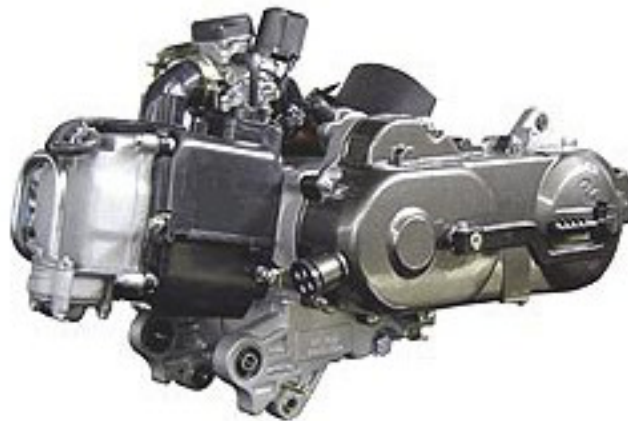




# **SERVICE AND REPAIR MANUAL**



# **4 STROKE ENGINE**

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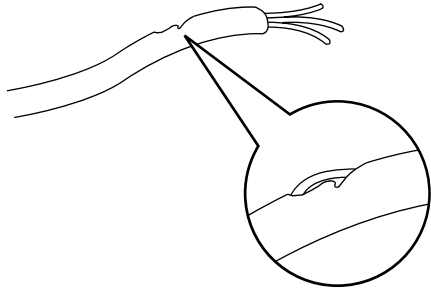
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# 1. General Information

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## Technical Tips (continued)

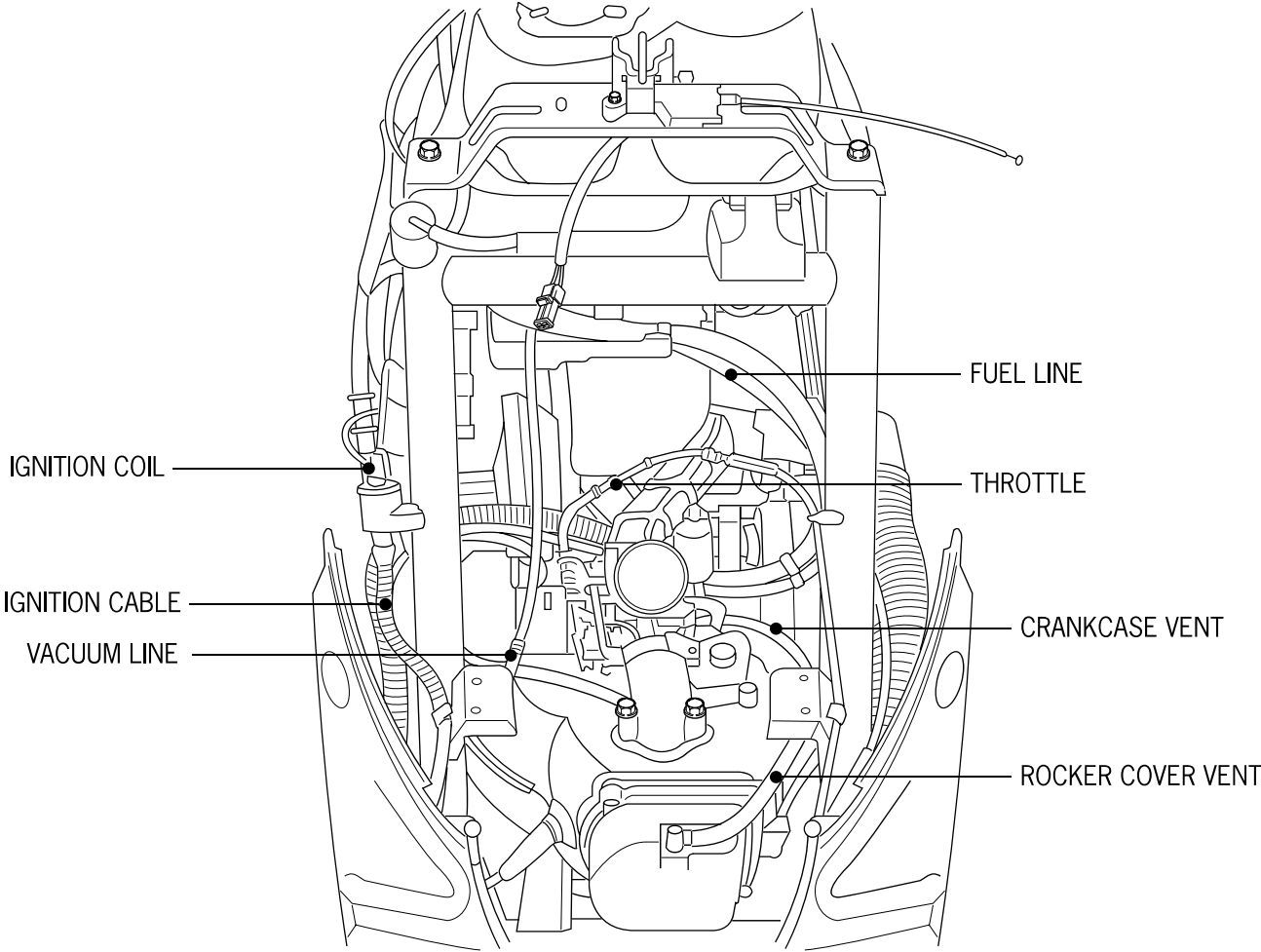
- Do not pull wires too tightly.
- Use tape to protect against sharp edges.
- Make sure that all rubber grommets are in place to protect the wiring harness.
- Do not reuse broken or frayed wires.
- Repair or replace wires as necessary.



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# 1. General Information

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## 2. Body Cover and Exhaust System

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Topic	Page
General Information	2-1
Body Cover Removal	2-2
Exhaust System Removal	2-4

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### General Information

- Do not use excessive force when removing body panels. Use a firm, consistent force to disengage the tabs and remove the panels.

- Do not pry or pound on the body panels. The mounting tabs are not designed to withstand prying, pounding or twisting.

Parts to be removed and sequence of removal.

- Front headlight and meter cover.
- Back headlight and meter cover.
- Front fender.
- Front body cover.
- Front body panel.
- Seat and helmet box.
- Rear handhold and taillight assembly.
- Footboard cover and battery cover.
- Footboard and rear cover.
- Front frame cover.
- Covers and body side panels.
- Bottom cover.

Torque requirements

- Body mounting nuts and screws 1.2kg-m
  - Exhaust pipe bolts 35kg-m
-

# 3. Scheduled Maintenance

## Valve Adjustment

- Always check and adjust with engine temperature lower than 35°C (95°F)

1. Remove cylinder head cover.
2. Rotate cooling fan to camshaft. Locate mark at center top, aligning magneto fly wheel mark with that on crankcase. Magneto "T" mark and box crankshaft mark.

**Valve gap checking and adjustment valve gap:**  
IN: 0.05mm (.00197 in.)  
EX: 0.05mm (.00197 in.)

3. To adjust the valve gap, loosen jam nut and rotate adjusting nut.

## Valve Adjustment Wrench

- Be sure to check valve gap again, after locking jam nut.

