

**Steering ball race installer** **70SRTKSP006**




## BOTTOM CONE RACE REPLACEMENT

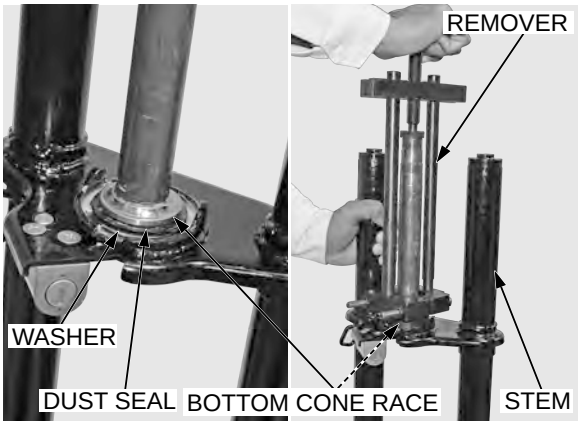
Avoid damaging the steering stem thread, temporarily install the stem nut.

Remove the dust seal and washer.

Remove the bottom cone race with a T-stem cone remover MC tool, being careful not to damage the stem.

**TOOL:**

**T-stem cone remover MC** **07000TCR900**

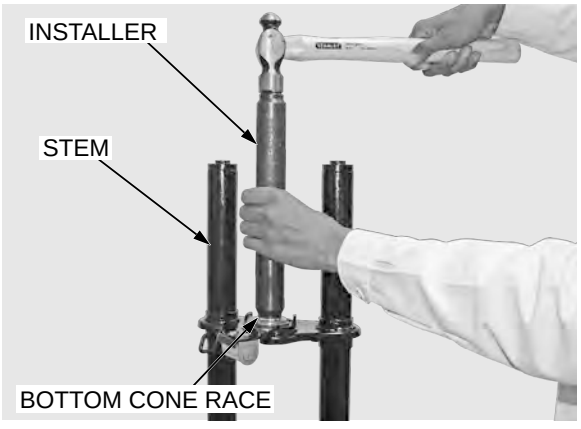



Install the washer and dust seal.

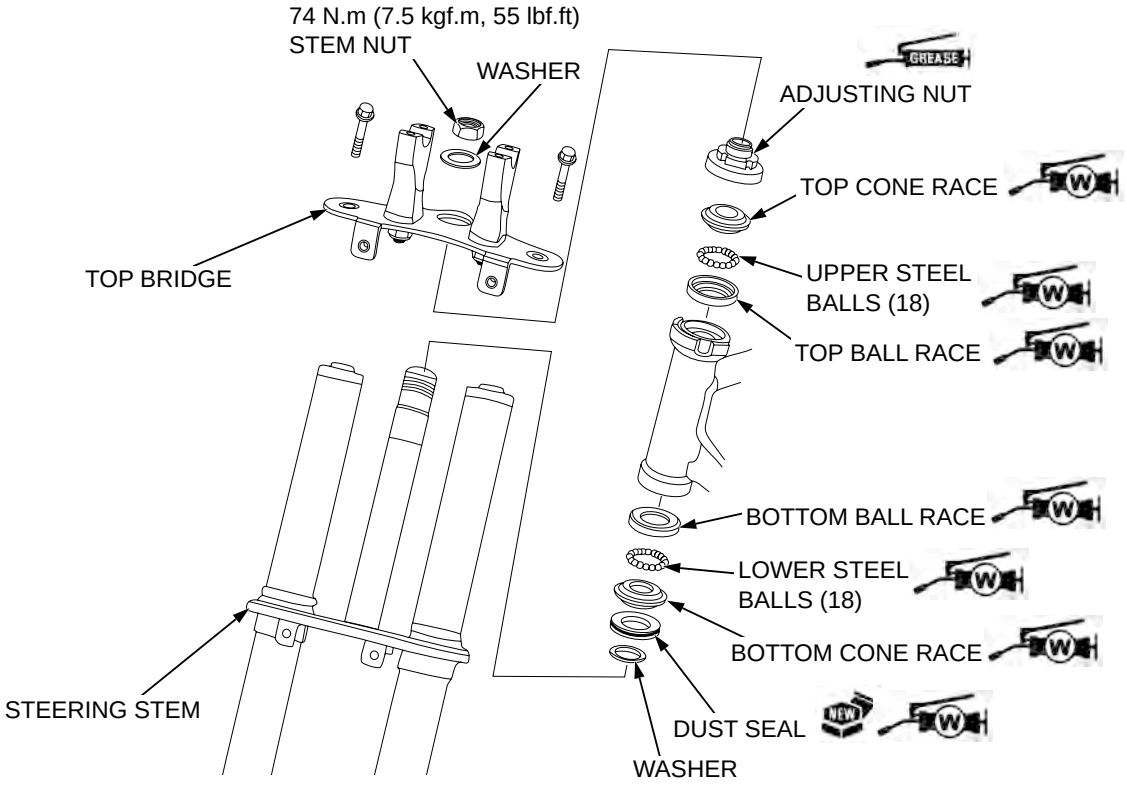
Press a new bottom cone race onto the steering stem using the special tool.

**TOOL:**

**Steering cone installer** **070SRTKSP007**



## ASSEMBLY




Apply water-proof grease to the steering cone races and steering ball races.

Install the steel balls in the bottom cone race and top ball race.

**Upper steel ball: 18**

**Lower steel ball: 18**

Install the steering stem and top cone race.



Install the adjusting nut and tighten it to the specified torque.

**TORQUE: 27 N.m (2.7 kgf.m, 20 lbf.ft)**

**TOOL:**

| | |
|---|---|
| **Socket wrench steering** | **070SRTKSP004** |


Turn the steering stem left and right several times and recheck that there is no vertical play and that the steering stem rotates smoothly.

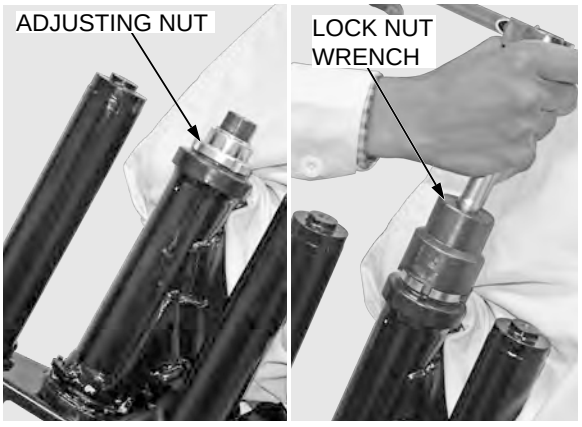
Temporarily loosen the adjusting nut completely, then retighten the adjusting nut to the specified torque.

**TOOL:**

**Socket wrench steering 070SRTKSP004**

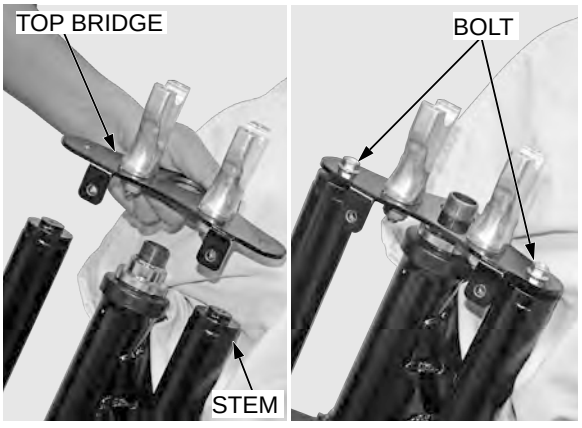
**TORQUE: 1.5 N.m (0.15 kgf.m, 1.0 lbf.ft)**

Check that there is no vertical play and that the steering stem rotates smoothly.

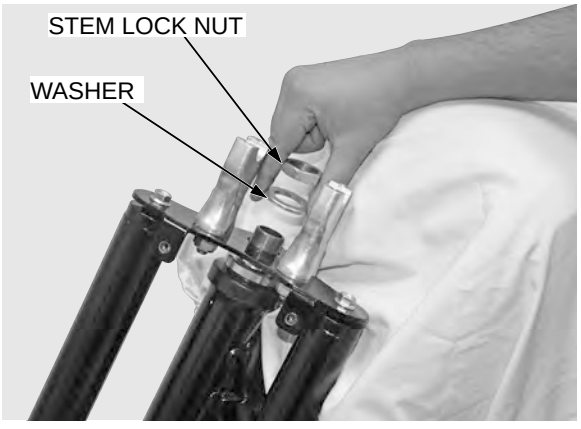



Install the top bridge on the stem and tighten the bolts (2 nos.) to the specified torque.

**TORQUE: 30 N.m (3.1 kgf.m, 22.1 lbf.ft)**



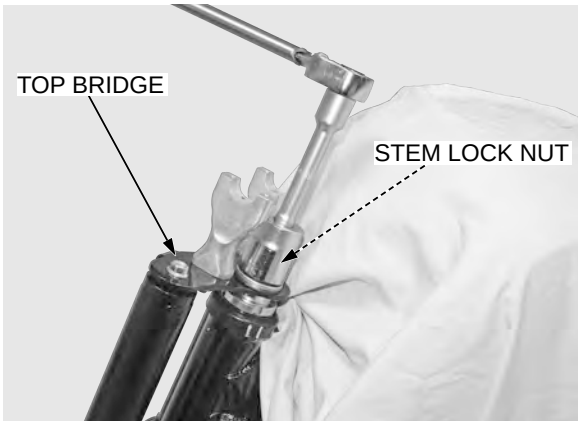

Install the washer and steering stem lock nut.



Tighten the steering stem nut to the specified torque.

**TORQUE: 74 N.m (7.5 kgf.m, 55 lbf.ft)**

Turn the steering stem left and right several times and recheck that there is no vertical play and that the steering stem rotates smoothly.



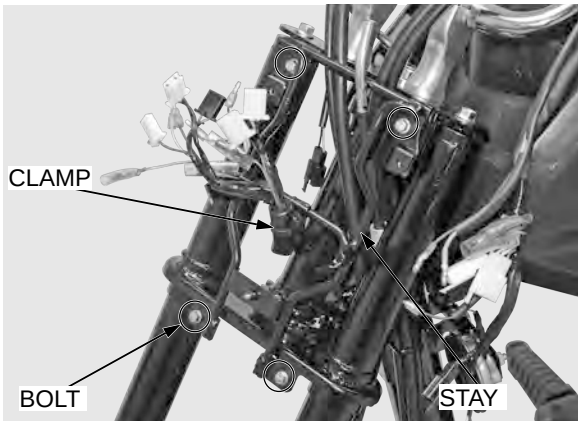

Install the cover stay and tighten the bolts (4 nos.) to the specified torque.

**TORQUE: 10 N.m (1.0 kgf.m, 7 lbf.ft)**

Install the following:

– Handlebar (page 13-16)
– Fork cover L & R (page 2-2)
– Meter assembly (page 2-2).

Connect the all connectors and install the front headlight assy.




# FORK

## REMOVAL

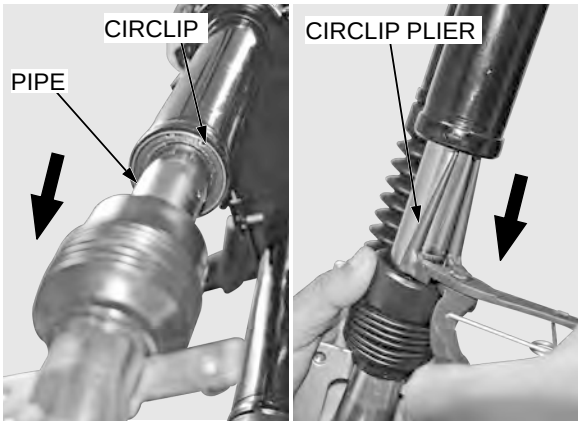
Remove the front wheel (13-3).

Remove the front fender (page 2-7).

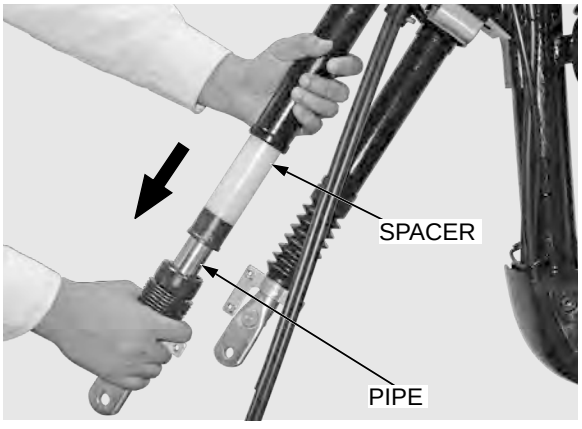
Remove the circlip using special tool downward direction.

**TOOLS:**

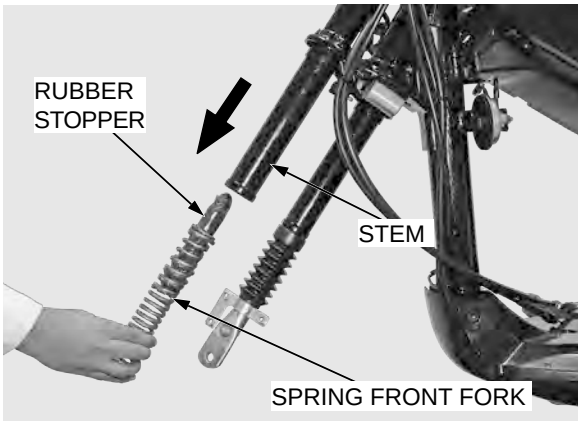
**Circlip plier** **07914-SA50001**




Pull the pipe comp. in downward direction to remove it.

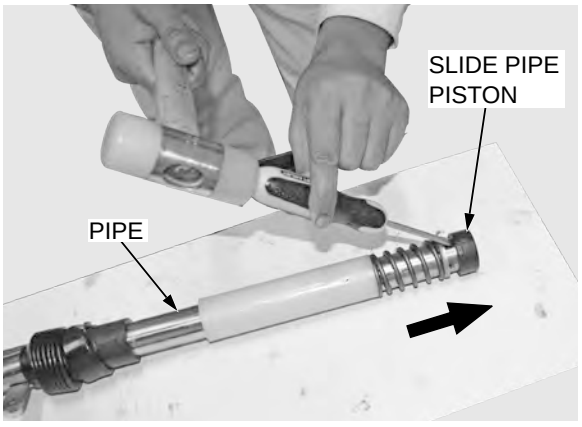


Remove the rubber stopper and spring front fork.




## DISASSEMBLY

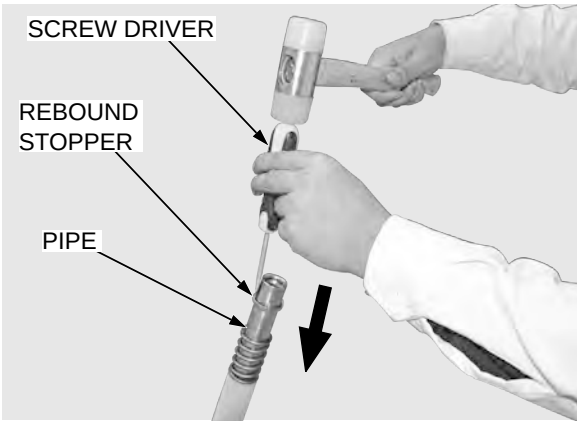
Remove the slide pipe piston by using flat screw driver.



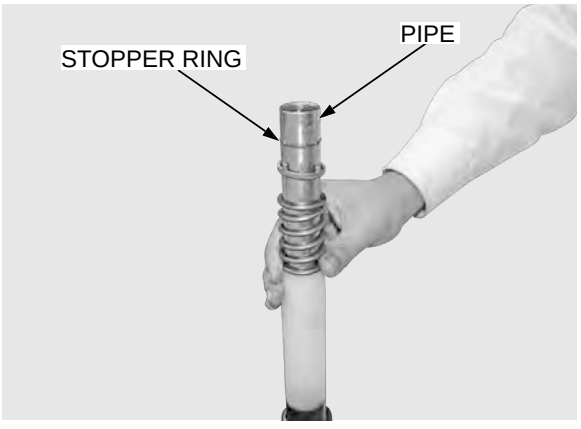

*Do not overtighten the vise on the fork slider.*

Set the fork slider in a vise with a piece of wood or soft jaws to avoid damage.

Unstuck the rebound stopper with the help of flat screw driver.



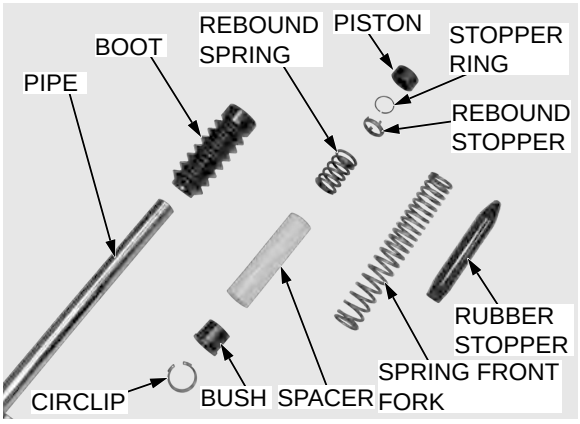

Remove the stopper ring.



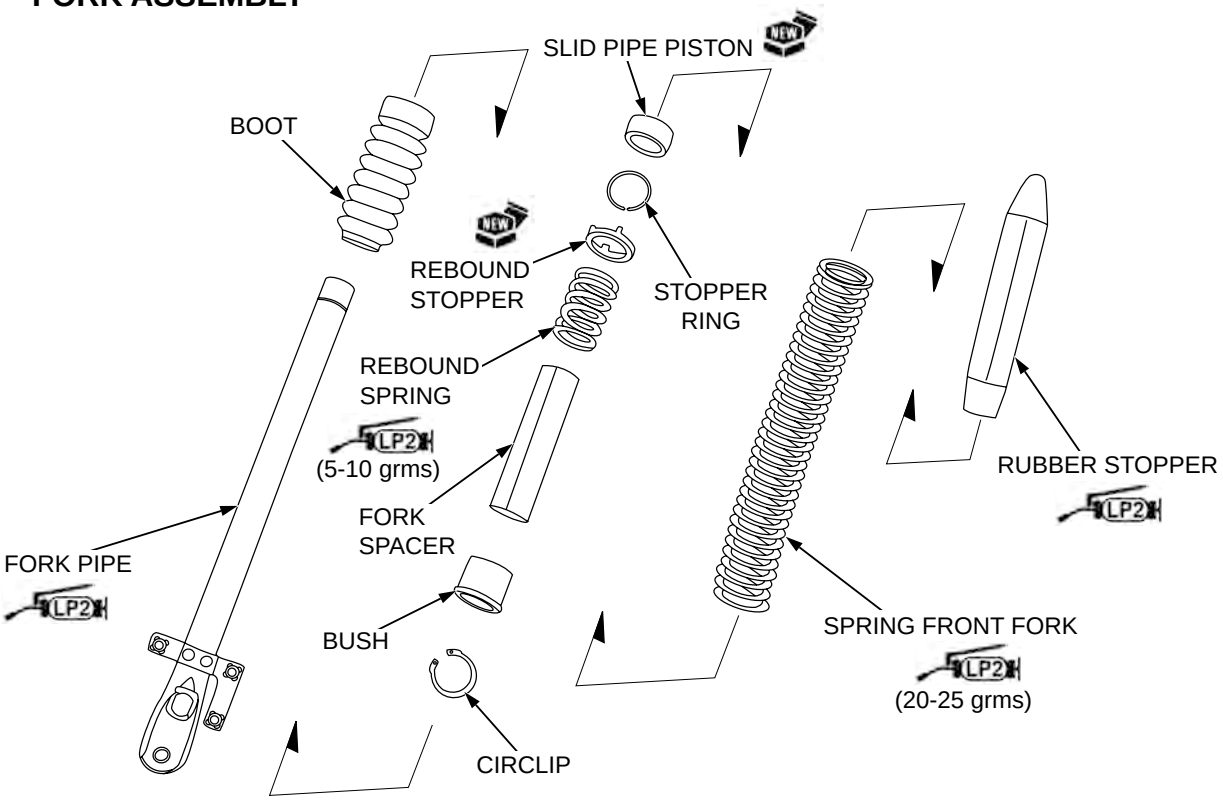
## INSPECTION

Remove and visually inspect the following for wear, damage or other faults:

– Pipe comp.
– Boot
– Circlip
– Bush
– Fork spacer
– Rebound spring
– Rebound stopper
– Stopper ring
– Slide pipe piston
– Spring front fork
– Rubber stopper.




## FORK ASSEMBLY

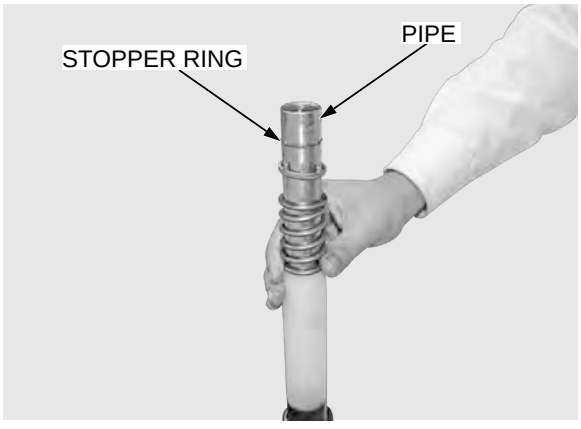



## INSTALLATION

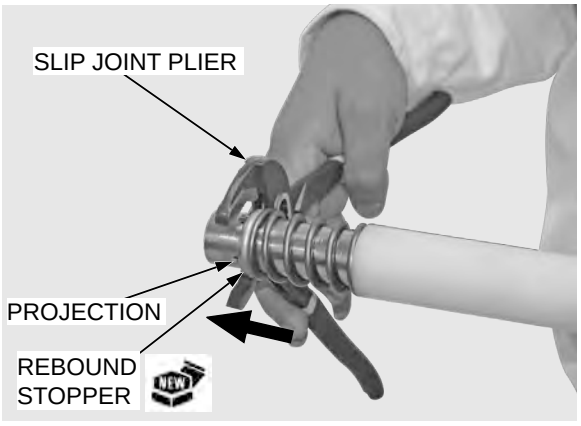
Install the parts in following sequence:

– Pipe comp.
– Boot
– Circlip (chamfered face should be inner side)
– Bush
– Fork spacer
– Rebound spring
– Rebound stopper

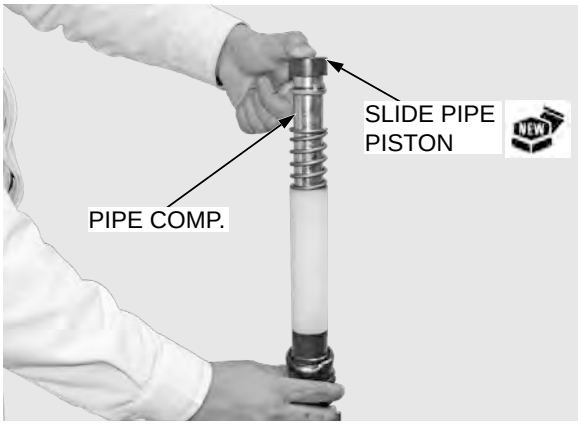
Install and fix the stopper ring to the fork pipe.



