

HYOSUNG

GV125S

SERVICE MANUAL

维修手册

99000HB8110

FOREWORD

This manual contains an introductory description on HYOSUNG 『GV125S』 and procedures for its inspection / service and overhaul of its main components.

Other information considered as generally known is not included.

Read GENERAL INFORMATION section to familiarize yourself with outline of the vehicle and MAINTENANCE and other sections to use as a guide for proper inspection and service.

This manual will help you know the vehicle better so that you can assure your customers of your optimum and quick service.

This manual has been prepared on the basis of the latest specification at the time of publication.

If modification has been made since then, difference may exist between the content of this manual and the actual vehicle.

- ❖ **Illustrations in this manual are used to show the basic principles of operation and work procedures.**

They may not represent the actual vehicle exactly in detail.

This manual is intended for those who have enough knowledge and skills for servicing HYOSUNG vehicles. Without such knowledge and skills, you should not attempt servicing by relying on this manual only.

Instead, please contact your nearby authorized HYOSUNG motorcycle dealer.

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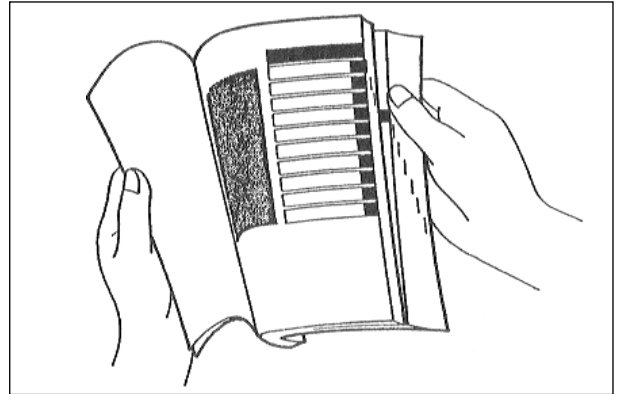
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 **HYOSUNG**

HOW TO USE THIS MANUAL

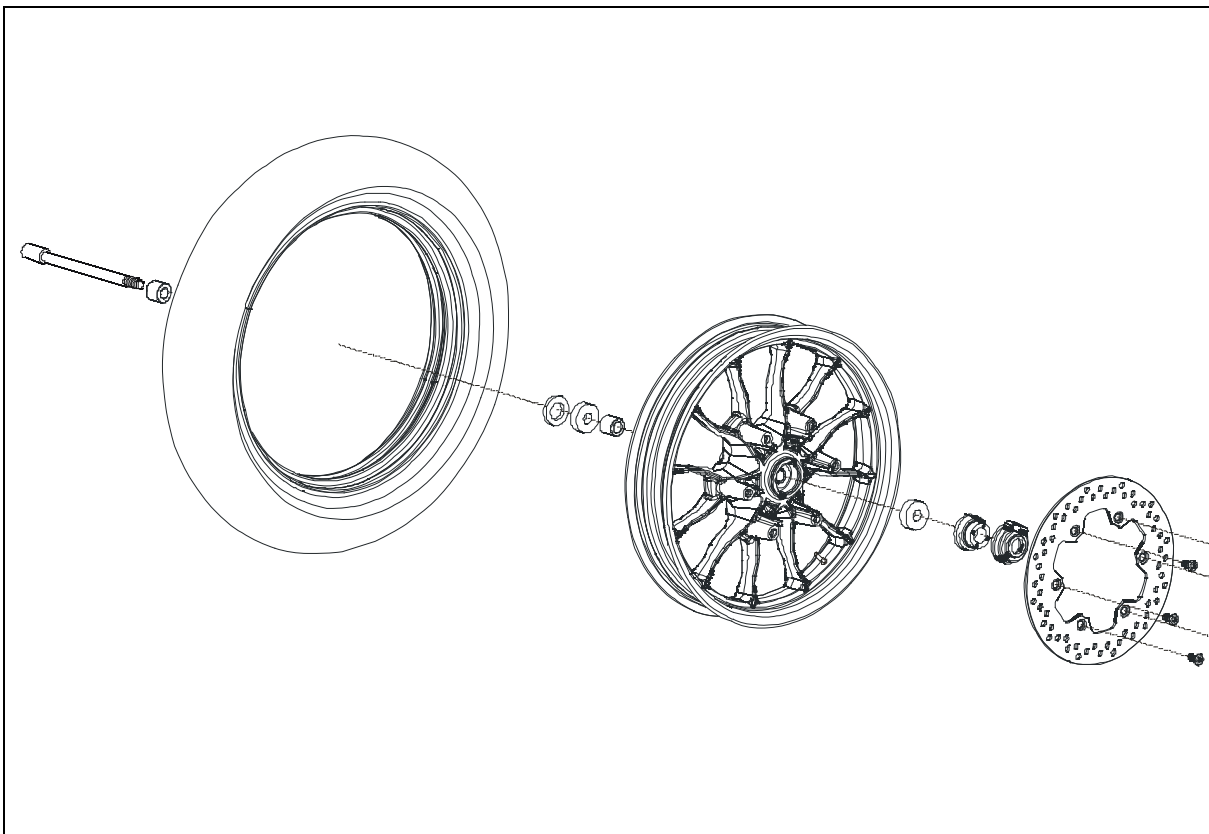
TO LOCATE WHAT YOU ARE LOOKING FOR :

1. The text of this manual is divided into sections.
2. As the title of these sections are listed on the previous page as GROUP INDEX, select the section where you are looking for.
3. Holding the manual as shown at the right will allow you to find the first page of the section easily.
4. On the first page of each section, its contents are listed. Find the item and page you need.






















COMPONENT PARTS

Example: Front wheel



SYMBOL

Listed in the table below are the symbols indicating instructions and other information necessary for servicing and meaning associated with them respectively.

SYMBOL	DEFINITION	SYMBOL	DEFINITION
	Torque control required. Data beside it indicates specified torque.		Use fork oil.
	Apply oil. Use engine oil unless otherwise specified.		Apply THREAD LOCK.
	Apply SUPER GREASE "A".		Apply or use brake fluid.
	Apply SUPER GREASE "C".		Measure in voltage range.
	Apply GREASE.		Measure in resistance range.
	Apply SILICONE GREASE.		Measure in current range.
	Apply MOLY PASTE.		Measure in diode test range.
	Apply BOND "1215".		Measure in continuity test range.
	Apply THREAD LOCK "1324".		Use special tool.
	Apply GASKET BOND.		

ABBREVIATIONS USED IN THIS MANUAL

A		L	
ABDC	: After Bottom Dead Center	LCD	: Liquid Crystal Display
AC	: Alternating Current	LED	: Light Emitting Diode
API	: American Petroleum Institute	LH	: Left Hand
ATDC	: After Top Dead Center	M	
B		Max	: Maximum
BBDC	: Before Bottom Dead Center	Min	: Minimum
BDC	: Bottom Dead Center	O	
BTDC	: Before Top Dead Center	O ₂ Sensor	: Oxygen Sensor (O ₂ S)
D		P	
DC	: Direct Current	PV	: Purge control Valve
DOHC	: Double Over Head Camshaft	R	
E		RH	: Right Hand
ECU	: Engine Control Unit, EI Control Unit	RO Switch	: Roll Over Switch
EI	: Electric fuel Injection, Electric fuel Injector	S	
F		SAE	: Society of Automotive Engineers
FP	: Fuel Pump	T	
G		TDC	: Top Dead Center
GP Switch	: Gear Position Switch	TP Sensor	: Throttle Position Sensor (TPS)
I		W	
IAP Sensor	: Intake Air Pressure Sensor (IAPS)	WT Sensor	: Water Temperature Sensor (WTS)
IAT Sensor	: Intake Air Temperature Sensor(IATS)		
IG	: Ignition		
ISC Solenoid	: Idle Speed Control Solenoid		

NOTE

NO.1 : For Front Cylinder
NO.2 : For Rear Cylinder

WIRE COLOR

B	: Black	Gr	: Gray	Sb	: Light blue
L	: Blue	Lg	: Light green	W	: White
Br	: Brown	O	: Orange	Y	: Yellow
G	: Green	R	: Red		

BL	: Black with Blue tracer	BBr	: Black with Brown tracer
BG	: Black with Green tracer	BO	: Black with Orange tracer
BR	: Black with Red tracer	BW	: Black with White tracer
BY	: Black with Yellow tracer	LB	: Blue with Black tracer
LG	: Blue with Green tracer	LR	: Blue with Red tracer
LW	: Blue with White tracer	LY	: Blue with Yellow tracer
BrB	: Brown with Black tracer	BrW	: Brown with White tracer
GB	: Green with Black tracer	GR	: Green with Red tracer
GY	: Green with Yellow tracer	GrB	: Gray with Black tracer
GrR	: Gray with Red tracer	GrW	: Gray with White tracer
OB	: Orange with Black tracer	OL	: Orange with Blue tracer
OG	: Orange with Green tracer	OR	: Orange with Red tracer
OW	: Orange with White tracer	OY	: Orange with Yellow tracer
RB	: Red with Black tracer	RW	: Red with White tracer
WB	: White with Black tracer	WL	: White with Blue tracer
WR	: White with Red tracer	YB	: Yellow with Black tracer
YL	: Yellow with Blue tracer	YG	: Yellow with Green tracer
YR	: Yellow with Red tracer		

GENERAL INFORMATION

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INFORMATION LABELS

WARNING / CAUTION / NOTE

Please read this manual and follow its instructions carefully. To emphasize special information, the symbol and the words WARNING, CAUTION and NOTE have special meanings. Pay special attention to the messages highlighted by these signal words.



Indicates a potential hazard that could result in death or injury.



Indicates a potential hazard that could result in vehicle damage.

NOTE

Indicates special information to make maintenance easier or instructions cleaner.

Please note, however, that the warning and cautions contained in this manual cannot possibly cover all potential hazards relating to the servicing, or lack of servicing, of the motorcycle. In addition to the WARNING and CAUTION stated, you must use good judgment and basic mechanical safety principles. If you are unsure about how to perform a particular service operation, ask a more experienced mechanic for advice.

GENERAL PRECAUTIONS

WARNING

- ❖ Proper service and repair procedures are important for the safety of the service mechanic and the safety and reliability of the vehicle.
- ❖ When 2 or more persons work together, pay attention to the safety of each other.
- ❖ When it is necessary to run the engine indoors, make sure that exhaust gas is forced outdoors.
- ❖ When working with toxic or flammable materials, make sure that the area you work in is well-ventilated and that you follow all of the material manufacturer's instructions.
- ❖ Never use gasoline as a cleaning solvent.
- ❖ To avoid getting burned, do not touch the engine, engine oil or exhaust system during or for a while after engine operation.
- ❖ After servicing fuel, oil, exhaust or brake systems, check all lines and fittings related to the system for leaks.

CAUTION

- ❖ If parts replacement is necessary, replace the parts with HYOSUNG Genuine Parts or their equivalent.
- ❖ When removing parts that are to be reused, keep them arranged in an orderly manner so that they may be reinstalled in the proper order and orientation.
- ❖ Be sure to use special tools when instructed.
- ❖ Make sure that all parts used in reassembly are clean, and also lubricated when specified.
- ❖ When use of a certain type of lubricant, bond, or sealant is specified, be sure to use the specified type.
- ❖ When removing the battery, disconnect the negative cable first and then positive cable. When reconnecting the battery, connect the positive cable first and then negative cable, and replace the terminal cover on the positive terminal.
- ❖ When performing service to electrical parts, if the service procedures do not require use of battery power, disconnect the negative cable at the battery.
- ❖ Tighten cylinder head and case bolts and nuts, beginning with larger diameter and ending with smaller diameter, from inside to outside diagonally, to the specified tightening torque.
- ❖ Whenever you remove oil seals, gaskets, packing, O-rings, locking washers, cotter pins, circlips, and certain other parts as specified, be sure to replace them with new ones. Also, before installing these new parts, be sure to remove any leftover material from the mating surfaces.
- ❖ Never reuse a circlip. When installing a new circlip, take care not to expand the end gap larger than required to slip the circlip over the shaft. After installing a circlip, always ensure that it is completely seated in its groove and securely fitted.
- ❖ Do not use self-locking nuts a few times over.
- ❖ Use a torque wrench to tighten fasteners to the torque values when specified. Wipe off grease or oil if a thread is smeared with them.
- ❖ After reassembly, check parts for tightness and operation.
- ❖ To protect environment, do not unlawfully dispose of used motor oil and other fluids: batteries, and tires.
- ❖ To protect Earth's natural resources, properly dispose of used vehicles and parts.

EXTERIOR PHOTOGRAPH



NOTE

Difference between photographs and actual motorcycles depends on the markets.

FUNCTION OF EI SENSOR

★ ECU (Engine Control Unit, EI Control Unit)

: ECU decide the fuel injection volume and ignition time to adjust the fuel injector opening and closing rate which is considered the engine speed, intake air pressure, intake air volume, engine temperature, oxygen volume and throttle opening angle, etc.

★ EI (Electric fuel Injector)

: EI spray the fuel to intake pipe by ECU's injection signal.

Fuel which is needed combustion in the combustion chamber is supplied from the fuel tank.

★ GP switch (Gear Position Switch)

: GP switch is used when start / stop and control ECU as the converted electrical signal of the gear position is supplied ECU.

★ IAP sensor (Intake Air Temperature : IAPS)

: IAP sensor measure the pressure which is generated from the intake pipe and compare with the provided absolute pressure, then analogize the air volume indirectly and help to work the fuel injector properly.

★ IAT sensor (Intake Air Temperature Sensor : IATS)

: IAT sensor perceive the atmospheric temperature and is located the air cleaner case.

★ ISC solenoid (Idle Speed Control Solenoid)

: ISC solenoid is interlocked with the throttle body, so ECU control the engine idle speed.

★ O₂ sensor (Oxygen Sensor : O₂S)

: O₂ sensor measure the oxygen volume from the exhaust gas and convert the oxygen volume into voltage value, then communicate the output voltage to ECU.

★ Pick-up Coil

: Pick-up coil perceive the front and rear cylinder's engine speed and realtime of piston position.

★ PV (Purge control Valve)

: Purge control valve is part of the evaporative emission control system. The purge control valve closes to prevent the vapor from reaching the engine when it is turned off. When the engine is started and is ready to receive the canister's contents, the purge control valve opens to allow the vapor flow.

★ RO switch (Roll Over Switch)

: RO switch is the fuel cut-off system when the motorcycle is leaned over 60° for upset accident.

★ TP sensor (Throttle Position Sensor : TPS)

: TP sensor detect the throttle opening angle and is located the throttle body.

It decide the fuel injection volume and compensate the ignition time as inform idle· acceleration· deceleration condition and throttle full opening etc. to ECU.

★ WT sensor (Water Temperature Sensor : WTS)

: WT sensor is located on the cylinder block's water jacket, the intake pipe or the cylinder head coolant passage's thermostat part for contact with the coolant.

WT sensor is the NTC (Negative Temperature Coefficient) resistor that measure the coolant temperature and inform ECU.

SERIAL NUMBER LOCATION

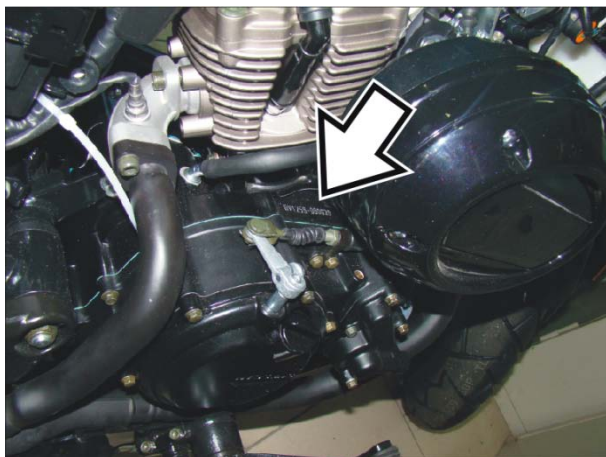
The frame serial number or V.I.N. (Vehicle Identification Number) is stamped on the steering head tube. The engine serial number is located on the left upside of crankcase assembly.

These numbers are required especially for registering the machine and ordering spare parts.

◎ FRAME SERIAL NUMBER



◎ ENGINE SERIAL NUMBER



FUEL AND OIL RECOMMENDATION

☉ FUEL

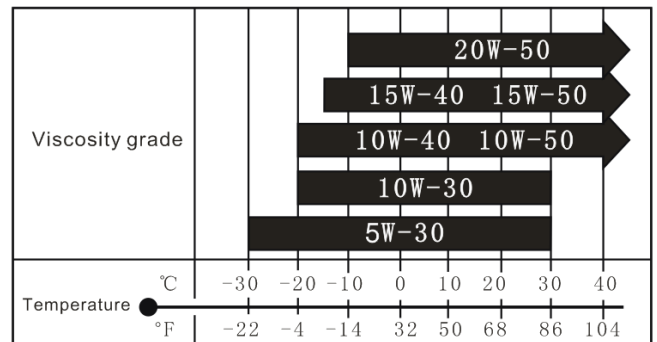
Gasoline used should be graded 92 octane (Research Method) or higher. An unleaded gasoline type is recommended.

☉ ENGINE OIL

ENGINE OIL SPECIFICATION

Classification system	Grade
API	Over SL
SAE	10W-40

- If an SAE 10W-40 motor oil is not available, select an alternative according to the following chart.



Use a premium quality 4-stroke motor oil to ensure longer service life of your motorcycle.

⚠ WARNING

- ❖ Don't mix the unrecommended oil. It could damage the engine.
- ❖ When refilling the oil tank, don't allow the dust to get inside.
- ❖ Mop the oil spilt.
- ❖ Don't put the patch on the cap. It could disturb the oil to be provided and damage the engine.

☉ BRAKE FLUID

Specification and classification: DOT4

⚠ WARNING

Since the brake system of this motorcycle is filled with a glycol-based brake fluid by the manufacturer, do not use or mix different types of fluid such as silicone-based and petroleum-based fluid for refilling the system, otherwise serious damage will result.

Do not use any brake fluid taken from old or used or unsealed containers.

Never re-use brake fluid left over from a previous servicing, which has been stored for a long period.

● **FRONT FORK OIL**

Use fork oil : TELLUS #22

● **ANTIFREEZE**

Antifreeze selection:

1. Antifreeze must not be mixed using.
2. The freezing point of antifreeze is normally lower than the local minimum ambient temperature 5-10 degrees.
3. The boiling point of antifreeze is more than 107 ° C.

 **WARNING**

This motorcycle engine is water cooling system. During motorcycle running, the antifreeze is high temperature and high pressure in the cooling system. So, it is strictly forbidden opening the radiator cap in this state, avoiding burn.

The antifreeze must be added in a timely manner and sufficient amount to prevent damaging the engine.

The antifreeze must be added after the engine is stopped and cooled.

 **WARNING**

Antifreeze belongs to chemicals, which include toxic substances. If the antifreeze gets into your eyes or skin, wash with plenty of water immediately.

BREAK-IN PROCEDURES

During manufacture only the best possible materials are used and all machined parts are finished to a very high standard but it is still necessary to allow the moving parts to BREAK-IN before subjecting the engine to maximum stresses. The future performance and reliability of the engine depends on the care and restraint exercised during its early life. The general rules are as follows:

- Keep to these break-in procedures:

Initial 800km	Less than 1/2 throttle
Up to 1,600km	Less than 3/4 throttle

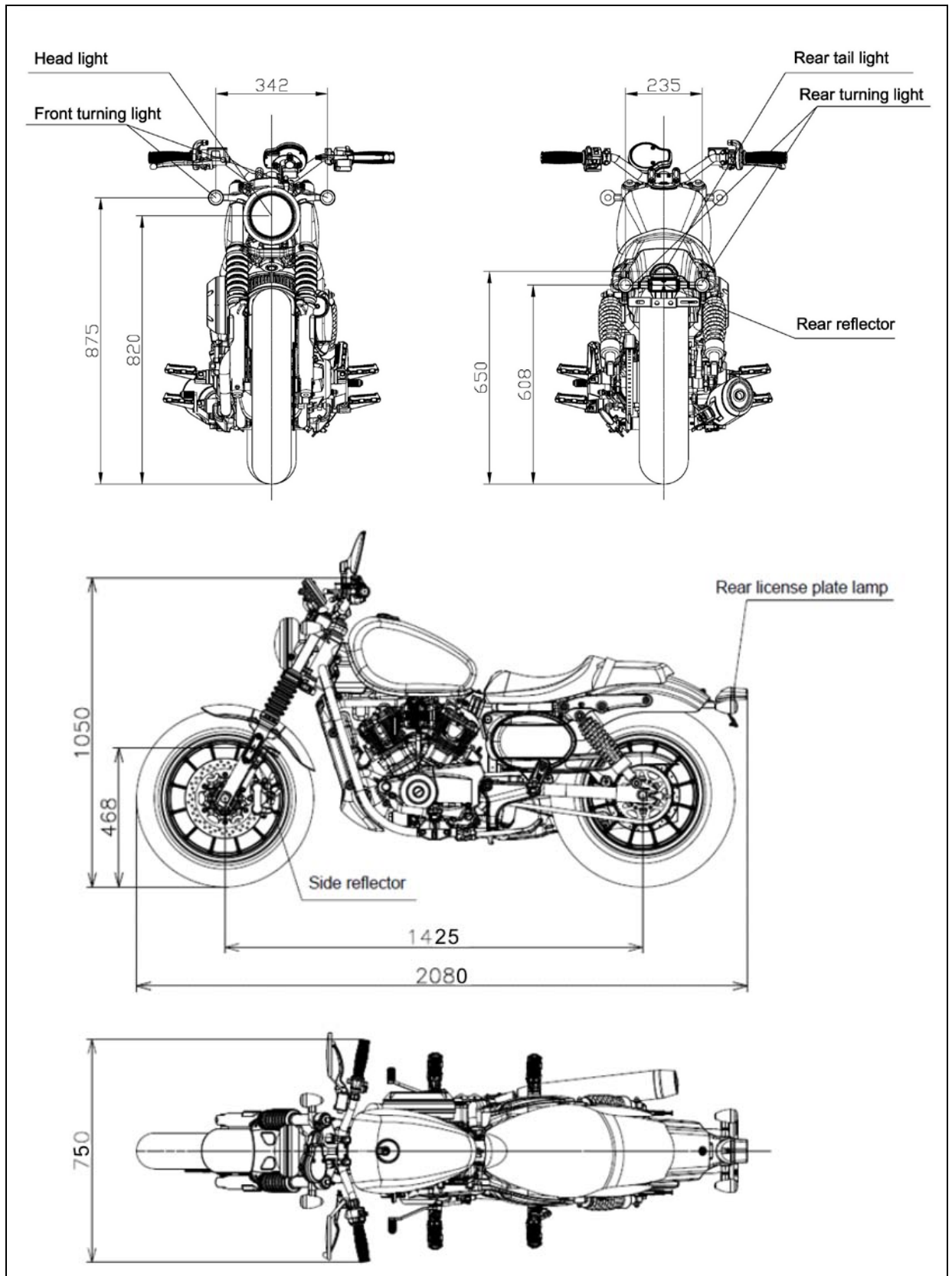
- Upon reaching an odometer reading of 1,600 km you can subject the motorcycle to full throttle operation.
- Do not maintain constant engine speed for an extended period during any portion of the break-in. Try to vary the throttle position.

CYLINDER CLASSIFICATION

The engine of GV125S is composed of the two cylinder, is classified into the front cylinder and rear cylinder as basis of the motorcycle ahead.



EXTERIOR ILLUSTRATION



SPECIFICATIONS

⊙ DIMENSIONS AND MASS

ITEM	GV125S
Overall length	2080 mm
Overall width	750 mm
Overall height	1050 mm
Wheelbase	1425 mm
Minimum ground clearance	175 mm
Turning clearance circle diameter	6120mm
Overall mass	165 kg

⊙ ENGINE

ITEM	GV125S
Type	V-type Duplex cylinder, 4-stroke, water cooling
Number of cylinder	V-2 cylinder
Bore	42.0 mm
Stroke	45.0mm
Total displacement	124.7
Fuel system	#92 or higher unleaded gasoline
Starter system	Electric starter
Lubrication system	Pressure and splashing

⊙ TRANSMISSION

ITEM	GV125S	
Clutch	Wet type normal pressure multi disc	
Transmission	Foot operated 5-gear transmission	
Primary reduction ratio	3.5	
Final stage reduction ratio	3.64	
Gear ratio	1st	2.75
	2nd	1.79
	3rd	1.37
	4th	1.05
	5th	0.91
Drive chain	428HO	

CHASSIS

ITEM	GV125S
Front spark plug model	Spring oil damping
Rear spark plug model	Spring oil damping
Steering angle	≤48° (right & left)
Caster	29°
Front brake	Disk brake
Rear brake	Disk brake
Front tire size	120/80-16
Rear tire size	150/80-15
Front fork stroke	132 mm

⊙ ELECTRICAL

ITEM	GV125S	
Ignition type	Electromagnetic discharge	
Ignition timing	BTDC 10°/ 2,000 rpm and 28°/ 6,000 rpm	
Spark plug	CR8E	
Battery	12 V 8 Ah	
Fuse	REG. REG/ IGN	30A
	ECU/ M. RELAY	20A
	HEAD LAMP L./ METER	10A
	HEAD LAMP H.	10A
	S. STAND/ STARTER/ CLUTCH	10A
	TURN/ STOP/ HORN/ S. SENS	10A
	POSITION/ TAIL/ FAN	10A
	SPARE	30A 20A 10A
Head light specification	Semi-closed 12V 55W/60W	
Turning light	12V 10WX4	
Brake light / rear-position light	LED TYPE	
Rear license plate lamp	LED TYPE	
Meter indicator light	LED TYPE	
Horn model	Electromagnetic vibration type 12V	

※LED: Light Emitting Diode

LCD: Liquid Crystal Display

CAPACITIES

ITEM		GV125S
Fuel tank capacity	Including reserve	12.5 L
	Reserve	1.2 L
Engine oil capacity	Change	1,100 ml
	Filter change	1,300 ml
	Overhaul	1,400 ml
Antifreeze	First add liquid antifreeze	0.75L
	Replacement and maintenance	0.7L
Front fork oil capacity (each leg)		170±2 ml

NOTE

The specifications are subject to change without notice.

PERIODIC MAINTENANCE


2

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PERIODIC MAINTENANCE SCHEDULE

The chart below lists the recommended intervals for all the required periodic service work necessary to keep the motorcycle operating at peak performance and economy.

 **CAUTION**

More frequent servicing should be performed on motorcycles that are used under severe conditions.

PERIODIC MAINTENANCE CHART

● ENGINE

Interval Item	Initial 1,000 km	Every 4,000 km	Every 8,000 km
Air cleaner element	Clean every 3,000 km Replace every 12,000 km		
Exhaust pipe nuts and muffler mounting bolts	Tighten	Tighten	—
Valve clearance adjust	Inspect	Inspect	—
Spark plug	Clean	Clean	Replace
Fuel hose	Inspect	Inspect	—
	Replace every 4 years		
Engine oil filter	Replace	Replace	—
Engine oil	Replace	Replace	—
Throttle cable	Inspect	Inspect	—
Idle speed	Inspect	Inspect	—
Clutch	Inspect	Inspect	—
Antifreeze	Replace every 2 years		
Radiator hoses	—	Inspect	—
	Replace every 4 years		

2-3 PERIODIC MAINTENANCE

◎ CHASSIS

Item	Interval	Initial 1,000 km	Every 4,000 km	Every 8,000 km
	Drive chain	Clean and lubricate every 1,000km		
Brake	Inspect	Inspect	–	
Brake hose	Inspect	Inspect	–	
	Replace every 4 years			
Brake fluid	Inspect	Inspect	–	
	Replace every 2 years			
Tires	Inspect	Inspect	–	
Steering	Inspect	Inspect	–	
Front forks	–	Inspect	–	
Rear suspension	–	Inspect	–	
Chassis bolts and nuts	Tighten	Tighten	–	

CAUTION

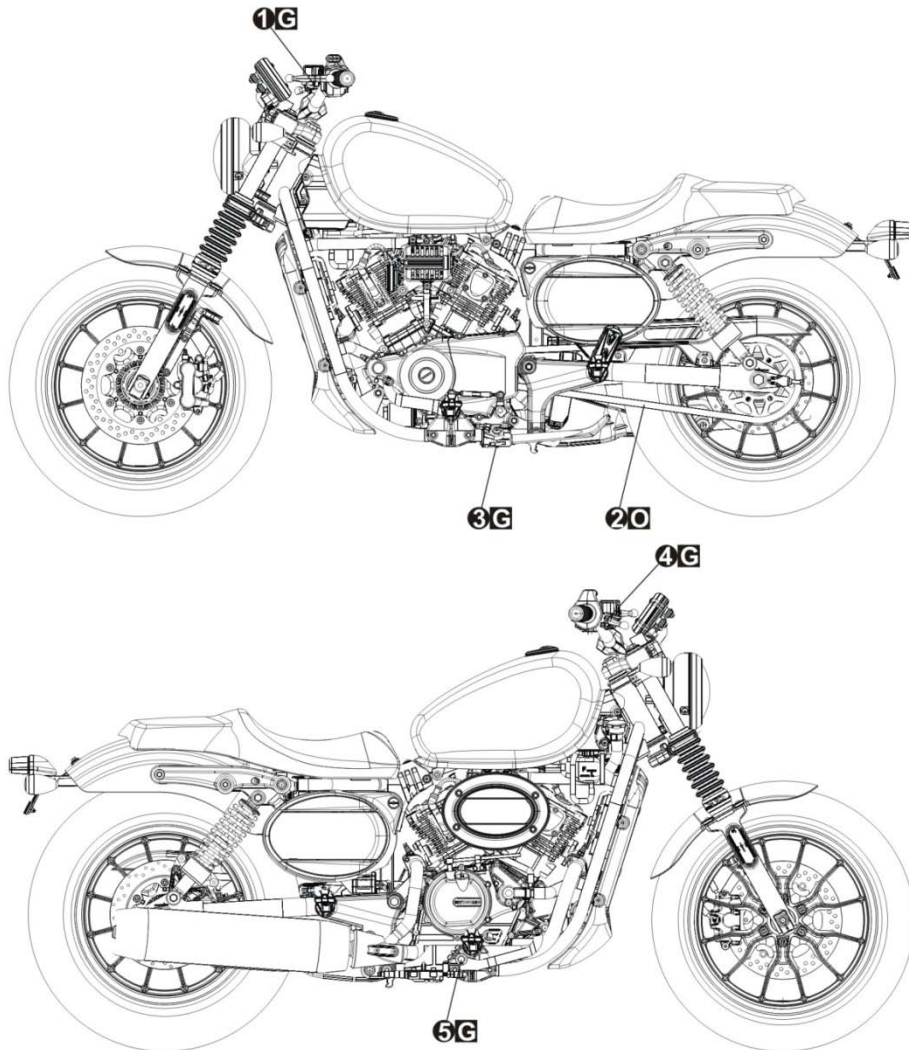
Using poor quality replacement parts can cause your motorcycle to wear more quickly and shorten its useful life.

Use only genuine Hyung replacement parts or their equivalent.

LUBRICATION POINT

Proper lubrication is important for smooth operation and long life of each working part of the motorcycle.

Major lubrication points are indicated below.



O - Motor oil, **G** - Grease

①	Clutch lever holder	②	Drive chain
③	Side stand pivot and spring hook	④	Brake lever holder
⑤	Brake pedal pivot		

NOTE

- ❖ **Before lubricating each part, clean off any rusty spots and wipe off any grease, oil, dirt or grime.**
- ❖ **Lubricate exposed parts which are subject to rust, with either motor oil or grease whenever the motorcycle has been operated under wet or rainy condition.**

MAINTENANCE PROCEDURE

This section describes the service procedure for each section of the periodic maintenance.

VALVE CLEARANCE

NOTE

Inspect Initial 1,000 km and Every 4,000 km.

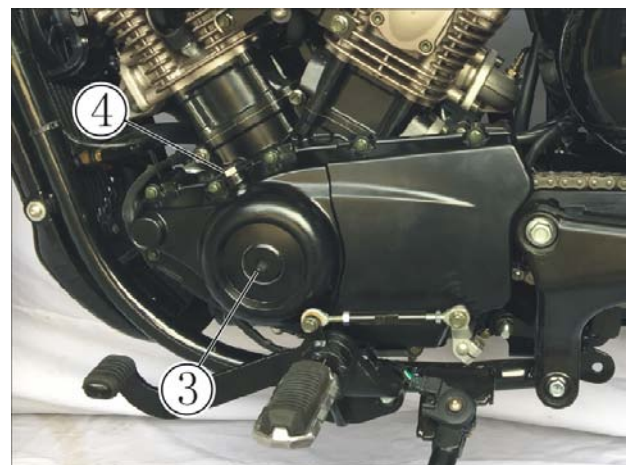
CAUTION

The clearance specification is for COLD state.

The valve clearance specification is different for intake and exhaust valves.

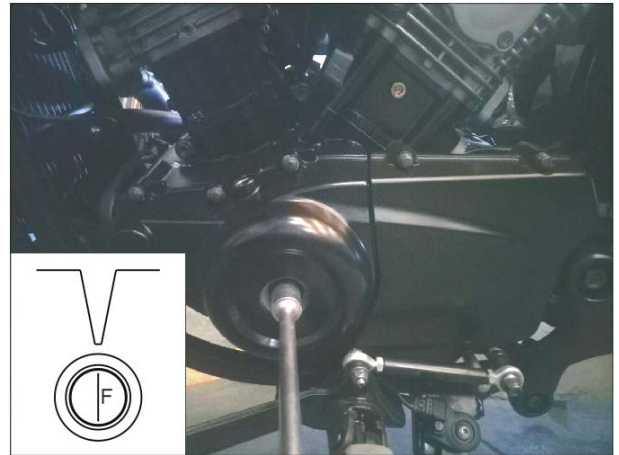
Valve clearance adjustment must be checked and adjusted, 1) at the time of periodic inspection, 2) when the valve mechanism is serviced, and 3) when the camshaft is disturbed by removing it for servicing.

- Remove the spark plug. (Refer to page 2-5)
 - Remove the right air cleanerbox.
 - Remove the fuel tank. (Refer to page 4-1)
 - Remove the cylinder head cover ① and ②.
-
- Remove the magneto cover plug ③ and the timing inspection plug ④.



- Rotate the magneto rotor to set the front cylinder's piston at TDC (Top Dead Center) of the compression stroke. (Rotate the rotor until "F" line on the rotor is aligned with the center of hole on the crankcase.)
- To inspect the front cylinder's valve clearance, insert the thickness gauge to the clearance between the camshaft and the tappet.

Valve clearance (when cold)	
IN.	0.08 ± 0.01
EX.	0.11 ± 0.01



Thickness gauge : 09900-20806

- If the clearance is out of specification, first remove the cam chain tensioner, camshaft housing, camshaft. To install the tappet shim at original position, record the shim NO. and clearance with "A", "B", "C", "D" mark on the cylinder head as the illustration.



Select the tappet that agree with tappet clearance (vertical line) and shim NO. (horizontal line) as refer to the tappet shim selection chart. Adjust valve timing, install the camshaft housing and the tensioner.

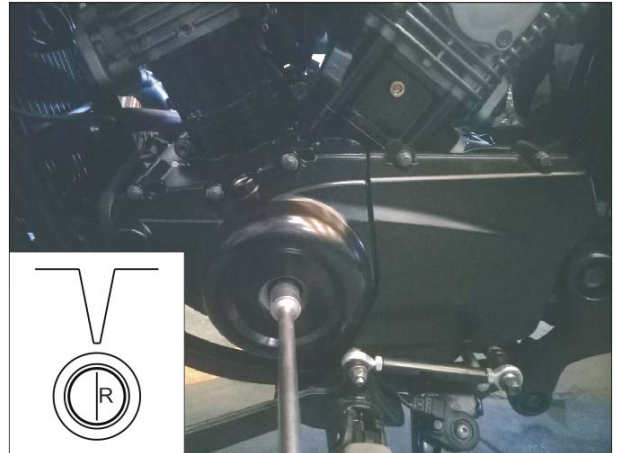
After the crankshaft rotate about 10 times, measure the valve clearance.

If the clearance be not agree, adjust the standard clearance as the same manner above.

2-7 PERIODIC MAINTENANCE

- In case that valve adjustment which there is no the tappet shim selection chart, please follow instructions of example in the below.

For example, the intake clearance is 0.4 and the shim is 170 (1.70 mm), select 195 (1.95 mm) of the shim which 170 (1.70 mm) of the shim add up the excess clearance 0.25 mm when adjust with the standard 0.15 as the intake standard clearance 0.1-0.2 mm.



CAUTION

- ❖ Valve clearance should be checked when the engine is cold.
 - ❖ If you don't rotate the crankshaft about 10 times before measuring the valve clearance, there is no meaning of valve clearance.
-
- Rotate the magneto rotor to set the rear cylinder's piston at TDC (Top Dead Center) of the compression stroke.
(Rotate the rotor 285 counter-clockwise from the "F" line, and until the "R" line on the rotor is aligned with the center of hole on the crankcase.)
-
- Inspect the rear cylinder's valve clearance with the same manner of the front cylinder.

SPARK PLUG

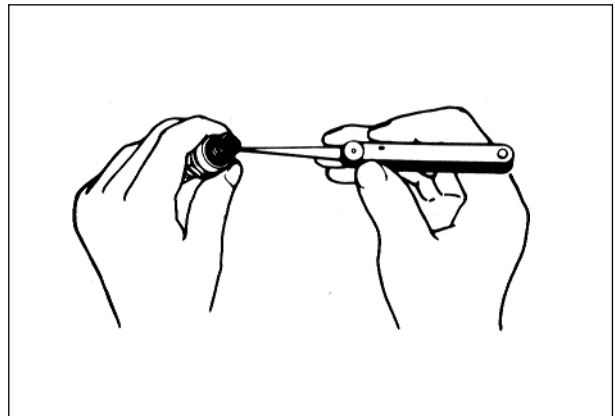
NOTE

Clean Initial 1,000 km and Every 4,000 km,
Replace Every 8,000 km.

- Disconnect the spark plug caps.
- Remove the spark plugs.



TYPE	SPARK PLUG SPECIFICATION
Hot type	CR7E
Standard type	CR8E
Cold type	CR9E



Remove the carbon deposite with wire or pin and adjust the spark plug gap to 0.7-0.8 mm, measuring with a thickness gauge.

Spark plug gap	0.7-0.8 mm
-----------------------	------------



Thickness gauge : 09900-20806

Check to see the worn or burnt condition of the electrodes.

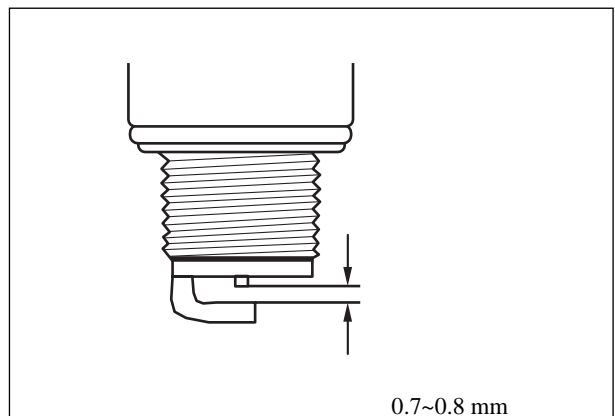
If it is extremely worn or burnt, replace the plug.

And also replace the plug if it has a broken insulator, damaged thread, etc.

- Install the spark plug, and then tighten it to specified torque.



Spatk plug : 15~20 N-m (1.5~2.0 kg-m)



EXHAUSE PIPE NUTS AND MUFFLER MOUNTING BOLTS

NOTE

Tighten Initial 1,000 km and Every 4,000 km.

- Tighten the exhaust pipe nuts ①, and muffler mounting bolts ② to the specified torque.

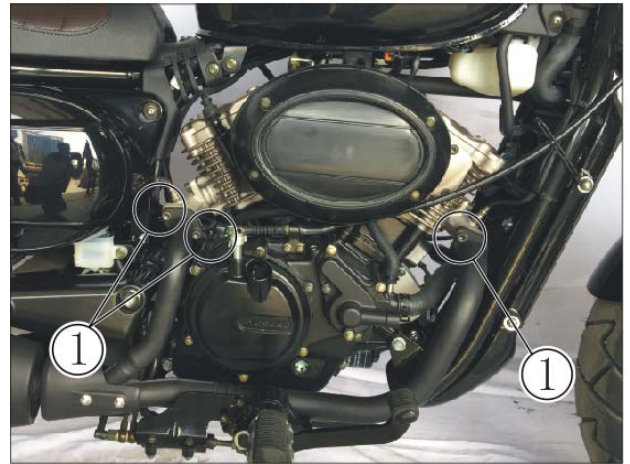


Exhaust pipe nut

: 18~28 N·m (1.8~2.8 kg·m)

Muffler mounting bolt

: 20~30 N·m (2.0~3.0 kg·m)



AIR CLEANER

NOTE

Clean Every 3,000 km, Replace Every 12,000 km.

- Remove the air cleaner case cover ①.
- With the three of air cleaner cap mounting bolts removed, remove the air cleaner cap ②.
- Remove the air cleaner element ③.

Clean the air cleaner element for the following:

- When the air cleaner element clean with the air gun, necessarily blow at the inside by compressed air.
- Carefully examine the air cleaner element for tears during.
- cleaning. Replace it with a new one if it is torn.

Assemble the element completely or damage severely the engine.

- Be careful not to allow water to go inside the air cleaner element.



⚠ CAUTION

More frequent servicing may be performed on motorcycles that are used under severe conditions, also clean the air cleaner element when replacing the oil to prevent damage of the engine.

FUEL HOSE

NOTE

Inspect Initial 1,000 km and Every 4,000 km, Replace every 4 years.

- Remove the left frame cover. (Refer to page 6-3) Inspect the fuel hoses for damage and fuel leakage. If any defects are found, the fuel hoses must be replaced.



IDLING ADJUSTMENT

This engine features EFI (electronic fuel injection).

Engine idle speed	1600±100 rpm
--------------------------	--------------

The idle speed is not adjustable.

CAUTION

Do not attempt to make any adjustment to the idle speed as it may permanently damage the EFI system.

THROTTLE CABLE PLAY

NOTE

Inspect Initial 1,000 km and Every 4,000 km.

There should be 0.5-1.0 mm play on the throttle cable.

To adjust the throttle cable play.

- Tug on the throttle cable to check the amount of play.
- Loosen the lock nut ① and turn the adjuster ② in or out until the specified play is obtained.
- Secure the lock nuts while holding the adjuster in place.

Throttle cable play	0.5-1.0 mm
----------------------------	------------



CLUTCH

NOTE

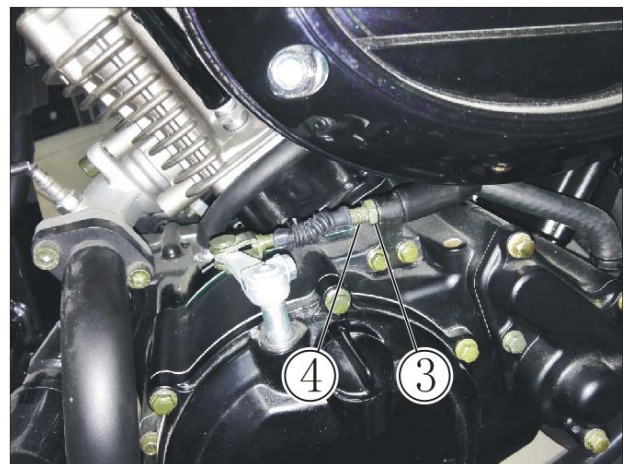
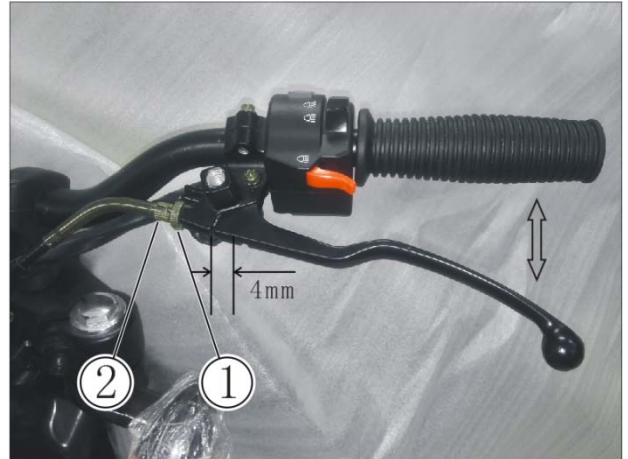
Inspect Initial 1,000 km and Every 4,000 km.

Clutch play should be 4 mm as measured at the clutch lever holder before the clutch begins to disengage. If the play in the clutch is incorrect, adjust it in the following way:

- Loosen the lock nut ① and screw the adjuster ② on the clutch lever holder all the way in.
- Loosen clutch cable adjuster lock nut ③.
- Turn the clutch cable adjuster ④ in or out to acquire the specified play.
- Tighten lock nut while holding the adjuster in position.
- The clutch cable should be lubricated with a light weight oil whenever it is adjusted.

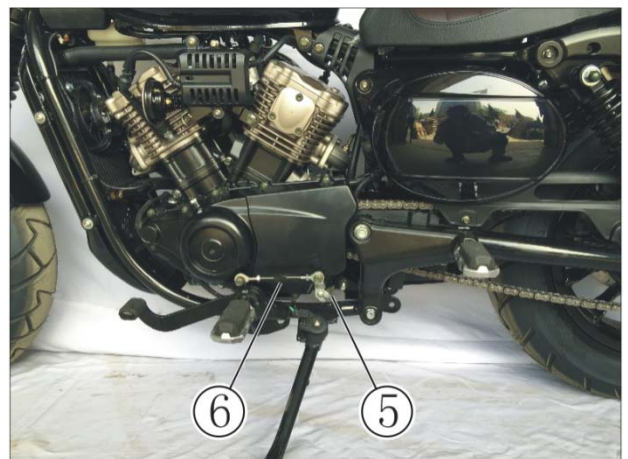
Clutch cable play

4 mm



GEARSHIFT LEVER HEIGHT ADJUSTMENT

- Loosen the lock nut ⑤.
- With the link rod ⑥ turned, adjust the gearshift lever height.



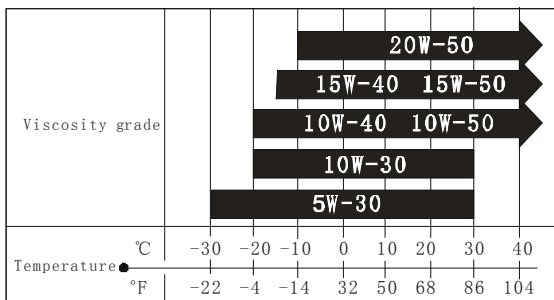
ENGINE OIL

Oil quality is a major contributor to your engine's performance and life. Always select good quality engine oil.

⊙ ENGINE OIL SPECIFICATION

Classification system	Grade	Remarks
API	Over SL	
SAE	10W-40	

※ If a SAE 10W-40 motor oil is not available, select alternative according to the following chart.



Use the chart to select a viscosity rating based on temperature range in your area.

NOTE

In very cold weather [below -15°C (5F)], use SAE 5W/30 for good starting and smooth operation.

Using a premium quality four stroke motor oil will increase the service life of your motorcycle.

⚠ WARNING

- Don't mix the unrecommended oil. It could damage the engine.
- When refilling the oil, don't allow the dust to get inside.
- Wipe the spilled oil up immediately.
- Don't put the patch on the filler cap. It could disturb the oil to be provided and damage the engine.

Long engine life depends much on the selection of quality oil and the periodic changing of the oil. Daily oil level checks and periodic changes are two of the most important maintenances to be performed.

⊙ ENGINE OIL LEVEL CHECK

Follow the procedure below to inspect the engine oil level.

1. Start up the engine and allow it to run for several minutes at idling speed.
2. Turn off the engine and wait about three minutes, then check the oil level through the inspection window. If the level is below mark“F”; add oil to“F” level. If the level is above mark“F”; drain oil to “F” level.



WARNING

The engine and the components of the exhaust system become very hot and remain hot for some time after the engine has been stopped. Before handling these components, wear insulating gloves or wait until the engine and the exhaust system have cooled down.

CAUTION

Never operate the motorcycle if the engine oil level is below the Lower line mark(L) in the engine oil level gauge. Never fill the engine oil above the Up- per line mark (F) . Engine oil level being most suitable about 1mm under the Upper line mark (F) of the engine oil lens. In case of the engine oil pouring in excessively, the engine output being made insufficient. Be careful not to pouring in the engine oil excessively.

 **CAUTION**

Necessarily, confirm and clean the oil strainer when replace the Engine oil (specially, when first replacement).

 **CAUTION**

More frequent servicing may be performed on motorcycles that are used under severe conditions.

3. Hold the motorcycle vertically using the stand.

NOTE

Place the motorcycle on firm and flat ground.

4. Inspect the engine oil level through the engine oil level lens on the right side on the engine.

NOTE

Engine oil expands and oil level increases when the engine oil is hot. Check and adjust engine oil level when the engine oil is not hot.

 **CAUTION**

Be sure to use the engine oil specified in the FUEL AND OIL RECOMMENDATION section.

 **CAUTION**

Operating the motorcycle with an incorrect amount of engine oil can damage your motorcycle.

Too little or too much engine oil can damage your engine.

Place the motorcycle on level ground.

Check the engine oil level with the engine oil level lens before each use of the motorcycle.


 **CAUTION**

Never operate the motorcycle if the engine oil level is below the “Lower line mark (L)” in the engine oil level lens. Never fill the engine oil above the “Upper line mark (F)”.

Engine oil level being most suitable about 1 mm under the “Upper line mark (F)” of the engine oil level lens. In case of the engine oil pouring excessively, the engine output being made insufficient.

Be careful not to pour the engine oil excessively.

⊙ ENGINE OIL AND FILTER CHANGE

 **CAUTION**

More frequent servicing may be performed on motorcycles that are used under severe conditions, inspect

- ① Quantity of Engine oil,
- ② Pollution degree of Engine oil before riding the motorcycle and then supplement and replace at any time to prevent damage of the engine.


NOTE

Change the engine oil and filter, after first running 1,000 km and every running 4,000 km.

The engine oil should always be changed when the engine is hot so that the engine oil will be drained thoroughly from the engine.

The procedure is as follows.

ENGINE OIL CAPACITY	
Oil change	1,100ml
Oil and filter change	1,300ml
Engine overhaul	1,400ml

 **CAUTION**

In case of the engine oil being over filled, the engine output will be reduced.

Be careful not to over fill the engine oil.

2-17 PERIODIC MAINTENANCE

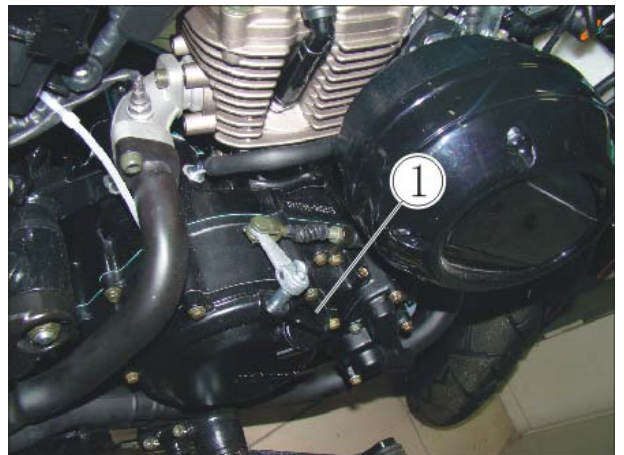
1. Hold the motorcycle vertically using the center stand.

NOTE

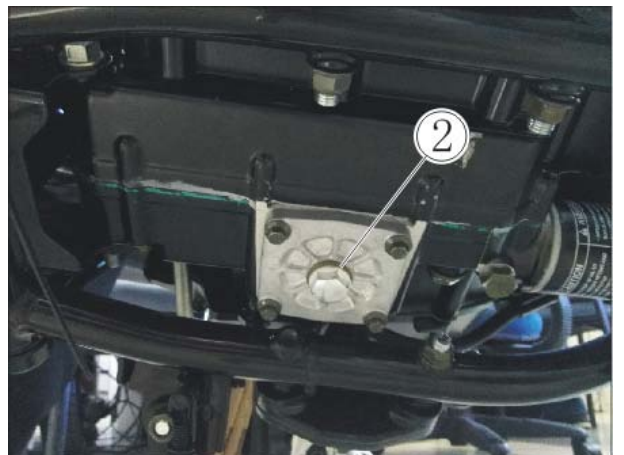
Place the motorcycle on firm and flat ground.

2. Place a drain pan under the engine.

3. Remove the engine oil filler plug ①.

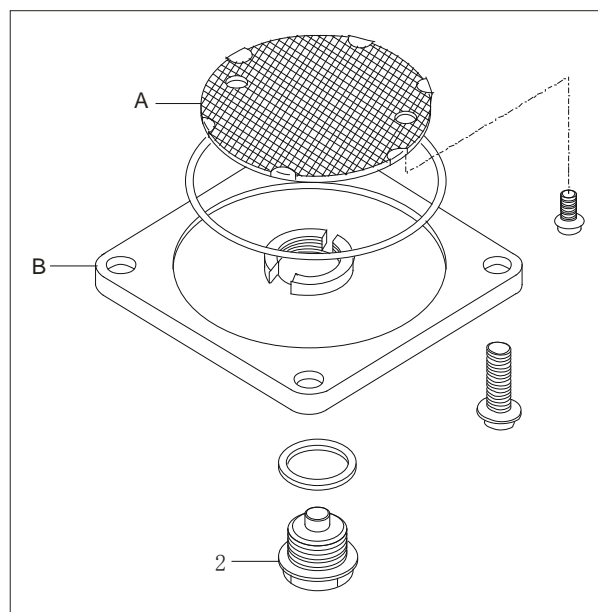


4. Drain the engine oil by removing the engine oil drain plug ② located on the bottom of the engine.



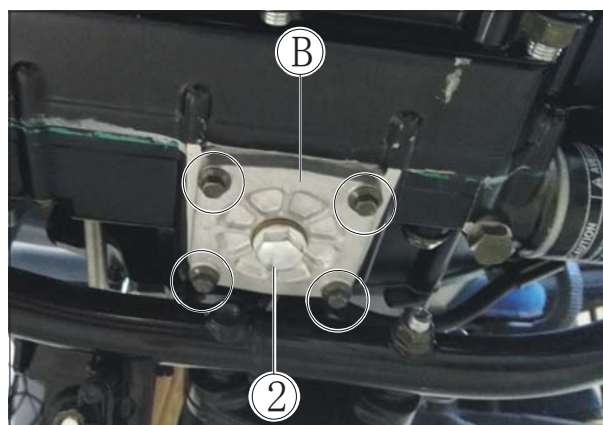
⚠ WARNING

New and used oil can be hazardous. Children and pets may be harmed by swallowing new or used oil. Continuous contact with used engine oil has been found to cause skin cancer in laboratory animals. Brief contact with used oil may irritate skin. Keep new and used oil and used oil filters away from children and pets. To minimize your exposure to used oil, wear a long-sleeve shirt and moistureproof gloves (such as dishwashing gloves) when changing oil. If oil contacts your skin, wash thoroughly with soap and water. Launder any clothing or rags if wet with oil. Recycle or properly dispose of used oil and filters.



⚠ WARNING

- The engine oil temperature may be high enough to burn you when the drain plug is loosened. Wait until the drain plug is cool enough to touch with bare hands before draining oil.
- Do not touch the hot muffler, or the hot muffler can burn you.



⚠ CAUTION

Remove, inspect and clean the oil strainer A by removing the engine oil strainer cap B when replacing the Engine oil (specially, when first replacing).

5. The oil fine filter is located on the lower side of the front end of the engine.

NOTE

No need cleaning during the use of the vehicle. Please replace it if necessary.

CAUTION


When installing the new oil fine filter, verify that the sealing ring is in place.



ENGINE OIL FILTER

6. Tighten the drain plug ② to the specified torque.

At this time, insert the gasket necessarily.

 Oil drain plug : 20~25 N-m (2.0~2.5 kg-m)

7. Pour a fresh engine oil through the engine oil filler hole.

Use an API classification of SL oil with SAE 10W-40 viscosity. At this time, insert the gasket necessarily. Approximately 1,450 ml of the engine oil will be required.

CAUTION

Approximately 1,100 ml of the engine oil must be required when changing the engine oil only without replacing the engine oil filter.

CAUTION

In case of the engine oil being over filled, the engine output will be reduced. Be careful not to over fill the engine oil.

CAUTION

Failure to use the correct oil can damage your motorcycle. Engine damage may occur if you use the engine oil that does not meet Hyosung's specifications. Be sure to use the engine oil specified in the FUEL AND OIL RECOMMENDATION section.

8. Install the engine oil filler plug①.

9. Start the engine and allow it idle for a few minutes. Check to see that no the engine oil is leaking from the engine oil filter and engine oil drain plug②.

10. Check the engine oil level according to Engine Oil Level Check procedure.

 **CAUTION**

Engine oil leaks from around the engine oil filter cap or drain plug indicate incorrect installation or the “O”-ring/gasket damage.

If you find any leaks or are not sure that the engine oil filter cap/ drain plug has been properly installed, have the motorcycle inspected by your Hyosung dealer or qualified mechanic.

ENGINE OIL FILTER

INSTALLATION

CAUTION

When install the oil filter, necessarily, HYOSUNG character NO. install to ward the outside, otherwise can damage the engine.

WARNING

Engine oil and exhaust pipes can be hot enough to burn you.

Wait until the oil drain plug and exhaust pipes are cool enough to touch with bare hands before draining oil.

Add new engine oil and check the oil level as described in the engine oil replacement procedure.



CAUTION

Use HYOSUNG MOTORCYCLE GENUINE OIL FILTER only, since the other make s genuine filters and after-market parts may differ filtering performance and durability, which could cause engine damage or oil leaks. Hyosung motors genuine oil filter is also not usable for the motorcycles.



ANTIFREEZE

WARNING

This motorcycle engine is water cooling system. During motorcycle running, the antifreeze is high temperature and high pressure in the cooling system. So, it is strictly forbidden opening the radiator cap in this state, avoiding burn.

The antifreeze must be added in a timely manner and sufficient amount to prevent damaging the engine.

The antifreeze must be added after the engine is stopped and cooled.

WARNING

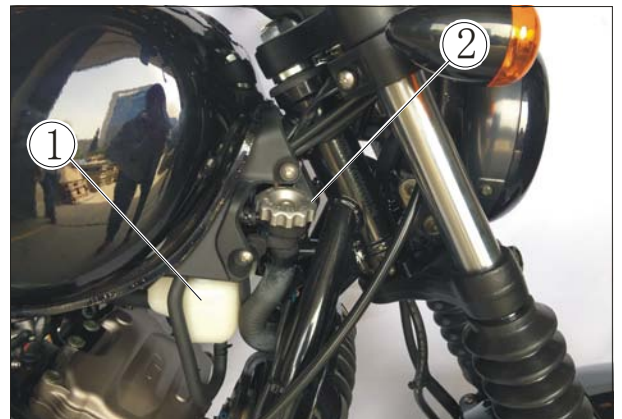
Antifreeze belongs to chemicals, which include toxic substances. If the antifreeze gets into your eyes or skin, wash with plenty of water immediately.

WATER TANK

The right side of the front end of the vehicle fuel tank is provided with a white makeup water tank ① and a radiator cover ②.

The makeup water tank ① is provided with a water level scale line and the antifreeze level in the water tank shall be between the upper and lower scale lines.

When the water level is lower than the lower limit, open the radiator cover ②, add special antifreeze to the water tank and do not add tap water or other liquid at will.



Antifreeze replacement

Carry out this work on about 10000 km running or when using the motorcycle for a year.

The operation is following:

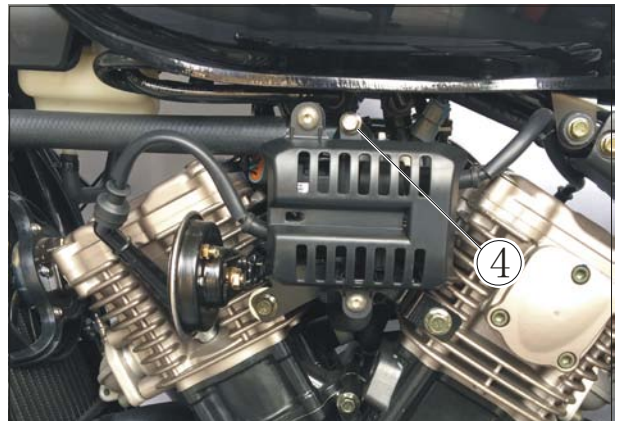
1. Please stand the motorcycle on a level ground with stand, take a container and put under the draining bolt③, then remove the bolt③, so antifreeze is outflow.



2. Remove the exhaust bolt ④.

CAUTION

For all antifreeze fully drained off from the system, remove the exhaust bolt ④, which need to use high-pressure air to blow the exhaust bolt connection on the left side of the engine cylinder head. There is a seal gasket on the draining bolt ③. If the seal gasket is damaged, it must be replaced.




When drain completed, assemble and tighten the drain bolt ③.

Slowly add 0.7L antifreeze into radiator cover using measuring glass, at same time observe the exhaust bolt ④ connection on the engine. When antifreeze outflow from the connection on the engine, plug in the exhaust bolt ④, continue to add liquid until all of 0.7L antifreeze is into the radiator.

3. Open the antifreeze radiator cover ②.

4. Tighten the radiator cover, start the engine, repeated acceleration and deceleration of the engine in place until the fan of cooling system turned on (or the needle of water temperature meter point to above the middle of the scale), then turn off the engine.

5. Until engine cool down and water temperature is at 80 degrees (middle scale line) or less, observe the antifreeze from the water tank. If the water level is low, add antifreeze until to the middle of upper and lower scale line. Then tighten the radiator cover.


CAUTION

First add liquid antifreeze is about 0.75L, replacement and maintenance add at about 0.7 L.

Antifreeze level shall not exceed the upper scale line, nor below the lower scale line.

Antifreeze liquid level should be the water tank between two scale marks, if necessary, add or remove.

Common fault of cooling system:

Check the makeup water tank, radiator, fan, water pump, rubber water pipe and antifreeze. If antifreeze boiling occurs during vehicle traveling, please find the reason:

1. The boiling point of anti-freezing solution is low and unqualified. Replace anti-freezing solution;
2. The antifreeze is too little. Please add antifreeze to the specified liquid level;
3. There is accumulated gas in cooling system. Please loosen the exhaust bolts on the engine for venting.
4. The cooling system is blocked. The radiator and the rubber water pipe should be checked, and the blockage should be eliminated.
5. The engine water pump is damaged. Please repair or replace it.
6. The fan does not work. It may be that the fan is damaged or the line connection is not good. Please replace the damaged fan or troubleshoot the line connection problem.
7. The radiator is damaged. Please repair or replace it.

Antifreeze selection:

1. Antifreeze must not be mixed using.
2. The freezing point of antifreeze is normally lower than the local minimum ambient temperature 5-10 degrees.
3. The boiling point of antifreeze is more than 107 ° C.

DRIVE CHAIN

NOTE

Clean and Lubricate Every 1,000 km.

Visually check the drive chain for the possible defects listed below. (Support the motorcycle by the jack or block, turn the rear wheel slowly by hand with the transmission shifted to Neutral.)

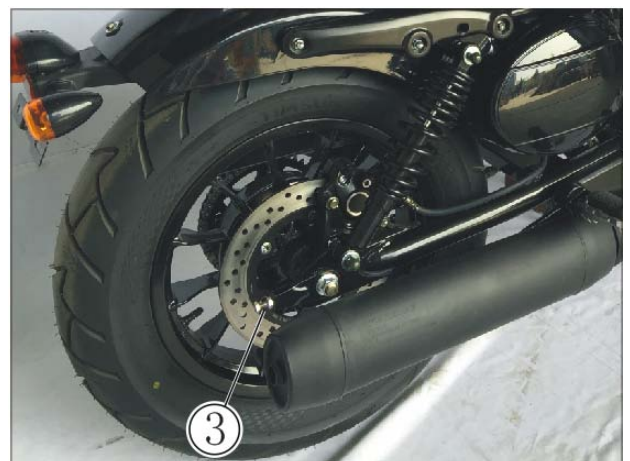
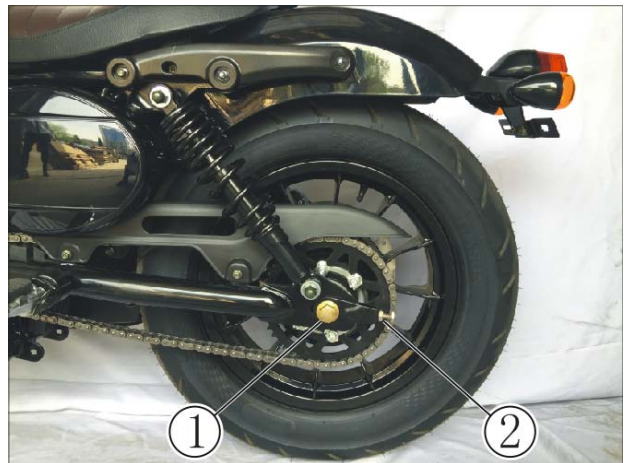
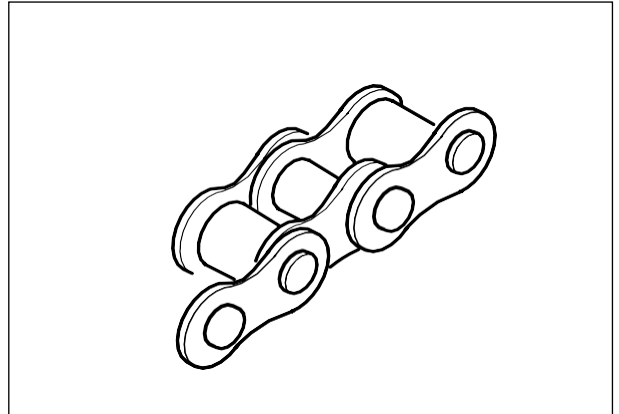
- Loose pins
- Excessive wear
- Damaged rollers
- Improper chain adjustment
- Dry or rusted links
- Kinked or binding links

If any defects are found, the drive chain must be replaced.

NOTE

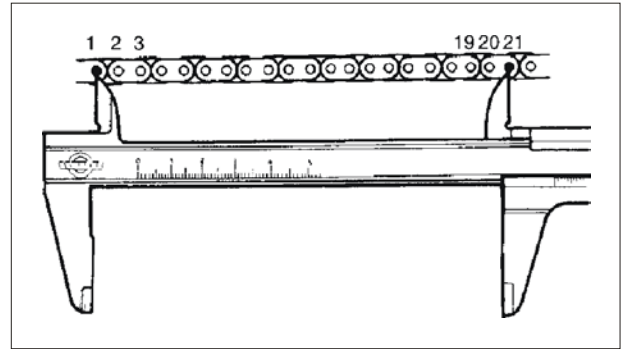
When replacing the drive chain, replace the drive chain and sprocket as a set.

- Loose the axle nut ①.
- Tense the drive chain fully by turning both chain adjusters ②, ③.



- Count out 21 pins (20 pitches) on the chain and measure the distance between the two points. If the distance exceeds the service limit, the chain must be replaced.

Drive chain 20-pitch length	Service limit
	254 mm




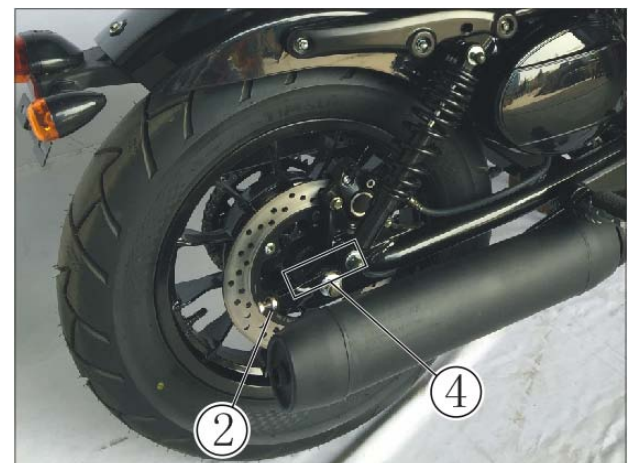
- Loosen or tighten both chain adjusters ①, ② until the chain has 20 - 30 mm of slack in the middle between the engine and rear sprockets. The marks ③, ④ on both chain adjusters must be at the same position on the scale to ensure that the front and rear wheels are correctly aligned.

Drive chain slack	20-30 mm
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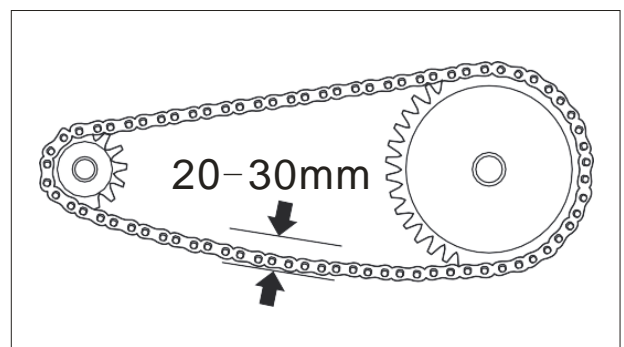


- Place the motorcycle on jack or block for accurate adjustment.
- After adjusting the drive chain, tighten the axle nut to the specified torque.
- Tighten both chain adjusters ①, ② securely.

 **Rear axle nut : 90~140 N·m (9.0~14.0 kg·m)**



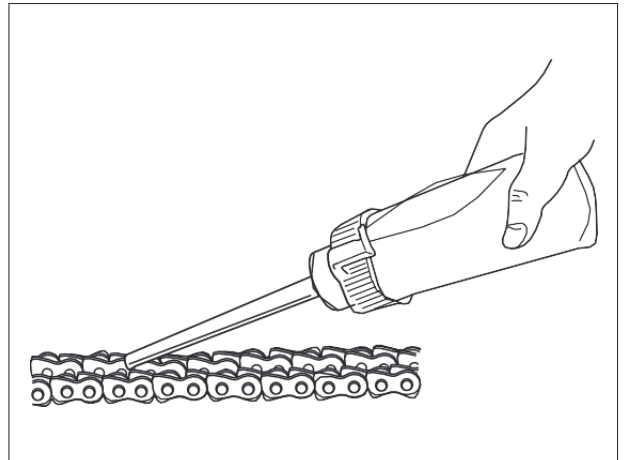
- Recheck the drive chain slack after tightening the axle nut.



- Wash the drive chain with kerosine. If the drive chain tends to rust quickly, the intervals must be shortened.
- After washing and drying the chain, oil it with a engine oil.

 **CAUTION**

The standard drive chain is a 428HO
Hyosung recommends that this standard
drive chain should be used for the
replacement.



BRAKE SYSTEM

NOTE

[BRAKE]

Inspect Initial 1,000 km and Every 4,000 km.

[BRAKE HOSE & BRAKE FLUID]

*Inspect Initial 1,000 km and Every 4,000 km.
Replace the brake hoses Every 4 years,
Replace the brake fluid Every 2 years.*

⊙ BRAKE FLUID

Be sure to check the brake fluid level in the master cylinder. If the level was found to be lower than the lower mark holding the motorcycle upright, inspect the brake pad's wear condition.

If the brake pad's wear condition is good, replenish with the proper brake fluid that meets Hyosung's requirements.

The motorcycle utilizes front and rear disk brakes. Properly operating the brake systems are vital to safe riding. Be sure to perform the brake inspection requirements as schedules. The brakes should be inspected at periodic inspection by your authorized dealer.

WARNING

Failure to properly inspect and maintain your motorcycle brake systems can be hazardous.

Improper maintenance of the brakes increases your chances of having an accident.

Be sure to inspect the brakes before each use of the motorcycle according to the INSPECTION BEFORE RIDING section.

Always maintain your brakes according to the MAINTENANCE SCHEDULE.



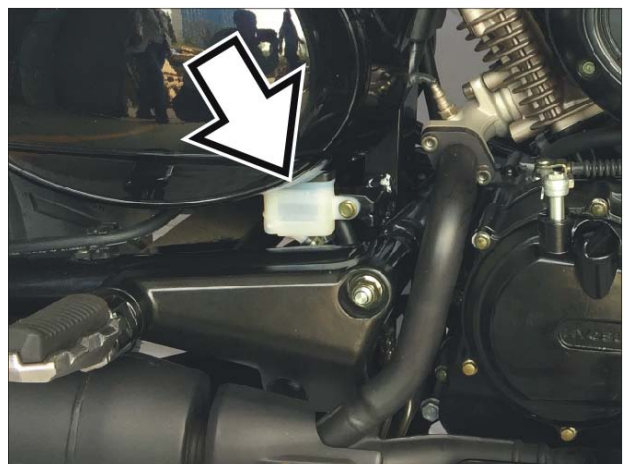
Front Brake Cylinder

WARNING

Operating the motorcycle in harsh condition can be hazardous if you do not inspect brake wear often.

Operating in mud, water, sand, or other extreme conditions can cause accelerated brake wear. This could lead to an accident.