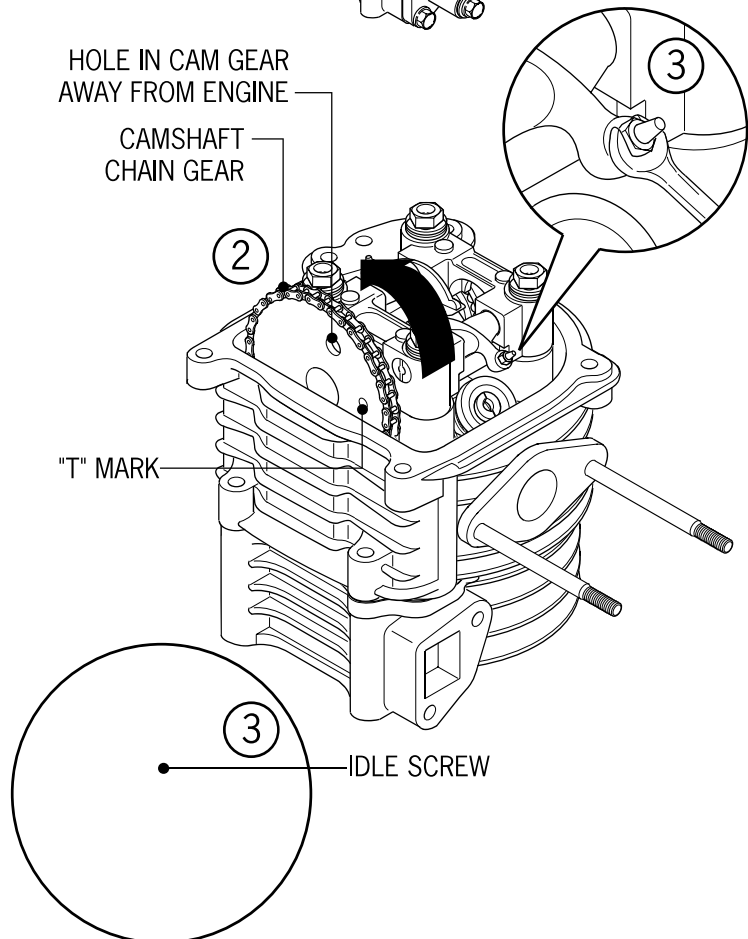
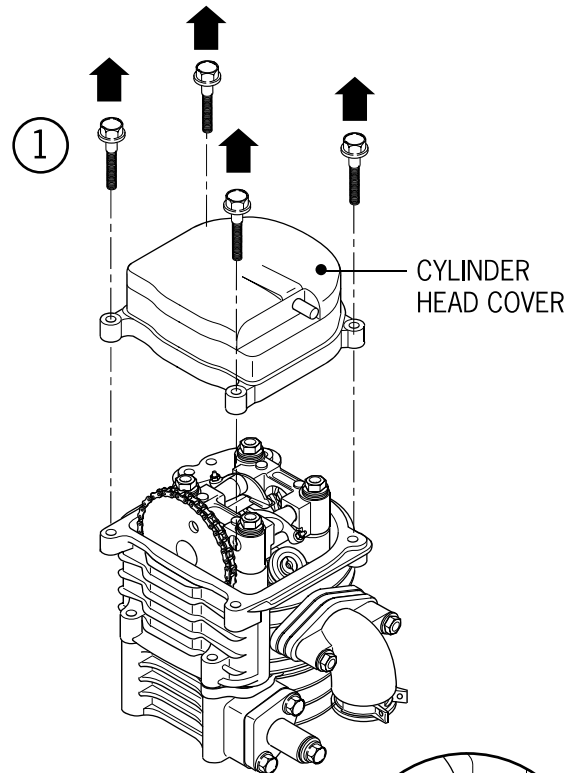
## Carburetor Idle Speed

- Idle adjustment should be made with the engine warmed up.

1. Remove cover.
2. After the engine warms up, connect it to an engine revolution counter.
3. Adjust idle screw until specified revolution is obtained.

*Minimum idling speed: 1900+190rpm*

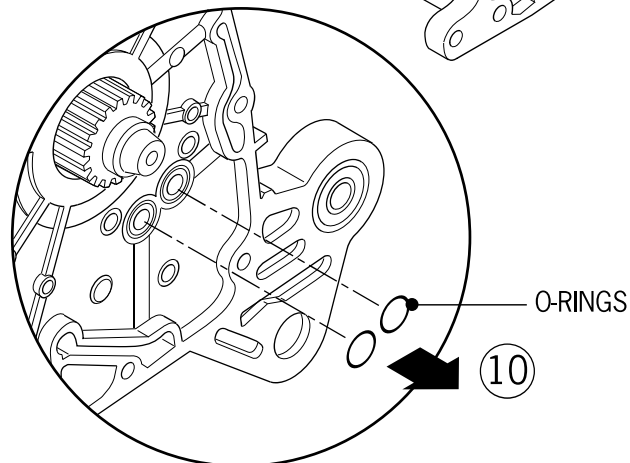
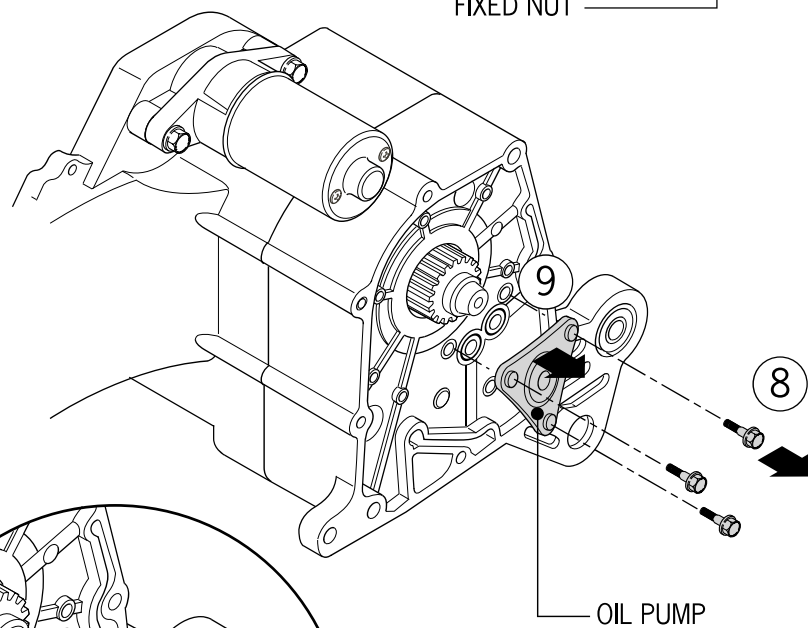
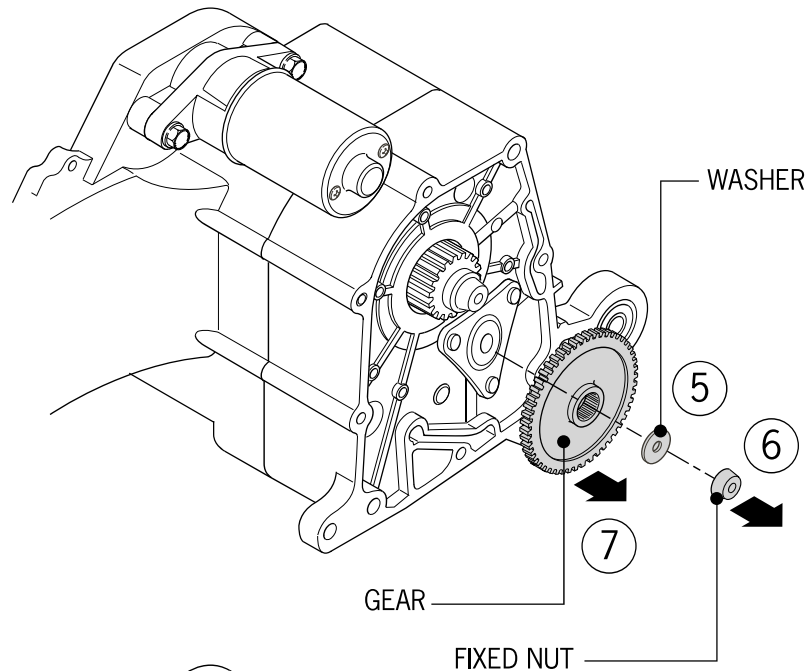
4. Readjust the screw if the idle speed is not steady or fuel cannot be properly applied.