Move the rebound stopper to upward till it move and tighten the rebound stopper with the help of slip joint plier by pressing the projections (4 nos.) in the rebound stopper .




Install the new slide pipe piston on the top of the fork pipe comp. and press it tightly.



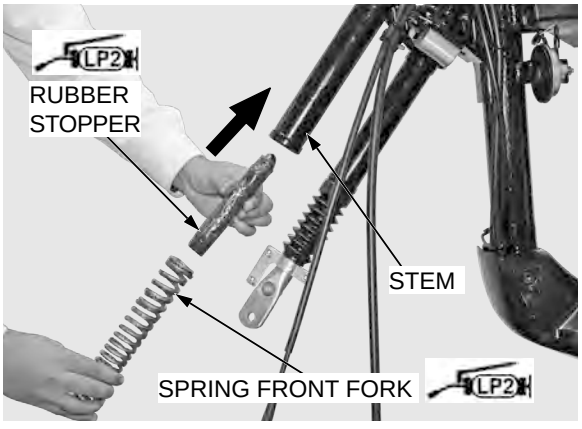

Apply grease on rubber stopper and spring front fork.

**Grease Qty: 20 to 25 grms (Each side)**

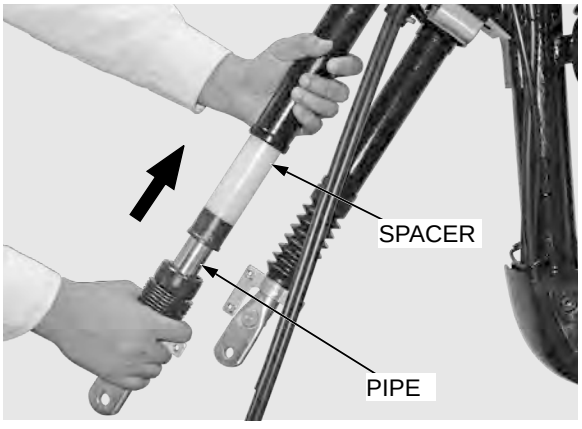
Install the rubber stopper and spring front fork to the stem.

**NOTE:**

Install the larger pitch of spring towards inner side.




Insert the fork pipe comp. inside the stem to install it.



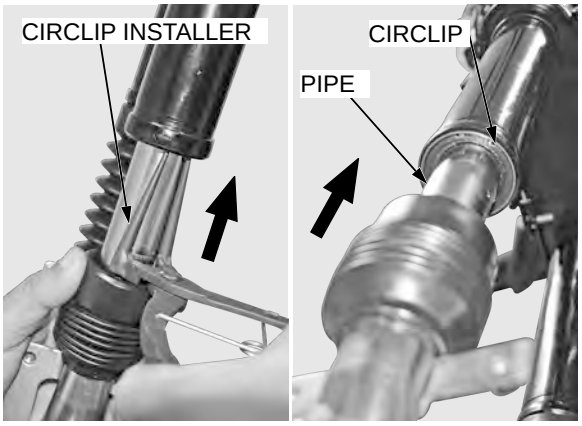
Install the circlip using special tool upward direction.

**TOOLS:**

| | |
|---|---|
| **Circlip plier** | **07914-SA50001** |

Install the front fender (page 2-7).

Install the front wheel (13-7).




# STEERING LOCK

## REMOVAL/INSTALLATION

Remove the steering stem (page 13-20).

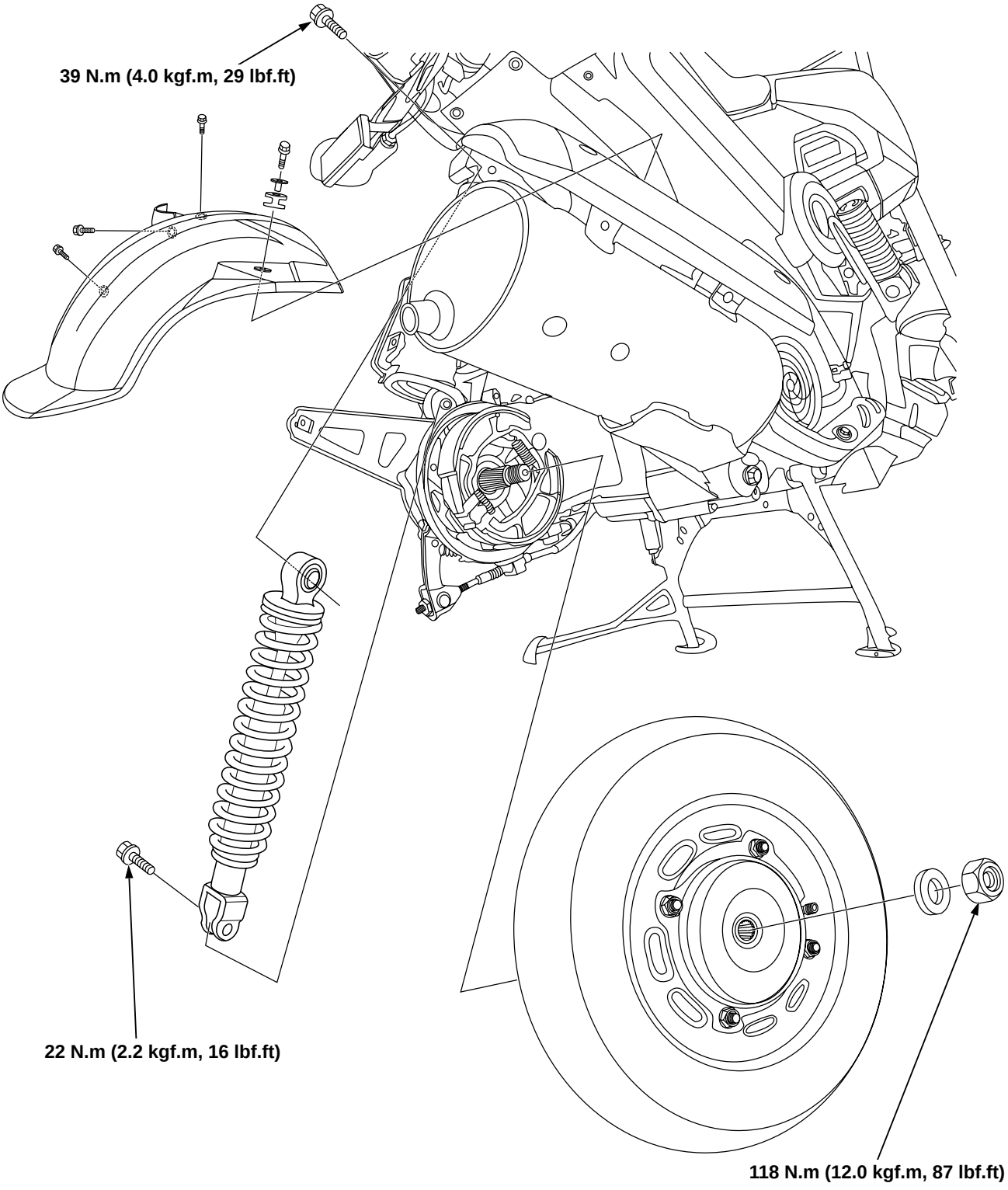
Remove the screws (2 nos.).

Remove the steering lock.

Installation is in the reverse order of removal.

**MEMO**

# COMPONENT LOCATION



# 14. REAR WHEEL/BRAKE/SUSPENSION



## SERVICE INFORMATION

### GENERAL

**⚠ CAUTION**

Frequent inhalation of brake shoe dust, regardless of material composition could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

- Riding on damaged rims impairs safe operation of the vehicle.
- When servicing the rear wheel and suspension, support the vehicle using a center stand or hoist.
- A contaminated brake drum or shoe reduces stopping power. Discard contaminated shoes, and clean a contaminated drum with a high quality brake de-greasing agent.
- After the rear wheel installation, check the brake operation by applying the brake lever.
- Use Honda genuine bolts and nuts for all suspension pivots and mounting points.

**NOTICE**

*A contaminated brake drum or lining reduces stopping power. Discard contaminated linings and clean a contaminated drum with a high quality brake de-greasing agent.*

- Always check the brake operation before riding the vehicle.
- Use genuine Honda replacement bolts and nuts for all suspension pivots and mounting points.

### SPECIFICATIONS

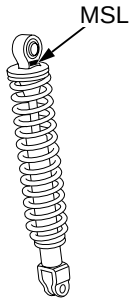
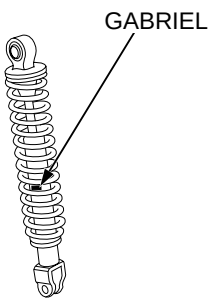
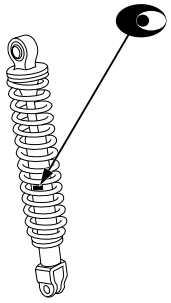
Unit: mm (in)

| ITEM | | STANDARD | SERVICE LIMIT | Page NO. |
|---|---|---|---|---|
| Cold tyre pressure | Driver only | 200 kPa (2.00 kgf/cm², 29 psi) | – | Page 3-18 |
| | Driver and passenger | 250 kPa (2.50 kgf/cm², 36 psi) | – | Page 3-18 |
| Rim size | | 10 x 2.15 in | | |
| Rear wheel rim runout | Radial | – | 2.0 (0.08) | Page 14-3 |
| | Axial | – | 2.0 (0.08) | Page 14-3 |
| Rear brake drum I.D. | | 130 (5.11) | 131 (5.16) | Page 14-4 |

### TORQUE VALUES

| ITEM | THREAD SIZE & TYPE | TORQUE VALUE N.m (kgf.m, lbf.ft) | REMARKS | PAGE NO. |
|---|---|---|---|---|
| Rr. axle nut | M16x1.5 | 118 (12.0, 87) | PT Nut Apply Oil | Page 14-4 |
| Rr. hub nut | M10x1.25 | 49 (5.0, 36.1) | PT Nut Apply Oil | Page 14-4 |
| | M10x1.25 | 49 (5.0, 36.1) | PT Nut Apply Oil | Page 14-4 |
| Rr. brake arm bolt | M6x1.0 | 10 (1.0, 7) | Alock Bolt | Page 14-6 |
| Rr. cushion (upper side) | M10x1.25 | 39 (4.0, 29) | | Page 14-7 |
| Rr. cushion (lower side) | M8x1.25 | 22 (2.2, 16) | | Page 14-7 |

## MULTIPLE SOURCED COMPONENT : CUSHION ASSEMBLY

| MAKER | MUNJAL SHOWA | GABRIEL | ENDURANCE |
|---|---|---|---|
| IDENTIFICATION MARKS |  |  |  |

**NOTE:** Parts are not interchangeable with other makers.

**REFERENCE:** For maker wise child part details refer latest parts catalogue.

# TROUBLESHOOTING

### Rear wheel wobbling
- Bent rim
- Worn or damaged final shaft bearing
- Worn or damaged engine mounting bushings
- Faulty tyre
- Axle nut or engine mounting nut not tightened properly
- Insufficient tyre pressure
- Unbalanced tyre and wheel

### Hard suspension
- Bent rear shock absorber damper rod
- High tyre pressure

### Poor brake performance
- Improper brake adjustment
- Contaminated brake shoe lining
- Worn brake shoes
- Worn brake cam
- Contaminated brake drum
- Worn brake drum

### Soft suspension
- Weak rear shock absorber spring
- Faulty rear shock absorber damper

# REAR WHEEL

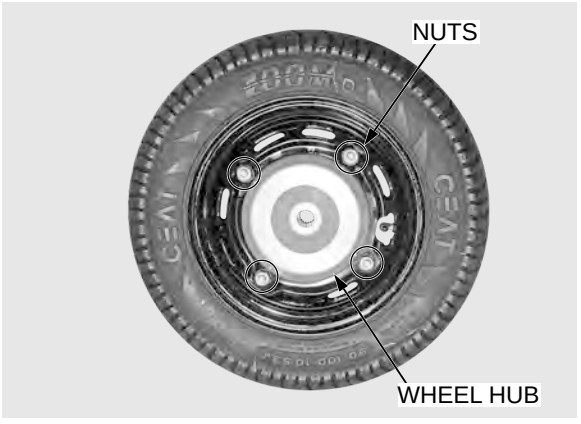
## REMOVAL

Remove the rear fender RR inner (page 2-9).

Remove the vehicle from the main stand and apply rear brake.

Remove the axle nut, washer and the rear wheel.


Remove the nuts (4 nos.) and wheel hub.



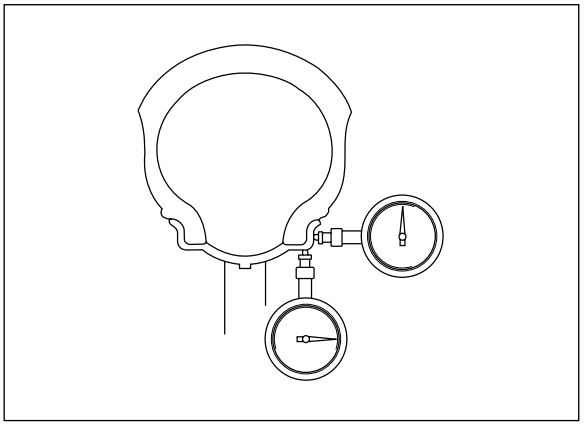

## INSPECTION

Check the wheel rim runout using a dial indicator.

Actual runout is 1/2 the total indicator reading.

**SERVICE LIMITS:** **Radial: 1.0 mm (0.03 in)**

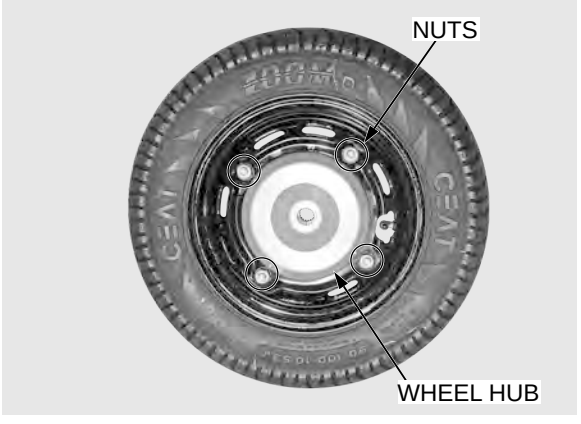
**Axial: 1.0 mm (0.03 in)**



## INSTALLATION

Install the wheel hub on the wheel and tighten the nuts (4 nos.) to the specified torque.

**TORQUE: 49 N·m (4.9 kgf·m, 36 lbf·ft)**



**NOTE:**

Check the rotating direction mark on the tyre (rear wheel) before installation.


Install the rear wheel and washer.

Apply oil to the axle nut threads and seating surface, and install it.

Tighten the axle nut.

**TORQUE: 118 N·m (12.0 kgf·m, 87 lbf·ft)**

Install the rear fender RR inner (page 2-9).


# REAR BRAKE

Remove the rear wheel (page 14-3).

## INSPECTION

Measure the rear brake drum I.D.

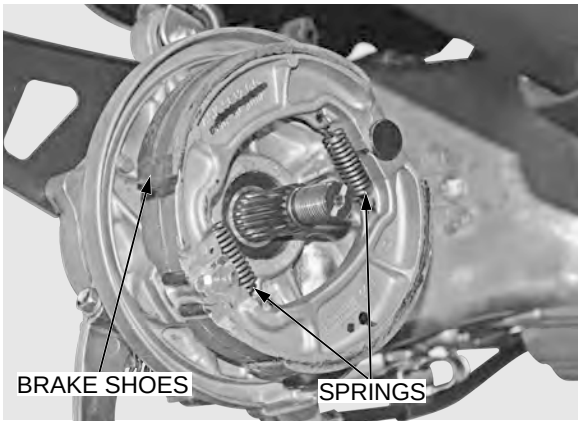
**SERVICE LIMIT: 131 mm (5.16 in).**

## DISASSEMBLY

**NOTICE**

- *Replace the brake shoes as a set.*
- *Mark the brake shoes to ensure that they are reinstalled on their original position.*

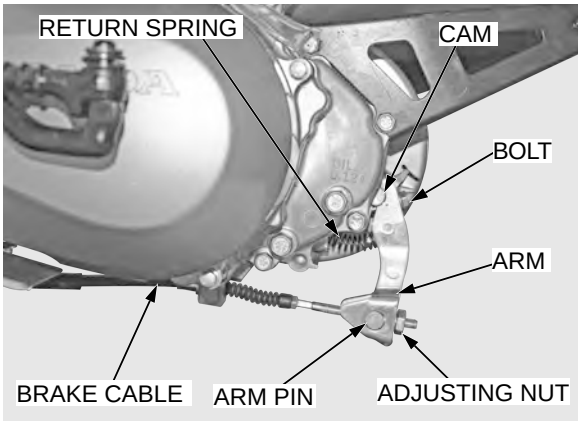
Remove the brake shoes and springs.



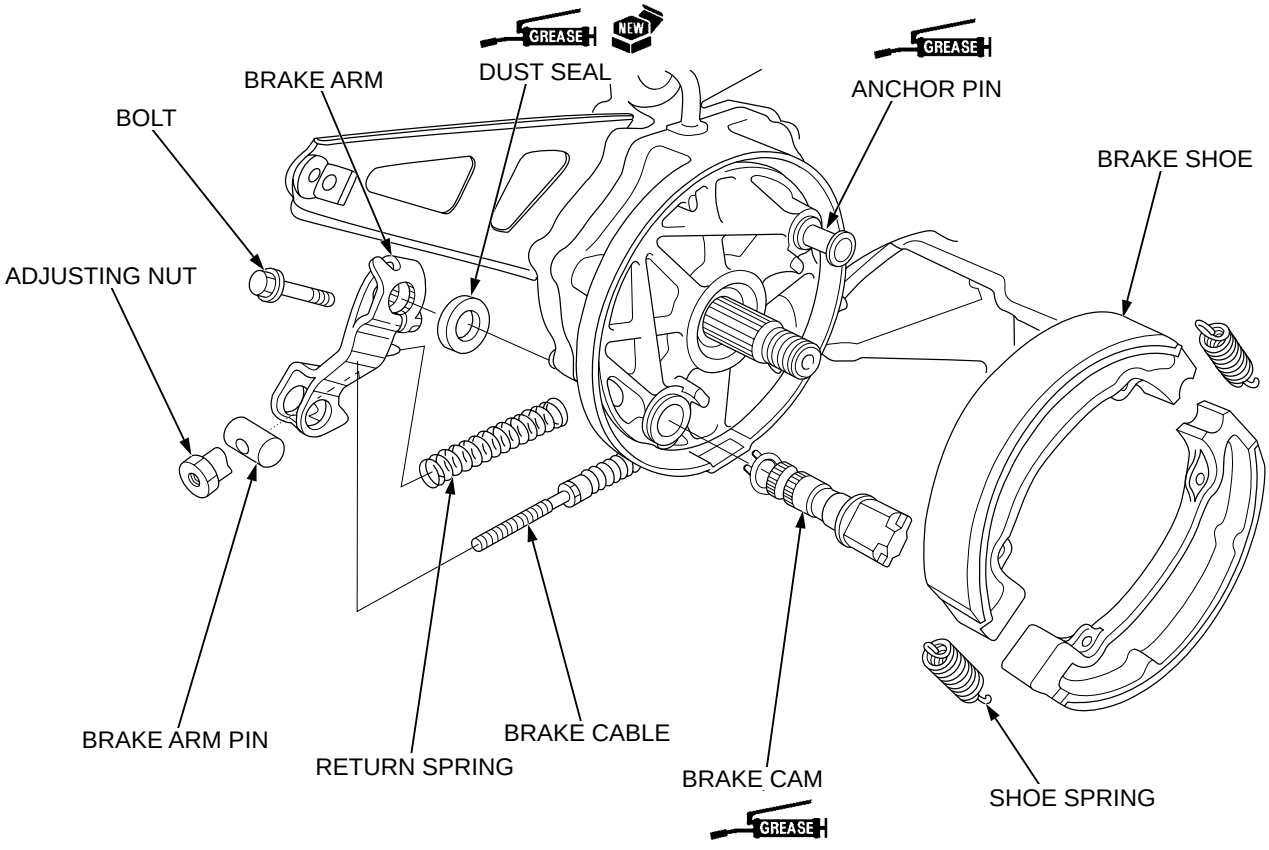
Remove the adjusting nut, brake cable and brake arm joint from the brake arm.

Remove the brake arm return spring.

Remove the brake arm bolt, brake arm, brake cam and dust seal from the brake panel (transmission case).

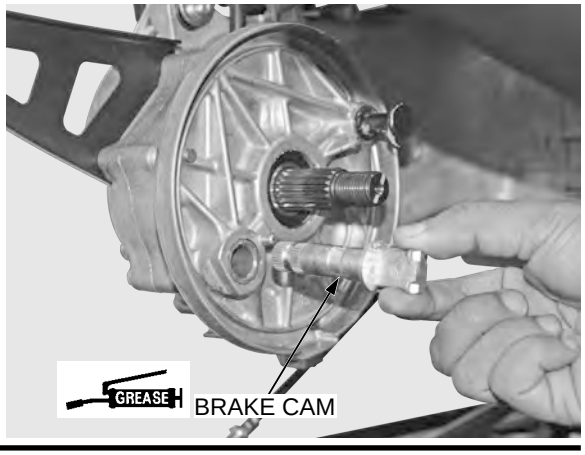



## ASSEMBLY

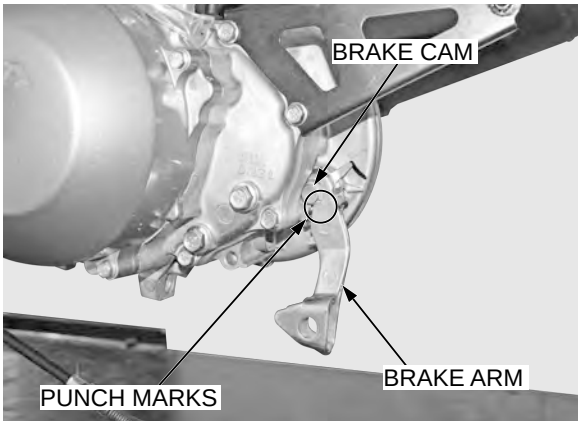



Apply grease to a new dust seal lip and install it into the brake panel (transmission case).

Apply grease to the brake cam sliding surface and install it into the brake panel.



Install the brake arm onto the brake cam, aligning the punch marks on the arm and cam.

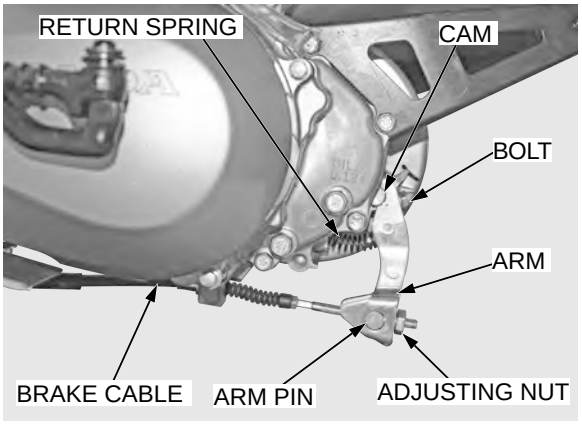



Install and tighten the brake arm bolt (1 no.).

**TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)**

Install the return spring.

Install the brake arm joint, brake cable and brake adjusting nut (page 3-15).




Apply grease to the brake cam and anchor pin.

**⚠ CAUTION**

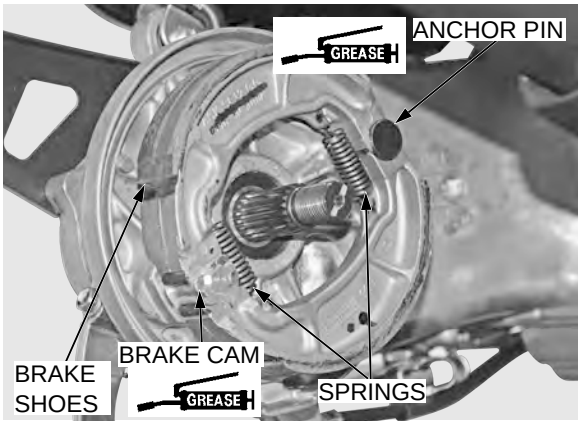
When the brake shoes are reused, install them on their original position.

Install the shoe springs onto the brake shoes.

Install the brake shoes and springs onto the brake cam and anchor pin.

Install the rear wheel (page 14-4).

Adjust the rear brake free play (page 3-15).

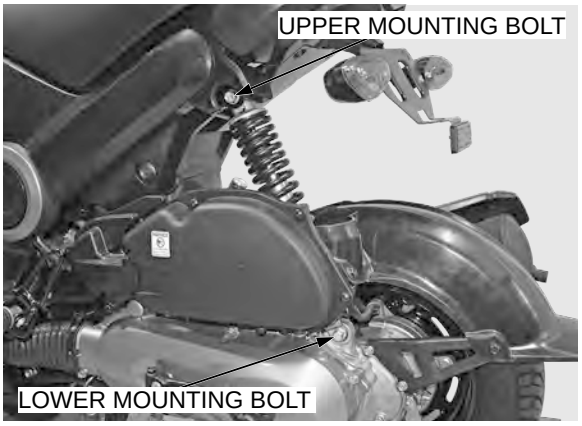


# SHOCK ABSORBER

## REMOVAL

Place the vehicle on its centre stand.

Remove the upper mounting bolt (1 no.) first and then lower mounting bolt (1 no.), then remove shock absorber.



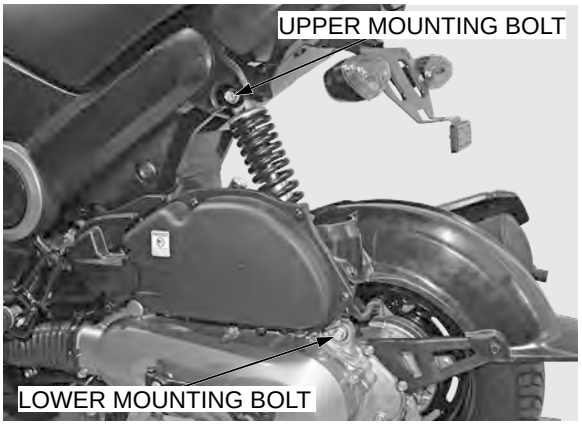

## INSPECTION

Visually inspect the shock absorber for oil leaks or other faults.

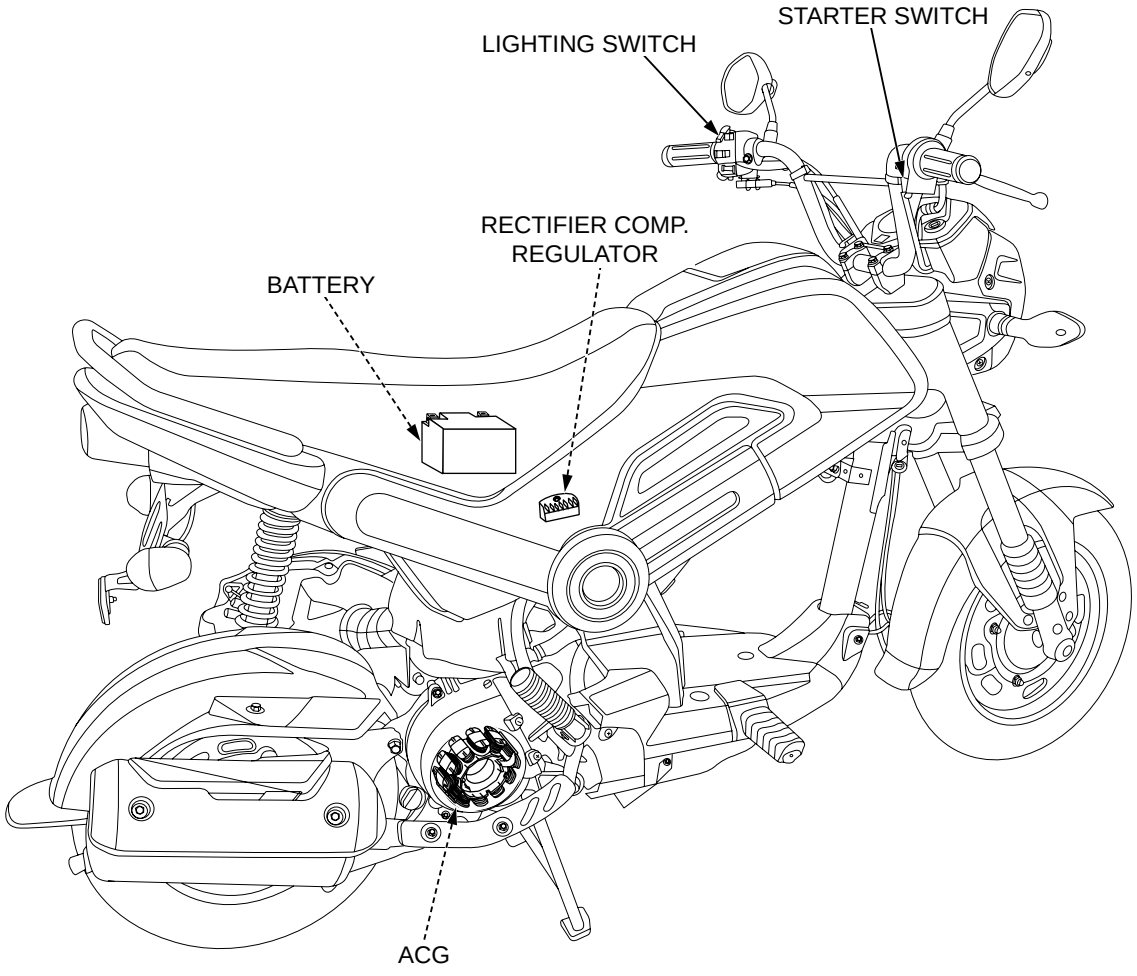

## INSTALLATION

Install the shock absorber and tighten the lower mounting bolt (1 no.) first then tighten the upper mounting bolt (1 no.) .

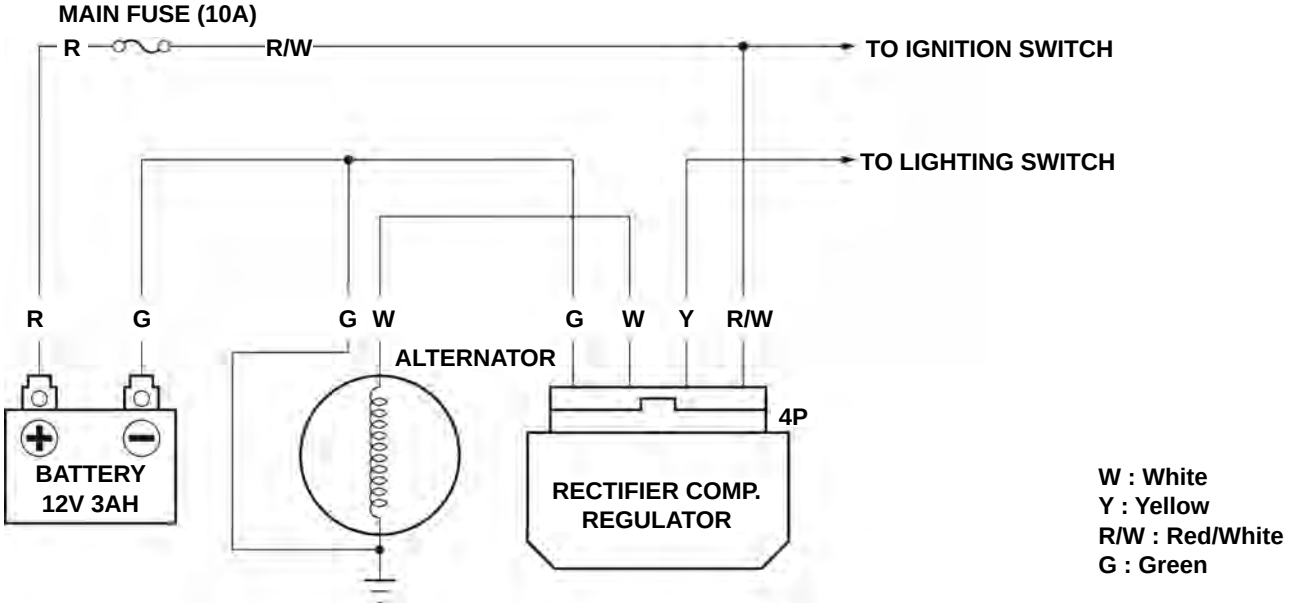
**TORQUE: Upper: 39 N·m (4.0 kgf·m, 29 lbf·ft)**
**Lower: 22 N·m (2.2 kgf·m, 16 lbf·ft)**



# COMPONENT LOCATION




# SYSTEM DIAGRAM



# 15. BATTERY/CHARGING SYSTEM



## SERVICE INFORMATION

### GENERAL

**⚠ WARNING**

- The battery gives off explosive gases, keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.
- The battery contains sulphuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.
  - If electrolyte gets on your skin, flush with water.
  - If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician immediately.
- Electrolyte is poisonous.
  - If swallowed, drink large quantities of water or milk and call your local Poison Control Center or a physician immediately.

**NOTICE**

- Always turn “OFF” the ignition switch before disconnecting any electrical component.
- Some electrical components may be damaged if terminals or connectors are connected or disconnected when the ignition switch is “ON”, and current is present.
- For extended storage, remove the battery, give it a full charge, and store it in a cool, dry space. For maximum service life, charge the stored battery every two weeks.
- For a battery remaining in a stored vehicle, disconnect the negative battery cable from the battery terminal.
- The battery can be damaged if overcharged or undercharged, or if left to discharge for a long period. These same conditions contribute to shortening the “life span” of the battery. Even under normal use, the performance of the battery deteriorates after 2–3 years.
- Battery voltage may recover after battery charging, but under heavy load, battery voltage will drop quickly and eventually die out. For this reason, the charging system is often suspected as the problem. Battery overcharge often results from problems in the battery itself, which may appear to be an overcharging symptom. If one of the battery cells is shorted and battery voltage does not increase, the rectifier comp. regulator supplies excess voltage to the battery. Under these conditions, the electrolyte level goes down quickly.
- The battery will self-discharge when the vehicle is not in use. For this reason, charge the battery every two weeks to prevent sulfation occurring of.
- When checking the charging system, always follow the steps in the troubleshooting flow chart (page 15-2).
- Refer to the alternator removal and disassembly.



#### BATTERY TESTING

Refer to instructions in the Operation Manual for the recommended battery tester for details about battery testing.
The recommended battery tester puts a “load” on the battery so that the actual battery condition can be measured.

**Recommended battery tester: FBT-50**

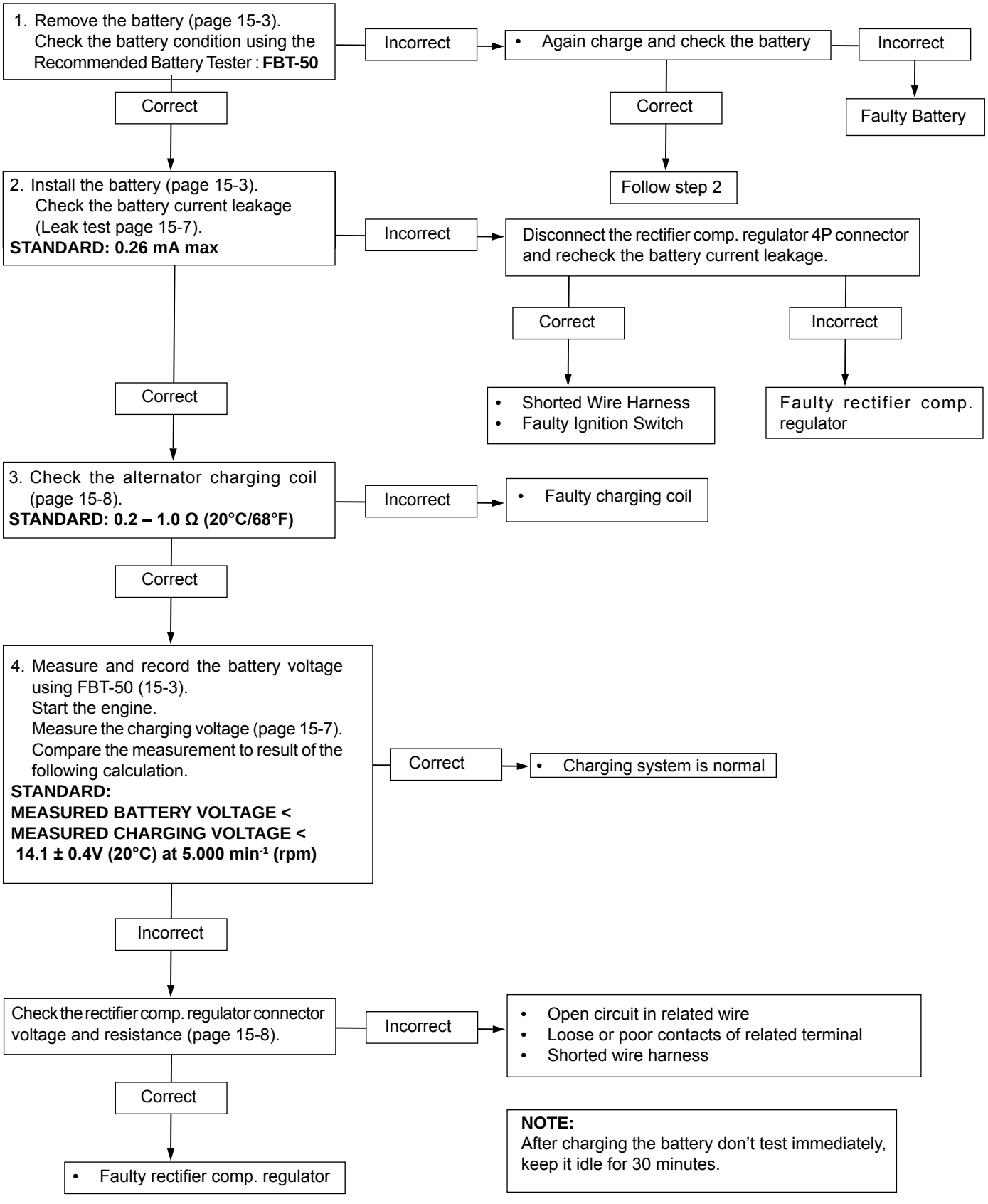
### SPECIFICATIONS

Unit: mm (in)

| ITEM | | | SPECIFICATION | Page NO. |
|---|---|---|---|---|
| Battery | Capacity | | 12 V – 3 Ah | Page 15-3 |
| | Current leakage | | 0.26 mA max. | Page 15-8 |
| Rectifier comp. Regulator | Regulated voltage | Charging | 13.9 – 14.7 V/ 5,000 $min^{-1}$ (rpm) | – |
| | | Lighting | 12.7 – 13.7 V/ 5,000 $min^{-1}$ (rpm) | – |
| Alternator coil resistance at 20°C (68°F) | | Charging coil | 0.2 – 1.0 Ω | Page 15-8 |

# TROUBLESHOOTING

## BATTERY IS DAMAGED OR WEAK



# BATTERY

## REMOVAL/INSTALLATION

*Always turn the ignition switch OFF before removing the battery.*

Remove the seat (page 2-3).

Remove the battery cover (page 2-6).

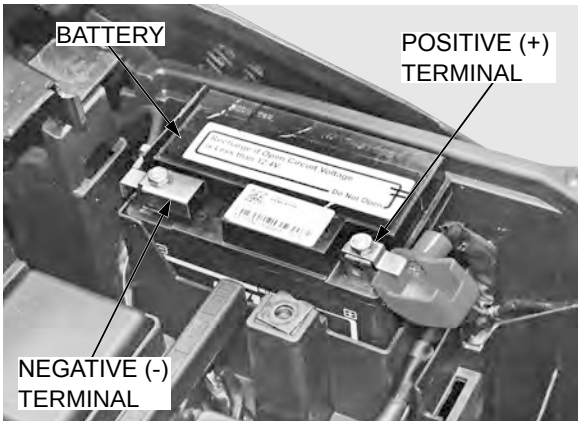
**While Removal :**Disconnect the negative (–) terminal first and then positive (+) terminal by removing the screw.

Remove the battery.

*Do not forget to apply terminal cover on (+) positive terminal.*

Install the battery in the reverse order of removal.

**While Installation :** Connect the positive (+) terminal first and then the negative (–) terminal.




## VOLTAGE INSPECTION

Remove the battery cover (page 2-6).

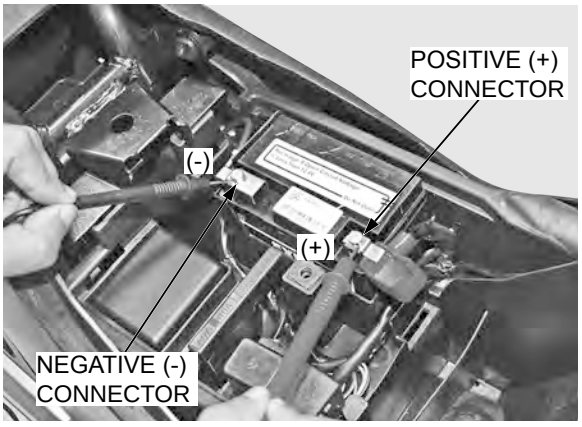
Measure the battery voltage using the FBT-50 battery tester.

**VOLTAGE (20°C/68°F):**

**Fully charged: More than 12.4 V**

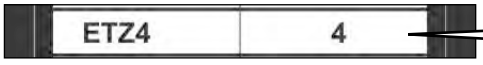
**Under charged: Below 12.4 V**

If the battery voltage is below 12.3 V, charge the battery.

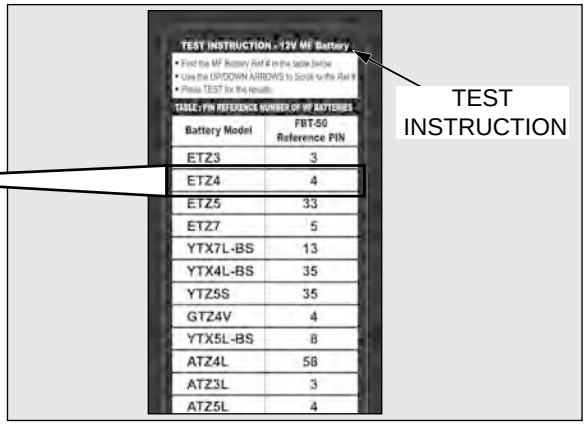



## BATTERY TESTING PROCEDURE

Check the battery model no. front side of the battery and refer the test instructions mention on back side of the FBT- 50 tester.



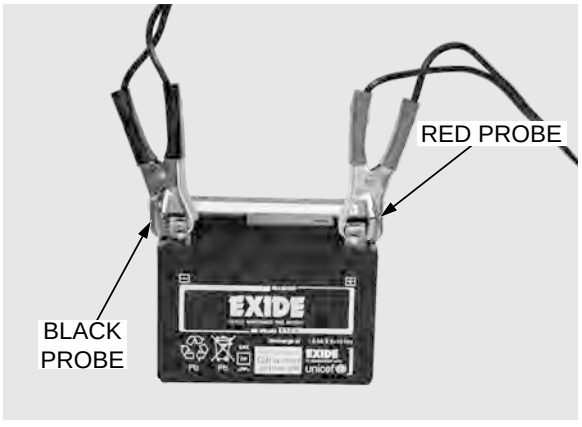

| Battery Model | Brand | FBT-50 Ref. pin |
|---|---|---|
| ETZ4 | EXIDE | 4 |




Connect the tester probes to the battery terminal.

**NOTICE**

*Always connect red probe to positive and black probe to negative terminal.*



On connecting probes, the screen displays battery pin number.


Use yellow selection arrow button to select the correct pin number. According to the battery reference table.


To check voltage press “V” button.


To load test the battery press “TEST” button.

**NOTE:** *Device will take approx 3 seconds to display result.*

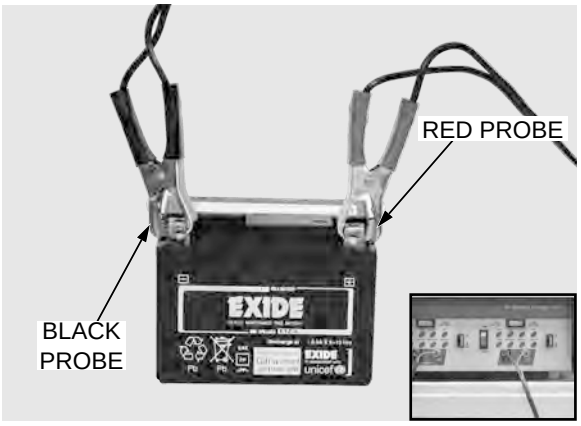
## BATTERY CHARGING

Connect charger red probe to positive and black to negative terminal.

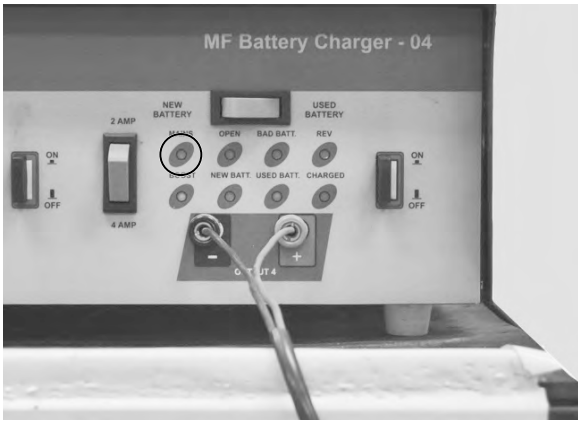
Select the “New Battery” mode or “Used Battery” mode by the selector switch based on condition of the battery (New or Used) and switch on the charger.

**⚠ CAUTION**

Don’t use the conventional battery charger for MF battery, always use MF battery charger.




After switching ON the Power, “MAINS LED” will glow instantly.




Main LED will be followed by Yellow LED (For New Battery) or Blue LED (For Used Battery) showing that the battery is getting charged properly.