If you operate your motorcycle under these conditions, the brakes must be inspected more often than recommended in the MAINTENANCE SCHEDULE.



Rear Brake Cylinder

As the brake pads wear, the fluid level will drop to compensate for the new position of brake pads. Replenishing the master cylinder to considered normal periodic maintenance.

WARNING

Brake fluid may be harmful if swallowed or if it comes in contact with skin or eyes. Contact your doctor immediately if brake fluid is swallowed and induce vomiting. If brake fluid gets into the eyes or in contact with the skin, flush thoroughly with plenty of water.

CAUTION

This motorcycle uses glycol-based brake fluid.
Do not use or mix different types of brake fluid, otherwise serious damage will result in the brake system.
Use Only DOT4 brake fluid.
Do not spill any brake fluid on painted or plastic surfaces as it will damage the surface severely.
Never use any brake fluid that has been stored in a used or unsealed container.
Never reuse brake fluid left over from the last servicing and stored for long period as it absorbs moisture from the air.

WARNING

Be careful that water or dust does not enter the brake fluid reservoir when refilling.

CAUTION

Brake fluid, if it leaks, will interfere with safe running and immediately discolor painted surfaces. Check the brake hoses and hose joints for cracks and oil leakage before riding.

BRAKE PADS

Inspect the front and rear brake pads to determine whether or not the friction pads are worn down to the grooved limit line. If a pad is worn to the grooved limit line it must be replaced with a new one by your authorized Hyosung dealer or qualified service mechanic.

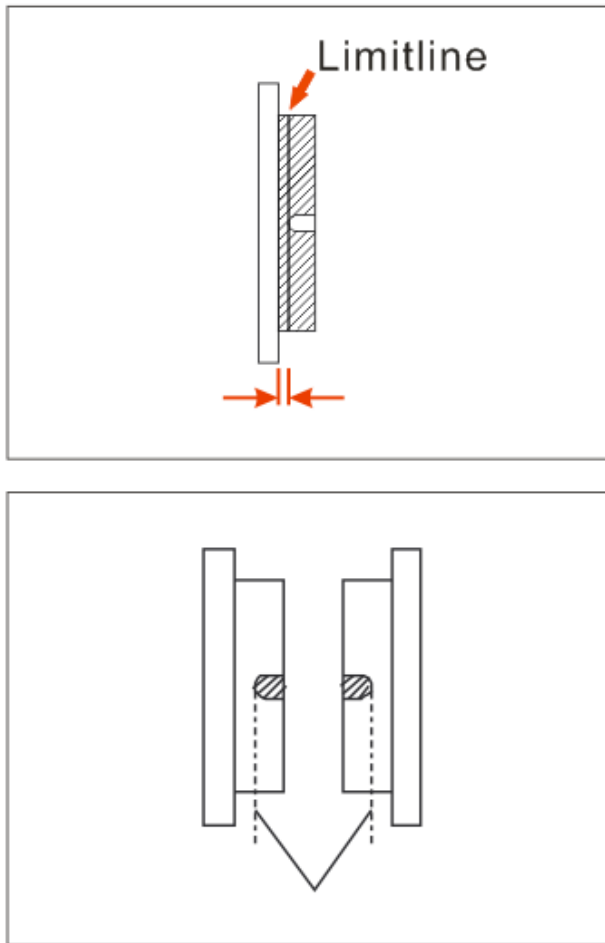
The rate at which brake pads will wear depends on motorcycle usage, riding style and road surface condition.



Front Brake Pads



Rear Brake Pads



The extend of brake pad wear can be checked by observing the grooved limit on the pad. When the wear exceeds the grooved limit, replace the pads with new ones.

CAUTION

Replace the brake pad as a set, otherwise braking performance will be adversely affected.

Inspect every day in the following point at the brake system.

- ① Brake fluid leakage of the front and rear brake system.
- ② Leak or damage of the brake hose.
- ③ Operating of the brake lever and pedal.
- ④ Wear of the front and rear brake pads.

CAUTION

The front and rear brake system requires the brake hose or the brake fluid to be replaced according to periodic inspection chart by your authorized Hyosung dealer for safety as they operate at high pressure.

WARNING

Riding with worn brake pads will reduce braking performance and will increase your chance of having accident. Inspect brake pad wear before each use. Ask your Hyosung dealer or qualified mechanic to replace brake pads if any pad is worn to the limit.

WARNING

If brake pads are allowed to wear down to the metal substrate, metal-to-metal contact with the brake disk would lead to noise and the brake caliper sparking ; this would result in loss of braking and brake disk damage, causing a dangerous riding condition.

WARNING

Replacing only one of the two brake pads can be hazardous. Replacing only one brake pads can result in uneven braking action. Replace both pads together.

CAUTION

After replaced the front or rear brake pads, squeeze / depress and release several times the brake lever/ pedal so that it is setting at the original place. Then, check that the brakes are operating correctly.

⦿ **BRAKE DISK INSPECTION**

Check the brake disk for damage or cracks.

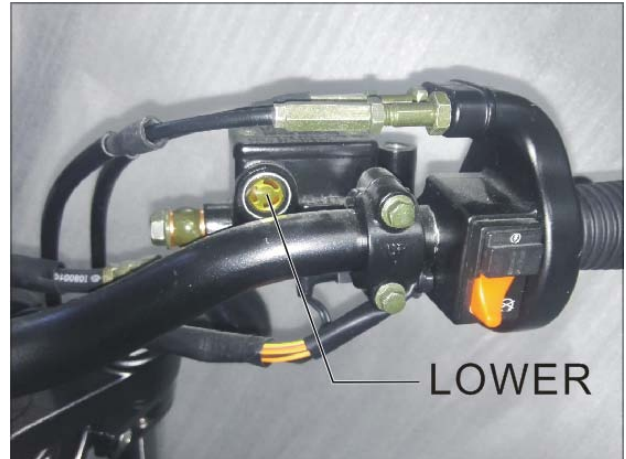
FRONT BRAKE

⦿ **BRAKE FLUID LEVEL CHECK**

- Keep the motorcycle upright and place the handle bars straight.
- Check the brake fluid level by observing the lower limit line (LOWER) on the front brake fluid reservoir.
- When the level is below the lower limit line (LOWER), replenish with brake fluid that meets the following specification.



Specification and Classification : DOT 4



⦿ **FRONT BRAKE PAD REPLACEMENT**

- Remove the brake caliper.
- Remove the brake pads.
- To reassemble, reverse the above sequence.



Brake caliper mounting bolt

: 18~28 N·m (1.8~2.8 kg·m)



◎ FRONT BRAKE FLUID REPLACEMENT

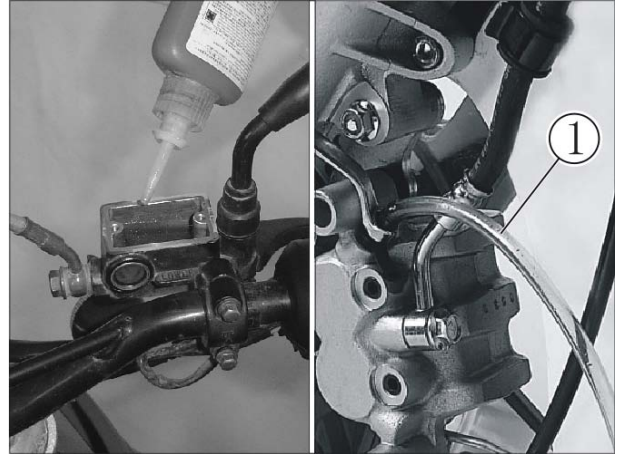
- Place the motorcycle on a level surface and keep the handlebars straight.
- Remove the master cylinder reservoir cap and diaphragm.
- Suck up the old brake fluid as much as possible.
- Fill the reservoir with new brake fluid.



Specification and Classification

: DOT 4

- Connect a clear hose ① to the air bleeder valve and insert the other end of the hose into a receptacle.



- Loosen the air bleeder valve and pump the brake lever until the old brake fluid is completely out of the brake system.



- Close the air bleeder valve and disconnect the clear hose. Fill the reservoir with new brake fluid to the upper line.



Front brake caliper air bleeder valve

: 6~9 N·m (0.6~0.9 kg·m)



◎ AIR BLEEDING OF THE BRAKE FLUID CIRCUIT

Air trapped in the brake fluid circuit acts like a cushion to absorb a large proportion of the pressure developed by the master cylinder and thus interferes with the full braking performance of the brake caliper. The presence of air is indicated by “sponginess” of the brake lever and also by lack of braking force. Considering the danger to which such trapped air exposes the machine and rider, it is essential that, after remounting the brake and restoring the brake system to the normal condition, the brake fluid circuit be purged of air in the following manner :

- Fill the master cylinder reservoir to top of the inspection window. Replace the reservoir cap to prevent dirt from entering it.
- Attach a hose to the air bleeder valve, and insert the free end of the hose into a receptacle.



- Bleed air from the brake system.
- Squeeze and release the brake lever several times in rapid succession and squeeze the lever fully without releasing it. Loosen the bleeder valve by turning it a quarter of a turn so that the brake fluid runs into the receptacle, this will remove the tension of the brake lever causing it to touch the handlebar grip. Then, close the air bleeder valve, pump and squeeze the brake lever, and open the valve. Repeat this process until the fluid flowing into the receptacle no longer contains air bubbles.




NOTE

While bleeding the brake system, replenish the brake fluid in the reservoir as necessary. Make sure that there is always some fluid visible in the reservoir.



- Close the air bleeder valve, and disconnect the hose. Fill the reservoir with brake fluid to the upper line.

- 
Front brake caliper air bleeder valve
 : 6~9 N – m (0.6~0.9 kg – m)

 **CAUTION**

Handle brake fluid with care : the fluid reacts chemically with paint, plastics, rubber materials, etc.

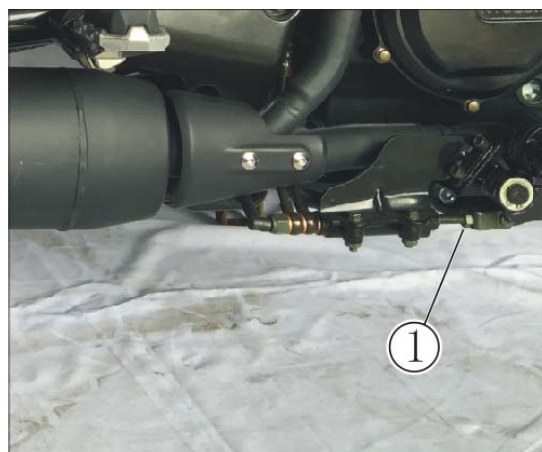


REAR BRAKE

⊙ **REAR BRAKE ADJUSTING**

- Adjust the free travel to 20~30 mm by turning the adjusting nut ①.

Rear brake pedal free travel	20~30 mm
------------------------------	----------



◎ BRAKE LAMP SWITCH

Adjust the front and rear brake light switches so that when the front brake handle is clenched or the brake pedal is pressed, the brake light will light up before the pressure is felt.



Front brake lamp switch



Rear brake lamp switch

STEERING

NOTE

Inspect Initial 1,000 km and Every 4,000 km.

Steering should be adjusted properly for smooth turning of handlebars and safe running. Overtight steering prevents smooth turning of the handlebars and too loose steering will cause poor stability. Check that there is no play in the steering stem while grasping the lower fork tubes by supporting the machine so that the front wheel is off the ground, with the wheel straight ahead, and pull forward. If play is found, perform steering bearing adjustment as described in page 6-30 of this manual.

FRONT FORK

NOTE

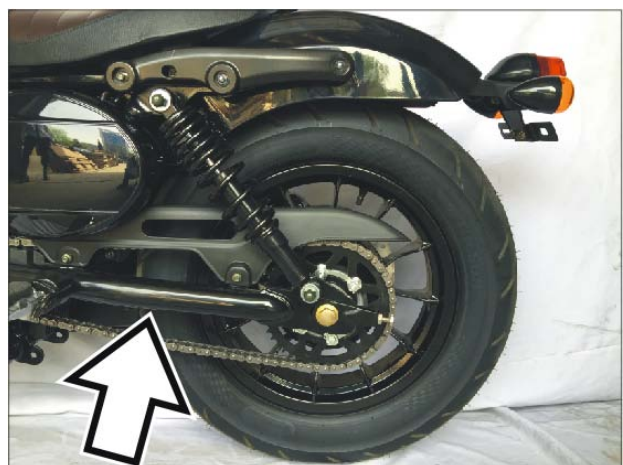
Inspect Every 4,000 km.

Inspect the front forks for oil leakage, scoring or scratches on the outer surface of the inner tubes. Replace any defective parts, if necessary.

REAR SUSPENSION

NOTE
<i>Inspect Every 4,000 km.</i>

Inspect the rear shock absorber for oil leakage and mounting rubbers including engine mounting for wear and damage. Replace any defective parts, if necessary.



TIRE

NOTE

Inspect Initial 1,000 km and Every 4,000 km.

Inspect the tire pressure and the tire thread depth periodically.

Inspect frequently the tire pressure for the safety and the tire life.

WARNING

Failure to follow these warnings may result in an accident due to tire failure. The tires on your motorcycle form the crucial link between your motorcycle and the road.

Follow these instructions ;

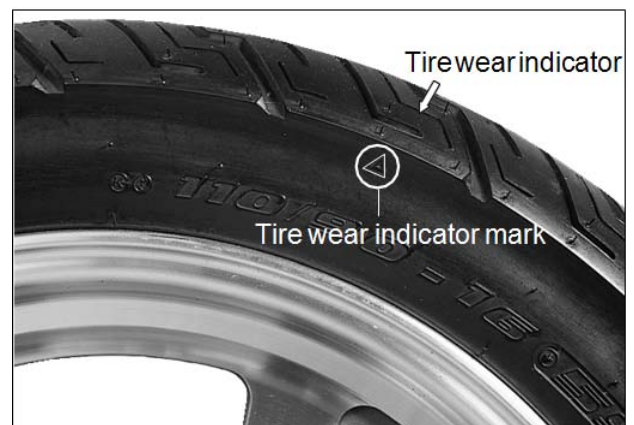
- Check tire condition and pressure, and adjust pressure before each ride.
- Avoid overloading your motor cycle.
- Replace a tire when worn to the specified limit, or if you find damage such as cuts or cracks.

Always use the size and type of tires specified in this owner's manual.

● TIRE TREAD CONDITION

Operating the motorcycle with excessively worn tires will decrease riding stability and can lead to loss of control.

- Inspect storage of tire thread s depth by the tire wear indicator
- Replace the front and rear tires at once when appear the tire wear indicator.



⚠ CAUTION

The standard tire on GV125S is 120/80-16 or front and 150/80-15 for rear.

The use of tires other than those specified may cause instability. It is highly recommended to use a **HYOSUNG Genuine Tire**.

● **TIRE PRESSURE**

Insufficient air pressure in the tires not only hasten tire wear but also seriously affects the stability of the motorcycle.

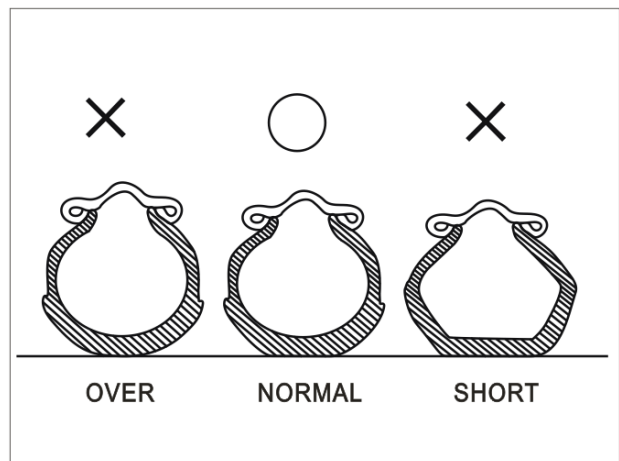
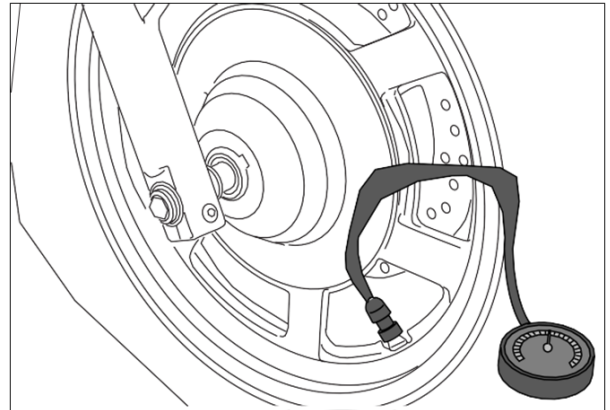
Under-inflated tires make smooth cornering difficult and over-inflated tires decrease the amount of tire in contact with the ground which can lead to skids and loss of control.

Be sure that the tire pressure is within the specified limits at all times.

Tire pressure should only be adjusted when the tire is cold.

If you see the problem with the tire, adjust the pressure with the pressure gauge.

If the tire pressure is too high or too low, steering will be adversely affected and tire wear increased. Therefore, maintain the correct tire pressure for good roadability or shorter tire life will result. Cold inflation tire pressure is as follows.



TIRE PRESSURE (COLD INFLATION)	NORMAL RIDING	
	SOLO RIDING	DUAL RIDING
FRONT	200Kpa(29psi)	200Kpa(29psi)
REAR	200Kpa(29psi)	200Kpa(29psi)

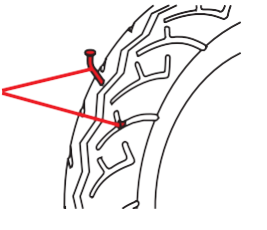
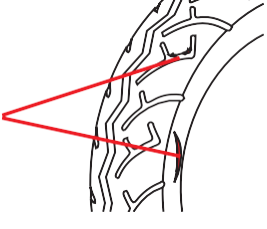
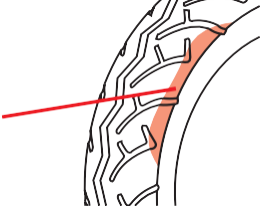
⚠ CAUTION

If there are some problem with the tire pressure or cracks and cuts, it will decrease the riding stability and lead to flat tire.

⊙ **CRACKS AND CUTS**

Check if

- 1) There are visible cracks and cuts.
- 2) There are abnormal wears.

<p>SCREW, FOREIGN MATERIAL</p>	
<p>WORN, CRACK</p>	
<p>ABNORMAL WEARS</p>	

CHASSIS BOLTS AND NUTS

NOTE

Tighten Initial 1,000 km and Every 4,000 km.

Check that all chassis bolts and nuts are tightened to their specified torque.

COMPRESSION PRESSURE

The compression of a cylinder is a good indicator of its internal condition.

The decision to overhaul the cylinder is often based on the results of a compression test. Periodic maintenance records kept at your dealership should include compression reading for each maintenance service.

Compression pressure	
Standard	14~16 kg/cm ² (at 600 rpm)
Service limit	12 kg/cm ² (at 600 rpm)

Low compression pressure can indicate any of the following conditions :

- Excessively worn cylinder wall
- Worn-down piston or piston rings
- Piston rings stuck in grooves
- Poor seating of valves
- Ruptured or otherwise defective cylinder head gasket

◎ COMPRESSION TEST PROCEDURE

NOTE

Before testing the engine for compression pressure, make sure that the cylinder head bolts are tightened to the specified torque values and valves are properly adjusted.

Have the engine warmed up by idling before testing.

Be sure that the battery used is in fully-charged condition.

Remove the parts concerned and test the compression pressure in the following manner.

- Loosen the water cooler mounting bolts from the frame.
- Remove all the spark plug.
- Fit the compression gauge in one of the plug holes, while taking care that the connection is tight.
- Keep the throttle grip in full-open position.
- Crank the engine a few seconds with the starter, and record the maximum gauge reading as the compression of that cylinder.



Compression gauge : 09915-64510



OIL PRESSURE

Check the oil pressure periodically. This will give a good indication of the condition of the moving parts.

Oil pressure	Standard
	1.4 ± 0.2 kg/cm ² (at 60 °C·4,000 rpm)

If the oil pressure is lower or higher than the specification, the following causes may be considered.

● LOW OIL PRESSURE

- Oil leakage from the oil passage
- Damaged O-ring
- Defective oil pump
- Combination of above items

● HIGH OIL PRESSURE

- Engine oil viscosity is too high
- Clogged oil passage
- Combination of the above items

● OIL PRESSURE TEST PROCEDURE

Check the oil pressure in the following manner.

- Remove the oil check plug and install the adapter of oil pressure gauge at the removed position.
- Connect an engine tachometer.
- Warm up the engine as follows :

Summer 10 min. at 2,000 rpm.

Winter 20 min. at 2,000 rpm.

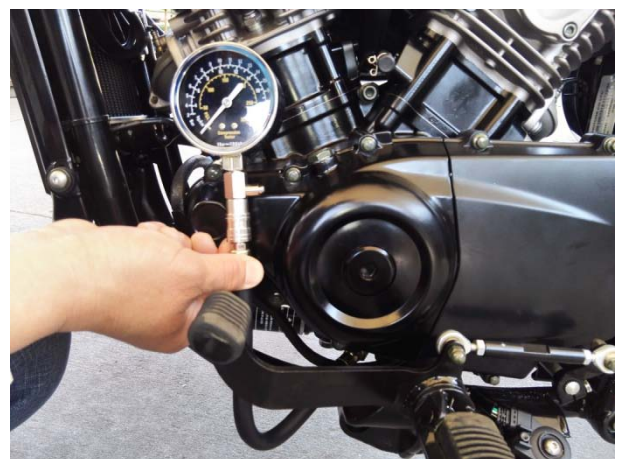
- After warming up, increase the engine speed to 4,000 rpm. (with the engine tachometer), and read the oil pressure gauge.



Oil pressure gauge : 09915-74510

Engine tachometer : 09900-26006

2-40 PERIODIC MAINTENANCE



ENGINE

CONTENTS

<i>BRIEF DESCRIPTION.....</i>	<i>3-2</i>
<i>ENGINE AND THE CHASSIS SEPARATION.....</i>	<i>3-3</i>
<i>ENGINE COMPONENT INSPEC- TION AND SERVICE.....</i>	<i>3-23</i>

BRIEF DESCRIPTION

Engine and the chassis separation:

1. Remove the seat and fuel tank (Tubing and trachea and power cord coupler).
2. Drain the engine oil and antifreeze. Remove the small sprockets and accessories. Disconnect the battery lead wire and magneto coupler and gear display switch.
3. Remove the gear shift cam lever and left footrest. Remove the starting motor.
4. Remove the left frame cover, front and rear tubing, tubing three-wire, upper water pipe, Ignition coil, intake air temperature sensor (IATS), fuel injector power cord, horn wire, thermostat comp.
5. Remove the air cleaner, throttle cable, clutch cable, muffler, front right footrest.
6. Remove the oxygen sensor, water temperature sensor, stepper motor, throttle open power cord, engine mounting bolts. remove the engine from the frame.

Engine decomposition:

1. Remove the throttle body, intake air connector, muffler connector comp.
2. Remove the cylinder head cover, magneto cover bolt, observation hole bolt.
3. Remove the engine sprocket outer cover, adjust the timing sprocket, remove the chain drive sprocket.
4. Remove the front cylinder head, cylinder comp, piston comp.
5. Remove the rear cylinder head, cylinder comp, piston comp, engine oil filter comp, magneto.
6. Remove the clutch inner and drive gears.
7. Remove the gear shift shaft comp, oil pump, camshaft plate, oil pump idle gear, gear shift cam driven gear, crankshaft bearing limit plate, cam chain tensioner.
8. Remove the left and right crankcase fixing bolts, open the left and right crankcase,
9. Remove the gear shift fork, gear shift pawl return spring, remove the camshaft and drive shaft, counter shaft.
10. Decomposition the cylinder head.
11. Decomposition the piston.

Assembly considerations.

Maintenance section:

1. Cylinder head combination Check repair;
2. Piston combination Check repair;
3. Crankshaft Check repair;
4. Magneto combination inspection repair;
5. Starting motor combination inspection repair;
6. Clutch inspection repair;
7. Crankcase inspection repair.

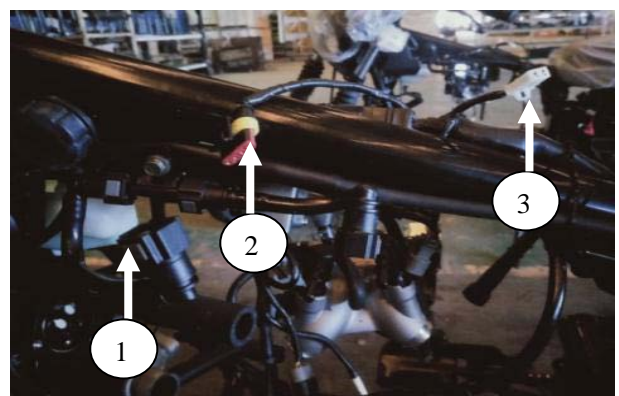
Engine and the chassis separation:

- With the left and right bolts removed, remove the seat.
- Remove fixed bolts on the left and right sides of the tank.



- Gently lift the rear of the tank, remove the injection pump tubing 1, trachea 2, oil pump power supply 3, fuel sensor 4.

Reverse operation during installation, requires installation in place.



- Drain the engine oil by removing the engine oil drain plug located on the bottom of the engine.

ENGINE OIL CAPACITY	
Oil change	1,100ml
Oil and filter change	1,300ml
Engine overhaul	1,400ml



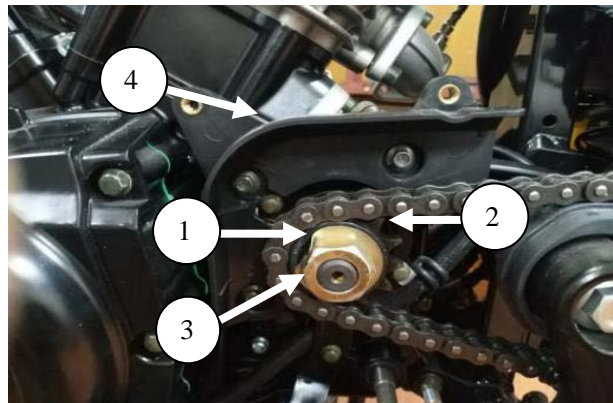
- Remove the lower water pipe.
Drain the antifreeze.

⚠ CAUTION

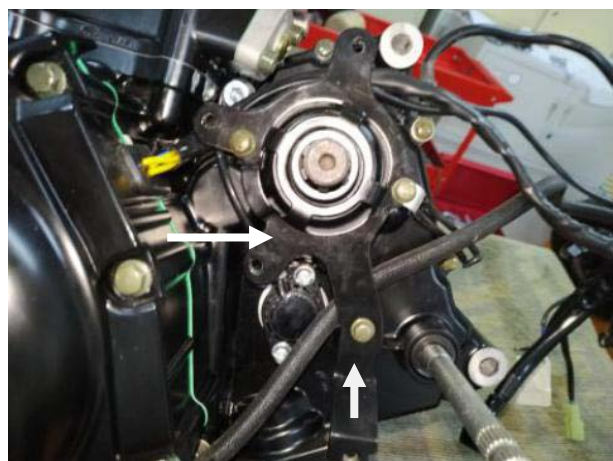
First add liquid antifreeze is about 0.75L, replacement and maintenance add at about 0.7 L. Antifreeze level shall not exceed the upper scale line, nor below the lower scale line. Antifreeze liquid level should be the water tank between two scale marks, if necessary, add or remove.



- Remove the engine sprocket locking nut 1, remove the small sprocket 2, Remove the chain 3 and cover plate 4. Tighten the engine sprocket nut to the specified torque.
Engine sprocket nut
: 80~100 N·m (8.0~10.0 kg·m)



- Remove the crimping plate.



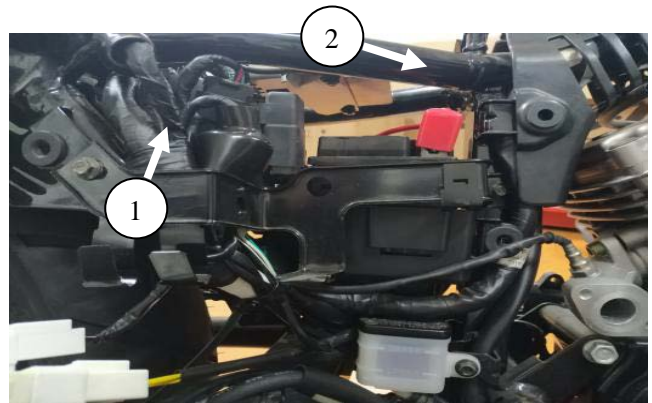
- Remove the Gear display switch.



- Remove the contacts and springs.

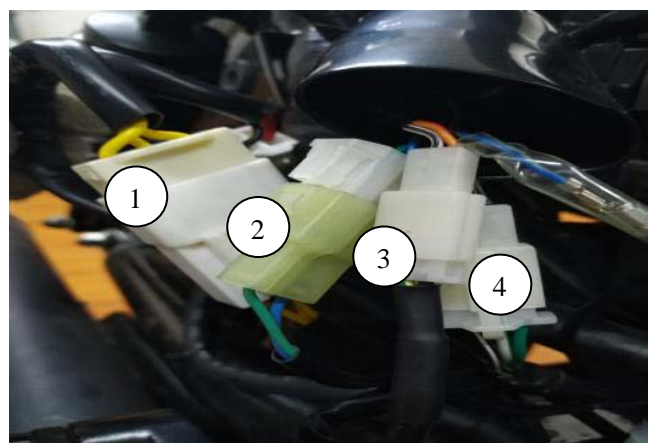


- Remove the battery bracket comp 1, Disconnect the battery lead wire 2.



- Remove the starter motor lead wire 1 . Ignition switch line 2, gear display power cord 3, side stand switch 4,

Link by number of wires, color, and interface shape during installation, otherwise you cannot link



- Remove the gear shift cam lever.



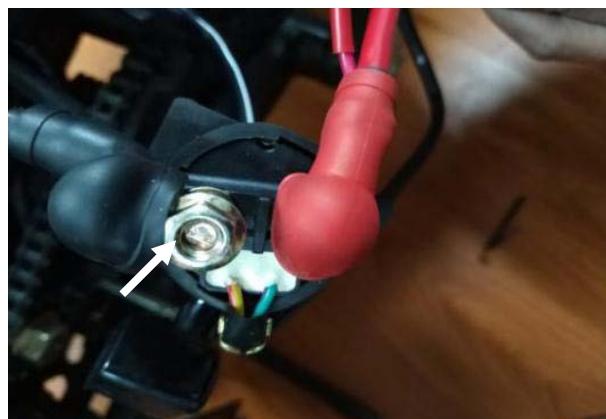
- Remove the left footrest.



- Remove the starting motor.



- Remove the starter motor lead wire.



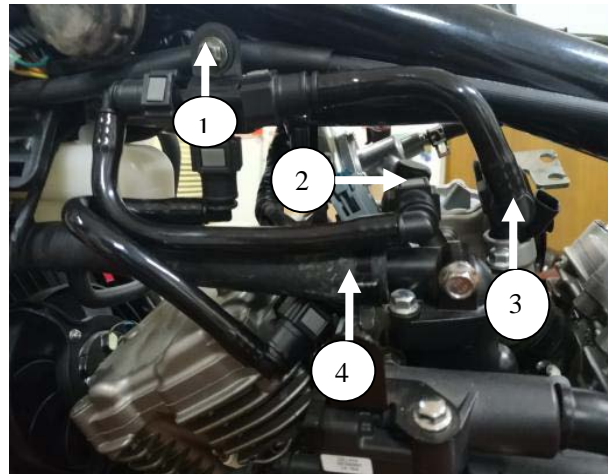
- Remove the left frame head cover.



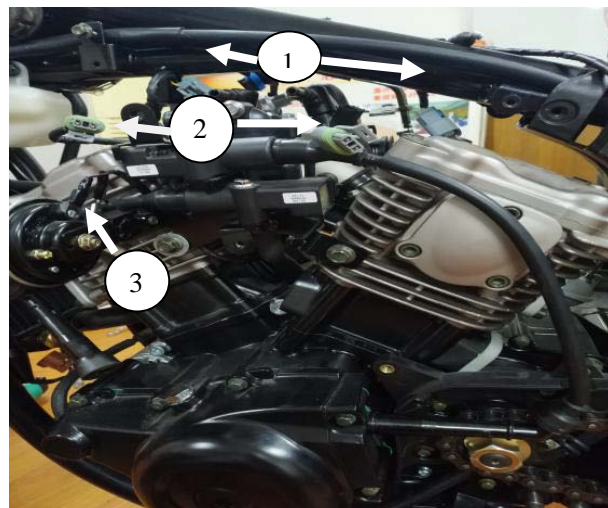
- Remove the decoration cover.



- Remove the fuel hose joint 1
- Remove the front cylinder fuel hose 2,
- Remove the rear cylinder fuel hose 3 and hose 4.



- Disconnect the injector and ignition coil coupler and horn.
- Note: Ignition coil coupler with white marked as front cylinder during installation.



- Remove the intake air temperature sensor (IATS).



- Remove the thermostat power cord.



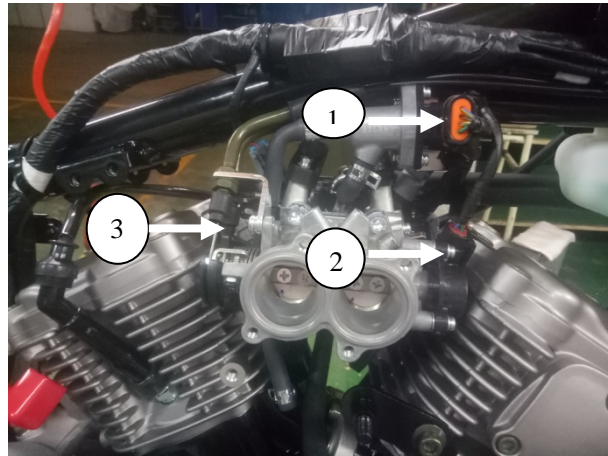
- With the four screws loosened, remove the right air cleaner case.



- With the four screws and a nut loosened. Remove the air filter case component.



- Remove the idle speed control solenoid 1, throttle position sensor (TPS) 2, Remove the throttle cable,



- Remove the idle speed control solenoid bolt. Remove the idle speed control solenoid.



- Disconnect the clutch cable end out of clutch release arm bolt 1 and 2. Remove the clutch wire cable



- With the bolt removed, Remove the right footrest.



- With the exhaust pipe bolts and muffler mounting bolts removed, remove the exhaust pipes and mufflers.



- Remove the muffler and exhaust pipe cover,



- Remove the muffler and exhaust pipe bolt. Remove the exhaust pipe.

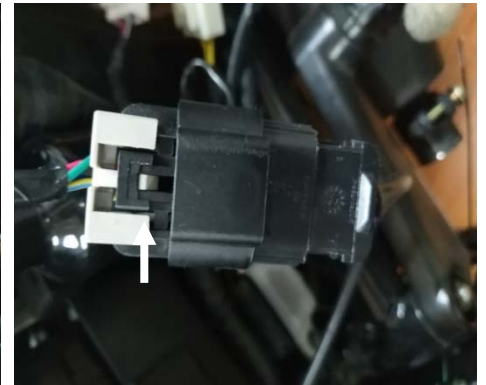
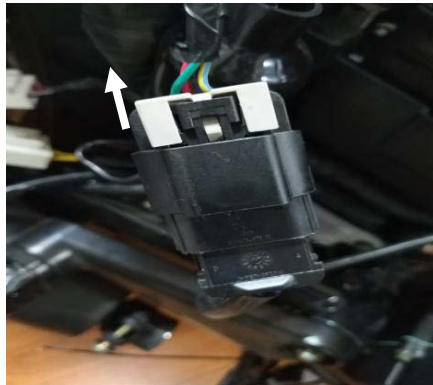


- Remove the front cylinder oxygen sensor 1, rear cylinder oxygen sensor 2.

Note: Only oxygen sensor connectors are separated.



- Oxygen sensor separation
white lock plate outward pull out.



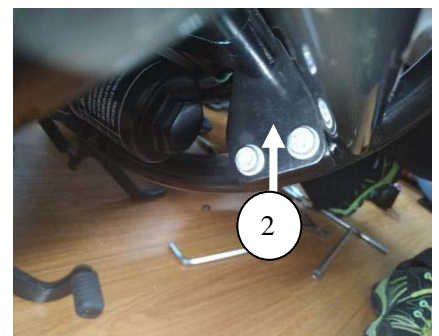
- Remove three fixed bolts from the rear of:
the engine assembly
- Rear swing arm pivot upper



- Rear swing arm pivot lower



- A bolt 1 below the front of
the engine.
Remove the left plate 2;



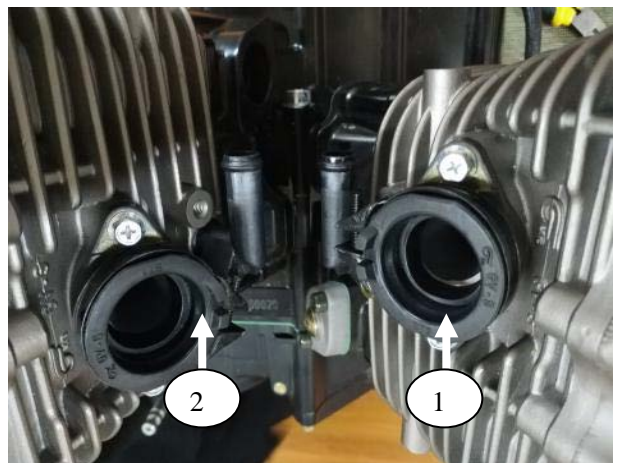
- Lift the engine from the left side of the body: remove the 2 bolts on the fixed bracket of the ignition coil.



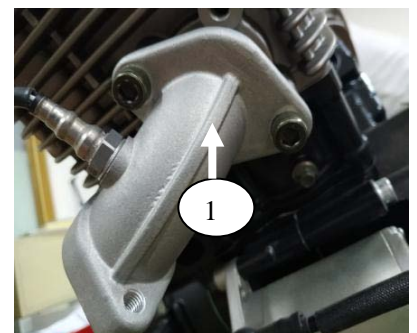
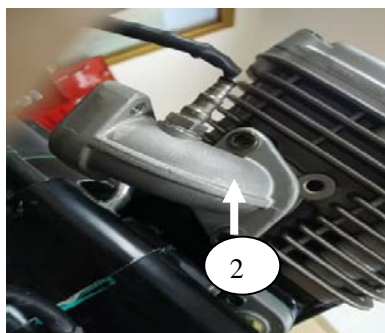
- Loosen the front and rear cylinder inlet bending pipe locking clamp, Remove the throttle body.



- Remove the front cylinder inlet interface 1, rear cylinder inlet interface 2;



- Remove the front cylinder exhaust bending pipe 1, front cylinder exhaust bending pipe 2, Perform the next dismantling:



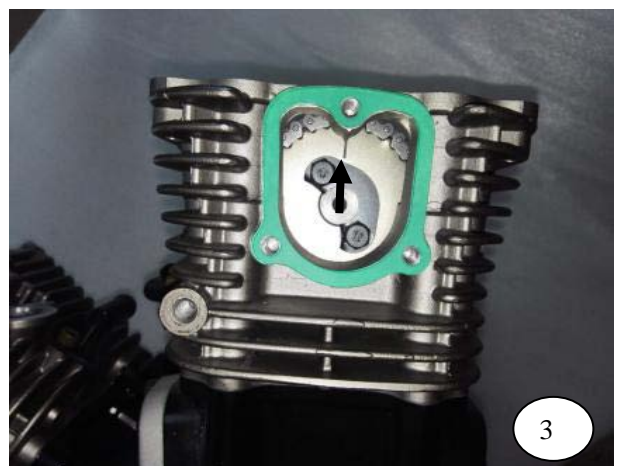
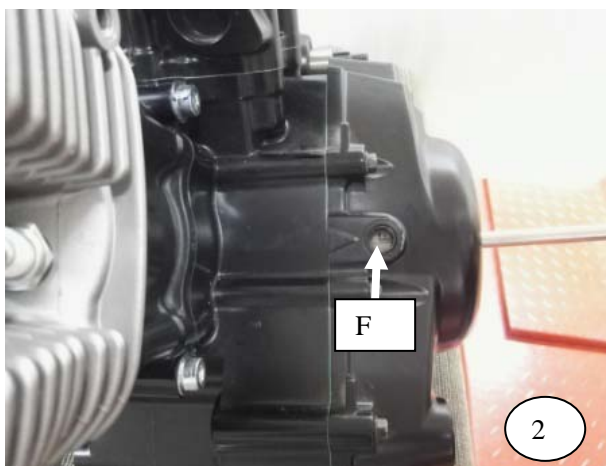
- Remove the front cylinder head cover 1, rear cylinder head cover 2.



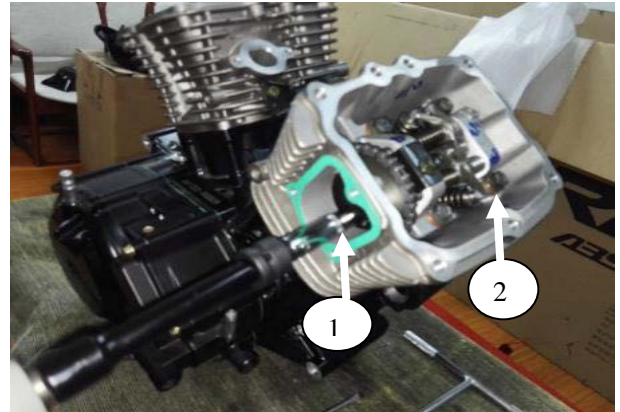
- Remove the cylinder head side cover.



- Remove the crankshaft hole plug, turn the crankshaft 1 counterclockwise, so that the timing mark "F" Alignment arrow 2; the cylinder head is marked as a straight line 3.



- Remove the sprocket and remove the positioning pin 1.
- Remove cylinder head fixing Bolts 2.
- Note that the torque is 25 Nm when assembling.



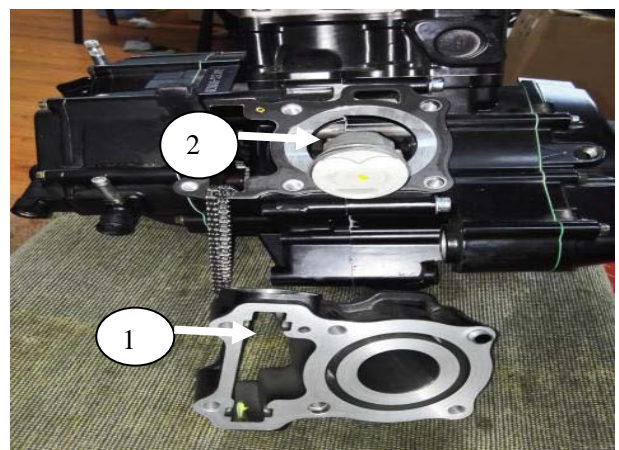
- Remove the chain tensioning device.



- Remove the cylinder head.

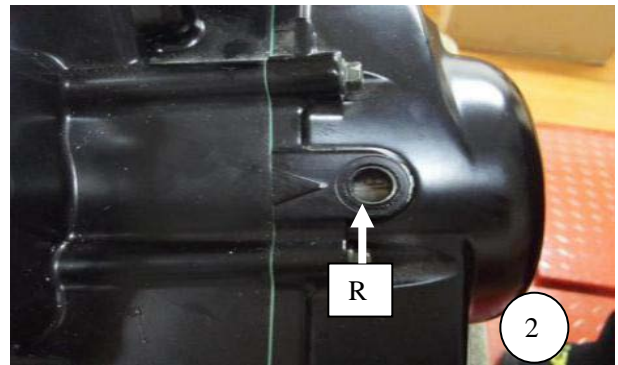


- Remove the cylinder 1.
- Remove the piston 2.
- Note that the cylinder is coated with lubricating oil during assembly.



- Remove the rear cylinder head. Cylinder and Piston: The steps are the same as the front cylinder.

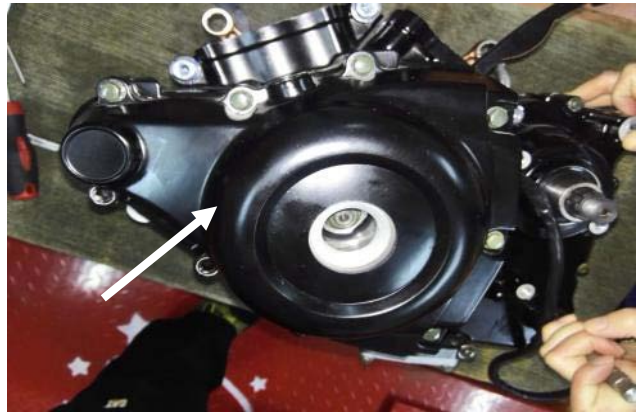
Note: Turn the magnetic motor rotor counterclockwise, rotate the 300° (Fig. 1), Mark the "R" Alignment arrow (Figure 2), and mark the cylinder head on the alignment (Fig. 3).



- Remove the Injector.



- Remove 9 bolts and remove the magnetic motor cover;
Note that the stator coil is fixed on the inside;



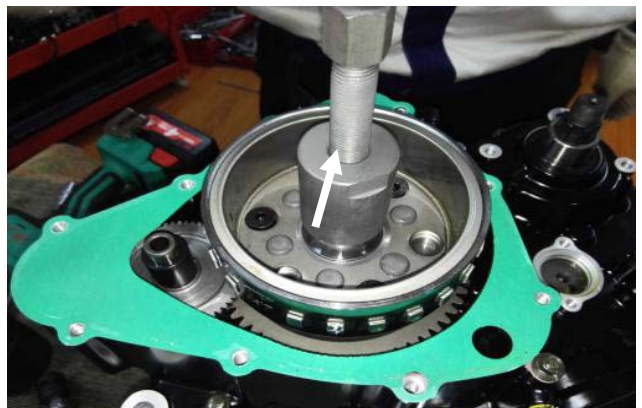
- Stator Coil fixing.



- Remove the crankshaft nut;
- Torque 50-60N-m when mounting nuts;



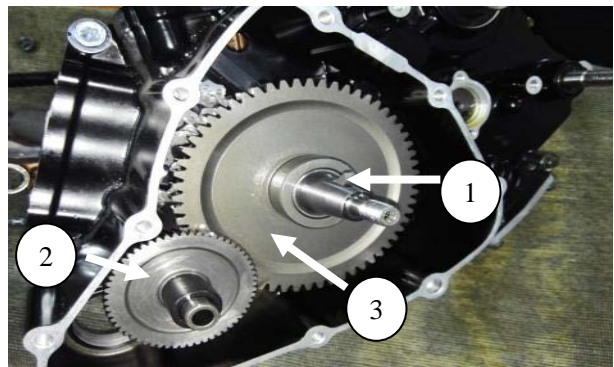
- Remove the rotor with special tools.



- Remove the oil filter;



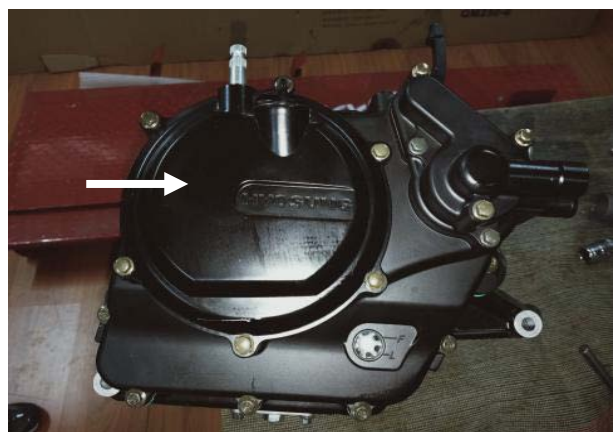
- Remove the semicircle key 1
- Starter idle gear 2
- Electric start clutch 3



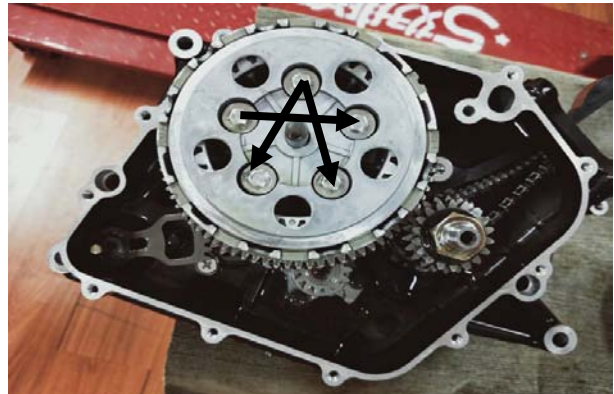
- Remove the bolt and remove the camchain guide.



- Remove 11 right cover bolts and remove the right cover;
- Torque Requirements During installation 8-12Nm



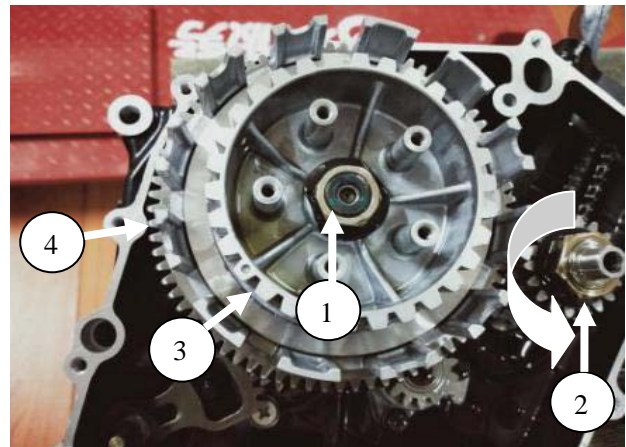
- Remove 5 clutch press plate fixing bolts
- Note: Diagonal fastening torque requirements during installation 6-10Nm



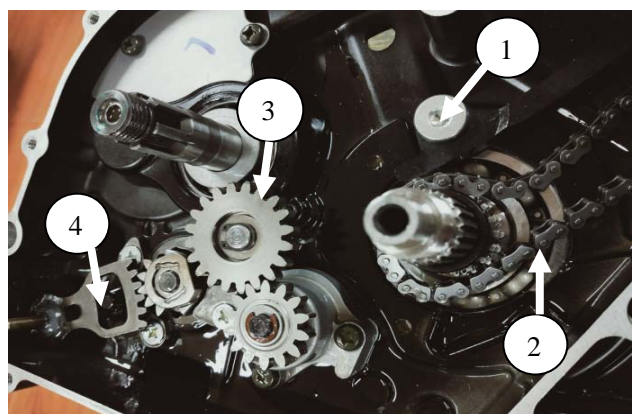
- Remove the clutch friction sheet.



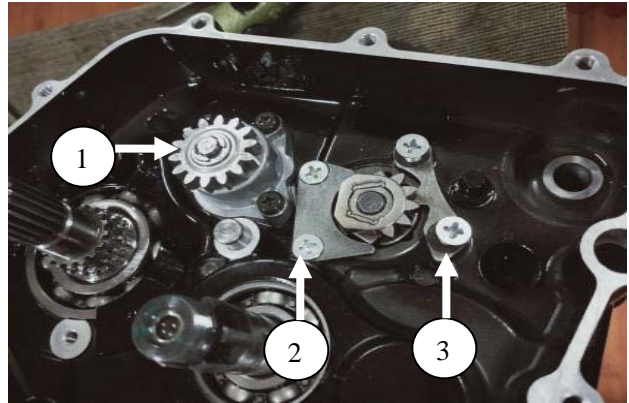
- Disassembly clutch Large hub fixing nut 1
- Mounting torque 30-50Nm
- Remove the drive gear fixing nut 2;
- Mounting torque 40-60Nm
- Note: The nut is left-handed and the gasket convex is outward oriented;
- Remove Clutch small Hub 3
- Demolition of clutch Large hub 4
- Remove the clutch top bar



- Remove the gas distribution chain tightening guide rail 1,
- Remove the gas distribution chain 2,
- Remove the machine oil pump drive inert wheel
- Remove the variable shaft 4;
- Note: The installation is assembled in the opposite order, This location is gap position.



- Remove 3 bolts from the pump and remove the oil pump 1
- Remove the variable camshaft bezel 2 bolts and remove the bezel 2
- Remove the variable camshaft holder 2 bolts and remove the cage 3



- Remove two gear shift fork for the variable camshaft
- NOTE: Pin shaft and spring;



- Gear shift fork.



- Remove 12 box fixing bolts on the left side of the engine.
- Note: Diagonal disassembly;
- Assembly torque M8 Bolt 18-28Nm;
- Assembly torque M6 Bolt 8-12Nm;



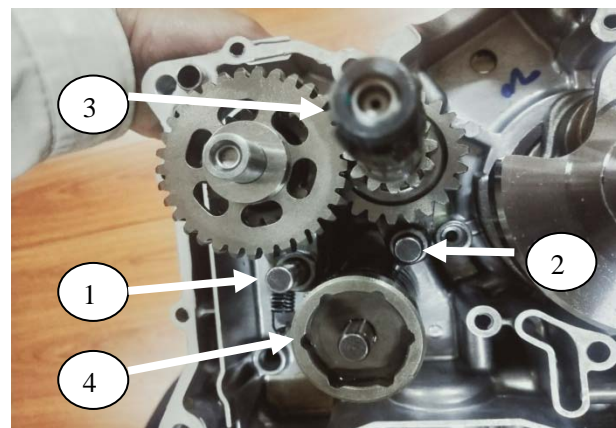
- Separation of Engine crankcase: Installation of special tools (crankcase separators) on the side of the right clutch. With crankshaft as the center, three key points are found, the separator is installed, and the center bolt of the separator is rotated to separate the box.
- Note Only the right box can be separated.



- Remove the right crankcase comp.



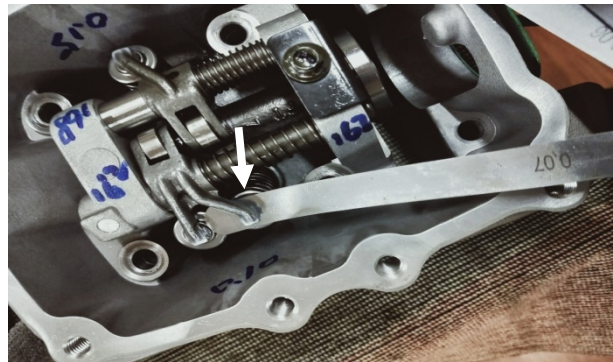
- Remove the gear shift fork shaft, remove gear shift fork 1.
- Remove the gear shift fork shaft and remove gear shift fork 2
- To remove the main and pay shafts together two sets of gears 3;
- Remove the camshaft limit spring hook and remove the camshaft 4;



- Remove the crankshaft assembly 1,
- Remove the oil pump pin shaft 2.



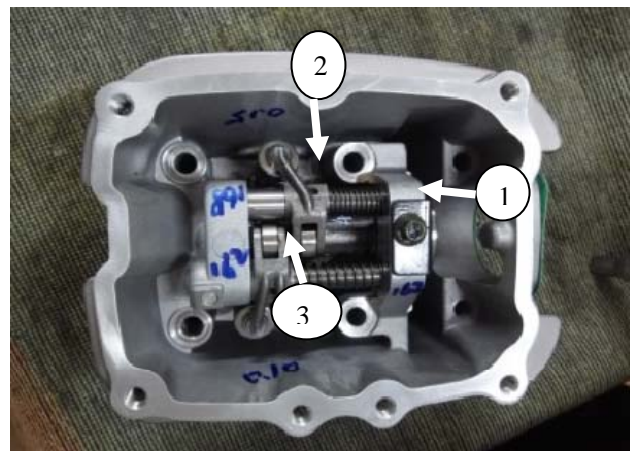
- Cylinder head combination decomposition;
- Intake valve clearance (When cold):
0.1~0.2mm



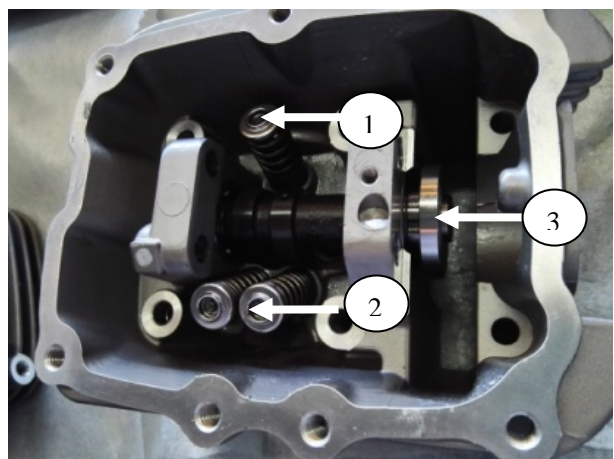
- Exhaust valve clearance (When cold):
0.2~0.3mm



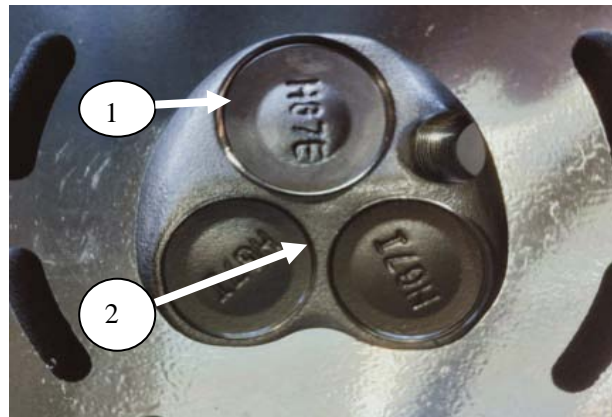
- Remove the camshaft limit plate 1;
- Remove the exhaust valve spring, intake valve arm, bushing 2;
- Remove the exhaust valve spring, exhaust valve arm 3



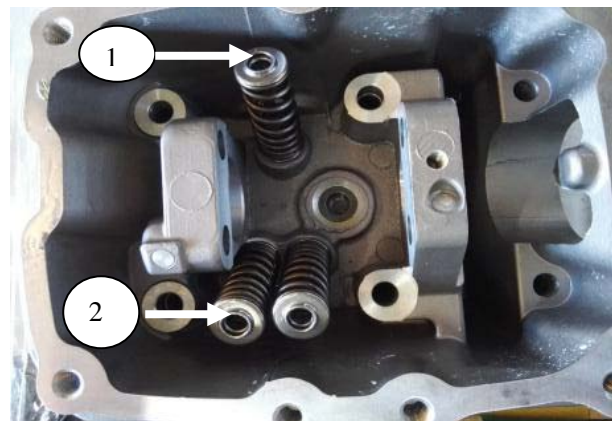
- Remove the exhaust valve gasket 1;
- Remove 2 Intake valve gasket 2;
- Remove Camshaft 3;



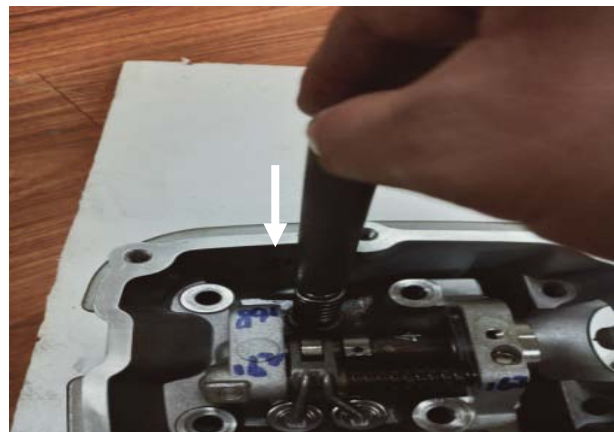
- See if the valve room is carbon-accumulating.
- 1 Exhaust valve, slightly larger in diameter,
- 2 Intake valve, slightly smaller in diameter.



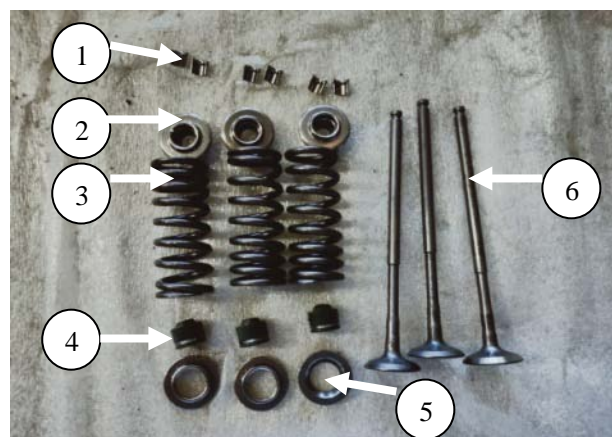
- Exhaust valve Installation combination 1
- Intake valve Installation combination 2



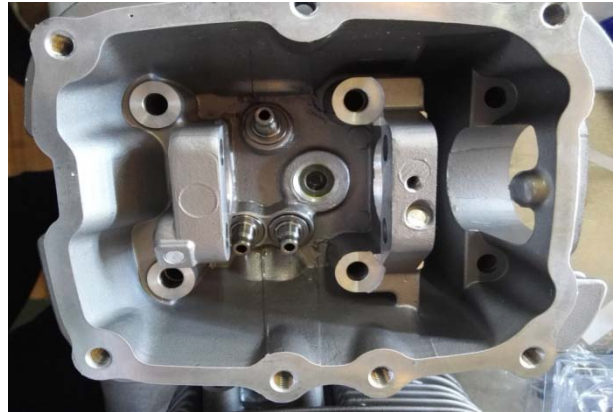
- Pressurized gas door lock disassembly device, remove the lock plate, remove the valve base, valve oil seal;



- Valve lock plate 1
- Valve lower seat 2
- Valve spring 3
- Valve oil seal 4
- Valve seat 5
- Valve 6



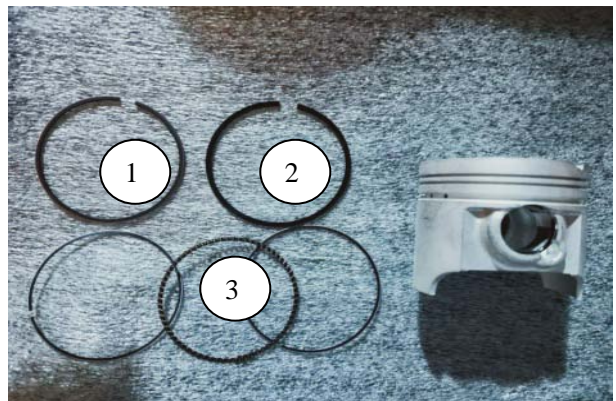
- Cylinder head;



- When the piston ring is installed, 3 ring openings are staggered 120° respectively;
- Note that the two gas ring marks the top notch of the upper piston at the time of installation corresponds to the valve chamber.



- Note When replacing:
- A gas ring chrome plating 1;
- Two air ring Black 2;
- Three oil ring combination up and down a scraper ring, the middle is a spring-like oil storage ring 3;



- Engine assembly Considerations:
- Reverse operation in the above order;
- The disassembled engine must be cleaned clean;
- When the left and right box is merged, apply the sealant evenly and the fixing bolt diagonally according to the torque requirement to lock;
- When installing the piston, apply lubricating oil;
- The mounting cylinder head must be aligned with the timing mark, the requirement corresponds to the magnetic motor mark, the fixed bolt diagonally according to the torque requirements locking, the valve clearance must be within the specified value;
- Clutch large hub, magnetic motor rotor, small sprocket according to the torque requirements of the lock;
- Engine using oil model SAE10W-40, oil volume 1100ml;
- Water tank filling antifreeze 0.1L, required between the upper and lower scales;
- 0.9L of antifreeze in radiator.

ENGINE COMPONENT INSPECTION AND SERVICE

CAUTION

Be sure to identify each removed part as to its location, and lay the parts out in groups designated as “Front cylinder”, “Rear cylinder”, “Exhaust”, “Intake”, so that each will be restored to the original location during assembly.

● CYLINDER HEAD DISTORTION

Decarbonize in combustion chamber. Check the gasketed surface of the cylinder head for distortion with a straightedge and thickness gauge, taking a clearance reading at several places as indicated. If the largest reading at any position of the straightedge exceeds the limit, replace the cylinder head.

Cylinder head distortion	Service limit
	0.05 mm

 Thickness gauge : 09900-20806

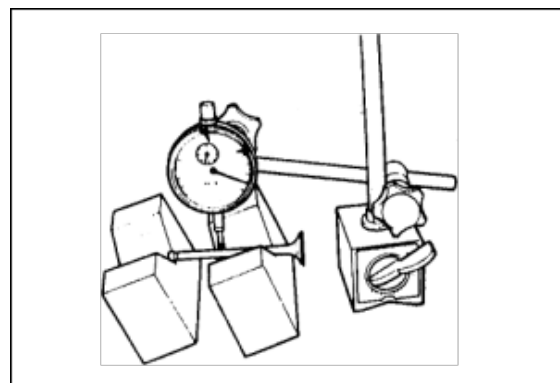
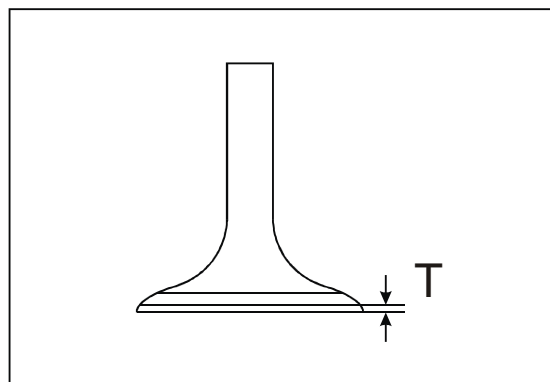
● VALVE FACE WEAR

Visually inspect each valve face for wear. Replace any valve with an abnormally worn face. The thickness of the valve face decreases as the face wears.

Measure the valve head T. If it is out of specification, replace the valve with a new one.

Valve face wear	Service limit
	0.5 mm

 Vernier calipers :



● VALVE STEM RUNOUT

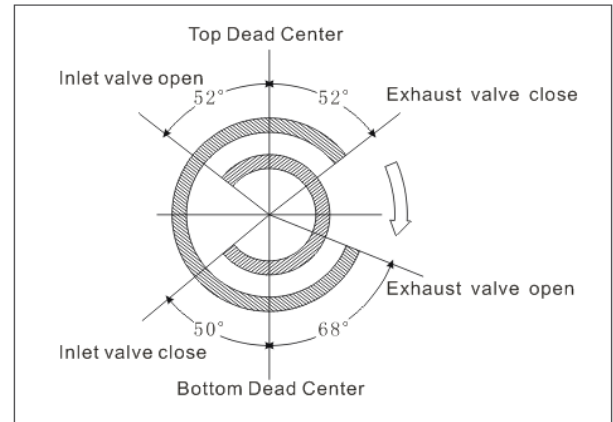
Check the valve stem for abnormal wear or bend. Place the valve on V-blocks and measure runout. If the service limit is exceeded or abnormal condition exists, replace the valve.

Valve stem runout	Service limit
	0.05 mm

 **Dial gauge :**

 **Magnetic stand :**

● **V-block :**



● CAMSHAFT

The camshaft should be checked for runout and also for wear of cams and journals if the engine has been noted to produce abnormal noise or vibration or a lack of output power. Any of these abnormality could be caused by a worn camshaft.


■ CAMSHAFT WEAR

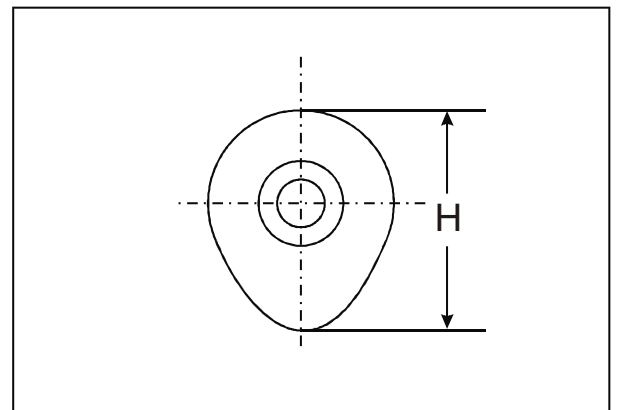
Worn-down cams are often the cause of mistimed valve operation resulting in reduced output power.

The limit of cam wear is specified for both intake and exhaust cams in terms of cam height H , which is to be measured with a micrometer.

Replace camshafts if found it worn down to the limit.

Cam height H	Service limit
Intake cam	34.170 mm
Exhaust cam	34.120 mm

 **Micrometer(25~50 mm) : 09900-20202**



◎ Valve rocker arm

If the engine produces abnormal noise or vibration or the output power decreases, the valve rocker arm should be checked, and any of these anomalies may be caused by the worn valve arm.

Exhaust valve 1

Inlet valve 2



◎ Tappet & shimwear

When measuring the valve clearance, the clearance should be within the standard range.

Valve clearance	Standard(When cold)
Intake valve	0.1~0.2mm
Exhaust valve	0.2~0.3mm



- Inspect the tappet for wear and scratch.

If modification or scratch is present, replace the tap pet.

- The shim has various size.

Replace the thin shim to valve clearance is narrow, or the thick shim to valve clearance is wide as that shim thickness was installed with standard at present.

■ SHIM KIND

There are 41 kinds of shim which thickness is increased by each 0.025 mm from 1.20 mm to 2.20 mm.



◎ VALVE HEAD RADIAL RUNOUT

Place a dial gauge as shown and measure valve head radial runout.

If the service limit is exceeded, replace the valve.

**Valve head radial
runout**

Service limit

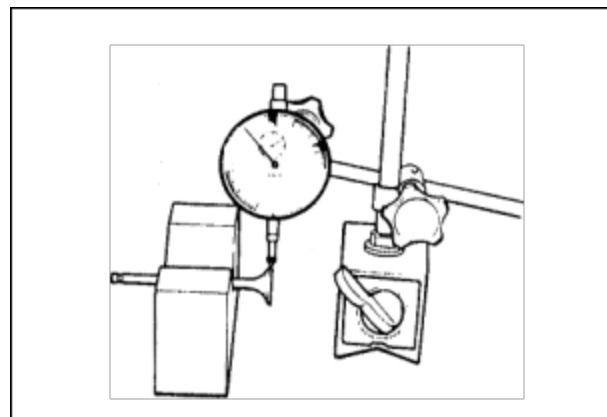
0.03 mm



Dial gauge : 09900-20606

Magnetic stand : 09900-20701

V-block : 09900-21304



◎ **VALVE GUIDE-VALVE STEM CLEAR-
ANCE**

Measure the clearance in the valve guide-valve stem, by rigging up the dial gauge as shown. If the clearance is measured exceeds the limit specified below, then deter- mine whether the valve or the guide should be replaced to reduce the clearance to within the standard range:

Valve guide-valve stem clearance	Standard
IN.	0.010~0.037 mm
EX.	0.030~0.057 mm



Dial gauge : 09900-20606

Magnetic stand : 09900-20701

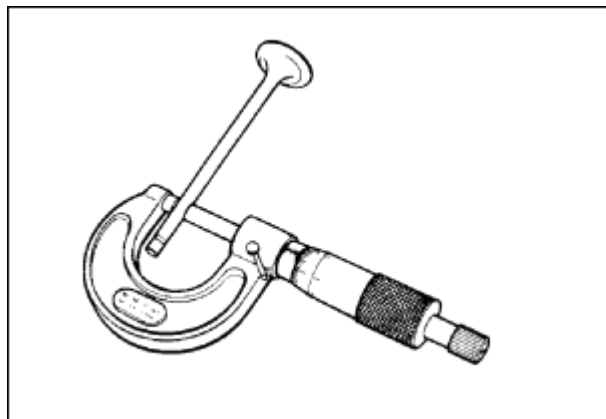
◎ **VALVE STEM DIAMETER**

Measure the valve stem outside diameter. If the diameter measured exceeds the standard, replace the valve.

Valve stem diameter	Standard
IN.	—
EX.	—



Micrometer(0~25 mm) : 09900-20201



◎ **VALVE SPRING**

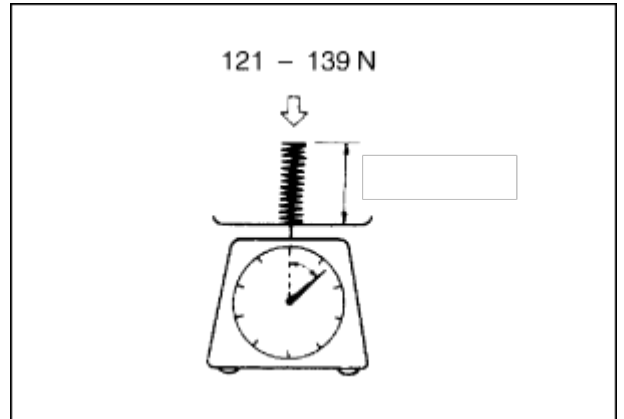
The force of the coil spring keeps the valve seat tight. A weakened spring results in reduced engine power out- put and often accounts for the chattering noise coming from the valve mechanism.

Check the valve springs for proper strength by measuring their free length and also by the force required to compress them. If the spring length is less than the ser- vice limit or if the force required to compress the spring does not fall within the specified range, replace both the inner and outer springs as a set.