# 4. Lubricating System

## Oil Pump Removal

1. Remove engine right outer cover fan magnetor.
2. Remove alternator rotor.
3. Remove stator pules coil.
4. Remove eight bolts of right crankshaft case cover and take off crankshaft case cover.
5. Remove washer and fixed pin.
6. Remove the fixed nut of the gear in the oil pump.
7. Take off the gear of the oil pump.
8. Remove fixed bolts of oil pump module body.
9. Take off oil pump.
10. Take off two o-rings.
11. Check o-rings for damage.
12. Replace if necessary.



# 5. Fuel System

## Vacuum Chamber-Break down

1. Remove two screws and take off cover.
2. Remove spring, diaphragm piston.
3. Remove fuel pin and slide.

⦿ Take special care not to damage diaphragm. Replace if damaged.

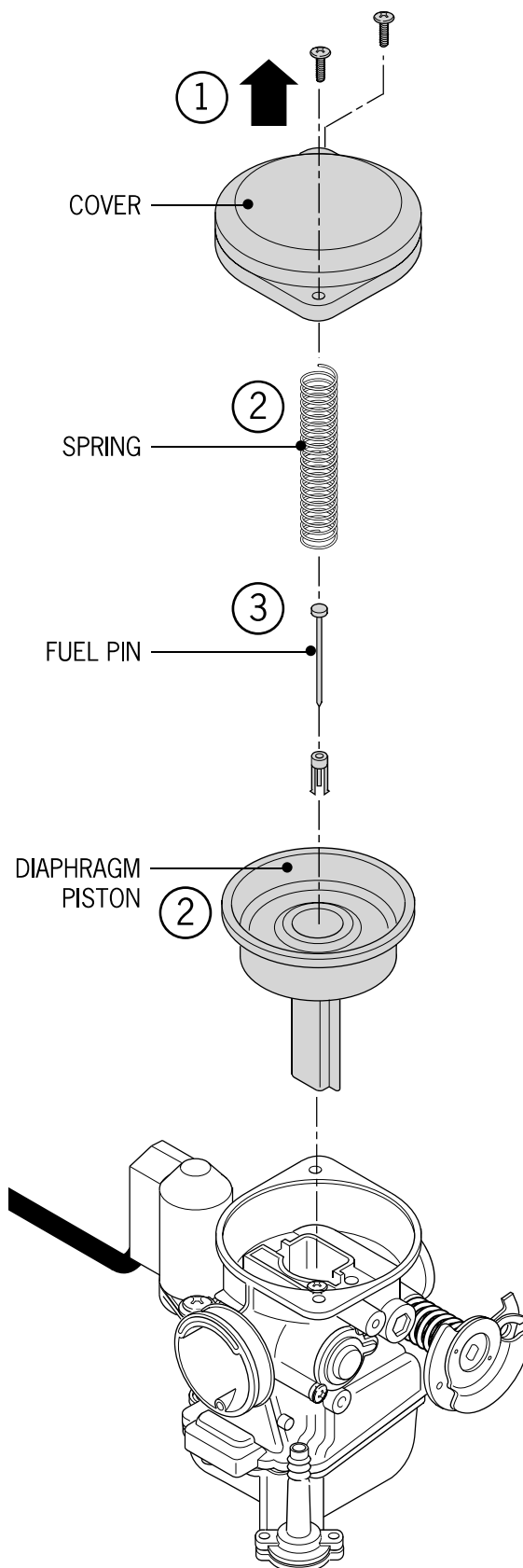
## Checking

1. Check pin for wear and replace if necessary.

## Assembling

1. Install piston or plate to body of carburetor.
2. Push the button of the piston to vacuum chamber side and keep open completely. Install spring and cover.
3. Install screw.

⦿ Be sure to hold slide and piston in up position when installing cover and tighten screw.



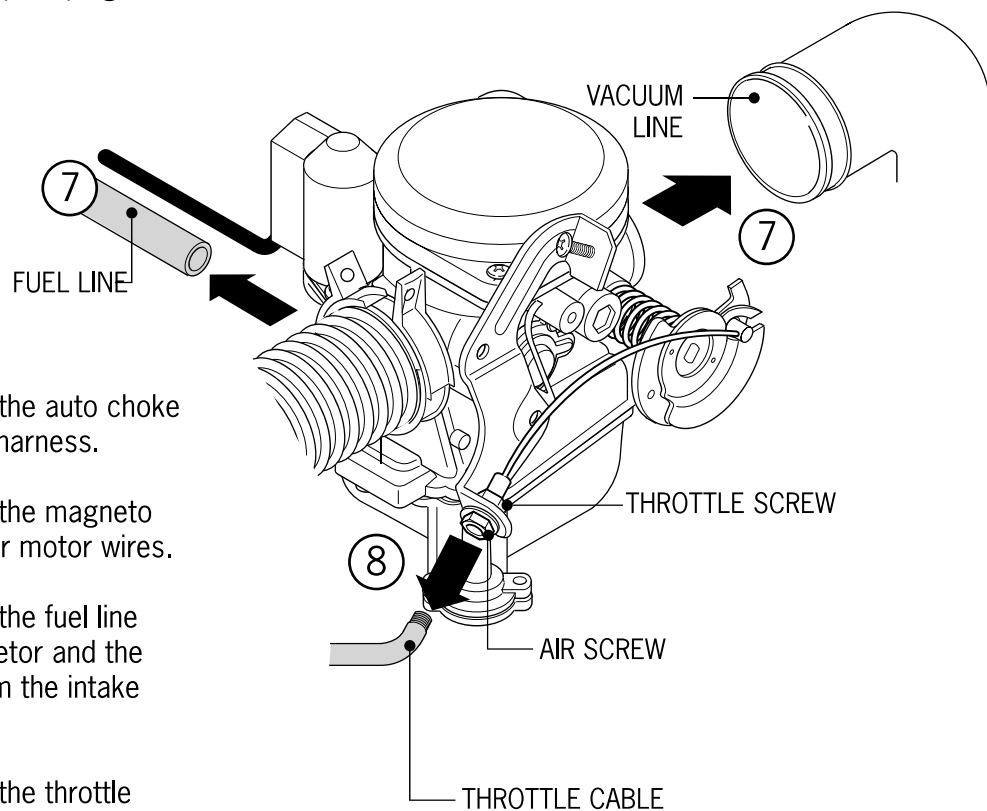
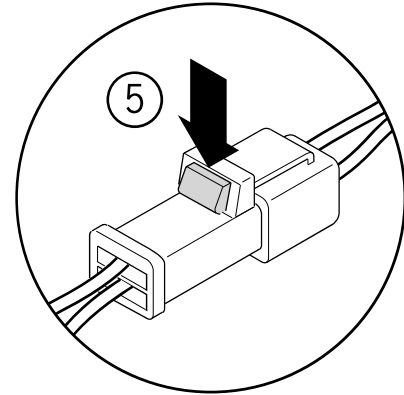
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# 6. Engine Removal and Installation

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## Engine Removal

1. Disconnect the battery ground wire.
2. Remove body panels to expose engine.
3. Disconnect the engine ground wire.
4. Remove the spark plug cable from the spark plug and the ignition coil.