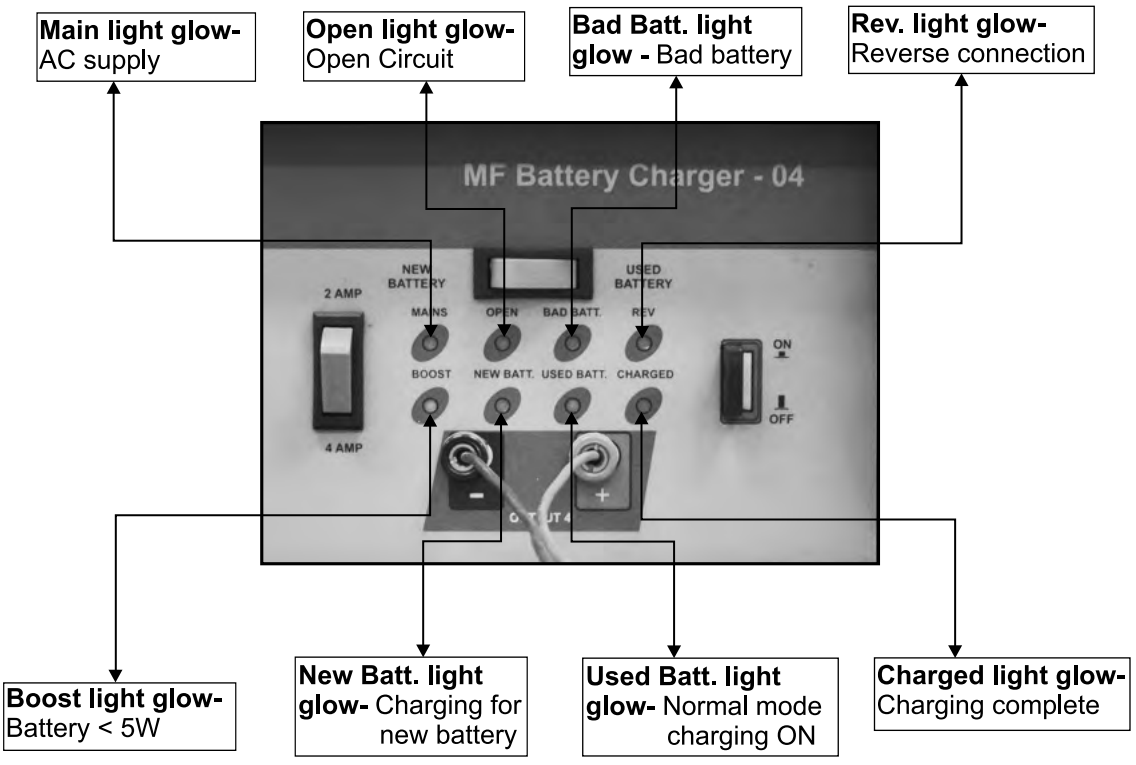

Green LED indicates, the battery is fully charged.

Again test the battery voltage (page 15-3).

**NOTICE**

*Before testing, battery should be kept idle for at least 30 minutes after charging.*

### INDICATION TABLE FOR MF BATTERY CHARGER




# CHARGING SYSTEM INSPECTION

## CHARGING VOLTAGE INSPECTION

**⚠ WARNING**

If the engine is running to do some work, make sure that area is well-ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and may lead to death.

Remove the battery cover (page 2-6).

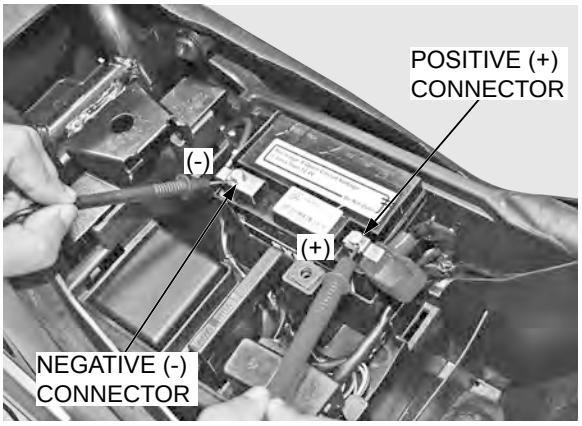
**NOTICE**

*Be sure the battery is in good condition before performing this test. Battery voltage should be more than 12.4 V.*

**CHARGING OUTPUT:**

Warm up the engine to normal operating temperature.

Stop the engine, and connect the multimeter as shown.




**⚠ CAUTION**

- To prevent short, make absolutely certain which are the positive and negative terminals or cable.
- Do not disconnect the battery or any cable in the charging system without first switching off the ignition switch. Failure to follow this precaution can damage the tester or electrical components.

Connect a tachometer according to the tachometer manufacture instruction.

Restart the engine.

With the headlight high beam ON, measure the voltage on the multimeter when the engine runs at 5,000 $min^{-1}$ (rpm)

**STANDARD**

**Measured BV < Measured CV = 14.3 ± 0.4V**

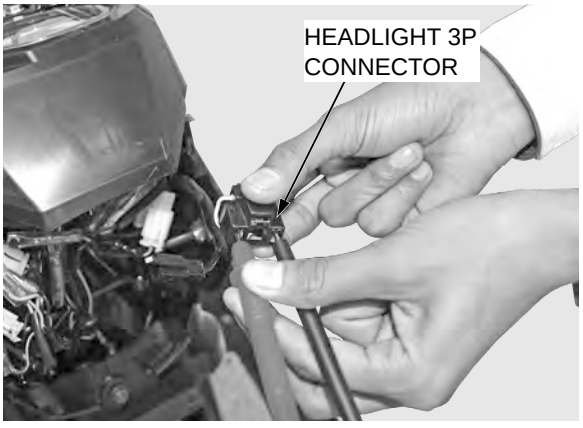
- **BV = Battery voltage (page 15-3).**
- **CV = Charging Voltage**

**LIGHTING OUTPUT:**

Open the headlight assy. (page 2-2).

**NOTE :** Do not remove headlight assy.

Connect the multimeter positive (+) probe to the headlight Blue terminal, and negative (–) probe to the Green wire terminal.




Start the engine and light switch is “ON” and the dimmer switch is “Hi” position, and read the voltage.

**REGULATED VOLTAGE:**

**13.2 ± 0.5V at 5,000 $min^{-1}$ (rpm)**

**NOTICE**

- *Measure the voltage with the headlight wire connectors connected.*

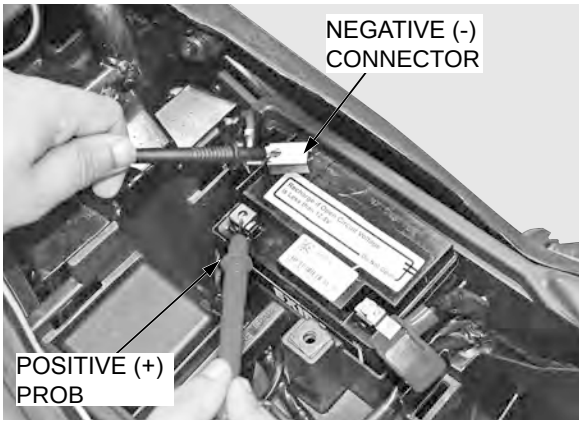
**CURRENT LEAKAGE INSPECTION**

Remove the battery cover (page 2-6).

Turn the ignition switch off and disconnect the battery negative cable from the battery.

Connect the ammeter (+) probe to the battery negative terminal and the ammeter (–) probe to the harness (–) connector.

With the ignition switch off, check for current leakage.



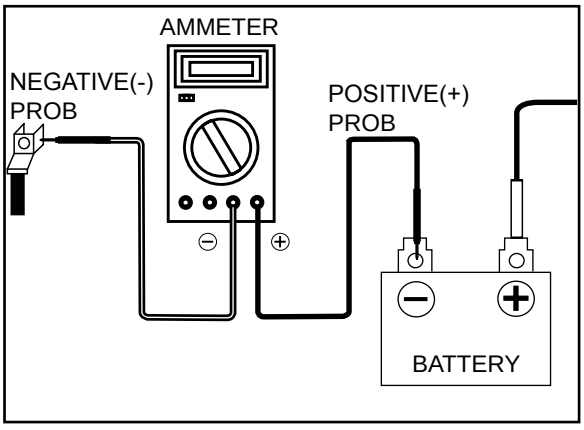
**NOTICE**

- *When measuring current using a tester, set it to a high range, and then bring the range down to an appropriate level. Current flow higher than the range selected may blow out the fuse in the tester.*
- *While measuring current, do not turn the ignition on. A sudden surge of current may blow out the fuse in the tester.*

**SPECIFIED CURRENT LEAKAGE: 0.26 mA max.**

If current leakage exceeds the specified value, a shorted circuit is likely.

Locate the short by disconnecting connections one by one and measuring the current.




# ALTERNATOR INSPECTION

**NOTICE**

*It is not necessary to remove the stator coil to make this test.*

Remove the cover center (page 2-4).

Disconnect the alternator 2P connector (page 11-2).

Check the resistance between following terminals.

**STANDARD:**

**Charging coil { White – Green (Ground)}:**

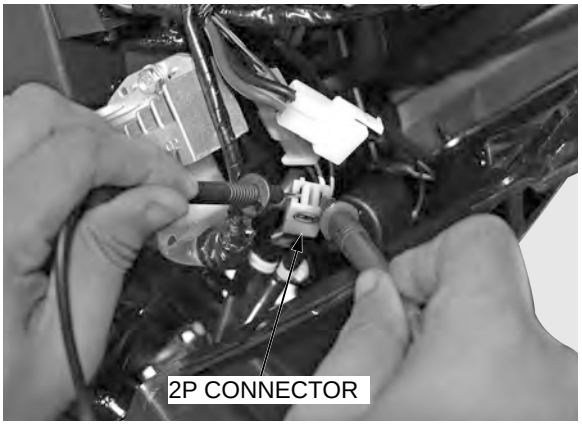
| | |
|---|---|
| White-Green | 0.2 – 1.0 Ω (at 20° C/68°F) |

Replace the alternator stator if readings are far beyond the standard.

For stator removal (page 11-2).

Connect the alternator 2P connector.

Install the cover center (page 2-4).



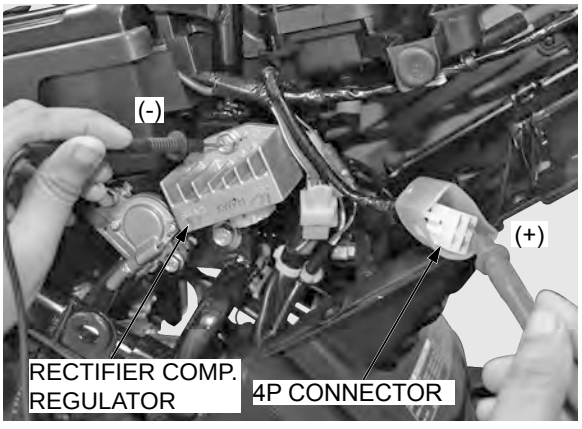

# RECTIFIER COMP. REGULATOR

## SYSTEM INSPECTION

Remove the right side cover (page 2-4).

Remove the rectifier comp. regulator 4P connector, and check it for loose contact or corroded terminals.

If the regulated voltage reading (page 15-7) is out of the specification, measure the voltage between connector terminals (wire harness side) as follows:



| Item | Terminal | Specification |
|---|---|---|
| Battery charging line | Red (+) and ground (–) | Battery voltage should register |
| Charging coil line | White and ground | 0.2 – 1.0 Ω (at 20°C/68°F) |
| Ground line | Green and ground | Continuity should exist |

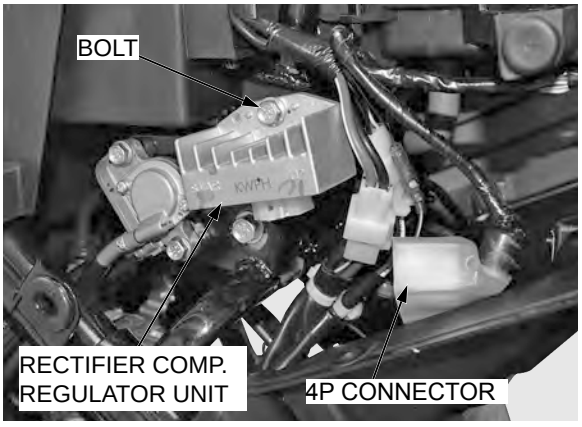
If all components of the charging system are normal and there are no loose connections at the rectifier comp. regulator connectors, replace the rectifier comp. regulator unit.

## REMOVAL/INSTALLATION

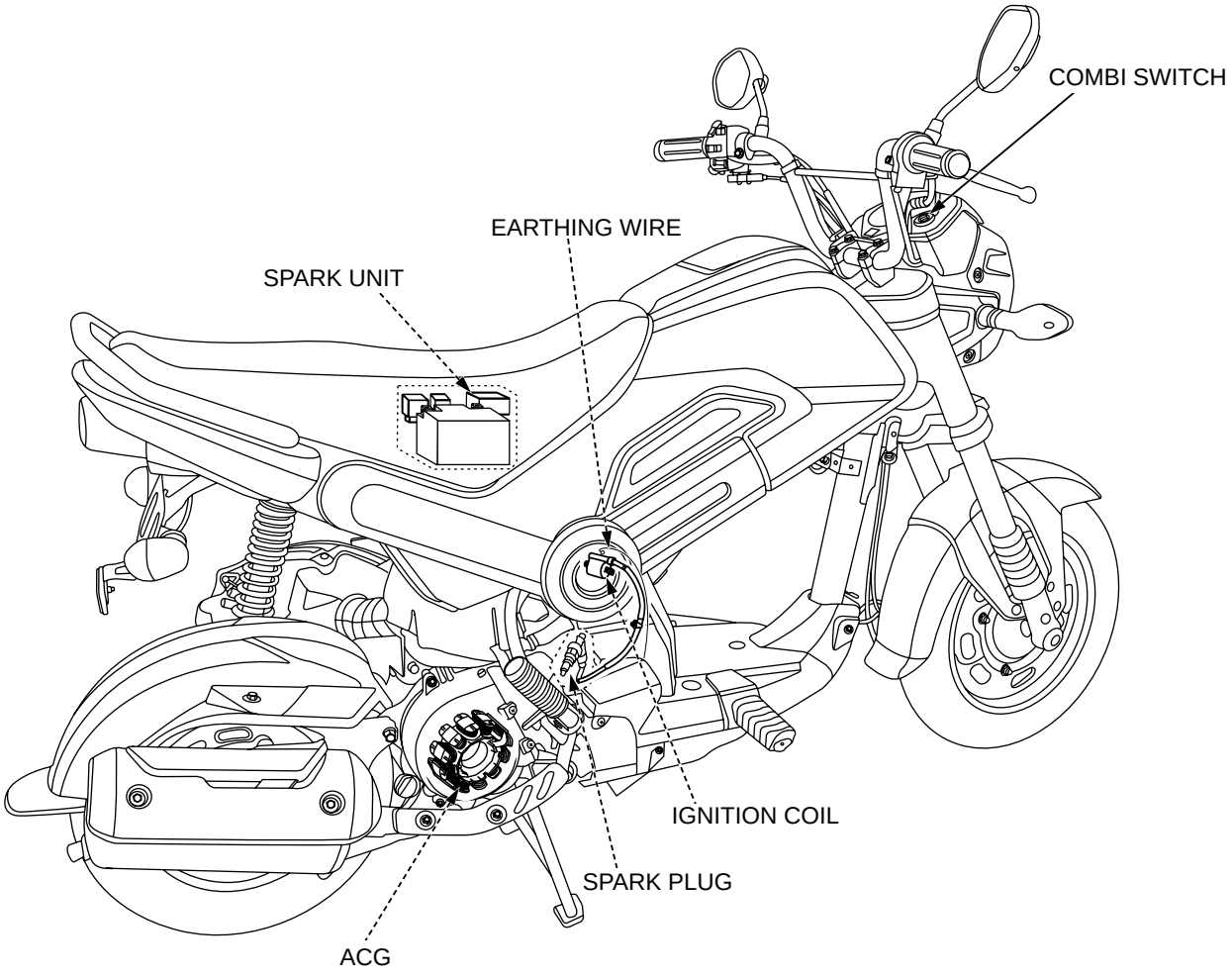
Remove the rectifier comp. regulator unit mounting bolt (1 no.).

Disconnect the connector and remove the rectifier comp. regulator unit.

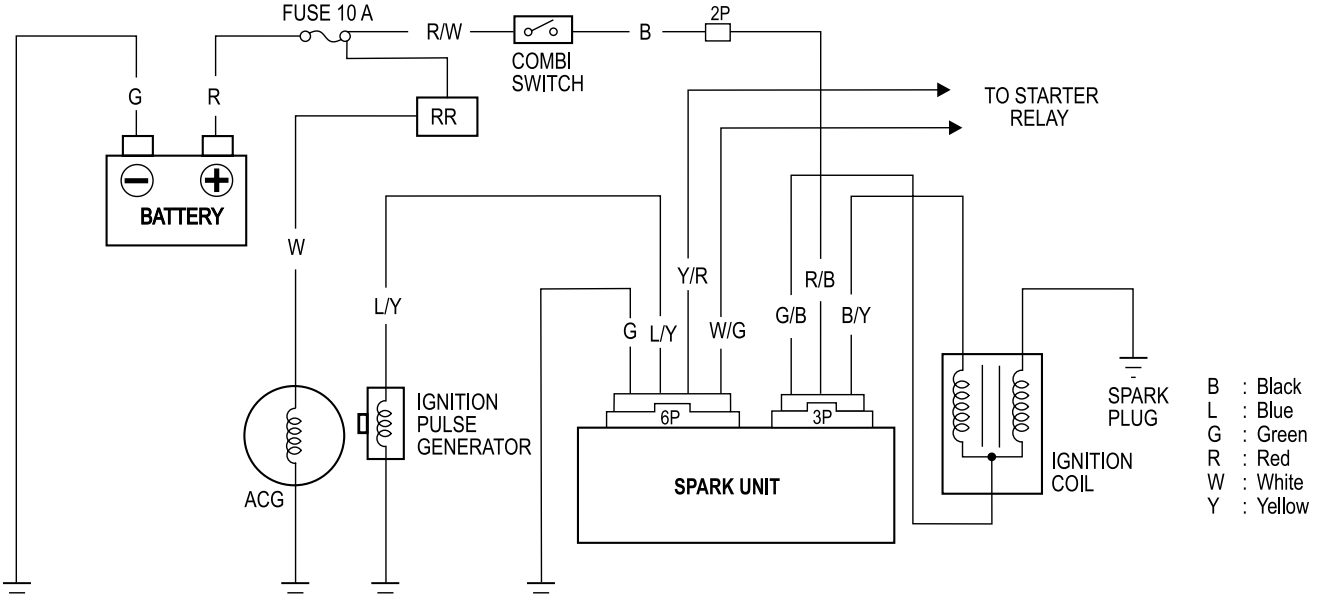
Install the rectifier comp. regulator unit in the reverse order of removal.



# COMPONENT LOCATION




# SYSTEM DIAGRAM



# 16. IGNITION SYSTEM



# SERVICE INFORMATION

## GENERAL

- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is ON and current is present.
- When servicing the ignition system, always follow the steps in the troubleshooting on page 16-2.
- The spark unit ignition system uses an electrically controlled ignition timing system. No adjustments can be made to the ignition timing.
- The spark unit may be damaged if dropped. Also, if the connector is disconnected when current is flowing, the excessive voltage may damage the spark unit. Always turn off the ignition switch before servicing.
- A faulty ignition system is often related to poor connections. Check those connections before proceeding.
- Make sure the battery is adequately charged. A weak battery may be unable to turn the starter motor quickly enough, or adequate ignition current may not be supplied.
- Use spark plug of the correct heat range. Using spark plug with an incorrect heat range can damage the engine.
- For ignition switch inspection, see section 18.
- For ignition pulse generator (alternator starter) removal/installation, see section 10.

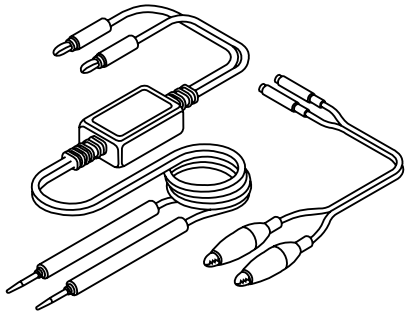
## SPECIFICATIONS

Unit: mm (in)

| ITEM | | SPECIFICATION | Page NO. |
|---|---|---|---|
| Spark plug | Standard | NGK MR7C-9N | Page 3-7 |
| Spark plug gap | | 0.8~0.9 | Page 3-7 |
| Ignition primary peak voltage | | 100 V minimum | Page 16-3 |
| Ignition pulse generator peak voltage | | 0.7 V minimum | Page 16-4 |
| Ignition timing (“F” mark) | | 15° BTDC at 1,700 rpm | – |
| Maximum timing (Advance) | | 34° BTDC at 2,700 rpm | – |

## TOOL

Peak voltage adapter
07HGJ-0020100



**NOTE:** Use with commercially available digital multimeter (Impedance 10 MΩ / DCV minimum) or imrie diagnostic tester (Model 625)

# TROUBLESHOOTING

- Inspect the following before diagnosing the system.
  - Faulty spark plug
  - Loose spark plug cap or spark plug wire connections
  - Water got into the spark plug cap (Leaking the ignition coil secondary voltage)
- If there is no spark at cylinder, temporarily exchange the ignition coil with the other good one and perform the spark test. If there is spark, the exchanged ignition coil is faulty.

**No spark at spark plug**

| | Unusual condition | Probable cause (check in numerical order) |
|---|---|---|
| Ignition coil primary voltage | Low peak voltage | 1. Incorrect peak voltage adaptor connections. (System is normal if measured voltage is over the specifications with reverse connections.)<br>2. The multimeter impedance is too low; below 10 MΩ/DCV.<br>3. Cranking speed is too low.<br>4. The sampling timing of the tester and measured pulse were not synchronized. (System is normal if measured voltage is over the standard voltage at least once.)<br>5. Poorly connected connectors or an open circuit in ignition system.<br>6. Faulty spark unit (in case when above No.1–5 are normal) |
| | No peak voltage | 1. Incorrect peak voltage adaptor connections.<br>2. Faulty ignition switch or engine stop switch.<br>3. Loose or poorly connected spark unit connectors.<br>4. Open circuit or poor connection in ground wire of the spark unit.<br>5. Faulty peak voltage adaptor.<br>6. Faulty ignition pulse generator (Measure the peak voltage).<br>7. Faulty spark unit (in cases when above No. 1–7 are normal). |
| | Peak voltage is normal.<br>but no spark jumps at the plug. | 1. Faulty spark plug or leaking ignition coil secondary current ampere.<br>2. Faulty ignition coil. |
| Ignition pulse generator | Low peak voltage | 1. Multimeter impedance is too low; below 10 MΩ/DCV.<br>2. Cranking speed is too low.<br>3. Operating force of the kickstarter is weak.<br>4. The sampling timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the specifications at least once).<br>5. Faulty exciter coil (in cases when above No. 1–3 are normal). |
| | No peak voltage | 1. Faulty peak voltage adaptor |
| Ignition pulse generator | Low peak voltage | 1. The multimeter impedance is too low; below 10 MΩ/DCV.<br>2. Cranking speed is too slow.<br>3. Operating force of the kickstarter is weak.<br>4. The sampling timing of the tester and measured pulse were not synchronized (System is normal if measured voltage is over the standard voltage at least once.)<br>5. Faulty ignition pulse generator (in case when above No. 1–3 are normal) |
| | No peak voltage | 1. Faulty peak voltage adaptor.<br>2. Faulty ignition pulse generator. |

# IGNITION SYSTEM INSPECTION

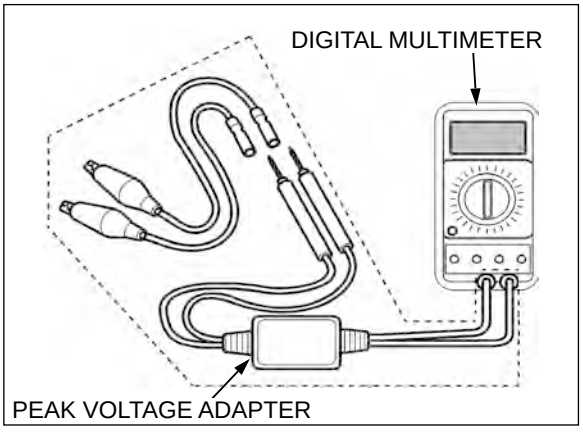
**NOTICE**

- *If not spark jumps at the plug, check all connections for loose or poor contact before measuring each peak voltage.*
- *Use a commercially available digital multimeter (impedance 10 MΩ/DCV minimum).*
- *The display value differs depending upon the internal impedance of the multimeter.*
- *If the Imrie diagnostic tester (model 625) is used, follow the manufacturer's instructions.*

Connect the peak voltage adaptor to the digital multimeter.