Valve spring free length(IN. & EX.)	Service limit
	—

 **Venier calipers : 09900-20101**

Valve spring tension (IN. & EX.)	Standard
	12.1~13.9kgf (at length 33.7mm)



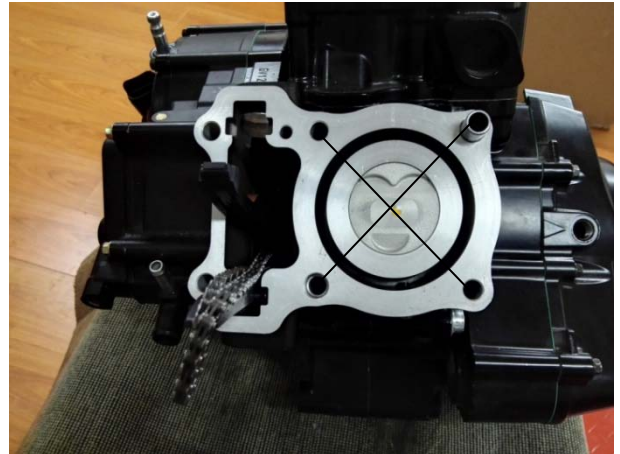
◎ CYLINDER DISTORTION

Check the gasketed surface of the cylinder for distortion with a straightedge and thickness gauge, taking a clearance reading at several places as indicated. If the largest reading at any position of the straightedge exceeds the limit, replace the cylinder.

Cylinder distortion	Service limit
	0.05 mm



Thickness gauge : 09900-20806



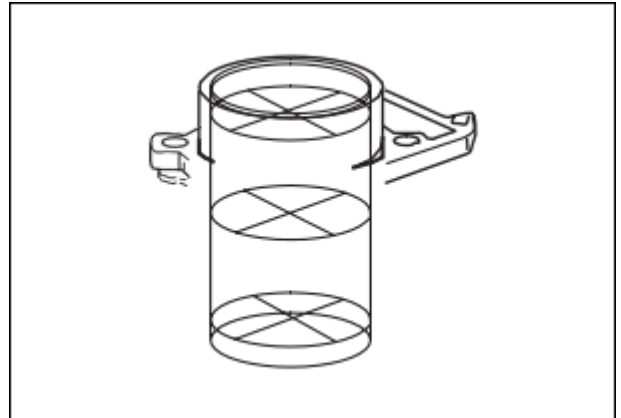
◎ CYLINDER BORE

Measure the cylinder bore diameter at six place. If any one of the measurements exceeds the limit, overhaul the cylinder and replace the piston with an oversize, or replace the cylinder.

Cylinder bore	Standard	Service limit
	57.000~57.015 mm	57.080 mm



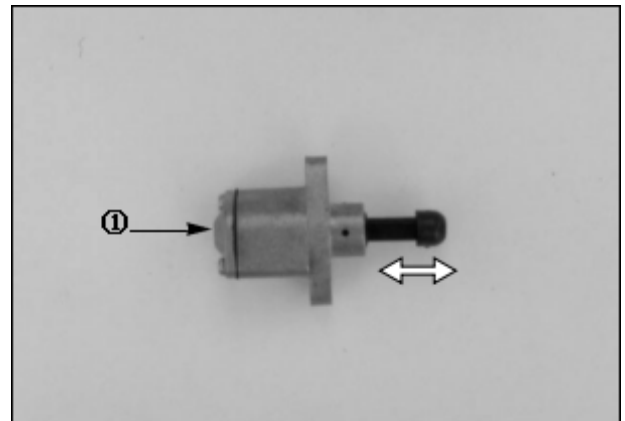
Cylinder gauge set : 09900-20508



◎ CAM CHAIN TENSION ADJUSTER

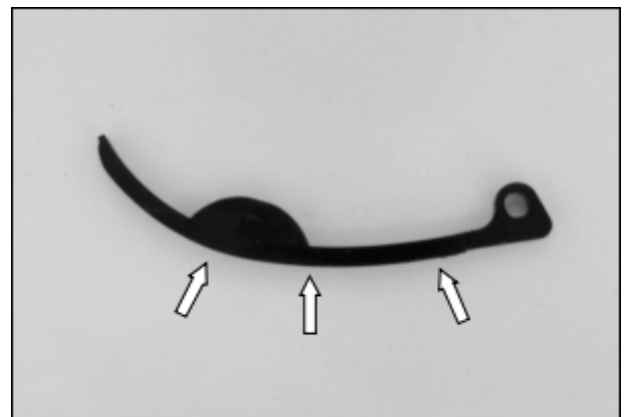
Check that the push rod slides smoothly with the lock shaft handle ① clockwise (↻).

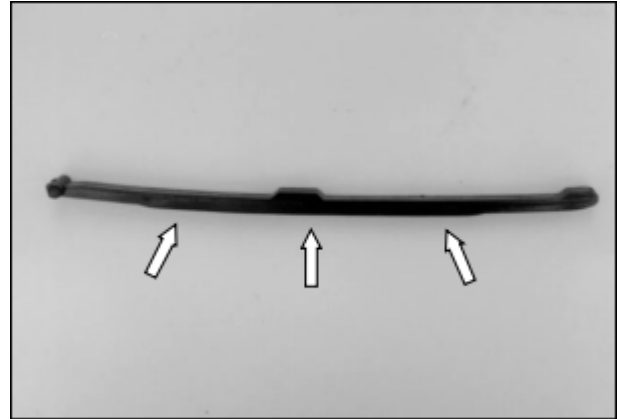
If it does not slide smoothly, replace the cam chain tension adjuster with a new one.



◎ CAM CHAIN TENSIONER

Check the contacting surface of the cam chain tensioner. If it is worn or damaged, replace it with a new one.





◎ CAM CHAIN AND CAM CHAIN GUIDE

Check the cam chain for wear, damage and kinked or binding links. If any defects are found, replace it with a new one.

Check the cam chain guide for wear and damage. If it is found to be damaged, replace it with a new one.




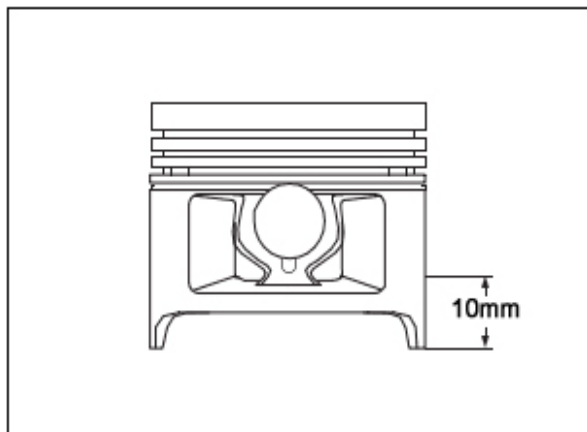
◎ PISTON DIAMETER INSPECTION

Measure the outside diameter of piston in the direction perpendicular to the piston pin axis at the height from the skirt as shown in the illustration using a micrometer.

If the measurement is found less than the service limit, replace the piston.

Piston diameter	Service limit
	56.880 mm

 **Micrometer(50~75 mm) : 09900-20203**

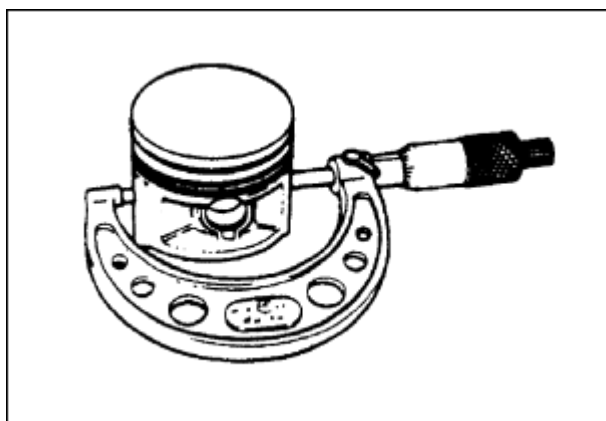


Piston oversize	0.5, 1.0 mm
------------------------	-------------

◎ PISTON-TO-CYLINDER CLEARANCE

To determine the piston-to-cylinder clearance, calculate the difference between the cylinder bore and outside diameter of the piston.

Piston-to-cylinder clearance	Standard	Service limit
	0.050~0.060 mm	0.120 mm



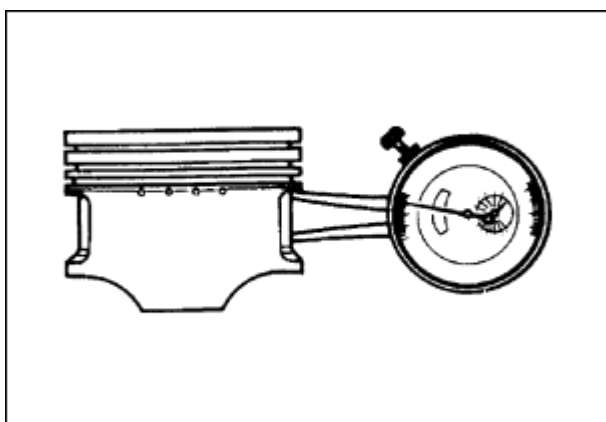
◎ PISTON PIN HOLE BORE

Using a dial calipers, measure the piston pin hole bore both in the vertical and horizontal directions.

If the measurement exceeds the service limit, replace the piston.

Piston pin hole bore	Service limit
	15.030 mm


 **Dial calipers : 09900-20605**

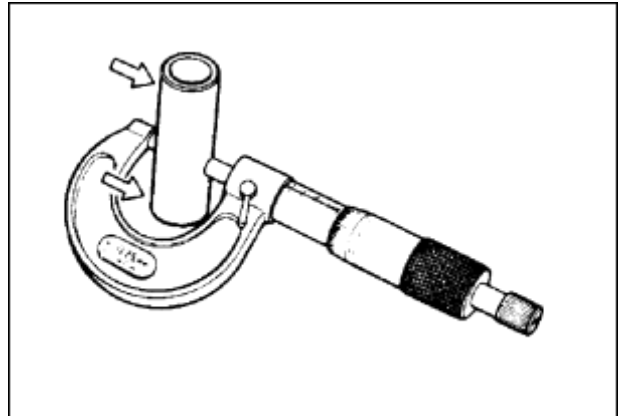


◎ **PISTON PIN DIAMETER INSPECTION**

Using a micrometer, measure the piston pin outside diameter at three position, both the ends and the center. If any of the measurements is found less than the service limit, replace the pin.

Piston pin diameter	Service limit
	14.980 mm

 **Micrometer(0~25 mm) : 09900-20201**

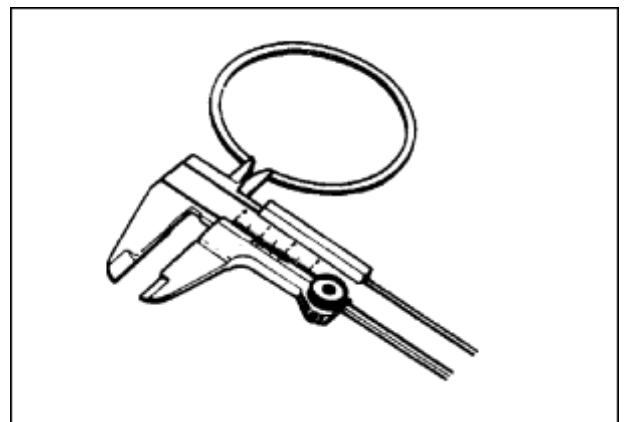


◎ **PISTON RING FREE END GAP INSPECTION**

Before installing piston rings, measure the free end gap of each ring using vernier calipers. If the gap is less than the service limit, replace the ring.

Piston ring free end gap	Standard
1st	7.2 mm
2nd	5.8 mm

 **Vernier calipers : 09900-20101**



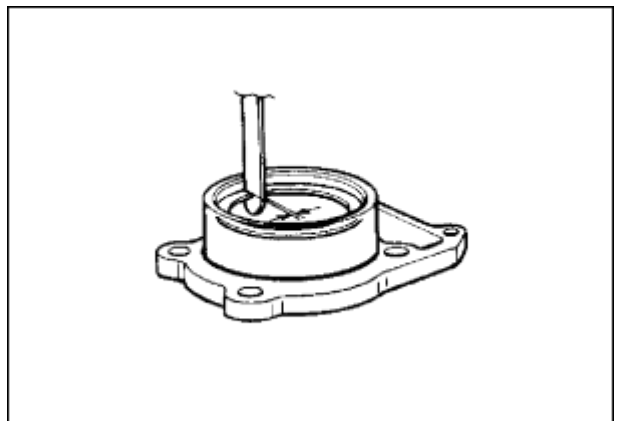
◎ **PISTON RING END GAP INSPECTION**

Insert the piston ring squarely into the cylinder using the piston head.

Measure the end gap with a thickness gauge. If the gap exceeds the service limit, replace the piston ring.

Piston ring end gap(Assembly condition)	Standard	Service limit
1st	0.20~0.32mm	0.5 mm
2nd	0.20~0.32 mm	0.5 mm

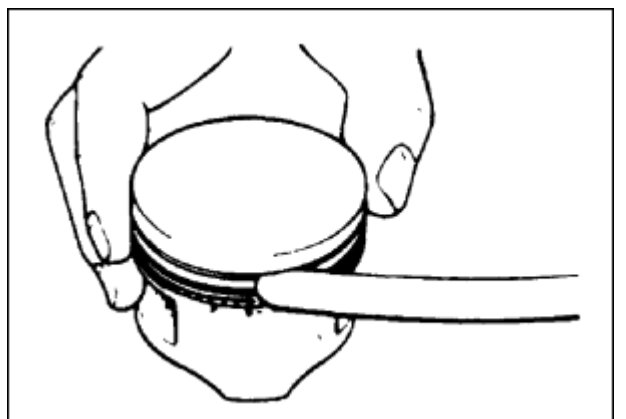
 **Thickness gauge : 09900-20806**



◎ **PISTON RING-TO-GROOVE CLEARANCE INSPECTION**

Remove carbon deposit both from the piston ring and its groove.

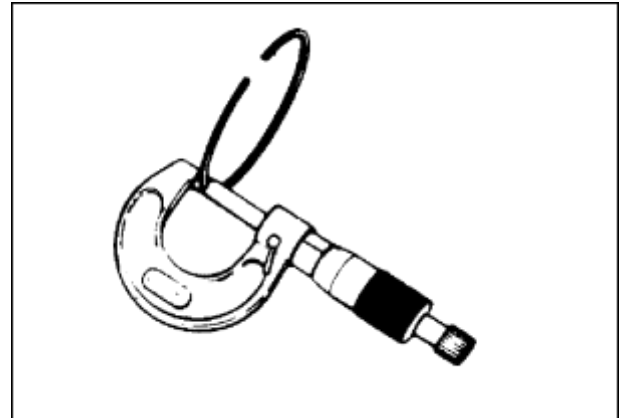
Fit the piston ring into the groove. With the ring compressed and lifted up, measure the clearance on the bottom side of the ring using a thickness gauge.




Piston ring-groove clearance	Service limit
1st	0.180 mm
2nd	0.150 mm

Piston ring-groove width	Standard
1st	1.01~1.03 mm
2nd	1.01~1.03 mm
Oil	2.01~2.03 mm

Piston ring thickness	Standard
1st	0.970~0.990 mm
2nd	0.970~0.990 mm

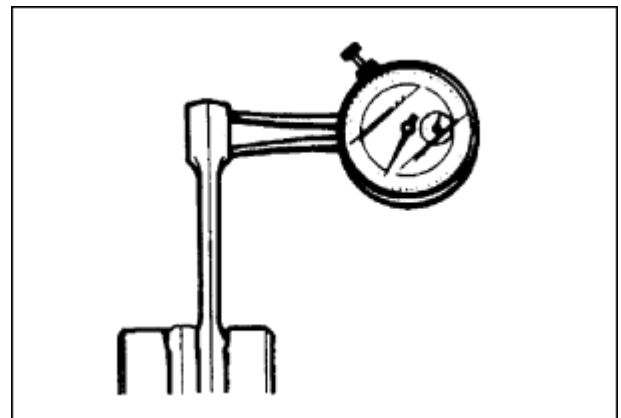


 Thickness gauge : 09900-20806
Micrometer(0~25 mm) : 09900-20201

■ **Oversize oil ring**

The following two types of oversize oil ring are used. They bear the following identification marks.

Oversize oil ring	Color classification
0.5 mm	Painted red
1.0 mm	Painted yellow

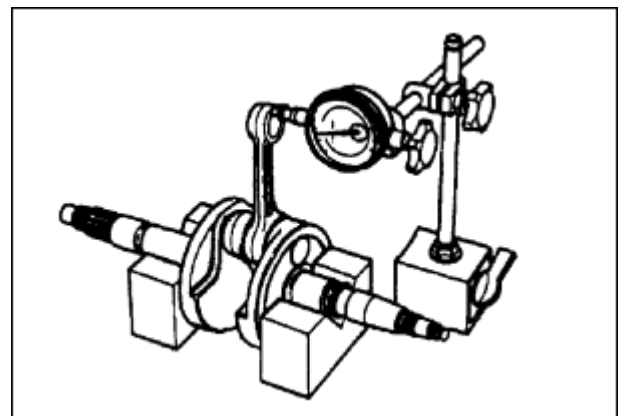


◎ **CONROD SMALL END INSIDE DIAMETER INSPECTION**

Using a dial calipers, measure the conrod small end inside diameter both in vertical and horizontal directions. If any of the measurements exceeds the service limit, replace the conrod.

Conrod small end inside diameter	Standard	Service limit
	13.006~13.014 mm	13.040 mm

 Dial calipers : 09900-20605

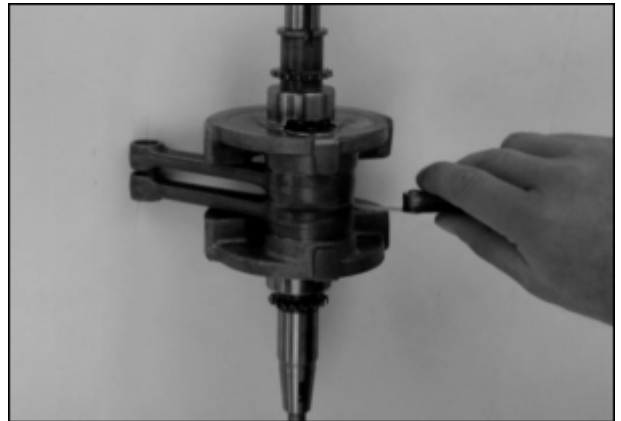


◎ **CONROD BIG END SIDE CLEARANCE INSPECTION**

Using a thickness gauge, measure the side clearance at the conrod big end. If the measurement is out of standard value, measure the conrod big end and the crank pin widths individually to determine which one is to be replaced.

Conrod big end side clearance	Standard	Service limit
	0.40~0.85 mm	1.0 mm


 **Thickness gauge : 09900-20806**

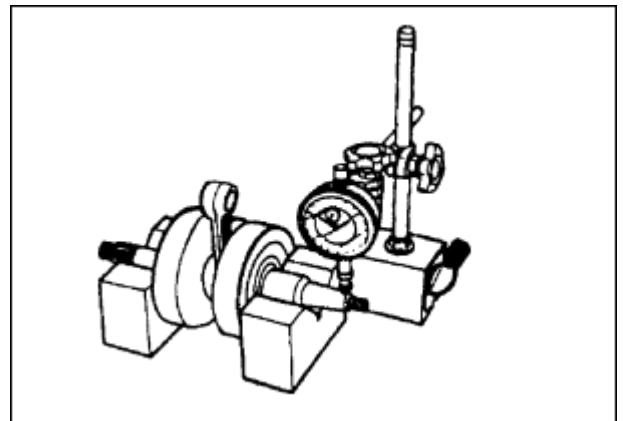


◎ **CRANKSHAFT RUNOUT INSPECTION**

With the right and left crank journals supported with V-block, turn the crankshaft slowly. At this time, measure the crankshaft end runout using a dial gauge. If the runout exceeds the service limit, replace the crankshaft.

Crankshaft runout	Service limit
	0.05 mm

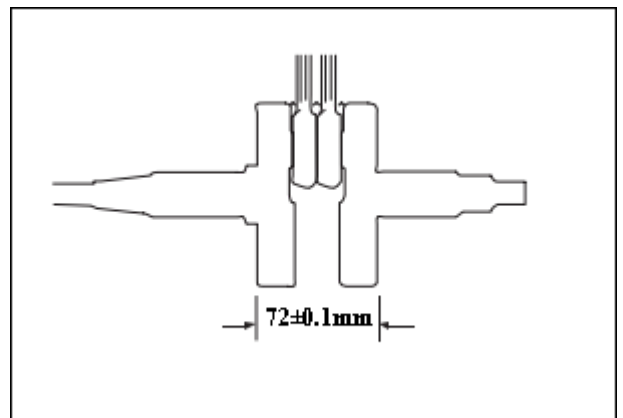
 **Magnetic stand :**
09900-20701 Dial gauge :
09900-20606
V-block : 09900-21304



◎ **CRANKSHAFT REASSEMBLY**

Measure the width between the webs referring to the figure below when rebuilding the crankshaft.

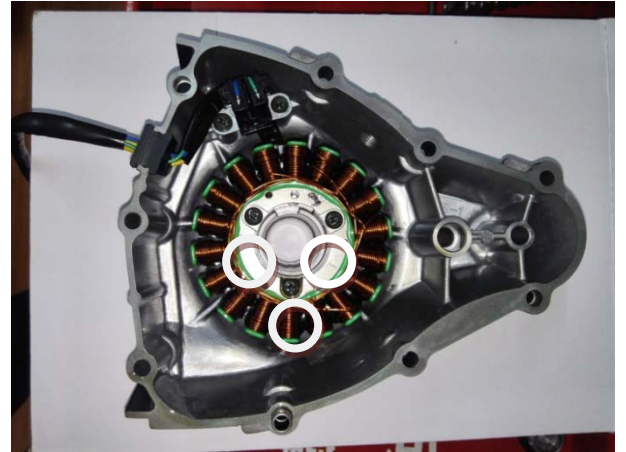
Width between webs	Standard
	72±0.1 mm



◎ MAGNETO COVER

- MAGNETO INSPECTION(Refer to page5-4)
- DISASSEMBLY

- Remove the stator.



◎ STARTER CLUTCH

Install the starter driven gear onto the starter clutch and turn the starter driven gear by hand(the gear turns in only one direction). The starter driven gear should turn smoothly. If excessive resistance is felt while turning the starter driven gear, inspect the starter clutch. Also, inspect the surface of the starter driven gear which contacts the starter clutch, for wear or damage. If any wear or damage is found, replace the defective part(-s).



■ DISASSEMBLY

- Hold the magneto rotor with the rotor holder and

remove the starter clutch bolts.



Rotor holder : 09930-44510



■ REASSEMBLY

- Apply a small quantity of THREAD LOCK “1324” to the starter clutch bolts and tighten them to the specified torque while holding the rotor holder.



Thread Lock “1324”



Rotor holder : 09930-44510



Starter clutch bolt

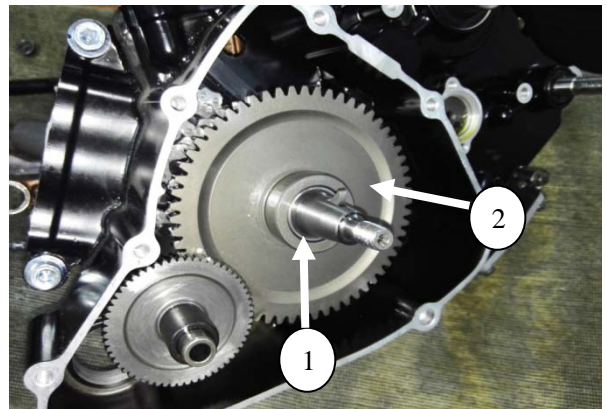
23~28 N·m(2.3~2.8 kg·m)



◎ STARTER DRIVEN GEAR

■ STARTER DRIVEN GEAR BUSHING

Install the starter driven gear bushing ① and gear ② onto the crankshaft and turn the starter driven gear by hand. Inspect the starter driven gear bushing for smooth rotation and any abnormal noise. If the bushing does not turn smoothly or there is any abnormal noise, replace it.



- Electric starting motor idler wheel assembly

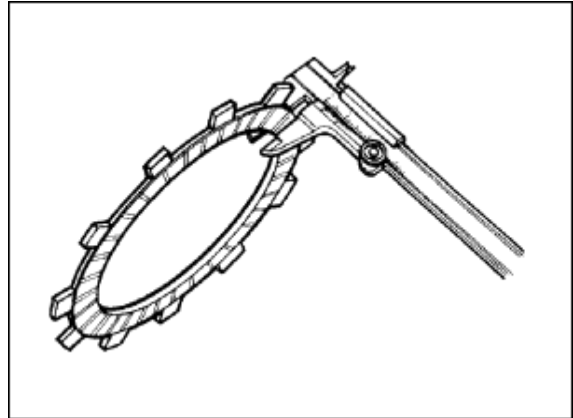


◎ **CLUTCH DRIVE PLATES**

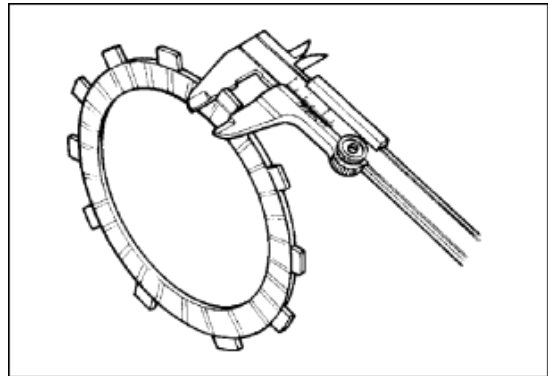
Measure the thickness and claw width of the clutch drive plates using vernier calipers. If a clutch drive plate is not within the service limit, replace the clutch plates as a set.

Clutch drive plate thickness	Standard	Service limit
	2.9~3.1 mm	2.6 mm

 Vernier calipers : 09900-20101



Clutch drive plate claw width	Standard	Service limit
	11.8~12.0 mm	11.0 mm

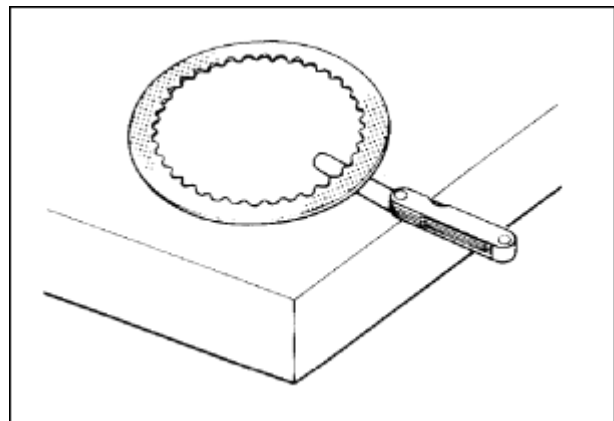


◎ **CLUTCH DRIVEN PLATES**

Measure each clutch driven plates for distortion using the thickness gauge. If a clutch driven plate is not within the service limit, replace the clutch plates as a set.

Clutch driven plate distortion	Service limit
	0.1 mm

 Thickness gauge : 09900-20806



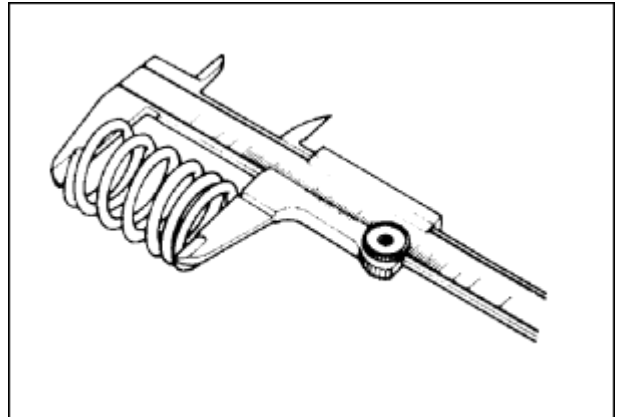
◎ CLUTCH SPRING FREE LENGTH

Measure the free length of each clutch spring using vernier calipers. If any spring is not within the service limit, replace all of the spring.

Clutch spring free length	Service limit
	29.5mm



Vernier calipers : 09900-20101



◎ CLUTCH RELEASE BEARING

Inspect the clutch release bearing for any abnormality, especially cracks. When removing the bearing from the clutch, decide whether it can be reused or if it should be replaced.

Smooth engagement and disengagement of the clutch depends on the condition of this bearing.



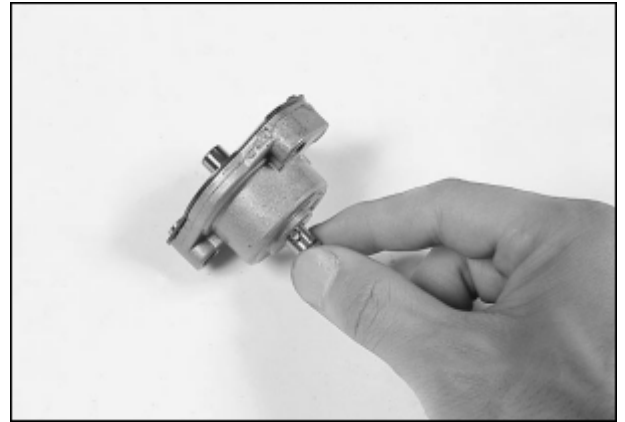
◎ PRIMARY DRIVEN GEAR

Inspect the primary driven gear bearing for any damage. If any abnormal condition are found, replace the primary driven gear.



◎ OIL PUMP

Turn the oil pump shaft and check that rotation is smooth. If any abnormal condition is found, replace the oil pump with new one.



◎ GEARSHIFT SHAFT

Disassemble and reassemble the gearshift shaft as shown in right picture.



◎ TRANSMISSION

■ INSPECTION

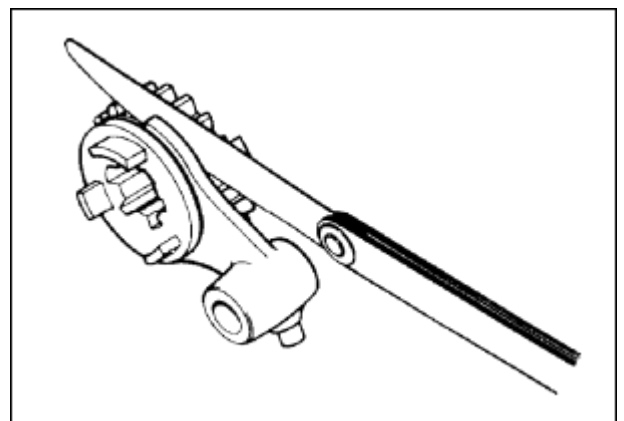
★ GEAR-SHIFTING FORK

Using a thickness gauge, check the clearance between in the groove of its gear and shifting fork.

The clearance for each of the three shifting forks plays an important role in the smoothness and positiveness of shifting action.

If the clearance checked is noted to exceed the limit specified, replace the fork or its gear, or both.

Shift fork-groove clearance	Standard	Service limit
	0.10~0.30 mm	0.5 mm

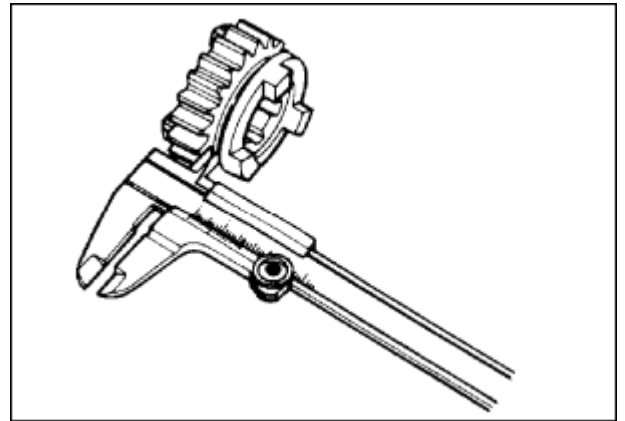




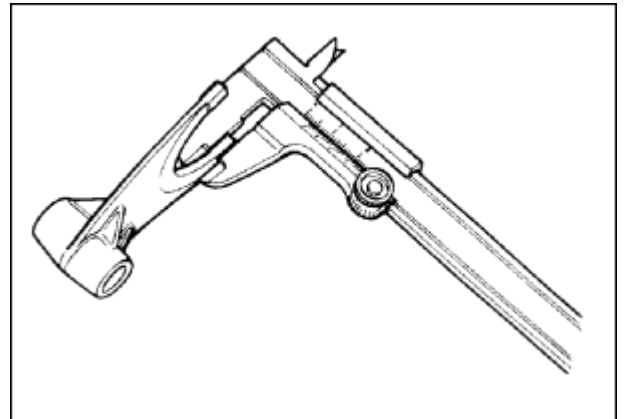
Thickness gauge : 09900-20806

Vernier calipers : 09900-20101

Shift fork groove width	Standard
NO.1 & NO.2	5.0~5.1 mm
NO.3	5.5~5.6 mm



Shift fork thickness	Standard
NO.1 & NO.2	4.8~4.9 mm
NO.3	5.3~5.4 mm

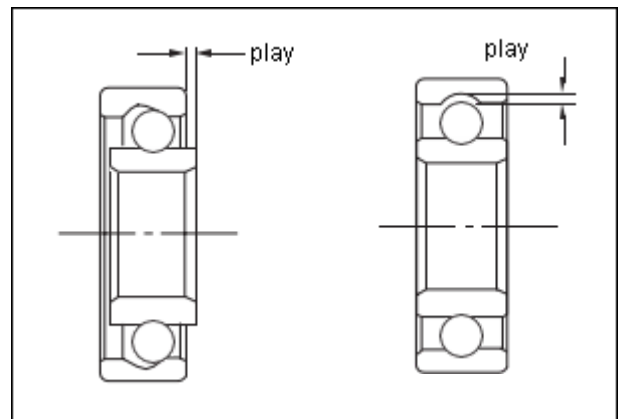


◎ CRANKCASE

■ BEARING INSPECTION

Rotate the bearing inner race by finger to inspect for abnormal play, noise and smooth rotation while the bearings are in the crankcase.

Replace the bearing in the following procedure if there is anything unusual.




■ DISASSEMBLY

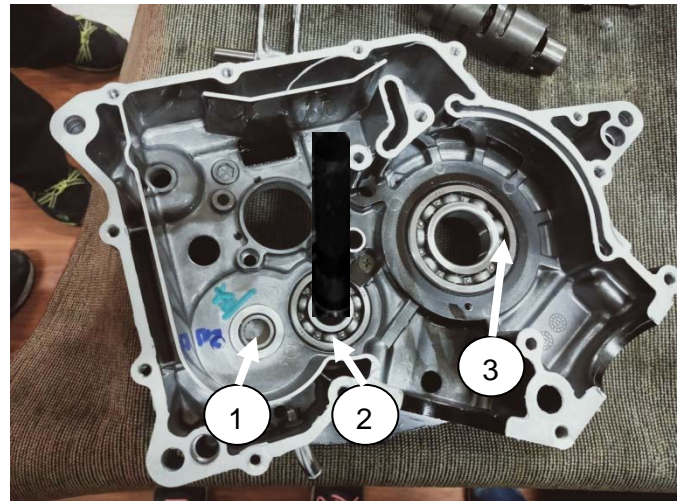
★ RIGHT CRANKCASE BEARING

- Remove the bearing retainer.



- Remove the bearings ① and ②.

 Bearing remover(17 mm) : 09923-73210
Bearing remover(20~35 mm) : 09923-74510



 Bearing installer : 09913-76010

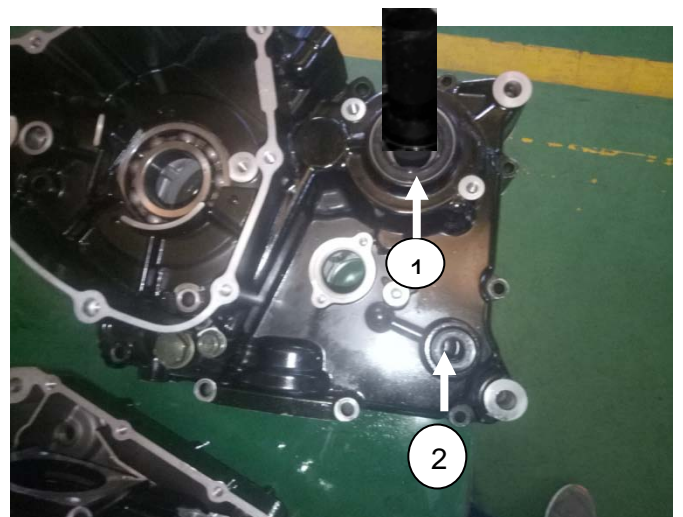
 CAUTION

The removed bearing should be replaced with a new one.

★ LEFT CRANKCASE BEARING

- Remove the oil seals 1 and 2.

 Oil seal remover : 09913-50121



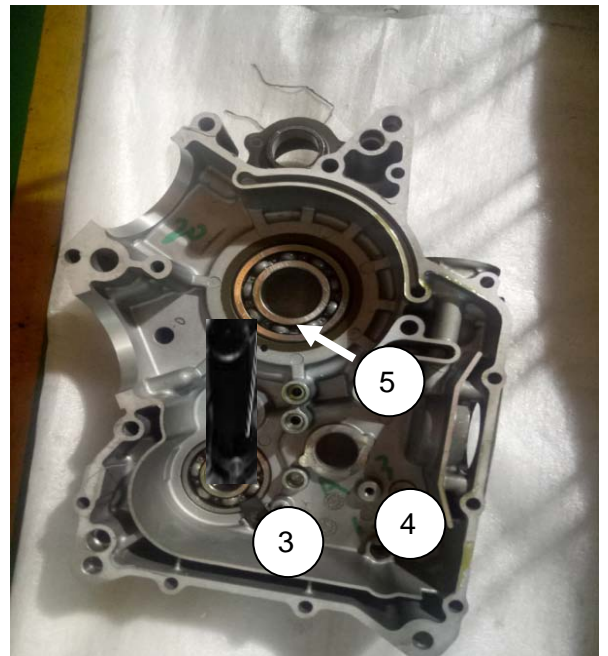
- Remove the bearing retainer.



- Remove the bearings 3, 4 and 5.



Bearing remover(17 mm) : 09923-73210
Bearing remover(20~35 mm) : 09923-74510



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PRECAUTIONS IN SERVICING

When handling the component parts or servicing the EI system, observe the following points for the safety of the system.

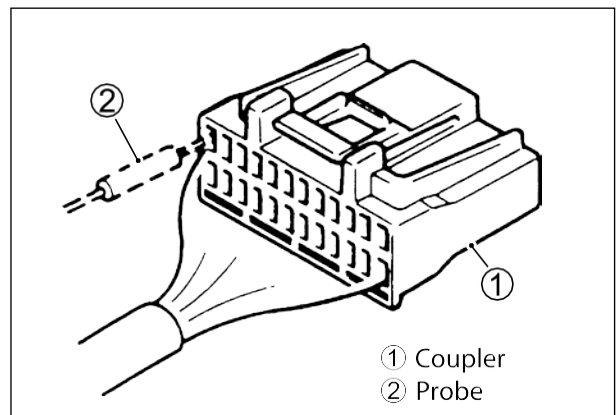
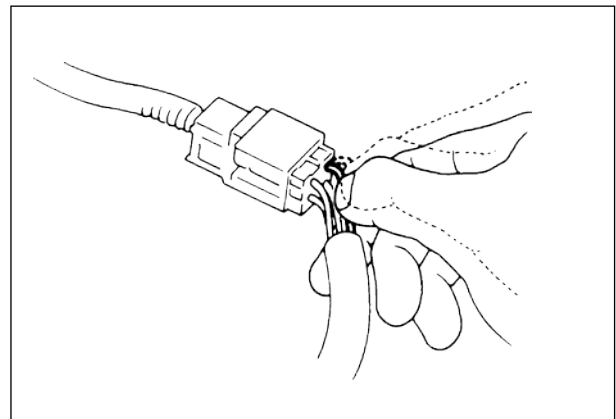
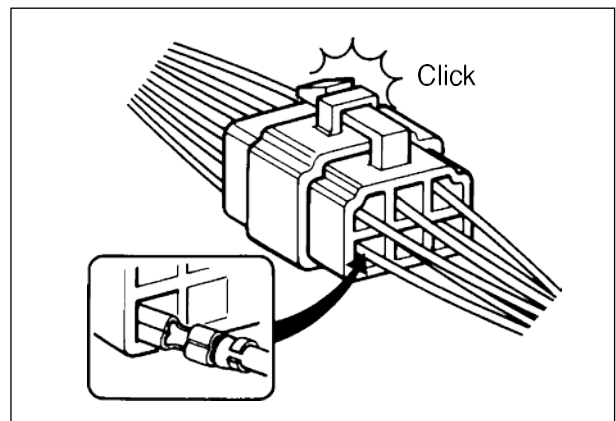
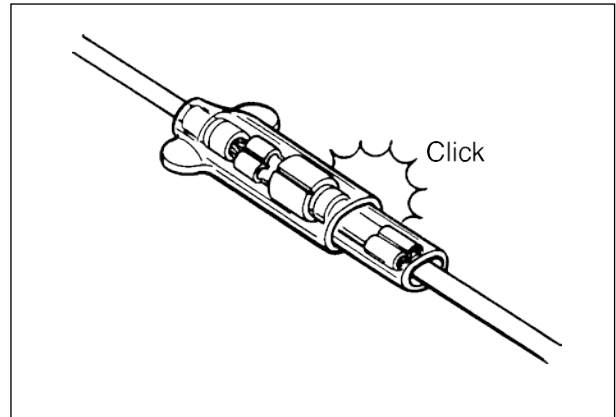
⊙ ELECTRICAL PARTS

▣ CONNECTOR / COUPLER

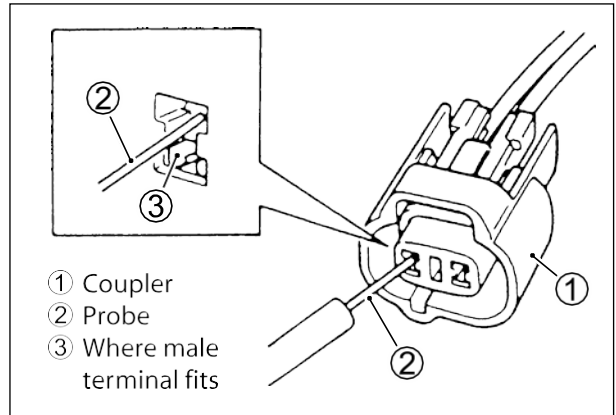
- When connecting a connector, be sure to push it in until a click is felt.
- With a lock type coupler, be sure to release the lock when disconnecting, and push it in fully till the works when connecting it.
- When disconnecting the coupler, be sure to hold the coupler body and do not pull the lead wires.
- Inspect each terminal on the connector / coupler for looseness or bending.
- Inspect each terminal for corrosion and contamination.

The terminals must be clean and free of any foreign material which could impede proper terminal contact.

- Inspect each lead wire circuit for poor connection by shaking it by hand lightly. If any abnormal condition is found, repair or replace.
- When taking measurements at electrical connectors using a tester probe, be sure to insert the probe from the wire harness side (backside) of the connector / coupler.

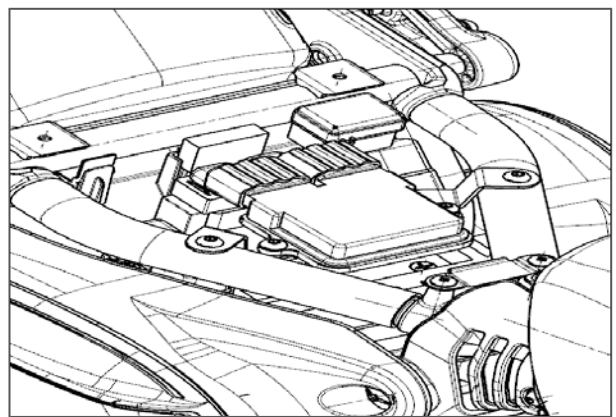


- When connecting meter probe from the terminal side of the coupler (connection from harness side not being possible), use extra care not to force and cause the male terminal to bend or the female terminal to open.
Connect the probe as shown to avoid opening of female terminal.
Never push in the probe where male terminal is supposed to fit.
- Check the male connector for bend and female connector for excessive opening. Also check the coupler for locking (looseness), corrosion, dust, etc.



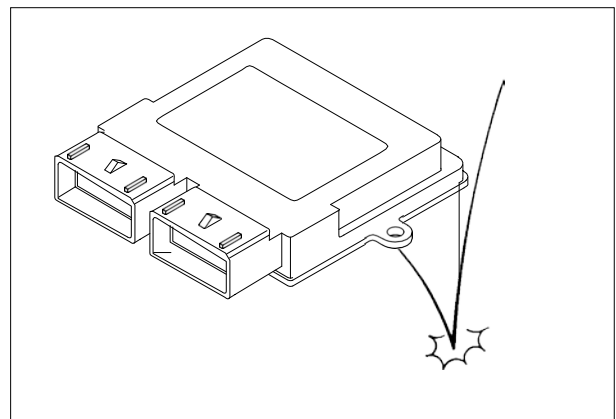
⊙ FUSE

- When a fuse blows, always investigate the cause to correct it and then replace the fuse.
- Do not use a fuse of a different capacity.
- Do not use wire or any other substitute for the fuse.

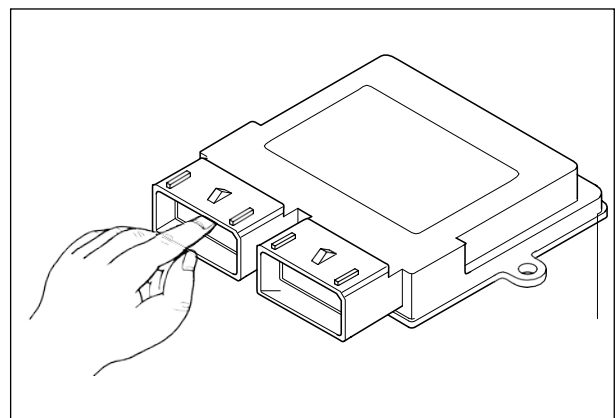


⊙ ECU / VARIOUS SENSORS

- Since each component is a high-precision part, great care should be taken not to apply any sharp impacts during removal and installation.

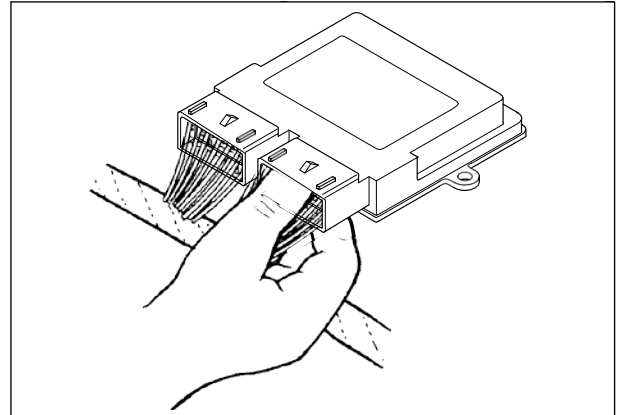


- Be careful not to touch the electrical terminals of the ECU.
The static electricity from your body may damage this part.

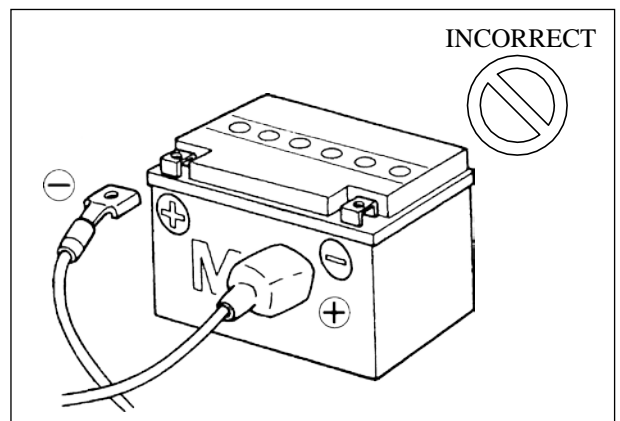


4-3 EI SYSTEM DIAGNOSIS

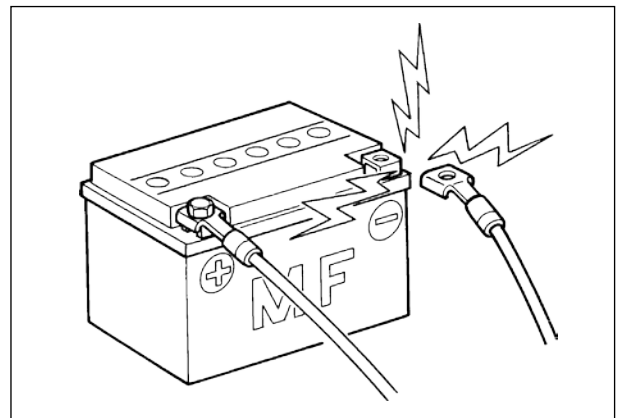
- When disconnecting and connecting the ECU, make sure to turn “OFF” the ignition switch, or electronic parts may get damaged.



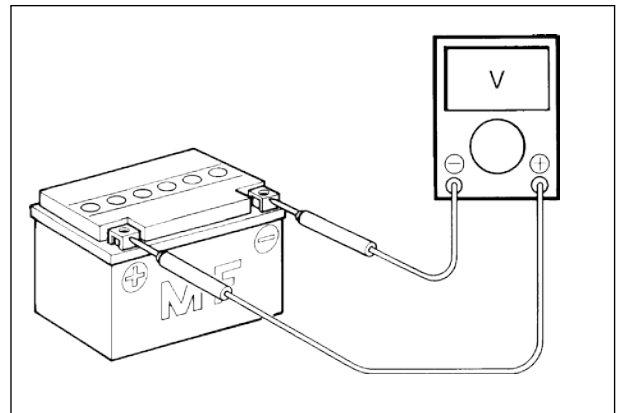
- Battery connection in reverse polarity is strictly prohibited. Such a wrong connection will damage the components of the EI system instantly when reverse power is applied.



- Removing any battery terminal of a running engine is strictly prohibited. The moment such removal is made, damaging counter electromotive force will be applied to the ECU which may result in serious damage.



- Before measuring voltage at each terminal, check to make sure that battery voltage is 11 V or higher. Terminal voltage check at low battery voltage will lead to erroneous diagnosis.



- Never connect an ohmmeter to the ECU with its coupler connected. If attempted, damage to ECU or sensors may result.
- Be sure to use a specified voltmeter / ohmmeter. Otherwise, accurate measurements may not be obtained and personal injury may result.

⊙ USING TESTERS

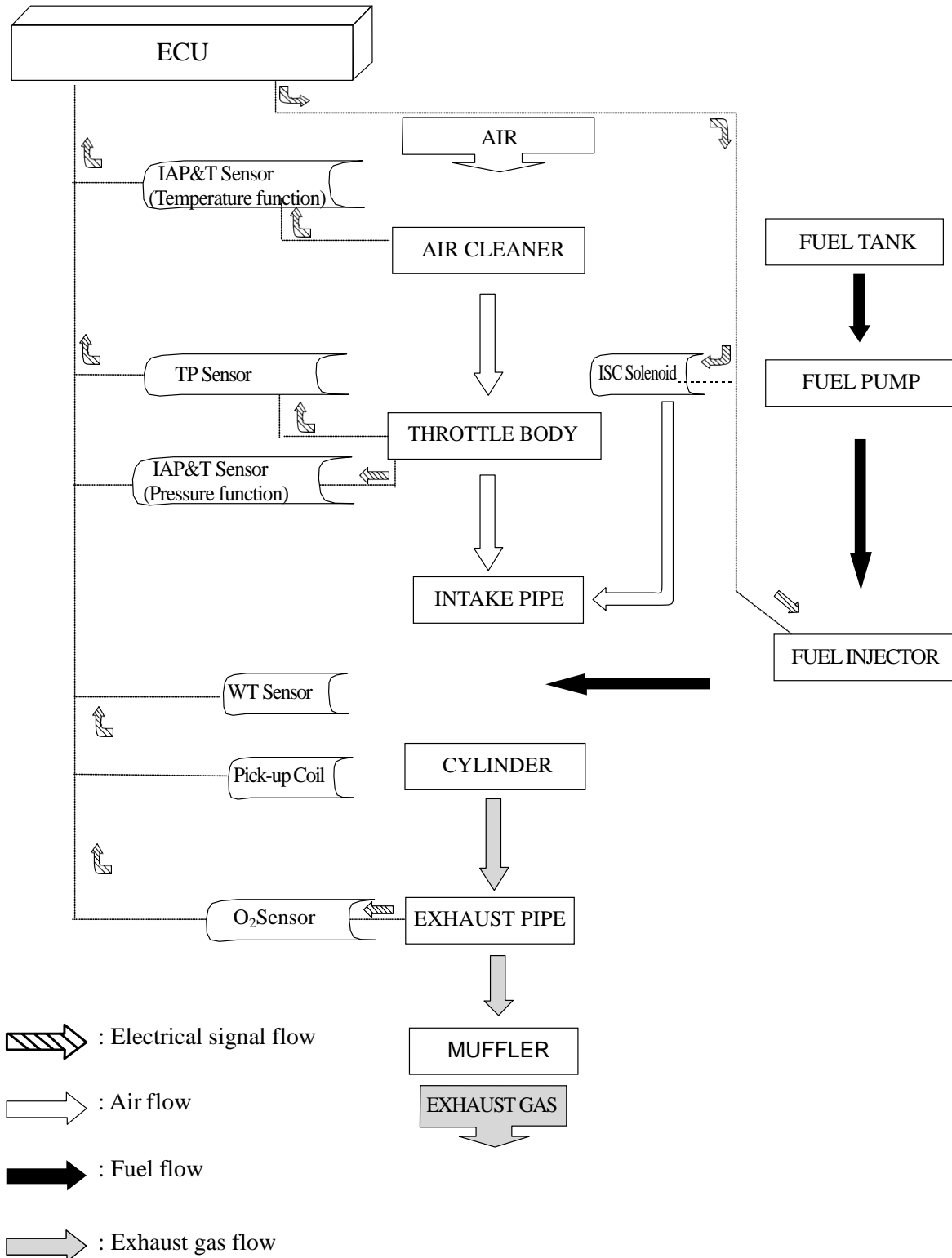
- Use well-charged batteries in the tester.
- Be sure to set the tester to the correct testing range.

▣ USING THE TESTER

- Incorrectly connecting the ⊕ and ⊖ probes may cause the inside of the tester to burnout.
- If the voltage and current are not known, make measurements using the highest range.
- After using the tester, turn the power off.

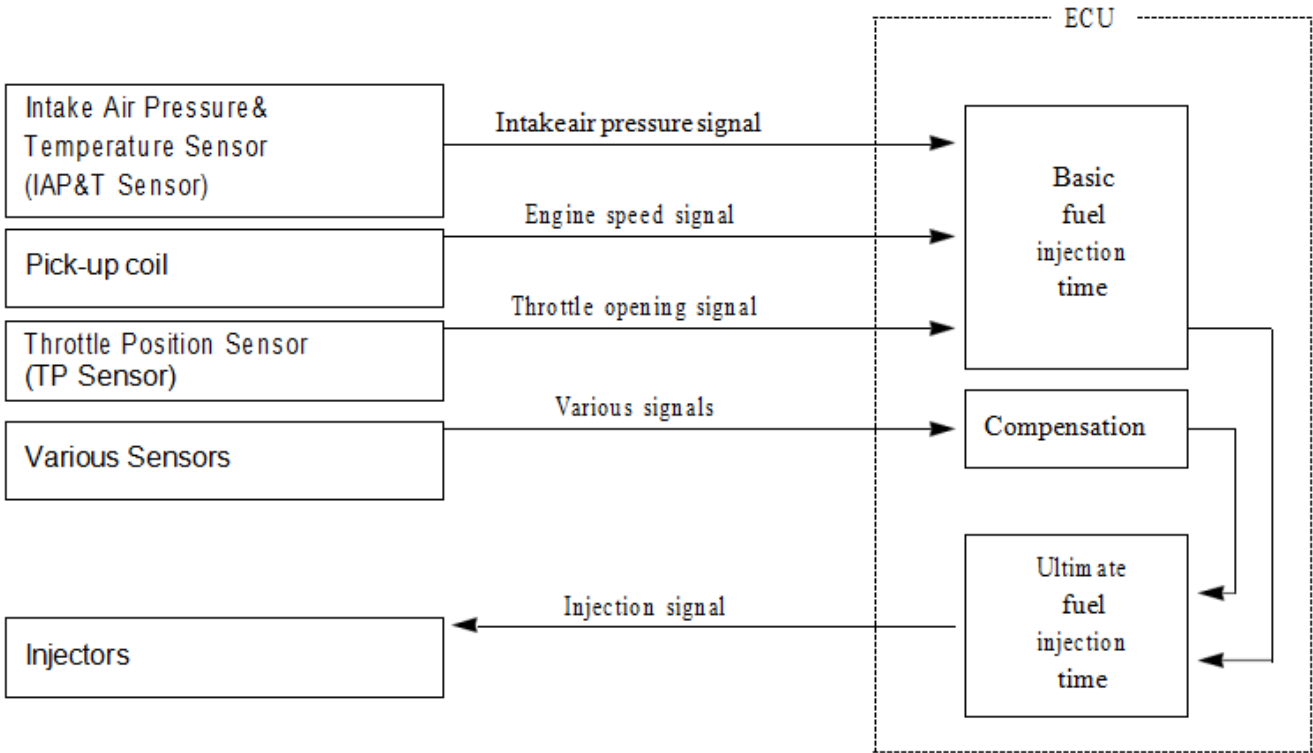
EI SYSTEM TECHNICAL FEATURES

EI SYSTEM'S CONTROL DIAGRAM



⊙ INJECTION TIME (INJECTION VOLUME)

The factors to determine the injection time include the basic fuel injection time, which is calculated on the basis of intake air pressure, engine speed and throttle opening angle, and various compensations. These compensations are determined according to the signals from various sensors that detect the engine and driving conditions.



4-7 EI SYSTEM DIAGNOSIS

⊙ COMPENSATION OF INJECTION TIME (VOLUME)

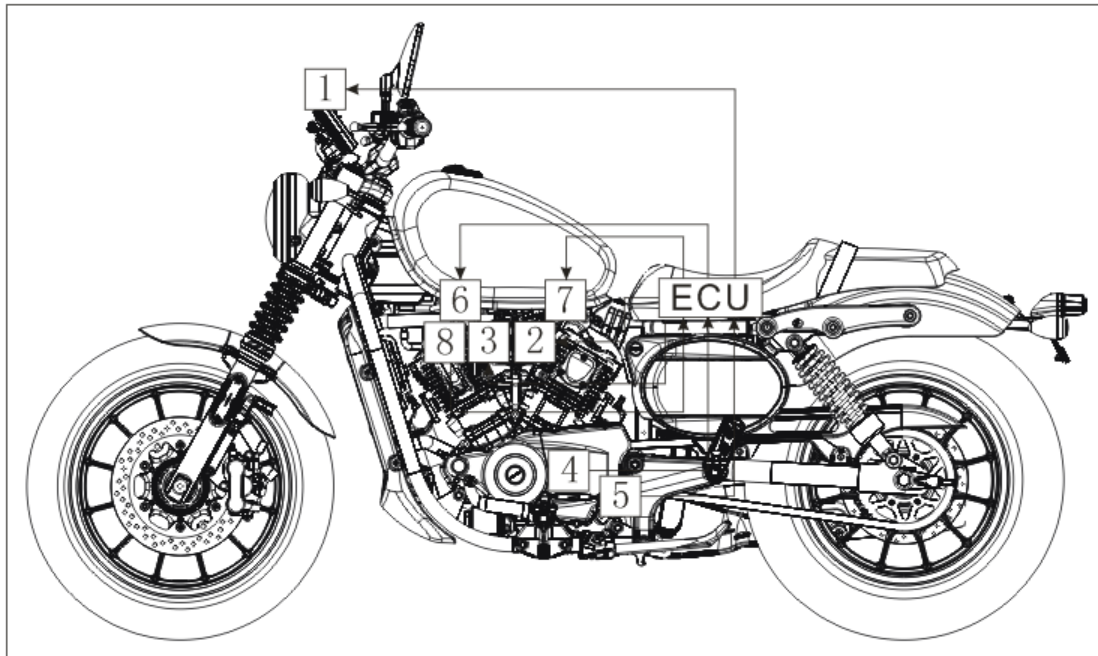
The following different signals are output from the respective sensors for compensation of the fuel injection time (volume).

SIGNAL	DESCRIPTION
WATER COOLANT TEMPERATURE SENSOR SIGNAL	When engine temperature is low, injection time (volume) is increased.
INTAKE AIR TEMPERATURE SENSOR SIGNAL	When intake air temperature is low, injection time (volume) is increased.
BATTERY VOLTAGE SIGNAL	ECU operates on the battery voltage and at the same time, it monitors the voltage signal for compensation of the fuel injection time (volume). A longer injection time is needed to adjust injection volume in the case of low voltage.
ENGINE RPM SIGNAL	At high speed, the injection time (volume) is increased.
STARTING SIGNAL	When starting engine, additional fuel is injected during cranking engine.
ACCELERATION SIGNAL / DECELERATION SIGNAL	During acceleration, the fuel injection time (volume) is increased in accordance with the throttle opening speed and engine rpm. During deceleration, the fuel injection time (volume) is decreased.

⊙ INJECTION STOP CONTROL

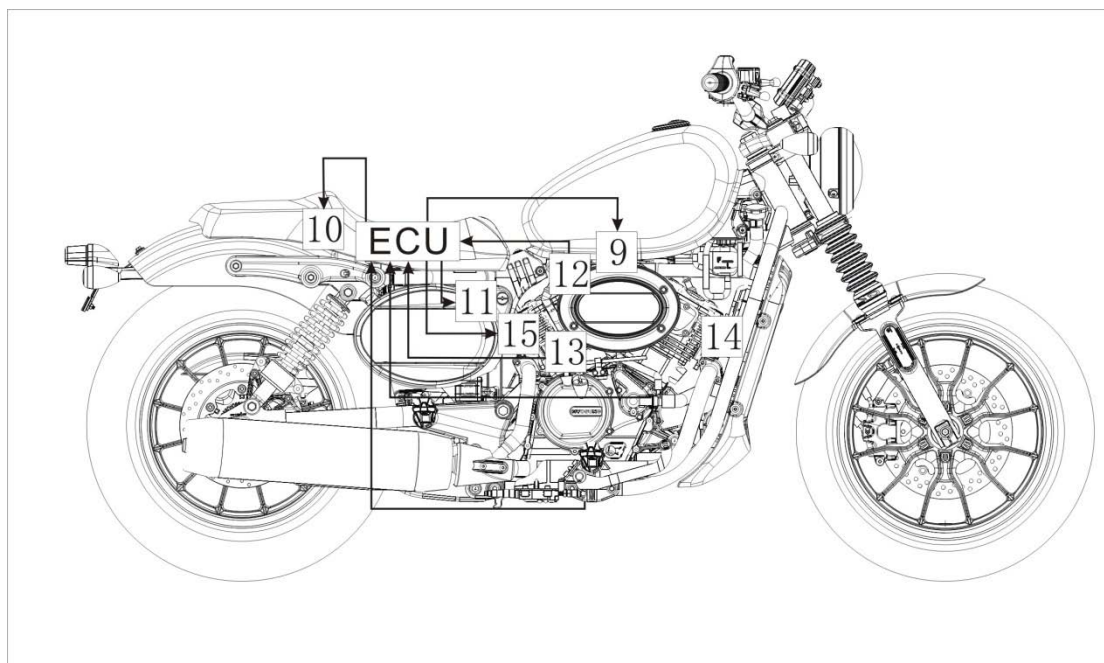
SIGNAL	DESCRIPTION
ROLL OVER SWITCH SIGNAL (FUEL CUT-OFF)	When the motorcycle rolls over, the roll over switch sends a signal to the ECU. Then, this signal cuts OFF current supplied to the fuel pump, fuel injector and ignition coil.
OVER-REV. LIMITER SIGNAL	The fuel injectors stop operation when engine rpm reaches rev. limit rpm.

EI SYSTEM PARTS LOCATION



- ① Speedometer
- ② Ignitioncoil,NO.1
- ③ Ignitioncoil,NO.2
- ④ Pick-up coil
- ⑤ GP switch
- ⑥ Fuel injector, NO.1
- ⑦ Fuel injector, NO.2
- ⑧ IAP&T SENSOR

4-9 EI SYSTEM DIAGNOSIS



- ⑨ ISC solenoid
- ⑩ RO switch
- ⑪ Fuel pump relay
- ⑫ TP SENSOR
- ⑬ WT SENSOR
- ⑭ Oxygen sensor, NO.1
- ⑮ Oxygen sensor, NO.2

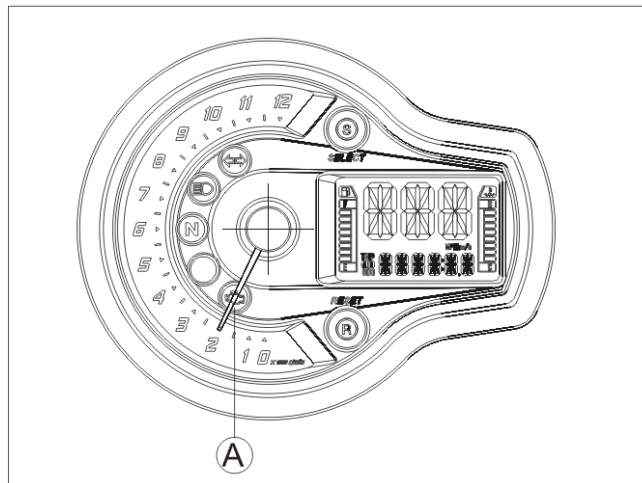
SELF-DIAGNOSIS FUNCTION

The self-diagnosis function is incorporated in the ECU.
The function has two modes, "USER MODE" and "DEALER MODE".

The user can only be notified by the engine warning lamp "🚗" A.

To check the function of the individual EI system devices, the dealer mode is prepared.
In this check, the special tool and additional operations is necessary to read the code of the malfunction items.

⦿ USER MODE



The engine warning lamp "🚗" A comes on when the ignition switch is set to "ON" position with the engine is stopped. For a test of injection system operation. As soon as the engine starts, this lamp should go out


If the fuel injection system fails, The yellow engine warning lamp "🚗" A does not come on when the ignition switch is set to "ON" position with the engine stopped or fail to go out after the engine start

CLASSIFICATION	MAFLUNCTION	ENGINE WARNING LAMP INDICATION A	REMARKS
ignition switch is set to "ON" position	"ON"	"FI" check lamp comer on continually	
	"YES"	"FI" check lamp comer on continually	
Engine RUNNING	"ON"	"FI" check lamp goes of	
	"YES"	"FI" check lamp comer on continually	


4-11 EI SYSTEM DIAGNOSIS

⊙ DEALER MODE

The defective function is memorized in the ECU.

The memorized malfunction code is displayed on the odometer screen B or by blinks signal of the engine warning lamp “” A.

Malfunction means that the ECU does not receive signal from the devices or fault signal received.

These affected devices are indicated in the code form on the odometer screen B or displayed by blinks signal of the engine warning lamp “” A.

■ A. ODOMETER SCREEN

To confirm the memorized malfunction code through the odometer screen B.

1. Remove the left side cover.
2. Connect the special tool to the dealer mode coupler at the wiring harness, and the ignition switch is set to the “ON” position.



Mode select switch: 09900-27000

3. Turn the special tool’s switch to the “ON” position.
4. Press the select switch **C** (in the odometer mode) for 5 seconds until the odometer screen B is displayed [the malfunction code mode] after displaying the “SEND” letters for a second.

NOTE

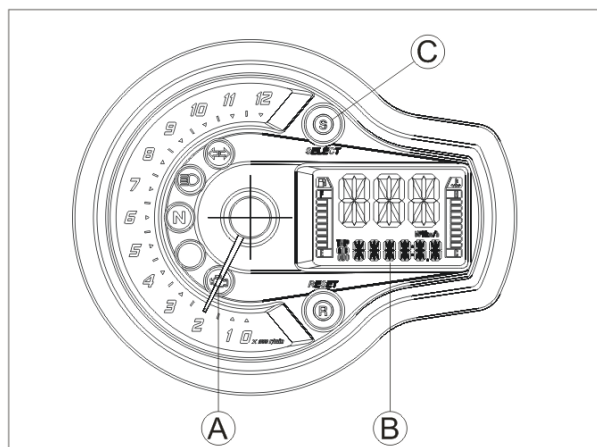
This time, if not connect the special tool, the odometer screen B is indicates the “CHECK” letters.

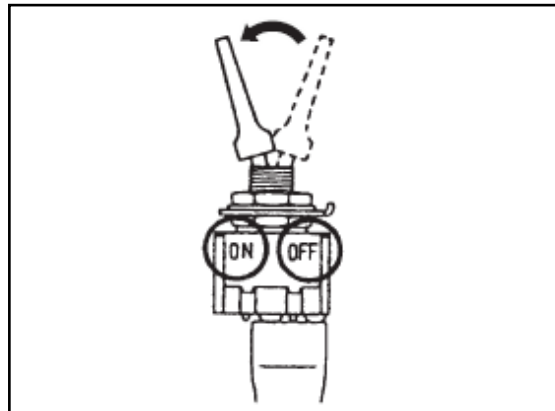
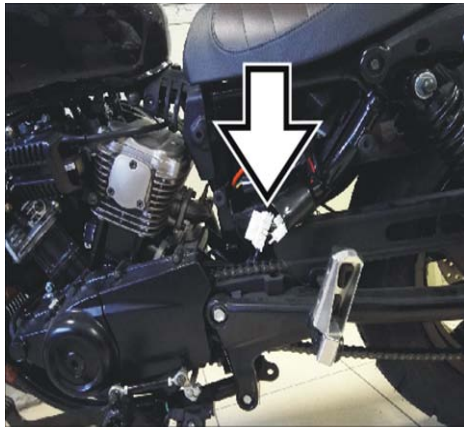
*If press the select switch **C** for 0.6 ~ 1 seconds, the “CHECK” letters disappear.*

5. The memorized malfunction code is displayed in the code form on the odometer screen B.
6. Start the engine and repeat the above procedure.
7. Check the malfunction code to determine the malfunction part.
8. If press the select switch **C** (in the malfunction code mode) for 0.6 ~ 1 seconds, [the malfunction code mode] is changed into [the odometer mode].

NOTE

The malfunction code of the odometer screen B is displayed the current code(s).





CAUTION

- ◆ Confirm the malfunction code after turning the ignition switch “ON” position and starting the engine separately.
- ◆ The dealer mode coupler of the wiring harness is located Left side cover.


CLASSIFICATION	MALFUNCTION	ODOMETER SCREEN INDICATION B	ENGINE WARNING LAMP INDICATION A	INDICATION MODE
IGNITION SWITCH “ON” POSTION	“NO”	NoErr	engine warning lamp comes on continually.	
	“YES”	**** code is indicated in order of occurrence.	engine warning lamp comes on continually.	For each 2 sec., code is indicated.
ENGINE RUNNING	“NO”	NoErr	engine warning lamp goes off.	
	“YES”	**** code is indicated in order of occurrence.	engine warning lamp comes on continually..	For each 2 sec., code is indicated.

NOTE

If press the select switch © (in the “no Err” display state) for 0.6 ~ 1 seconds, it is changed into the odometer mode.

4-13 EI SYSTEM DIAGNOSIS

■ A. ENGINE WARNING LAMP


To confirm the memorized malfunction code through the engine warning lamp “” A:

1. Turn the ignition switch alternately, “ON” and “OFF” position, for 2 seconds by three times.

CAUTION

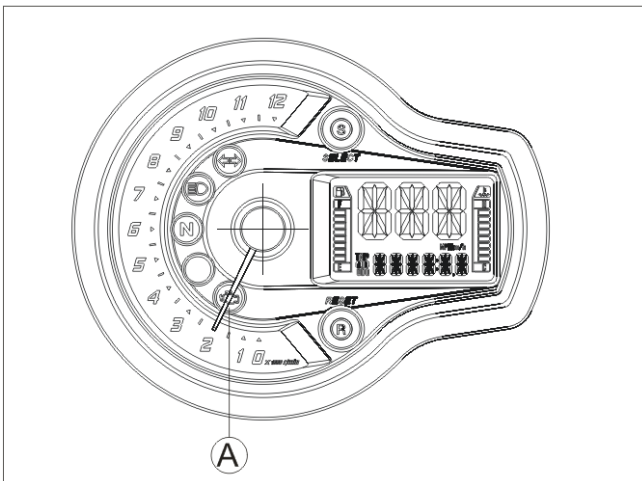
Take special care when operating above procedure.

If the ignition switch is turned alternately, “ON” and “OFF” position, for 2 seconds by five times, the ECU is initialized.

2. The memorized malfunction code is displayed with blink signal of the engine warning lamp “” A.
3. Check the malfunction code to determine the malfunction part.

NOTE

The malfunction code of the engine warning lamp “” A is displayed both the current code(s) and history code(s).