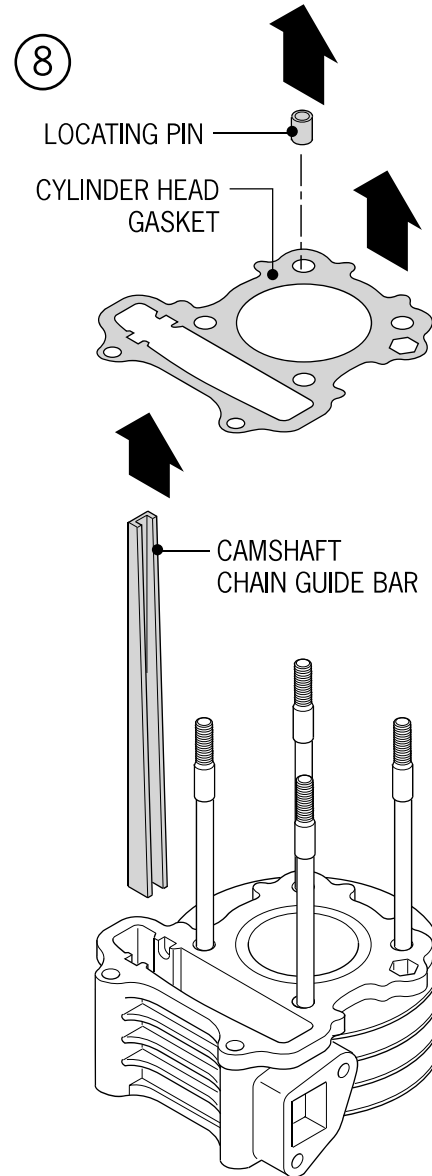
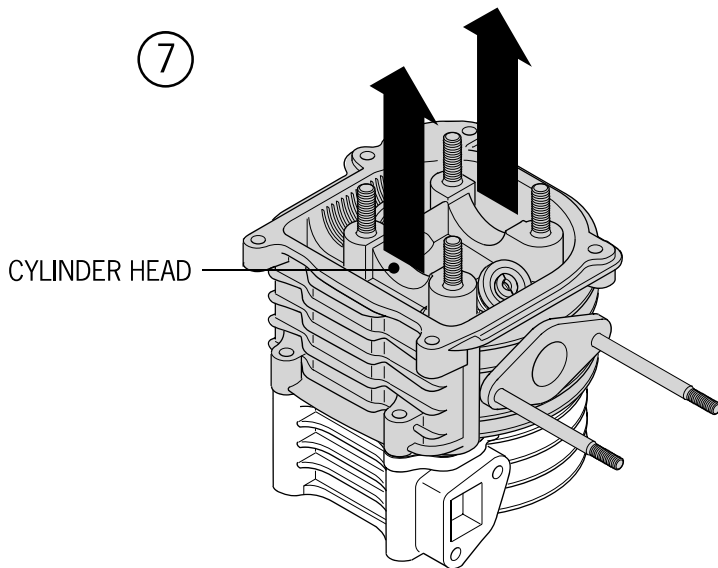
5. Disconnect the auto choke from the wiring harness.
6. Disconnect the magneto wires and starter motor wires.
7. Disconnect the fuel line from the carburetor and the vacuum line from the intake manifold.
8. Disconnect the throttle cable from the carburetor.
9. Remove the air filter box.

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# 7. Cylinder Head Valve

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4. Remove fan cover.
5. Remove bolt and screw of engine cover.
6. Disassemble and remove engine cover.
7. Pull up on cylinder head to break gasket and slide off cylinder stands.
8. Take off location pin and cylinder head gasket.
9. Take off camshaft chain guide bar.





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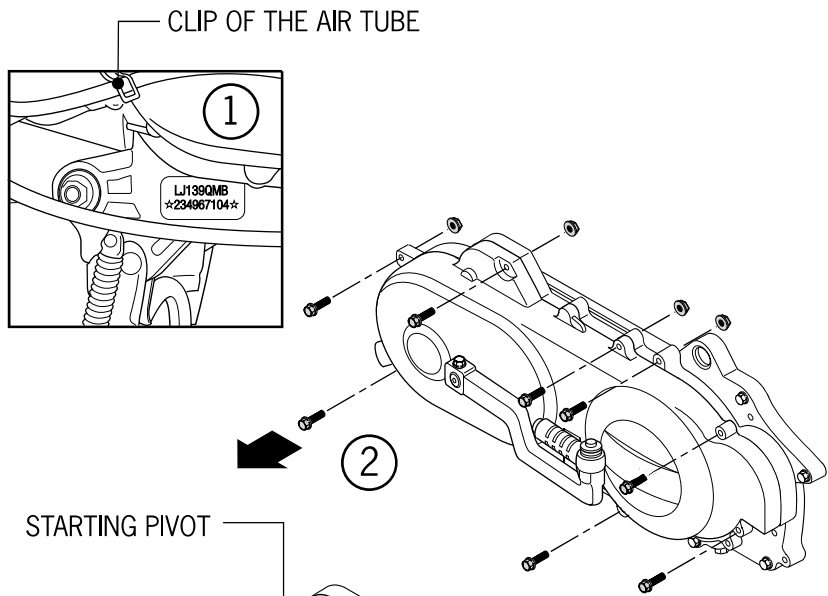
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# 9. Driving Belt Device & The Starting Lever

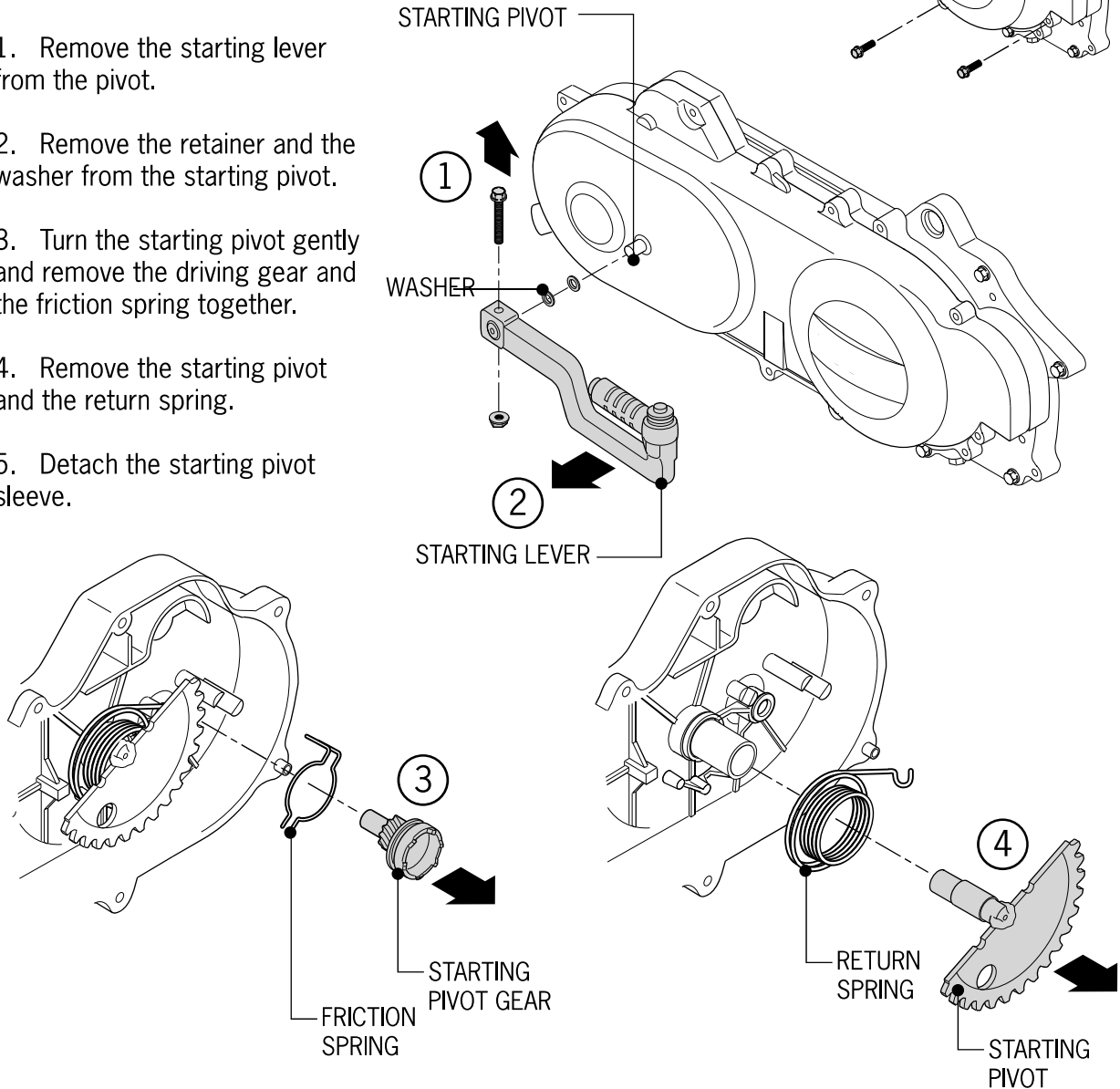
## Detaching the Left Crankcase Cover

1. Unlock the clip for the air tube for the driving belt.
2. Remove eight bolts and then take off the left crankcase cover and the locating pin.
3. Check whether the gasket is damaged or fractured.