**TOOL:**

**Imrie diagnostic tester (model 625) or**
**Peak voltage adaptor 07HGJ – 0020100**
**with commercially available digital multimeter**
**(impedance 10 MΩ/DCV minimum)**




## IGNITION COIL PRIMARY PEAK VOLTAGE

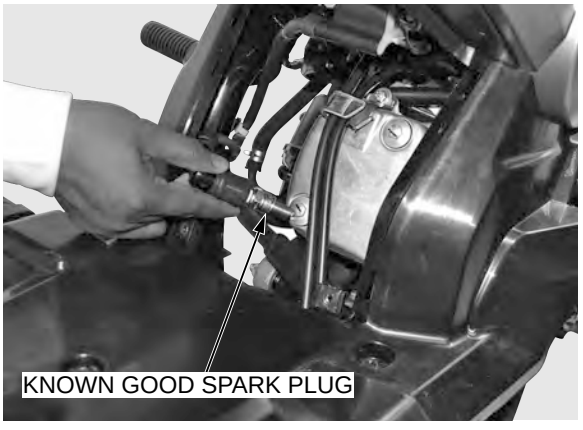
**NOTICE**

- *Check all system connections before this inspection. Poor connected connectors can cause incorrect readings*
- *If the system is disconnected, incorrect peak voltage might be measured.*
- *Check that the cylinder compression is normal and check that the spark plug is installed correctly in the cylinder head.*

Remove the cover center (page 2-3).

Disconnect the spark plug cap from the spark plug.

Connect a good known spark plug to the spark plug cap and ground the spark plug to the cylinder head as done in a spark test.




With the connector connected, connect the peak voltage adaptor probes to the ignition coil primary terminal and ground.

**TOOL:**

**Imrie diagnostic tester (model 625) or**
**Peak voltage adaptor 07HGJ – 0020100**
**with commercially available digital multimeter**
**(impedance 10 MΩ/DCV minimum)**

*Avoid touching the spark plug and tester probes to prevent electric shock.*

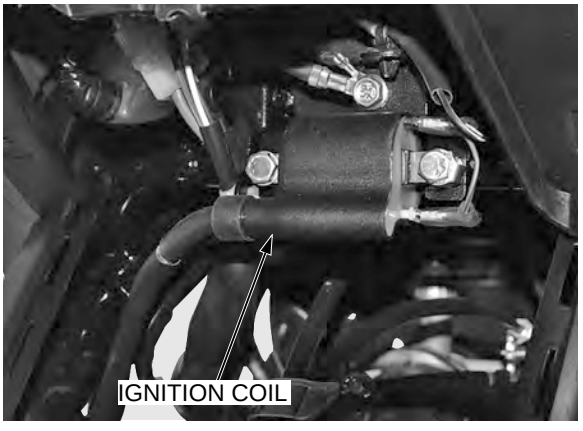
**CONNECTION: Black/yellow (–) – body ground (+)**

Turn the ignition switch ON.

Crank the engine with the kickstarter and read the ignition coil primary voltage.

**PEAK VOLTAGE: 100 V minimum**

If the peak voltage is lower than the standard value,follow the checks described in the troubleshooting on (page 16-2).



## IGNITION PULSE GENERATOR PEAK VOLTAGE


**NOTICE**

- *Check that the cylinder compression is normal and the spark plug is installed correctly in the cylinder head.*
- *If the system is disconnected, incorrect peak voltage might be measured.*
- *Check all system connections before this inspection. Poor connected connectors can cause incorrect readings*

Disconnect the spark unit (6P) connector (page 16-5).

Connect the peak voltage adaptor probes to the ignition pulse generator wire and ground wire terminals of the wire harness side connector.

**TOOL:**

**Imrie diagnostic tester (model 625) or**
**Peak voltage adaptor 07HGJ – 0020100**
**with commercially available digital multimeter**
**(impedance 10 MΩ/DCV minimum)**

*Avoid touching the spark plug and tester probes to prevent electric shock.*

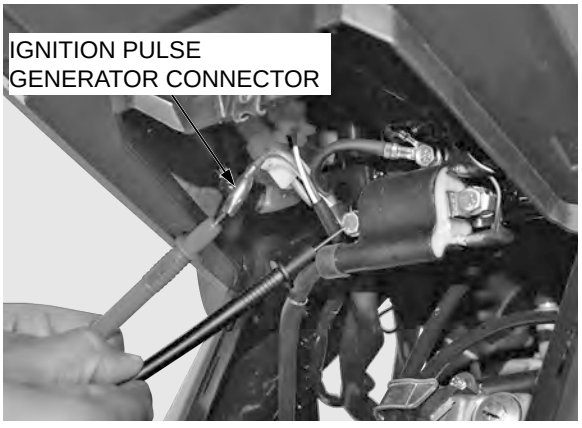
**CONNECTION: Blue/Yellow (+) – green (–)**

Turn the ignition switch ON.

Crank the engine with the kickstarter and read the peak voltage.

**PEAK VOLTAGE: 0.7 V min**

If the peak voltage measured at the spark unit connector is abnormal, disconnect the ignition pulse generator connector and connect the adaptor probes to the ignition pulse generator side connector.




In the same manner as the spark unit connector, measure the peak voltage and compare it to the voltage measured at the spark unit connector.

- If the peak voltage measured at the spark unit connector is abnormal and the one measured at the ignition pulse generator connector is normal, the blue/yellow wire has an open or short circuit, or loose connections.
- If both peak voltages are abnormal, follow the checks described in the troubleshooting on (page 16-2).

## IGNITION PRIMARY AND SECONDARY COIL RESISTANCE

Disconnect the ignition coil connectors.

Connect the digital multimeter probes to the ignition coil connectors.

**PRIMARY COIL RESISTANCE: 2.07 – 2.53 Ω**

Disconnect the spark plug suppressor cap and wire.

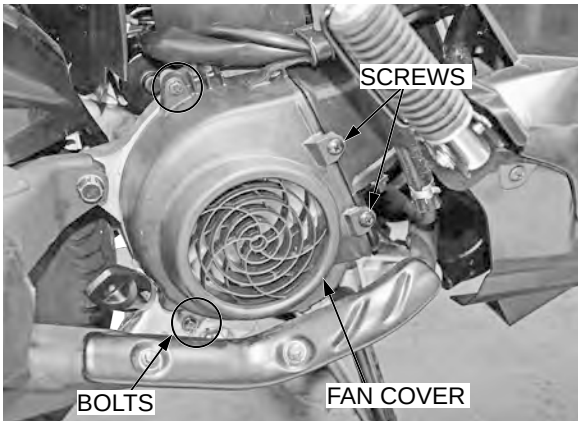
Connect the digital multimeter probes to the ignition coil connector and spark plug wire.

**SECONDARY COIL RESISTANCE: 12.33 – 15.07 kΩ**

# IGNITION TIMING

**⚠ WARNING**

When the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in a closed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and lead to death. Run the engine in an open area or with an exhaust evacuation system in an enclosed area.




The ignition timing is factory preset and only needs to be checked when an electrical system component is replaced.

Warm up the engine to the normal operating temperature.

Remove the fan cover.

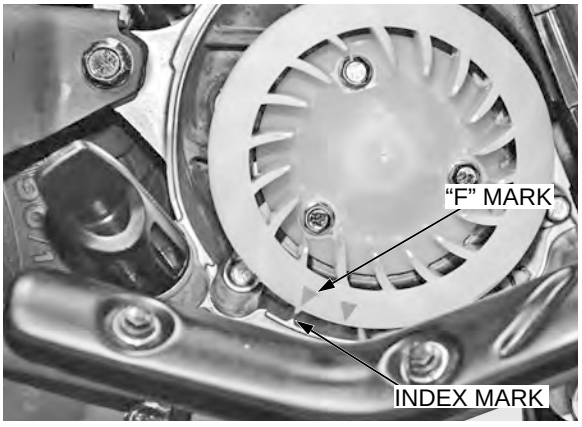
Connect the timing light and a tachometer.

**NOTICE**

*Read the manufacturer's instructions for the timing light and tachometer.*

The ignition timing is correct if the "F" mark on the flywheel aligns with the index mark of the right crankcase at idle.

Install the fan cover.




# IGNITION COIL

## REMOVAL/INSTALLATION

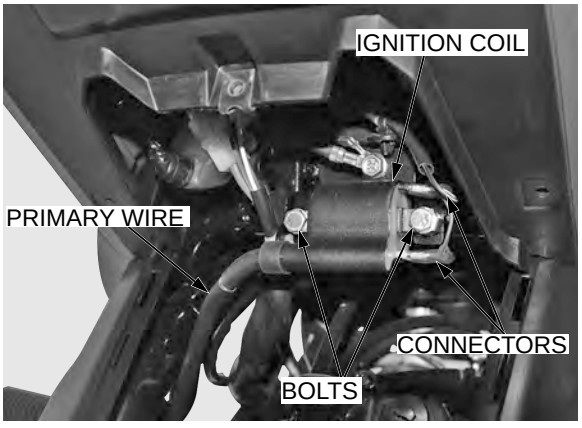
Remove the cover center (page 2-3).

Disconnect the ignition coil primary wire and connectors.

Remove the spark plug cap (page 3-7).

Remove the bolts (2 nos.) and ignition coil from the frame.

Install the ignition coil in the reverse order of removal.




# SPARK UNIT

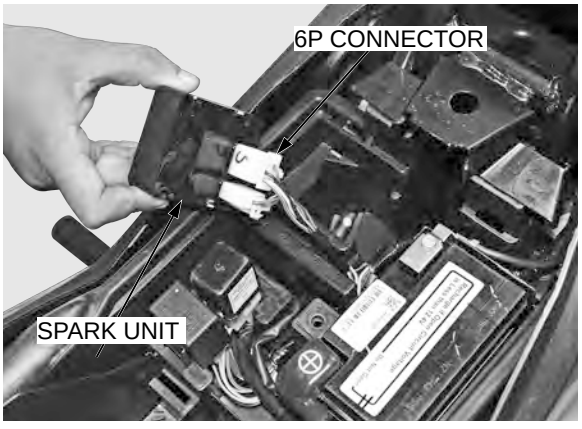
## REMOVAL/INSTALLATION

Remove the battery cover (page 2-6).

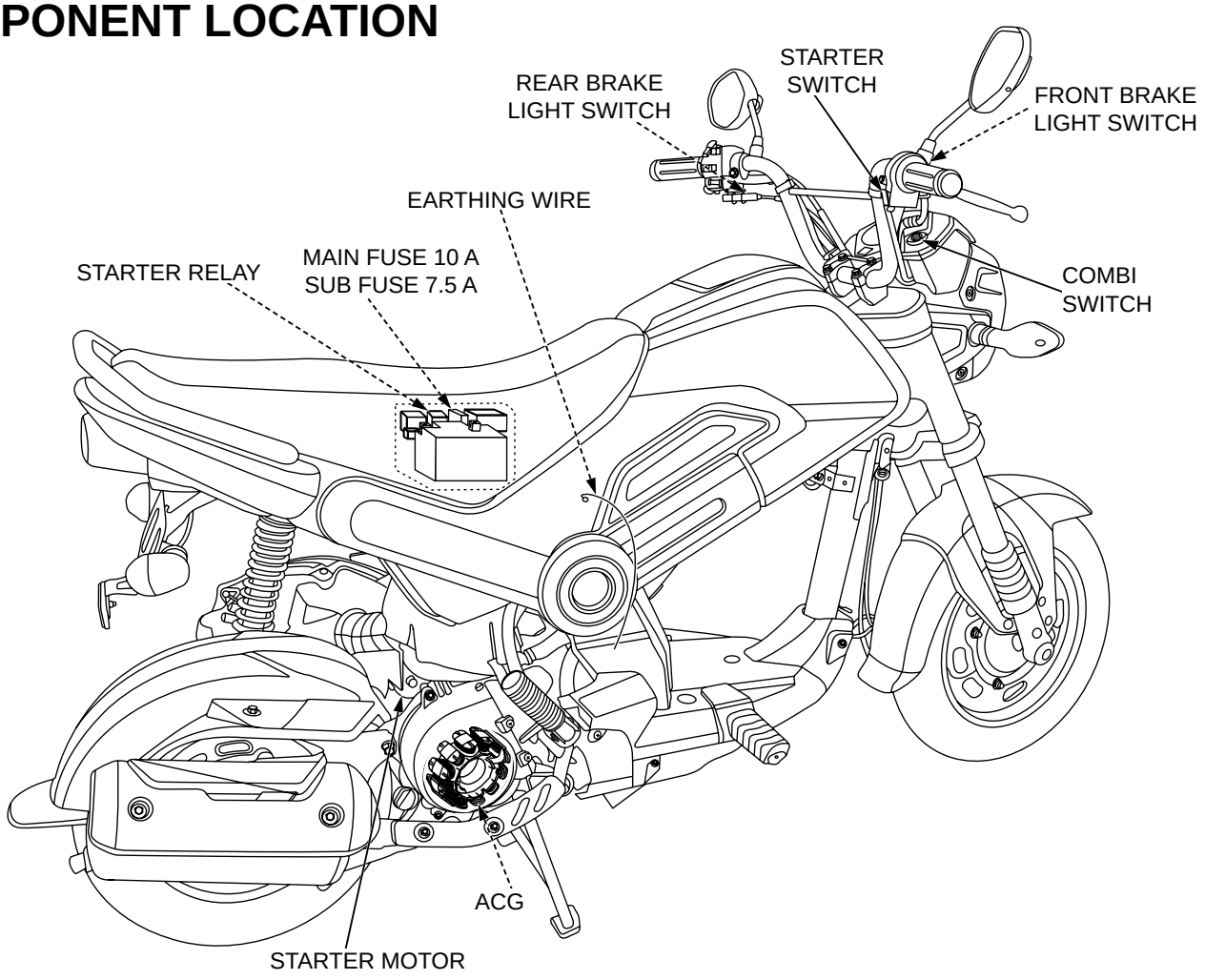
Remove the spark unit from the battery stay, disconnect the connectors and remove the spark unit.

Install the spark unit in the reverse order of removal.

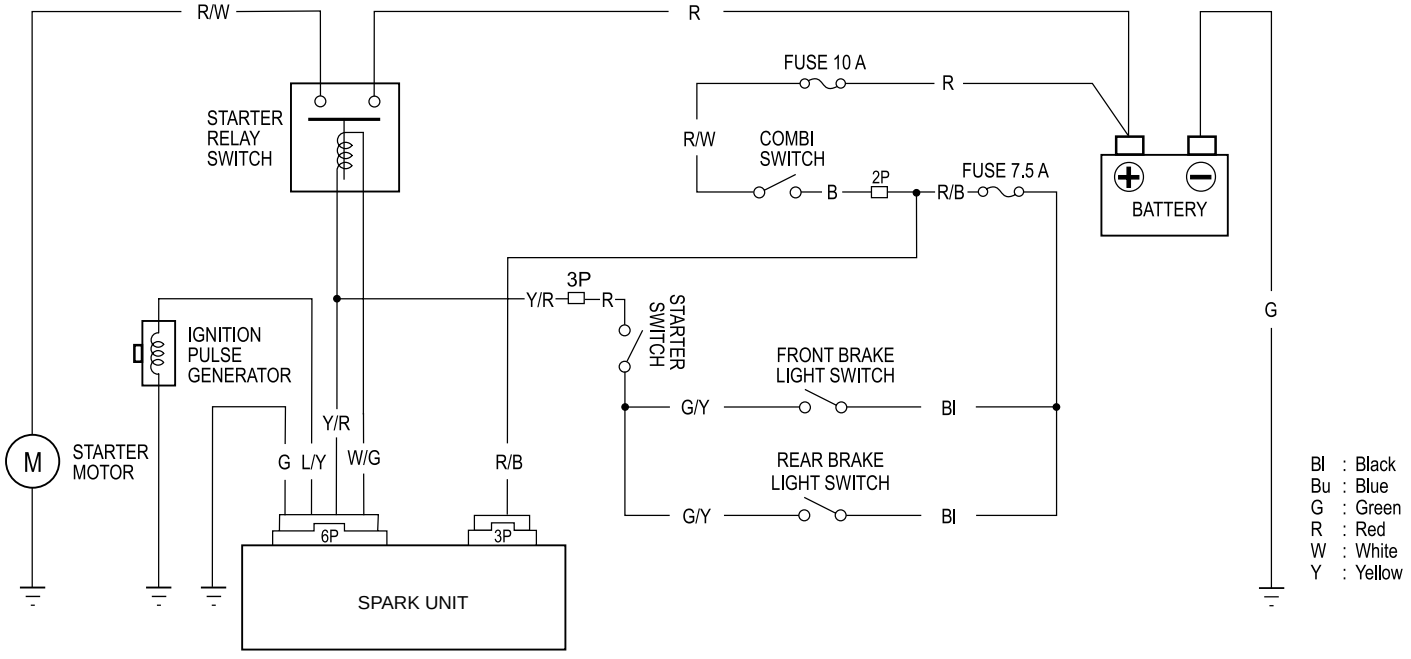
Check continuity between green wire and body ground.



# COMPONENT LOCATION




# SYSTEM DIAGRAM



# 17. ELECTRIC STARTER



## SERVICE INFORMATION

### GENERAL

**⚠ WARNING**

Always turn the ignition switch OFF before servicing the starter motor. The motor could suddenly start, causing serious injury.

- The starter motor can be serviced with the engine installed in the frame.
- When checking the starter system, always follow the steps in the troubleshooting flow chart (page 17-2).
- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.
- If the current is kept flowing through the starter motor to turn it while the engine is not cranking over, the starter motor may be damaged.
- See section 18 for starter switch and ignition switch inspections.
- See section 9 for starter pinion inspection.
- The following color codes are used throughout this section.

| | | | |
|---|---|---|---|
| B = Blue | G = Green | Lg = Light green | R = Red |
| L = Black | Gr = Gray | O = Orange | W = White |
| Br = Brown | Lb = Light blue | P = Pink | Y = Yellow |

### SPECIFICATIONS

Unit: mm (in)

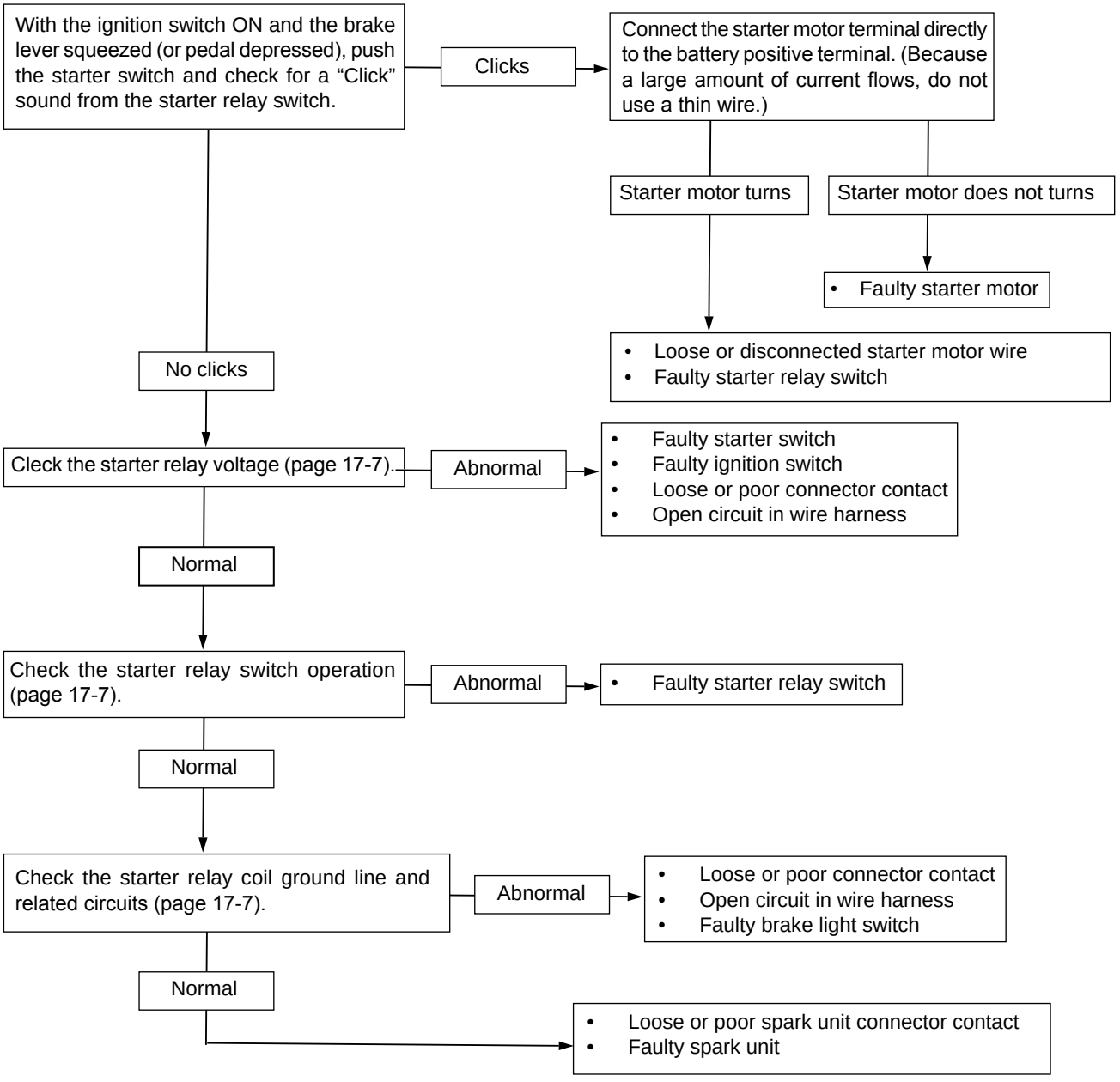
| ITEM | STANDARD | SERVICE LIMIT | Page NO. |
|---|---|---|---|
| Starter motor brush length | 9.0 (0.35) | 3.5 (0.14) | Page 17-3 |

17

# TROUBLESHOOTING

**Starter motor will not turn**

- Check for a blown main fuse (10 A)
- Check that the battery is fully charged and in good condition.