MALFUNCTION	ENGINE WARNING LAMP INDICATION A
“NO”	Engine warning lamp comes continually
“YES”	Malfunction code is displayed by blinking signal In order of occurrence







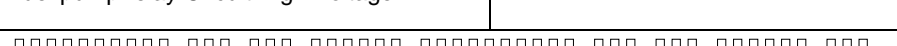
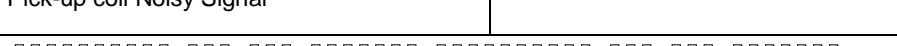


A CODE	B CODE	
	MALFUNCTION PART	REMARKS
P0031	 [0 0 3 1 0 0 3 1]	
	NO.1 O ₂ S heater Circuit Low Voltage	For NO.1 cylinder
P0032	 [0 0 3 2 0 0 3]	
	NO.1 O ₂ S heater Circuit High Voltage	For NO.1 cylinder
P0037	 [0 0 3 7 0 0]	
	NO.2 O ₂ Sheater Circuit Low Voltage	For NO.2 cylinder
P0038	 [0 0 3 8 0 0]	
	NO.2 O ₂ Sheater Circuit High Voltage	For NO.2 cylinder
P0107	 [0 1 0 7 0 0]	
	IAP&TS(Pressure function) Circuit Low Voltage or Open	
P0108	 [0 1 0 8 0 1 0]	
	IAP&TS(Pressure function) Circuit High Voltage	
P0112	 [0 1 1 2 0 1 1 2 0 1 1 2]	
	IAP&TS(Temperature function) Circuit Low Voltage	
P0113	 [0 1 1 3 0 1 1 3 0 1 1 3]	
	IAP&TS(Temperature function) Circuit High Voltage or Open	

※A CODE: For Odometer screen indication
 ※B CODE: For Engine warning lamp indication

4-15 EI SYSTEM DIAGNOSIS

A CODE	B CODE	
	MALFUNCTION PART	REMARKS
P0117	 [0 1 1 7 0 1 1 7 0]	
	WTS Circuit Low Voltage	
P0118	 [0 1 1 8 0 1 1 8 0]	
	WTS Circuit High Voltage or Open	
P0122	 [0 1 2 2 0 1 2 2 0 1 2 2]	
	TPS Circuit Low Voltage or Open	
P0123	 [0 1 2 3 0 1 2 3 0 1 2]	
	TPS Circuit High Voltage	
P0131	 [0 1 3 1 0 1 3 1 0 1 3 1]	
	NO.1 O2S Circuit Low Voltage	For NO.1 cylinder
P0132	 [0 1 3 2 0 1 3 2 0 1]	
	NO.1 O2S Circuit High Voltage	For NO.1 cylinder
P0137	 [0 1 3 7 0 1 3 7]	
	NO.2 O2S Circuit Low Voltage	For NO.2 cylinder
P0138	 [0 1 3 8 0 1 3 8]	
	NO.2 O2S Circuit High Voltage	For NO.2 cylinder

※A CODE: For Odometer screen indication
 ※B CODE: For Engine warning lamp indication

A CODE	B CODE	
	MALFUNCTION PART	REMARKS
P0171		
	[0 1 7 1 0 1 7 1]	Injection Fuel Shortage
P0172		
	[0 1 7 2 0 1 7 2]	Injection Fuel Excess
P0201		
	[0 2 0 1 0 2 0 1]	NO.1 Fuel injector Circuit Malfunction For NO.1 cylinder
P0202		
	[0 2 0 2 0 2 0 2]	NO.2 Fuel injector Circuit Malfunction For NO.2 cylinder
P0230		
	[0 2 3 0 2 3 0 2 3]	Fuel pump relay Circuit Low Voltage or
P0232		
	[0 2 3 2 0 2 3 0 2 3]	Fuel pump relay Circuit High Voltage
P0336		
	[0 3 3 6 0 3 3 6]	Pick-up coil Noisy Signal
P0337		
	[0 3 3 7 0 3 3 7]	Pick-up coil No Signal
P0351		
	[0 3 5 1 0 3 5 1]	NO.1 IG coil Malfunction For NO.1 cylinder
P0352		
	[0 3 5 2 0 3 5 2]	NO.2 IG coil Malfunction For NO.2 cylinder

※A CODE: For Odometer screen indication


※B CODE: For Engine warning lamp indication

A CODE	B CODE	
	MALFUNCTION PART	REMARKS
P0500	 [0 5 0 0 0]	
	Speed Sensor Malfunction	
P0505	 [0 5 0 5 0 5]	
	ISC Error	
P0562	 [0 5 6 2 0 5 6 2]	
	Battery Voltage Low	
P0563	 [0 5 6 3 0 5 6]	
	Battery Voltage High	
P0601	 [0 6 0 1 0 6]	
	Ecu Fault	
P0650	 [0 6 5 0 0]	
	Engine warning lamp Circuit Malfunction	
P0850	 [0 8 5 0 0]	
	GP or clutch lever switch Circuit Malfunction	

※A CODE: For Odometer screen indication

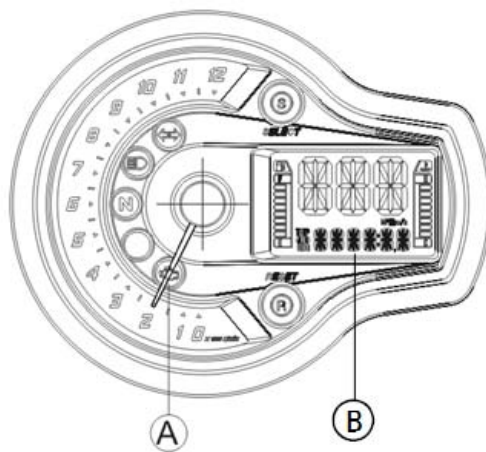
※B CODE: For Engine warning lamp indication

A. ENGINE WARNING LAMP INDICATION

In the engine warning lamp “” A the malfunction code is displayed by blinking the signal in order of occurrence.

B. ODOMETER SCREEN INDICATION

In the odometer screen B, the malfunction code is indicated in order of occurrence.



EI SYSTEM TROUBLESHOOTING

CUSTOMER COMPLAINT ANALYSIS

Record details of the problem (failure, complaint) and how it occurred as described by the customer.

For this purpose, use of such an inspection form will facilitate collecting information to the point required for proper analysis and diagnosis.

▣ EXAMPLE : CUSTOMER PROBLEM INSPECTION FORM

User name :	Model :	VIN :	
Date of issue :	Date Reg. :	Date of problem :	Mileage :

Engine warning lamp	<input type="checkbox"/> Always ON <input type="checkbox"/> Sometimes ON <input type="checkbox"/> Always OFF <input type="checkbox"/> Good condition
Malfunction display / code (odometer screen) or Blinks signal (Engine warning lamp)	<input type="checkbox"/> No code <input type="checkbox"/> Malfunction code ()

PROBLEM SYMPTOMS


- | | |
|--|---|
| <ul style="list-style-type: none"> <input type="checkbox"/> Difficult Starting <input type="checkbox"/> No cranking <input type="checkbox"/> No initial <input type="checkbox"/> No combustion <input type="checkbox"/> Poor starting at
(<input type="checkbox"/> cold <input type="checkbox"/> warm <input type="checkbox"/> always) <input type="checkbox"/> Other | <ul style="list-style-type: none"> <input type="checkbox"/> Poor Driveability <input type="checkbox"/> Hesitation on acceleration <input type="checkbox"/> Back fire / <input type="checkbox"/> After fire <input type="checkbox"/> Lack of power <input type="checkbox"/> Surging <input type="checkbox"/> Abnormal knocking <input type="checkbox"/> Engine rpm jumps briefly <input type="checkbox"/> Other _____ |
| <ul style="list-style-type: none"> <input type="checkbox"/> Poor Idling <input type="checkbox"/> Poor fast Idle <input type="checkbox"/> Abnormal idling speed
(<input type="checkbox"/> High <input type="checkbox"/> Low) (rpm) <input type="checkbox"/> Unstable <input type="checkbox"/> Hunting (rpm. To rpm) <input type="checkbox"/> Other _____ | <ul style="list-style-type: none"> <input type="checkbox"/> Engine Stall when <input type="checkbox"/> Immediately after start <input type="checkbox"/> Throttle valve is opened <input type="checkbox"/> Throttle valve is closed <input type="checkbox"/> Load is applied <input type="checkbox"/> Other _____ |

OTHERS :

MOTORCYCLE / ENVIRONMENTAL CONDITION WHEN PROBLEM OCCURS	
Environmental condition	
Weather	<input type="checkbox"/> Fair <input type="checkbox"/> Cloudy <input type="checkbox"/> Rain <input type="checkbox"/> Snow <input type="checkbox"/> Always <input type="checkbox"/> Other
Temperature	<input type="checkbox"/> Hot <input type="checkbox"/> Warm <input type="checkbox"/> Cool <input type="checkbox"/> Cold (°F / °C) <input type="checkbox"/> Always
Frequency	<input type="checkbox"/> Always <input type="checkbox"/> Sometimes (times / day, month) <input type="checkbox"/> Only
Road	once <input type="checkbox"/> Under certain condition
	<input type="checkbox"/> Urban <input type="checkbox"/> Suburb <input type="checkbox"/> Highway <input type="checkbox"/> Mountainous (<input type="checkbox"/> Uphill <input type="checkbox"/> Downhill)
	<input type="checkbox"/> Tarmacadam <input type="checkbox"/> Gravel <input type="checkbox"/> Other
Motorcycle condition	
Engine condition	<input type="checkbox"/> Cold <input type="checkbox"/> Warming up phase <input type="checkbox"/> Warmed up <input type="checkbox"/> Always <input type="checkbox"/> Other at starting
	<input type="checkbox"/> Immediately after start <input type="checkbox"/> Racing without load <input type="checkbox"/> Engine speed (rpm)
Motorcycle condition	During driving : <input type="checkbox"/> Constant speed <input type="checkbox"/> Accelerating <input type="checkbox"/> Decelerating
	<input type="checkbox"/> Right hand corner <input type="checkbox"/> Left hand corner <input type="checkbox"/> At stop
	<input type="checkbox"/> Motorcycle speed when problem occurs (km/h, Mile/h)
	<input type="checkbox"/> Other _____

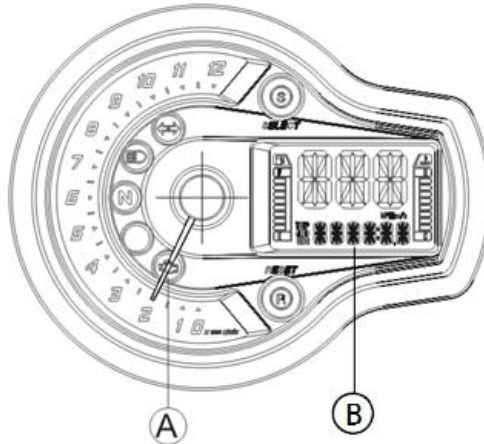
NOTE
<i>The above form is a standard sample. If should be modified according to conditions characteristic of each market.</i>

SELF-DIAGNOSTIC PROCEDURES

Don't disconnect couplers from ECU, battery cable from battery, ECU ground wire harness from engine or main fuse before confirming malfunction code (self-diagnostic trouble code) stored in memory. the memorized malfunction code is displayed in the code form on the odometer screen B or by blinks signal of the engine warning lamp "  " A.

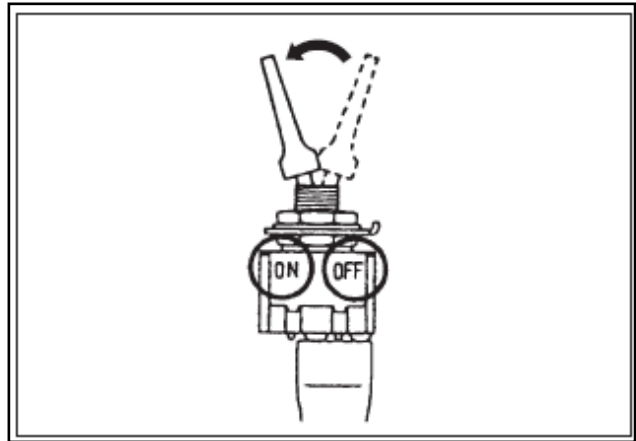
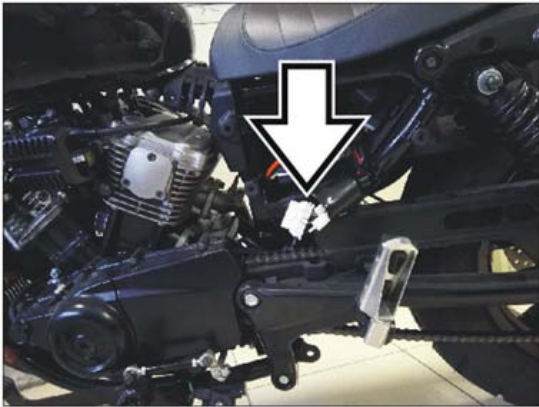
To check malfunction code, read SELF-DIAGNOSIS FUNCTION "DEALER MODE" (Refer to page [4-11~ 18]) carefully to have good understanding as to what functions are available and how to use it.

Be sure to read "PRECAUTIONS for Electrical Circuit Service" (Refer to page [4-1]) before inspection and observe what is written there.



A. ODOMETER SCREEN INDICATION

☞ Refer to page [4-11]



B. ENGINE WARNING LAMP INDICATION

☞ Refer to page [4-13]



MALFUNCTION CODE AND DEFECTIVE CONDITION

MALFUNCTION CODE	DETECTED ITEM		DETECTED FAILURE CONDITION
			CHECK FOR
noEr	NO FAULT		—
P0031	NO.1 O ₂ Sheater Circuit	Low Voltage	After engine running, if oxygen sensor heater signal open or is happened the ground short fault for 1 second by 10 times in 12 times test cycle, the code 0031 is indicated.
			Oxygen sensor, lead wire / coupler connection.
P0032		High Voltage	After engine running, if oxygen sensor heater signal is happened the high short fault for 1 second by 10 times in 12 times test cycle, the code 0032 is indicated.
			Oxygen sensor, lead wire / coupler connection.
P0037	NO.2 O ₂ Sheater Circuit	Low Voltage	After engine running, if oxygen sensor heater signal open or is happened the ground short fault for 1 second by 10 times in 12 times test cycle, the code 0037 is indicated.
			Oxygen sensor, lead wire / coupler connection.
P0038		High Voltage	After engine running, if oxygen sensor heater signal is happened the high short fault for 1 second by 10 times in 12 times test cycle, the code 0038 is indicated.
			Oxygen sensor, lead wire / coupler connection.
P0107	IAP&TS (Pressure function) Circuit	Low Voltage or Open	The sensor should produce following voltage. 0.15 V ≤ Sensor output voltage Without the above range for 2.2 sec.and more,0107 is indicated.
			Intake air pressure sensor, lead wire / coupler connection.
P0108		High Voltage	The sensor should produce following voltage. Sensor output voltage ≤ 5 V Without the above range for 10.0sec.and more,0108 is indicated.
			Intake air pressure sensor, lead wire / coupler connection.
P0112	IAP&TS (Temperatu er function) Circuit	Low Voltage	The sensor voltage should be the following. 0.1 V ≤ Sensor output voltage Without the above range for 6.25sec.and more,0112 is indicated.
			Intake air temperature sensor, lead wire / coupler connection.
P0113		High Voltage or Open	The sensor voltage should be the following. Sensor output voltage ≤ 4.9V Without the above range for 6.25sec.and more,0113 is indicated.
			Intake air temperature sensor, lead wire / coupler connection.

4-25 EI SYSTEM DIAGNOSIS

MALFUNCTION CODE	DETECTED ITEM		DETECTED FAILURE CONDITION
			CHECK FOR
P0117	WTS Circuit	Low Voltage	The sensor voltage should be the following. 0.1 V ≤ Sensor output voltage Without the above range for 6.25 sec. and more, 0117 is indicated.
			Water temperature sensor, lead wire / coupler connection.
High Voltage or Open		The sensor voltage should be the following. Sensor output voltage ≤ 5V Without the above range for 6.25 sec. and more, 0118 is indicated.	
		Water temperature sensor, lead wire / coupler connection.	
P0122	TPS Circuit	Low Voltage or Open	The sensor should produce following voltage. 0.2 V ≤ Sensor output voltage Without the above range for 7.8 sec. and more, 0122 is indicated.
Throttle position sensor, lead wire / coupler connection.			
P0123	TPS Circuit	High Voltage	The sensor should produce following voltage. Sensor output voltage ≤ 4.9 V Without the above range for 7.8 sec. and more, 0123 is indicated.
Throttle position sensor, lead wire / coupler connection.			
P0131	NO.1 O ₂ S Circuit	Low Voltage	After engine running, the oxygen sensor signal is inputted in ECU since then 300 sec. In this case, the sensor voltage should be the following. 30 mV ≤ Sensor output voltage Without the above range for 28.1 sec. and more, 0131 is indicated.
			Oxygen sensor, lead wire / coupler connection.
High Voltage		After engine running, the oxygen sensor signal is inputted in ECU since then 300 sec. In this case, the sensor voltage should be the following. Sensor output voltage ≤ 1.0V Without the above range for 29.4 sec. and more, 0132 is indicated.	
		Oxygen sensor, lead wire / coupler connection.	
P0137	NO.2 O ₂ S Circuit	Low Voltage	After engine running, the oxygen sensor signal is inputted in ECU since then 300 sec. In this case, the sensor voltage should be the following. 30 mV ≤ Sensor output voltage Without the above range for 28.1 sec. and more, 0137 is indicated.
			Oxygen sensor, lead wire / coupler connection.
High Voltage		After engine running, the oxygen sensor signal is inputted in ECU since then 300 sec. In this case, the sensor voltage should be the following. Sensor output voltage ≤ 1.0V Without the above range for 29.4 sec. and more, 0138 is indicated.	
		Oxygen sensor, lead wire / coupler connection.	

MALFUNCTION CODE	DETECTED ITEM		DETECTED FAILURE CONDITION
			CHECK FOR
P0171	Fuel Injection Circuit Malfunction	Injection Fuel Shortage	After engine running, rate of fuel calibration remains less than standard value (1.3) for 10 sec. and more, the code P0171 is indicated. ECU, O2 sensor, Fuel pump, Fuel hose line
		Injection Fuel Excess	After engine running, rate of fuel calibration remains less than standard value (0.7) for 10 sec. and more, the code P0172 is indicated. ECU, O2 sensor, Fuel pump, Fuel hose line
P0201	NO.1 Fuel Injector Circuit Malfunction		After engine running, if NO.1 fuel injector signal open or is happened the high / ground short fault for 1 second by 5 times in 10 times test cycle, the code 0201 is indicated. Injector, wiring/ coupler connection, power supply to the injector.
P0202	NO.2 Fuel Injector Circuit Malfunction		After engine running, if NO.2 fuel injector signal open or is happened the high / ground short fault for 1 second by 5 times in 10 times test cycle, the code 0202 is indicated. Injector, wiring/ coupler connection, power supply to the injector.
P0230	Fuel pump relay Circuit	Low Voltage or Open	After engine running, if fuel pump relay signal open or is happened the ground short fault for 1 second by 10 times in 20 times test cycle, the code 0230 is indicated. Fuel pump relay, connecting lead wire, power source to fuel pump relay, fuel injector.
		High Voltage	After engine running, if fuel pump relay signal is happened the high short fault for 1 second by 10 times in 20 times test cycle, the code 0232 is indicated. Fuel pump relay, connecting lead wire, power source to fuel pump relay, fuel injector.
P0336	Pick-up coil	Noisy Signal	After engine running, if the magneto rotor tooth's error is happened continuously by 10 times in 100 times test cycle, the code 0336 is indicated. Pick-up coil wiring and mechanical parts. (Pick-up coil lead wire coupler connection)
P0337		No Signal	After engine running, if the pick-up coil signal does not reach ECU for more than 0.5 sec., the code 0337 is indicated. Pick-up coil wiring and mechanical parts. (Pick-up coil, lead wire coupler connection)
P0351	NO.1 IG coil Malfunction		After engine running, if NO.1 ignition coil signal open or is happened the high / ground short fault for 1 second by 5 times in 10 times test cycle, the code 0351 is indicated. Ignition coil, wiring / coupler connection, power supply from the battery.
P0352	NO.2 IG coil Malfunction		After engine running, if NO.2 ignition coil signal open or is happened the high / ground short fault for 1 second by 5 times in 10 times test cycle, the code 0352 is indicated. Ignition coil, wiring / coupler connection, power supply from the battery.

4-27 EI SYSTEM DIAGNOSIS

MALFUNCTION CODE	DETECTED ITEM		DETECTED FAILURE CONDITION
			CHECK FOR
P0500	Speed sensor Malfunction		Motorcycle speed < 10km/h Water temperature < 20°C IAP&TS pressure > 40kpa 20% < TPS open angle < 100% 2,000rpm < Engine speed < 6,000rpm If the above conditions are maintained for 32.5sec. and more, The code P0500 is indicated
			Speedo sensor, wiring/coupler connection to ECU
P0505	ISC Error		After engine running, if idle speed is different to 500 rpm from the specified range in 25 seconds test cycle, the code 0505 is indicated.
			Idle speed control solenoid, wiring / coupler connection.
P0562	Battery Voltage	Low	The battery voltage should be the following 9 V ≤ Battery voltage Without the above range for 3.125sec. and more, 0562 is indicated.
		Battery, wiring / coupler connection to ECU.	
P0563	Battery Voltage	High	The battery voltage should be the following. Battery voltage ≤ 16V Without the above range for 3.125 sec. and more, 0563 is indicated.
		Battery, wiring / coupler connection to ECU.	
P0601	ECU Fault		When ML on The ECU will check malfunction code, if there's ECU error the code P0601 is indicated. The fuel injection will be cut off Accordingly
			ECU
P0650	Engine warning lamp Circuit Malfunction		After engine running, if "FI" check lamp signal open or is happened the high / ground short fault for 1 second by 40 times in 80 times test cycle, the code 0650 is indicated.
			"FI" check lamp, wiring / coupler connection.
P0850	GP or Clutch lever Switch Circuit Malfunction		If gear position or clutch lever switch signal feedback is not active in continuous by 20 times in fully power down cycles, the code 0850 is indicated. (Fully power down cycle : Ignition switch "ON" "OFF" position)
			Gear position or clutch lever switch, wiring / coupler connection, gearshift cam etc.

**“P0031”, “P0032”, “P0037” or “P0038”
 OXYGEN SENSOR HEATER CIRCUIT MALFUNCTION
 & “0131”, “0132”, “0137” or “0138”
 OXYGEN SENSOR CIRCUIT MALFUNCTION**

LCD (DISPLAY)INDICATION	ENGINE WARING LAMP INDICATION
P0031	[0 0 3 1 0 0 3 1]
P0032	[0 0 3 2 0 0 3]
P0037	[0 0 3 7 0 0]
P0038	[0 0 3 8 0 0]
P0131	[0 1 3 1 0 1 3 1 0 1 3]
P0132	[0 1 3 2 0 1 3 2 0 1]
P0137	[0 1 3 7 0 1 3 7]
P0138	[0 1 3 8 0 1 3 8]

DETECTED CONDITION	POSSIBLE CAUSE
☞ Refer to page [4-24 4-25]	<ul style="list-style-type: none"> ● Oxygen sensor, Oxygen sensor heater circuit open or short. ● Oxygen sensor, Oxygen sensor heater malfunction. ● ECU malfunction.

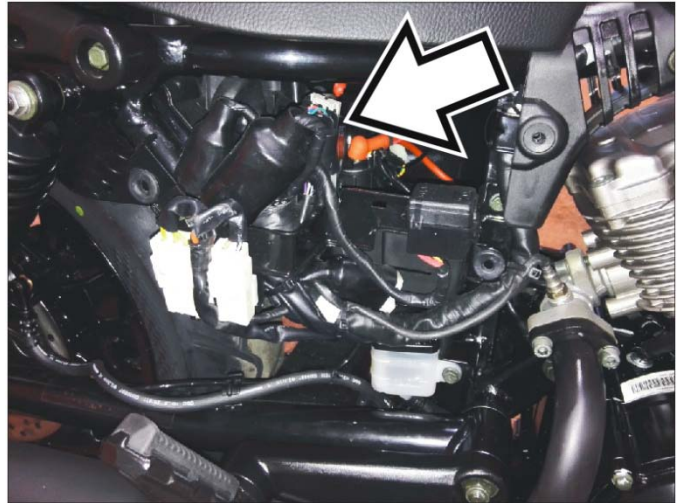


※:NO.1 O₂S
 NO.2 O₂S

4-29 EI SYSTEM DIAGNOSIS

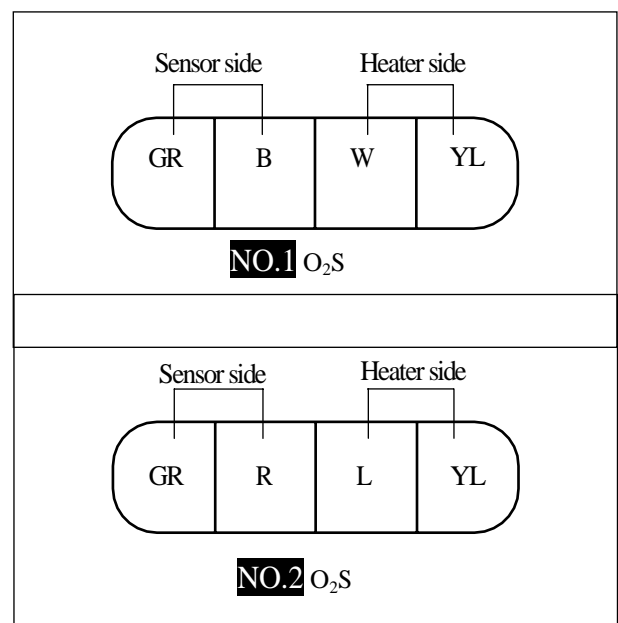
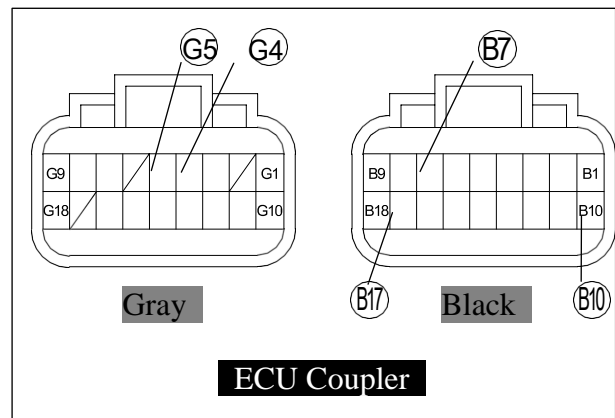
▣ INSPECTION

- 1) The connectors of two oxygen sensors are located in the frame head left cover lower, and another the right side cover inside.
- 2) Turn the ignition switch to the "OFF" position.
- 3) Check the Oxygen sensor coupler for loose or poor contacts.



Is OK?

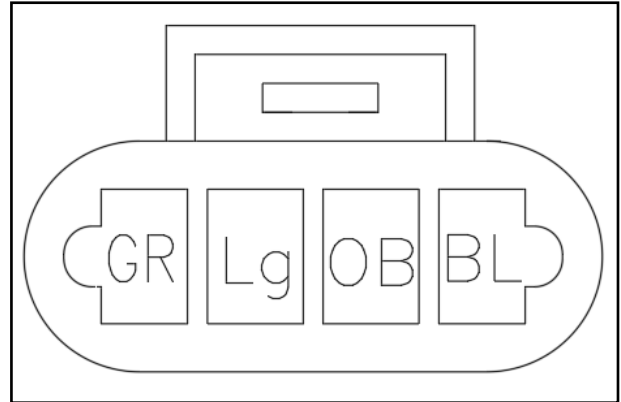
YES	<ul style="list-style-type: none"> ● B or GR(NO.1 O₂S)/R or GR (NO.2 O₂S)wire open or shorted to ground, or poor B17 or B10 (NO.1 O₂S)/G5 or B10 (NO.2 O₂S)connection of ECU coupler. [Sensor side] ● W(NO.1 O₂S heater)/L(NO.2 O₂S heater)wire open or shorted to ground, or poor B7(NO.1 O₂S heater) /G4(NO.2 O₂S heater) connection of ECU coupler. YL coupler open or shorted to the wiring harness (main relay output side). [Heater side] ● If wire and connection are OK, intermittent trouble or faulty ECU. ● Recheck each terminal and wire harness for open circuit and poor connection.
NO	Replace the Oxygen sensor with a new one.



4-31 EI SYSTEM DIAGNOSIS

Is the input voltage OK?

YES	Go to Step 2.
NO	<ul style="list-style-type: none"> Loose or poor contacts on the ECU coupler. Open or short circuit in the OB wire or GR wire.



◆ Step 2

- 1) Connect the IAP&T(Pressure function) sensor coupler ①.
- 2) Insert the needle pointed probes to the lead wire coupler.
- 3) Turn the ignition switch to the "ON" position.
- 4) Measure the IAP&T (Pressure function)sensor output voltage at the wire side coupler(between BL and GR wires).



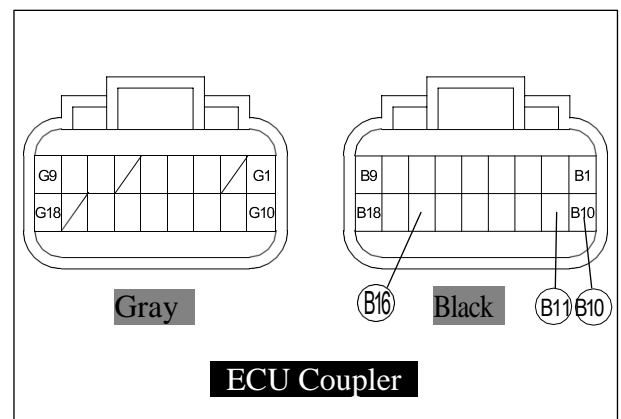
IAP&T(Pressure function)sensor output voltage

Approx. 1.5V at idle speed
(⊕ BL- ⊖ GR)

 **Tester knob indication: Voltage (—)**

Is the output voltage OK?

YES	<ul style="list-style-type: none"> OB, BL or GR wire open or shorted to ground, or poor B16 , B11 or B10 connection of ECU coupler. If wire and connection are OK, intermittent trouble or faulty ECU. Recheck each terminal and wire harness for open circuit and poor connection.
NO	If check result is not satisfactory, replace the IAP&T (Pressure function) sensor with a new one.



“P0112” or “P0113” IAP&T(Temperature function) SENSOR CIRCUIT MALFUNCTION

LCD (DISPLAY) INDICATION	ENGINE WARNING LAMP INDICATION
P0112	[0 1 1 2 0 1 1 2 0 1 1 2]
P0113	[0 1 1 3 0 1 1 3 0 1 1]

DETECTED CONDITION	POSSIBLE CAUSE
Refer to page [4-24]	<ul style="list-style-type: none"> ● IAP&T(Temperature function) sensor circuit open or short. ● IAP&T(Temperature function) sensor malfunction. ● ECU malfunction.

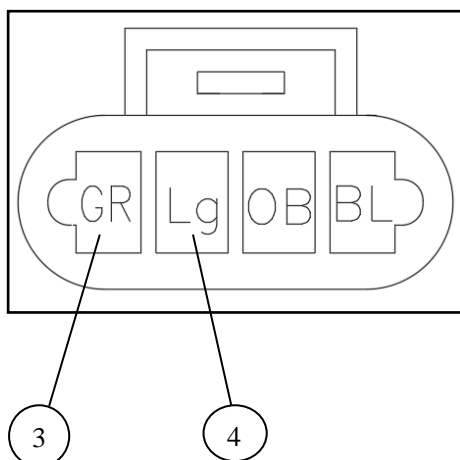
INSPECTION

- 1) Turn the ignition switch to the “OFF” position.
- 2) Check the IAP&T(Temperature function) sensor coupler ① for loose or poor contacts.
If OK, then measure the IAP&T(Temperature function) sensor resistance.
- 3) Disconnect the IAP&T(Temperature function) sensor coupler ②.
- 4) Measure the resistance between the terminals ③ and ④.



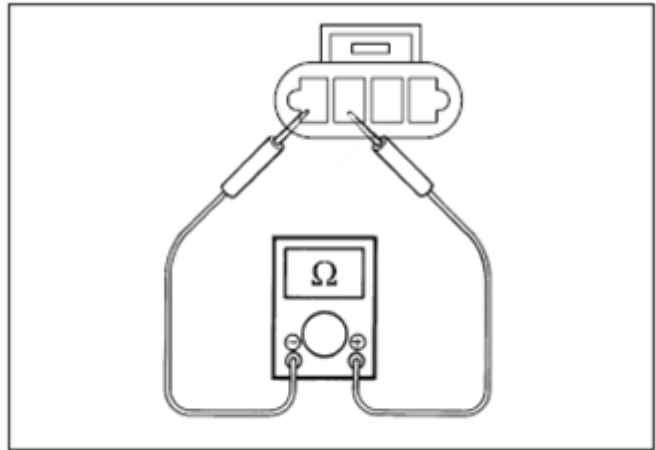
IAP&T(Temperature function) sensor resistance	0.075 ~ 14.541 KΩ [When Intake air temperature is -20°C ~ 140°C (-4°F ~ 284°F)]
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Tester knob indication : Resistance (Ω)



4-33 EI SYSTEM DIAGNOSIS

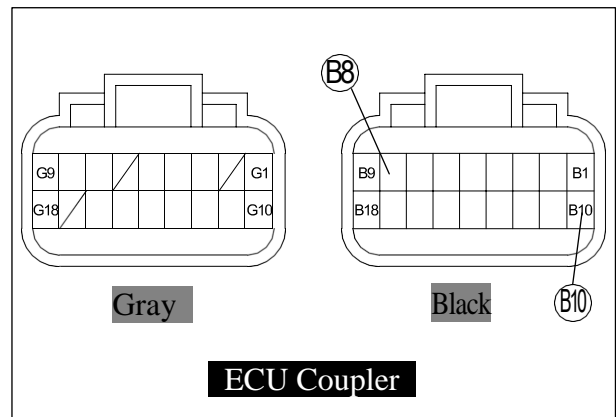
IAP&T(Temperature function) Sensor resistance	
Intake Air Temp.	Resistance
-20 °C (-40°F)	Approx 14.541kΩ
-0 °C (32°F)	Approx 5.627kΩ
20 °C (68 °F)	Approx 2.429kΩ
40 °C (104 °F)	Approx 1.155kΩ
60 °C (140 °F)	Approx 0.594kΩ
80 °C (176 °F)	Approx 0.3277kΩ
120 °C (248°F)	Approx 0.1168kΩ
140 °C (284°F)	Approx 0.0749kΩ



 **Tester knob indication : Resistance (Ω)**

Is the resistance OK?

YES	<ul style="list-style-type: none"> • Lg or GR wire open or shorted to ground, or poor B8 or B10 connection of ECU coupler. • If wire and connection are OK, intermittent trouble or faulty ECU. • Recheck each terminal and wire harness for open circuit and • poor connection.
NO	Replace the IAP&T(Temperature function)sensor with a new one.



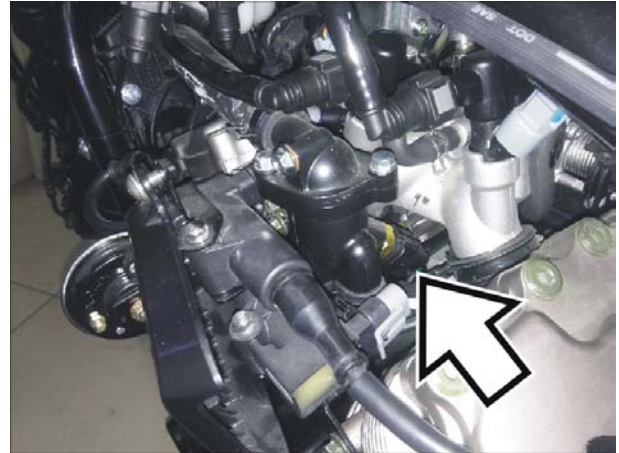
“P0117” or “P0118” WT SENSOR CIRCUIT MALFUNCTION

LCD (DISPLAY)INDICATION	ENGINE WARNING LAMP INDICATION
P0117	[0 1 1 7 0 1 1 7]
P0118	[0 1 1 8 0 1 1 8]

DETECTED CONDITION	POSSIBLE CAUSE
☞ Refer to page [4-25]	<ul style="list-style-type: none"> • WT sensor circuit open or short. • WT sensor malfunction. • ECU malfunction.

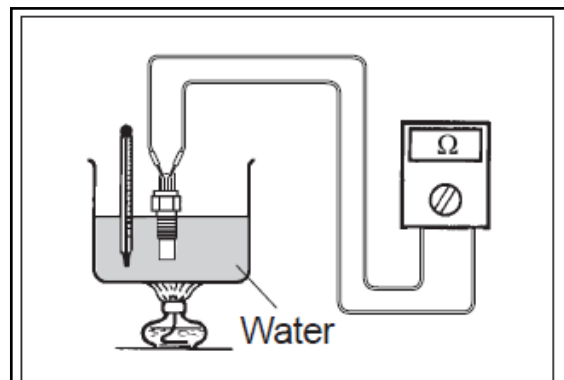
▣ INSPECTION

- 1) Turn the ignition switch to the “OFF” position.
- 2) Check the WT sensor coupler for loose or poor contacts.
If OK, then measure the WT sensor resistance.

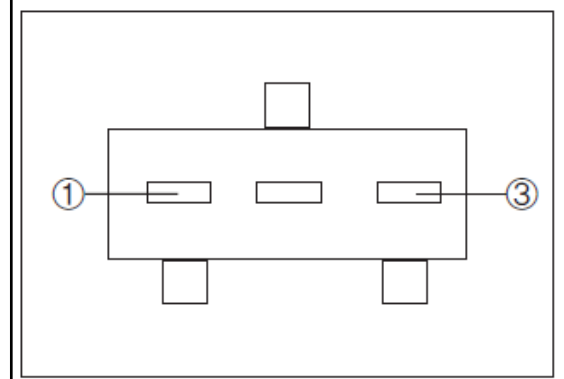


- 3) Disconnect the WT sensor coupler.
- 4) Measure the resistance between the terminals ① And ③ of the WT sensor.

WT sensor resistance	0.1163 ~ 48.1400 KΩ [When Water temperature is -40°C ~ 120°C (-40°F ~ 248°F)]
-----------------------------	--



Tester knob indication : Resistance (Ω)



4-35 EI SYSTEM DIAGNOSIS

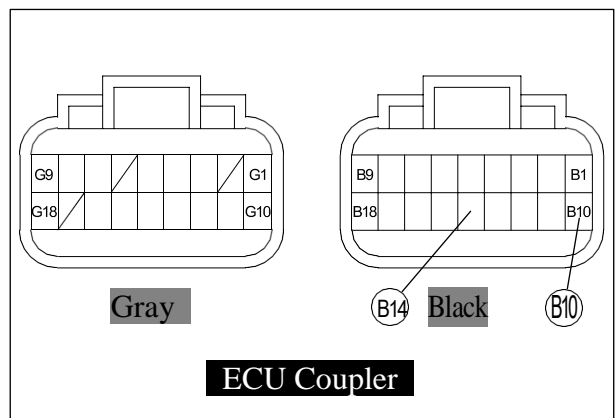
WT sensor resistance	
Engine Coolant Temp.	Resistance (To ECU)
-40 °C (-40°F)	Approx. 48.140KΩ
0 °C (32 °F)	Approx.5.790 KΩ
20 °C (68 °F)	Approx. 2.450 KΩ
40 °C (104 °F)	Approx. 1.148 KΩ
60 °C (140 °F)	Approx.0.586 KΩ
80 °C (176 °F)	Approx. 0.322 KΩ
120 °C (248 °F)	Approx. 0.1163 KΩ



 Tester knob indication : Resistance (Ω)

Is the resistance OK?

YES	<ul style="list-style-type: none"> ● G or GR wire open or shorted to ground, or poor B14 or B10 connection of ECU coupler. ● If wire and connection are OK, intermittent trouble or faulty ECU. ● Recheck each terminal and wire harness for open circuit and poor connection.
NO	Replace the WT sensor with a new one.



“P0122” or “P0123” TP SENSOR CIRCUIT MALFUNCTION

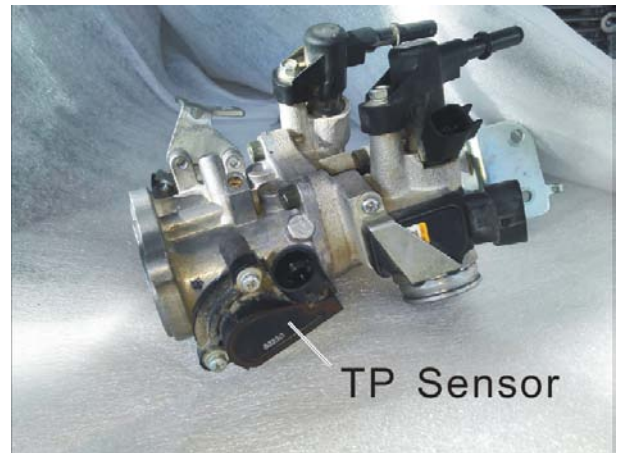
LCD (DISPLAY) INDICATION	ENGINE WARNING LAMP INDICATION
P0122	[0 1 2 2 0 1 2 2 0 1]
P0123	[0 1 2 3 0 1 2 3 0]

DETECTED CONDITION	POSSIBLE CAUSE
☞ Refer to page [4-25]	<ul style="list-style-type: none"> ● TP sensor circuit open or short. ● TP sensor malfunction. ● ECU malfunction.

▣ INSPECTION

◆ Step 1

- 1) Turn the ignition switch to the “OFF” position.
- 2) Check the TP sensor coupler for loose or poor contacts.
If OK, then measure the TP sensor input voltage.



- 3) Disconnect the TP sensor coupler①.
- 4) Turn the ignition switch to the “ON” position.
- 5) Measure the voltage at the OB wire and ground.
- 6) If OK, then measure the voltage at the OB wire and GR wire.

TP sensor input voltage	4.8 ~ 5.2 V
	(⊕ OB – ⊖ Ground)
	(⊕ OB – ⊖ GR)

Tester knob indication: Voltage (—)

Is the input voltage OK?

YES	Go to Step 2.
NO	<ul style="list-style-type: none"> ● Loose or poor contacts on the ECU coupler. ● Open or short circuit in the OB wire or GR wire.



4-37 EI SYSTEM DIAGNOSIS

◆ Step 2

- 1) Turn the ignition switch to the "OFF" position.
- 2) Disconnect the TP sensor coupler.
- 3) Check the continuity between **A** (LY) and ground.

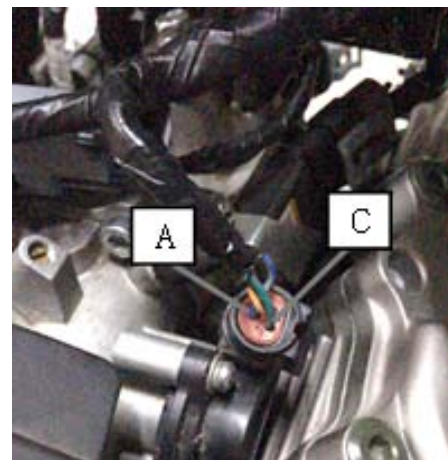
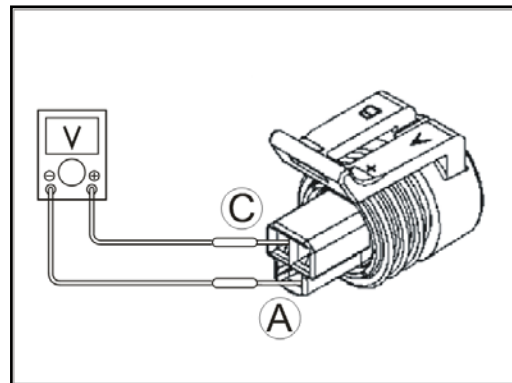
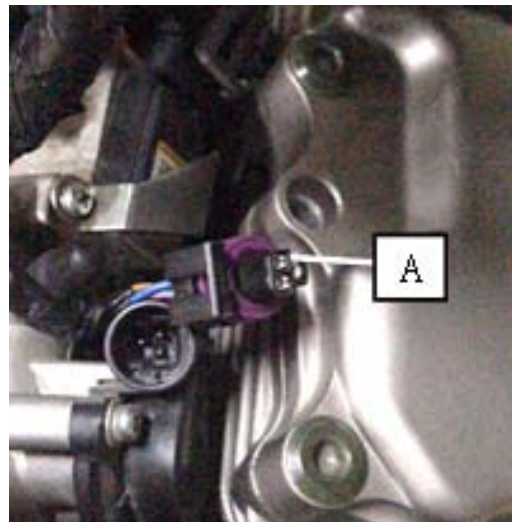
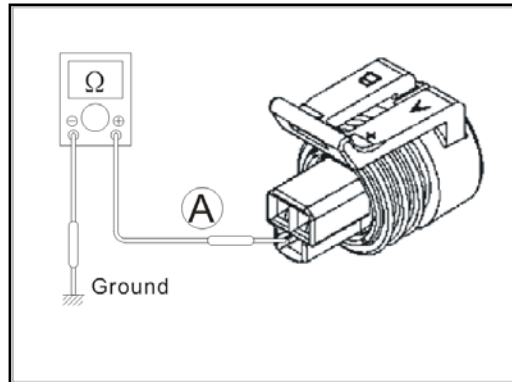
TP sensor continuity

$\infty \Omega$ (Infinity)
(A- Ground)

 Tester knob indication : Resistance (Ω)

Is the continuity OK?

YES	Go to Step 3.
NO	Replace the TP sensor with a new one.



◆ Step 3

- 1) Connect the TP sensor coupler.
- 2) Insert the needle pointed probes to the lead wire coupler.
- 3) Turn the ignition switch to the "ON" position.

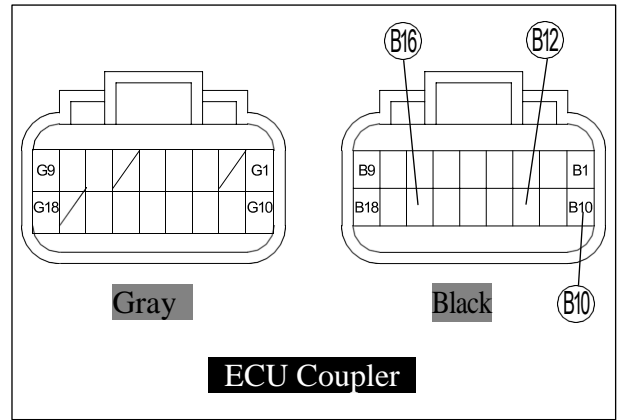
Measure the TP sensor output voltage at the coupler between **A** (\oplus B: LY) and **C** (\ominus GR) by turning the throttle grip.

TP sensor output voltage

Throttle valve is closed	Approx.0.60~1.00V
Throttle valve is opened	Approx.4.00~4.60V

 Tester knob indication: Voltage (V)

<p>YES</p>	<ul style="list-style-type: none"> ● OB, LY or GR wire open or shorted to ground, or poor B16 ,B12 or B10 connection of ECU coupler. ● If wire and connection are OK, intermittent trouble or faulty ECU. ● Recheck each terminal and wire harness for open circuit and poor connection.
<p>NO</p>	<p>If check result is not satisfactory, replace the TP sensor with a new</p>




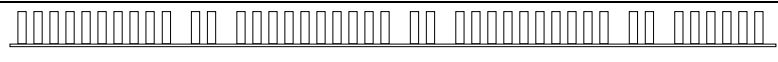
4-39 EI SYSTEM DIAGNOSIS

“ P0171” or “P0172” FUEL INJECTOR CIRCUIT MALFUNCTION

LCD (DISPLAY)INDICATION	ENGINE WARING LAMP INDICATION
P0171	 [0 1 7 1 0 1 7 1]
P0172	 [0 1 7 2 0 1 7 2]

DETECTED CONDITION	POSSIBLE CAUSE
<p>☞ Refer to page [4-26]</p>	<ul style="list-style-type: none"> ● Fuel injection system malfunction. ● Oxygen sensor malfunction. ● ECU malfunction.

“P0201” or “P0202” FUEL INJECTOR CIRCUIT MALFUNCTION

LCD (DISPLAY)INDICATION	ENGINE WARNING LAMP INDICATION
P0201	 [0 2 0 1 0 2]
P0202	 [0 2 0 2 0 2]

DETECTED CONDITION	POSSIBLE CAUSE
☞ Refer to page [4-26]	<ul style="list-style-type: none"> • Injector circuit open or short. • Injector malfunction. • ECU malfunction.

INSPECTION

Step 1

- 1) Remove the fuel tank.
- 2) Turn the ignition switch to the “OFF” position.
- 3) Check the injector couplers NO.1 ① and NO.2 ② for loose or poor contacts.

If OK, then measure the injector resistance.

**※NO.1 FUEL INJECTOR
NO.2 FUEL INJECTOR**

- 4) Disconnect the injector couplers NO.1 ① and NO.2 ② and measure the resistance between terminals ③ and ④.

Injector resistance	11.4 ~ 12.6 Ω at 20°C (68°F)
----------------------------	---------------------------------

 **Tester knob indication: Resistance (Ω)**

- 5) If OK, then check the continuity between injector terminals and ground.

Injector continuity	∞Ω (Infinity)
----------------------------	---------------

 **Tester knob indication: Resistance (Ω)**

Are the resistance and continuity OK?

YES	Go to Step 2
NO	Replace the Injector with a new one.



4-41 EI SYSTEM DIAGNOSIS

◆ Step 2

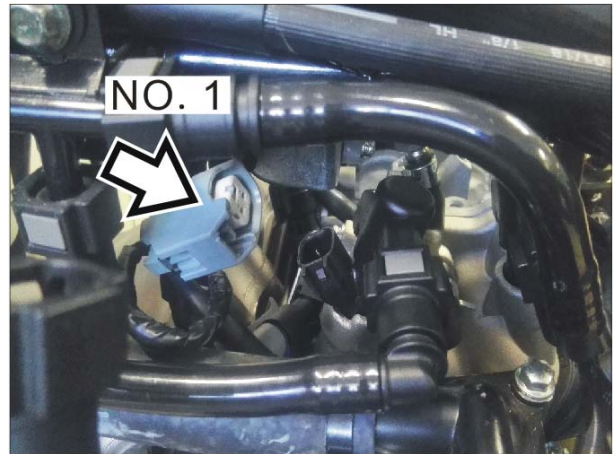
- 1) Turn the ignition switch to the "ON" position.
- 2) Measure the injector voltage between YL(NO.1 & NO.2) wire and ground.

Injector voltage	Battery voltage
	NO.2 ⊕YL-⊖ Ground, NO.2 ⊕YL-⊖ Ground)

 **Tester knob indication: Voltage (---)**

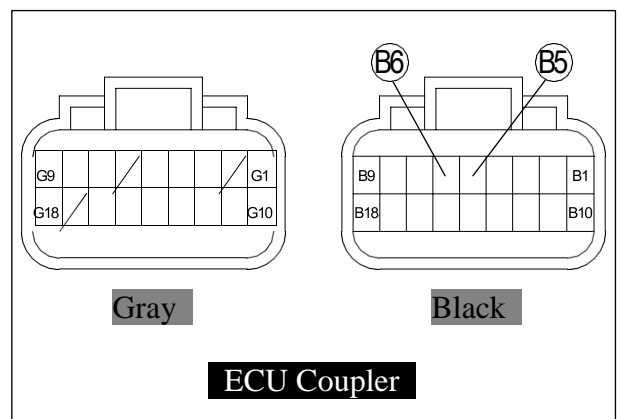
NOTE

Injector voltage can be detected only 3 seconds after ignition switch is turned "ON" position.





Is the voltage OK?

YES	<ul style="list-style-type: none"> ● YR(NO.1), RB(NO.2) wire open or shorted to ground, or poor B5 (NO.1), B6 (NO.2) connection of ECU coupler. ● If wire and connection are OK, intermittent trouble or faulty ECU. ● Recheck each terminal and wire harness for open circuit and poor connection.
NO	Inspect the fuel pump or fuel pump relay. (Refer to page 79 [5-5,5-6])



“P0230” or “P0232” FUEL PUMP RELAY CIRCUIT MALFUNCTION

LCD (DISPLAY)INDICATION	ENGINE WARNING LAMP INDICATION
P0230	 [0 2 3 0 0 2 3]
P0232	 [0 2 3 2 0 2 3 2]

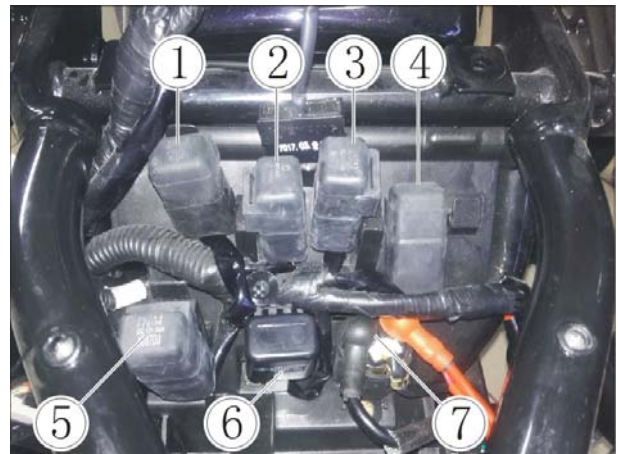
DETECTED CONDITION	POSSIBLE CAUSE
Refer to page [4-26]	<ul style="list-style-type: none"> Fuel pump relay circuit open or short. Fuel pump relay malfunction. ECU malfunction.

INSPECTION

- Remove the seat set and frame cover.
- Turn the ignition switch to the “OFF” position.
- Check the fuel pump relay coupler for loose or poor contacts.

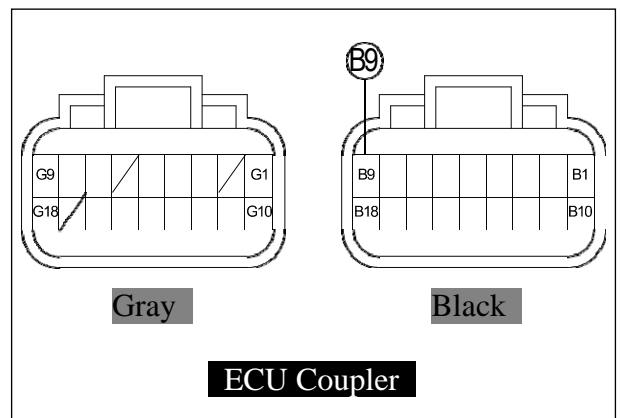
If OK, then check the insulation and continuity for details.

- ※ ①: Side stand relay ②: Main relay
 ③: Head lamp relay ④: Fan relay
 ⑤: Fuel pump relay ⑥: Turn signal relay
 ⑦: Starter relay

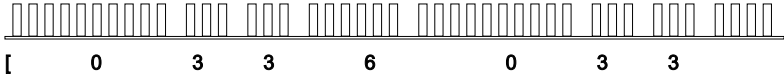
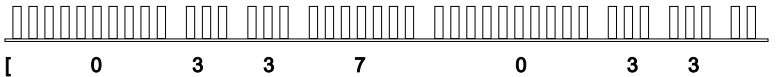


Is the Fuel pump relay OK?

YES	<ul style="list-style-type: none"> GW wire open or shorted to ground, or poor B9 connection of ECU coupler. If wire and connection are OK, intermittent trouble or faulty ECU. Recheck each terminal and wire harness for open circuit and poor connection. <ul style="list-style-type: none"> Inspect the fuel injectors. (Refer to page 60 [4-40])
NO	Replace the fuel pump relay with a new one.



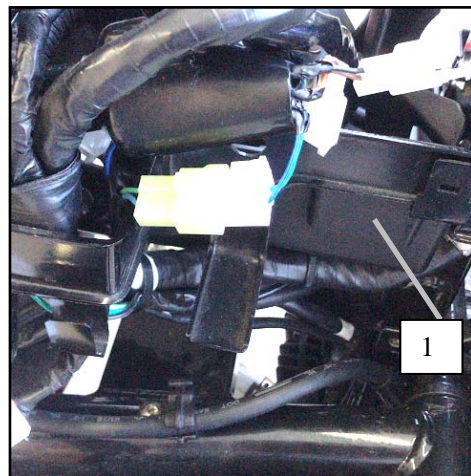
“P0336” or “P0337” PICK-UP COIL CIRCUIT MALFUNCTION

LCD (DISPLAY) INDICATION	ENGINE WARNING LAMP INDICATION
P0336	 [0.3 0.3 6.0 0.3 0.3]
P0337	 [0.3 0.3 7.0 0.3 0.3]

DETECTED CONDITION	POSSIBLE CAUSE
☞ Refer to page [4-26]	<ul style="list-style-type: none"> ● Metal particles or foreign material being attached on the pick-up coil and rotortip. ● Pick-up coil circuit open or short. ● Pick-up coil malfunction. ● ECU malfunction.

☐ INSPECTION

- 1) Remove the frame cover.
- 2) Turn the ignition switch to the “OFF” position.
- 3) Check the pick-up coil coupler ① for loose or poor contacts.
If OK, then measure the pick-up coil resistance.



- 4) Disconnect the pick-up coil coupler ① and measure the resistance.

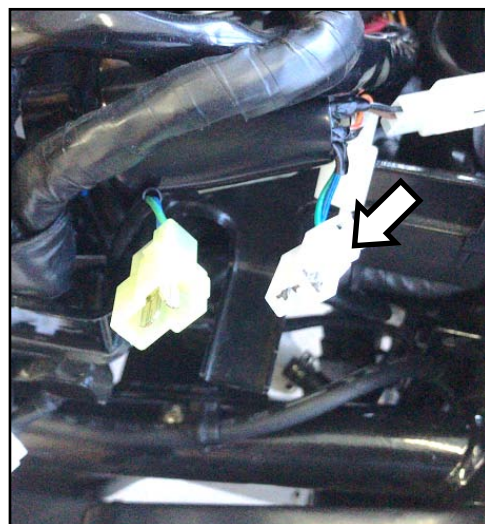
Pick-up coil resistance	Approx. 95 ~ 125 Ω (G - L)
--------------------------------	-------------------------------

 Tester knob indication : Resistance (Ω)

- 5) If OK, then check the continuity between each terminal and ground.

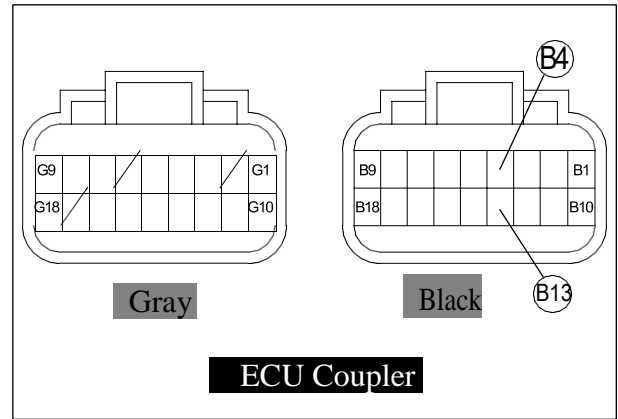
Pick-up coil continuity	∞ Ω (Infinity) (G - Ground) (L - Ground)
--------------------------------	---

 Tester knob indication: Resistance (Ω)





Are the resistance and continuity OK?

YES	<ul style="list-style-type: none"> ● L or G wire open or shorted to ground, or poor B13 or B4 connection of ECU coupler. ● If wire and connection are OK, intermittent trouble or faulty ECU. ● Recheck each terminal and wire harness for open circuit and poor connection.
NO	<ul style="list-style-type: none"> ● Loose or poor contacts on the pick-up coil coupler or ECU coupler. ● Replace the pick-up coil with a new one.

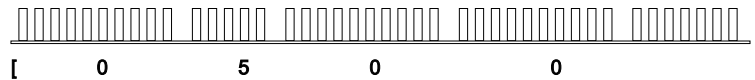


“P0351” or “P0352” IGNITION COIL MALFUNCTION

LCD (DISPLAY)INDICATION	ENGINE WARING LAMP INDICATION
<p>P0351</p>	 <p>0 3 5 1 0 3 5 1]</p>
<p>P0352</p>	 <p>0 3 5 2 0 3 5 2]</p>

☞ Refer to the IGNITION COIL for details.

“P0500” SPEEDO SENSOR MALFUNCTION

LCD (DISPLAY)INDICATION	ENGINE WARNING LAMP INDICATION
P0500	

DETECTED CONDITION	POSSIBLE CAUSE
☞ Refer to page [4-27]	<ul style="list-style-type: none"> • Speedo sensor circuit open and short • Speedo sensor malfunction. • ECU malfunction.

▣ INSPECTION

Step 1

- 1) Check the speedometer of the instrument panel
- 2) for works while driving the motorcycle

Is the speedo meter OK?

YES	Go to step2
NO	Replace the speedo sensor with a new one.

Step 2

- 1) Check the continuity between G wire of the speedo Sensor coupler(3 pins) ① and G 15 of the ECU coupler

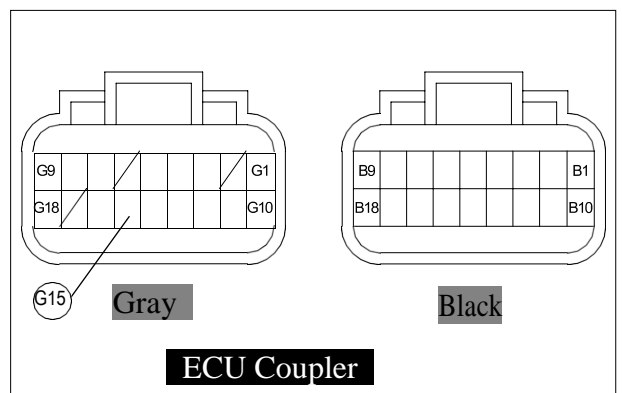
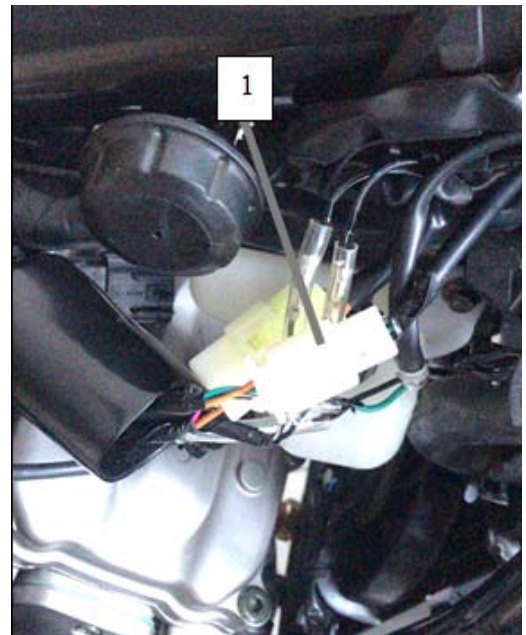
Is the speedo meter OK?

Speedo sensor continuity	0 Ω
---------------------------------	-----

 Tester knob indication: Resistance (Ω)

Is OK?

YES	If wire and connection are OK, Intermittent trouble or faulty ECU. Replace the speedo sensor or ECU with a new one.
NO	Recheck each terminal and wire harness for Open circuit and poor connection.



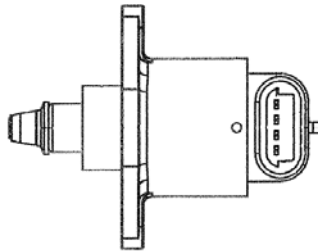
“P0505” ISC SOLENOID RANGE ABNORMAL

LCD (DISPLAY) INDICATION	ENGINE WARNING LAMP INDICATION
P0505	

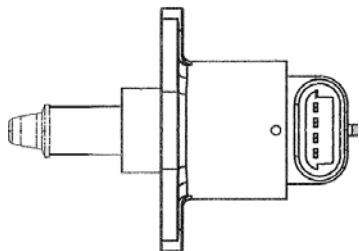
DETECTED CONDITION	POSSIBLE CAUSE
<p>☞ Refer to page [4-27]</p>	<ul style="list-style-type: none"> ● ISC solenoid malfunction. ● ISC solenoid's step is out of the specified range. ● ECU malfunction.

INSPECTION

- 1) Remove the fuel tank.
- 2) Turn the ignition switch to the “OFF” position.
- 3) Check the ISC solenoid coupler for loose or poor contacts.
- 4) Turn the ignition switch “ON” position to check the ISC solenoid operation.



[When Ignition switch “OFF”]

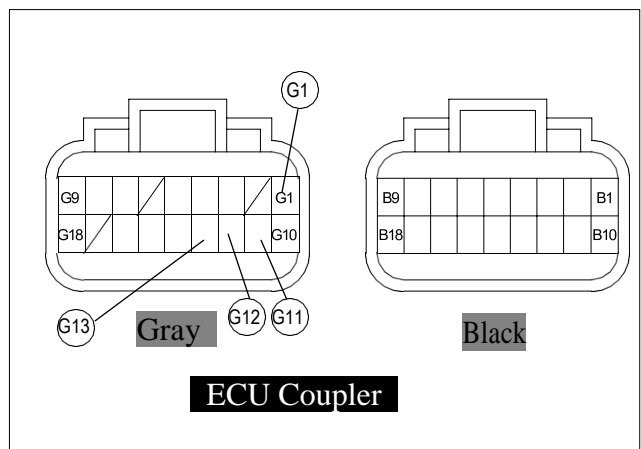


[When Ignition switch “ON”]





Is OK?

YES	<ul style="list-style-type: none"> ● LY, G, BBr or YL wire loose or poor contacts on the ISC solenoid coupler, or poor G13 , G12 , G11 or ● G1 connection of ECU coupler. ● If wire and connection are OK, intermittent trouble or faulty ECU. ● Recheck each terminal and wire harness for open circuit and poor connection.
NO	Replace the ISC solenoid with a new one.



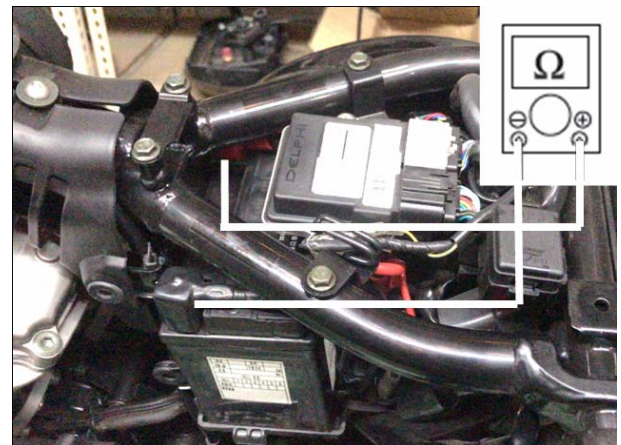
“P0562” or “P0563” BATTERY VOLTAGE MALFUNCTION

LCD (DISPLAY)INDICATION	ENGINE WARNING LAMP INDICATION
P0562	 [0 5 6 2 0 5]
P0563	 [0 5 6 3 0 5]

DETECTED CONDITION	POSSIBLE CAUSE
<p>☞ Refer to page [4-27]</p>	<ul style="list-style-type: none"> ● Battery voltage circuit open and short. ● Battery malfunction. ● ECU malfunction.

☐ INSPECTION

- 1) Remove the front seat.
- 2) Turn the ignition switch to the “OFF” position.
- 3) Using the pocket tester, measure the DC voltage between the battery ⊕ and ⊖ terminal.

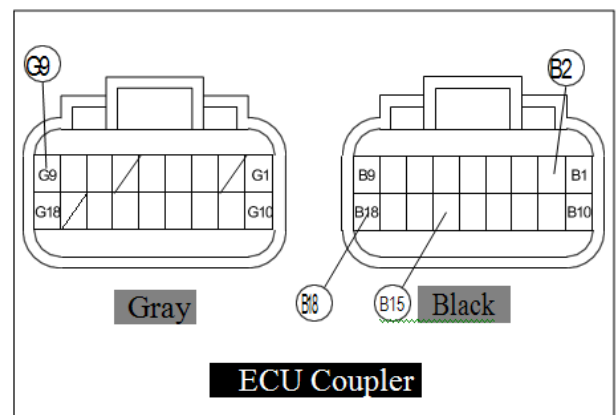


Battery voltage	11 ~ 16 V
-----------------	-----------

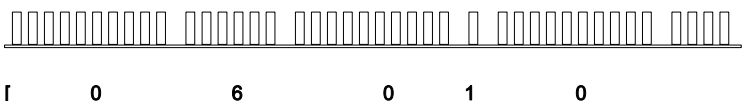
🔌 Tester knob indication: Voltage (V)

Is the battery voltage OK

YES	<ul style="list-style-type: none"> • OB, BW, BW or RB wire open or shorted to ground, or poor B15, G9, B2 or B18 connection of ECU coupler. • If wire and connection are OK, Intermittent trouble or faulty ECU. • Recheck each terminal and wire harness for open circuit and poor connection.
NO	Replace the battery with a new one.



“P0601” ECU FAULT

LCD (DISPLAY)INDICATION	ENGINE WARNING LAMP INDICATION
<p>P0601</p>	

DETECTED CONDITION	POSSIBLE CAUSE
<p>☞ Refer to page [4-27]</p>	<ul style="list-style-type: none"> ● ECU error

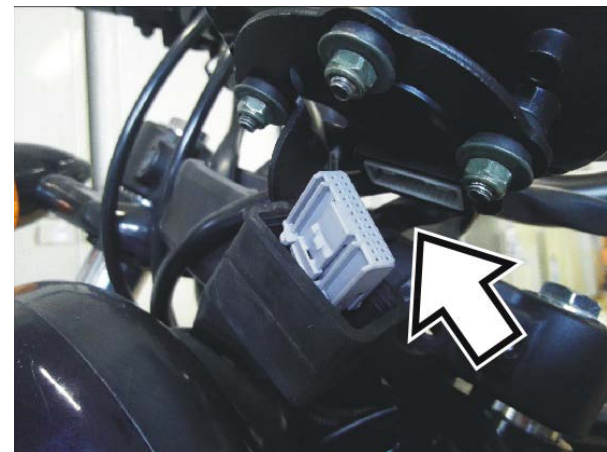
“P0650” ENGINE WARNING LAMP CIRCUIT MALFUNCTION

LCD (DISPLAY) INDICATION	ENGINE WARNING LAMP INDICATION
P0650	

DETECTED CONDITION	POSSIBLE CAUSE
<p>☞ Refer to page [4-27]</p>	<ul style="list-style-type: none"> ● Engine warning lamp circuit open and short. ● Engine warning lamp malfunction. ● ECU malfunction.

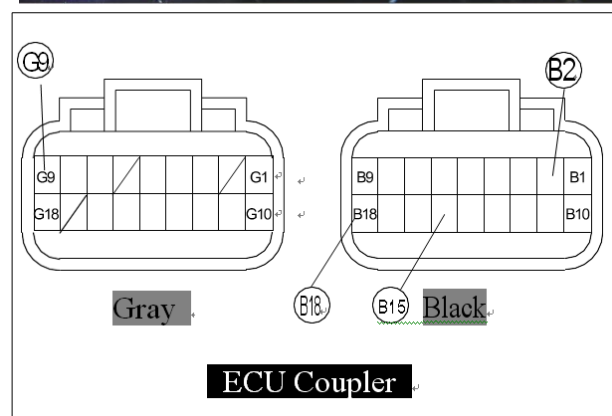
▣ INSPECTION

- 1) Turn the ignition switch to the “OFF” position.
- 2) Disconnect the instrument panel lead wires.
- 3) Connect the battery ⊕ terminal to the **R/W** wire and **O** wire of the instrument panel and the battery ⊖ terminal to the **BW** wire of the instrument panel. And then connect the **LY** wire of the instrument panel to the battery ⊖ terminal directly.



Is the engine warning lamp lit?

YES	<ul style="list-style-type: none"> ● LY or OB wire open or shorted to ground or poor G3 or B15 connection of ECU coupler. ● If wire and connection are OK, intermittent trouble or faulty ECU. ● Recheck each terminal and wire harness for open circuit and poor connection.
NO	Replace the instrument panel with a new one.



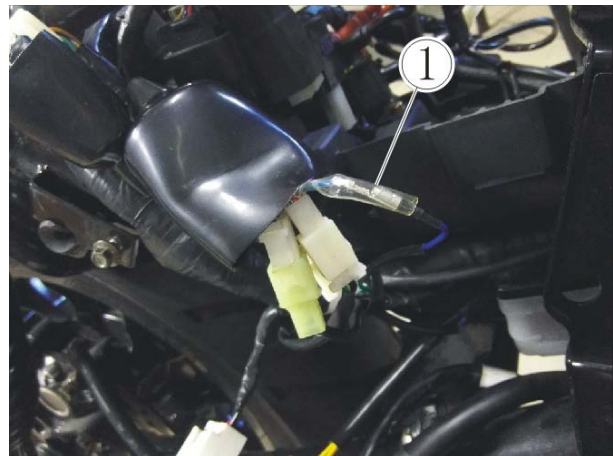
“P0850” GP or CLUTCH LEVER SWITCH CIRCUIT MALFUNCTION

LCD (DISPLAY) INDICATION	ENGINE WARNING LAMP INDICATION
P0850	

DETECTED CONDITION	POSSIBLE CAUSE
<p>➔ Refer to page [4-27]</p>	<ul style="list-style-type: none"> ● GP switch circuit open or short. ● GP switch malfunction. ● Clutch lever switch circuit open or short. ● Clutch lever switch malfunction. ● ECU malfunction.