## Removing the Starting Pivot

1. Remove the starting lever from the pivot.
2. Remove the retainer and the washer from the starting pivot.
3. Turn the starting pivot gently and remove the driving gear and the friction spring together.
4. Remove the starting pivot and the return spring.
5. Detach the starting pivot sleeve.



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# 9. Driving Belt Device & The Starting Lever

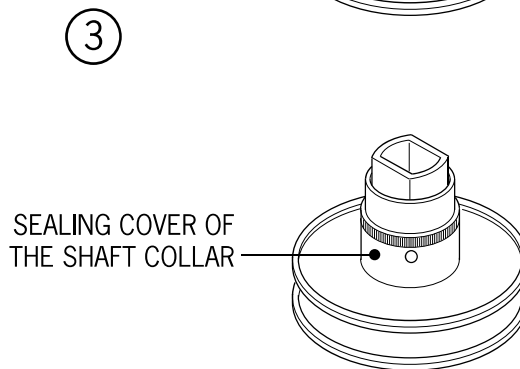
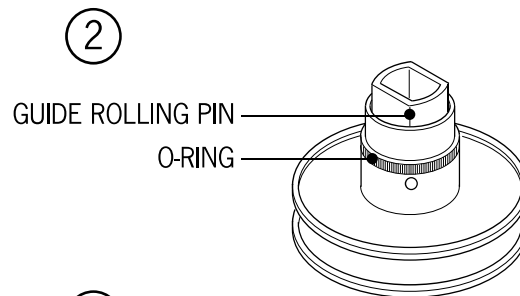
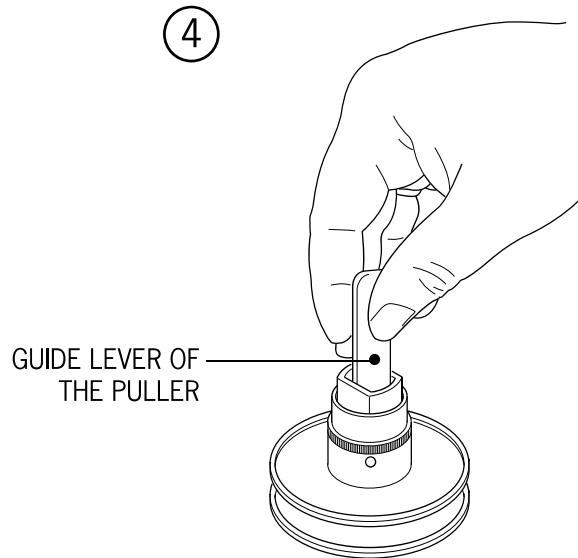
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4. Drive in the new needle bearing, keeping the "mark" side up.

## The Clutch/Transmission Pulley Assembly

1. Assemble the transmission pulley guide pin and oil seal.
2. Install the sealing cover of the collar.
3. Assemble the transmission pulley disk and the spring to the clutch assembly, pressing down with the spring compressor for the clutch spring.
4. Install the 28mm fix nut and tighten it.

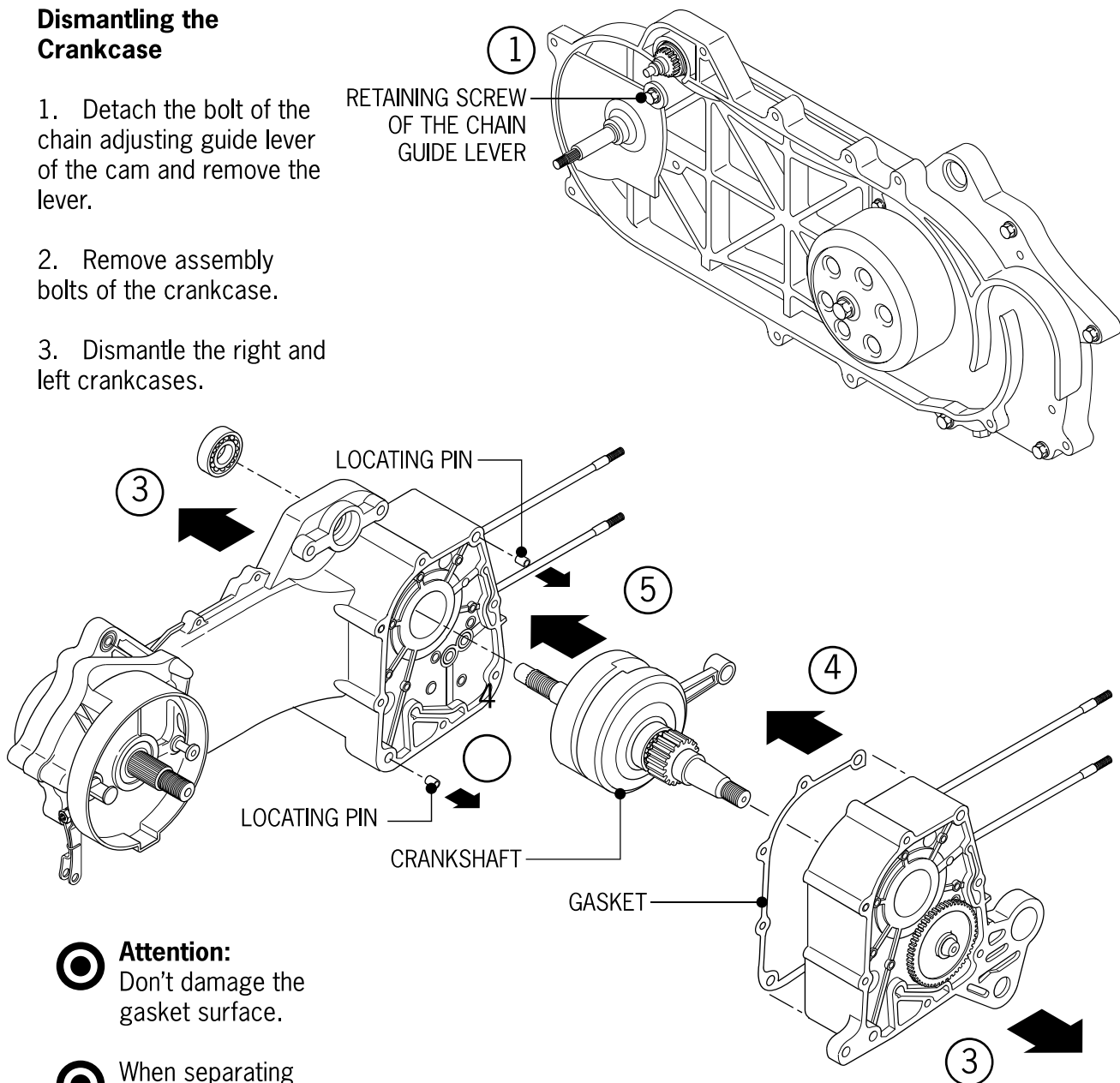
*Torque: 5.0-6.0kg/m 35-40ft lbs*



# 11. The Crankcase and the Crankshaft

## Dismantling the Crankcase

1. Detach the bolt of the chain adjusting guide lever of the cam and remove the lever.
2. Remove assembly bolts of the crankcase.
3. Dismantle the right and left crankcases.