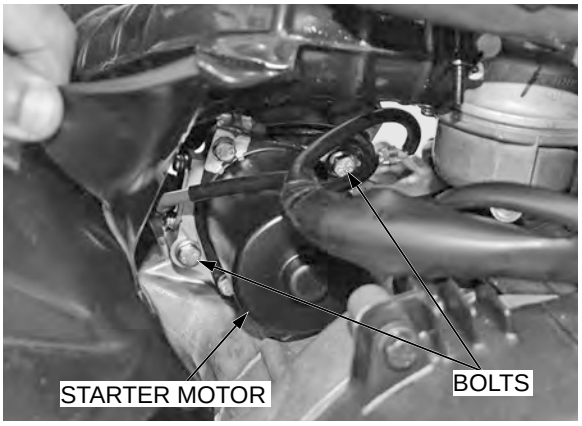
# STARTER MOTOR

## REMOVAL

**⚠ WARNING**

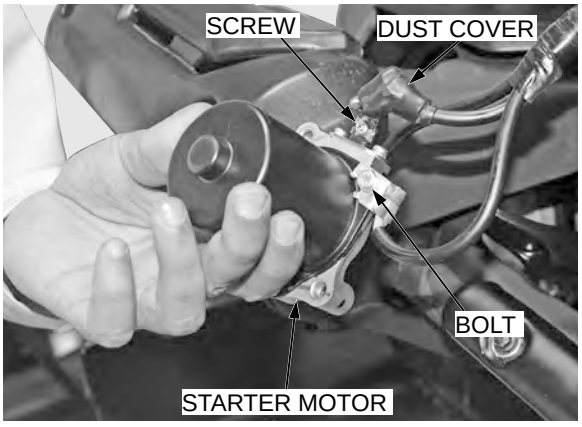
Always turn the ignition switch OFF before servicing the starter motor. The motor could suddenly start, causing serious injury.

Remove the mounting bolts (2 nos.), ground wire and the starter motor from the crankcase.




Slide the dust cover off the starter motor terminal.

Remove the screw (1 no.) and bolt (1 no.) to release the starter motor wire from the starter motor.

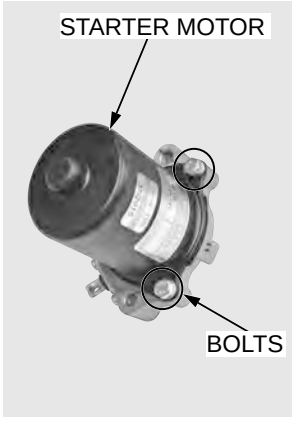


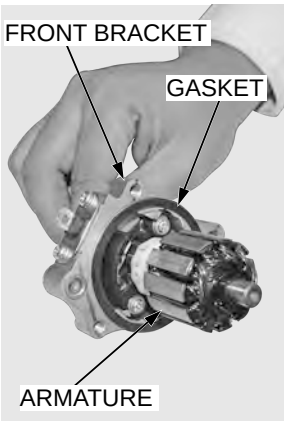

## DISASSEMBLY

Remove the bolts (2 nos.) and motor case.

Remove the following:

– Gasket
– Armature
– Front bracket
– Springs

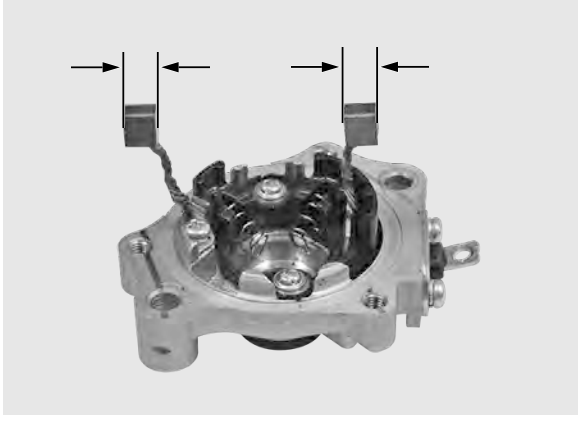



## INSPECTION

Measure the brush length.

**SERVICE LIMIT: 3.5 mm (0.14 in)**

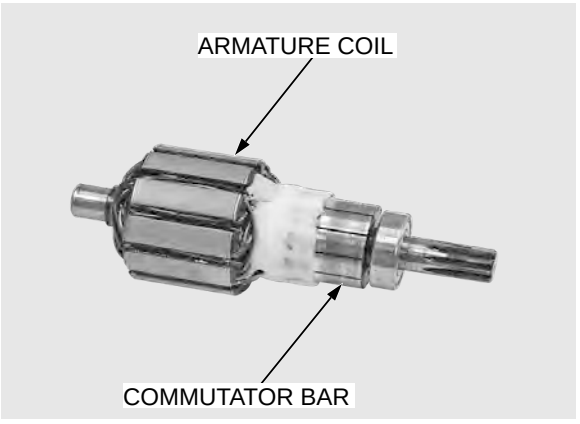


Inspect the commutator bars of armature for discoloration.

Bars discolored in pairs indicate shorted coils.

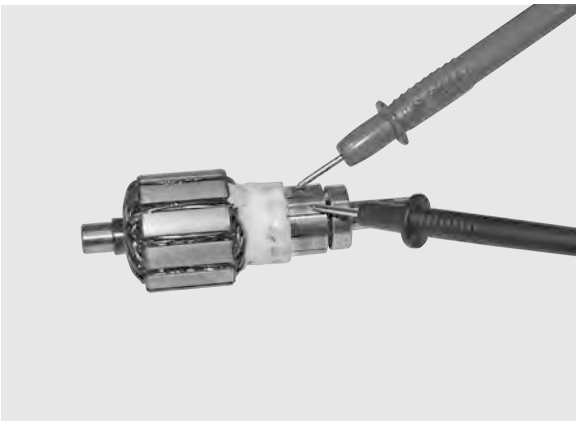
**NOTICE**

*Do not use emery or sand paper on the commutator.*



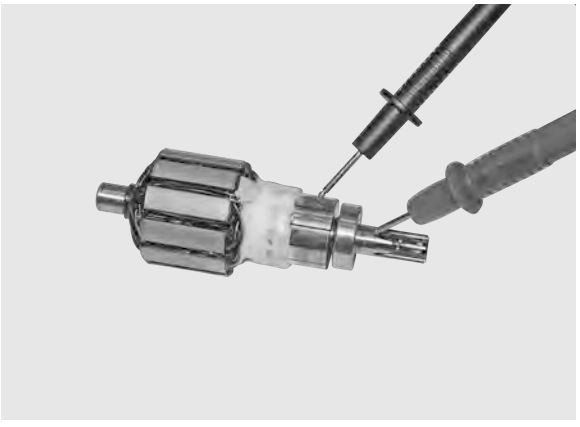

Check for continuity between pairs of commutator bars.

There should be continuity.

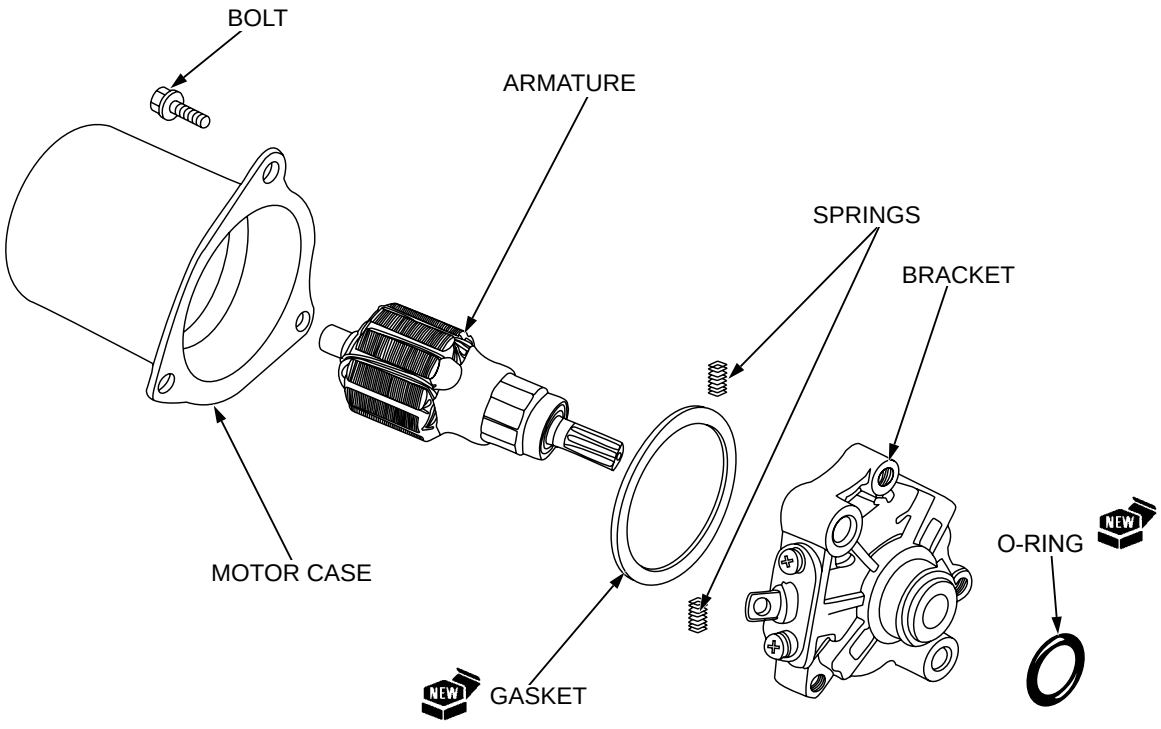


Check for continuity between each commutator bar and the armature shaft.

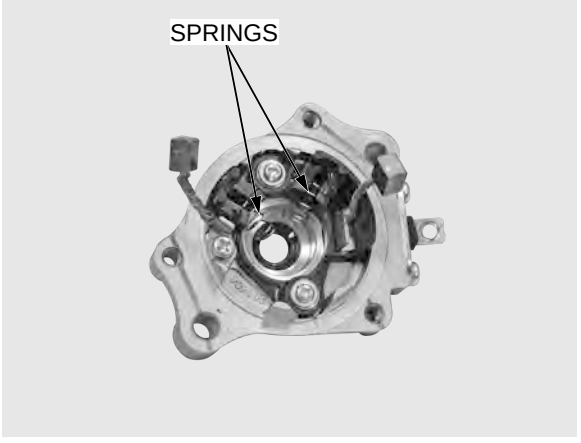
There should be no continuity.



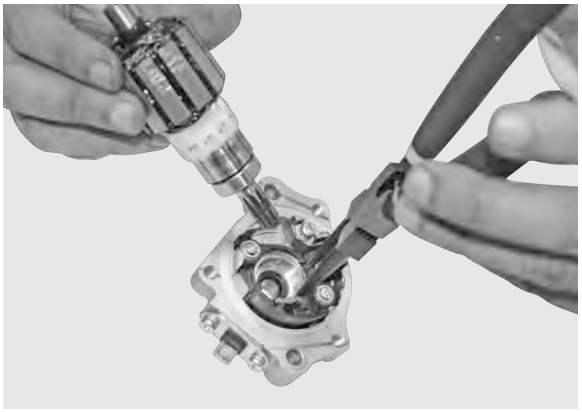
## STARTER MOTOR ASSEMBLY




Install the springs into the brush holders.




Push and hold the brushes into the brush holders, and insert the armature into the front bracket.



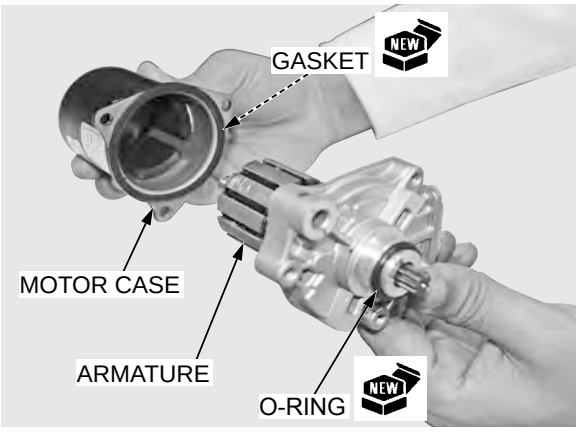
**⚠ WARNING**

Be careful not to damage the brush and armature.

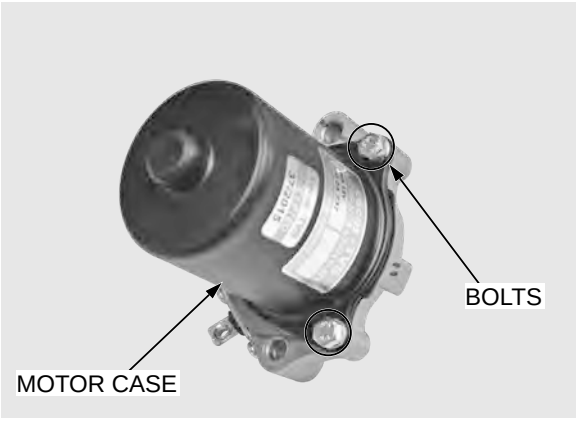
Install the new gasket onto the front bracket.

Install the armature into the motor case while holding the armature tightly to keep the magnet from pulling the armature against the case.

Install a new O-ring.



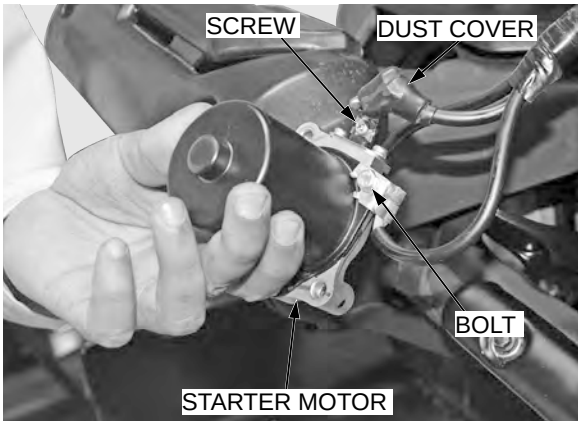

Install and tighten the bolts (2 nos.).




## INSTALLATION

Tighten the screw (1 no.) and bolt (1 no.) to connect the starter motor wire from the starter motor.

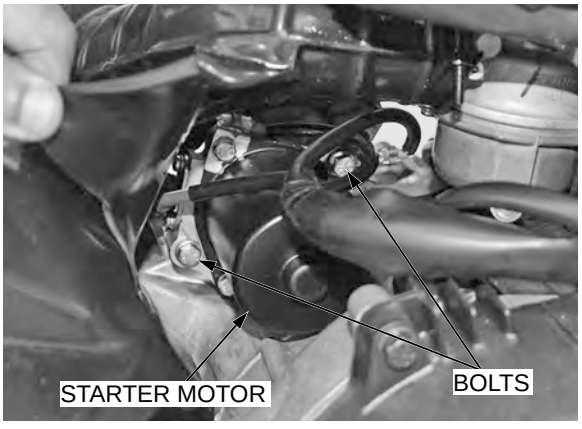
Slide the dust cover on the starter motor wire (Red/White) terminal.




Install the starter motor into the crankcase.

Install the ground wire and mounting bolts (2 nos.), and tighten the bolts securely.

Connect the starter motor wire to the terminal, tighten the screw (1 no.) and install the dust cover over the terminal.



# STARTER RELAY


## INSPECTION

Remove the battery cover (page 2-6).

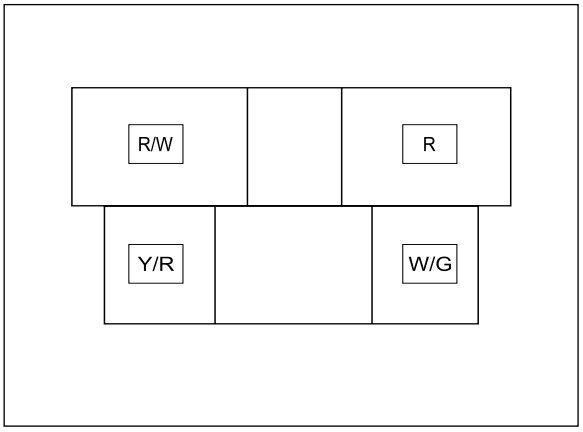
Remove the starter relay.

## STARTER RELAY VOLTAGE

Measure the voltage between the yellow/red wire terminal (+) and ground (–).

If battery voltage appears when the starter switch is pushed with the ignition switch ON, the power source circuit is normal.

Connect the starter relay switch connector.

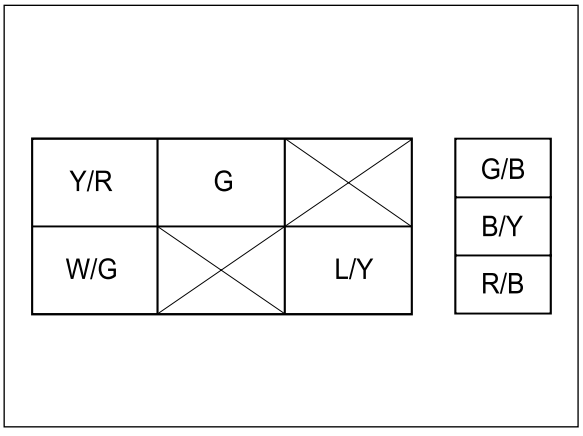



### GROUND LINE AND RELATED CIRCUITS

Disconnect the spark unit connector (page 16-5).

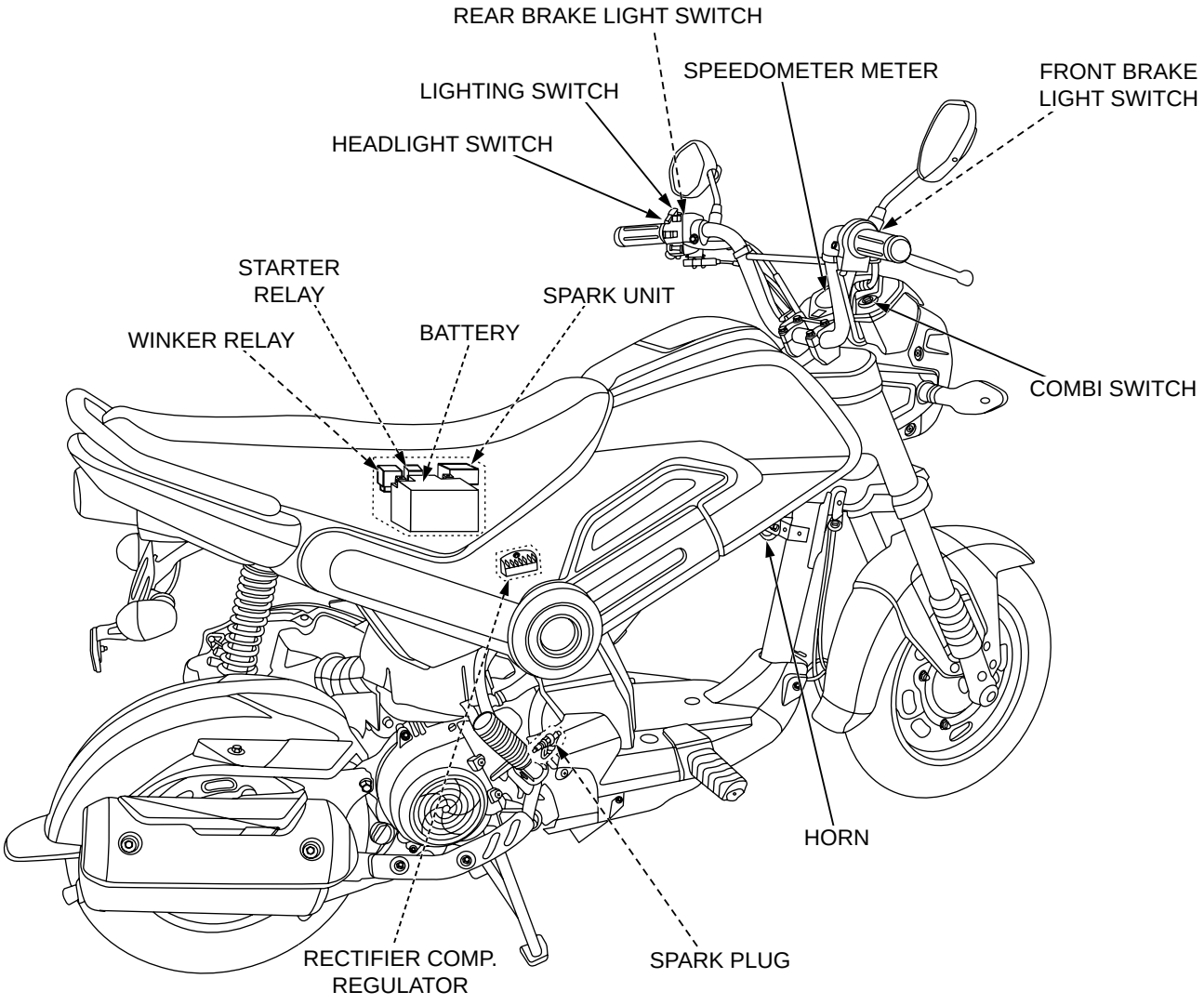
Measure the following between the wire terminals of the wire harness side connectors with the ignition switch ON.

| Item | Terminal | Specification |
|---|---|---|
| Starter relay switch ground line | White/green (+) and green (–) | Battery voltage with the starter switch pushed |
| Starter switch line | Yellow/red (+) and green (–) | Battery voltage with the starter switch pushed |
| Brake light switch line | Green/yellow (+) and green (–) | Battery voltage with the brake applied |




Install the removed parts in the reverse order of removal.