▣ INSPECTION

- 1) Remove the side cover Rh.
- 2) Turn the ignition switch to the “OFF” position.
- 3) Check the GP switch and clutch lever switch coupler for loose or poor contacts.
If OK, then measure the GP switch and the clutch lever switch resistance.



- 4) Park the motorcycle on a firm, flat surface vertically.
- 5) Disconnect the GP switch coupler ① and then check the continuity between L wire and ground when gearshift lever is shifted from the neutral state.

GP switch continuity	0Ω (L - Ground)
-----------------------------	---------------------------

Tester knob indication: Resistance (Ω)

1) Disconnect the clutch lever switch coupler ② and then check the continuity between GR wire and Br wire when the squeezing the clutch lever.

Clutch lever switch continuity	0 Ω (GR – Br)
---------------------------------------	------------------

 **Tester knob indication: Resistance (Ω)**



1) Measure the voltage between G18 of the ECU and the LY wire of the wiring harness's GP switch coupler, and measure the voltage between G18 of the ECU and the GR wire of the wiring harness's clutch lever switch coupler.

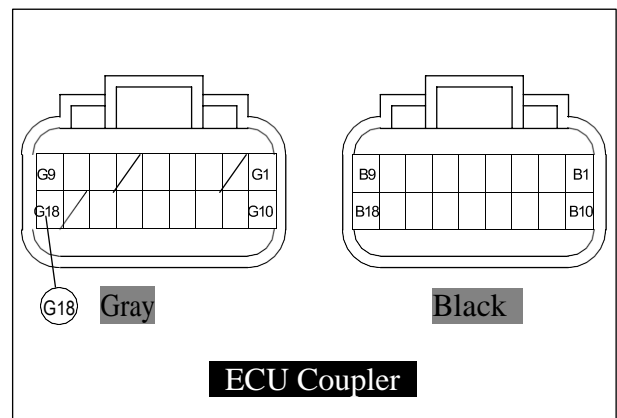
If the measurement is out of 0.4 ~ 0.7 V, replace the DIODE #3 with a new one

 **Tester knob indication: Diode test(←→)**



Is OK?

YES	<ul style="list-style-type: none"> ● If wire and connection are OK, intermittent trouble or faulty ECU. ● Recheck each terminal and wire harness for open circuit and poor connection.
NO	Replace the GP switch or Clutch lever switch with a new one.



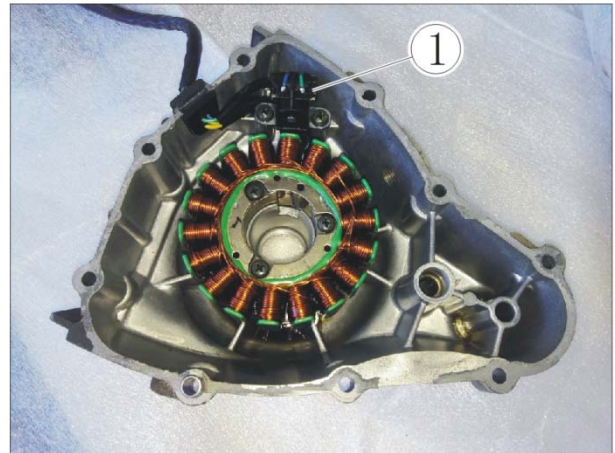
SENSORS

⊙ PICK-UP COIL INSPECTION

The pick-up coil ① is installed in the magneto cover.
(Refer to page [4-43])

⊙ PICK-UP COIL REMOVAL AND INSTALLATION

- Remove the magneto cover.
- Install the magneto cover in the reverse order of removal.



⊙ IAP&T SENSOR INSPECTION

The intake air pressure (IAP&T) sensor ② is installed at the rear intake pipe.
(Refer to page [4-30])

⊙ IAP&T SENSOR REMOVAL AND INSTALLATION

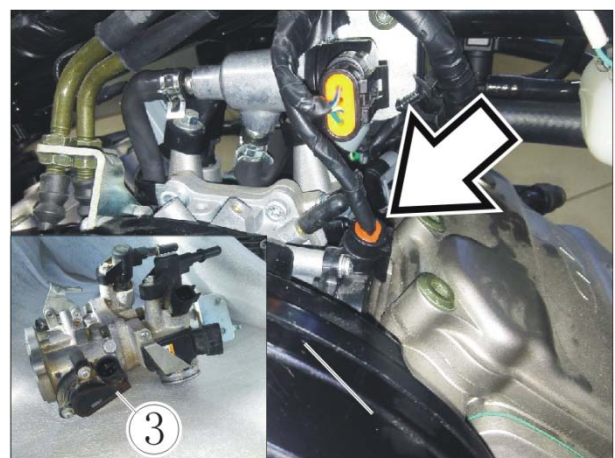
- Remove the fuel tank.
- Remove the IAP&T sensor from the rear intake pipe.
- Install the IAP&T sensor in the reverse order of removal.



⊙ TP SENSOR INSPECTION

The throttle position (TP) sensor ③ is installed at the front throttle body. (Refer to page 57 [4-36])

⊙ TP SENSOR REMOVAL AND INSTALLATION



 CAUTION

Never remove or adjust the TP sensor.


⊙ WT SENSOR INSPECTION

The engine temperature (WT) sensor ① is installed at the thermostat case.

(Refer to page [4-34])

⊙ WT SENSOR REMOVAL AND INSTALLATION

- Remove the WT sensor.
- Install the WT sensor in the reverse order of removal.

 WT sensor: 5~8N – m (0.5~0.8kgf – m)



⊙ RO SWITCH REMOVAL AND INSTALLATION

The roll over (RO) switch ② is located in the downside of the front seat striker.

- Remove the front seat.
- Remove the RO switch from the frame.
- Install the RO switch in the reverse order of removal.

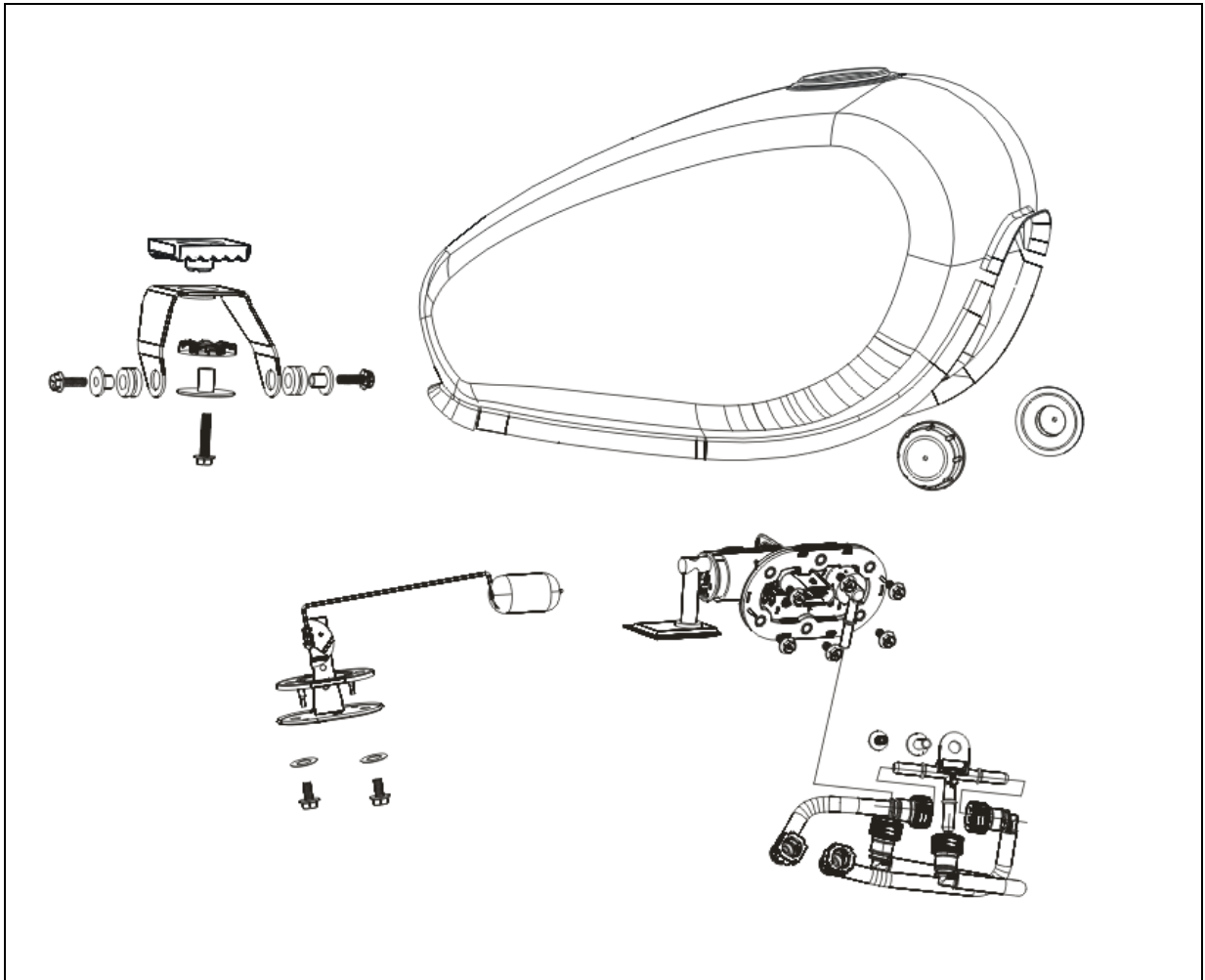


FUEL SYSTEM AND THROTTLE BODY

CONTENTS

FUEL SYSTEM.....	5-2
REMOVAL AND DISASSEMBLY.....	5-2
REASSEMBLY AND INSTALLATION.....	5-3
FUEL PRESSURE INSPECTION.....	5-4
FUEL PUMP RELAY INSPECTION.....	5-4
FUEL MESH FILTER INSPECTION AND CLEANING.....	5-6
FUEL GAUGE INSPECTION.....	5-7
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CLEANING.....	5-10
INSPECTION.....	5-10
INSTALLATION.....	5-10

FUEL SYSTEM



 CAUTION

Gasoline must be handled carefully in an area well ventilated and away from fire or sparks.

REMOVAL AND DISASSEMBLY

WARNING

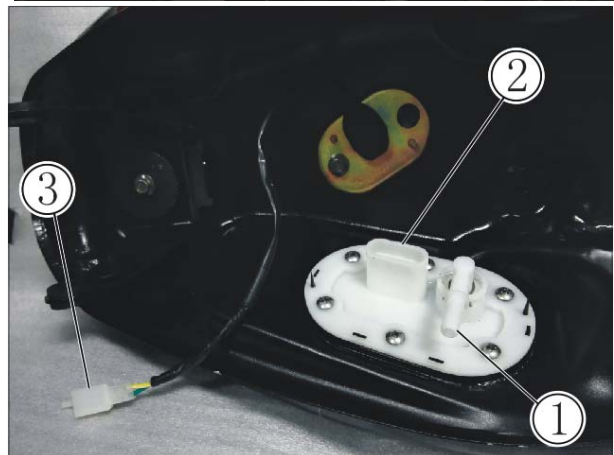
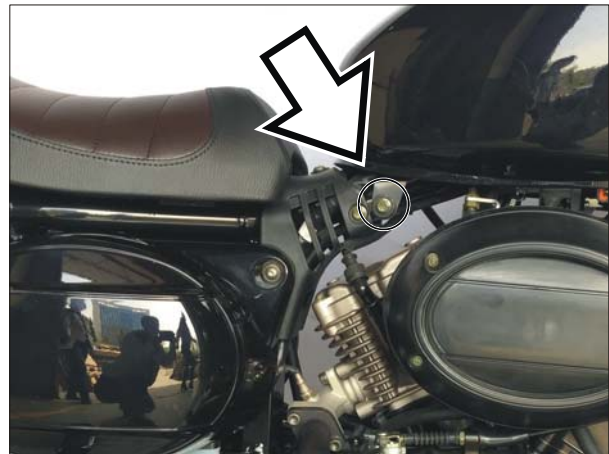
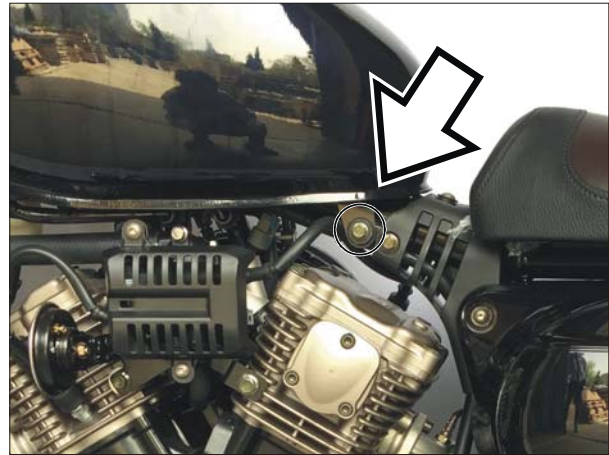
Gasoline is very explosive. Extreme care must be taken.

- Drain the fuel.
- Remove the fuel tank mounting bolts.

- Disconnect the fuel injector hose①.
- Disconnect the fuel pump lead wire coupler② and fuel sender gauge coupler wire coupler③.

CAUTION

After disconnecting the fuel injector hose ①, insert a blind plug into the end to stop fuel leakage.



- Remove the fuel tank.

CAUTION

As gasoline leakage may occur in this operation, keep away from fire and sparks.

- Remove the fuel sensors mounting bolts.
- Remove the fuel sensor.
- Remove the fuel pump mounting screws.
- Remove the fuel pump.

WARNING

- ❖ Gasoline is highly flammable and explosive.
- ❖ Keep heat, spark and flame away.



REASSEMBLY AND INSTALLATION

Reassembly and installation the fuel tank in the reverse order of removal and disassembly.

- When installing the fuel pump assembly, first tighten all the fuel pump assembly mounting bolts lightly in diagonal stages, and then tighten them in the above tightening order.



NOTE

Apply a small quantity of the **THREAD LOCK** to the thread portion of the fuel pump mounting bolt.



THREAD LOCK

FUEL PRESSURE INSPECTION

- Place a rag under the fuel injector hose.
- Disconnect the fuel injector hose from the fuel hose joint.
- Install the special tool between the fuel tank and fuel hose joint.

Fuel pump pressure gauge
: 09915-54510

Turn the ignition switch to the “ON” position and check the fuel pressure.

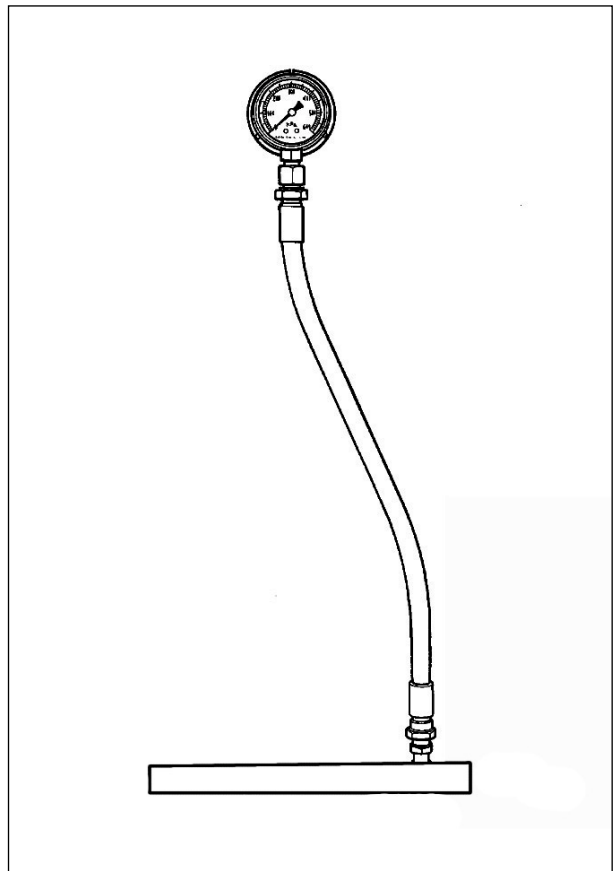
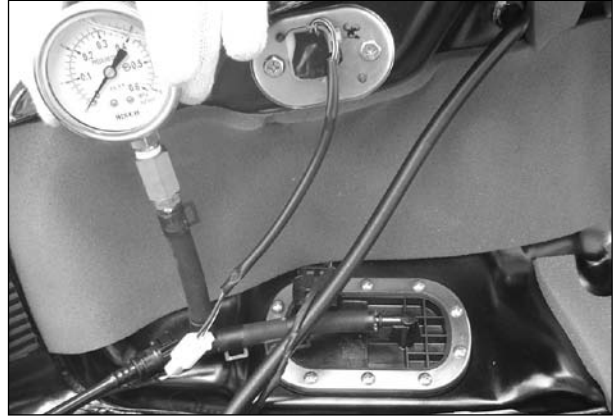
Fuel pressure of fuel pump	Approx. 2.44 ~ 2.54 kgf/cm ² (240 ~ 250 kPa, 34.8 ~ 36.2 psi)
-----------------------------------	---

If the fuel pressure is lower than the specification, inspect the following items :

- * Fuel hose leakage
- * Clogged fuel filter
- * Pressure regulator
- * Fuel pump

If the fuel pressure is higher than the specification, inspect the following items :

- * Fuel pump check valve
- * Pressure regulator



⚠ WARNING

- ❖ Before removing the special tool, turn the ignition switch to the “OFF” position and release the fuel pressure slowly.
- ❖ Gasoline is highly flammable and explosive. Keep heat, sparks and flame away.

FUEL PUMP RELAY INSPECTION

GV125S’s fuel pump relay is located inside the right side cover.

- Remove the right side cover.
- Remove the fuel pump relay **A**.



First, check the insulation between ① and ② terminals with the pocket tester. Then apply 12 volts to ③ and ④ terminals, ⊕ to ③ and ⊖ to ④, and check the continuity between ① and ②.

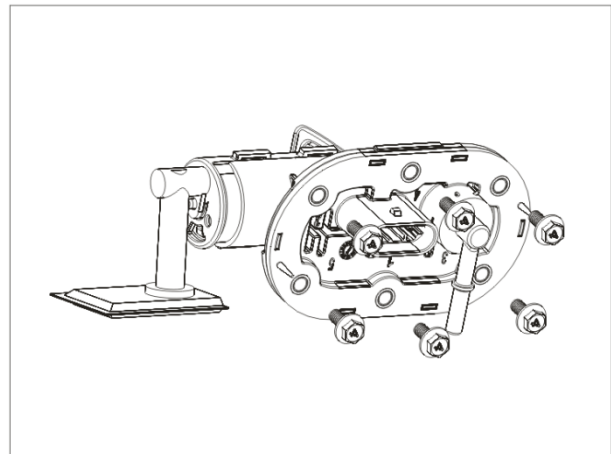
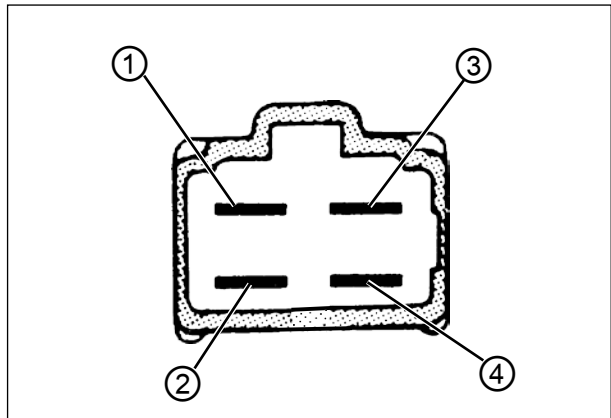
If there is no continuity, replace it with a new one.

FUEL MESH FILTER INSPECTION AND CLEANING

- If the fuel mesh filter is clogged with sediment or rust, fuel will not flow smoothly and loss in engine power may result.
- Blow the fuel mesh filter with compressed air.

NOTE

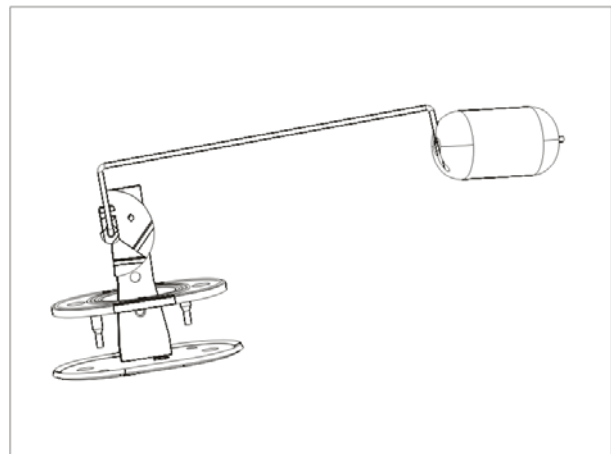
If the fuel mesh filter is clogged with many sediment or rust, replace the fuel filter cartridge with a new one.



FUEL GAUGE INSPECTION

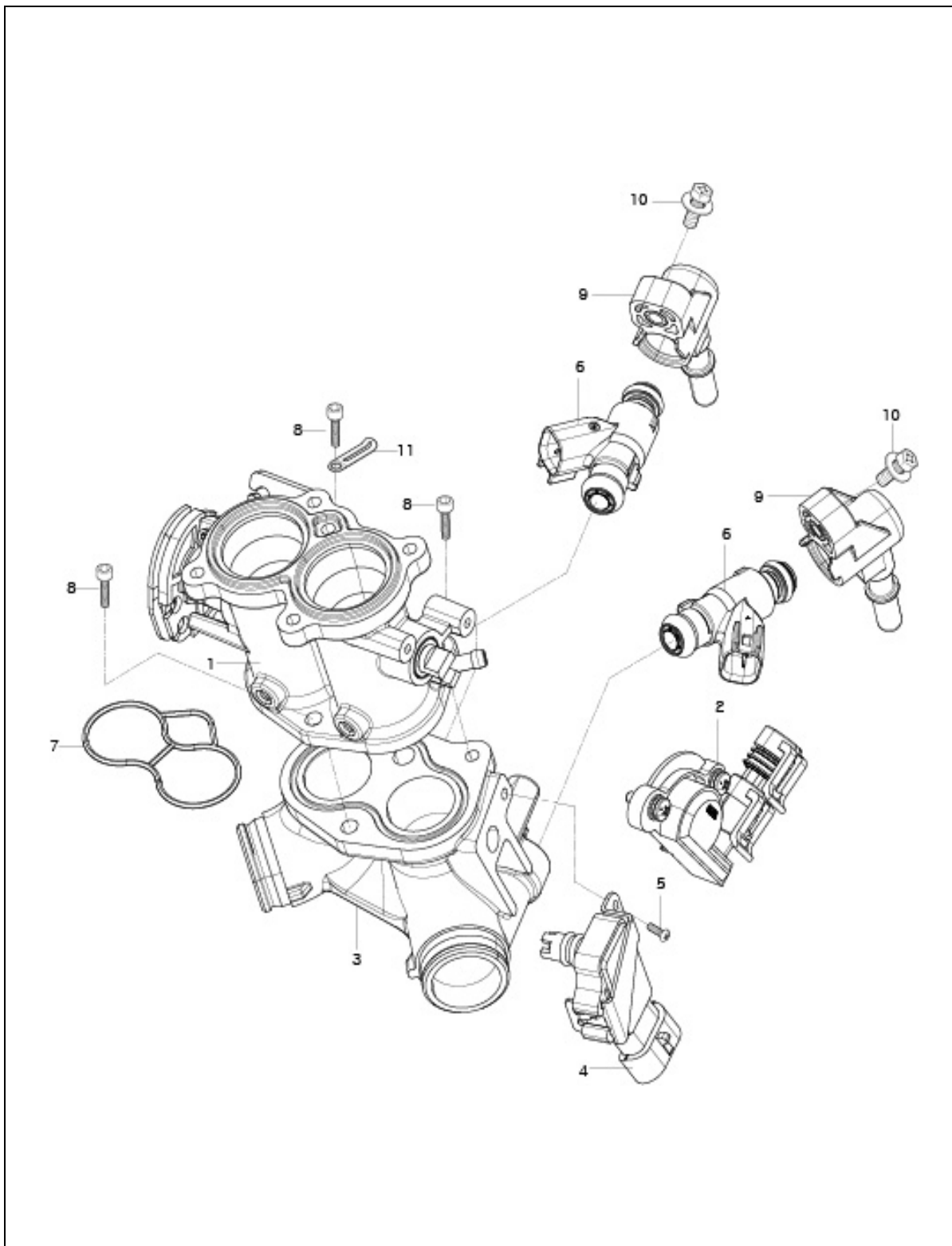
- Measure resistance between the terminals when float is at the position instead below.

Fuel float position	Resistance between terminals
F	Approx. 90 ~ 100 Ω
1/2	Approx. 65 Ω
E	Approx. 4 ~ 10 Ω



- If the resistance measured is out of the specification, replace the fuel gauge with a new one.
- Inspect the instrument panel (fuel level meter).

THROTTLE BODY

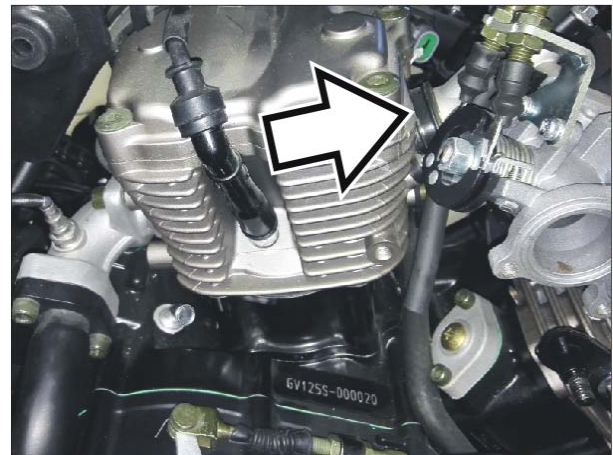


REMOVAL

- Remove the fuel tank.
- Remove the air cleaner chamber.
- Disconnect the fuel hoses.
- Remove the all couplers connected to the throttle body.



- Loosen the throttle body clamp screws.



- Disconnect the throttle cables from their drum.
- Dismount the throttle body assembly.

CAUTION

- ❖ Be careful not to damage the throttle cable bracket when dismounting or remounting the throttle body assembly.
- ❖ After disconnecting the throttle cables, do not snap the throttle valve from full open to full close. It may cause damage to the throttle valve and throttle body.

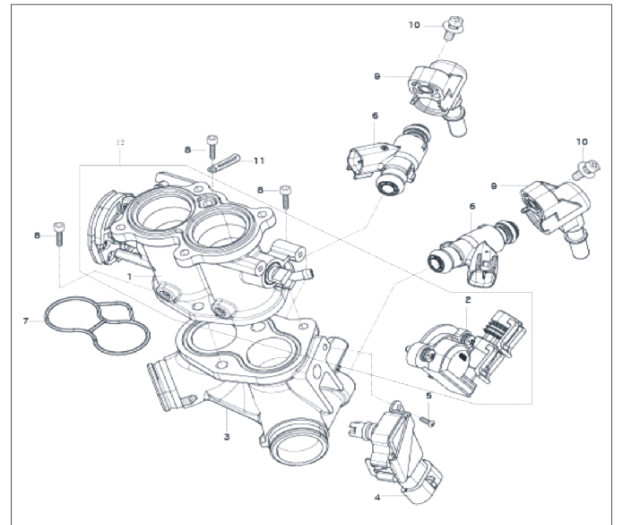


LEANING

- Clean all passageways with a spray-type throttle body cleaner and blow dry with compressed air.

WARNING

Some throttle body cleaning chemicals, especially dip-type soaking solutions, are very corrosive and must be handled carefully. Always follow the chemical manufacturer's instructions on proper use, handling and storage.



CAUTION

Do not use wire to clean passageways. Wire can damage passageways. If the components cannot be cleaned with a spray cleaner it may be necessary to use a dip-type cleaning solution and allow them to soak. Always follow the chemical manufacturer's instructions for proper use and cleaning of the throttle body components. Do not apply throttle body cleaning chemicals to the rubber and plastic materials.


INSPECTION

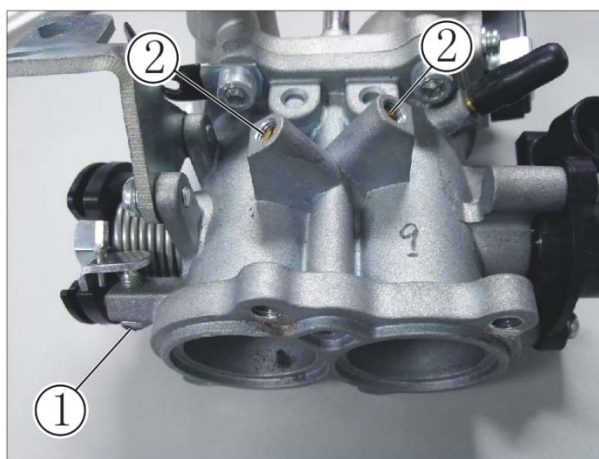
- Check following items for any damage or clogging.
 - * O-ring
 - * Throttle shaft bushing and seal
 - * Injector cushion seal
 - * Fuel injector
 - * Throttle body
 - * Intake pipe
 - * Throttle valve
 - * Vacuum hose

Check fuel injector filter for evidence of dirt and contamination. If present, clean and check for presence of dirt in the fuel lines and fuel tank.

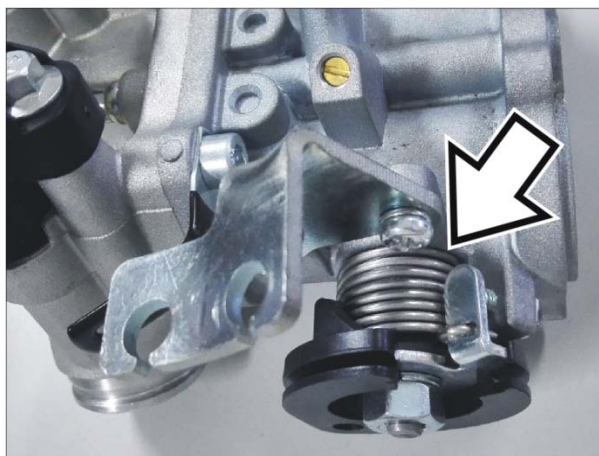
INSTALLATION

Installation is in the reverse order of removal. Pay attention to the following points :

 CAUTION
<p>Never operate the idle nuts ① and ② to avoid variations of the ECU setting.</p>



- Connect the throttle cable to the throttle cable drum.
- Adjust the throttle cable play with the cable adjuster.

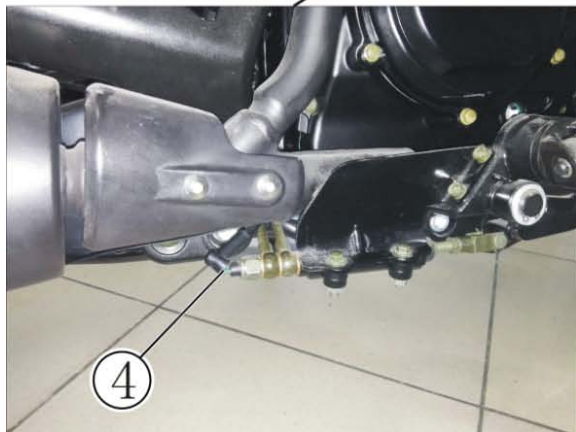
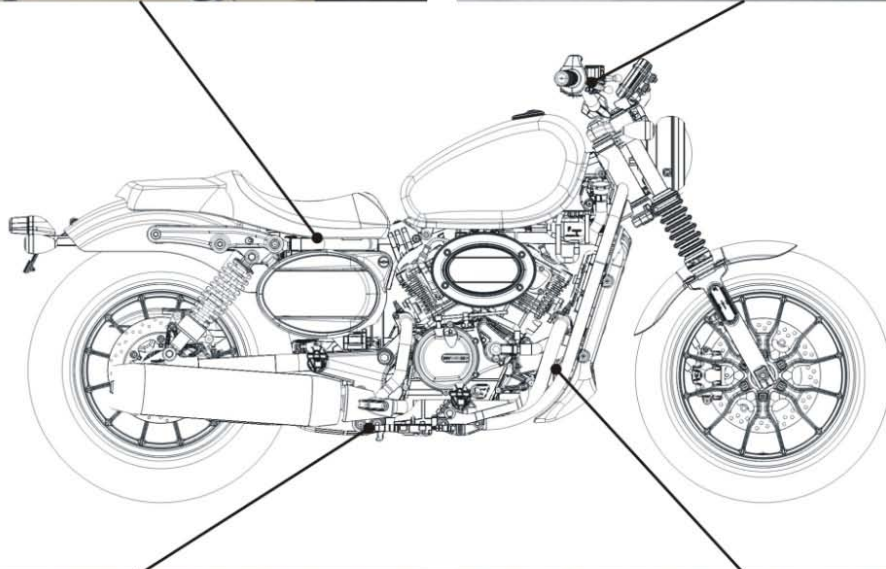
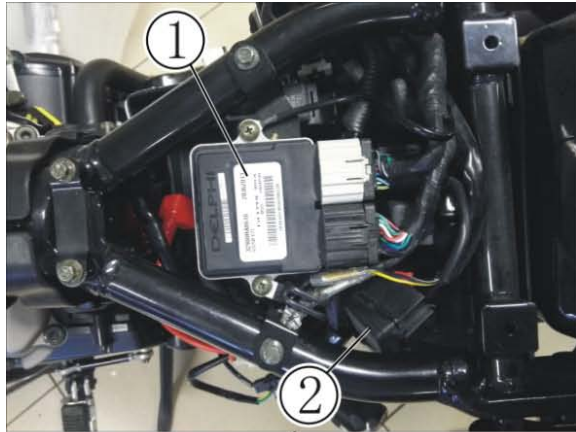


ELECTRICAL SYSTEM

CONTENTS

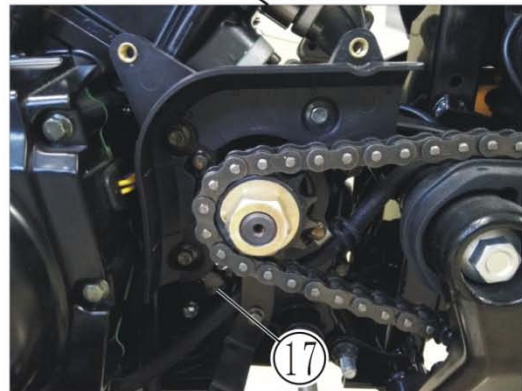
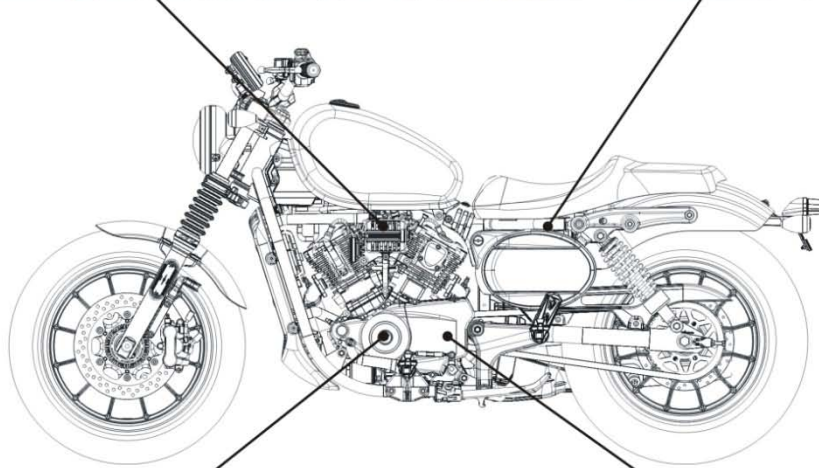
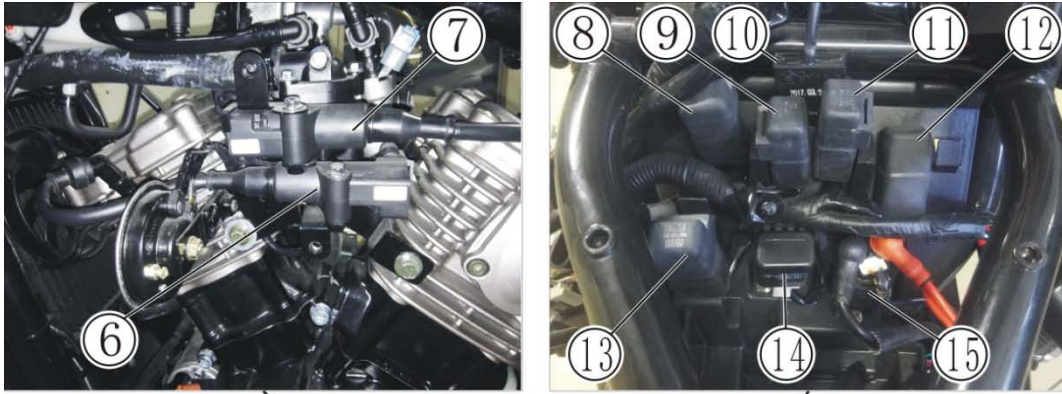
<i>LOCATION OF ELECTRICAL COMPONENTS.....</i>	6-2
<i>IGNITION SYSTEM.....</i>	6-4
<i>CHARGING SYSTEM.....</i>	6-8
<i>STARTER SYSTEM AND SIDE STAND.....</i>	6-12
<i>IGNITION INTERLOCK SYSTEM.....</i>	6-4
<i>SWITCHES.....</i>	6-16
<i>LAMP.....</i>	6-17
<i>BATTERY.....</i>	6-19

LOCATION OF ELECTRICAL COMPONENTS



①	ECU	②	Fuse	③	Front brake lamp switch
④	Rear brake lamp switch	⑤	Starter motor		

6-3 ELECTRICAL SYSTEM

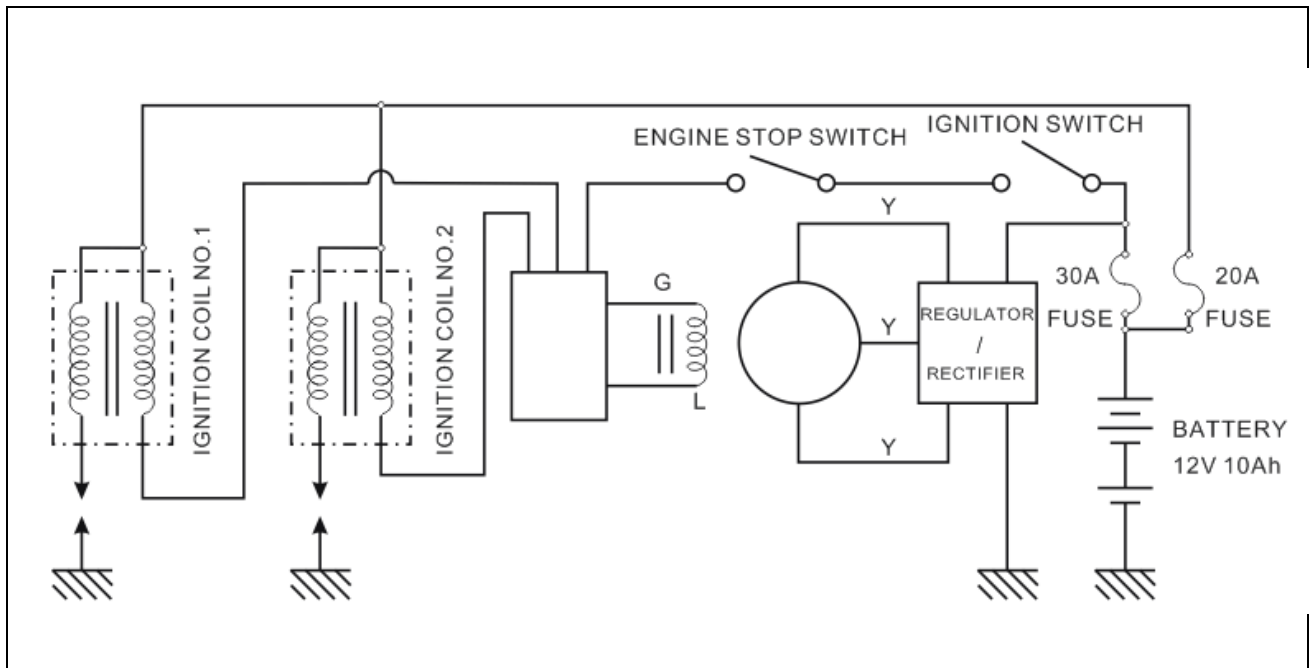


①	Ignition coil (NO.1 FRONT)	②	Ignition coil (NO.2 REAR)	③	Side stand relay
④	Main relay	⑤	(RO) switch	⑥	Head lamp relay
⑦	Fan relay	⑧	Fuel pump relay	⑨	Turn signal relay
⑩	Starter relay	⑪	Magneto	⑫	Gear position switch

CAUTION

Be sure not to misassemble the position of battery plus & minus terminal.

IGNITION SYSTEM



- **INSPECTION**
- **MAGNETO**
- Using the pocket tester, measure the resistance between the lead wires in the following table.
- If the resistance is not within the specified value, replace the stator coil, with a new one.

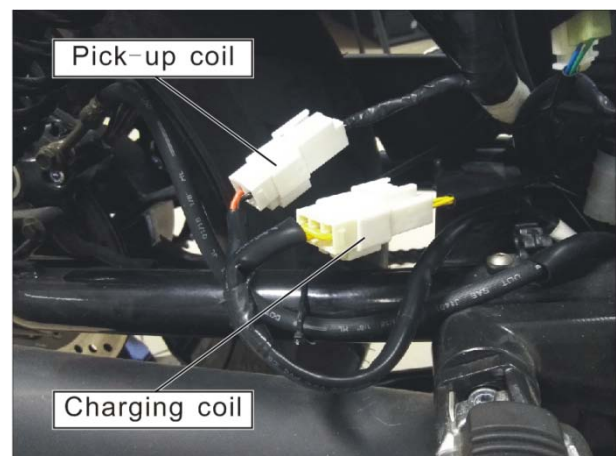
Stator coil resistance	Standard
Pick-up coil	G-L Approx. 95 ~ 125 Ω
Charging coil	Y-Y Approx. 0.3 ~ 0.6 Ω



Pocket Tester : 09900-25002



Tester knob indication : Resistance(Ω)



NOTE

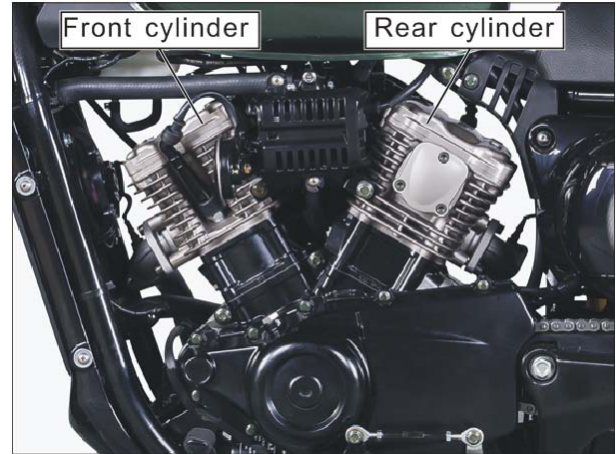
When making above test, it is not necessary to remove the magneto.

IGNITION COIL PRIMARY PEAK VOLTAGE INSPECTION

- Remove the fuel tank and frame cover.
- Disconnect the two spark plug caps.
- With the spark plug cap connected, place a new spark plug on the engine to ground it.

NOTE

- ❖ Check that all the couplers are connected.
- ❖ Check that the all battery is fully charged.

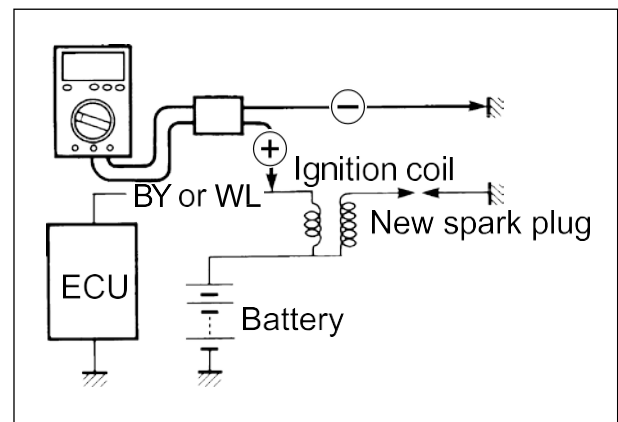


Measure the No.1 and No.2 ignition coil primary peak voltage using the tester in the following procedure.

- Connect the tester as follows.

NO.1 Ignition coil	
⇒ ⊕	Probe : BY lead wire terminal
⊖	Probe : Ground

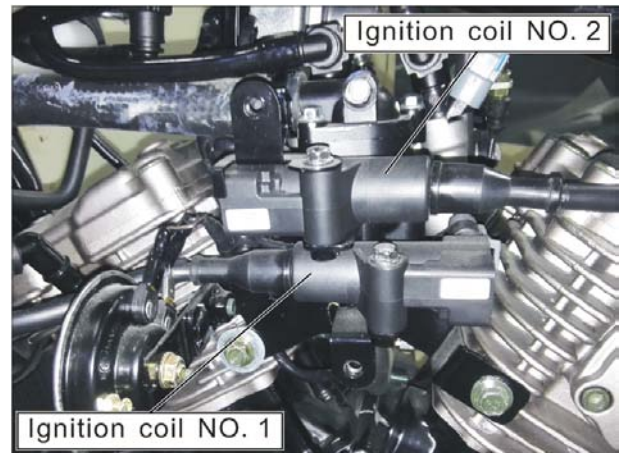
NO.2 Ignition coil	
⇒ ⊕	Probe : WL lead wire terminal
⊖	Probe : Ground



NOTE

Do not disconnect the ignition coil / plug cap lead wire couplers.

- Shift the transmission into the neutral and then turn the ignition switch to the “ON” position.
- Squeeze the clutch lever.
- Press the starter switch and allow the engine to crank for a few seconds, and then measure the ignition coil primary peak voltage.
- Repeat the above procedure a few times and measure the highest ignition coil primary peak voltage.



Ignition coil primary peak voltage	400 V and more
---	----------------

TOOL Pocket tester : 09900-25002

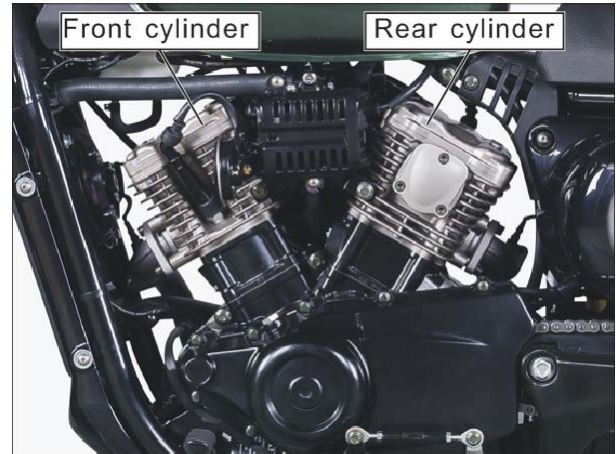
Tester knob indication : Voltage (---)

IGNITION COIL PRIMARY PEAK VOLTAGE INSPECTION

- Remove the fuel tank and frame cover.
- Disconnect the two spark plug caps.
- With the spark plug cap connected, place a new spark plug on the engine to ground it.

NOTE

- ❖ Check that all the couplers are connected.
- ❖ Check that the all battery is fully charged.

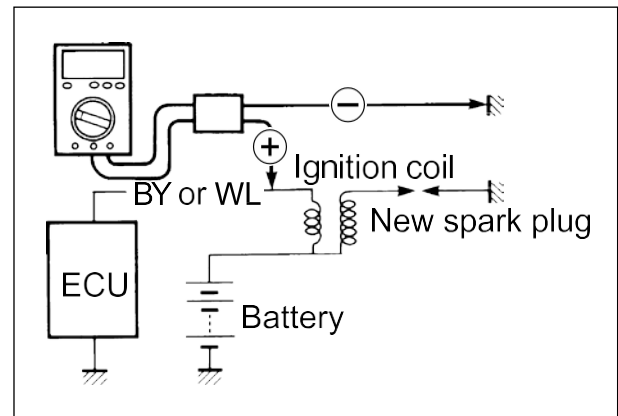


Measure the No.1 and No.2 ignition coil primary peak voltage using the tester in the following procedure.

- Connect the tester as follows.

NO.1 Ignition coil	
⇒ ⊕	Probe : BY lead wire terminal
⇒ ⊖	Probe : Ground

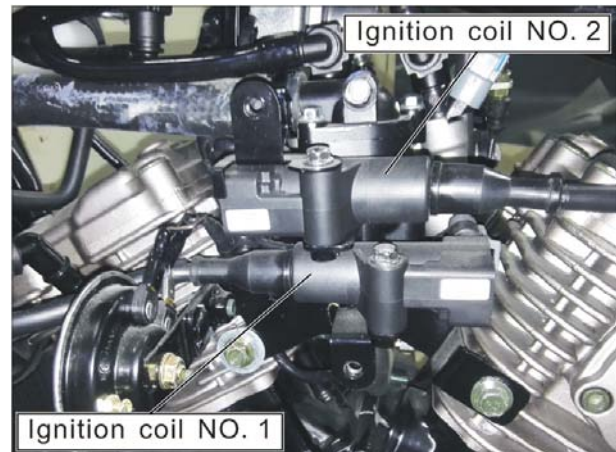
NO.2 Ignition coil	
⇒ ⊕	Probe : WL lead wire terminal
⇒ ⊖	Probe : Ground



NOTE

Do not disconnect the ignition coil / plug cap lead wire couplers.

- Shift the transmission into the neutral and then turn the ignition switch to the “ON” position.
- Squeeze the clutch lever.
- Press the starter switch and allow the engine to crank for a few seconds, and then measure the ignition coil primary peak voltage.
- Repeat the above procedure a few times and measure the highest ignition coil primary peak voltage.



Ignition coil primary peak voltage	400 V and more
---	----------------

TOOL Pocket tester : 09900-25002

Tester knob indication : Voltage (V)

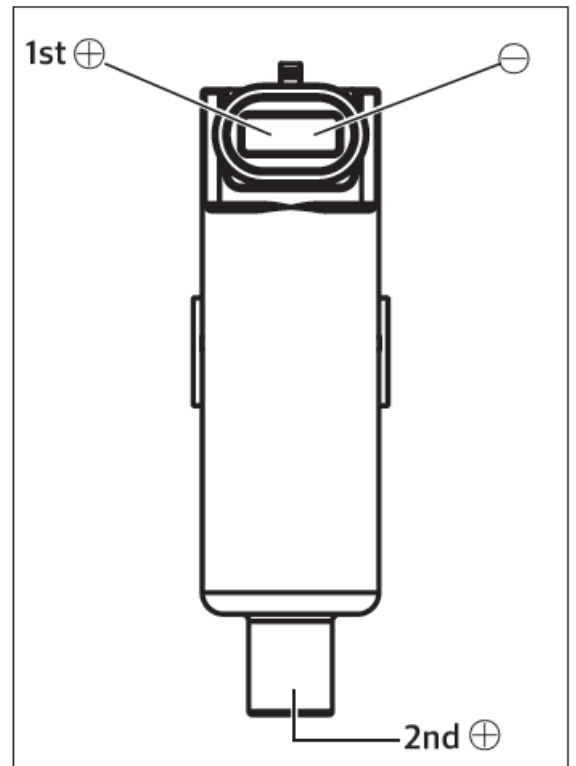
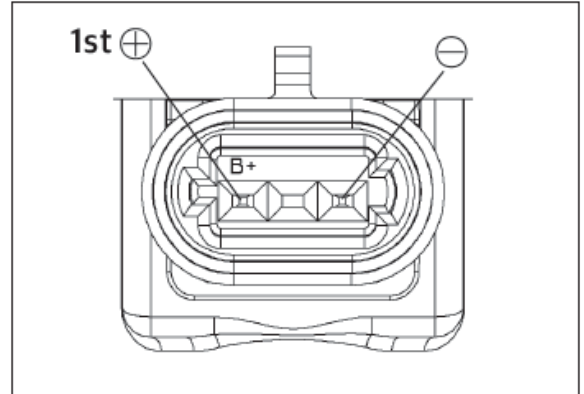
⚠ WARNING

While testing, do not touch the tester probes and sparkplugs to prevent receiving an electric shock.

If the peak voltage is lower than the specified values, inspect the ignition coil. (Refer to the next page.)

■ I GNITION COIL RESISTANCE INSPECTION

- Remove the fuel tank. (Refer to page 5-2)
 - Disconnect the ignition coil read wire.
- Measure the ignition coil resistance in bolt the primary and secondary windings. If the resistance is not within the standard range, replace the ignition coil with a new one.

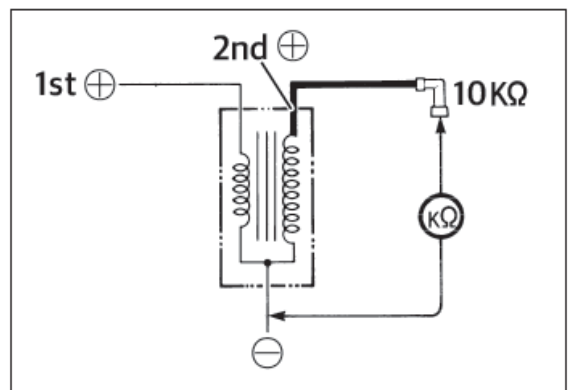


IGNITION COIL RESISTANCE	
Primary	0.52 ~ 0.64 Ω (1st ⊕ Terminal - ⊖ Terminal)
Secondary	6.4 ~ 7.8 KΩ (2nd ⊕ Terminal - ⊖ Terminal)

- TOOL** Pocket tester : 09900-25002
- Tester knob indication : Resistance (Ω)**

Spark plug cap resistance	10 KΩ
---------------------------	-------

Ignition coil secondary / Spark plug cap resistance (spark plug cap - ⊖ Terminal)	16.4 ~ 17.8 KΩ
---	----------------



■ SPARK PLUG

▷ CARBON DEPOSITS

Check to see if there are carbon deposits on the spark plug.

If carbon is deposited, remove it with a spark plug cleaner machine or carefully use a tool with a pointed end.

▷ SPARK PLUG GAP

Measure the spark plug gap with a thickness gauge. If the spark plug gap is out of specification, adjust the gap.

Spark plug gap

**0.7 ~ 0.8 mm
(0.028 ~ 0.032 in)**



Thickness gauge : 09900-20806

▷ ELECTRODE'S CONDITION

Check to see the worn or burnt condition of the electrodes.

If it is extremely worn or burnt, replace the spark plug. Replace the spark plug if it has a broken insulator, damaged thread, etc.



CAUTION

Use recommended spark plug only.

A spark plug of the wrong rating may shorten engine life and cause loss of performance.

▷ SPARK PLUG INSTALLATION



CAUTION

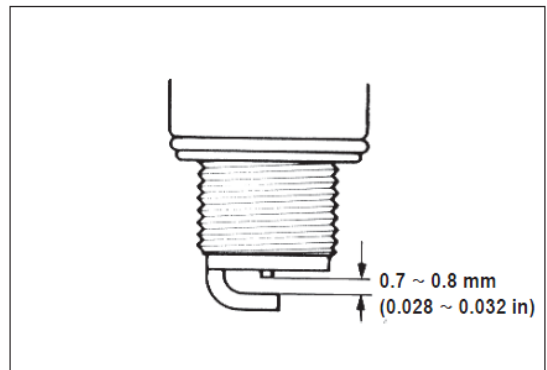
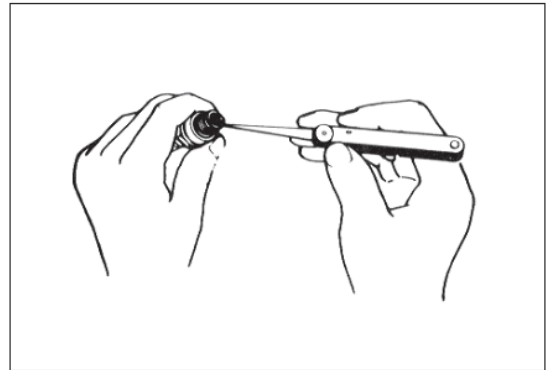
Before tightening the spark plug to the specified torque, carefully turn the spark plug by finger into the threads of the cylinder head to prevent damage the aluminum threads.

● First, finger tighten the spark plug, and then tighten them to the specified torque.

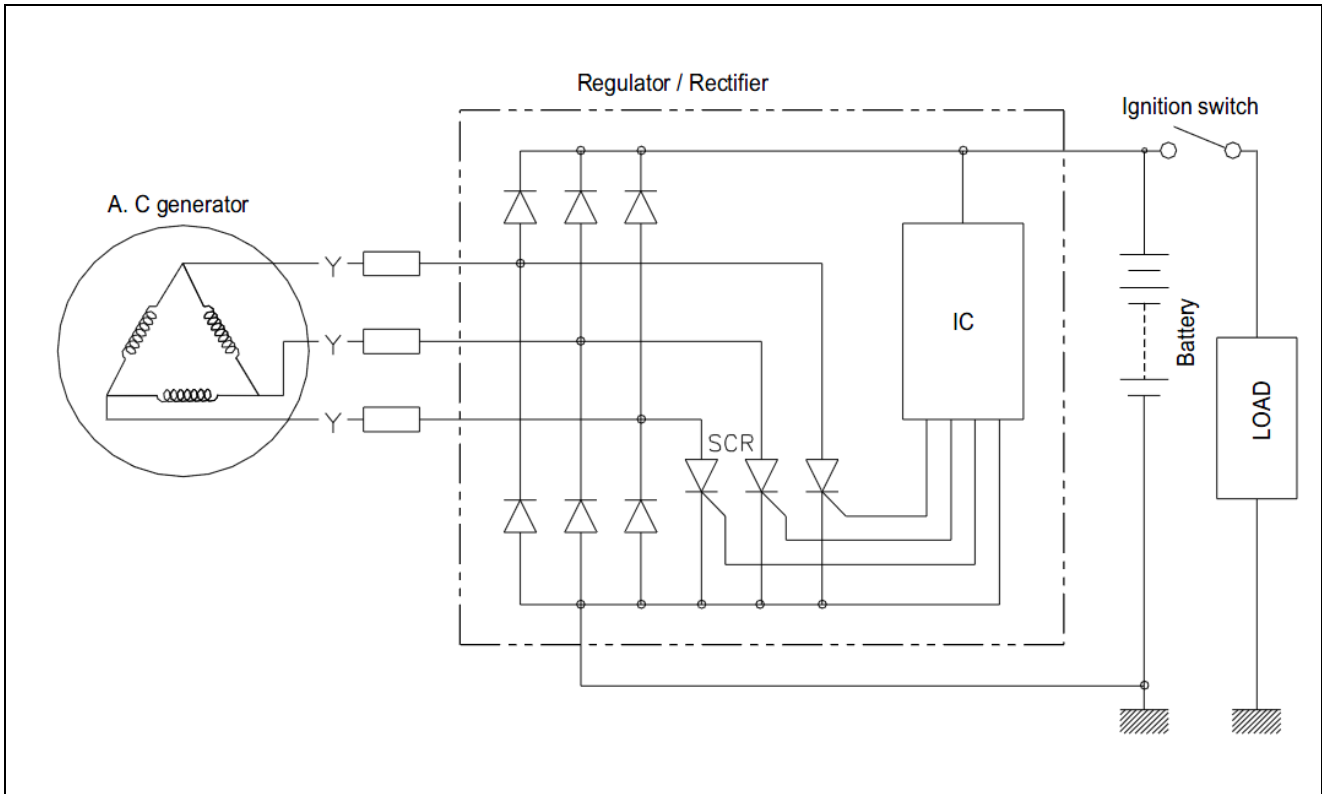


Spark plug

: 15 ~ 20 N·m (1.5 ~ 2.0 kgf·m)



CHARGING SYSTEM



INSPECTION

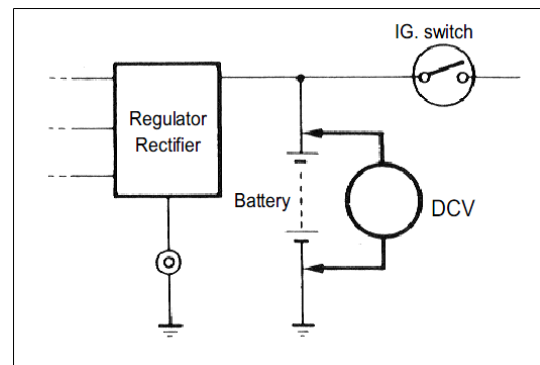
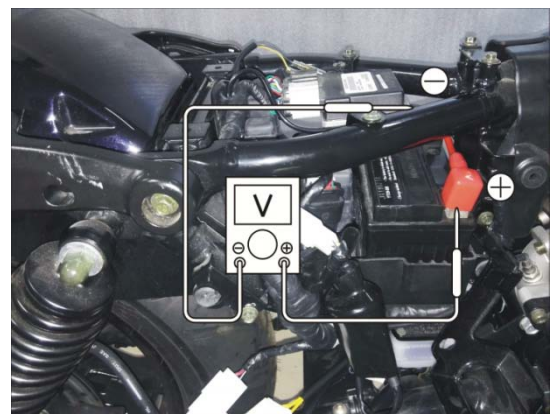
CHARGING OUTPUT CHECK

Start the engine and keep it running at 5,000 rpm.

Using the pocket tester, measure the DC voltage

between the battery terminal \oplus and \ominus .

If the voltage is not within the specified value, check the magneto no-load performance and regulator / rectifier.



CAUTION

When making this test, be sure that the battery is full-charged condition.

Standard charge

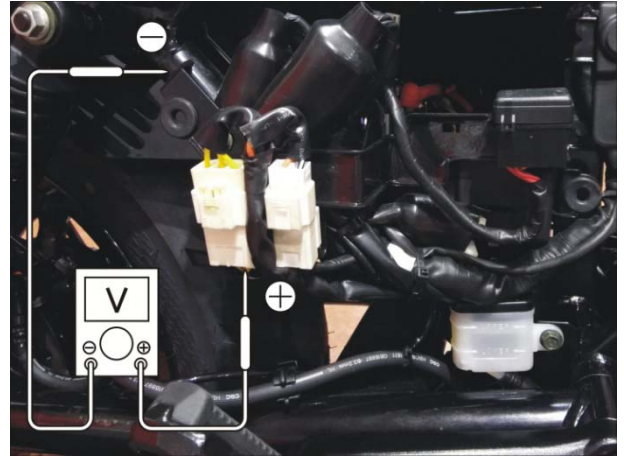
13.5 ~ 15.0 V
(at 5,000 rpm)

6-9 ELECTRICAL SYSTEM

MAGNETO NO-LOAD PERFORMANCE

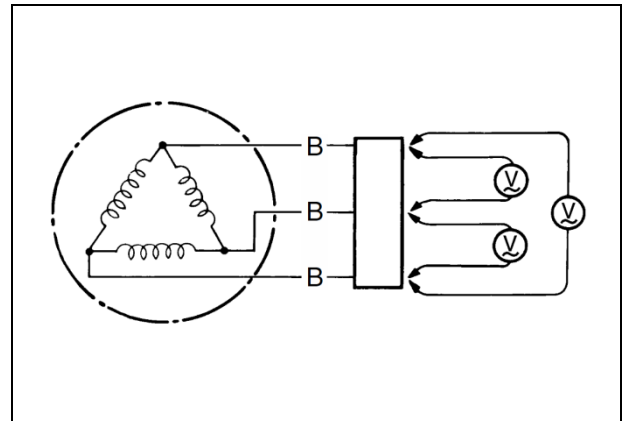
Disconnect the three lead wires from the magneto terminal.
 Start the engine and keep it running at 5,000 rpm.
 Using the pocket tester, measure the AC voltage between the three lead wires.
 If the voltage is under the specified value, replace the magneto with a new one.

Standard no-load performance of magneto	Over 60V (at 5,000 rpm)
--	----------------------------



 **TOOL** Pocket tester : 09900-25002

 **Tester knob indication : Voltage (~)**

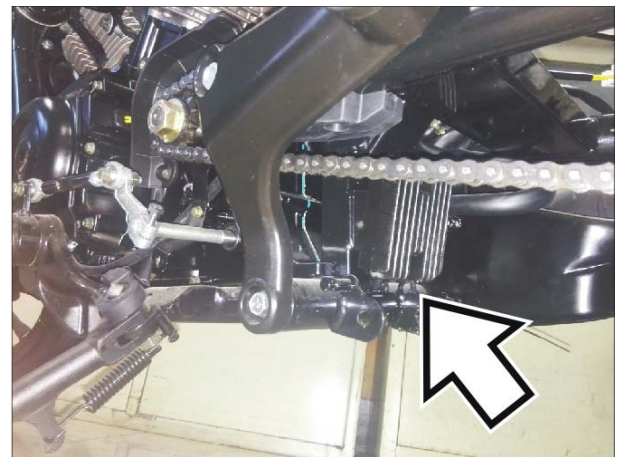


REGULATOR / RECTIFIER

Disconnect the regulator / rectifier couplers.
 Measure the voltage between the terminals using the pocket tester as indicated in the table below.
 If the voltage is not within the specified value, replace the regulator / rectifier with a new one.

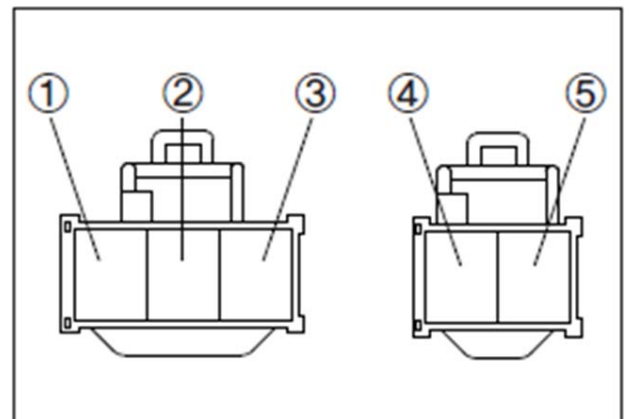
Unit : V

- Tester probe	+ Tester probe				
	①	②	③	④	⑤
①	/	0	0	0	0.4~0.7
②	0	/	0	0	0.4~0.7
③	0	0	/	0	0.4~0.7
④	0	0	0	/	1.8 ~ 2.1
⑤	0	0	0	0	/



 **TOOL** Pocket tester : 09900-25002

 **Tester knob indication : Diode test (⚡)**

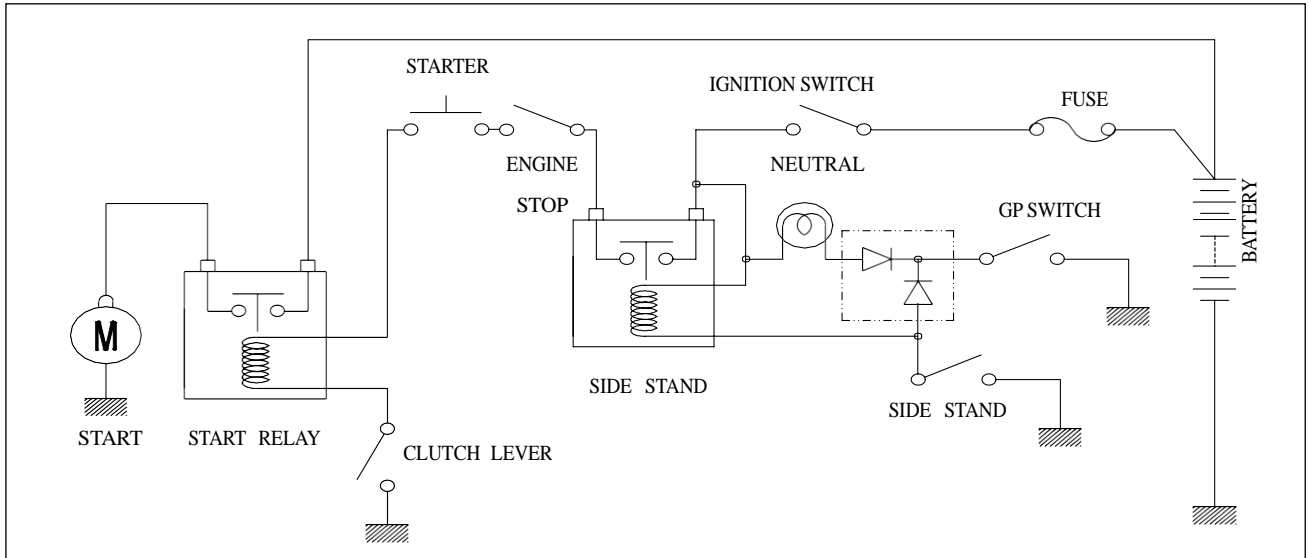


STARTER SYSTEM AND SIDE STAND IGNITION INTERLOCK SYSTEM

⊙ STARTER SYSTEM DESCRIPTION

The starter system consists of the following components : the starter motor, starter relay, clutch lever switch, side stand switch, GP switch, starter switch, engine stop switch, ignition switch and battery.

Pressing the starter switch (on the right handlebar switch) energizes the starter relay, causing the contact points to close, thus completing the circuit from the starter motor to the battery.



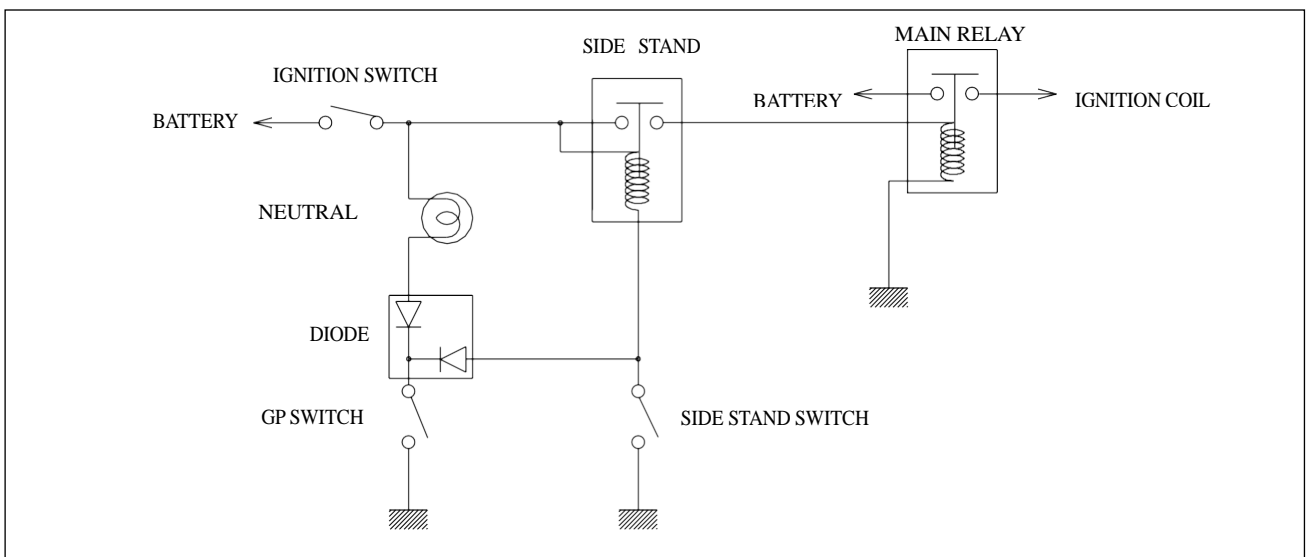
SIDE STAND / IGNITION INTERLOCK SYSTEM DESCRIPTION

This side stand / ignition interlock system prevents the motorcycle from being started with side stand down. The system is operated by an electric circuit provided between the battery and ignition coil.

The circuit consists of the neutral indicator light and switches.