- ⦿ **Attention:** Don't damage the gasket surface.
- ⦿ When separating the crankcases, don't use a screwdriver to pry them apart.

4. Remove the gasket and the locating pin.
5. Remove the crankshaft from the crankcase.

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# 12. The Front Wheel, Front Brake,

## *Front Buffer and the Front Fork*

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3. Coat the end of the throttle grip with grease.
4. Install the throttle grip and then the cable.
5. To assemble, reverse order of disassembly steps.

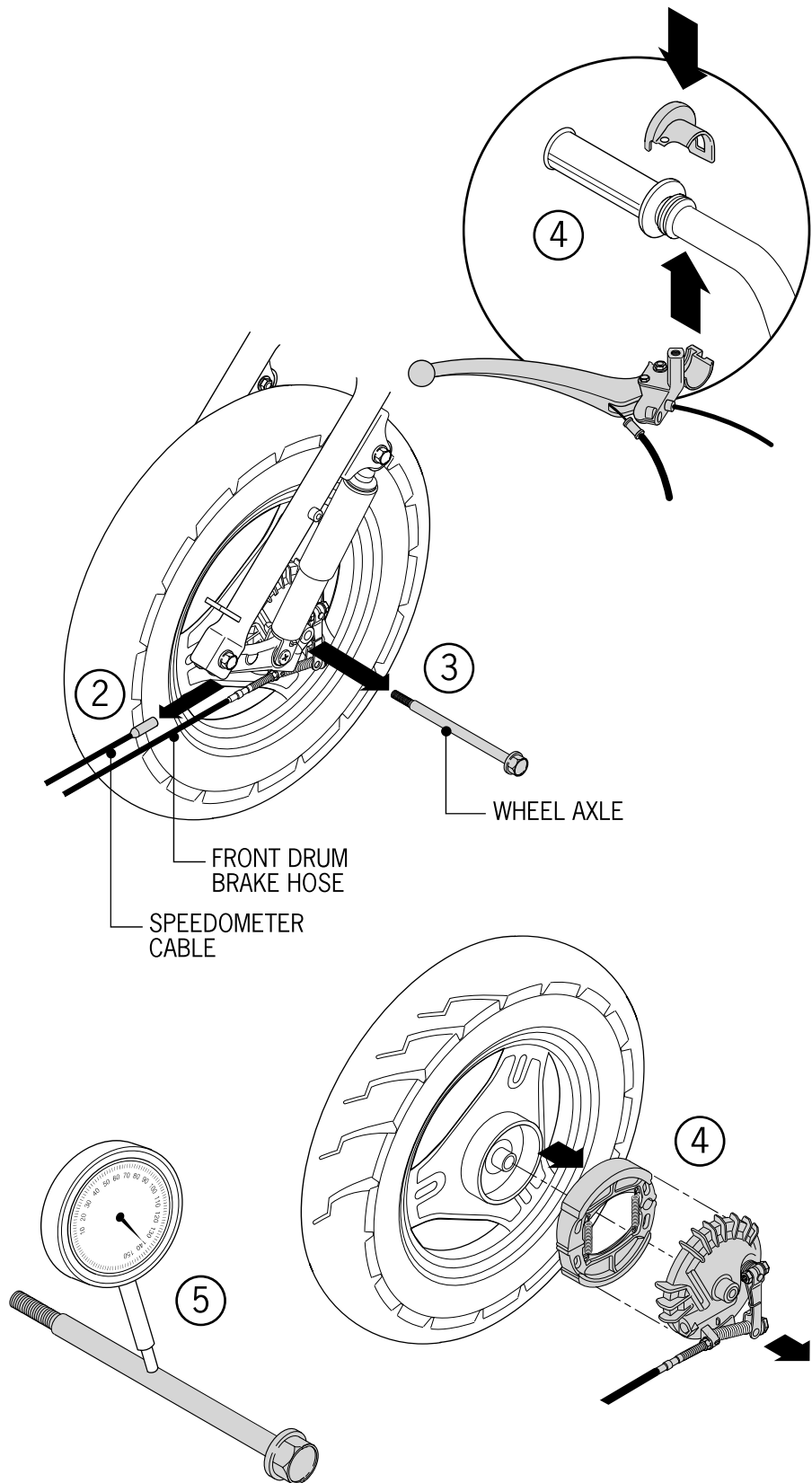
### **Front Wheel Removal**

1. Lift the frame to make sure the front wheel is off the ground. Support the scooter in this position.
2. Detach the screw of the speedometer cable and remove the cable.
3. Remove the nut of the front wheel axle; take out the axle and the wheel.
4. Remove the drum disk and the collar.

### **Checking**

5. Check the straightness of the axle. The meter indicates 1/2 of the total bending value.

Maximum service allowance:  
Replace when it goes beyond  
0.2mm (.008 in.).

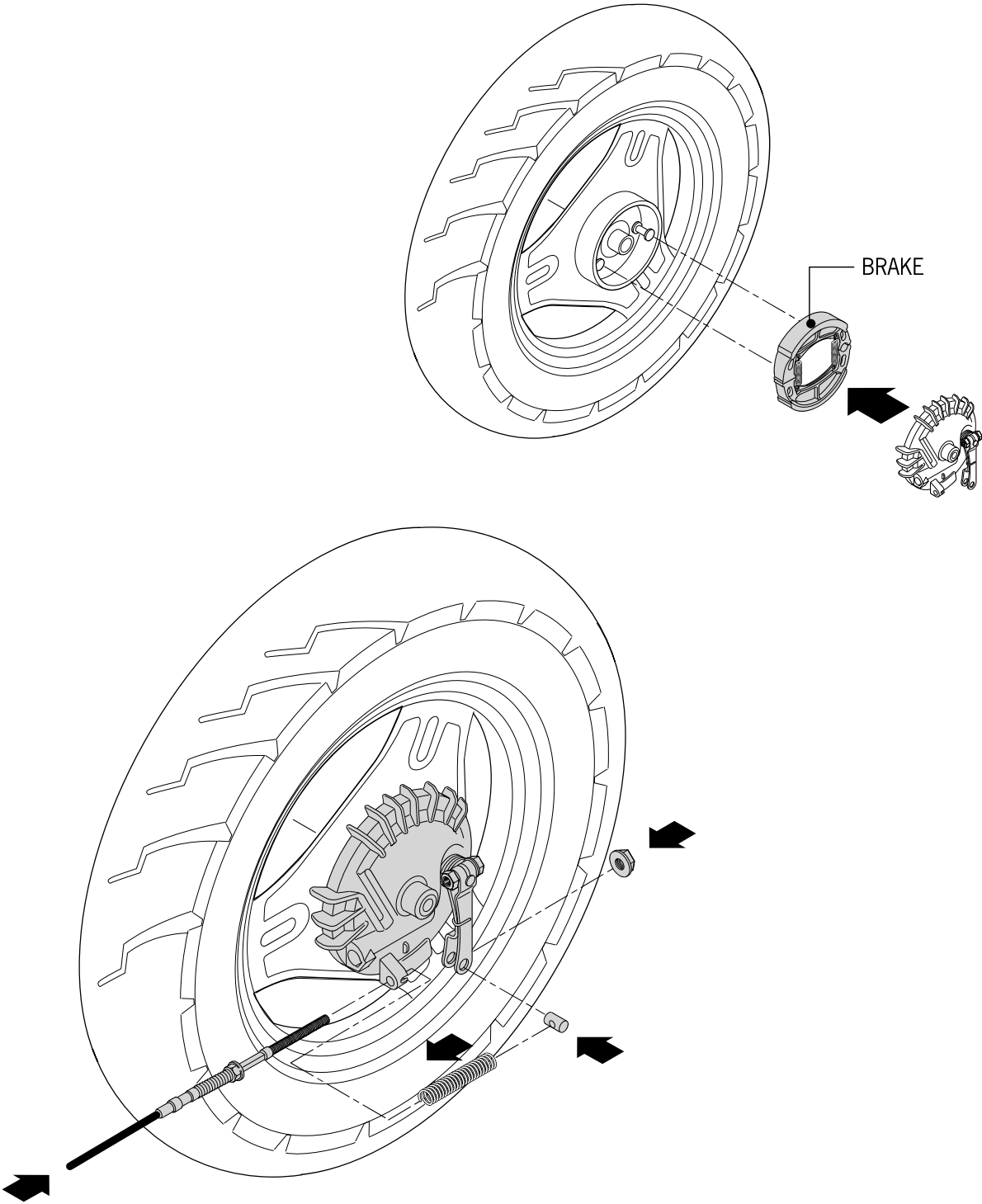


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# 12. The Front Wheel, Front Brake,