# COMPONENT LOCATION



# 18. LIGHTS/METER/SWITCHES



# SERVICE INFORMATION

## GENERAL

**NOTICE**

- A halogen headlight bulb become very hot while the headlight is “ON”, and remain hot for a while after it is turned “OFF”. Be sure to let it cool down before servicing.
- Note the following when replacing the halogen headlight bulb.
  - Wear clean gloves by replacing the bulb. Do not put finger prints on the headlight bulb, as they may create hot spots on the bulb and cause is to fail.
  - If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol to prevent its early failure.
  - Be sure to install the dust cover after replacing the bulb.
- Keep all flammable materials away from the electric heating element. Wear protective clothing, insulated gloves and eye protection.
- Check the battery condition before performing any inspection that requires proper battery voltage.
- A continuity test can be made with the switches installed on the vehicle.
- All plastic connectors have locking tabs that must be released before disconnecting, and must be aligned when reconnecting.
- To isolate an electrical failure, check the continuity of the electrical path through the part. A continuity check can usually be made without removing the part from the vehicle. Simply disconnect the connectors and connect a continuity tester to the terminals or connections.
- The following color codes are used throughout this section.

| | | | |
|---|---|---|---|
| Bu = Blue | G = Green | Lg = Light green | R = Red |
| Bl = Black | Gr = Gray | O = Orange | W = White |
| Br = Brown | Lb = Light blue | P = Pink | Y = Yellow |

## SPECIFICATIONS

| ITEM | | | SPECIFICATION | Page NO. |
|---|---|---|---|---|
| Bulb | Headlight | Hi beam | 12 V – 35 W | – |
| | | Low beam | 12 V – 35 W | – |
| | Tail/Brake Light | | 12 V – 5/21 W | – |
| | Front turn signal light | | 12 V – 10 W x 2 | – |
| | Rear turn signal light | | 12 V – 10 W x 2 | – |
| | Meter light | | 1.7 W x 1 | – |
| | Position light | | 5 W x 1 | – |
| | High beam indicator | | 1.7W x 1 | – |
| | Turn signal indicator | | 1.7W x 1 | – |
| Fuse | Main Fuse | | 10A | – |

## TORQUE VALUES

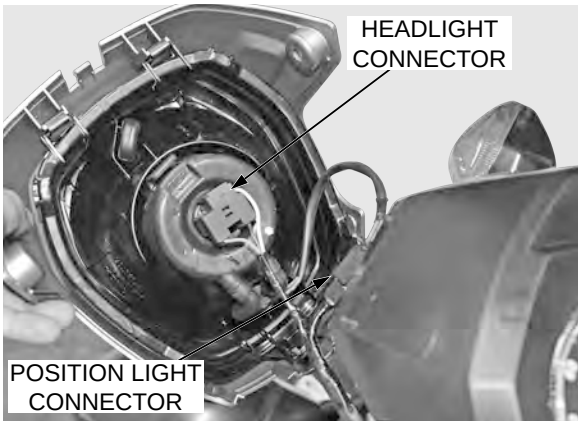
| ITEM | QTY | THREAD DIA. (mm) | TORQUE N·m (kgf·m, lbf·ft) | REMARKS | PAGE NO. |
|---|---|---|---|---|---|
| Light assy. head bolt adjusting | 1 | 4 | 2 (0.2, 1.5) | | – |
| Light assy. tail screw | 6 | 4 | 1 (0.10, 0.73) | | – |
| Speedometer assy screw | 3 | 4 | 0.8 (0.08, 0.59) | | – |

# HEADLIGHT

## BULB REPLACEMENT

Remove the headlight assy. (page 2-2).

Disconnect the headlight and position light connectors.




*Avoid touching halogen headlight bulb. Finger prints can create hot spots that cause a bulb to break.*

Remove the dust cover.

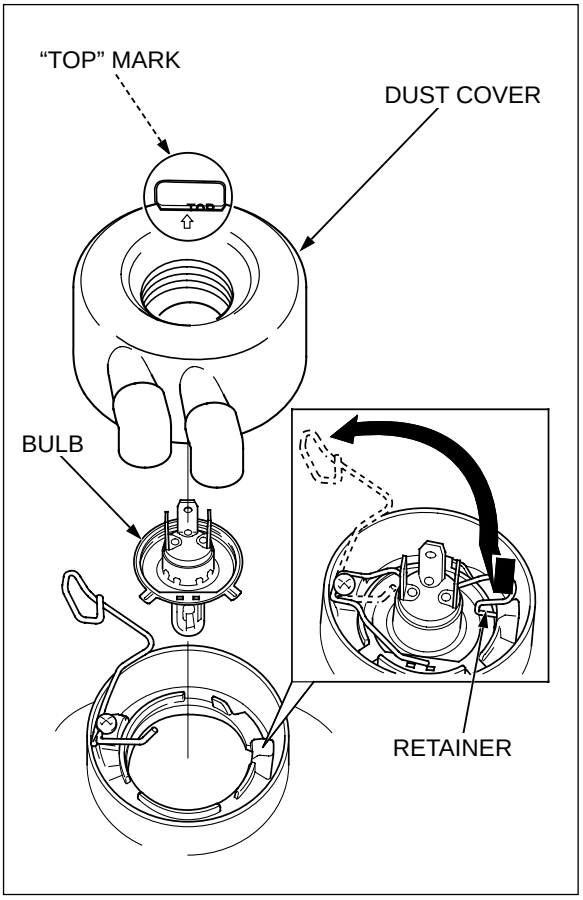
Unhook the bulb retainer.

Remove the headlight bulb.

Install the new bulb while aligning the tabs of the bulb with the slots of the headlight unit.

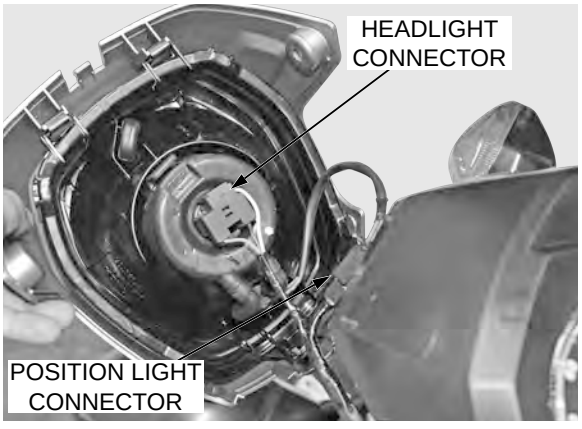
Hook the bulb retainer into the headlight unit groove.

Install the dust cover with the " TOP " mark facing up.



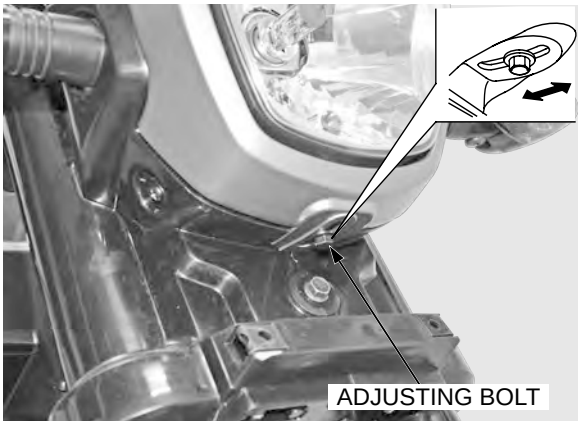

Connect the headlight and position light connectors.

Install the headlight assy. (page 2-2).



### HEADLIGHT UNIT REMOVAL/INSTALLATION

Remove the headlight adjusting bolt.

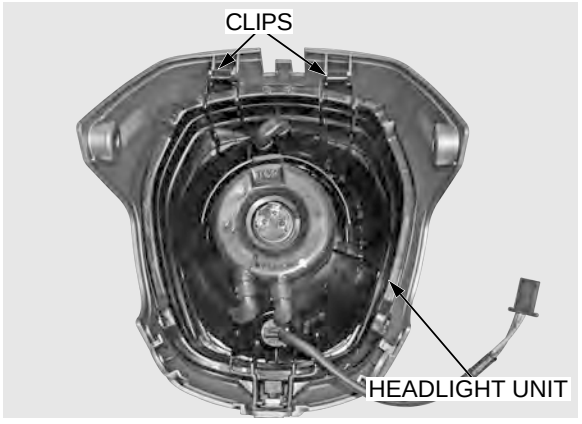



Remove the headlight assy (page 2-2).

Remove the clips and headlight unit.

Installation is in the reverse order of removal.

Adjust the headlight aim (page 3-16).




# BRAKE/TAIL LIGHT

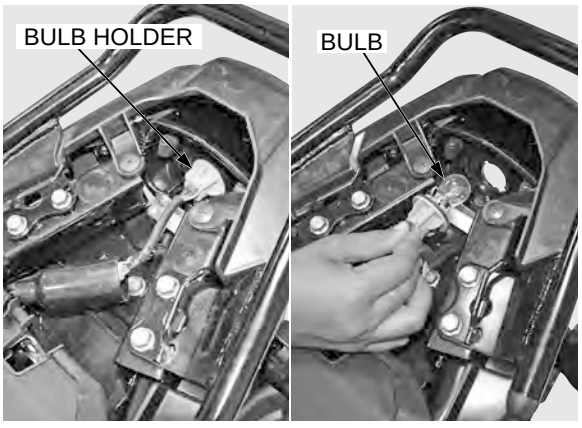
### BULB REPLACEMENT

Remove the seat (page 2-3).

Remove the tail light bulb holder by turning counter clockwise.

Remove bulb by pressing in and turning counter clock wise and replace it with a new one.

Installation is in the reverse order of removal.




# TURN SIGNAL LIGHTS

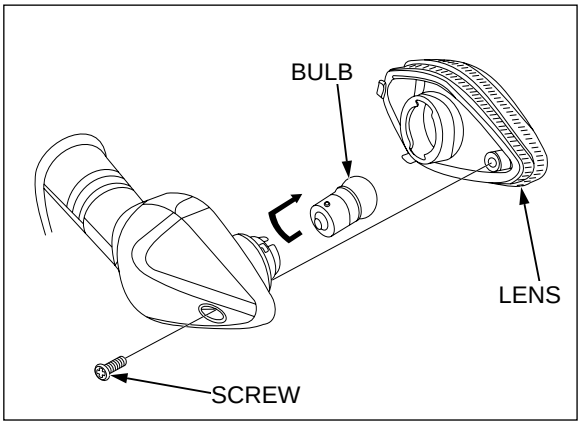
### BULB REPLACEMENT

Remove the screw and turn signal light lens.

Push the bulb in and turn it counterclockwise to remove.

Replace the bulb with a new one.

Installation is in the reverse order of removal.



## REMOVAL/INSTALLATION

### FRONT

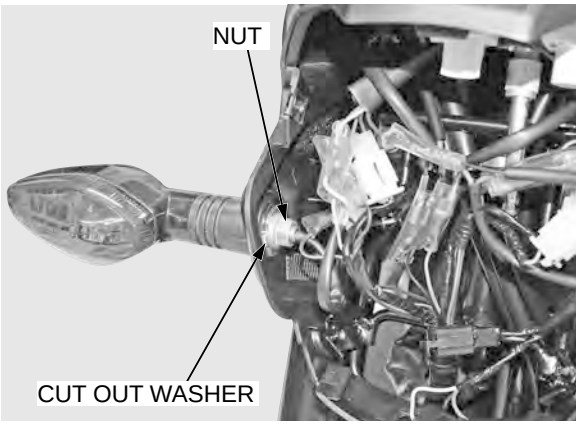
*Route the wires properly (page 1-13).*

Remove the headlight assy. (page 2-2).

Remove the turn signal mounting nut and cut out washer.

Install the winker assy. by aligning the cut-out of the cover headlight RR assy. with cut-out washer.

Installation is in the reverse order of removal.

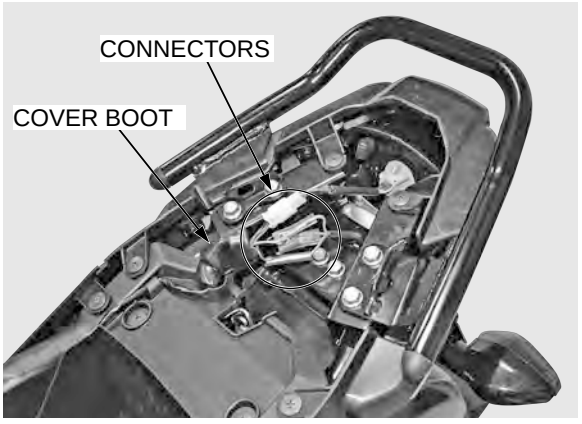



### REAR

Remove the seat (page 2-3).

Remove the wire cover boot.

Disconnect the turn signal light connectors.

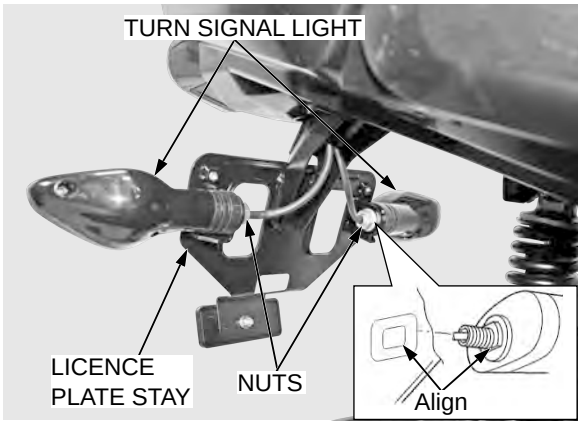



*Route the wires properly (page 1-13).*

Remove the nuts (1 no.) from each winker assy.

Install the winker assy. by aligning the cut-out of the licence plate stay.

Installation is in the reverse order of removal.




# SPEEDO METER

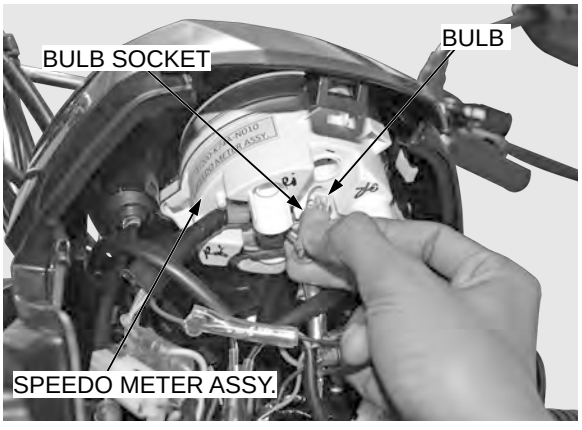
## BULB REPLACEMENT

Remove the headlight assy. (page 2-2).

Remove the meter bulb socket.

Remove the bulb out of the meter bulb socket, and replace it with a new one.

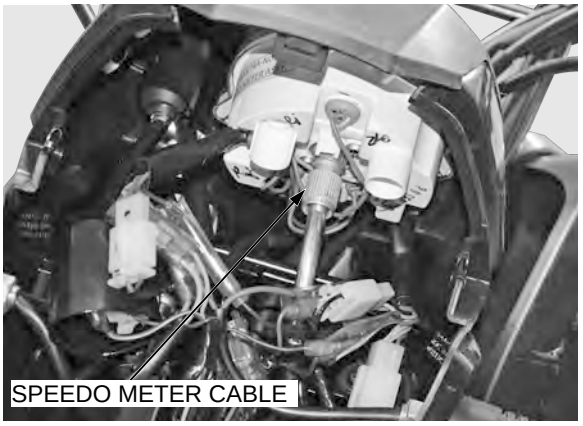
Installation is in the reverse order of removal.



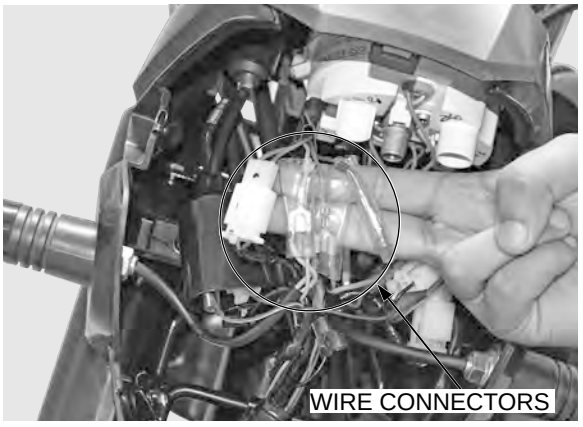
## REMOVAL/INSTALLATION

Remove the headlight assy. (page 2-2).

Disconnect the speedo meter cable.



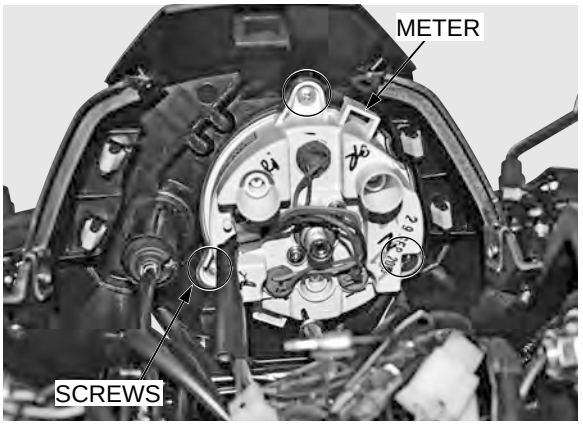

Disconnect the speedo meter wire connectors.




Remove the screws (3 nos.) and speedo meter assembly.

Installation is in the reverse order of removal.

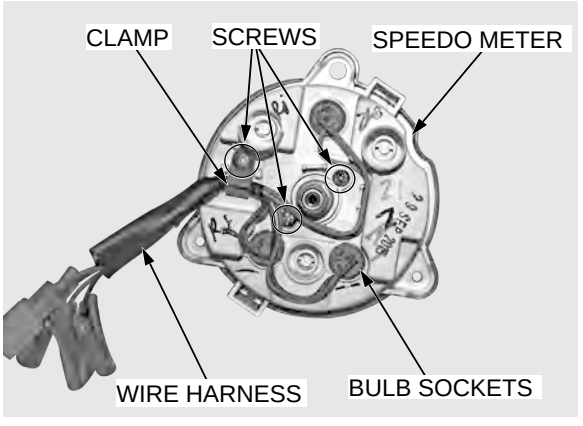
**TORQUE: 1.1 N·m (0.1 kgf·m, 0.8 lbf·ft)**



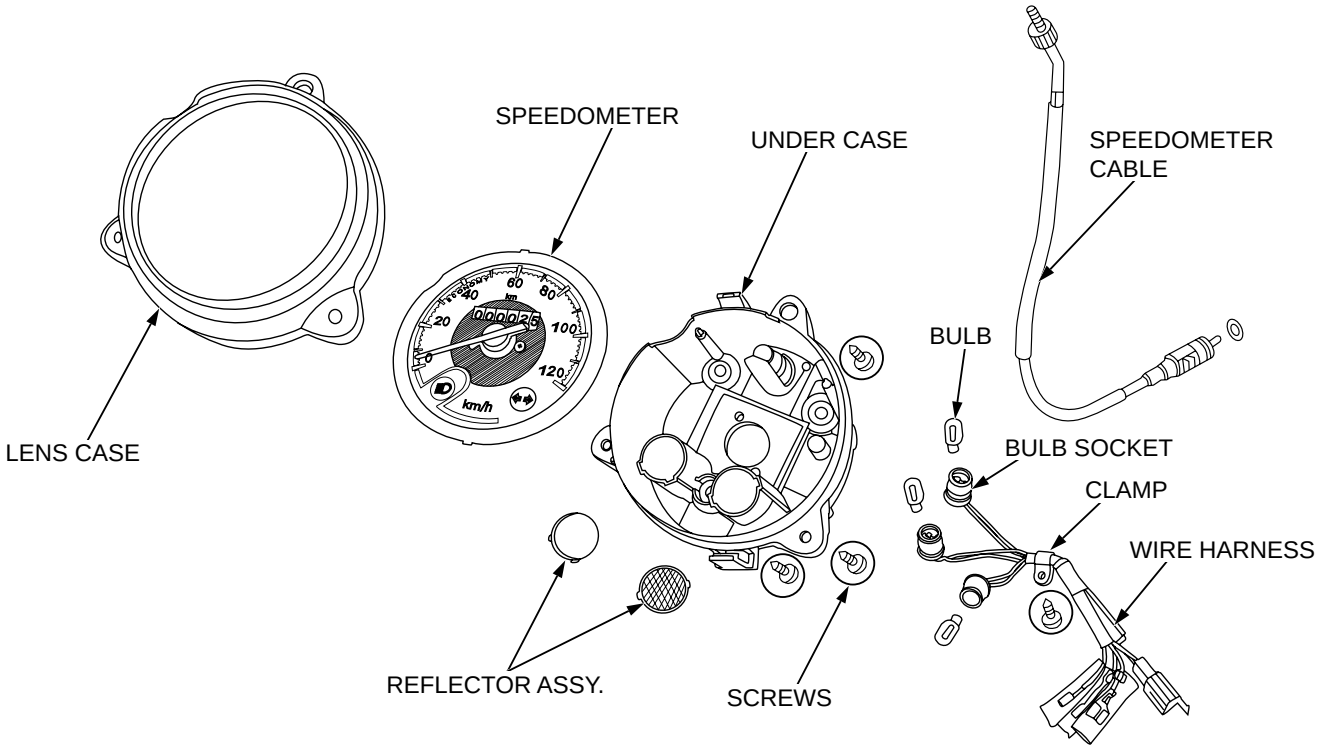

## DISASSEMBLY

Remove the following from speedo meter case under:

– Screws (3 nos.)
– Clamp (1 no.)
– Bulb sockets (3 nos.)
– Wire harness.



### SPEEDO METER ASSEMBLY




# IGNITION SWITCH

## INSPECTION

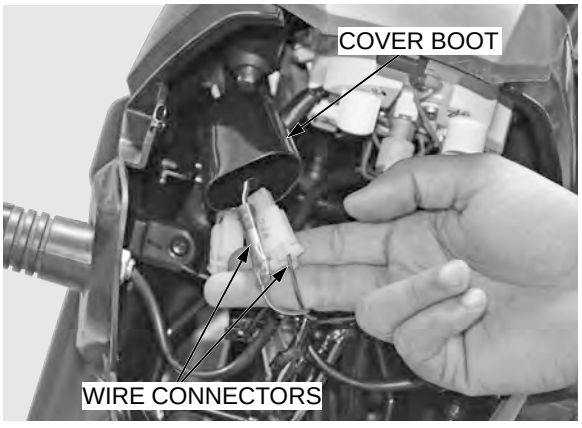
Remove the headlight assy. (page 2-2).

Disconnect the ignition switch 2P (White) connector and red/white connector after removing cover boot.

Check for continuity between the ignition switch connector terminal in each switch position.

Continuity should exist between the color coded wires as follows:

| | BAT1 | BAT2 |
|---|---|---|
| LOCK | | |
| OFF | | |
| ON | ○ | ○ |
| COLOR | R/W | B |



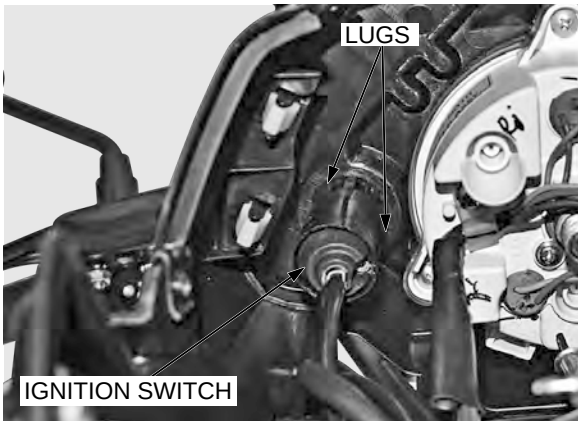

## REMOVAL/INSTALLATION

Remove the headlight assy. (page 2-2).

Disconnect the ignition switch wire connectors.

Carefully release the ignition switch by pressing lugs from the cover meter.

Installation is in the reverse order of removal.



# HANDLEBAR SWITCHES

## LEFT HANDLEBAR SWITCHES

Remove the headlight assy. (page 2-2).

Disconnect the handlebar switches 6P and 3P from left handlebar.

Check for continuity between the terminals in each switch position according to the table.