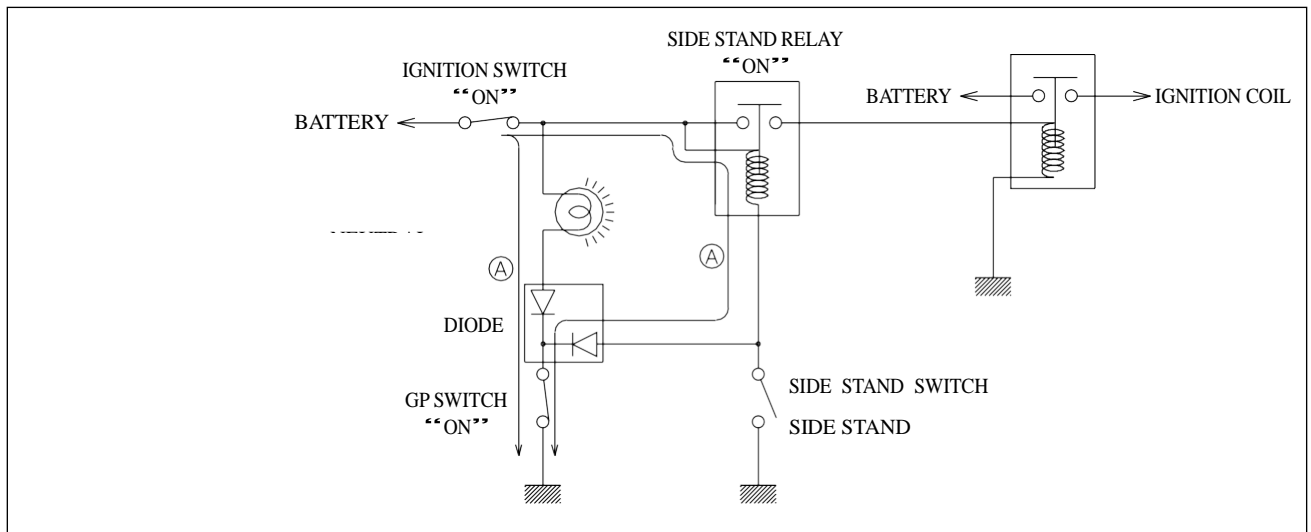
The ignition coils will send voltage to the spark plugs depending on what gear the transmission is in and whether the side stand is either up or down.

The gear position and side stand switches work together in this system. The ignition coil work only in two situations as follows.

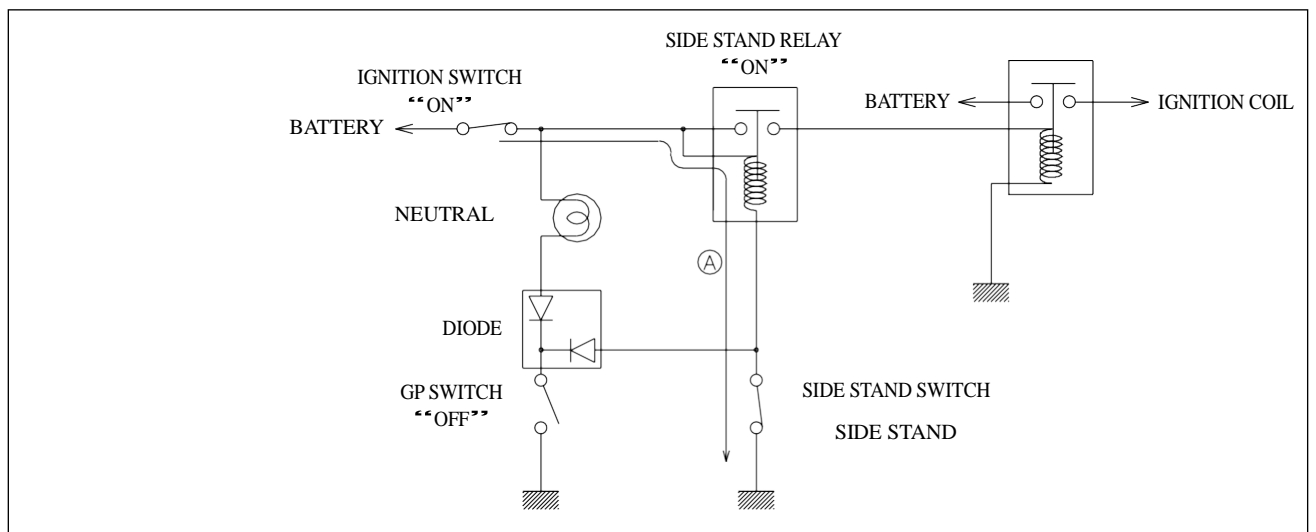


6-11 ELECTRICAL SYSTEM

TRANSMISSION : Neutral -“ON”
 Side stand - Down
 Clutch lever - Squeeze



TRANSMISSION : Neutral -“OFF”
 Side stand - Up
 Clutch lever - Squeeze



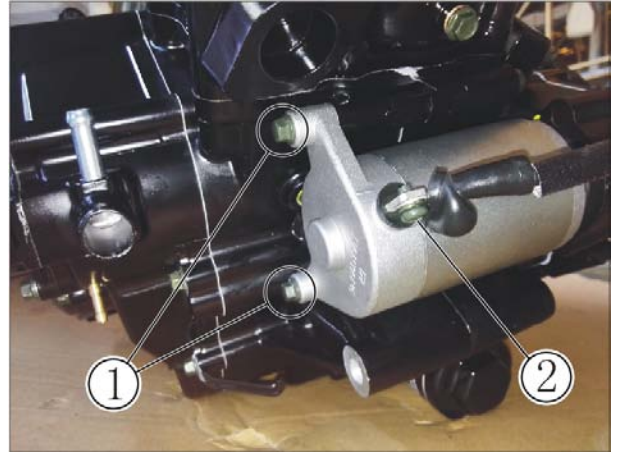
GV125S are equipped with the side stand ignition interlock system.

If the transmission is in neutral or side stand up, you can only start the engine with pulling the clutch lever.

NO	Neutral switch	Clutch lever	Side stand	Engine Start		
1	●	●	△	Possible	NOTE	
2	△	●	●	Possible		
3	●	△	△	Impossible	●	<i>On or Up</i>
4	△	●	△	Impossible	△	<i>Off or Down</i>
5	△	△	●	Impossible		

STARTER MOTOR REMOVAL AND DISASSEMBLY

- Disconnect the starter motor lead wire ①. (Refer to page 3-6)
- With loosen the bolt ②, remove the starter motor. (Refer to page 3-6)
- Disassemble the starter motor.



☉ **STARTER MOTOR INSPECTION**

□ **CARBON BRUSH**

Inspect the brushes for abnormal wear, crack or smoothness in the brush holder.

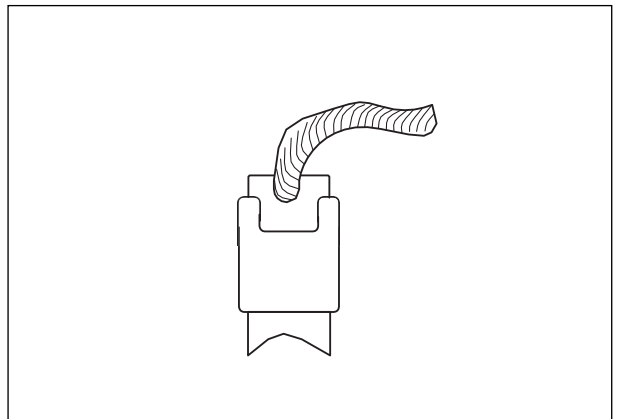
If the brush has failed, replace the brush sub assy.

COMMUTATOR

Inspect the commutator for discoloration, abnormal wear or undercut ③.

If the commutator is abnormally worn, replace the armature.

When surface is discolored, polish it with #400 sand paper and clean it with dry cloth.

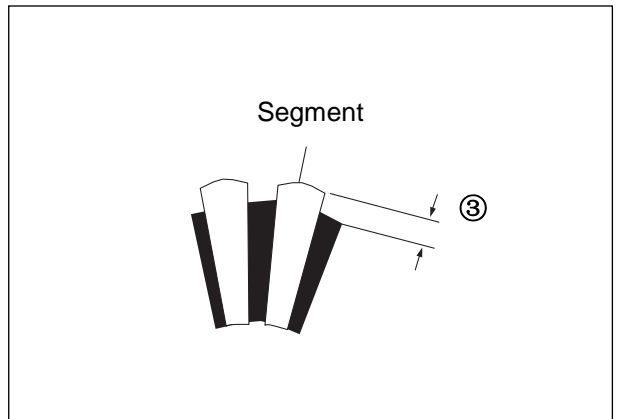


ARMATURE COIL INSPECTION


Check for continuity between each segment.

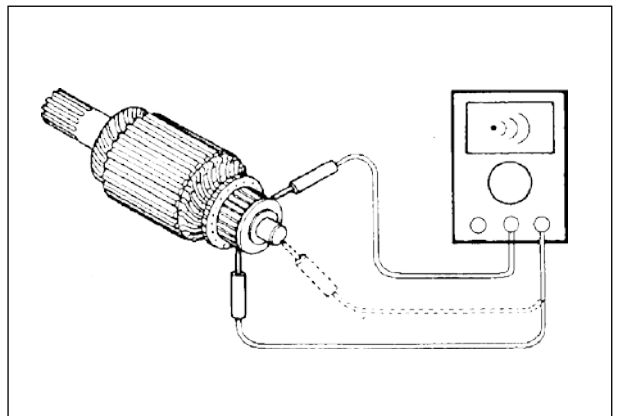
Check for continuity between each segment and the armature shaft.

If there is no continuity between the segments or there is continuity between the segment and shaft, replace the starter motor with a new one.



 **TOOL** Pocket tester : 09900-25002

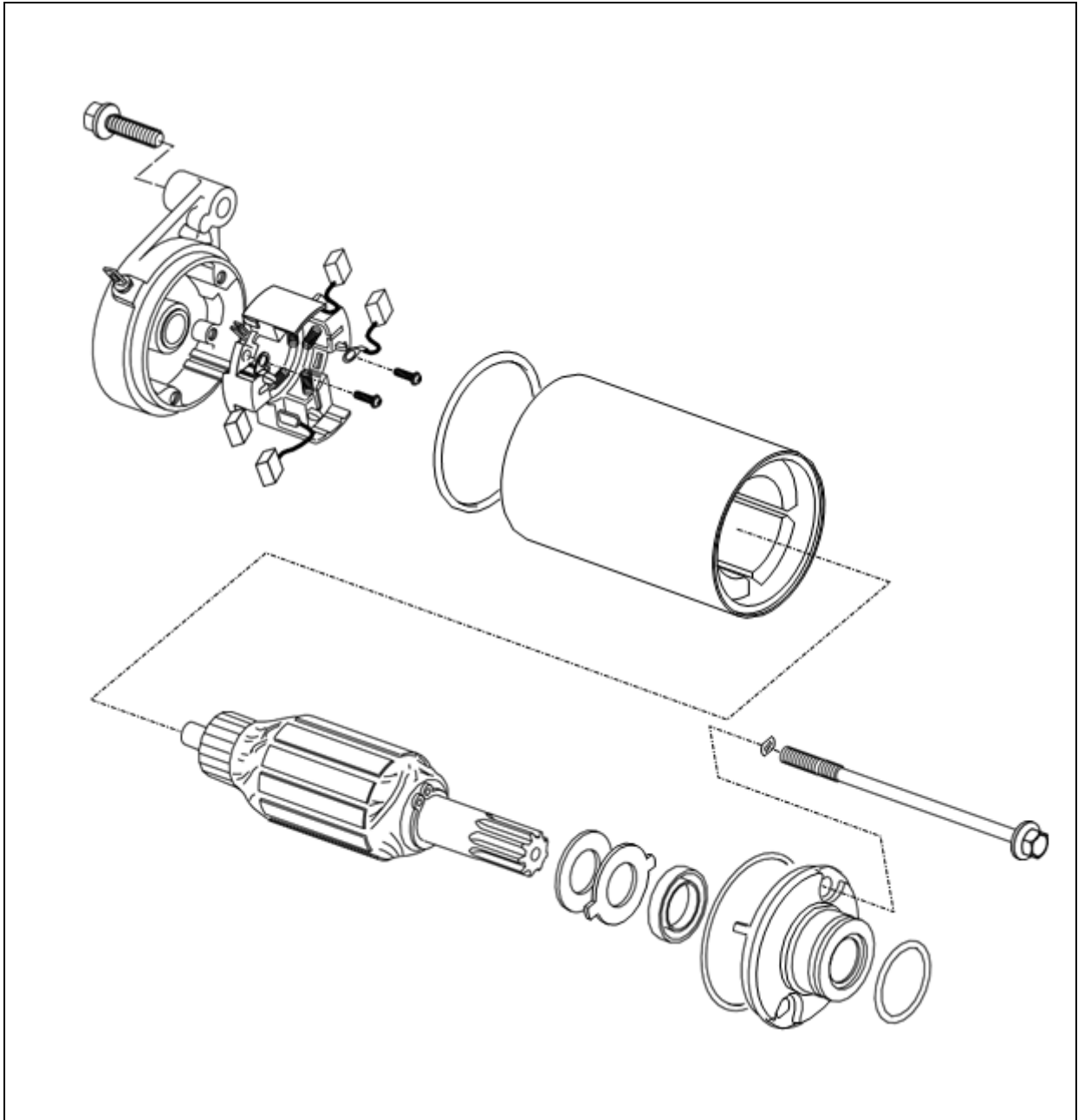
 **Tester knob indication**
: Continuity test (•••)



□ **STARTER MOTOR REASSEMBLY**

Reassembly the starter motor. Pay attention to the following points :

- Reassembly the starter motor as shown in the illustration.



6-15 ELECTRICAL SYSTEM

- Align the mark ① on the housing with the line on the housing end.



- Apply GREASE to the O-ring ① and remount the starter motor.

SWITCHES

Measure each switch for continuity using a tester. If any abnormality is found, replace the respective switch assemblies with new ones.



Pocket tester : 09900-25002

IGNITION SWITCH		
	R	O
ON		
OFF		

ENGINE STOP SWITCH		
	L	OB

HAZARD SWITCH		
	Sb	Gr

STARTER SWITCH		
	OB	YR
PUSH		
OFF		

DIMMER SWITCH			
	YW	Y	W

CLUTCH LEVER SWITCH		
	Br	GR
ON		
OFF		

TURN SIGNAL SWITCH			
	Lg	Sb	B

HORN SWITCH		
	BBr	BW
ON		
OFF		

PASS SWITCH		
	O	Y
ON		
OFF		

FRONT / REAR BRAKE LAMP SWITCH		
	O	WB
ON		
OFF		

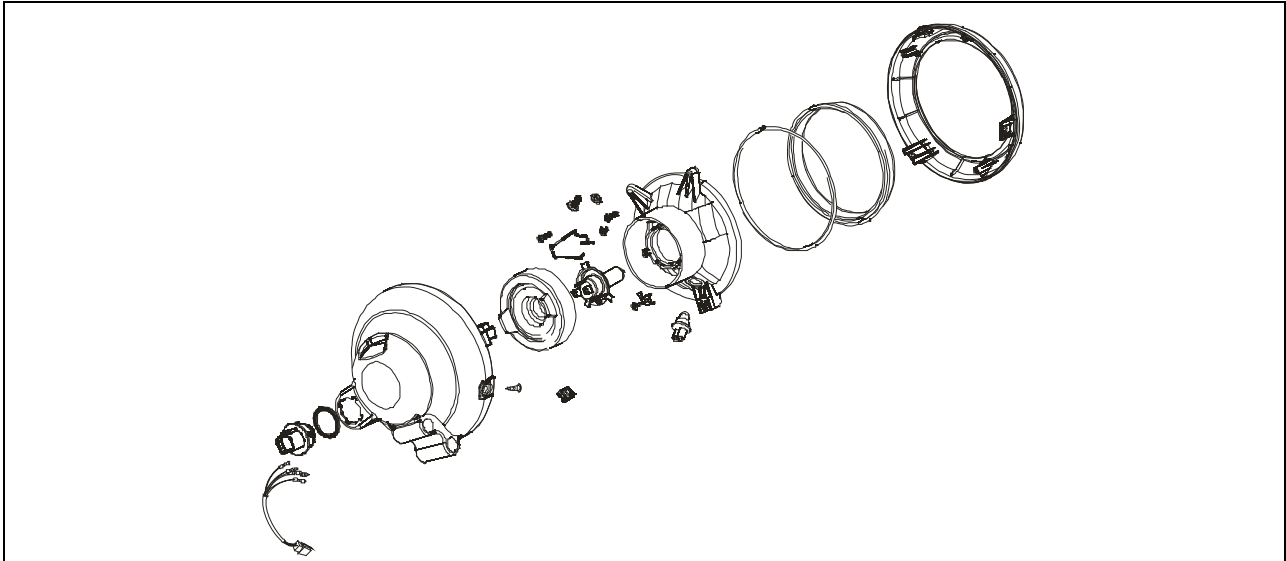
SIDE STAND SWITCH		
	Br	BW
ON		
OFF		

LAMP

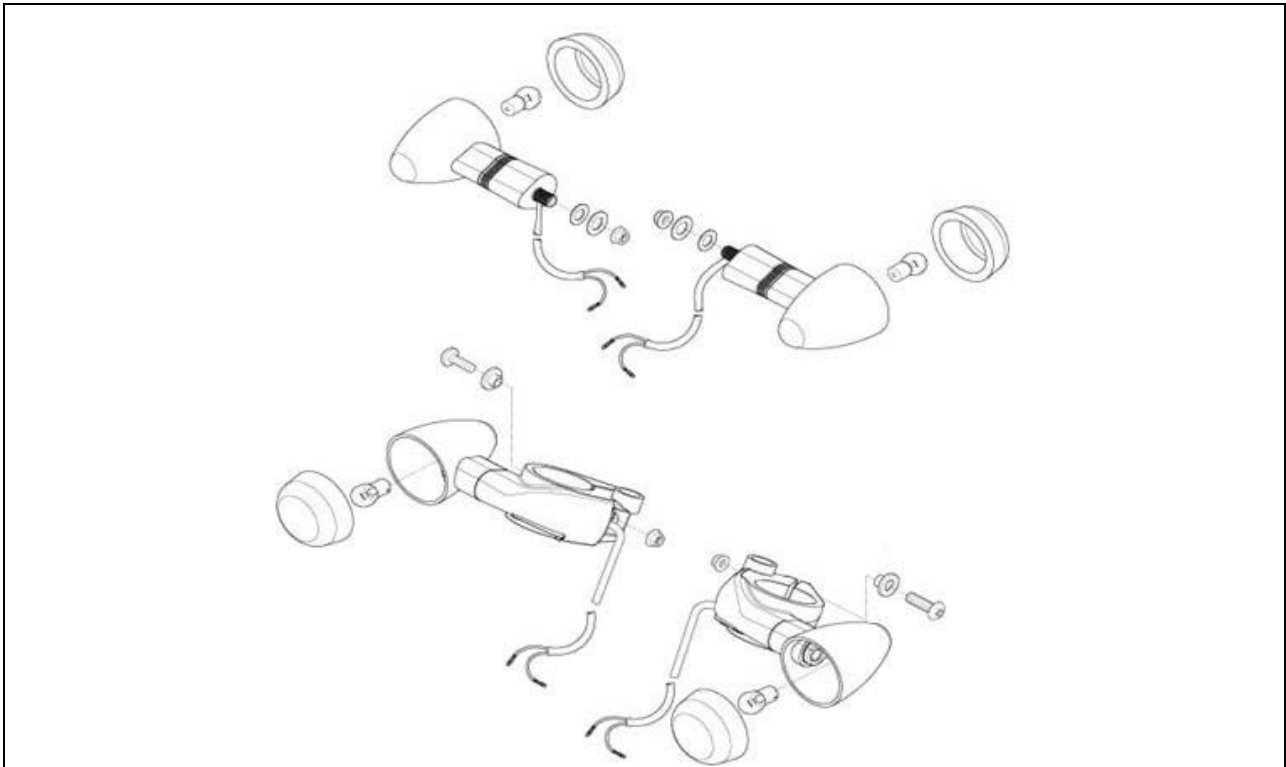
⚠ CAUTION

If you touch the bulb with your bare hands, clean the bulb with a cloth moistened with alcohol or soapy water to prevent premature bulb failure.

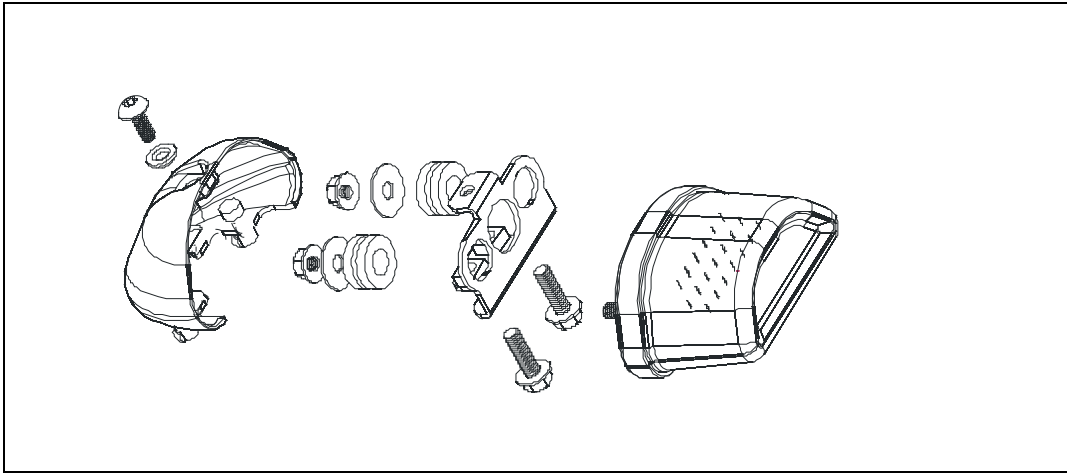
◎ HEADLAMP



◎ TURN SIGNAL LAMP



○ TAIL / BRAKE LAMP



COMBINATION METER

Remove the combination meter.
 Disassemble the combination meter as shown in the illustration.

INSPECTION

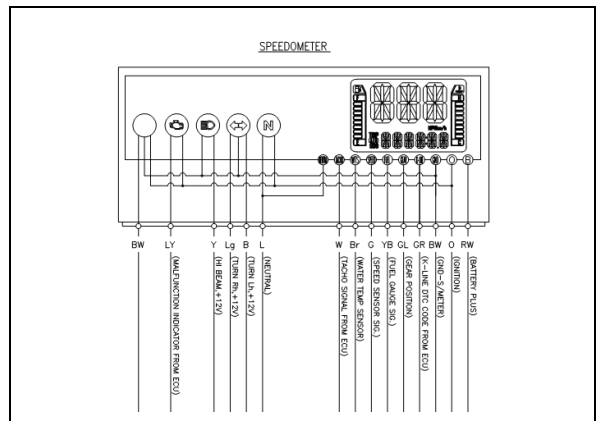
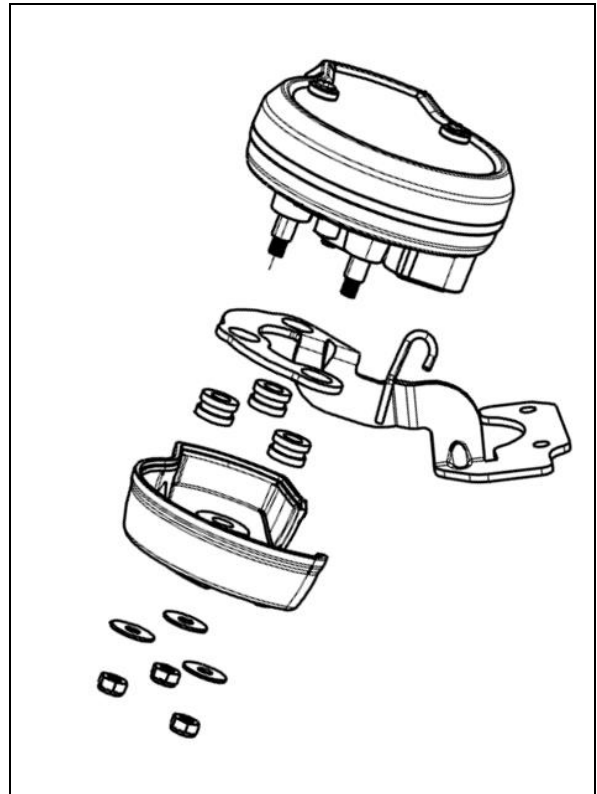
Using the pocket tester, check the continuity between lead wires in the following illustration.
 If the continuity measured incorrect, replace the respective part.



Pocket tester : 09900-25002

CAUTION

When making this test, it is not necessary to remove the combination meter.



BATTERY



CAUTION

Use only the genuine Hyosung battery on GV125S.

● CAUTION OF BATTERY TREATMENT

The battery needs attention generally as it occurs flammability gas.

If you don't follow the instruction in the below, there may be an explosion and severe accident.

Therefore, please pay attention to the following points.

- Positively prohibit battery from contacting to short, spark or firearms.
- The recharge of battery should be done in the wide place where the wind is well ventilated.

● CAUTION OF BATTERY ELECTROLYTE TREATMENT

- Pay attention to the battery electrolyte not to stain the chassis or the human body.
- If stains the chassis or the human body, at once wash a vast quantity of water.

When they were stained, clothes will come into being a hole or painting will take off.

Consult a doctor.

- When the battery electrolyte was dropped to the surface of land, wash it with a vast quantity of water.

Neutralize by hydroxide, bicarbonate of soda and so on.

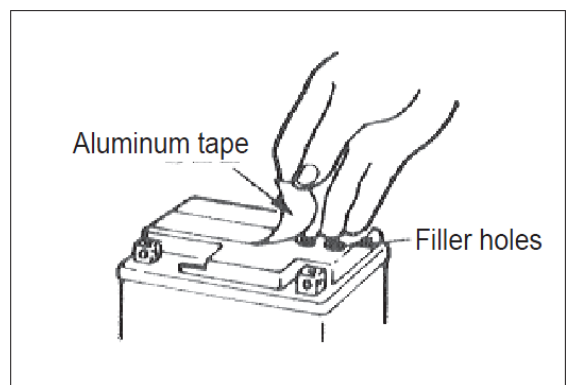
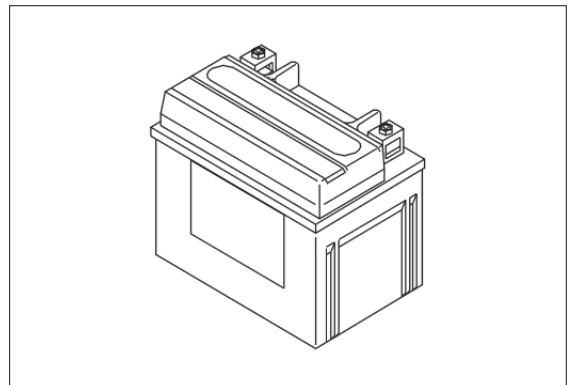
CAUTION OF MAINTENANCE

FREE BATTERY TREATMENT

- Do not remove the aluminum tape sealed the battery electrolyte filler hole until just before use as the sealed type battery.
- Never use anything except the specified battery electrolyte.
- When filling the battery electrolyte, fill the electrolyte to the specified capacity.
- Once install the caps to the battery : do not remove the caps.

■ FILLING ELECTROLYTE

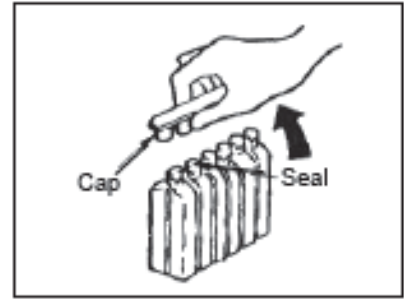
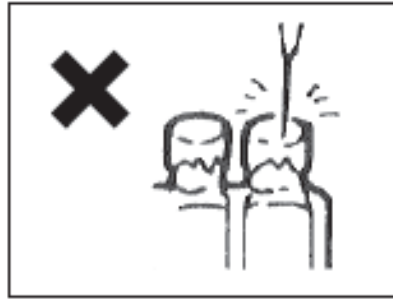
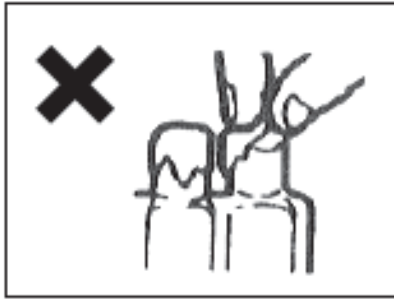
- ① Put the battery on even land and remove the aluminum tape.
- ② Remove the cap at the electrolyte container.
After filling the electrolyte completely, use the removed cap as the sealed cap of the battery filler holes.



CAUTION

Do not remove or pierce the sealed areas of the electrolyte container.

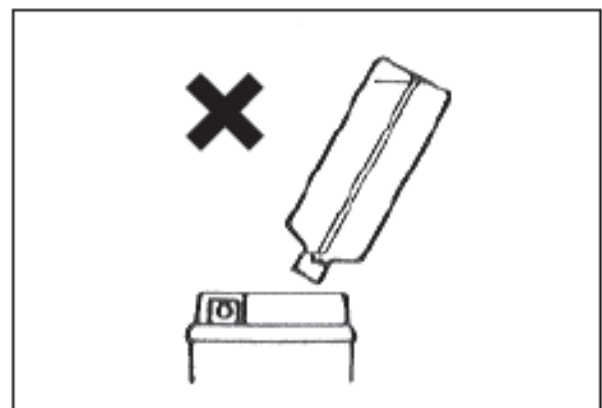
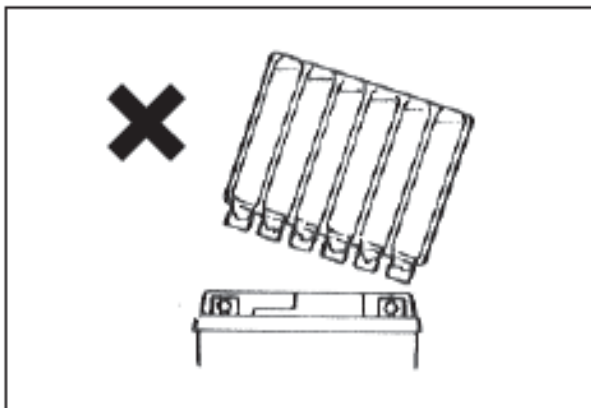
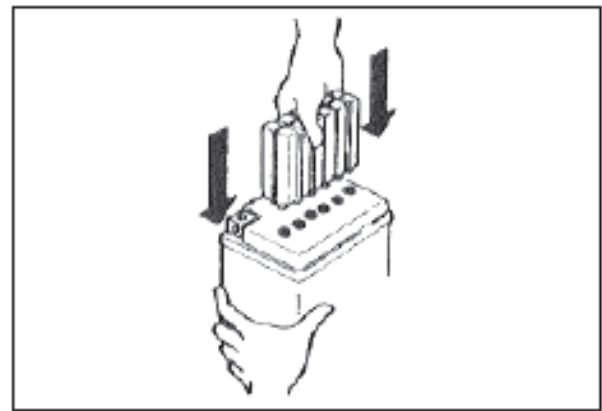
6-21 ELECTRICAL SYSTEM



③ Filling of battery electrolyte

When inserting the nozzles of the electrolyte container into the battery's electrolyte filler holes, holding the container firmly so that it does not fall.

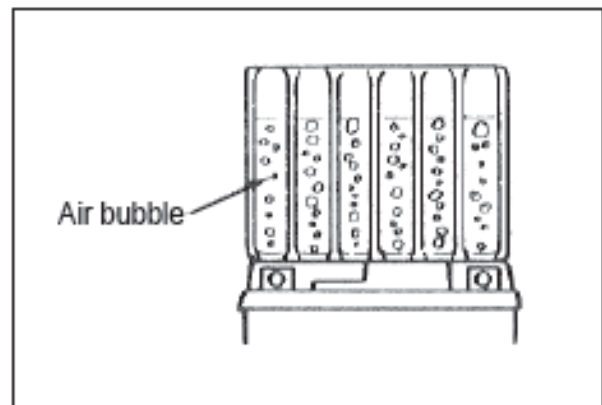
Take precaution not to allow any fluid to spill.



④ Confirming for filling

Make sure that air bubbles are coming up each electrolyte container, and keep this position for more than about 20 minutes.

CAUTION
If no air bubbles are coming up from a filler port, tap the bottom of the electrolyte container two or three times.

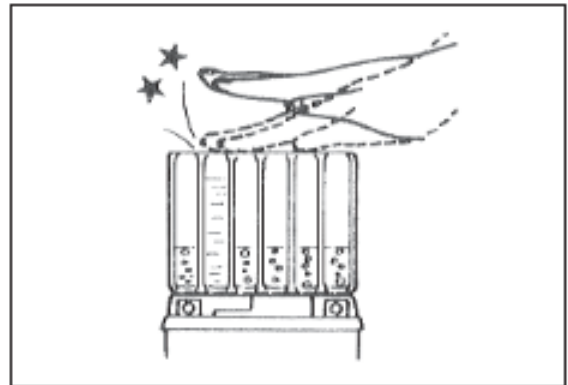


⑤ Separation of electrolyte container

After confirming that the electrolyte has entered into the battery completely, remove the electrolyte containers from the battery.

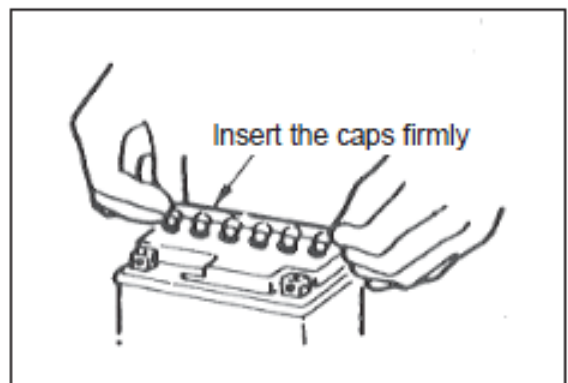
⚠ CAUTION

Draw the empty receptacle out slowly because there may be a chance remaining electrolyte vaporize.



⑥ Inserting the caps

Insert the cap into the filler holes, pressing it firmly so that the top of the caps do not protrude above the upper surface of the battery's top cover.



⊙ SERVICING

Visually inspect the surface of the battery container. If any signs of cracking or electrolyte leakage from the sides of the battery have occurred, replace the battery with a new one. If the battery terminals are found to be coated with rust or an acidic white powdery substance, then this can be cleaned away with sandpaper.

⊙ RECHARGING OPERATION

- Using the pocket tester, check the battery voltage. If the voltage reading is less than the 12.0 V (DC), recharge the battery with a battery charger.

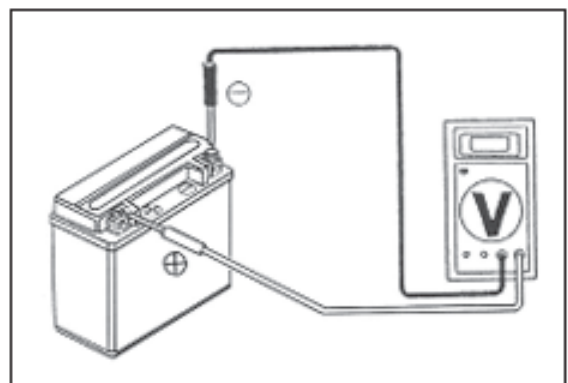
How to charge	
Standard	1.0 A × 10 hours
Fast	5.0 A × 1 hour

⚠ CAUTION

When recharging the battery, remove the battery from the vehicle.

NOTE

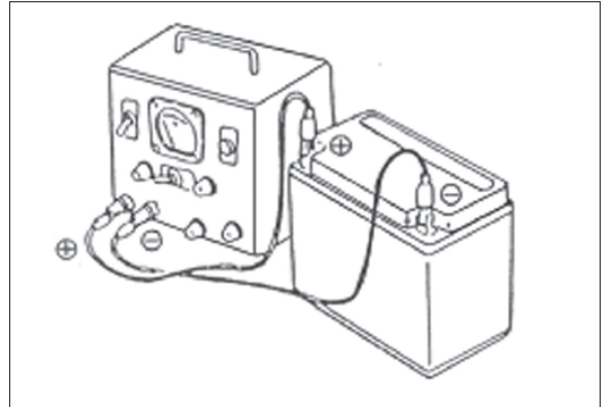
Do not remove the caps on the battery top while recharging.



CAUTION

Be careful not to permit the charging current to exceed 5 A at any time.

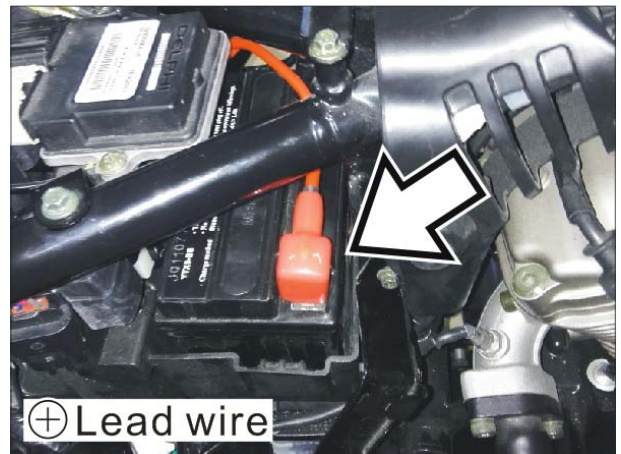
- After recharging, wait for more than 30 minutes and check the battery voltage with a pocket tester.
- If the battery voltage is less than the 12.5 V, recharge the battery again.
- If battery voltage is still less than 12.5 V, after recharging, replace the battery with a new one.
- When the vehicle is not used for a long period, check the battery every 1 month to prevent the battery discharge.



● BATTERY INSTALLATION

GV125S battery installation order pay attention to following points :

- ① Remove the seat, left frame cover
- ② Orient the battery's positive terminal toward the right side of the battery case
- ③ Install (+) positive lead wire at the battery terminal.
- ④ Put on the rubber cap at the (+) positive terminal of the battery.
- ⑤ Install (-) negative lead wire at the battery terminal.
- ⑥ Install the battery support and right frame cover.



CHASSIS

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EXTERIOR PARTS

⦿ FRONT FENDER

- With the bolts removed, remove the front fender.

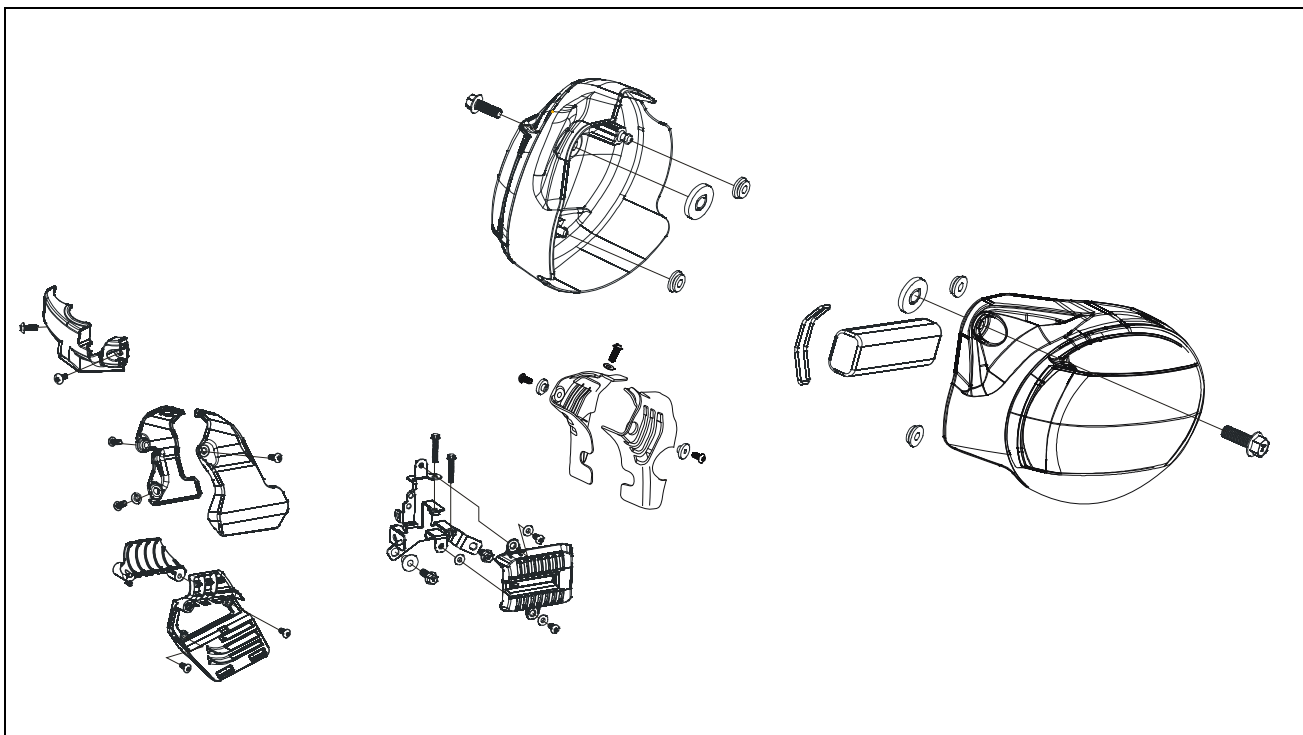


⦿ SEAT

- With the bolts removed, remove the seat.



FRAME COVER



◉ LEFT FRAME COVER

- Remove the screw ①.
- With the hook ②, ③ removed, remove the left frame cover.



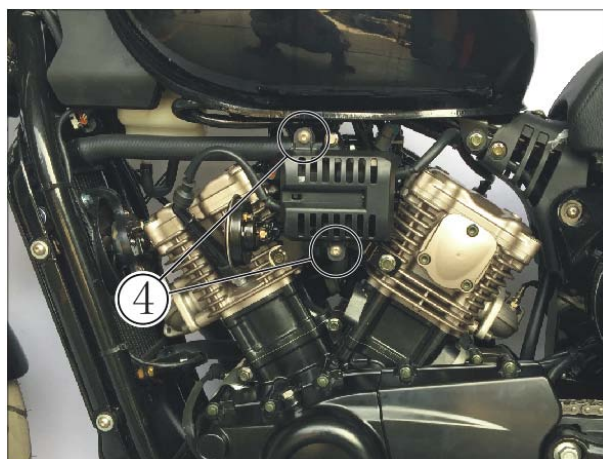
⦿ RIGHT FRAME COVER

- Remove the screw ①.
- With the hook ②, ③ removed, remove the right frame cover.



⦿ DECORATION COVER

- Remove the two screw ④.
- Remove the decoration cover.



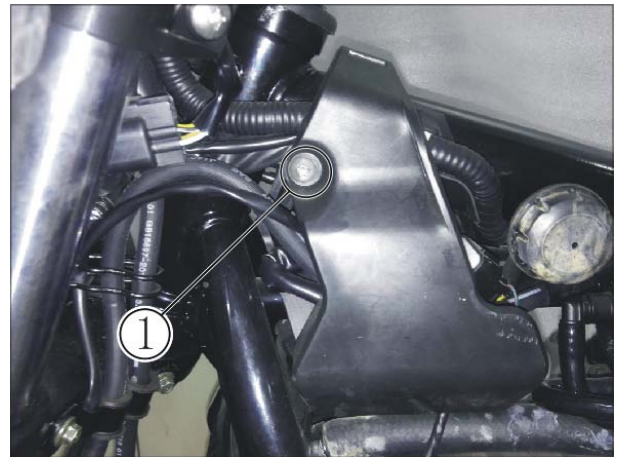
⦿ MAIN KEY COVER

- Remove the two screw ⑤.
- Remove the main key cover.

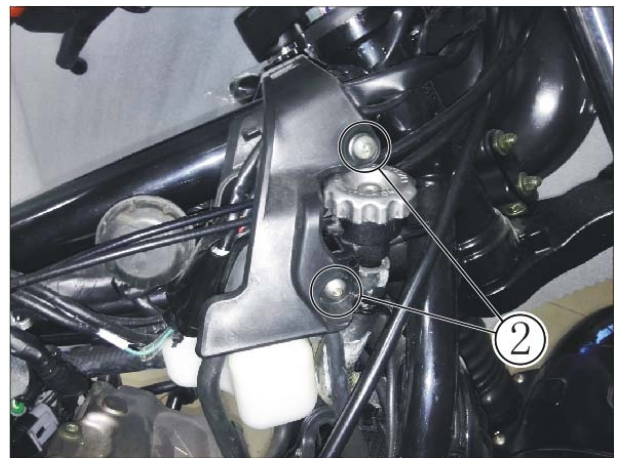


◉ LEFT AND RIGHT FRAME HEAD COVER

- Remove the left frame head cover with mounting screws ①.



- Remove the right frame head cover with two mounting screws ②.



- With the hook ③ removed, remove the left and right frame head cover.

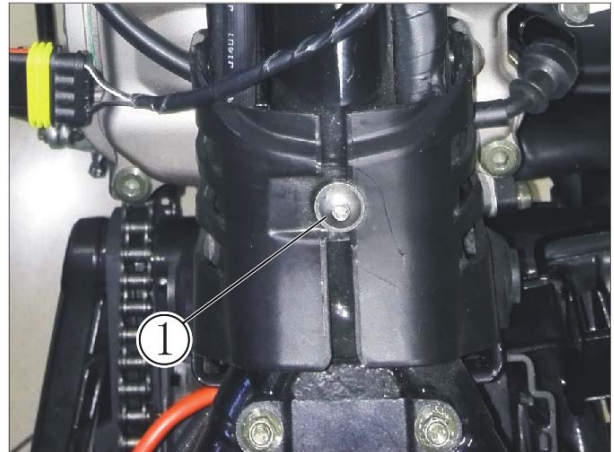


- Remove the left and right frame head guide comp with two mounting screws ④.



◉ **LEFT AND RIGHT DECORATION
FRAME CENTER COVER**

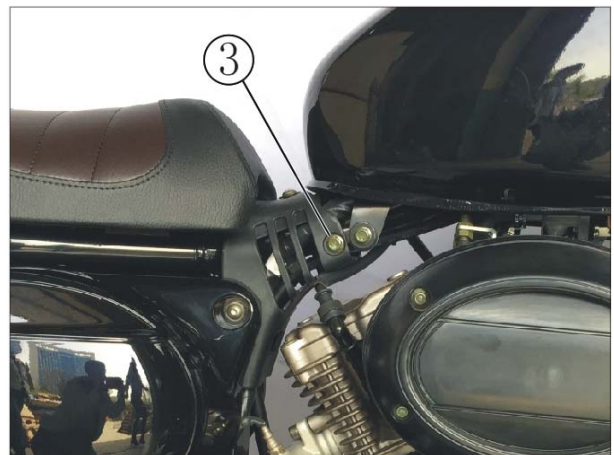
- Remove the upper screw ①.



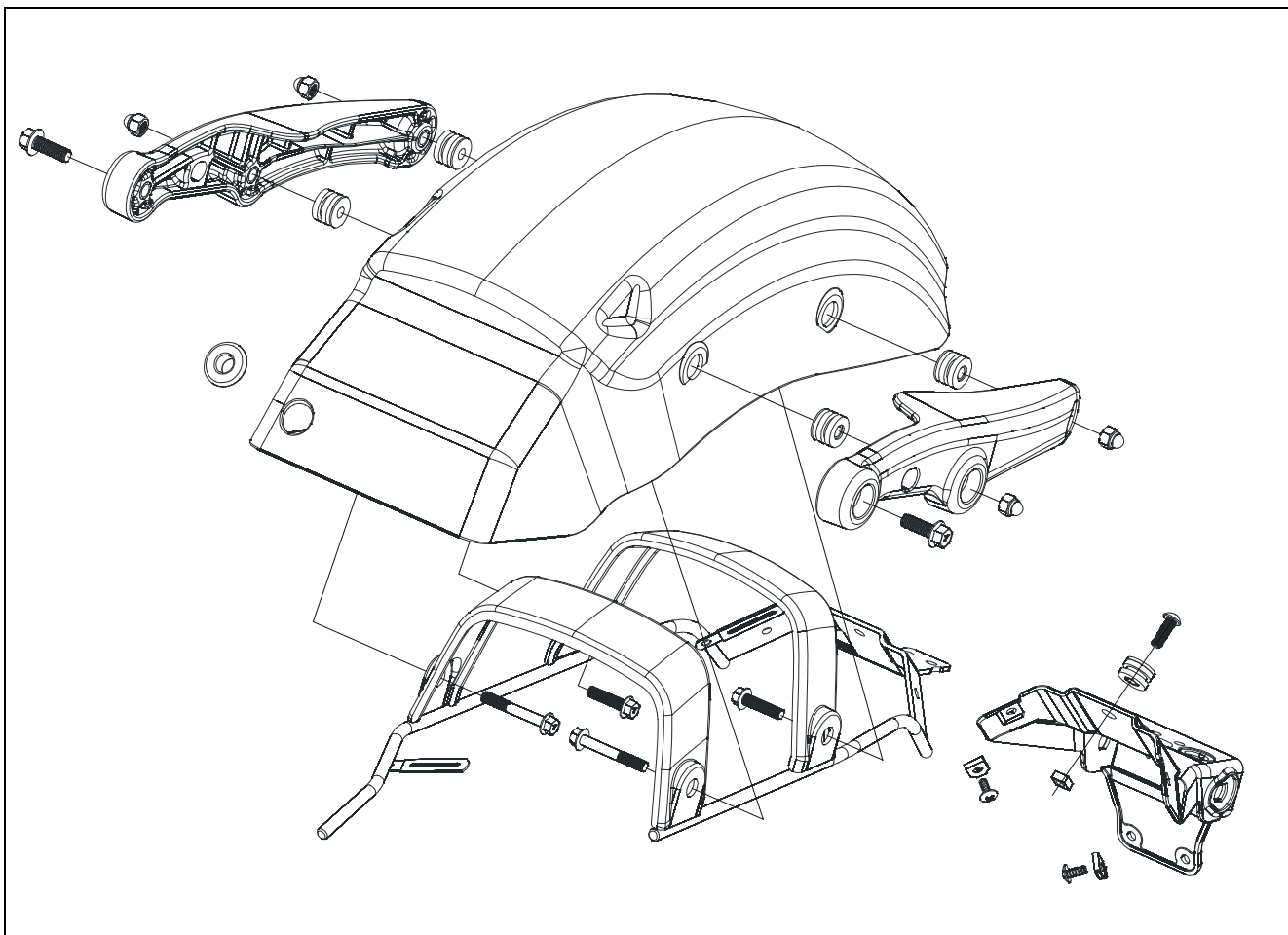
- Remove the left screw ②.
- Remove the left decoration frame center cover.



- Remove the right screw ③.
- Remove the right decoration frame center cover.



REAR FRAME COVER



- Remove the seats.
- Remove the frame covers.
- Remove the left pillion rider grip comp mounting nut.



- Remove the right pillion rider grip comp mounting nut.



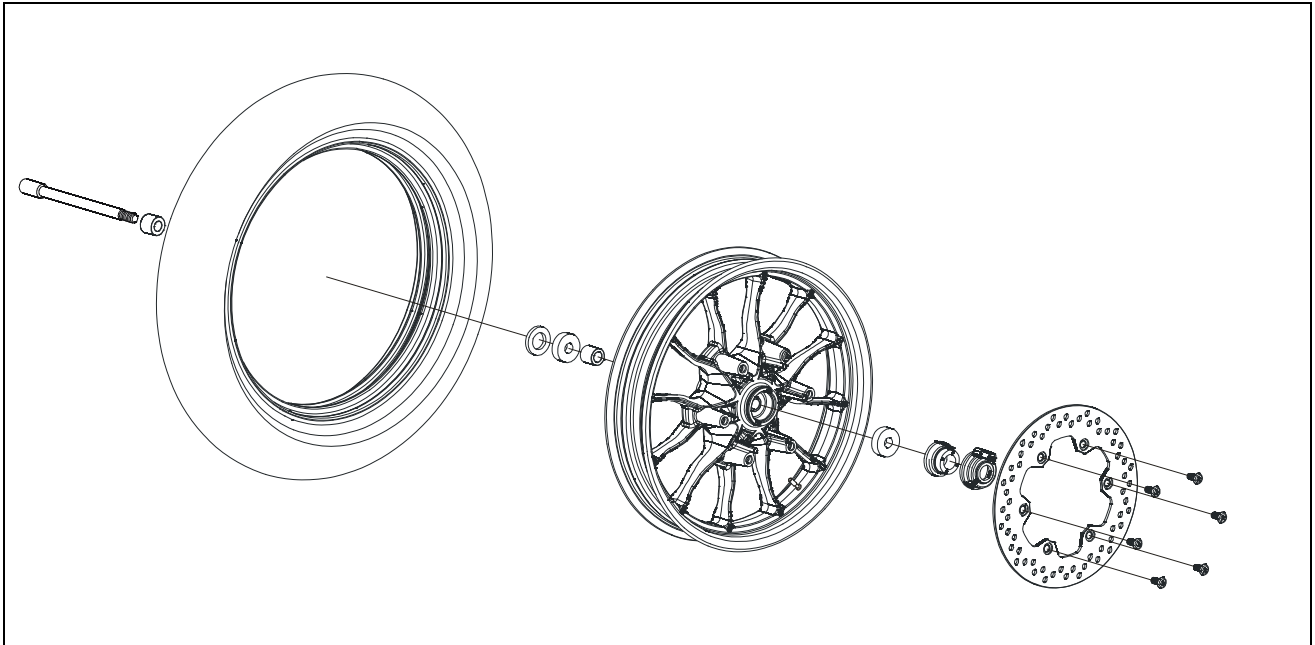
- Disconnect the rear turn signal lamp couplers and rear combination lamp coupler.



- With the bolts removed, remove the rear fender.



FRONT WHEEL



REMOVAL

- Loosen the axle pinch bolt ①.
- Loosen the front axle ②.
- Raise the front wheel off the ground with a block or jack.

CAUTION

When using a jack, take care not to cause scratches on the chassis.

- Remove the front wheel by removing the front axle ②.

- Remove the brake disc.



⦿ INSPECTION AND DISASSEMBLY

□ TIRE

For inspection of the tire : Refer to page 2-19.

□ FRONT AXLE

Measure the front axle runout using the dial gauge. If the runout exceeds the limit, replace the front axle.

Axle shaft runout

Service limit

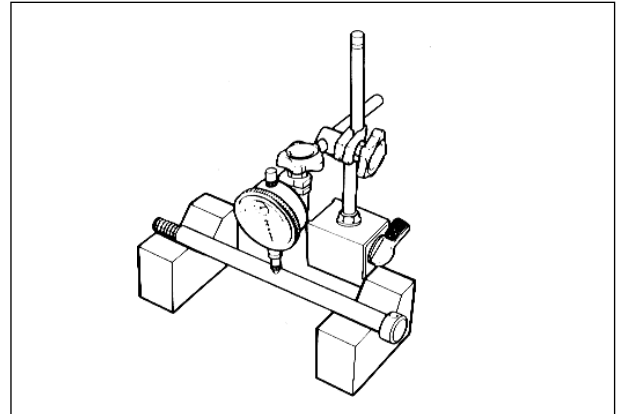
0.25 mm



Dial gauge : 09900-20606

Magnetic stand : 09900-20701

V-block : 09900-21304



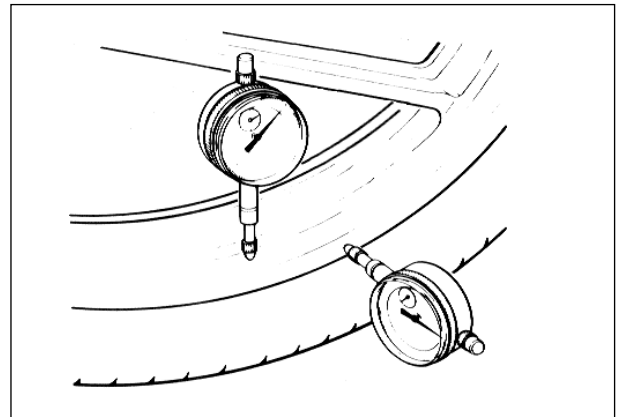
□ WHEEL

Make sure that the wheel runout (axial and radial) does not exceed the service limit when checked as shown. An excessive amount of runout is usually due to worn or loose wheel bearings and can be corrected by replacing the bearings. If bearing replacement fails to reduce the wheel runout, replace the wheel.

**Wheel runout
(axial and radial)**

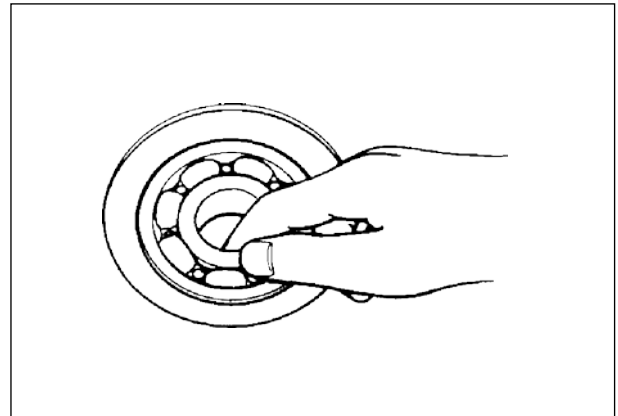
Service limit

2.0 mm



□ WHEEL BEARING

Inspect the play of the wheel bearings by finger while they are in the wheel. Rotate the inner race by finger to inspect for abnormal noise and smooth rotation. Replace the bearing in the following procedure if there is anything unusual.



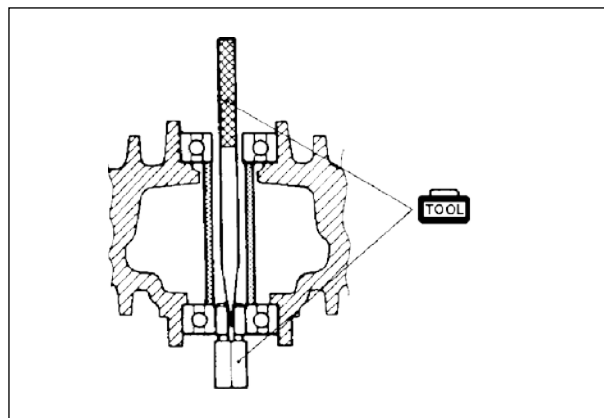
□ **WHEEL BEARING REMOVAL**

- Remove the wheel bearing by using the special tool.

 **Wheel bearing remover : 09941-50111**

 **CAUTION**

The removed bearings should be replaced with new ones



◎ **REASSEMBLY**

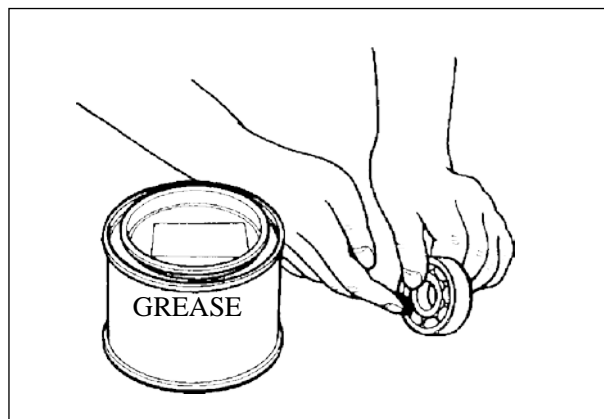
Reassemble the front wheel in the reverse order of removal and disassembly.

Pay attention to the following points :


□ **WHEEL BEARING**

- Apply SUPER GREASE“ A ”to the wheel bearings.

 **SUPER GREASE“ A ”**



- Install the wheel bearings as follows by using the special tools.

 **Steering race installer : 09941-34513**

 **CAUTION**


First install the right wheel bearing, then install the left wheel bearing.



□ **BRAKE DISC**

Make sure that the brake disc is clean and free of any greasy matter.

- Apply THREAD LOCK“ 1324 ”to the disc mounting bolts and tighten them to the specified torque.

 **Brake disc bolt : 18~28 N • m (1.8 ~2.8 kg • m)**

 **THREAD LOCK“ 1324 ”**



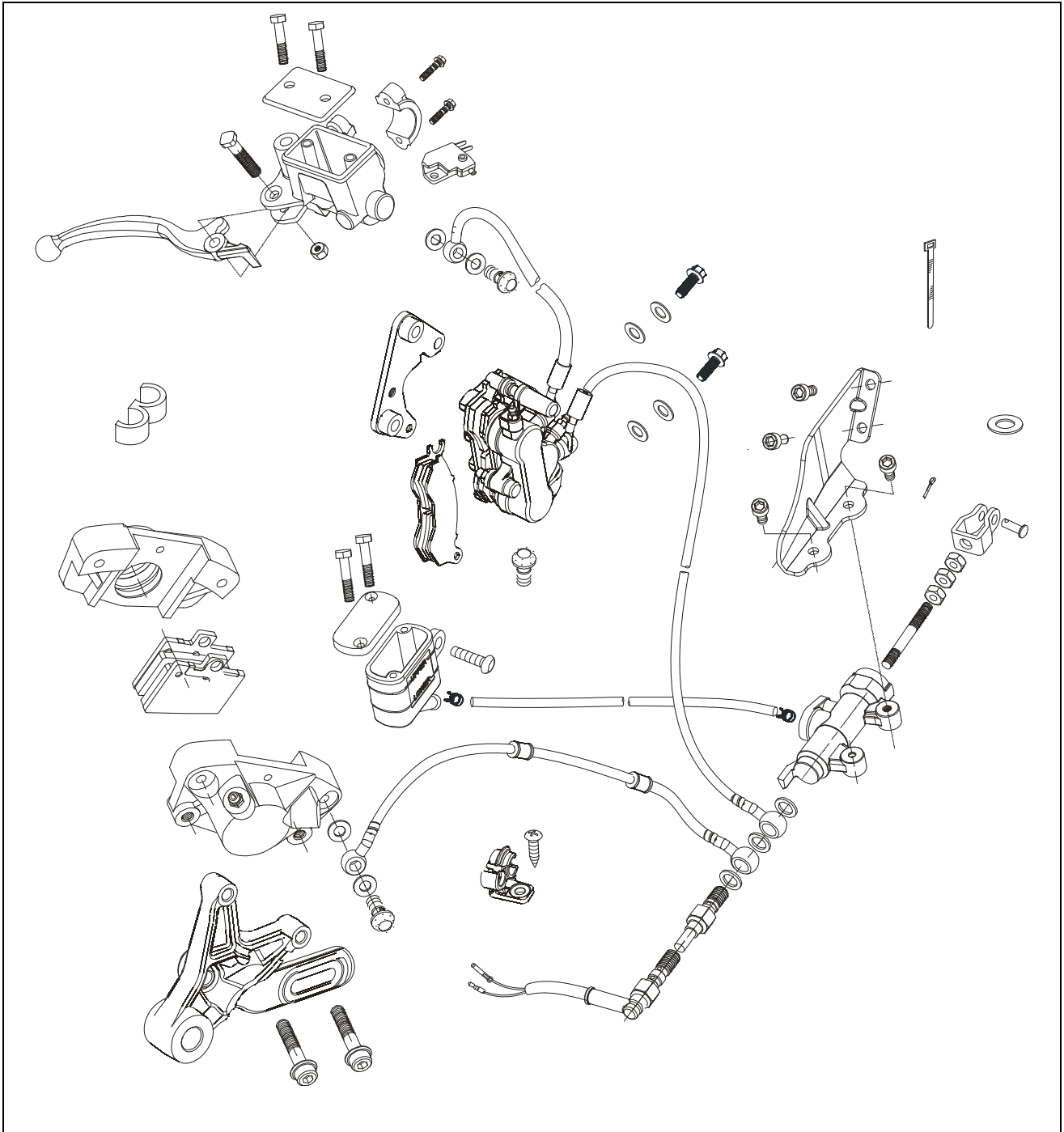
● Tighten the front axle ① and axle pinch bolt ② to the specified torque.

🔧 **Front axle : 50~80 N•m (5.0 ~8.0 kg•m)**

Front axle pinch bolt : 15~25 N•m (1.5 ~2.5 kg•m)



FRONT BRAKE AND REAR BRAKE



WARNING

- ❖ Do not mix with brake fluid of different brand.
- ❖ Do not use a brake fluid kept in an open container or stored for long period of time.
- ❖ To store brake fluid, make sure to seal the container and keep it in a safe place to be out of reach of children.
- ❖ When filling brake fluid, take care not to allow water or dirt to enter the system.
- ❖ To wash the brake system parts, use brake fluid and not any other material.
- ❖ Do not allow dirt and fluid to contact the brake disc or pad.

⚠ CAUTION

Do not allow brake fluid to contact the paint surface, plastic or rubber parts, or its chemical reaction can cause discoloration or crack.

👁 **BRAKE FLUID REPLACEMENT**

- For replacing procedure of brake fluid : Refer to page 2-28

👁 **BRAKE PAD REPLACEMENT**

- For replacing procedure of brake pad : Refer to page 2-28

👁 **CALIPER DISASSEMBLY**

- Drain brake fluid.

⚠ CAUTION

To prevent brake fluid from splashing on the parts nearby, cover the parts with cloth.

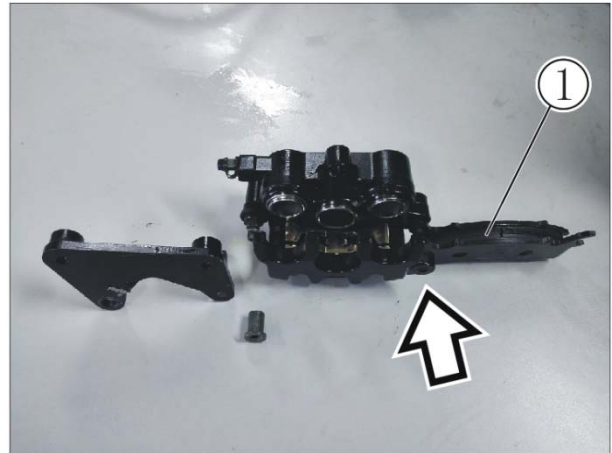
CALIPER FRONT BRAKE DISASSEMBLY

- Remove the front brake two union bolt ① and two Caliper mounting bolts ②.

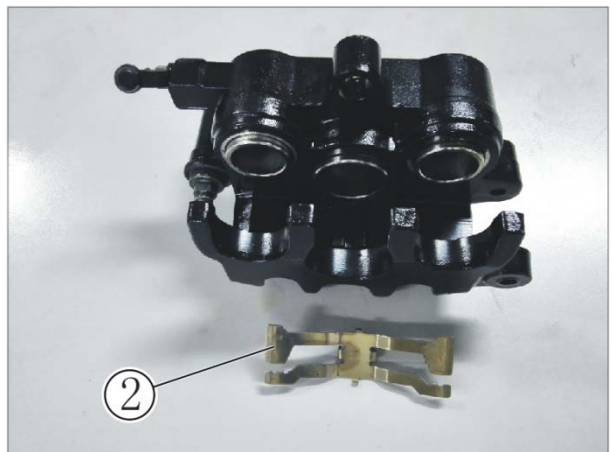
- Remove the front brake disassembly and caliper holder ③



- Remove the front brake caliper pad comp ①.



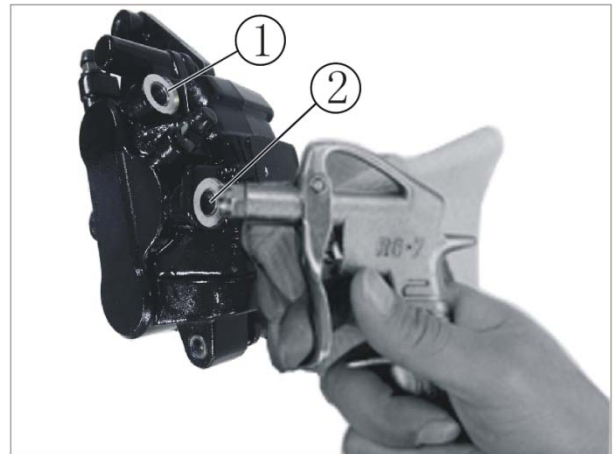
- Remove the front brake caliper spring sheet ②.



- Using an air gun, push out the caliper piston.

⚠ WARNING

- ❖ Place a rag over the piston to prevent it from popping out and flying and keeping hand off the piston.
- ❖ Be careful of brake fluid which can possibly splash.
- ❖ Do not use high pressure air but increase the pressure gradually.



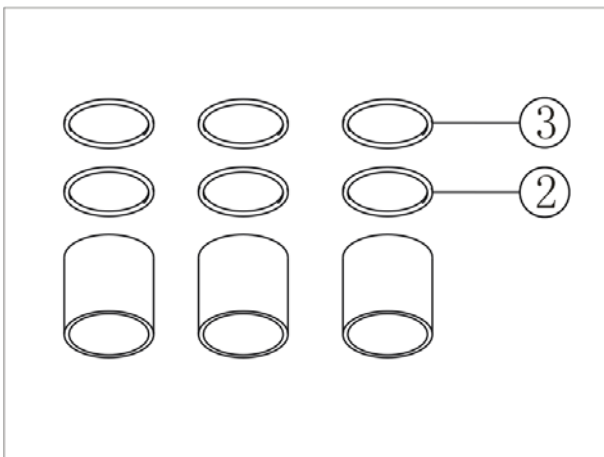
⚠ CAUTION

The car is equipped with a CBS system. When clenching the front brake handle, because the oil channel 1 is connected to the position of the front brake tubing, the piston at both ends work, clamping friction sheet, when stepping down the rear brake pedal, because the oil channel 2 is connected to the rear brake tubing position, the middle piston works, clamping friction sheet.

- Remove the dust seal ② and piston seal ③.

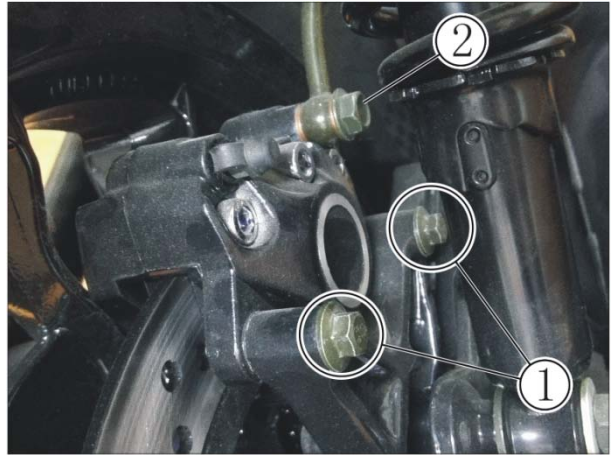
⚠ CAUTION

- ❖ Care not to cause scratch on the cylinder bore.
- ❖ Donot reuse the piston seal and dust seal that have been removed.

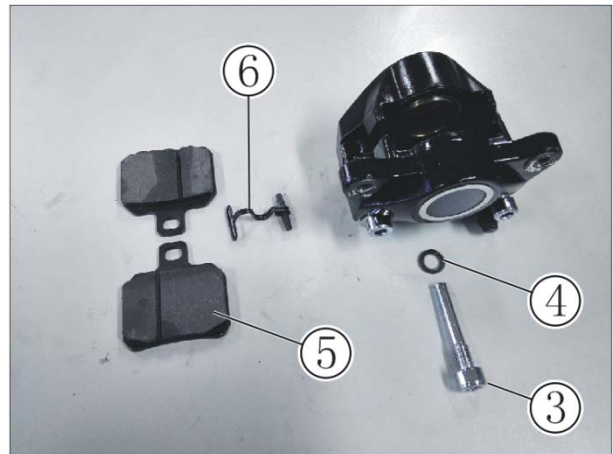


CALIPER REAR BRAKE DISASSEMBLY

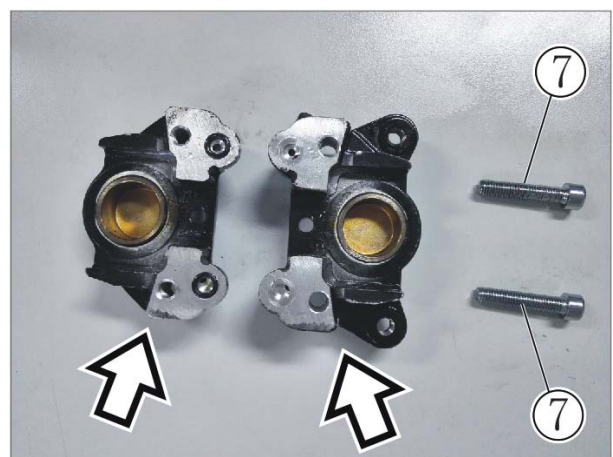
- Remove the rear brake union bolt ① and caliper mounting bolts ②.



- Remove the rear brake caliper friction sheet ⑤ fixing screws ③ and washer ④.
- Remove the spring slice ⑥.



- Remove the caliper combination bolt ⑦ of the rear brake caliper and separate the left and right caliper body.



- Using an air gun, push out the caliper piston.

⚠ WARNING

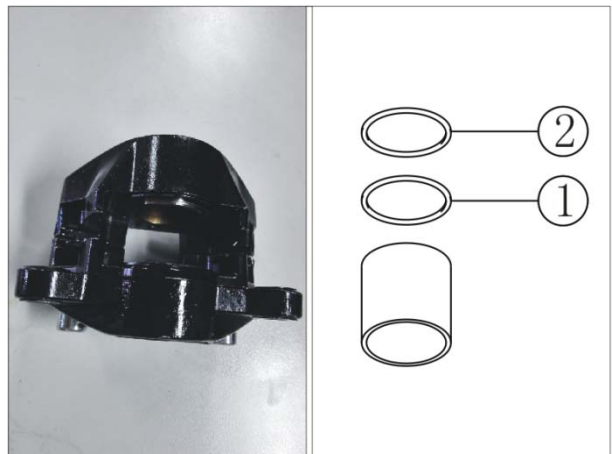
- ❖ Place a rag over the piston to prevent it from popping out and flying and keeping hand off the piston.
- ❖ Be careful of brake fluid which can possibly splash.
- ❖ Do not use high pressure air but increase the pressure gradually.



- Remove the dust seal ① and piston seal ②.