## *Front Buffer and the Front Fork*

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# 14. The Battery and the Charging System

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Topic	Page	Topic	Page
Instructions	14-1	The Charging System	
Diagnosis	14-2	Testing short circuit	14-7
The battery	14-3	Assembling the magnetor	14-8
The charging system	14-4	The Magneto Charging Coil	14-9
The rectifying voltage stabilizer	14-5	Checking The magneto lighting coil	14-9
The magneto charging coil	14-6	Checking the Resistor	14-9
Checking the resistor	14-6	Dismounting the Magneto	14-9
Dismantling the magneto	14-6	Assembling the Magneto	14-11

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## Important Points

The electrolyte (diluted sulfuric acid) is very toxic. DO NOT allow acid to splash onto clothes, the skin or eyes to protect them from burning. Eye contact with acid may cause blindness. In case of contact with the acid, use a large amount of clean water to flush and rinse the areas in which the acid came into contact. See a Physician immediately. If the electrolyte acid gets into clothes, it will permeate to the skin. Remove tainted clothes immediately and then put them in water to rinse.

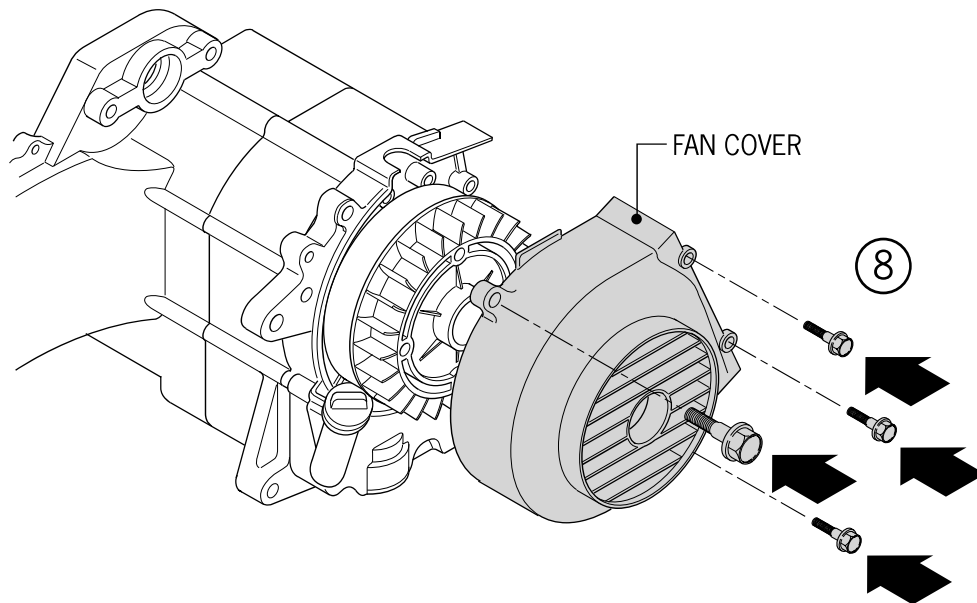
- The battery can withstand numerous cycles of charging and discharging as long as it is not left in a discharged condition for a long period of time.
  - If the battery is overcharged, it can be detected by close inspection of the battery itself. If the battery is exposed to an extreme overcharged condition, it can break down and short circuit internally. In this condition, the battery will produce zero voltage under all load and charge conditions. An overcharged battery can “boil off” the electrolyte solution. This problem can be due to excessive time on a battery charger or a failed voltage regulator.
  - If the scooter is left to sit for a long time or is stored, the battery will slowly discharge. It is advisable to recharge the battery before attempting to start the scooter after a period of storage.
  - When filling a new battery with acid, allow it to sit and “breathe” for fifteen minutes before installing it into the scooter or charging it. It is advisable to charge a new battery after filling with acid even though it may appear to have sufficient charge.
  - When working on the scooter’s electrical system, make sure that the main switch is turned off and/or the battery is disconnected. Disconnecting and reconnecting of live circuits can cause high instantaneous currents that can damage the battery and cause injury.
  - Any short-circuiting of the wiring can cause damage to the battery.
-

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# 14. The Battery and the Charging System

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8. Install the fan cover and securely tighten fasteners.

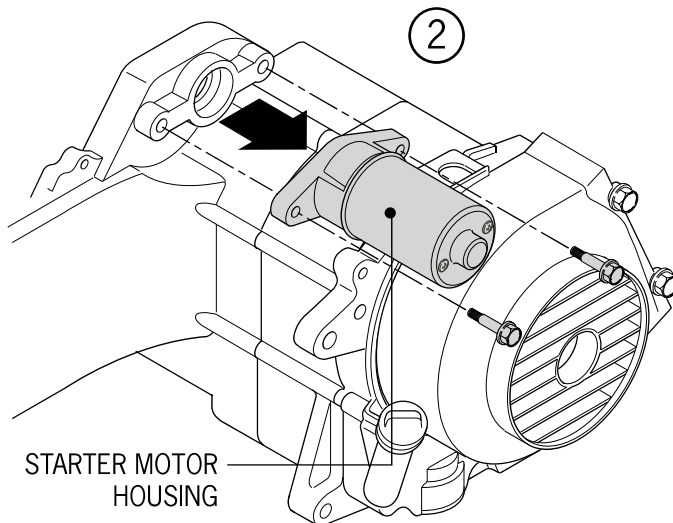


# 16. Starter System

## Starter Motor Removal

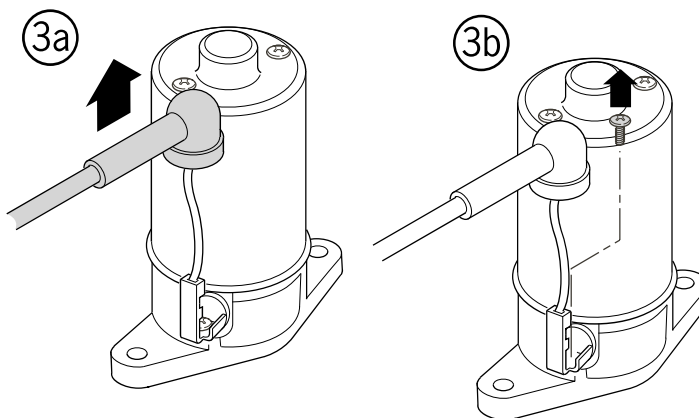
⊙ Never work on the starter motor until main switch is turned off and the battery ground wire is disconnected to ensure that the motor cannot turn.

1. Remove the starter motor lead clamp.
2. Remove the two bolts and remove the starter motor.
3. Roll up the water-proof rubber cover to disconnect the starter motor.