**DIMMER SWITCH**

| | HL | LO | HI |
|---|---|---|---|
| LO | ○—— | ——○ | |
| (N) | ○—— | ——○ | ——○ |
| HI | ○—— | | ——○ |
| COLOR | | W | L/W |

**WINKER SWITCH**

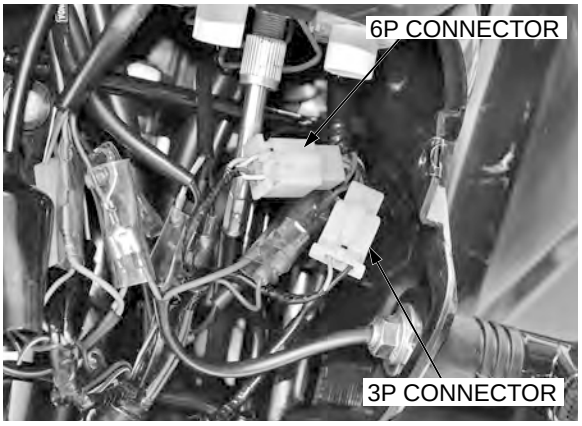
| | WR | L | R |
|---|---|---|---|
| L | ○—— | ——○ | |
| (N) | | | |
| R | ○—— | | ——○ |
| COLOR | SB | GR | O |

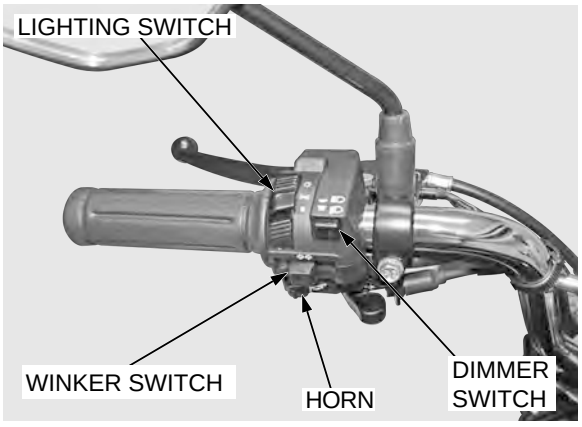
**HORN SWITCH**

| | BAT | HO |
|---|---|---|
| FREE | | |
| PUSH | ○—— | ——○ |
| COLOR | B | LG |

**LIGHTING SWITCH**

| | HL | C1 | RE | C2 | HL |
|---|---|---|---|---|---|
| OFF | | ○—— | ——○ | | |
| (N) | | ○—— | ——○ | ○—— | ——○ |
| PO | | | | ○—— | ——○ |
| (N) | ○—— | ——○ | | ○—— | ——○ |
| H/L | ○—— | ——○ | | ○—— | ——○ |
| COLOR | Y | W | | | |



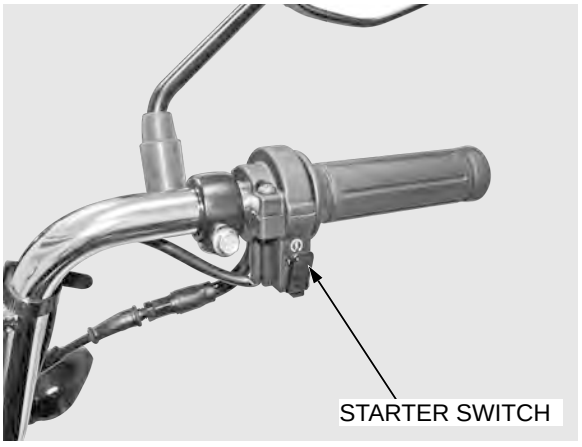




## RIGHT HANDLEBAR SWITCHES

Check for continuity between the terminals in each switch position according to the table.

**STARTER SWITCH**

| | BAT | ST |
|---|---|---|
| FREE | | |
| PUSH | ○—— | ——○ |
| COLOR | B | Y/R |




# BRAKE LIGHT SWITCH

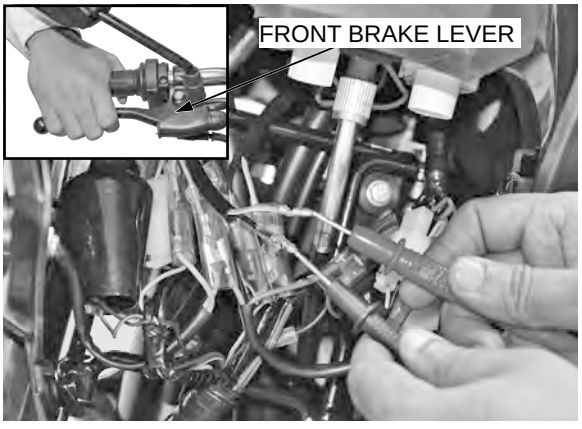
## FRONT

Remove the headlight assy. (page 2-2).

Disconnect the front brake light connectors.

There should be continuity with the brake lever squeezed, and there should be no continuity when the brake lever is released.

**Continuity : Green/Yellow - Black**



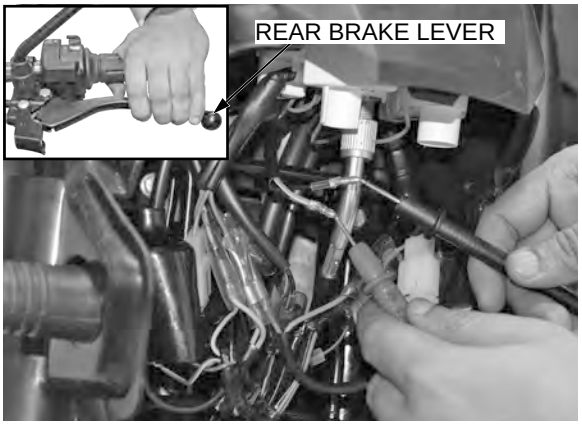
### REAR

Remove the headlight assy. (page 2-2).

Disconnect the rear brake light switch 2P connectors, and check for continuity between the terminals.

There should be continuity with the brake pedal squeezed, and there should be no continuity when the brake pedal is released.

**Continuity : Green/Yellow - Black**



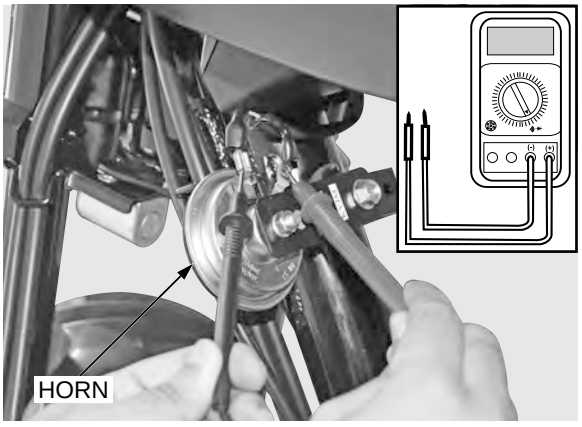

# HORN

### INSPECTION

Disconnect the wire connectors from the horn.

Connect the multi-meter to the horn terminals.

The horn is normal if it sounds when the battery voltage is connected across the horn terminals.

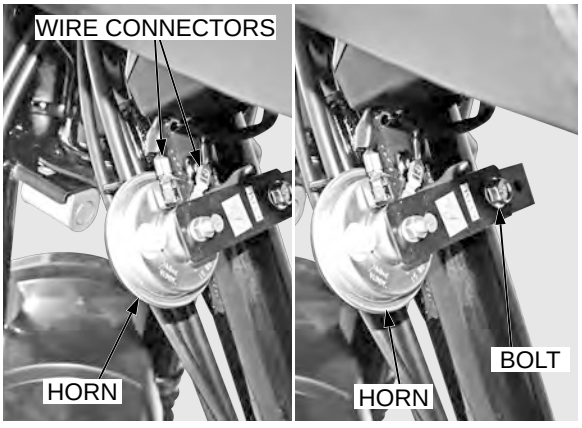



### REMOVAL/INSTALLATION

Disconnect the wire connectors from the horn.

Remove the bolt and horn.

Installation is in the reverse order of removal.



# TURN SIGNAL RELAY

## INSPECTION

**1. Recommended Inspection**

Check the following:

– Battery condition
– Burned out bulb or non-specified wattage
– Burned fuse
– Ignition and turn signal switches function
– Loose connector

**Are the above items in good condition?**

**NO** – Replace or repair the malfunction parts.

**YES** – GO TO STEP 2.

**2. Turn Signal Circuit Inspection**

Remove the battery cover (page 2-6).

Disconnect the turn signal relay 2P connector from the turn signal relay.

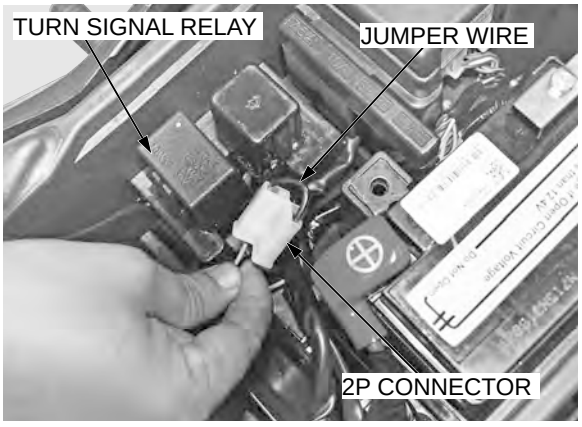
Short the Black and Gray terminals of the turn signal relay connector with a jumper wire.

Start the engine and check the turn signal light by turning the switch “ON”.

**Is the light come on?**

**YES** – • Faulty turn signal relay
• Poor connection of the connector

**NO** – Open circuit in Black or Gray wires



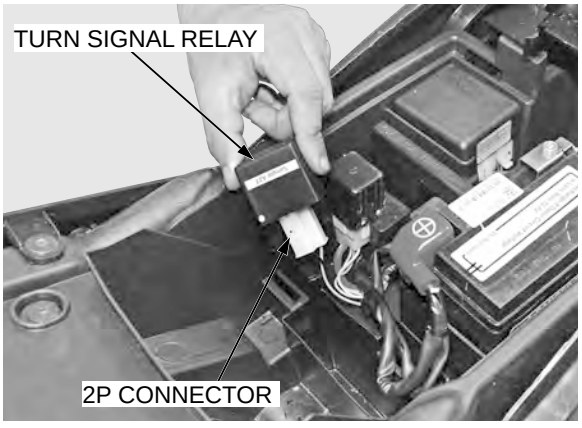

## REMOVAL/INSTALLATION

Remove the battery cover (page 2-6).

Disconnect the turn signal relay 2P connector from the relay.

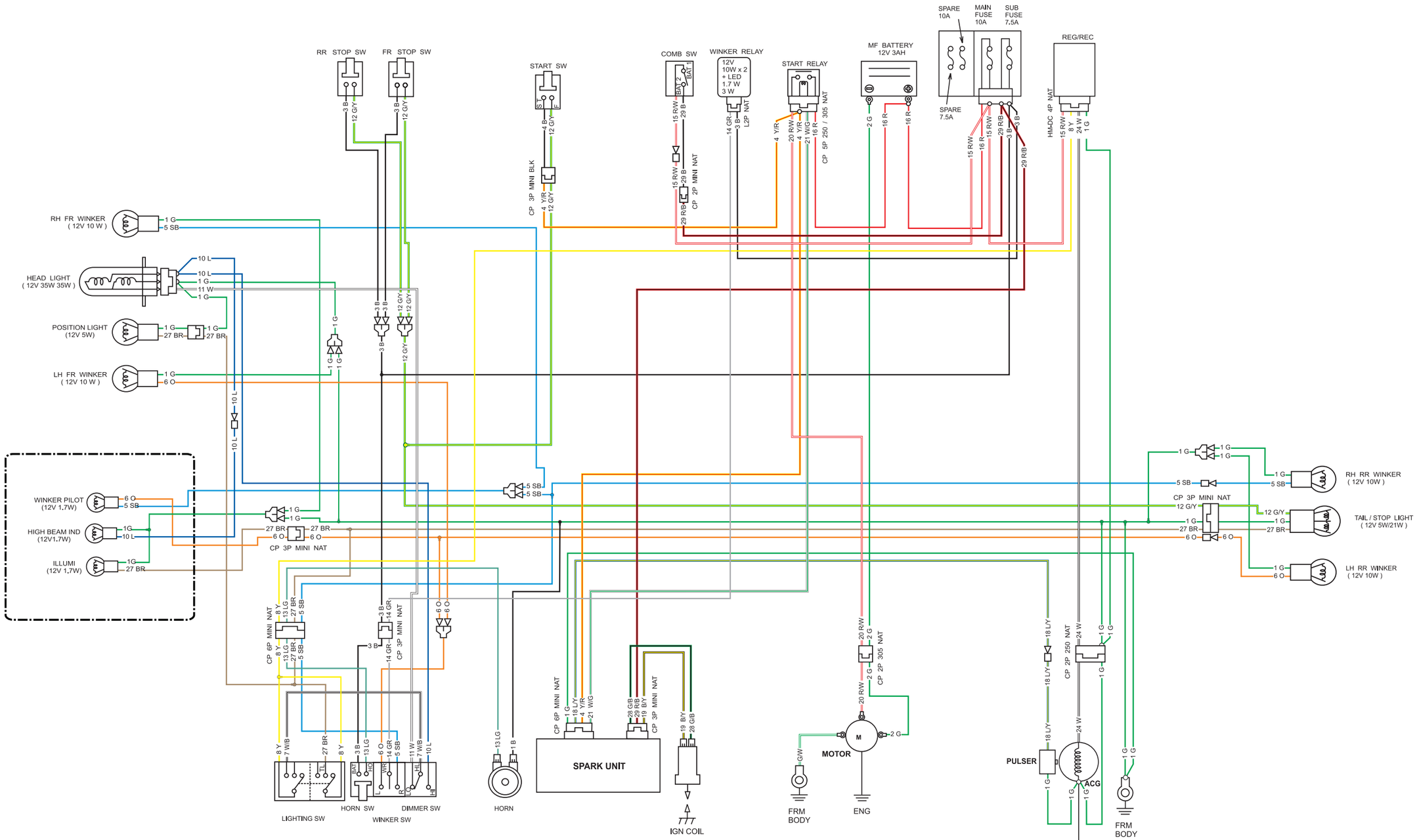
Remove the turn signal relay from the bracket.

Installation is in the reverse order of removal.



**MEMO**

**Model: NAVI** **19-1**




| COMB. SW | BAT1 | BAT2 |
|---|---|---|
| ON | ● | ● |
| OFF | | |

| STAR . SW | BAT | ST |
|---|---|---|
| FREE | | |
| PUSH | ● | ● |

| HORN SW | BAT | HO |
|---|---|---|
| FREE | | |
| PUSH | ● | ● |

| DIMMER SW | HL | LO | HI |
|---|---|---|---|
| LO | ● | ● | |
| ( N ) | ● | ● | ● |
| HI | ● | | ● |

| WINKER SW | WR | L | R |
|---|---|---|---|
| L | ● | ● | |
| N | | | |
| R | ● | | ● |

| LIGHTING SW | HL | C1 | RE | C2 | TL |
|---|---|---|---|---|---|
| OFF | | ● | ● | | |
| N | | ● | ● | ● | ● |
| POSITION | | | | ● | ● |
| ( N ) | ● | ● | | ● | ● |
| H/L | ● | ● | | ● | ● |

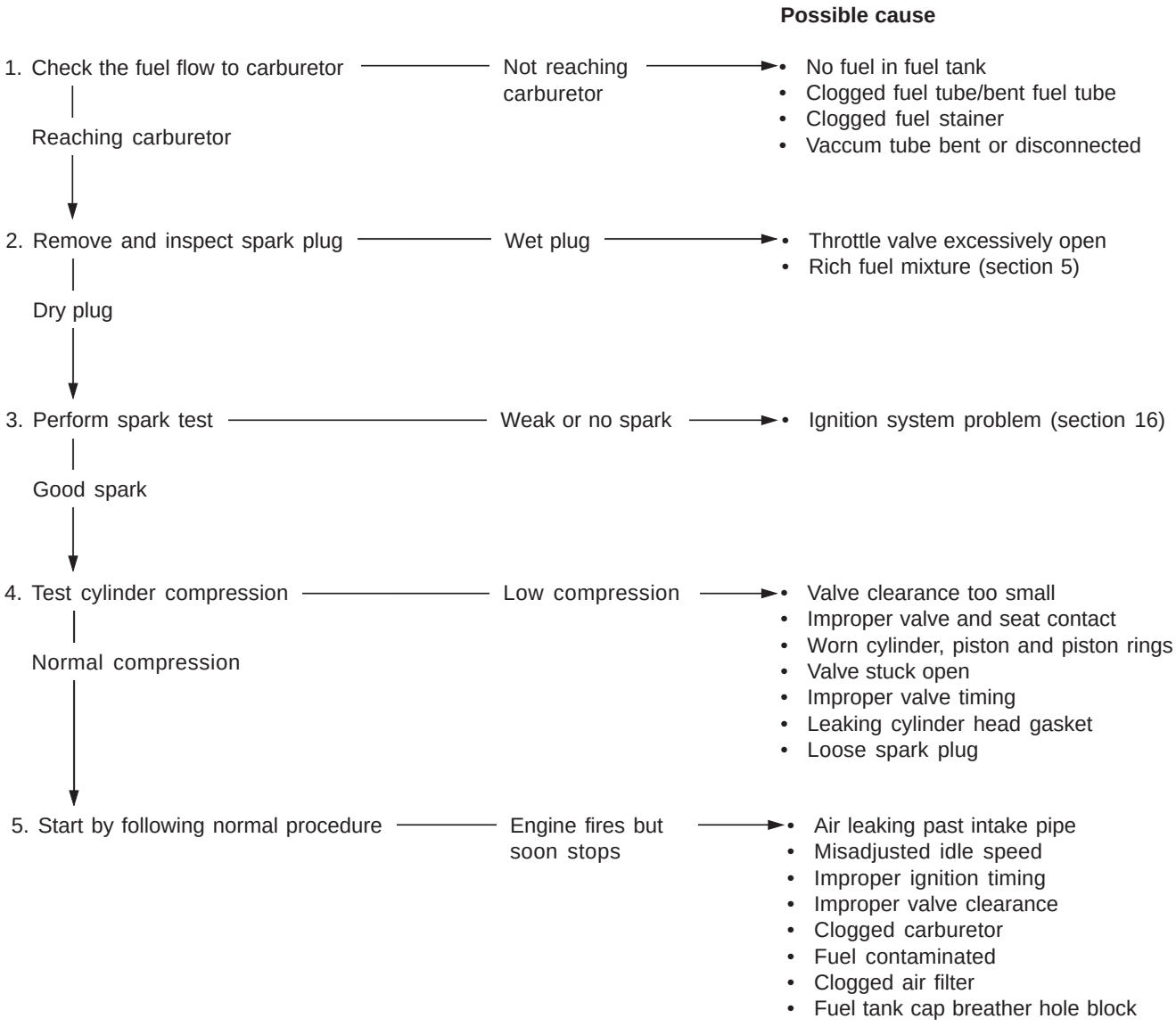
| | | | |
|---|---|---|---|
| B | BLACK/काला | BR | BROWN/ भूरा |
| Y | YELLOW/पीला | O | ORANGE/ संतरी |
| L | BLUE/ नीला | SB | SKY BLUE/आसमानी |
| G | GREEN/हरा | LG | LIGHT GREEN/ हल्का हरा |
| R | RED/लाल | P | PINK/ गुलाबी |
| W | WHITE/ सफेद | GR | GRAY/ सलेटी |

**COLOR COMB GROUND/MARKING**

# 20. TROUBLESHOOTING



## ENGINE DOES NOT START OR IS HARD TO START



# ENGINE LACKS POWER

| | | Possible cause |
|---|---|---|
| 1. Raise rear wheel off ground and accelerate lightly<br>Engine speed increase | Engine speed does not increase sufficiently | • Clogged air cleaner<br>• Restricted fuel flow<br>• Clogged fuel tank cap breather hole<br>• Clogged muffler |
| 2. Check ignition timing<br>Correct | Incorrect | • Faulty spark unit<br>• Faulty ignition pulse generator |
| 3. Test cylinder compression<br>Normal compression | Low compression | • Valve clearance too small<br>• Improper valve and seat contact<br>• Worn cylinder, piston and piston rings<br>• Valve stuck open<br>• Improper valve timing<br>• Leaking cylinder head gasket<br>• Loose spark plug |
| 4. Check carburetor for clogging<br>Normal | Clogged | • Carburetor not serviced frequently enough |
| 5. Remove and inspect spark plug<br>Not fouled or discolored | Fouled or discolored | • Plug not serviced frequently enough<br>• Use of plug with improper heat range |
| 6. Check if engine overheats<br>Not overheating | Overheating | • Lean fuel mixture (section 5)<br>• Wrong type of fuel<br>• Excessive carbon build-up in combustion chamber<br>• Ignition timing too advance (Faulty spark unit or ignition pulse generator)<br>• Drive and driven pulleys/ clutch slipping (section 10)<br>• Any extra modification |
| 7. Try rapid acceleration or run at high speed | Engine knocks | • Excessive carbon build-up in combustion chamber<br>• Wrong type of fuel<br>• Lean fuel mixture (section 5)<br>• Ignition timing too advance (Faulty spark unit or ignition pulse generator)<br>• Throttle position switch faulty |

# POOR PERFORMANCE AT LOW AND IDLE SPEEDS

| | | Possible cause |
|---|---|---|
| 1. Check carburetor air screw adjustment | Incorrect | • See section 5 |
| Correct | | |
| 2. Check if air is leaking past intake pipe | Leaking | • Loose carburetor and/or intake pipe<br>• Damaged carburetor insulator<br>• Deteriorated intake pipe O-ring |
| Not leaking | | |
| 3. Perform spark test | Weak or intermittent spark | • Ignition system problem (section 16) |
| Good spark | | |
| 4. Check choke valve | Abnormal | • Faulty choke valve |
| Normal | | |
| 5. Check ignition timing | Incorrect | • Faulty ignition pulse generator<br>• Faulty spark unit |

# POOR PERFORMANCE AT HIGH SPEED

| | | Possible cause |
|---|---|---|
| 1. Check fuel flow from fuel tank | Fuel flow restricted | • Clogged fuel stainer<br>• Clogged fuel tube/vaccum tube |
| Fuel flows enough | | |
| 2. Check carburetor for clogging | Clogged | • Carburetor not serviced frequently enough |
| Normal | | |
| 3. Check valve timing | Incorrect | • Cam sprocket not installed properly |
| Correct | | |
| 4. Check ignition timing | Incorrect | • Faulty ignition pulse generator<br>• Faulty spark unit |
| Correct | | |
| 5. Check choke valve | Abnormal | • Choke valve open or broken |
| Normal | | |
| 6. Check valve spring | Weak | • Faulty valve spring |

# POOR HANDLING

| | Possible cause |
|---|---|
| 1. If steering is hard | • Steering stem adjusting nut too tight<br>• Damaged steering head bearings |
| 2. If either wheel is wobbling | • Excessive wheel bearing play<br>• Bent rim<br>• Improper installed wheel hub<br>• Swingarm pivot bushing excessively worn<br>• Bent frame |
| 3. If the scooter pulling to one side | • Faulty shock absorber<br>• Front and rear wheel not aligned<br>• Bent fork<br>• Bent swingarm<br>• Bent axle |

# 21. INDEX

HONDA

The Power of Dreams


82K74P0

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