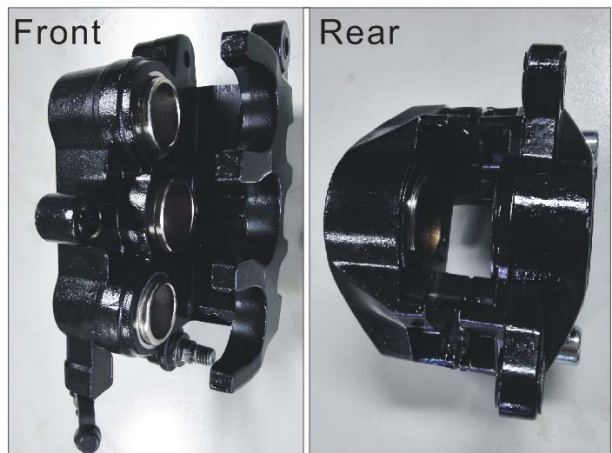
⚠ CAUTION

- ❖ Care not to cause scratch on the cylinder bore.
- ❖ Do not reuse the piston seal and dust seal that have been removed.



👁 CALIPER INSPECTION

Inspect the front and rear caliper cylinder wall and piston surface for scratch, corrosion or other damages. If any abnormal condition is noted, replace the caliper.



◎ CALIPER REASSEMBLY

Reassemble the caliper in the reverse order of disassembly procedures and observe the following points.

⚠ CAUTION

- ❖ Wash the caliper components with fresh brake fluid before reassembly. Do not wipe off brake fluid after washing the components.
- ❖ Replace the piston seal and dust seal with new ones with brake fluid applied.



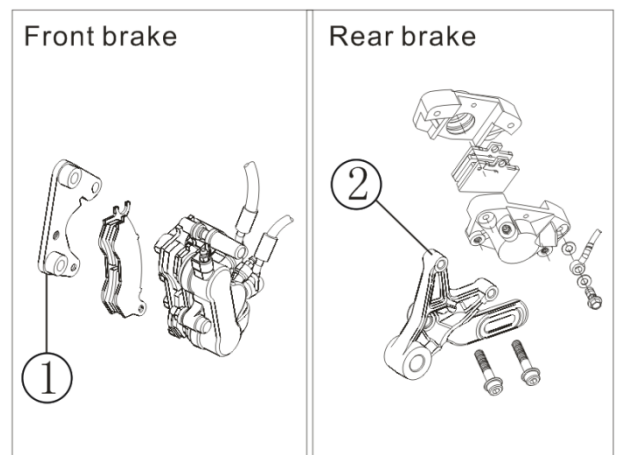
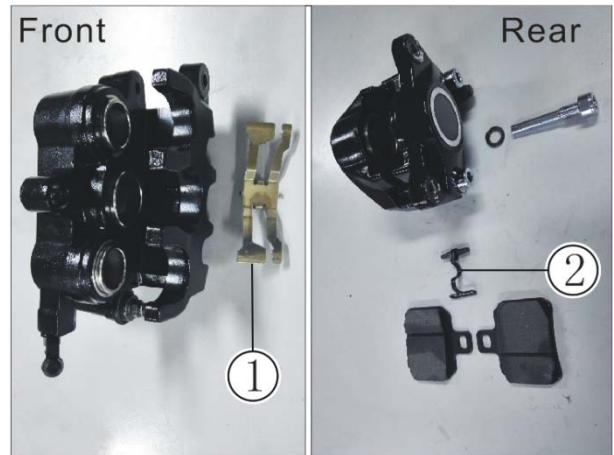
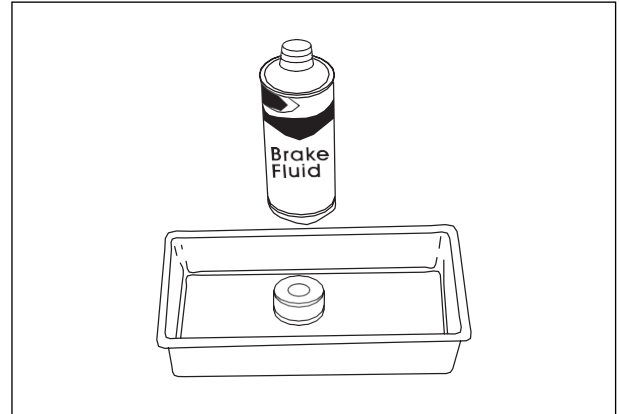
Brake fluid specification and classification : DOT 4

- Install the brake pad spring.

- Apply SILICONE GREASE to the brake caliper holder.

SILICONE GREASE

- Install the brake pads.



- Tighten the front caliper mounting bolts ① and rear caliper mounting bolts ②.
- With the hose end seated to the stopper, tighten the union bolt ③ and ④.

🔧 Front brake caliper mounting bolts
:18~28 N•m (1.8~2.8 kg•m)
Front brake hose union bolts
:20~25 N•m (2.0~2.5 kg•m)

🔧 Rear brake caliper mounting bolts
:18~28 N•m (1.8~2.8 kg•m)
Rear brake hose union bolts
:20~25 N•m (2.0~2.5 kg•m)

- Fill the system with brake fluid and bleed air.

Inspection after reassembly : Refer to page 2-28

👁️ BRAKE DISC INSPECTION

Check the brake disc for damage or cracks. Measure the thickness using the micrometer.

Replace the brake disc if the thickness is less than the service limit or if damage is found.

Brake disc thickness	Service limit
	3.0 mm

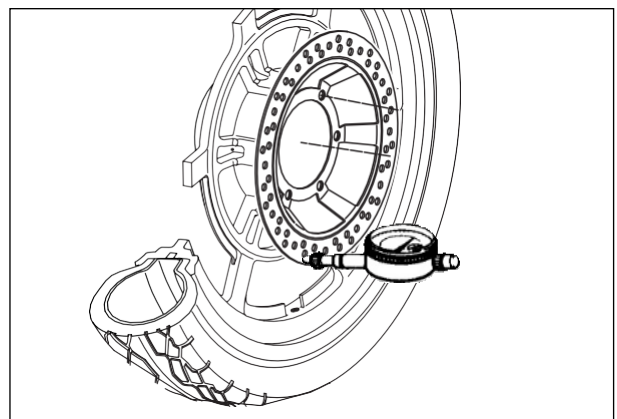
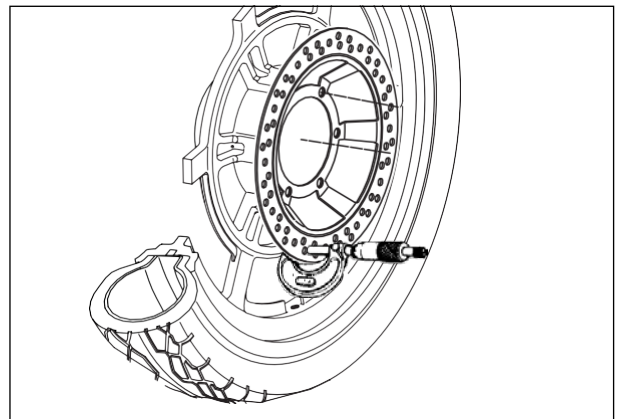
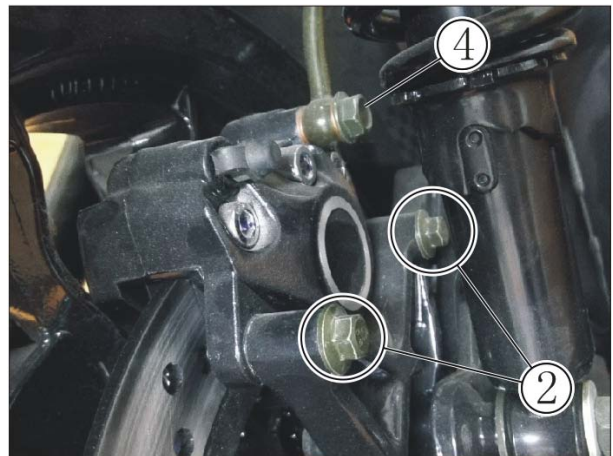
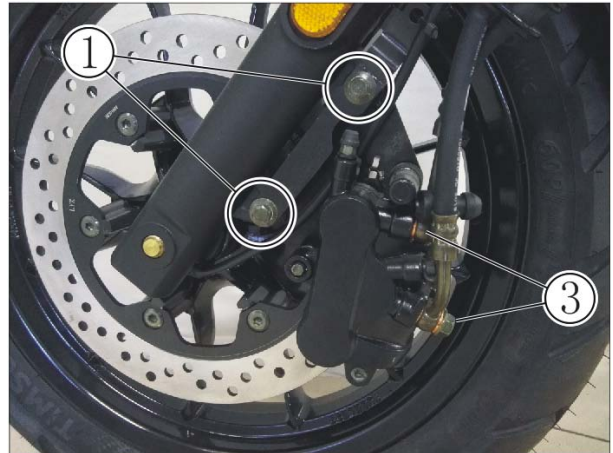
🔧 TOOL Micrometer (0-25 mm) : 09900-20201

Measure the runout using the dial gauge.
Replace the brake disc if the runout exceeds the service limit.

Brake disc runout	Service limit
	0.3 mm

🔧 TOOL Dial gauge : 09900-20606
Magnetic stand : 09900-20701

- If either measurement exceeds the service limit, replace the brake disc.



⦿ MASTER CYLINDER DISASSEMBLY

- Drain brake fluid the mastercylinder.
- Disconnect the brake lamp switch lead wire coupler.
- Remove the union bolt ①.



CAUTION

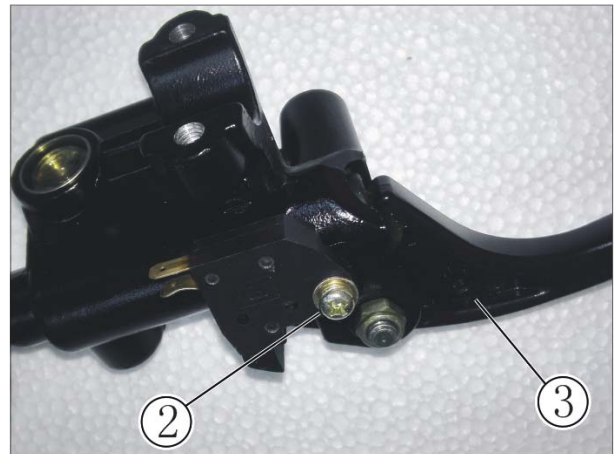
Place a rag under the union bolt so that brake fluid can not contact the parts.



- Remove the master cylinder.



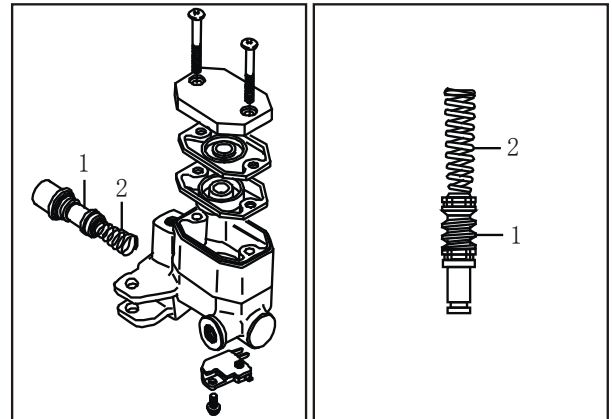
- Remove the brake lamp switch ② and brake lever ③.



- Remove the master cylinder cap.



- Detach the dust seal boot and remove the circlip.
- Pull out the piston/cup set ① and spring ②.



⦿ MASTER CYLINDER INSPECTION

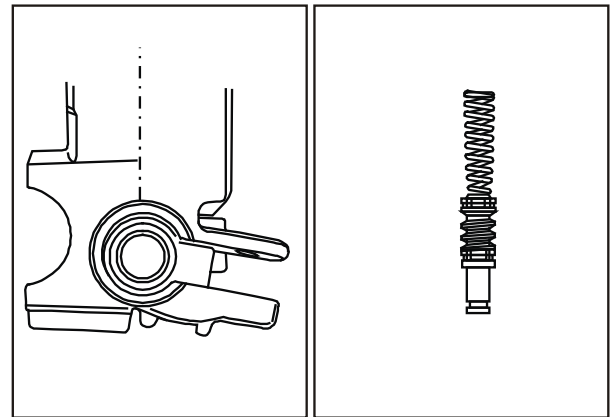
Inspect the master cylinder bore for any scratches or other damage.

Inspect the piston surface for any scratches or other damage.

⦿ MASTER CYLINDER REASSEMBLY

Reassemble the master cylinder in the reverse order of disassembly.

Pay attention to the following points :



⚠ CAUTION

- ❖ Wash the master cylinder components with new brake fluid before reassembly.
- ❖ When washing the components, use the specified brake fluid. Never use different types of fluid or cleaning solvents such as gasoline, kerosine, etc.



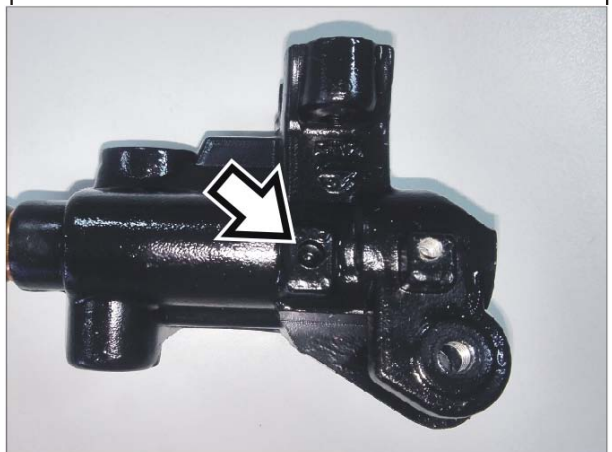
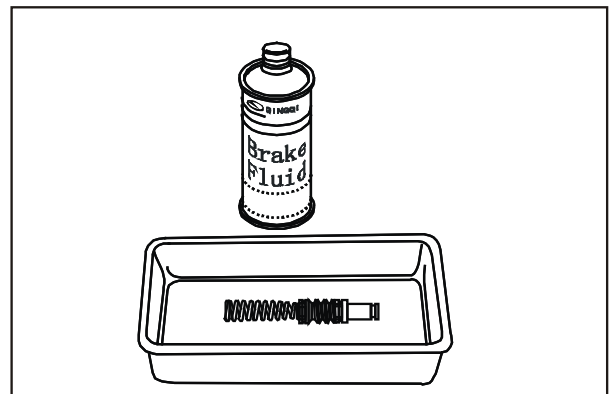
Specification and Classification

: DOT 4

NOTE:

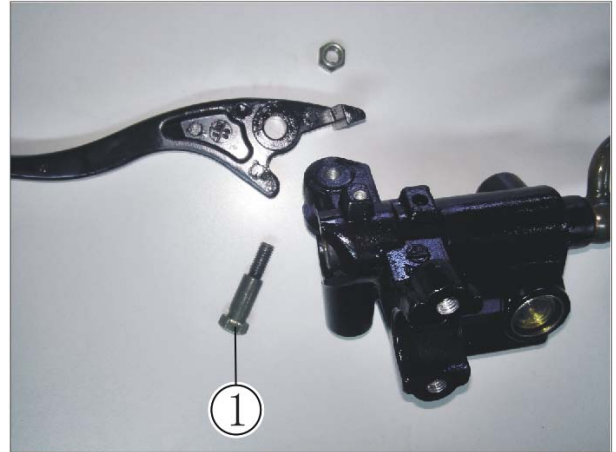
When installing the circlip, make sure that the sharp edge of the circlip faces outside.

- When reinstalling the brake lamp switch, align the projection on the switch with the hole in the master cylinder.




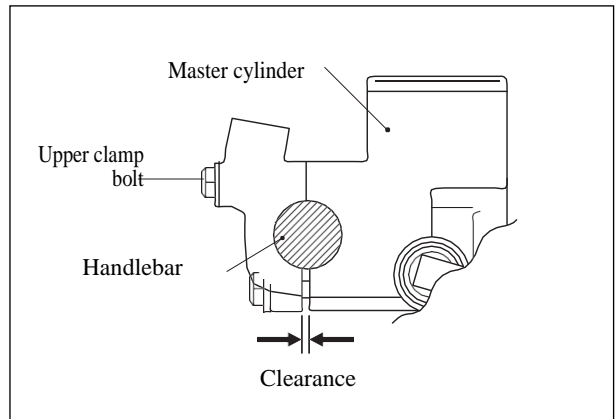
- Apply SUPER GREASE“ A ” to the brake lever pivot ①.

 SUPER GREASE“ A ”



- When remounting the master cylinder onto the handlebars, align the master cylinder holder's mating surface with punch mark on the handlebar and tighten the upper clamp bolt first.

 **Front brake master cylinder mounting bolt**



: 5~8 N·m (0.5 ~0.8 kg·m)

- Install the brake hose union, tighten the union bolt to the specified torque.

 **Front brake hose union bolt**

: 20~25 N·m (2.0 ~2.5 kg·m)



 **CAUTION**

Bleed air from the brake system after reassembling the master cylinder.

HANDLEBARS

HANDLEBARS RIGHT SIDE PARTS REMOVAL

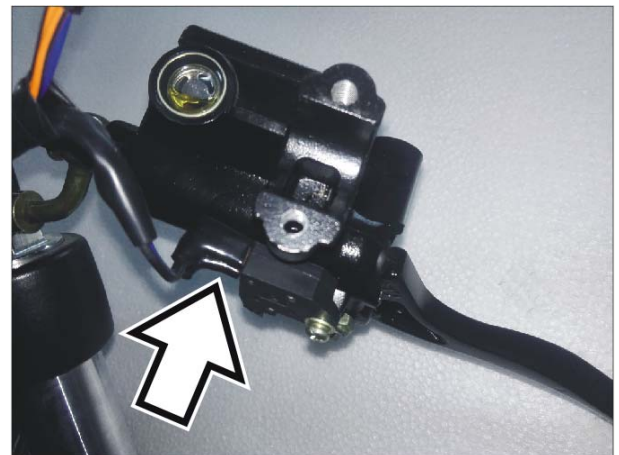
- Remove the rearview mirror ①.



- Remove the front master cylinder set.



- Disconnect the brake lamp switch lead wires and remove the master cylinder.
- Remove the brake lever.



- Remove the right handlebar switches.



- Remove the throttle cable.



- Remove the handlebar grip ①.



HANDLEBARS LEFT SIDE PARTS REMOVAL

- Remove the rearview mirror ①.



- Remove the clutch lever rear holder.



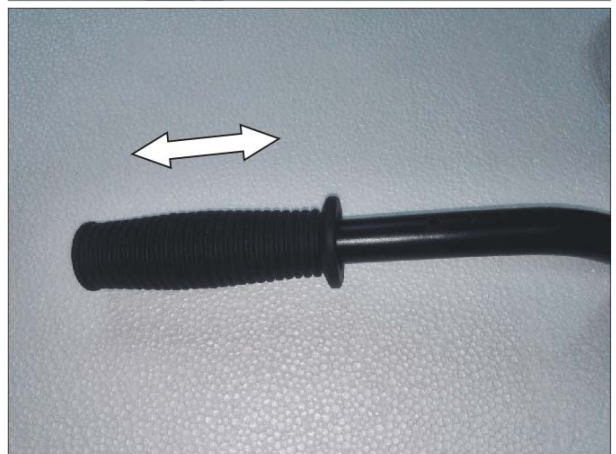
- Disconnect the clutch switch lead wires.
- Remove the clutch cable.
- Remove the clutch lever.



- Remove the left handlebar switches.



- Remove the handlebar grip.



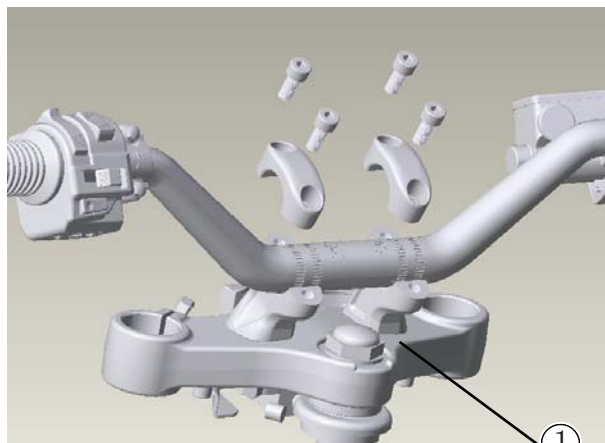
- Remove the clamp bolts and detach the handlebar holders.
- Remove the handlebar.



□ REMOUNTING

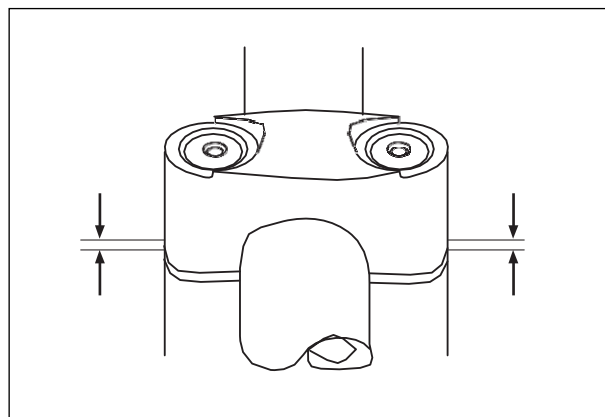
Perform the remounting work in the reverse order of the removal procedures while observing the following instructions.

- Install the handlebars with the punch mark ① aligned with the handlebar clamp as shown.
- Tighten the handlebar clamp bolts to the specified torque.

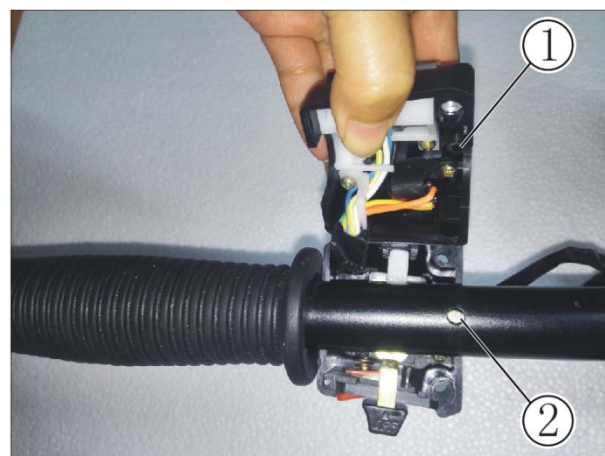


- 🔧 **Handlebar clamp bolt**
: 18~28 N•m (1.8 ~2.8 kg•m)

NOTE
<i>The gap between the handlebar clamp and holder should be even.</i>



- Align the mating face ① of left handle switch with the respective punch marks ② and tighten the bolt.



- Apply SUPER GREASE““A””to the throttle cables and assemble them.

 SUPER GREASE““A””



- Align the mating face ① of right handle switch with the respective punch marks ② and tighten the bolt.

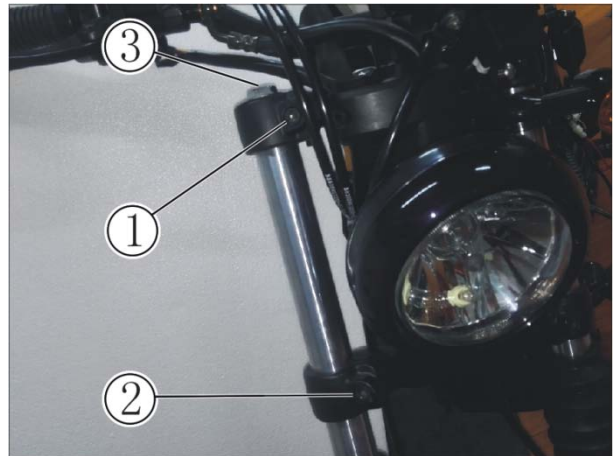


- Install the brake master cylinder.

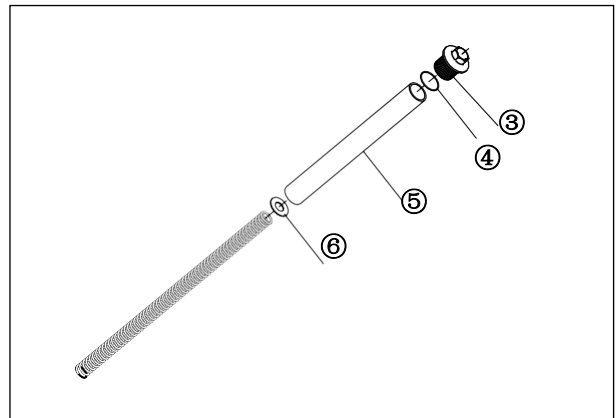
- Remove the front fork after loosening the front fork upper ① and lower clamp bolts ②.

NOTE

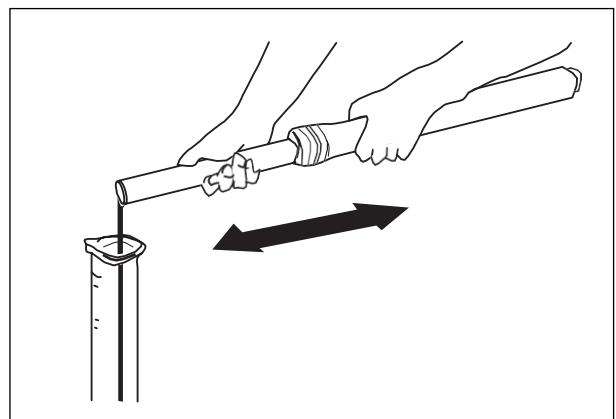
Slightly loosen the front fork upper bolt ③ to facilitate later disassembly.



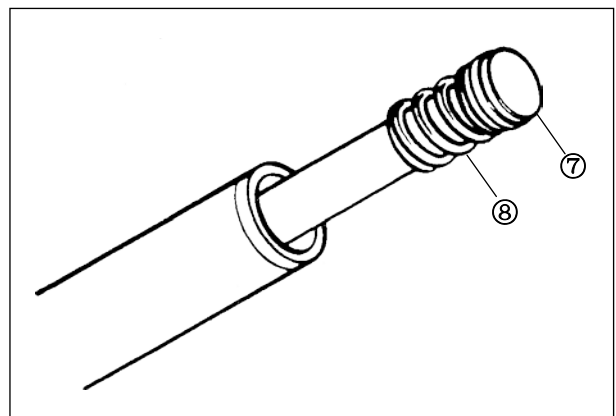
- Remove the front fork upper bolt ③, O-ring ④, front fork inner spacer ⑤ and spring guide ⑥.



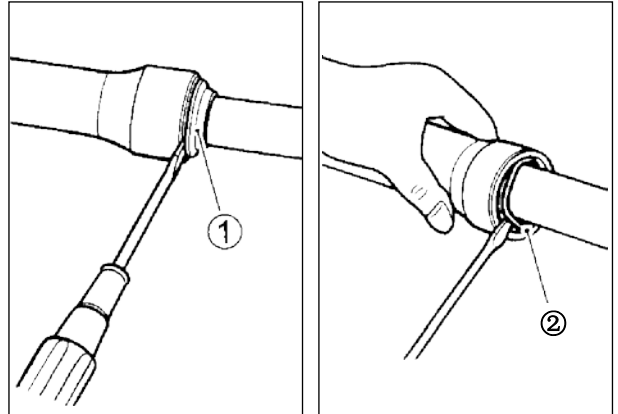
- Invert the front fork and stroke it several times to drain out the fork oil.
- Hold the front fork in the inverted position for a few minutes to allow the fork oil to fully drain.



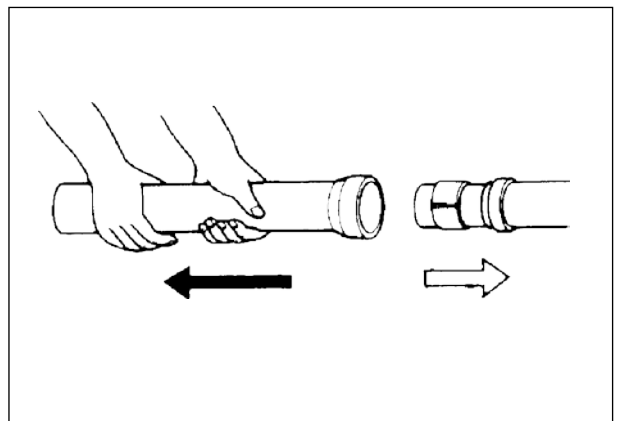
- With the damper rod held immovable, remove the damper rod bolt.
- Remove the damper rod ⑦ and rebound spring ⑧ from the inner tube.



- Remove the dust seal ① and oil seal stopper ring ②.

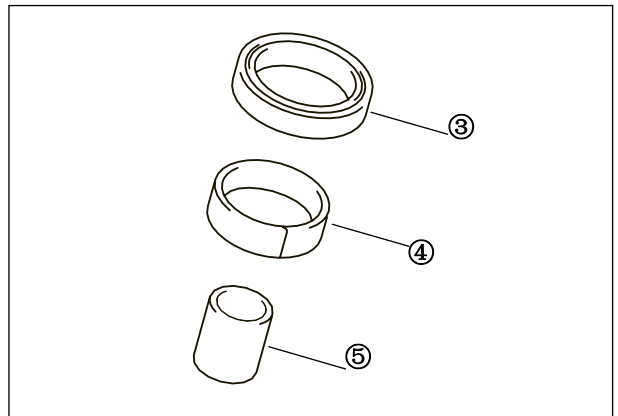


- Separate the inner tube from the outer tube.



- Remove the following parts.

- ③ Oil seal
- ④ Slide metal
- ⑤ Oil lock piece



 **CAUTION**

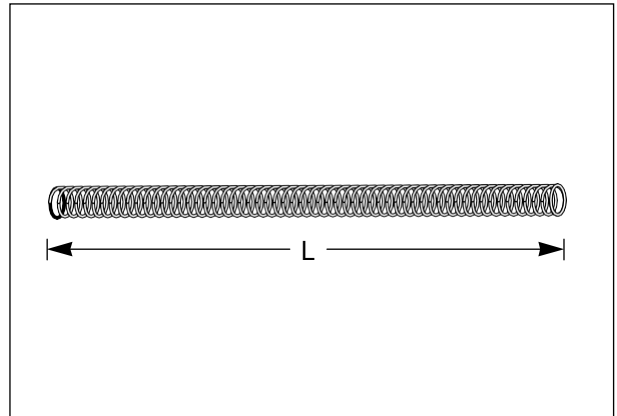
The removed oil seal and slide metal should be replaced with new ones.

👁 INSPECTION

☐ FRONT FORK SPRING

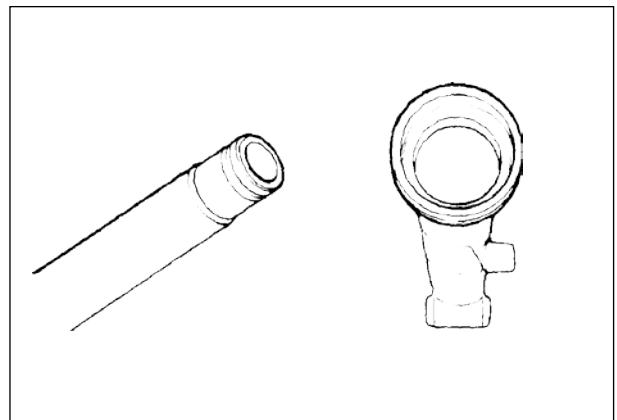
Measure the free length of the front fork spring. If the length is found shorter than the service limit, replace the spring.

Front fork spring free length L	Service limit
	356 mm



☐ INNER TUBE AND OUTERTUBE

Check the sliding of the inner tube, outer tube and damper rod ring for scratch, wear, bending, or other abnormal condition.



👁 REASSEMBLY

Perform the reassembly and remounting work in the reverse order of the disassembly and removal procedures while observing the following instructions.

⚠ CAUTION

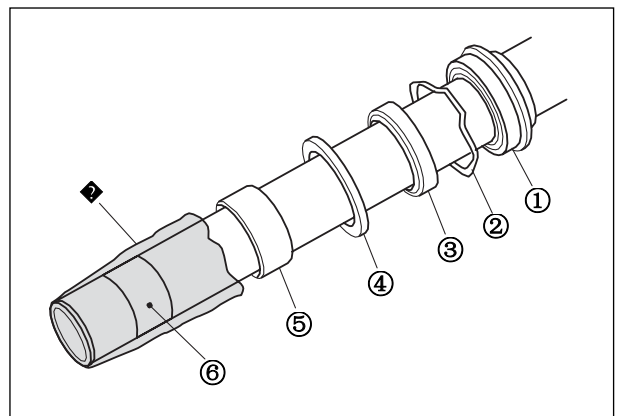
- ❖ Thoroughly wash all the component parts being assembled. Insufficient washing can result in oil leakage or premature wear of the parts.
- ❖ When reassembling the front fork, use new fork oil.
- ❖ Use the specified fork oil for the front fork.
- ❖ When reassembling, replace the slide metals, oil seal, dust seal and damper rod bolt gasket with new ones.

● On the inner tube, assemble the following parts.

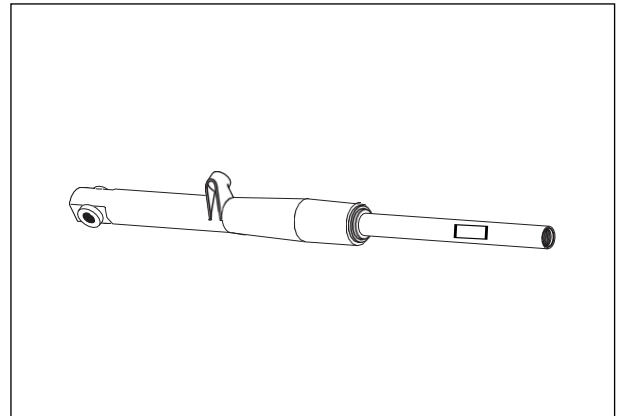
- ① Dust seal
- ② Oil seal stopper ring
- ③ Oil seal
- ④ Oil seal retainer
- ⑤ Slide metal
- ⑥ Guide bushing

⚠ CAUTION

To prevent the lip of oil seal ③ from being damaged, cover the inner tube with vinyl sheet during installation.



- With the oil lock piece fitted to the inner tube, assemble the inner tube to the outer tube.



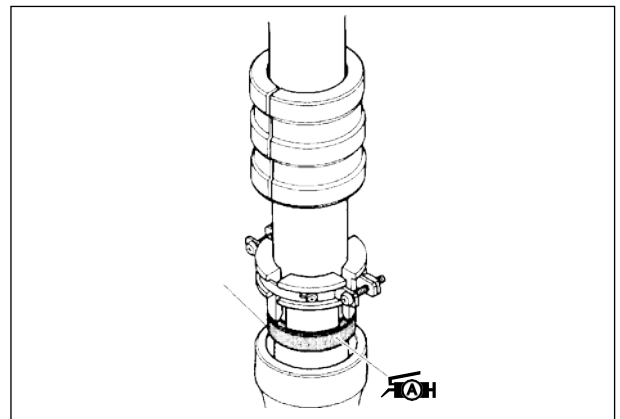
- Apply SUPER GREASE“ A ” to the lip of the oil seal and install it into the outer tube using the front fork oil seal installer.

 SUPER GREASE“ A ”

 Front fork oil seal installer set : 09940-52861

 **CAUTION**

Wash and clean the front fork oil seal installer before using. If dirt is on the installer, the inner tube may possibly be damaged during press-fitting work.

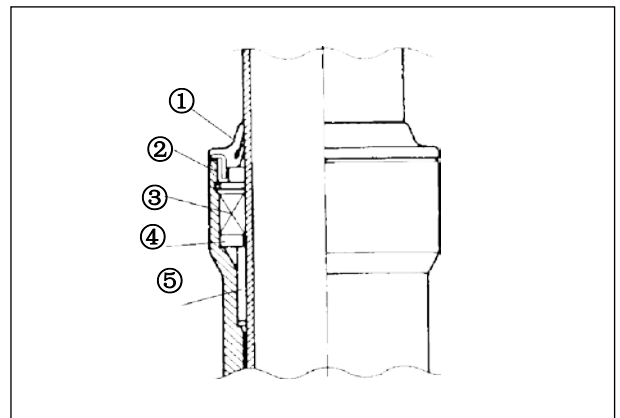


- Fit the stopper ring ② and dust seal ①.

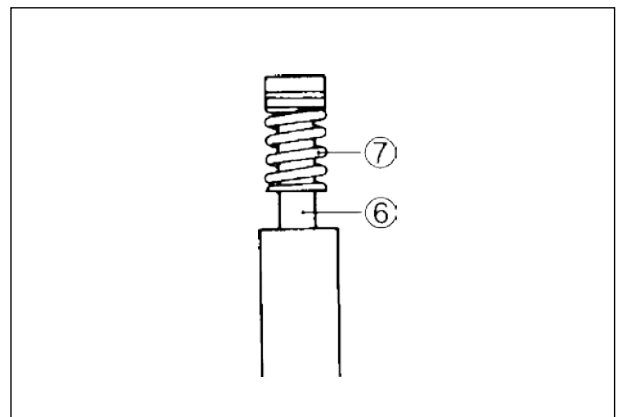
 **CAUTION**

Make sure that the stopper ring is securely fitted into the groove on the outer tube.

- ① Dust seal
- ② Oil seal stopper ring
- ③ Oil seal
- ④ Oil seal retainer
- ⑤ Slide metal




- Fit the rebound spring ⑦ on the damper rod ⑥ and install them together to the inner tube.

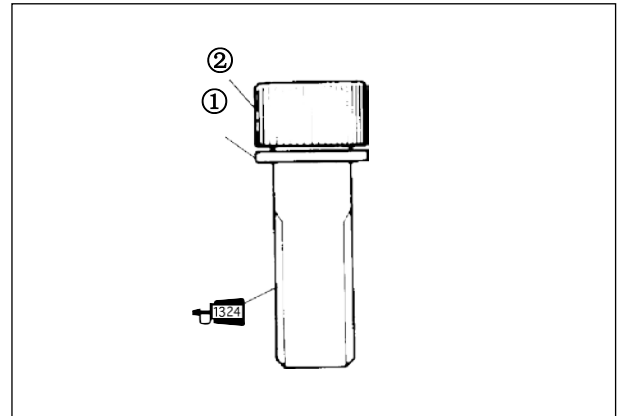


- Apply THREAD LOCK™ “1324” to the damper rod bolt ②.

- With the damper rod held immovable, with the gasket ① fitted, tighten the damper rod bolt ②.

 **Front fork damper rod bolt**
: 15~25 N·m (1.5~2.5 kg·m)

 **THREAD LOCK™ “1324”**



CAUTION

Replace the gasket with a new one.

□ FRONT FORK OIL

- With the inner tube in fully compressed position, pour the specified amount of fork oil and stroke the tube several times to expel air.

 **Front fork oil specification : TELLUS #22**

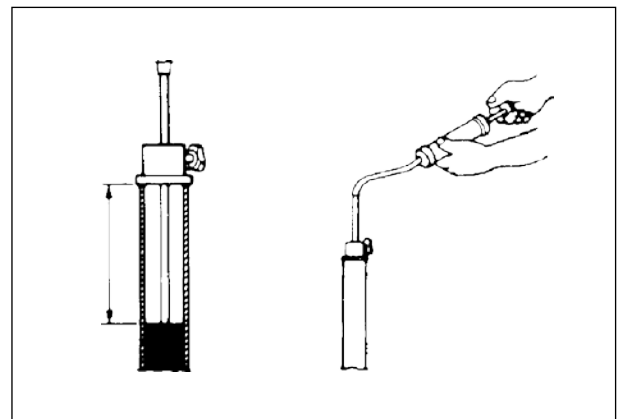
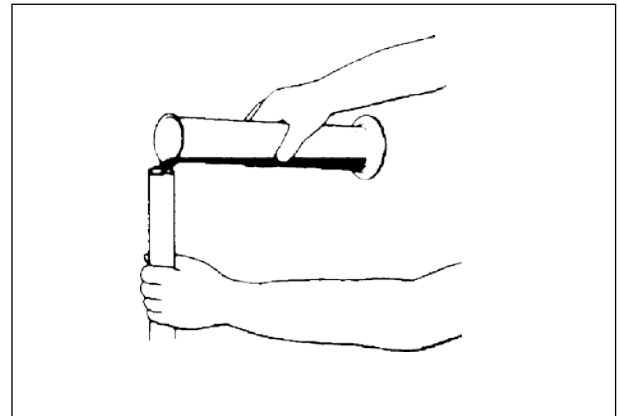
Front fork oil capacity	Each leg
	250 ml

- With the front fork held in vertical position, compress the inner tube all the way.

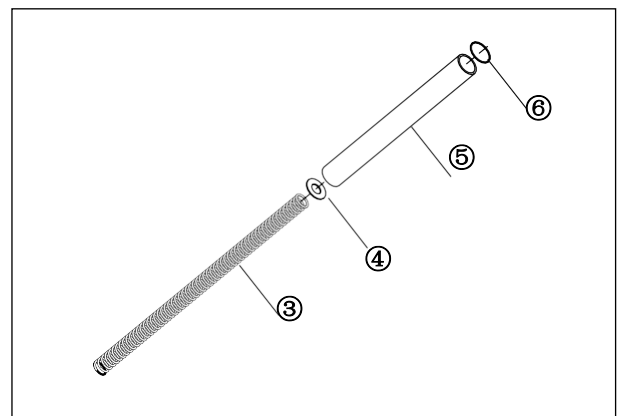
- Wait until the fluid level stabilizes, measure and adjust the level to specification using the special tool.

Front fork oil level	325 mm (without spring)
-----------------------------	----------------------------

 **Front fork oil level gauge: 09943-74111**



- Install the front fork spring ③.
- Install the spring guide ④, front fork inner spacer ⑤, and O-ring ⑥.



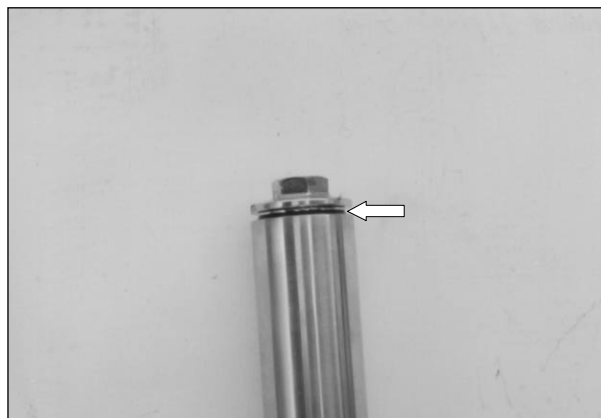
- Fit the O-ring to the front fork upper bolt and apply SUPER GREASE“ A”.

 SUPER GREASE“ A”

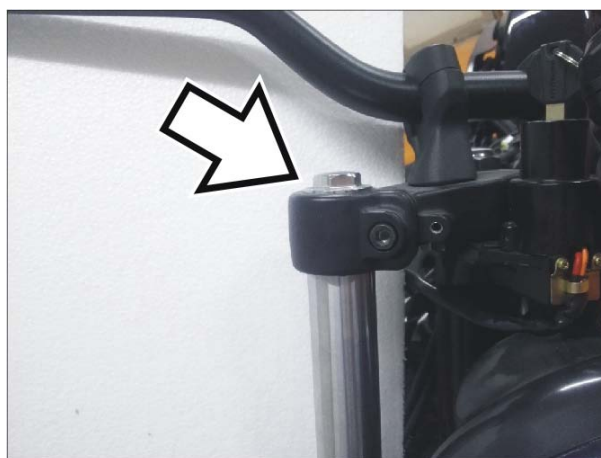


CAUTION

Use a new O-ring to prevent oil leakage.




- Install the front fork to the motorcycle.
- Align the upper surface of the inner tube with the upper surface of the steering stem upper bracket.



- Tighten the front fork lower clamp bolts ② and front fork upper bolts ③ to the specified torque.
- Tighten the front fork upper clamp bolts ① to the specified torque.

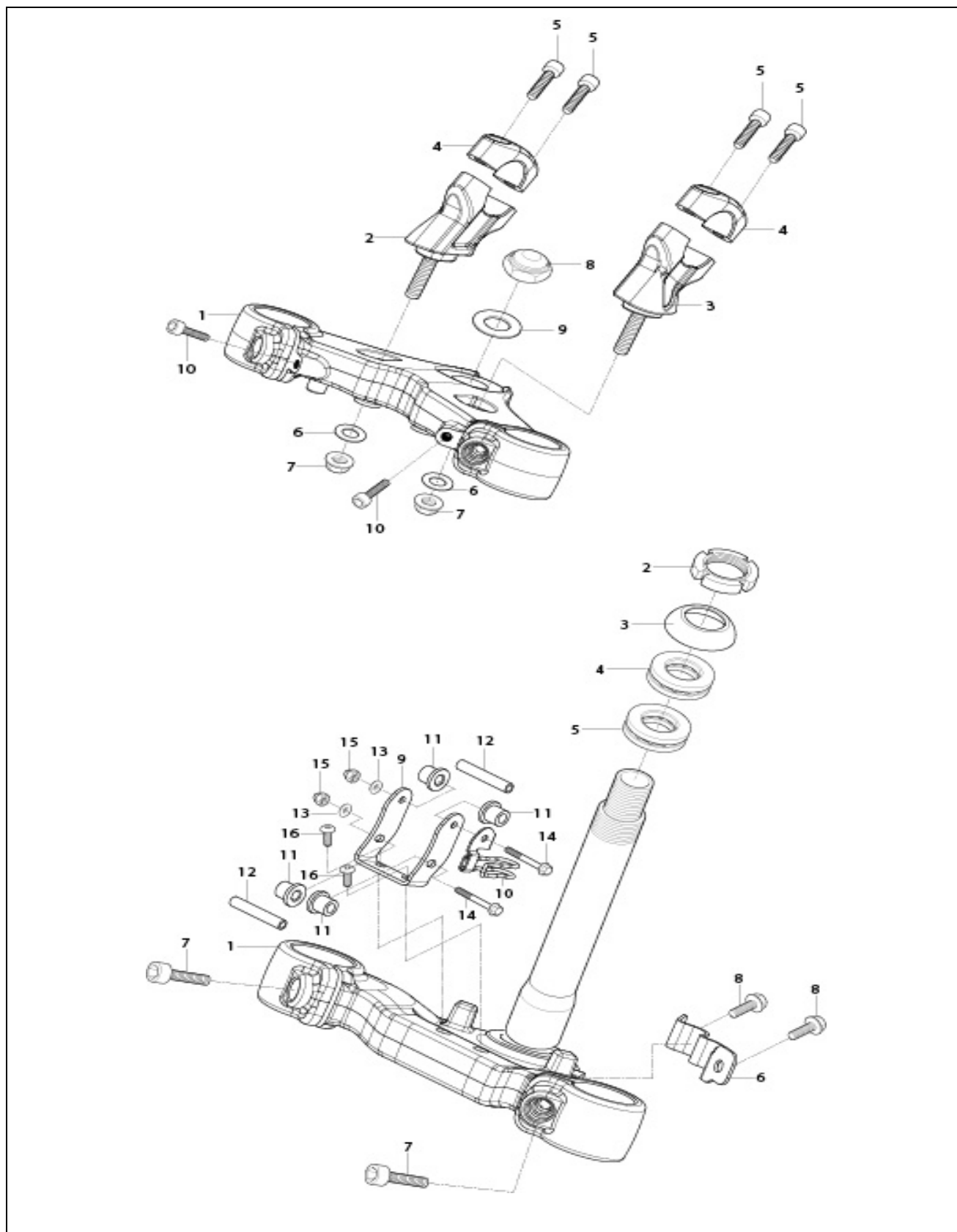


-  **Front fork upper clamp bolt**
 : 22~35 N•m (2.2~3.5 kg•m)
- Front fork lower clamp bolt**
 : 22~35 N•m (2.2~3.5 kg•m)
- Front fork upper bolt**
 : 15~30 N•m (1.5~3.0 kg•m)

- Install the front fender and tighten the mounting bolts temporarily.
- Install the front wheel.
- Install the front brake caliper.
- Move the front fork up and down several times.
- Tighten the front fender mounting bolts securely.



STEERING



👁 **DISASSEMBLY**

- Remove the front wheel.
- Remove the front fork.
- Remove the head lamp ①.



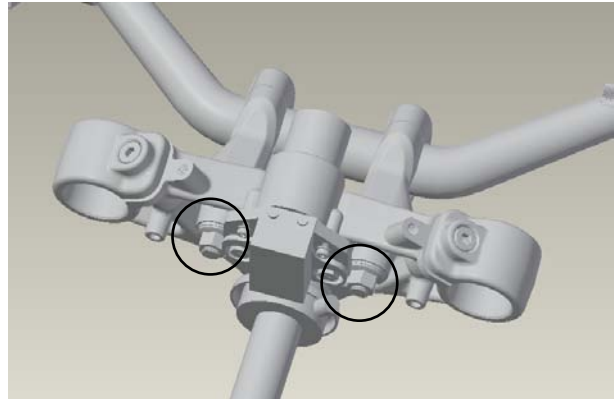
- Remove the steering lock ② and speedometer bracket ③.



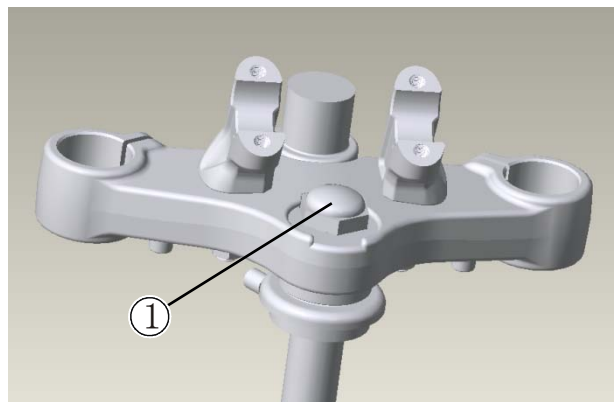
- Remove the brake hose guide.



- With the nuts removed, remove the headlamp housing.
- Remove the handlebars.



- Remove the steering stem head nut ①.
- Remove the steering stem upper bracket.



- Remove the steering stem nut ② using the special tool.

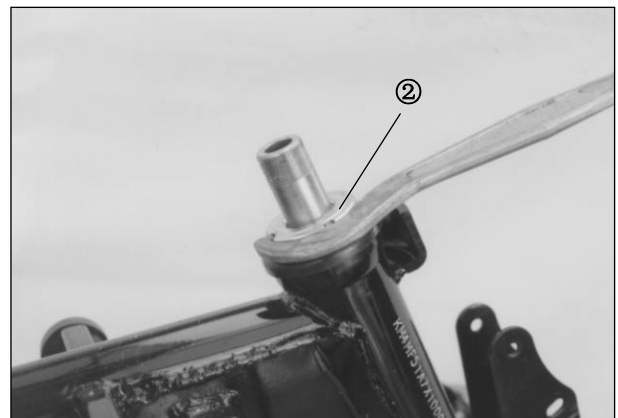


Clamp wrench : 09940-10122

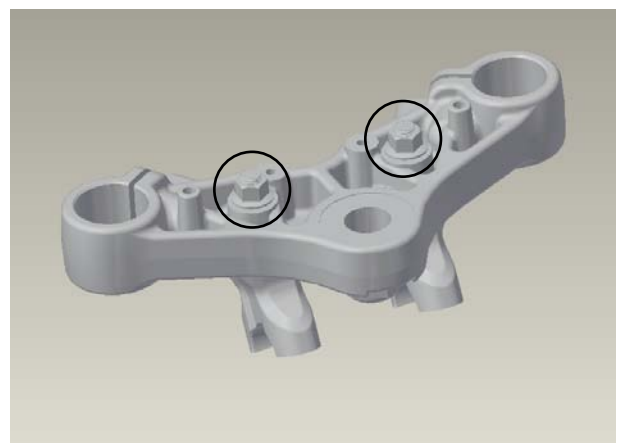
- Draw out the steering stem lower bracket.

NOTE

Hold the steering stem lower bracket to prevent it from falling.



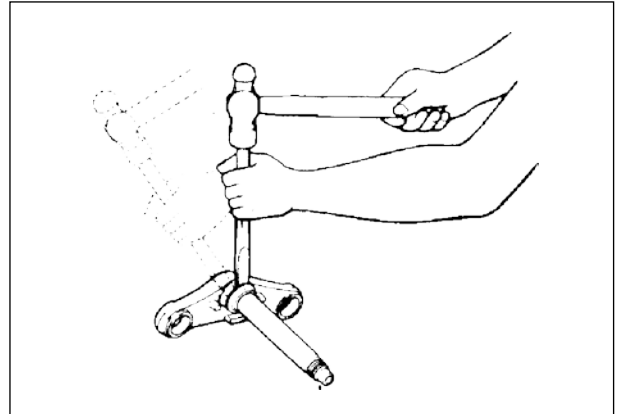
- Remove the handlebar holders by removing the nuts.



- To remove the lower inner race, use a chisel like.

CAUTION

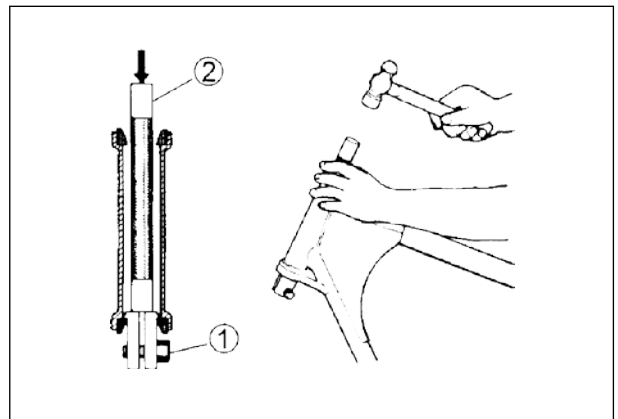
- ❖ Unless corrosion, damage or other abnormal condition is found, the bearing race need not be replaced.
- ❖ Once the lower inner race has been removed, replace it with a new one.



- Drive out the steering stem bearing outer races using the special tools ① and a suitable wedge bar ②.



Bearing outer race remover ① : 09941-54911



INSPECTION

Check the steering stem and steering stem head for any damage.

Check the bearing and race for corrosion, nick or other damage.



REASSEMBLY

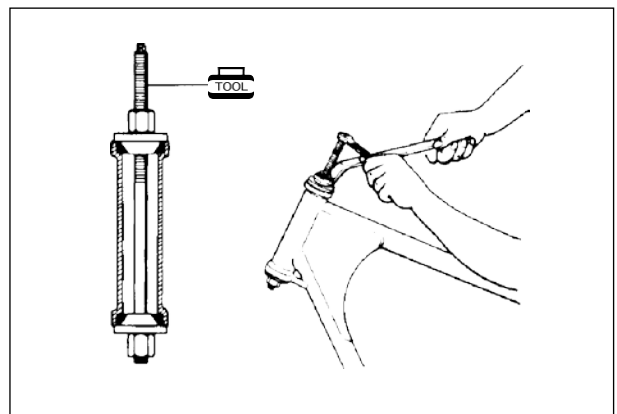
Reassembly can be performed in reverse order of disassembly procedures.

However, operate the work taking care for the following points.

- Press in the upper and lower outer race using the special tool.



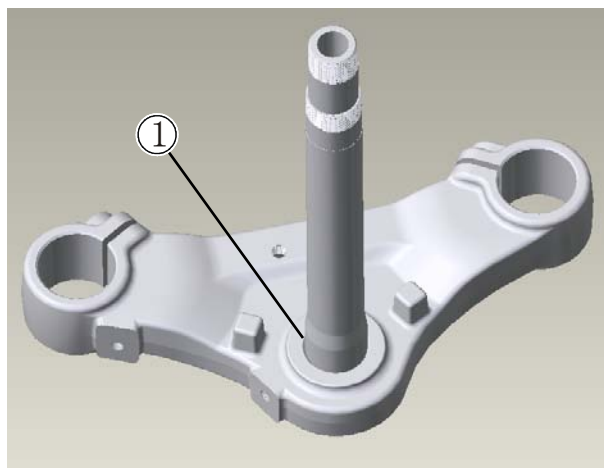
Steering race installer : 09941-34513



- Press in the lower inner race ①.



Bearing installer : 09913-80112

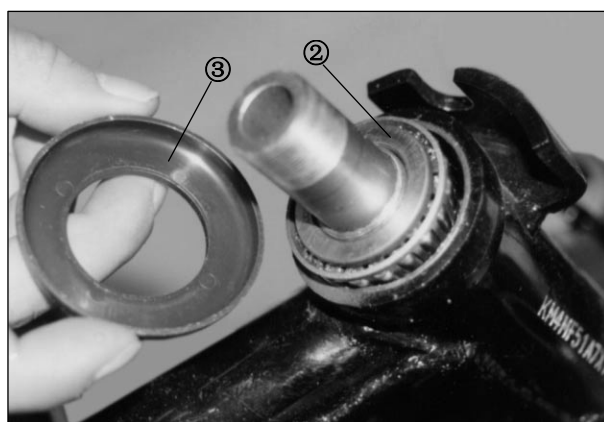


- Apply SUPER GREASE™ A to the upper bearing, lower bearing and outer races prior to installing the steering stem.



SUPER GREASE A

- Install the upper inner race ② and dust cover ③.



- Install the handlebar holders and tighten their nuts temporarily.



- Install the steering stem.
- Tighten the steering stem nut.



Steering stem nut : 40~50 N•m (4.0~5.0 kg•m)



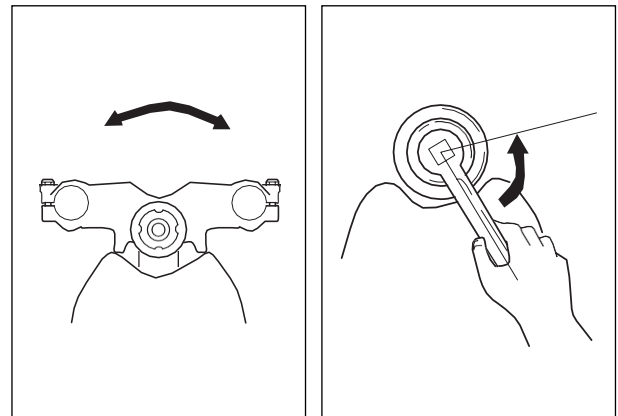
Clamp wrench : 09940-10122



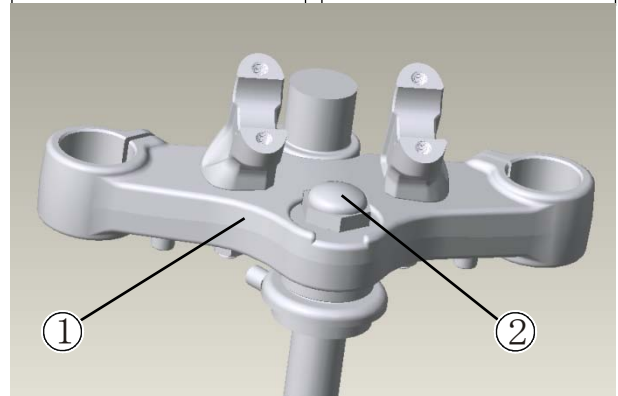
- Turn the steering stem lower bracket about five or six times to the left and right.
- Loosen the steering stem nut $\frac{1}{4}$ - $\frac{1}{2}$ of a turn .

NOTE

This adjustment will vary from motorcycle to motorcycle. Make sure that the steering turns smoothly and easily in both directions without play.

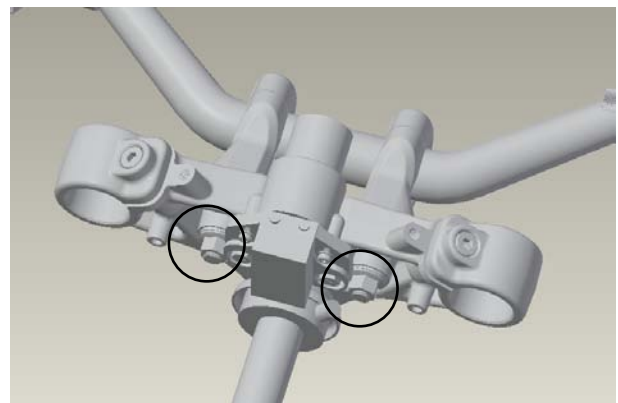


- Install the steering stem upper bracket ① and washer ②.
- Tighten the steering stem head nut temporarily.




- Install the handlebars.
- Tighten the handlebar holder nuts to the specified torque.

 **Handlebar holder lower nut**
: 40~60 N•m (4.0~6.0 kg•m)



- Align the upper surface of the front fork inner tube with the upper surface of the steering stem upper bracket.
- Tighten the upper front fork clamp bolts to the specified torque.

 **Front fork upper clamp bolt**
: 22~35 N•m (2.2~3.5 kg•m)

- Tighten the steering stem head nut to the specified torque.

 **Steering stem head nut**
: 80~100 N•m (8.0~10.0 kg•m)



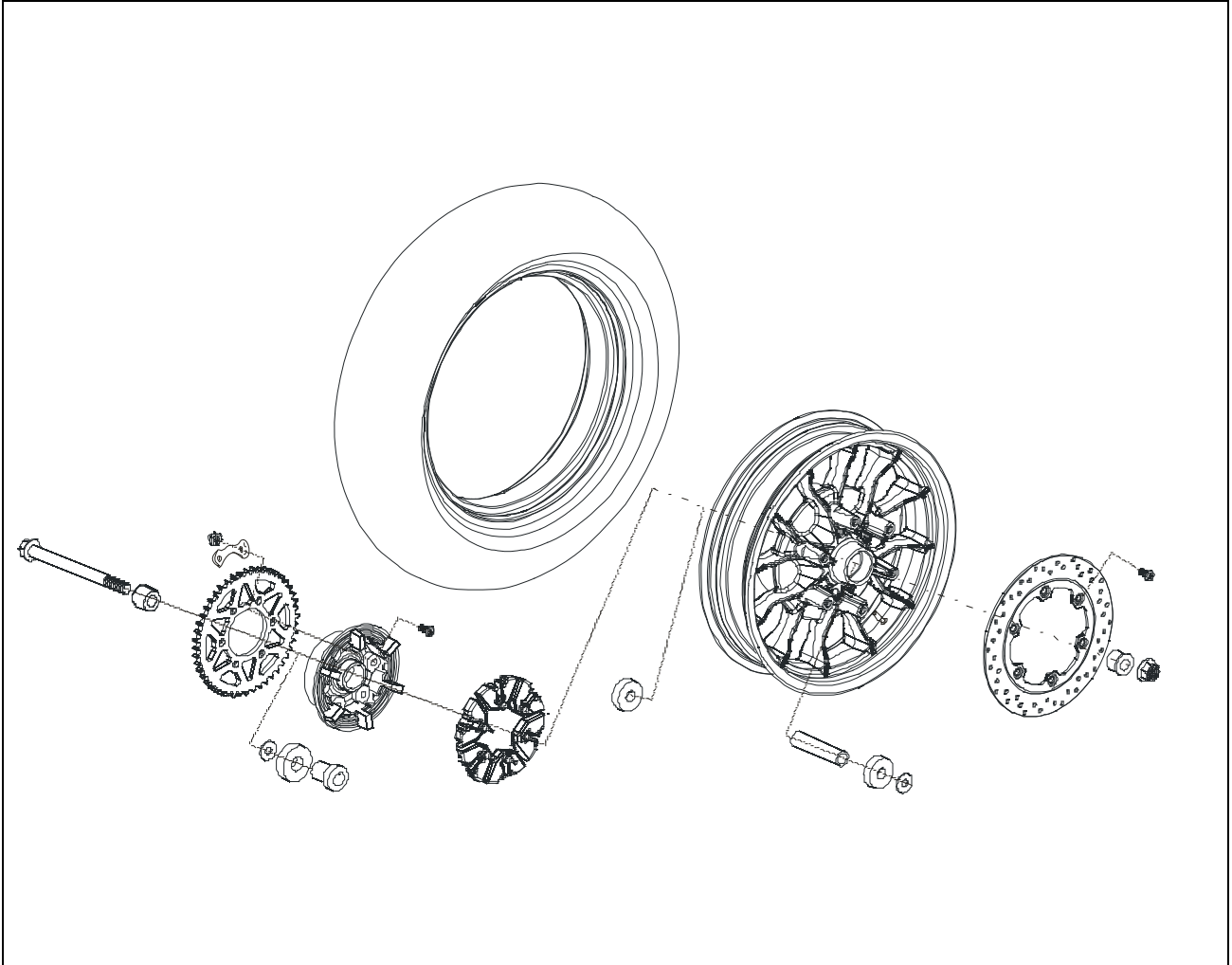
- Install the front wheel.

NOTE

Hold the front fork legs, move them back and forth and make sure that the steering is not loose.

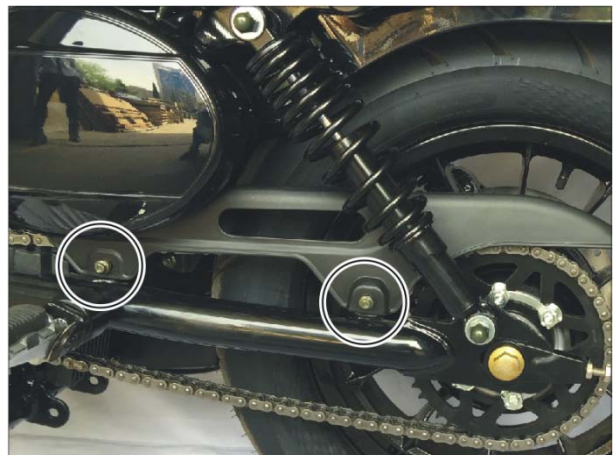


REAR WHEEL



REMOVAL

- Remove the drive chain cover.



- Remove the rear brake caliper.

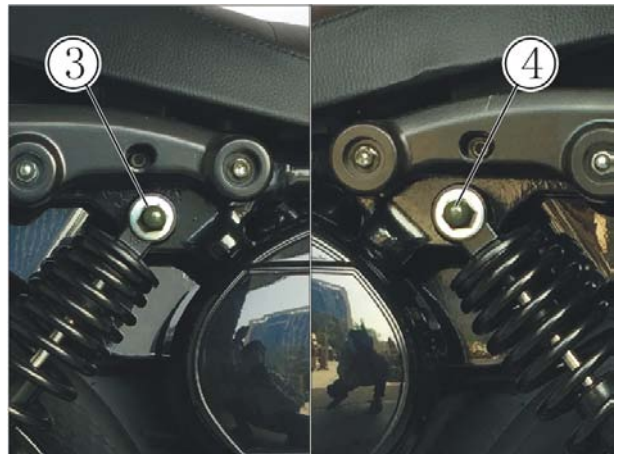


- Raise the rear wheel off the ground with a jack or block.

- Loosen the right drive chain adjuster nut ① and left drive chain adjuster nut ②.
- Disengage the drive chain from the rear sprocket.



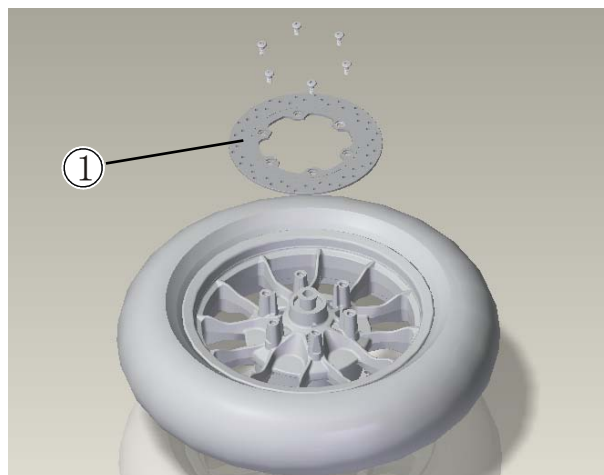
- Loosen the right rear shock absorber upper bolt ③ and left rear shock absorber upper bolt ④.



- Draw out the rear axle ⑤ with the rear wheel push to the bottom.
- Pull the rear wheel assembly rearward.



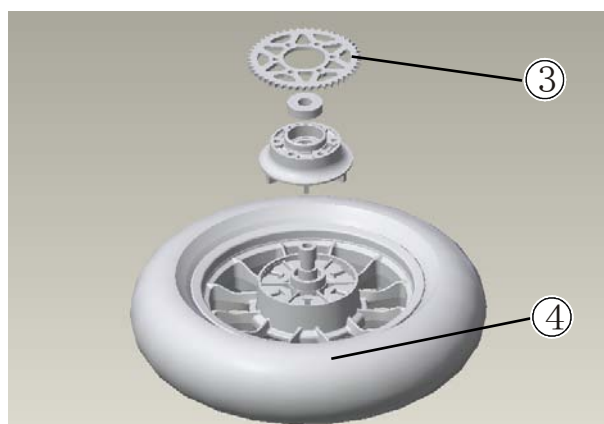
- Remove the rear brake panel ①.



- Remove the spacer ②.
- Remove the rear sprocket ③ with mounting drum from the rear wheel.

NOTE

Before separating the rear sprocket and mounting drum, slightly loosen the rear sprocket bolts.



- Remove the rear wheel shock absorber ④.

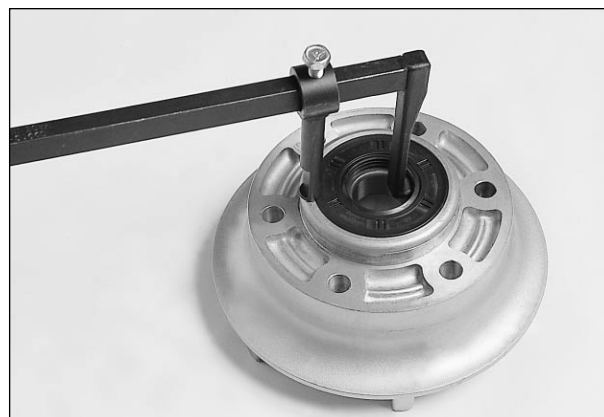
- Remove the rear sprocket ⑤ from the rear sprocket mounting drum.



- Remove the dust seal.



Oil seal remover : 09913-50121



👁️ INSPECTION

WHEEL AXLE : Refer to page 7-9

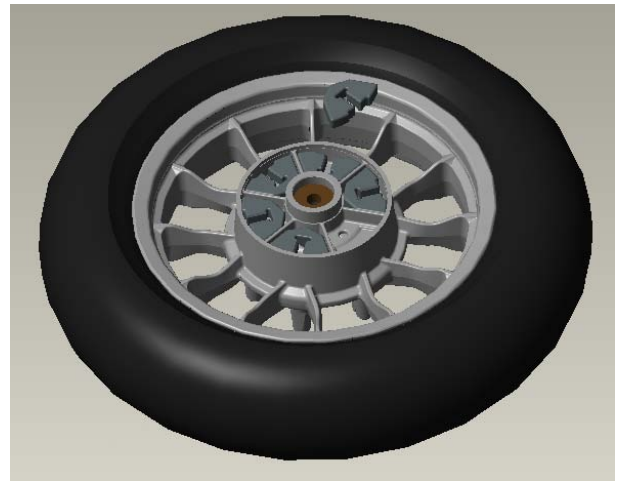
WHEEL : Refer to page 7-9

WHEEL BEARING : Refer to page 7-9

❑ REAR WHEEL SHOCK ABSORBER

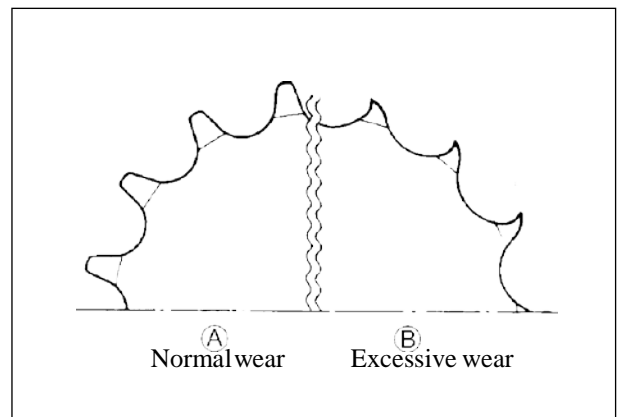
Inspect the rear wheel shock absorber for wear and damage.

Replace the rear wheel shock absorber if there is anything unusual.




❑ SPROCKET

Inspect the sprocket's teeth for wear. If they are worn, replace the sprocket and drive chain as a set.



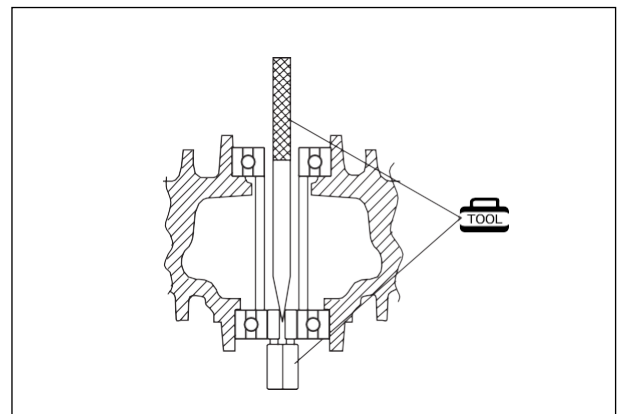
❑ WHEEL BEARING REMOVAL

- Remove the bearing by using the special tool.

 Wheel bearing remover : 09941-50111

CAUTION

The removed bearing should be replaced with new one.