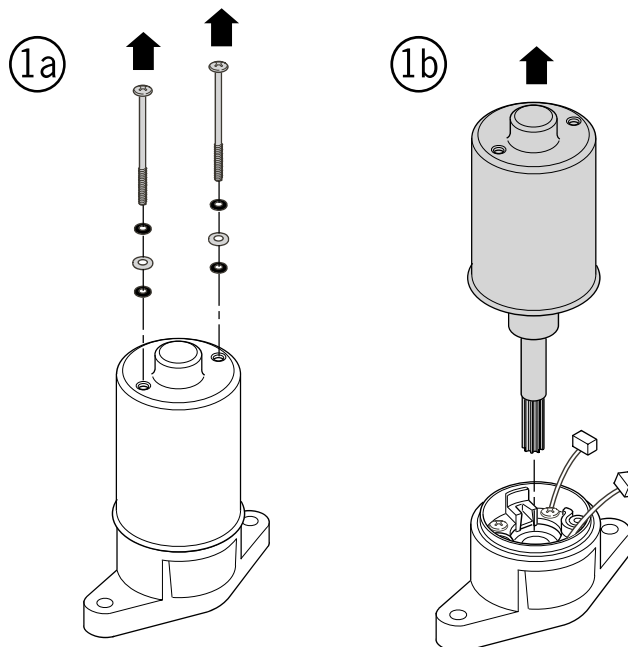
## Starter Disassembly

1. Remove the two case bolts and remove the motor housing from the internal parts.



## Starter Inspection

2. Inspect brushes and commutator for wear, damage or discoloration. Replace if necessary.
3. Clean attached metal particles from the commutator surfaces.
4. Measure the resistance between each contact surface of the components.
5. Make sure there is no conduction current between each commutator segment and the armature shaft.



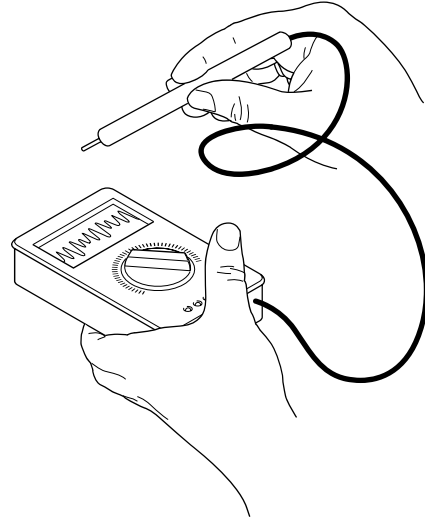
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# 17. Meters, Switches and Lighting System

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## Brake Light Switch Inspection

1. Remove the speedometer cover.
2. Disconnect the front brake switch lead.
3. Operate the front brake lever to check the switch for proper operation.
4. Disconnect the rear brake switch wire connector.
5. Operate the rear brake lever to check for proper operation.
6. The above tests can be conducted with a continuity tester or ohm meter.



## Horn Inspection

1. Remove the front panel.
2. Disconnect the horn wire connector and connect the terminal to a battery (12V).
3. The horn is good if it sounds properly.
4. Check operation of switch with ohm meter or continuity tester.

### To replace the horn switch:

5. Disconnect the horn switch wire connector.
6. Remove the mounting bolt.
7. Remove the horn.
8. Reverse the procedure for installation.

## Speedometer Removal and Reinstallation

1. Remove front and rear handlebar covers (refer to 12-2).
  2. Disconnect all the wiring connectors.
  3. Remove the three set screws and speedometer.
  4. Reverse the removal procedure for installation.
-

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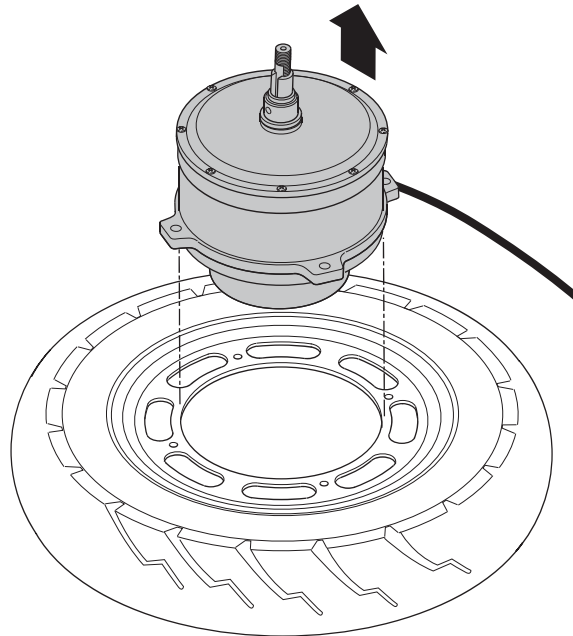
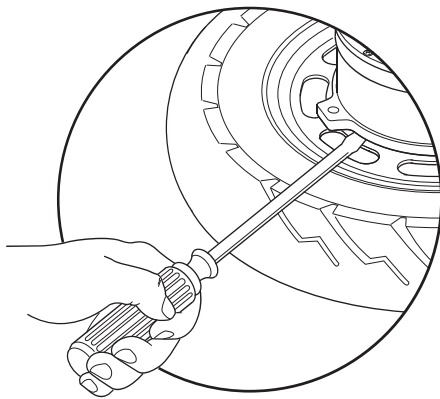
# A. Electric Scooter Assembly

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2. Carefully place rear wheel onto ground with electric motor facing upwards.

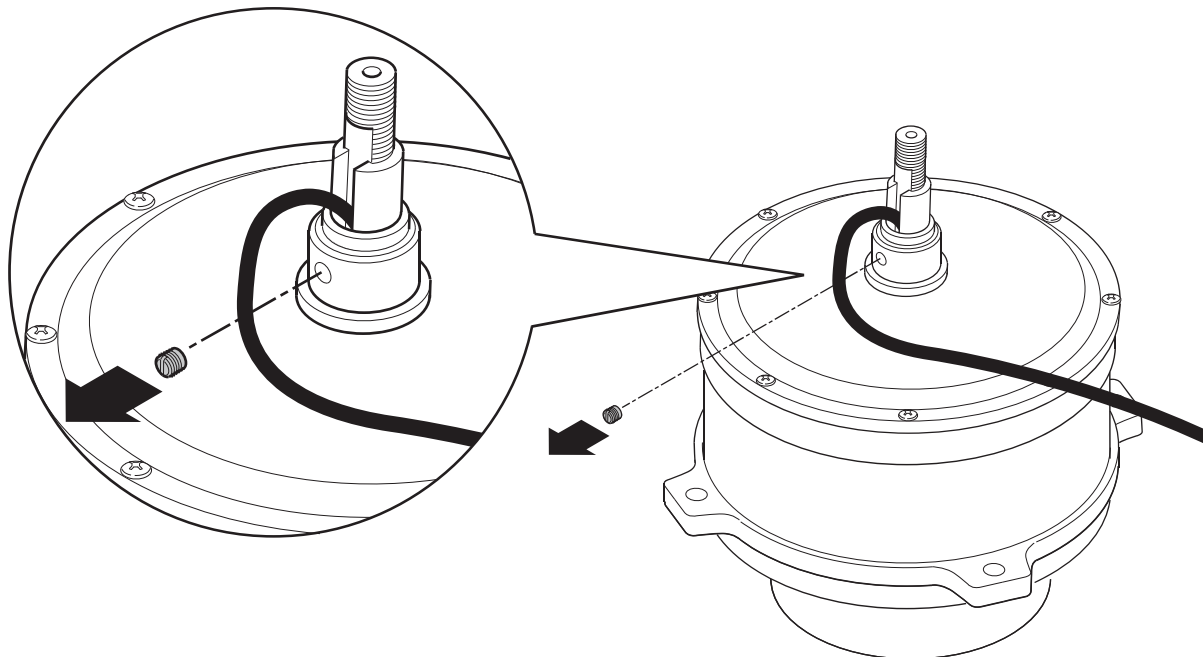
3. Using a flat-head screwdriver, cautiously pry the electric motor from the rear wheel rim.

4. Lift and remove electric motor from wheel assembly.



5. Loosen set screw securing collar to motor spindle.

6. Remove and place collar set screw in secure place for reuse.



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