□ REAR SPROCKET MOUNTING DRUM BEARING

- Remove the bearing by using special tool.



Bearing remover(17mm) : 09923-73210



CAUTION

The removed bearing should be replaced with new one.



⊙ REASSEMBLY

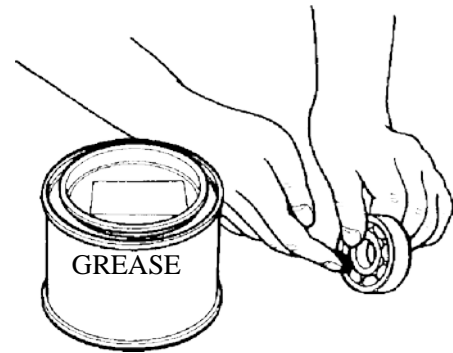
Reassemble the rear wheel and rear brake in the reverse order of disassembly.

Pay attention to the following points :

□ WHEEL BEARING

- Apply SUPER GREASE“ A ”to the bearing before installation.

SUPER GREASE“ A ”



- Press fit the bearing to the wheel using the special tools.

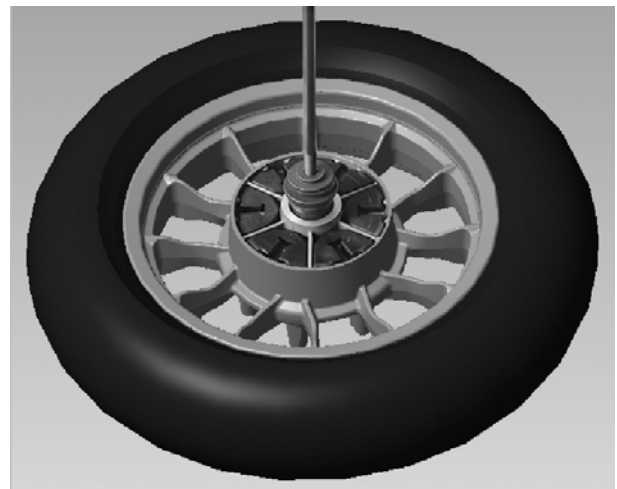


Steering race installer : 09941-34513



CAUTION

First install the right wheel bearing, then left wheel bearing.



□ REAR SPROCKET MOUNTING DRUM BEARING

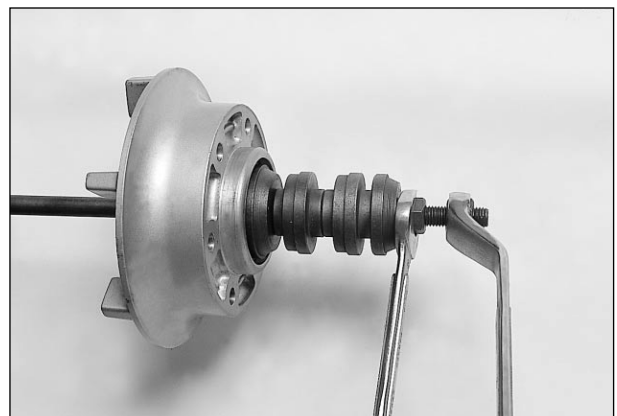
- Install the rear sprocket mounting drum bearing and dust seal using the special tool.



Steering race installer : 09941-34513

NOTE

Apply grease to the bearing and dust seal lip before assembling the rear sprocket mounting drum.



SUPER GREASE“ A ”

□ **REAR SPROCKET**

- Tighten the rear sprocket nuts to the specified torque.

🔧 Rear sprocket nut : 20~30 N•m (2.0~3.0 kg•m)



- Install the retainers to the mounting drum as shown.



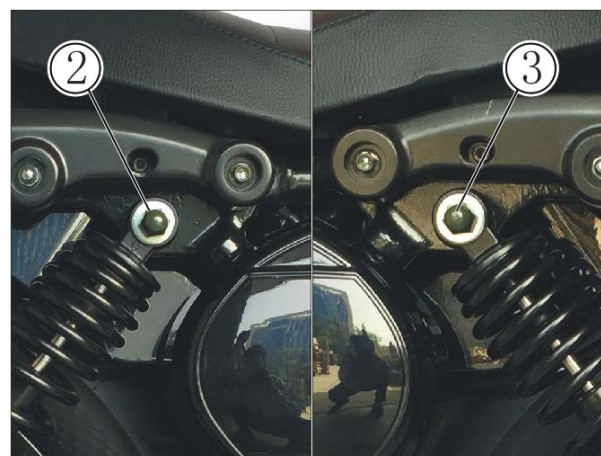
□ **REAR WHEEL**

- After the rear wheel install, tighten the rear axle nut ① to the specified torque.

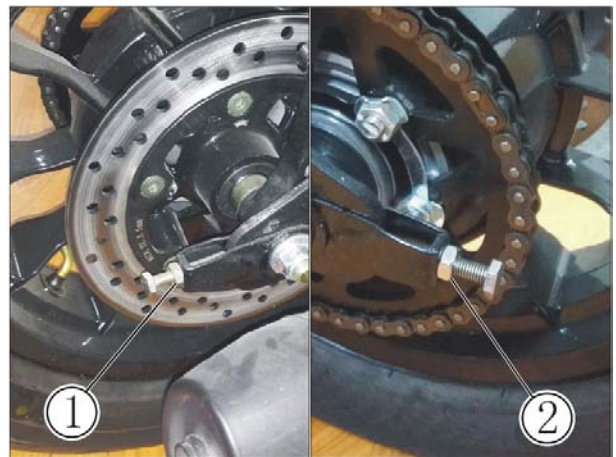
🔧 Rear axle nut : 90~140 N•m (9.0~14.0 kg•m)



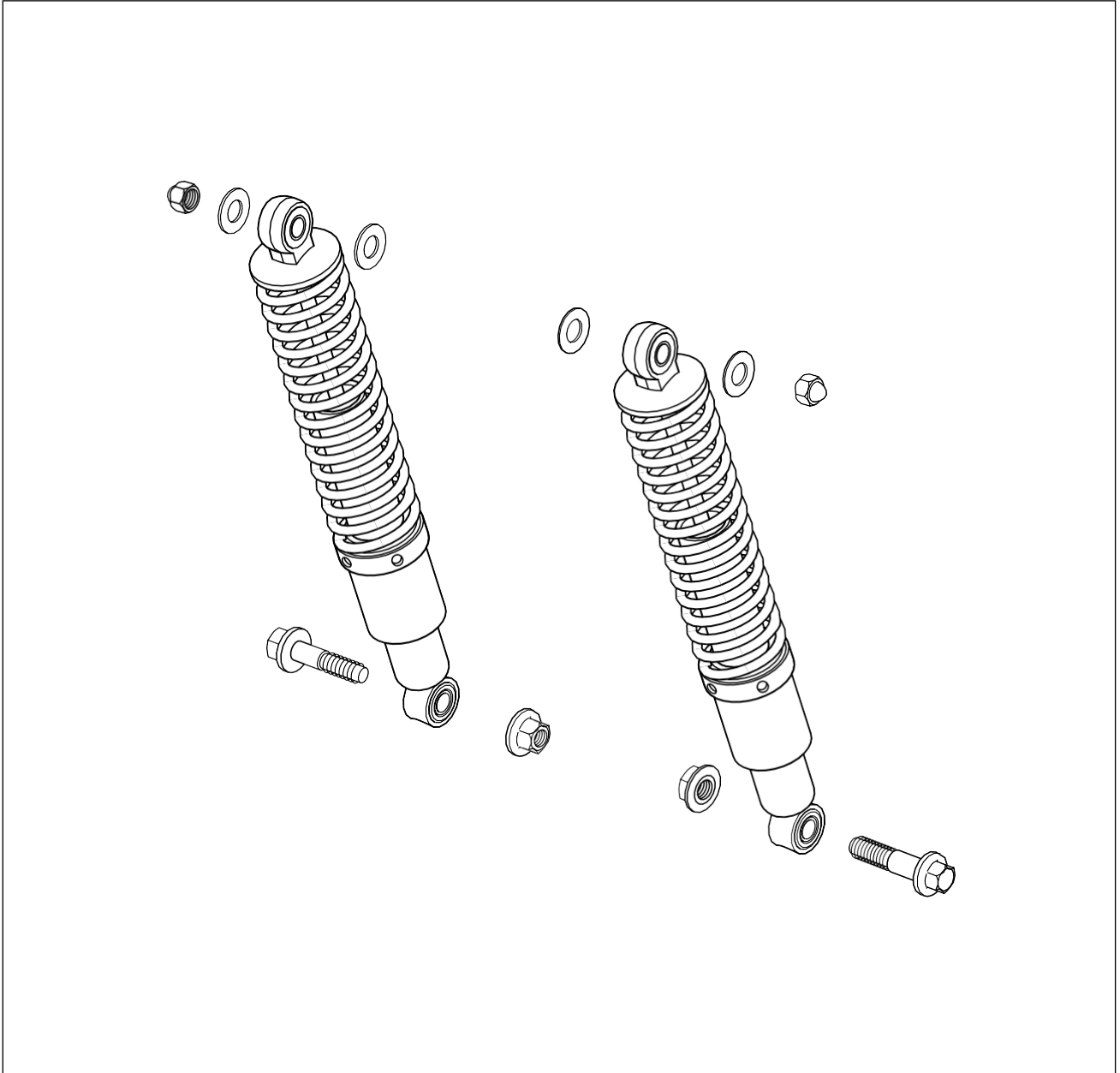
- Tighten the right rear shock absorber upper bolt ② and left rear shock absorber upper bolt ③.



- After installing the drive chain to the rear sprocket, adjust the drive chain.
- Tighten the right drive chain adjuster nut ① and left drive chain adjuster nut ②.
- Adjust the rear brake pedal free travel.



REAR SHOCK ABSORBER



REMOVAL

- Remove the right and left rear frame cover.
- Remove the right and left rear shock absorbers by removing their nuts.

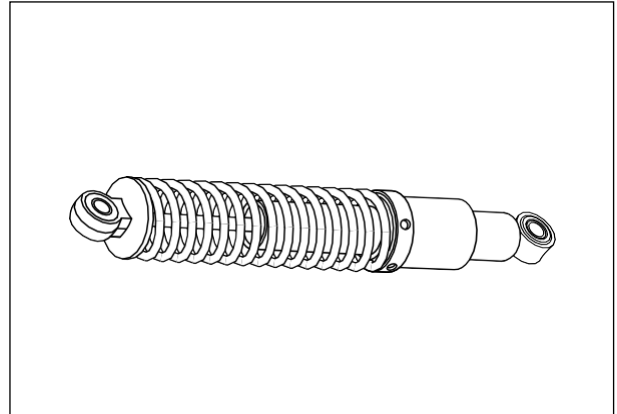
⦿ INSPECTION

Inspect the rear shock absorber for damage and oil leakage. If any defects are found, replace the rear shock absorber with a new one.



CAUTION

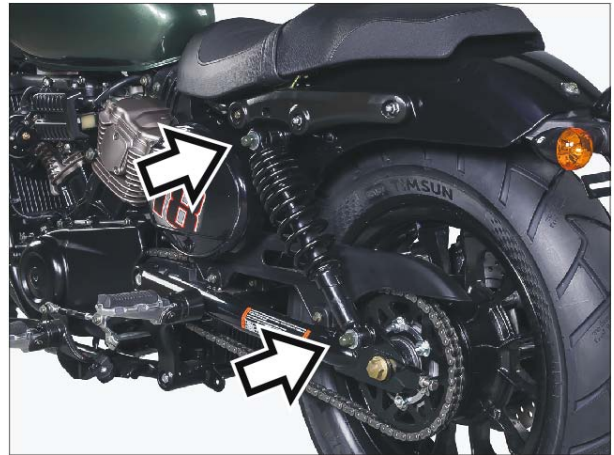
Do not attempt to disassemble the rear shock absorber. It is unserviceable.



⦿ REMOUNTING

- Install the rear shock absorber and tighten the nuts to the specified torque.

- ☑ Shock absorber mounting nut (upper)
: 20~30 N•m (2.0~3.0 kg•m)
- Shock absorber mounting nut (lower)
: 35~55 N•m (3.5~5.5 kg•m)

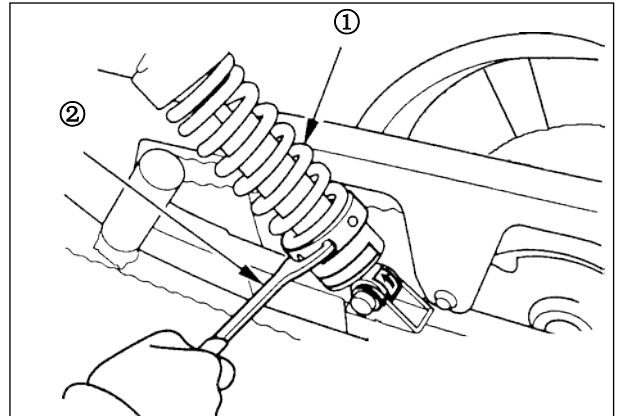


👁️ **SPRING PRE-LOAD ADJUSTMENT**

- Adjust the rear shock absorber spring pre-load.

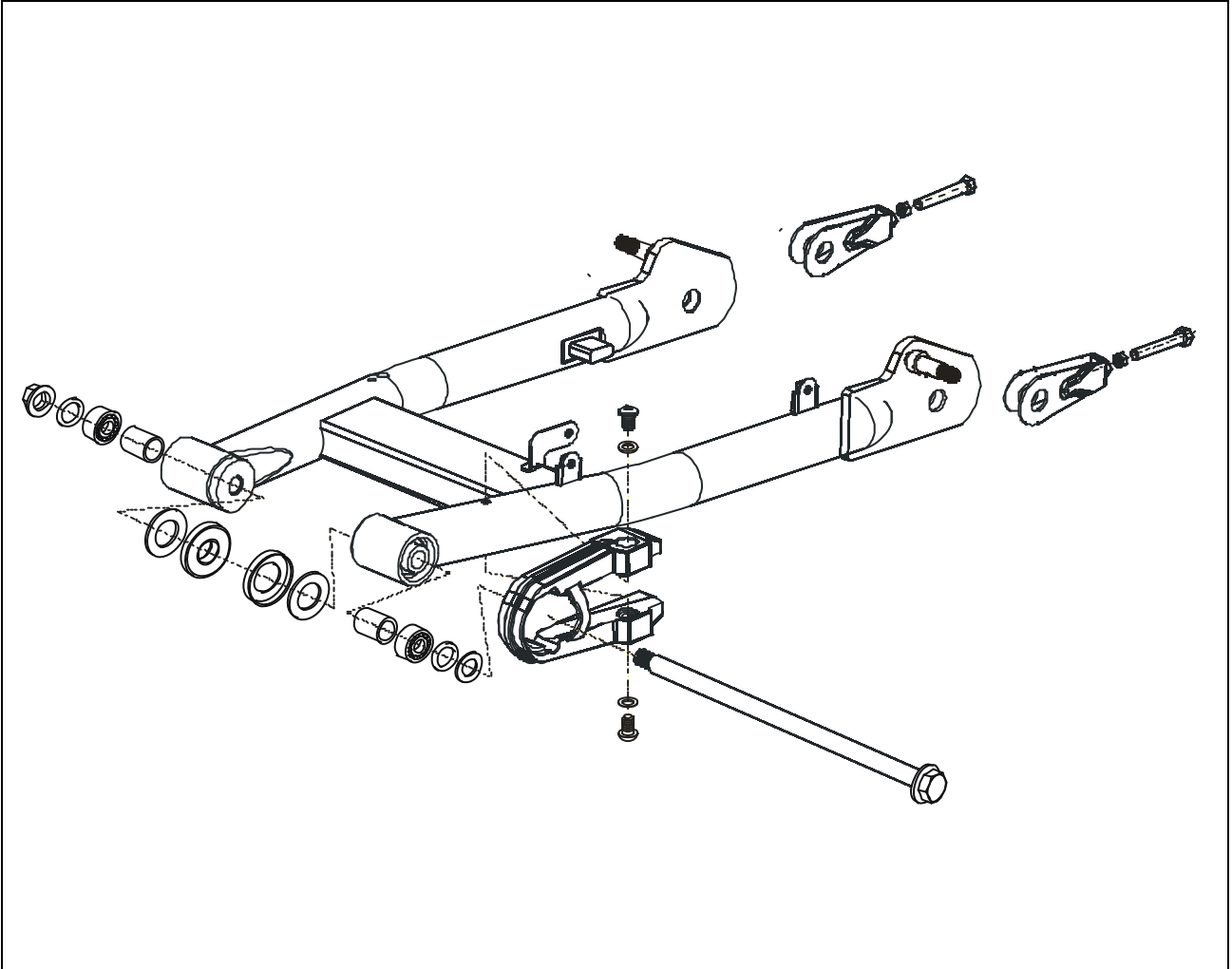
Rear shock absorber spring length	Standard
	199.8 mm

Rear shock absorber spring pre-load	Standard
	1/5 position



① Rear shock absorber ② Pin spanner

SWINGARM



⦿ REMOVAL

- Remove the rear wheel.
- Remove the exhaust pipe and mufflers.



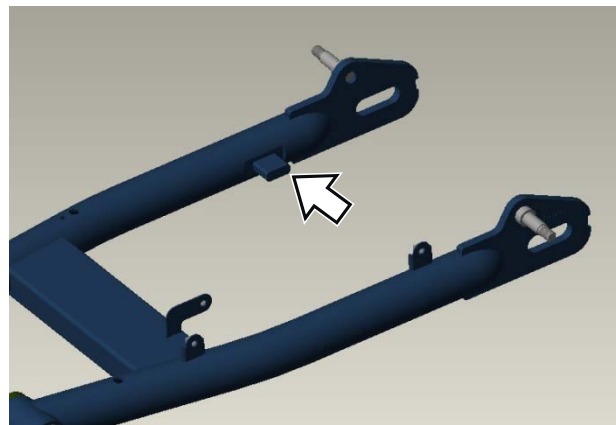
- Remove the engine sprocket cover.



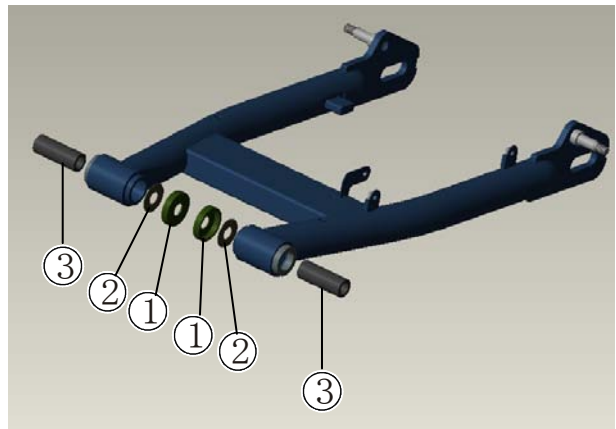
- Remove the swingarm pivot nut and washer.
- Remove the swingarm by removing the pivot shaft.



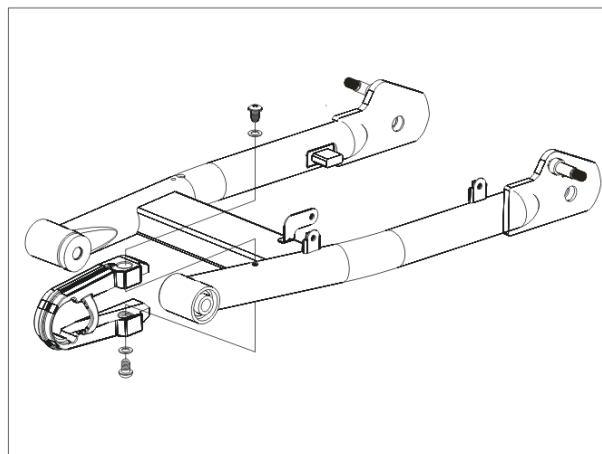
- Remove the rear brake hub from the swingarm.



- Remove the dust covers ①, washers ② and spacers ③.



- Remove the chain buffer ① from the swingarm.

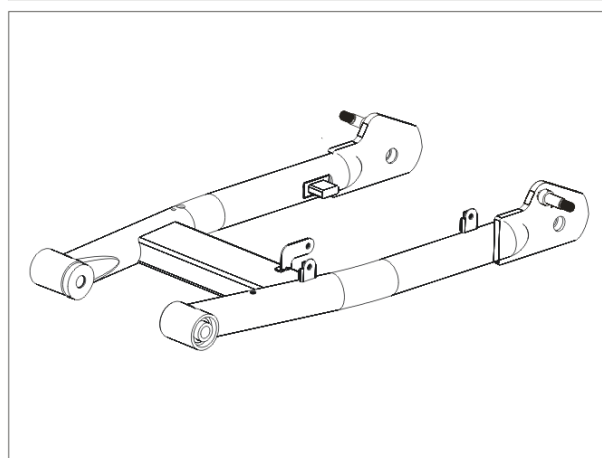


👁️ INSPECTION

❑ SWINGARM

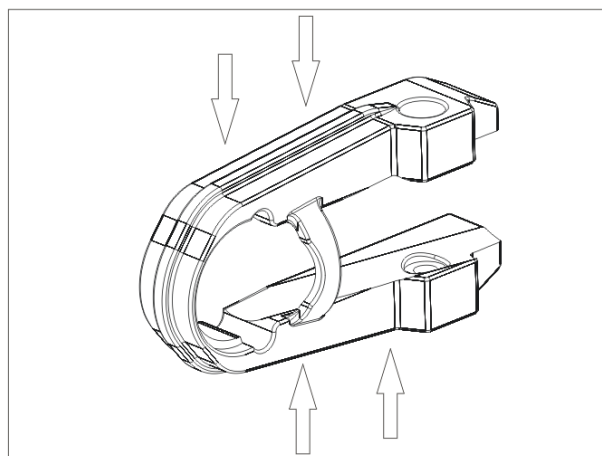
Inspect the swingarm for damage.

If any defects are found, replace the swingarm with a new one.



❑ CHAIN BUFFER

Inspect the chain buffer for wear and damage. If any defects are found, replace the chain buffer with a new one.



❑ SWINGARM PIVOT SHAFT

Measure the pivot shaft runout using the dial gauge. If the pivot shaft exceeds the service limit, replace it with a new one.

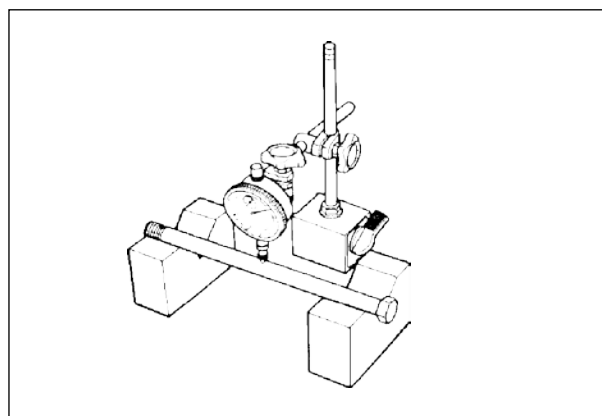
Swingarm pivot shaft runout	Service limit
	0.6 mm



Dial gauge : 09900-20606

Magnetic stand : 09900-20701

V-block : 09900-21304



□ **SWINGARM PIVOT SPACERS AND DUST SEALS**


Inspect the swingarm pivot spacers and dust seals for damage. If any defects are found, replace the spacer with a new one.

□ **SWINGARM NEEDLE BEARINGS**

Insert the spacers into the needle bearings, rotate the spacer and check for abnormal noise and smooth rotation.

If there is anything unusual, replace the bearing(-s) with a new one.

- Remove the swingarm needle bearings using the special tool.

 **Bearing remover(φ17mm) : 09923-73210**



CAUTION

The removed bearings should be replaced with new ones.

◎ **REASSEMBLY**

Reassemble the swingarm and rear shock absorber in the reverse order of disassembly.

Pay attention to the following points :


- Press the needle bearings into the swingarm pivot using the special tool.

 **Steering race installer : 09941-34513**

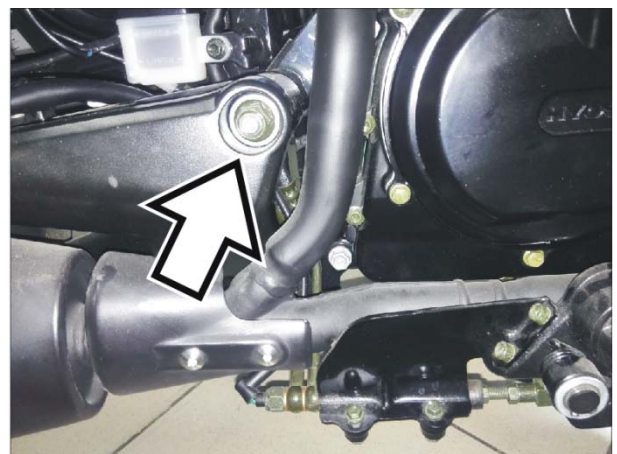
- Apply SUPER GREASE“ A ”to the needle bearing and spacers.

 **SUPER GREASE“ A ”**

- Install the swingarm and tighten the swingarm pivot nut to the specified torque.

 **Swingarm pivot nut : 45~70 N•m (4.5~7.0 kg•m)**

- Install the rear shock absorber.
- Install the rear wheel.
- Adjust the following points :
Drive chain slack : Refer to page 2-26
Rear brake pedal free travel : Refer to page 2-34



SERVICING INFORMATION

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TROUBLESHOOTING

⊙ MALFUNCTION CODE AND DEFECTIVE CONDITION

MALFUNCTION CODE	DETECTED ITEM		DETECTED FAILURE CONDITION
			CHECK FOR
noEr	NO FAULT		—
P0031	NO.1 O ₂ Sheater Circuit	Low Voltage	After engine running, if oxygen sensor heater signal open or is happened the ground short fault for 1 second by 10 times in 12 times test cycle, the code 0031 is indicated.
			Oxygen sensor, lead wire / coupler connection.
P0032	NO.1 O ₂ Sheater Circuit	High Voltage	After engine running, if oxygen sensor heater signal is happened the high short fault for 1 second by 10 times in 12 times test cycle, the code 0032 is indicated.
			Oxygen sensor, lead wire / coupler connection.
P0037	NO.2 O ₂ Sheater Circuit	Low Voltage	After engine running, if oxygen sensor heater signal open or is happened the ground short fault for 1 second by 10 times in 12 times test cycle, the code 0037 is indicated.
			Oxygen sensor, lead wire / coupler connection.
P0038	NO.2 O ₂ Sheater Circuit	High Voltage	After engine running, if oxygen sensor heater signal is happened the high short fault for 1 second by 10 times in 12 times test cycle, the code 0038 is indicated.
			Oxygen sensor, lead wire / coupler connection.
P0107	IAP&TS (Temperature function) Circuit	Low Voltage or Open	The sensor should produce following voltage. 0.15 V ≤ Sensor output voltage Without the above range for 2.2 sec. and more, 0107 is indicated.
			Intake air pressure sensor, lead wire / coupler connection.
P0108	IAP&TS (Temperature function) Circuit	High Voltage	The sensor should produce following voltage. Sensor output voltage ≤ 5 V Without the above range for 10.0 sec. and more, 0108 is indicated.
			Intake air pressure sensor, lead wire / coupler connection.
P0112	IAP&TS (Temperature function) Circuit	Low Voltage	The sensor voltage should be the following. 0.1 V ≤ Sensor output voltage Without the above range for 6.25 sec. and more, 0112 is indicated.
			Intake air temperature sensor, lead wire / coupler connection.
P0113	IAP&TS (Temperature function) Circuit	High Voltage or Open	The sensor voltage should be the following. Sensor output voltage ≤ 4.9 V Without the above range for 6.25 sec. and more, 0113 is indicated.
			Intake air temperature sensor, lead wire / coupler connection.

8-3 SERVICING INFORMATION

MALFUNCTION CODE	DETECTED ITEM		DETECTED FAILURE CONDITION
			CHECK FOR
P0117	WTS Circuit	Low Voltage	The sensor voltage should be the following. 0.1 V ≤ Sensor output voltage Without the above range for 6.25 sec. and more, 0117 is indicated.
			Water temperature sensor, lead wire / coupler connection.
P0118		High Voltage or Open	The sensor voltage should be the following. Sensor output voltage ≤ 5V Without the above range for 6.25 sec. and more, 0118 is indicated.
			Water temperature sensor, lead wire / coupler connection.
P0122	TPS Circuit	Low Voltage or Open	The sensor should produce following voltage. 0.2 V ≤ Sensor output voltage Without the above range for 7.8 sec. and more, 0122 is indicated.
			Throttle position sensor, lead wire / coupler connection.
P0123		High Voltage	The sensor should produce following voltage. Sensor output voltage ≤ 4.9 V Without the above range for 7.8 sec. and more, 0123 is indicated.
			Throttle position sensor, lead wire / coupler connection.
P0131	NO.1 O ₂ S Circuit	Low Voltage	After engine running, the oxygen sensor signal is inputted in ECU since then 300 sec. In this case, the sensor voltage should be the following. 30 mV ≤ Sensor output voltage Without the above range for 28.1 sec. and more, 0131 is indicated.
			Oxygen sensor, lead wire / coupler connection.
P0132		High Voltage	After engine running, the oxygen sensor signal is inputted in ECU since then 300 sec. In this case, the sensor voltage should be the following. Sensor output voltage ≤ 1.0V Without the above range for 29.4 sec. and more, 0132 is indicated.
			Oxygen sensor, lead wire / coupler connection.
P0137	NO.2 O ₂ S Circuit	Low Voltage	After engine running, the oxygen sensor signal is inputted in ECU since then 300 sec. In this case, the sensor voltage should be the following. 30 mV ≤ Sensor output voltage Without the above range for 28.1 sec. and more, 0137 is indicated.
			Oxygen sensor, lead wire / coupler connection.
P0138		High Voltage	After engine running, the oxygen sensor signal is inputted in ECU since then 300 sec. In this case, the sensor voltage should be the following. Sensor output voltage ≤ 1.0V Without the above range for 29.4 sec. and more, 0138 is indicated.
			Oxygen sensor, lead wire / coupler connection.

MALFUNCTION CODE	DETECTED ITEM		DETECTED FAILURE CONDITION
			CHECK FOR
P0171	Fuel Injection Circuit	Injection Fuel Shortage	After engine running, rate of fuel calibration remains less than standard value (1.3) for 10 sec. and more, the code P0171 is indicated.
			ECU, O2 sensor, Fuel pump, Fuel hose line
P0172	Malfunction	Injection Fuel Excess	After engine running, rate of fuel calibration remains less than standard value (0.7) for 10 sec. and more, the code P0172 is indicated.
			ECU, O2 sensor, Fuel pump, Fuel hose line
P0201	NO.1 Fuel Injector Circuit Malfunction		After engine running, if NO.1 fuel injector signal open or is happened the high / ground short fault for 1 second by 5 times in 10 times test cycle, the code 0201 is indicated.
			Injector, wiring/coupler connection, power supply to the injector.
P0202	NO.2 Fuel Injector Circuit Malfunction		After engine running, if NO.2 fuel injector signal open or is happened the high / ground short fault for 1 second by 5 times in 10 times test cycle, the code 0202 is indicated.
			Injector, wiring/coupler connection, power supply to the injector.
P0230	Fuel pump relay Circuit	Low Voltage or Open	After engine running, if fuel pump relay signal open or is happened the ground short fault for 1 second by 10 times in 20 times test cycle, the code 0230 is indicated.
			Fuel pump relay, connecting lead wire, power source to fuel pump relay, fuel injector.
P0232		High Voltage	After engine running, if fuel pump relay signal is happened the high short fault for 1 second by 10 times in 20 times test cycle, the code 0232 is indicated.
			Fuel pump relay, connecting lead wire, power source to fuel pump relay, fuel injector.
P0336	Pick-up coil	Noisy Signal	After engine running, if the magneto rotor tooth's error is happened continuously by 10 times in 100 times test cycle, the code 0336 is indicated.
			Pick-up coil wiring and mechanical parts. (Pick-up coil lead wire coupler connection)
P0337		No Signal	After engine running, if the pick-up coil signal does not reach ECU for more than 0.5 sec., the code 0337 is indicated.
			Pick-up coil wiring and mechanical parts. (Pick-up coil, lead wire coupler connection)
P0351	NO.1 IG coil Malfunction		After engine running, if NO.1 ignition coil signal open or is happened the high / ground short fault for 1 second by 5 times in 10 times test cycle, the code 0351 is indicated.
			Ignition coil, wiring / coupler connection, power supply from the battery.
P0352	NO.2 IG coil Malfunction		After engine running, if NO.2 ignition coil signal open or is happened the high / ground short fault for 1 second by 5 times in 10 times test cycle, the code 0352 is indicated.
			Ignition coil, wiring / coupler connection, power supply from the battery.

8-5 SERVICING INFORMATION

MALFUNCTION CODE	DETECTED ITEM		DETECTED FAILURE CONDITION
			CHECK FOR
P0500	Speedo sensor Malfunction		Motorcycle speed < 10km/h Water temperature < 20°C IAP&TS pressure > 40kpa 20% < TPS open angle < 100% 2,000rpm < Engine speed < 6,000rpm If the above conditions are maintained for 32.5sec. and more, The code P0500 is indicated
			Speedo sensor, wiring/coupler connection to ECU
P0505	ISC Error		After engine running, if idle speed is different to 500 rpm from the specified range in 25 seconds test cycle, the code 0505 is indicated.
			Idle speed control solenoid, wiring / coupler connection.
P0562	Battery Voltage	Low	The battery voltage should be the following 9 V ≤ Battery voltage Without the above range for 3.125sec. and more, 0562 is indicated.
		Battery, wiring / coupler connection to ECU.	
P0563	Battery Voltage	High	The battery voltage should be the following. Battery voltage ≤ 16V Without the above range for 3.125 sec. and more, 0563 is indicated.
		Battery, wiring / coupler connection to ECU.	
P0601	ECU Fault		When ML on The ECU will check malfunction code, if there's ECU error the code P0601 is indicated. The fuel injection will be cut off Accordingly
			ECU
P0650	Engine warning lamp Circuit Malfunction		After engine running, if "FI" check lamp signal open or is happened the high / ground short fault for 1 second by 40 times in 80 times test cycle, the code 0650 is indicated.
			"FI" check lamp, wiring / coupler connection.
P0850	GP or Clutch lever Switch Circuit Malfunction		If gear position or clutch lever switch signal feedback is not active in continuous by 20 times in fully power down cycles, the code 0850 is indicated. (Fully power down cycle : Ignition switch "ON" "OFF" position)
			Gear position or clutch lever switch, wiring / coupler connection, gearshift cam etc.

8-9 SERVICING INFORMATION

Complaint	Symptom and possible causes	Remedy
<p>Engine runs poorly in high speed range.</p>	<p>Defective engine internal / electrical parts</p> <ol style="list-style-type: none"> 1. Weakened valve springs. 2. Worn camshafts. 3. Valve timing out of adjustment. 4. Too narrow spark plug gaps. 5. Ignition not advanced sufficiently due to poorly working timing advance circuit. 6. Defective ignition coils. 7. Defective pick-up coil. 8. Defective ECU. 9. Clogged fuel hose, resulting in inadequate fuel supply to injector. 10. Defective fuel pump. 11. Defective TP sensor. 12. Clogged air cleaner element. <p>Defective air flow system</p> <ol style="list-style-type: none"> 1. Clogged air cleaner element. 2. Defective throttle valve. 3. Sucking air from throttle body joint. 4. Defective ECU. <p>Defective control circuit or sensor</p> <ol style="list-style-type: none"> 1. Low fuel pressure. 2. Defective IAT sensor. 3. Defective pick-up coil. 4. Defective IAP sensor. 5. Defective ECU. 6. Defective TP sensor. 	<p>Replace. Replace. Adjust. Adjust. Replace ECU.</p> <p>Replace. Replace. Replace. Clean and prime. Replace. Replace. Clean.</p> <p>Clean or replace. Adjust or replace. Repair or replace. Replace.</p> <p>Repair or replace. Replace. Replace. Replace. Replace. Replace.</p>

8-11 SERVICING INFORMATION

Complaint	Symptom and possible causes	Remedy
Dirty or heavy exhaust smoke.	<ol style="list-style-type: none"> 1. Too much engine oil in the engine. 2. Worn piston rings or cylinders. 3. Worn valve guides. 4. Cylinder wall scored or scuffed. 5. Worn valves stems. 6. Defective stem seals. 7. Worn side rails. 	<p>Check with inspection window, drain out excess oil.</p> <p>Replace.</p> <p>Replace.</p> <p>Replace.</p> <p>Replace.</p> <p>Replace.</p> <p>Replace.</p>
Slipping clutch.	<ol style="list-style-type: none"> 1. Weakened clutch springs. 2. Worn or distorted pressure plates. 3. Distorted clutch plates or pressure plates. 	<p>Replace.</p> <p>Replace.</p> <p>Replace.</p>
Dragging clutch.	<ol style="list-style-type: none"> 1. Some clutch springs weakened while others are not. 2. Distorted pressure plates or clutch plates. 	<p>Replace.</p> <p>Replace.</p>
Transmission will not shift.	<ol style="list-style-type: none"> 1. Broken gearshift cam. 2. Distorted gearshift forks. 3. Worn gearshift pawl. 	<p>Replace.</p> <p>Replace.</p> <p>Replace.</p>
Transmission will not shift back.	<ol style="list-style-type: none"> 1. Broken return spring on shift shaft. 2. Rubbing or sticky shift shaft. 3. Distorted or worn gearshift forks. 	<p>Replace.</p> <p>Repair or replace.</p> <p>Replace.</p>
Transmission jumps out of gear.	<ol style="list-style-type: none"> 1. Worn shifting gears on driveshaft or countershaft. 2. Distorted or worn gearshift forks. 3. Weakened stopper spring on gearshift stopper. 	<p>Replace.</p> <p>Replace.</p> <p>Replace.</p>

RADIATOR (COOLING SYSTEM)

Complaint	Symptom and possible causes	Remedy
Engine overheats.	<ol style="list-style-type: none"> 1. Not enough engine coolant. 2. Radiator core clogged with dirt or scale. 3. Faulty cooling fan. 4. Defective cooling fan thermo-switch. 5. Clogged water passage. 6. Air trapped in the cooling circuit. 7. Defective water pump. 8. Use of incorrect engine coolant. 9. Defective thermostat. 	<p>Add coolant. Clean.</p> <p>Repair or replace.</p> <p>Replace.</p> <p>Clean.</p> <p>Bleed out air.</p> <p>Replace.</p> <p>Replace. Replace.</p>
Engine overcools.	<ol style="list-style-type: none"> 1. Defective cooling fan thermo-switch. 2. Extremely cold weather. 3. Defective thermostat. 	<p>Replace.</p> <p>Put on the radiator cover.</p> <p>Replace.</p>

⊙ ELECTRICAL

Complaint	Symptom and possible causes	Remedy
No sparking or poor sparking.	<ol style="list-style-type: none"> 1. Defective ignition coils or spark plug caps. 2. Defective spark plugs. 3. Defective pick-up coil. 4. Defective ECU. 5. Defective RO switch. 6. Open-circuited wiring connections. 	Replace. Replace. Replace. Replace. Replace. Check and repair.
Spark plug soon become fouled with carbon.	<ol style="list-style-type: none"> 1. Mixture too rich. 2. Idling speed set too high. 3. Incorrect gasoline. 4. Dirty element in air cleaner. 5. Spark plugs too cold. 	Inspect EI system. Inspect EI system. Change. Clean or replace. Replace by hot type plug.
Spark plug become fouled too soon.	<ol style="list-style-type: none"> 1. Worn piston rings. 2. Pistons or cylinders worn. 3. Excessive clearance of valve stems in valve guides. 4. Worn stem oil seal. 	Replace. Replace. Replace. Replace.
Spark plug electrodes overheat or burn.	<ol style="list-style-type: none"> 1. Spark plugs too hot. 2. The engine overheats. 3. Spark plugs loose. 4. Mixture too lean. 	Replace by cold type plug. Tune up. Retighten. Inspect EI system.
Magneto charge, but charging rate is below the specification.	<ol style="list-style-type: none"> 1. Lead wires tend to get shorted or open-circuited or loosely connected at terminals. 2. Grounded or open-circuited stator coils of magneto. 3. Defective regulator / rectifier. 4. Defective cell plates in the battery. 	Repair or retighten. Replace. Replace. Replace the battery.
Magneto overcharges.	<ol style="list-style-type: none"> 1. Internal short - circuit in the battery. 2. Resistor element in the regulator / rectifier damaged or defective. 3. Regulator / rectifier poorly grounded. 	Replace the battery. Replace. Clean and tighten ground connection.
Magneto does not charge.	<ol style="list-style-type: none"> 1. Open - or short - circuited lead wires, or loose lead connections. 2. Short - circuited, grounded or open stator coil. 3. Short - circuited or punctured regulator / rectifier. 	Repair or replace or retighten. Replace. Replace.
Unstable charging.	<ol style="list-style-type: none"> 1. Lead wire insulation frayed due to vibration resulting in intermittent shorting. 2. Magneto internally shorted. 3. Defective regulator / rectifier. 	Repair or replace. Replace. Replace.
Starter switch is not effective.	<ol style="list-style-type: none"> 1. Battery run down. 2. Defective switch contacts. 3. Brushes not seating properly on commutator in starter motor. 4. Defective starter relay / ignition interlock switch. 5. Defective main fuse. 	Recharge or replace. Replace. Repair or replace. Replace. Replace.

BATTERY

Complaint	Symptom and possible causes	Remedy
<p>“Sulfation” acidic white powdery substance or spots on surfaces of cell plates.</p>	<ol style="list-style-type: none"> 1. Not enough electrolyte. 2. Battery case is cracked. 3. Battery has been left in a run-down condition for a long time. 4. Contaminated electrolyte. (Foreign matter has enters the battery and become mixed with the electrolyte.) 	<p>Add distilled water, if the battery has not been damaged and “sulfation” has not advanced too far, and recharge. Replace the battery. Replace the battery or recharge.</p> <p>If “sulfation” has not advanced far, try to restore the battery by replacing the electrolyte, recharging it fully with the battery detached from the motorcycle and then adjusting electrolyte specific gravity.</p>
<p>Battery runs down quickly.</p>	<ol style="list-style-type: none"> 1. The charging method is not correct. 2. Cell plates have lost much of their active material as a result of over-charging. 3. A short-circuit condition exists within the battery due to excessive accumulation of sediments caused by the high electrolyte specific gravity. 4. Electrolyte specific gravity is too low. 5. Contaminated electrolyte. 6. Battery is too old. 	<p>Check the generator, regulator/rectifier and circuit connections, and make necessary adjustments to obtain specified charging operation. Replace the battery, and correct the charging system.</p> <p>Replace the battery.</p> <p>Recharge the battery fully and adjust electrolyte specific gravity. Replace the electrolyte, recharge the battery and then adjust specific gravity. Replace the battery.</p>
<p>Reversed battery polarity.</p>	<p>The battery has been connected the wrong way round in the system, so that it is being charged in the reverse direction.</p>	<p>Replace the battery and be sure to connect the battery properly.</p>
<p>Battery “sulfation”</p>	<ol style="list-style-type: none"> 1. Charging rate too low or too high. (When not in use, batteries should be recharged at least once a month to avoid sulfation.) 2. Battery electrolyte excessive or insufficient, or its specific gravity too high or too low. 3. The battery left unused for too long in cold climate. 	<p>Replace the battery.</p> <p>Keep the electrolyte up to the prescribed level, or adjust the specific gravity by consulting the battery maker’s directions. Replace the battery, if badly sulfated.</p>
<p>Battery discharges too rapidly.</p>	<ol style="list-style-type: none"> 1. Dirty container top and sides. 2. Impurities in the electrolyte or electrolyte specific gravity is too high. 	<p>Clean. Change the electrolyte by consulting the battery maker’s directions.</p>

CHASSIS

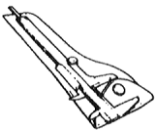


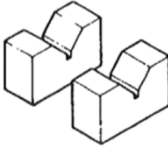
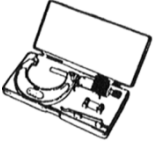





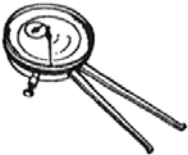





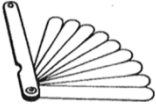
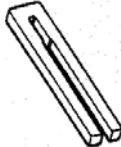
Complaint	Symptom and possible causes	Remedy
Steering feels too heavy or stiff.	<ol style="list-style-type: none"> 1. Steering stem nut overtightened. 2. Worn bearing or race in steering stem. 3. Distorted steering stem. 4. Not enough pressure in tires. 	Adjust. Replace. Replace. Adjust.
Steering oscillation.	<ol style="list-style-type: none"> 1. Loss of balance between right and left front suspensions. 2. Distorted front fork. 3. Distorted front axle or crooked tire. 	Replace. Repair or replace. Replace.
Wobbling front wheel.	<ol style="list-style-type: none"> 1. Distorted wheel rim. 2. Worn-down wheel bearings. 3. Defective or incorrect tire. 4. Loosen nut on axle. 	Replace. Replace. Replace. Retighten.
Front suspension too soft.	<ol style="list-style-type: none"> 1. Weakened springs. 2. Not enough fork oil. 	Replace. Refill.
Front suspension too stiff.	<ol style="list-style-type: none"> 1. Fork oil too viscous. 2. Too much fork oil. 	Replace. Drain excess oil.
Noisy front suspension.	<ol style="list-style-type: none"> 1. Not enough fork oil. 2. Loosen nuts on suspension. 	Refill. Retighten.
Wobbling rear wheel.	<ol style="list-style-type: none"> 1. Distorted wheel rim. 2. Worn-down rear wheel bearing. 3. Defective or incorrect tire. 4. Loose nut on axle. 5. Worn swing arm bushing or bearing. 6. Loosen nut on the rear shock. 	Replace. Replace. Replace. Retighten. Replace. Retighten.
Rear suspension too soft.	<ol style="list-style-type: none"> 1. Weakened springs. 2. Rear suspension adjuster improperly set. 	Replace. Adjust.
Rear suspension too stiff.	<ol style="list-style-type: none"> 1. Rear suspension adjuster improperly set. 2. Worn swing arm bushing or bearing. 	Adjust. Replace.
Noisy rear suspension.	<ol style="list-style-type: none"> 1. Loosen nuts on suspension. 2. Worn swing arm bushing or bearing. 	Retighten. Replace.

8-15 SERVICING INFORMATION

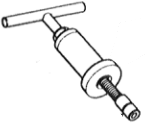

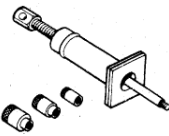








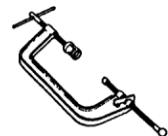


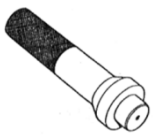


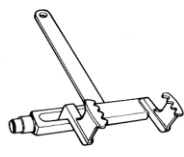
BRAKES



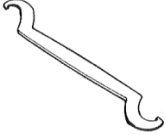

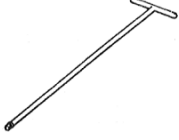



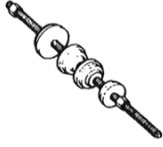
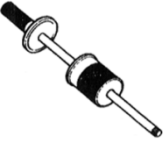



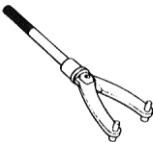
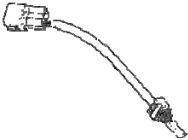
Complaint	Symptom and possible causes	Remedy
Poor braking (FRONT and REAR)	<ol style="list-style-type: none">1. Not enough brake fluid in the reservoir.2. Air trapped in brake fluid circuit.3. Pads worn down.4. Too much play on brake lever or pedal.5. Shoes worn down.	Refill to level mark. Bleed air out. Replace. Adjust. Replace.
Insufficient brake power.	<ol style="list-style-type: none">1. Leakage of brake fluid from hydraulic system.2. Worn pads.3. Oil adhesion of engaging surface of pads.4. Worn disk.5. Air in hydraulic system.	Repair or replace. Replace. Clean disk and pads. Replace. Bleed air.
Brake squeaking.	<ol style="list-style-type: none">1. Carbon adhesion on pad surface.2. Tilted pad.3. Damaged wheel bearing.4. Loosen front-wheel axle or rear-wheel axle.5. Worn pads.6. Foreign material in brake fluid.7. Clogged return port of master cylinder.	Repair surface with sandpaper. Modify pad fitting. Replace. Tighten to specified torque. Replace. Replace brake fluid. Disassemble and clean master cylinder.
Excessive brake lever stroke.	<ol style="list-style-type: none">1. Air in hydraulic system.2. Worn brake lever cam.3. Insufficient brake fluid.4. Improper quality of brake fluid.	Bleed air. Replace brake lever. Replenish fluid to specified level ; bleed air. Replace with correct fluid.
Leakage of brake fluid.	<ol style="list-style-type: none">1. Insufficient tightening of connection joints.2. Cracked hose.3. Worn piston and/or cup.	Tighten to specified torque. Replace. Replace piston and/or cup.

SPECIAL TOOLS

Special tools	Part Number - Part Name - Description	Special tools	Part Number - Part Name - Description
	09900-20101 Vernier Caliper		09900-21109 Torque wrench
	Used to conveniently measure various dimensions.		Measure torque of tightening.
	09900-20201 Micrometer(0~25mm)		09900-21304 V-block
	Used for precise measurement (00-25mm measure ranges).		With using magnetic stand.
	09900-20202 Micrometer(25~50mm)		09900-22301 Plastigauge
	Used for precise measurement (25-50mm measure ranges).		Measure clearance of crankshaft thrust.
	09900-20203 Micrometer(50~75mm)		09900-22401 Small bore gauge
	Used for precise measurement (50-75mm measure ranges).		Measure inside diameter of conrod small-end.
	09900-20508 Cylinder gauge set		09900-25002 Pocket tester
	Measure inside diameter of cylinder.		Measure voltage, electric current, resistance.
	09900-20605 Dial calipers		09900-26006 Engine tachometer
	Measure width of conrod big-end.		Measure rotational frequency of engine.
	09900-20606 Dial gauge		09900-28107 Electro tester
	Measure oscillation of wheel with using magnetic stand.		Inspect ignition coil.
	09900-20701 Magnetic stand		09900-28500 Battery charger
	With using dial gauge.		Used to charge the discharged battery.
	09900-20806 Thickness gauge		09910-20115 Conrod holder
	Measure clearance of piston ring.		Used to lock the crankshaft.

8-17 SERVICING INFORMATION

Special tools	Part Number - Part Name - Description	Special tools	Part Number - Part Name - Description
	09910-32812 Crankshaft installer Used to install the crankshaft in the crankcase.		09913-80112 Bearing installer Used to drive bearing in.
	09910-34510 Piston pin puller Use to remove the piston pin.		09915-63310 Compression gauge adapter Used with compression gauge.
	09915-54510 Fuel pump pressure gauge Measure fuel pressure of fuel pump.		09915-64510 Compression gauge Measure cylinder compression.
	09913-50121 Oil seal remover Used to remove the oil seal.		09915-74510 Oil pressure gauge Measure oil pressure of 4-stroke engine.
	09913-70122 Bearing installer Used to drive bearing in.		09915-74531 Oil pressure gauge hose attachment Used with oil pressure gauge.
	09913-75520 Bearing installer Used to drive bearing in.		09916-14510 Valve spring compressor Used to remove and remounting valve stem.
	09913-75820 Bearing installer Used to drive bearing in.		09916H35C00 Valve spring compressor attachment Used with valve spring compressor.
	09913-75830 Bearing installer Used to install rear axle shaft oil seal.		09920-13120 Crankcase separator Separate to crankcase.
	09913-76010 Bearing installer Used to drive crankshaft bearing in.		09920-53710 Clutch sleeve hub holder Used to install or remove clutch sleeve hub nut.

Special tools	Part Number-Part Name-Description	Special tools	Part Number-Part Name-Description
	09921-20200 Bearing remover(10mm) Used to remove oil seal or bearing.		09930-44510 Rotor holder Widely used to lock rotary parts such as a flywheel magneto.
	09921-20210 Bearing remover(12mm) Used to remove oil seal or bearing.		09940-10122 Clamp wrench A hook wrench to adjust the steering head of motorcycle.
	09923-73210 Bearing remover(17mm) Used to remove bearing with the rotor remove sliding shaft.		09940-34520 T-handle Remove and remounting front fork oil cylinder.
	09923-74510 Bearing remover(20~35mm) Used to remove bearing with the rotor remove sliding shaft.		09940-34561 Front fork assembling tool attachment "D" Used with T-handle.
	09924-84521 Bearing installer Used to drive small bearing in.		09940-50113 Front fork oil seal installer Install front fork oil seal.
	09930-10121 Spark plug socket wrench set Used to remove or remounting spark plug.		09941-34513 Steering race installer Used to install steering outer race.
	09930-30102 Rotor remove sliding shaft Used to with bearing remover or rotor remover.		09941-50111 Wheel bearing remover Used to remove wheel bearing.
	09930-30164 Rotor remover Attached to the top of sliding shaft when removing rotor.		09943-74111 Front fork oil level gauge Used to drain the fork oil to the specified level.
	09930-40113 Rotor holder Widely used to lock rotary parts such as a flywheel magneto.		09900-27000 Mode select switch Inspect EI system sensor.

TIGHTENING TORQUE

ENGINE

ITEM	POSITION	DIA (Ø)	STRENGTH (T)	N-m	kgf-cm	Remark
Spark plug		10	-	18	180	(150 ~ 200)
Crankcase bolt(M8)		8	7	23	230	(180 ~ 280)
Cylinder head bolt(M8)	Initial			18	180	
	Final	8	12	25	250	
Cylinder head bolt no.2(M8)		8	7	15	150	
Cylinder head cover bolt(M8)		8	9	20	200	(180 ~ 280)
Starter clutch bolt		8	10	25	250	(230 ~ 280)
Engine sprocket nut		16	-	88	900	(800 ~ 1000)
Water pump drive gear nut		18	-	49	500	(400 ~ 600)
Magneto rotor nut		10	-	54	550	(500 ~ 600)
Engine oil drain plug		14	4	23	230	(200 ~ 250)
Engine oil check plug		14	4	23	230	(200 ~ 250)
Clutch sleeve hub nut		16	-	39	400	(300 ~ 500)
Exhaust joint bolt		8	10	23	230	(180 ~ 280)
Exhaust pipe nut		8	10	23	230	(180 ~ 280)
Muffler connector clamp bolt		8	9	23	230	(180 ~ 280)

CHASSIS

ITEM	N-m	kg-m
Rear shock absorber fitting nut (Upper)	20 ~ 30	2.0 ~ 3.0
Rear shock absorber fitting nut (Lower)	35 ~ 55	3.5 ~ 5.5
Rear sprocket nut	20 ~ 30	2.0 ~ 3.0
Rear axle nut	90 ~ 140	9.0 ~ 14.0
Swing arm pivot nut	45 ~ 70	4.5 ~ 7.0
Steering stem nut	40 ~ 50	4.0 ~ 5.0
Steering stem head nut	80 ~ 100	8.0 ~ 10.0
Front brake disc bolt	18 ~ 28	1.8 ~ 2.8
Front brake master cylinder mounting bolt	5 ~ 8	0.5 ~ 0.8
Front brake caliper air bleeder valve	6 ~ 9	0.6 ~ 0.9
Front brake caliper mounting bolt	18 ~ 28	1.8 ~ 2.8
Front brake hose union bolt	20 ~ 25	2.0 ~ 2.5
Front axle	50 ~ 80	5.0 ~ 8.0
Front axle pinch bolt	15 ~ 25	1.5 ~ 2.5
Front fork damper rod bolt	15 ~ 25	1.5 ~ 2.5
Front fork upper clamp bolt	22 ~ 35	2.2 ~ 3.5
Front fork upper bolt	15 ~ 30	1.5 ~ 3.0
Front fork lower clamp bolt	22 ~ 35	2.2 ~ 3.5
Front footrest bolt	36 ~ 52	3.6 ~ 5.2
Handlebar clamp bolt	18 ~ 28	1.8 ~ 2.8
Handlebar holder lower nut	40 ~ 60	4.0 ~ 6.0

SERVICE DATA

VALVE + GUIDE

Unit : mm

ITEM		STANDARD	LIMIT
Valve diam.	IN.	22	—
	EX.	19.0	—
Valve clearance (When cold)	IN.	0.1~0.2	—
	EX.	0.2~0.3	—
Valve guide to valve stem clearance	IN.	0.010~0.037	—
	EX.	0.030~0.057	—
Valve stem deflection	IN. & EX.	—	0.35
Valve guide I.D.	IN. & EX.	4.500~4.512	—
Valve stem O.D.	IN.	4.475~4.490	—
	EX.	4.455~4.470	—
Valve stem runout	IN. & EX.	—	0.05
Valve head thickness	IN. & EX.	—	0.5
Valve seat width		0.9~1.1	—
Valve seat angle	IN. & EX.	45 °	
Valve head radial runout	IN. & EX.	—	0.03
Valve spring free length	IN.	—	37.8
	EX.	—	37.8
Valve spring tension	IN.	12.1~13.9kgf (at length 33.7mm)	—
	EX.	12.1~13.9kgf (at length 33.7mm)	—

CAMSHAFT + CYLINDER HEAD

Unit : mm

ITEM		STANDARD	LIMIT
Cam height	IN.	34.470 ~ 34.510	34.170
	EX.	34.420 ~ 34.460	34.120
Camshaft journal holder I.D.	IN. & EX.	35.000 ~ 35.018	—
Cylinder head distortion		—	0.05
Cylinder head cover distortion		—	0.05
Cam chain pin (Arrow ³)		16th pin	—

CYLINDER + PISTON + PISTON RING

Unit : mm

ITEM	STANDARD		LIMIT
Compression pressure	14~16 kg/cm ² (at 600 rpm)		12 kg/cm ²
Piston to cylinder clearance	0.050~0.060		0.120
Cylinder bore	57.000~57.015		57.080
Piston diam.	56.945~56.960 (Measure at 15mm from the skirt end)		56.880
Cylinder or cylinder head distortion	—		0.05
Piston ring free end gap	1st	7.2	5.7
	2nd	5.8	4.6
Piston ring end gap (Assembly condition)	1st	0.20~0.32	0.5
	2nd	0.20~0.32	0.5
Piston ring to groove clearance	1st	—	0.180
	2nd	—	0.150
Piston ring to groove width	1st	1.01~1.03	—
	2nd	1.01~1.03	—
	Oil	2.01~2.03	—
Piston ring thickness	1st	0.970~0.990	—
	2nd	0.970~0.990	—
Piston pin hole I.D.	15.002 ~ 15.008		15.030
Piston pin O.D.	14.994 ~ 15.000		14.980

CONROD + CRANKSHAFT

Unit : mm

ITEM	STANDARD	LIMIT
Conrod small end I.D.	13.006~13.014	13.040
Conrod deflection	—	3.0
Conrod big end side clearance	0.40~0.85	1.0
Conrod big end width	15.95~16.00	—
Crank web to web width	72 ±0.1	—
Crankshaft runout	—	0.05

OIL PUMP

Unit : mm

ITEM	STANDARD	NOTE
Oil pressure	1.4 ± 0.2 kg/cm ² (at 60 °C, 4,000 rpm)	—
Oil pump reduction ratio	77/22 × 14/20=2.45	—

8-23 SERVICING INFORMATION

CLUTCH

Unit: mm

ITEM	STANDARD	LIMIT
Clutch cable play	4	—
Drive plate thickness	2.9~3.1	2.6
Drive plate claw width	11.8~12 .0	11.0
Driven plate distortion	—	0.1
Clutch spring free length	31	29.5

TRANSMISSION + DRIVE CHAIN

Unit: mm

ITEM	STANDARD	LIMIT	
Primary reduction ratio	3.5 (77/22)	—	
Secondary reduction ratio	3.29 (51/14)	—	
Gear ratio	1st	2.75 (33/12)	—
	2nd	1.79 (25/14)	—
	3rd	1.37 (26/19)	—
	4th	1.05 (23/22)	—
	5th	0.91 (21/23)	—
Shift fork to groove clearance	0.10~0.30	0.5	
Shift fork groove width	NO.1 & NO.2	5.0~5.1	—
	NO.3	5.5~5.6	—
Shift fork thickness	NO.1 & NO.2	4.8~4.9	—
	NO.3	5.3~5.4	—
Drive chain	Type	428HO	—
	Links	130 LINKS	—
	20-pitch length	254	259.4
Drive chain slack	20~30	—	

⊕ EI SYSTEM PARTS

ITEM	N - m	kgf - m
Water temperature sensor (WT sensor)	5 ~ 8	0.5 ~ 0.8
Fuel injector mounting bolt	5 ~ 8	0.5 ~ 0.8
Intake air temperature & temperature sensor (IAP&T sensor)	5 ~ 6	0.5 ~ 0.8

SERVICE DATA

⊙ EI SENSORS

ITEM	SPECIFICATION	
IAP&T (Pressure function) sensor input voltage	4.9 ~ 5.1V	
IAP&T (Pressure function) sensor output voltage	Approx. 1.5V at. idle speed	
TP sensor input voltage	4.8 ~ 5.2V	
TP sensor output voltage	Closed	Approx. 0.6 ~ 1.0V
	Opened	Approx. 4.0 ~ 4.6V
IAP&T (Temperature function) sensor resistance	0.075 ~ 14.541 KΩ	
	[When Intake air temperature is -20°C ~ 140°C (-4°F ~ 284°F)]	
IAP&T (Temperature function) sensor resistance (each temperature)	-20°C (-4°F)	Approx 14.541 KΩ
	0°C (32°F)	Approx 5.627 KΩ
	20°C (68°F)	Approx 2.429 KΩ
	40°C (104°F)	Approx 1.155 KΩ
	60°C (140°F)	Approx 0.594 KΩ
	80°C (176°F)	Approx 0.3277 KΩ
	120°C (248°F)	Approx 0.1168 KΩ
	140°C (284°F)	Approx 0.0749 KΩ
RO switch resistance	∞ Ω (Infinity) [at normal condition]	
	0 Ω [at leaned more than 60°]	
Oxygen sensor heater voltage	Battery voltage	
WT sensor resistance	0.1163 ~ 48.140 KΩ	
	[When Water temperature is -40°C ~ 120°C (-40°F ~ 248°F)]	
WT sensor resistance [To ECU] (each temperature)	-40°C (-40°F)	Approx 48.140 KΩ
	0°C (32°F)	Approx 5.790 KΩ
	20°C (68°F)	Approx 2.450 KΩ
	40°C (104°F)	Approx 1.148 KΩ
	60°C (140°F)	Approx 0.586 KΩ
	80°C (176°F)	Approx 0.322 KΩ
	120°C (248°F)	Approx 0.1163 KΩ

8-25 SERVICING INFORMATION

⊙ THROTTLE BODY

ITEM	SPECIFICATION	NOTE
I.D. No.	13400H88	
Bore size	∅ 28	
Idle rpm	1,500 ~ 1,700 rpm	
Throttle cable play	0.5 ~ 1.0 mm (0.02 ~ 0.04 in)	

⊙ FUEL INJECTOR + FUEL PUMP

ITEM	SPECIFICATION	NOTE
Fuel injector resistance	11.4 ~ 12.6 Ω at 20°C (68°F)	
Fuel injector voltage	Battery voltage	
Fuel pressure of fuel pump	Approx. 2.44 ~ 2.54 kgf/cm ² (240 ~ 250 kPa, 34.8 ~ 36.2 psi)	

⊙ ELECTRICAL

Unit : mm (in)

ITEM	SPECIFICATION		NOTE
Ignition timing	BTDC 10° / 2,000 rpm and 28° / 6,000 rpm		
Spark plug	Type	CR8E	
	Gap	0.7 ~ 0.8 (0.028 ~ 0.032)	
	Hot type	CR7E	
	Standard type	CR8E	
	Cold type	CR9E	
Spark performance	More than 8 (0.32)		
Ignition coil primary peak voltage	400 V and more		
Ignition coil resistance	Primary	0.52 ~ 0.64 Ω	1st ⊕ - ⊖
	Secondary	6.4 ~ 7.8 kΩ	2nd ⊕ - ⊖
Spark plug cap resistance	10 kΩ		
Ignition coil secondary/ Spark plug cap resistance	16.4 ~ 17.8 kΩ		spark plug cap - ⊖
Stator coil resistance	Pick-up coil	Approx. 95 ~ 125 Ω	G - L
	Charging coil	Approx. 0.3 ~ 0.6 Ω	Y - Y
Magneto no-load performance	Over 60 V / 5,000 rpm		
Battery standard charging voltage	13.5 ~ 15.0 V / 5,000 rpm		
Battery	Type	YTX12-BS	
	Capacity	12V 10Ah	
	Standard electrolyte S.G.	1.320 at 20°C (68°F)	
ECU Fuse size	REC. / REG. / IGN	30 A	
	ECU / M.RELAY	20 A	
	HEAD L. / METER	10 A	
	HEAD H.	10 A	
	S. STAND / STARTER /CLUTCH	10 A	
	POSITION/ TAIL/ FAN	10 A	
	TURN / STOP / HORN /S.SENS	10 A	
	SPARE		30 A
		20 A	
		10 A	

8-27 SERVICING INFORMATION

WATTAGE

Unit:W

ITEM	SPECIFICATION
Head lamp	12V—H4 : 55W/60W
Position lamp	12V – W5W
License lamp	LED TYPE
Brake/Tail lamp	LED TYPE
Turn signal lamp	12V 10W x 4
Speedometer lamp	LED TYPE
Engine warning lamp	LED TYPE
Turn signal indicator lamp	LED TYPE
High beam indicator lamp	LED TYPE
Odometer/ Trip meter/ clock	LCD TYPE
Fuel meter/ Coolant temp. meter	LCD TYPE
Neutral indicator lamp	LED TYPE

- ※ LED: Light Emitting Diode
LCD: Liquid Crystal Display

CAUTION

Do not use except the specified bulb (Wattage).

SUSPENSION

Unit : mm

ITEM	STANDARD	LIMIT
Front fork stroke	132	—
Front fork spring free length	429	356
Front fork oil type	ISO VIG46, JSK2001	—
Front fork oil level	443	—
Front fork oil capacity (each leg)	170±2 ml	—
Rear wheel travel	89	—
Swingarm pivot shaft runout	—	0.6
Rear shock absorber pre-load position	2 / 5 position	—
Rear shock absorber spring length	207.3	195

BRAKE+WHEEL

Unit : mm

ITEM	STANDARD		LIMIT
Rear brake pedal free travel	50~60		—
Rear brake pedal height	283 (when one person riding from the ground)		—
Brake disc thickness	Front	4	3
Brake disc runout	Front	—	0.3
Master cylinder bore	Front	12.700~12.743	Φ14
	Rear	14.00~14.043	
Master cylinder piston diam	Front	12.657~12.684	Φ14
	Rear	13.957~13.980	
Brake caliper cylinder bore	Front	(30.2~30.243) ×1, (25.0~25.043) ×2	Φ 30.2×1+Φ 25×2
	Rear	30.2~30.243	
Brake caliper piston diam	Front	(30.157~30.184) ×1, (24.957~24.984) ×2	Φ 30.2×1+Φ 25×2
	Rear	30.157~30.184	
Brake fluid type	DOT4		—
Wheel rim runout	Axial	—	2.0
	Radial	—	2.0
Wheel axle runout	Front	—	0.25
	Rear	—	0.25
Wheel rim size	Front	J16×MT2.75	—
	Rear	J15×MT3.50	—

8-29 SERVICING INFORMATION

TIRE

ITEM	STANDARD		LIMIT
Cold inflation tire pressure (Solo riding)	Front	200Kpa(29psi)	200Kpa(33psi)
	Rear	200Kpa(29psi)	200Kpa(33psi)
Cold inflation tire pressure (Dual riding)	Front	200Kpa(29psi)	200Kpa(33psi)
	Rear	200Kpa(29psi)	200Kpa(33psi)
Tire tread depth	Front	———	5.5
	Rear	———	8.0

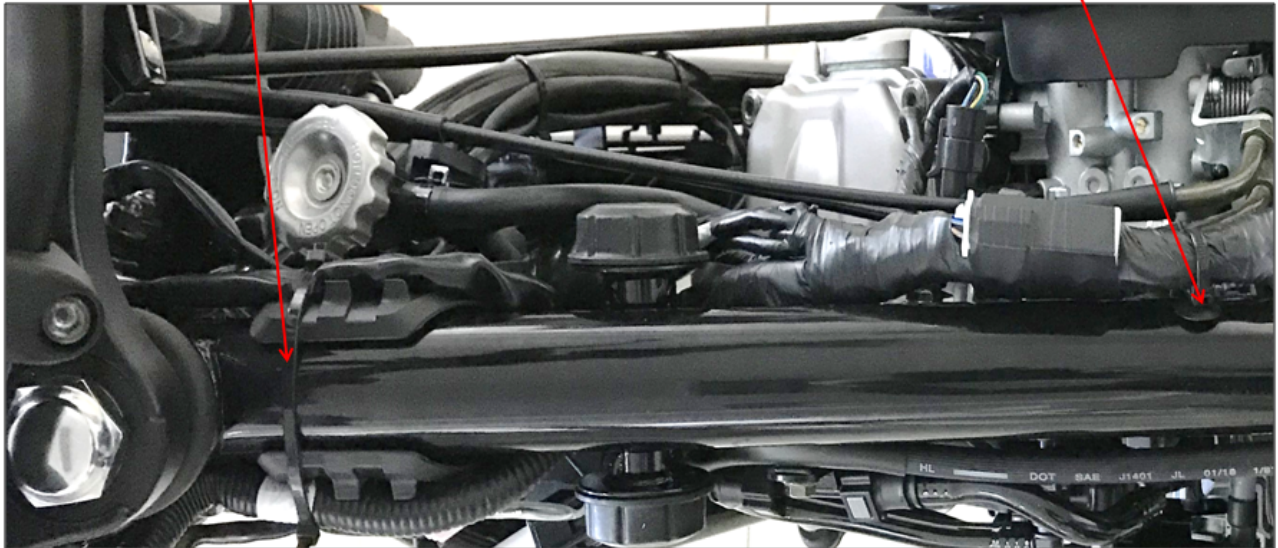
FUEL + OIL

ITEM	SPECIFICATION		NOTE
Fuel type	Gasoline used should be graded 91 octane or higher. An unleaded gasoline is recommended.		
Fuel tank capacity	Including reserve	12.5 L	
	Reserve	1.2 L	
Engine oil type	SAE 10W40		
Engine oil capacity	Change	1,100 ml	
	Filter change	1,300 ml	
	Overhaul	1,400 ml	

WIRING AND CABLE ROUTING

- 09407-28402 [CLAMP]
 - HARNESS
 - HANDLE SWITCH Rh
 - HANDLE SWITCH Lh
 - TURN SIGNAL LAMP Rh
 - TURN SIGNAL LAMP Lh
 - STEERING LOCK

- CLAMP, HARNESS
 (INSTALL FRAME HOLE)



- 34100HG7200
 - SPEEDOMETER

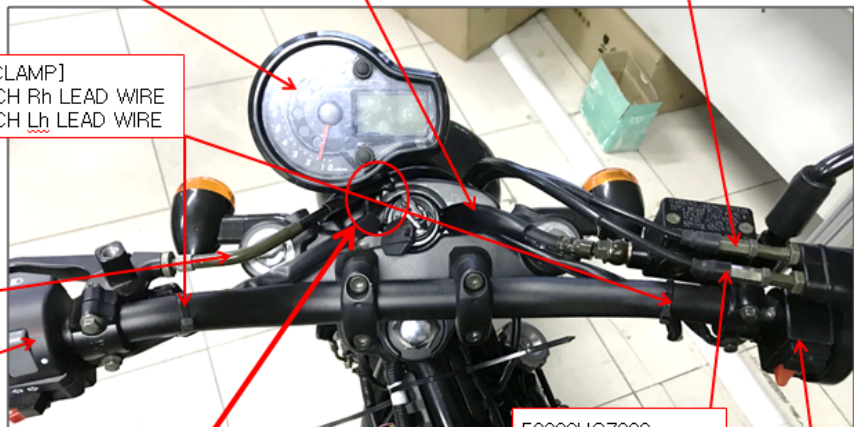
- 59480HG7200
 - Ft. BRAKE HOSE

- 58600HG7200
 - THROTTLE RETURN CABLE

- 09407-20406 [CLAMP]
 - HANDLE SWITCH Rh LEAD WIRE
 - HANDLE SWITCH Lh LEAD WIRE

- 58200HG7200
 - CLUTCH CABLE

- 37400HG7200
 - HANDLE SWITCH Lh

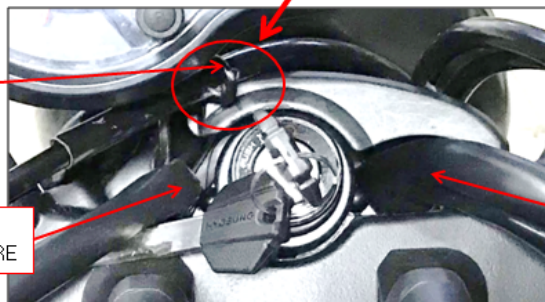


- 58300HG7200
 - THROTTLE CABLE

- SPEEDOMETER BRACKET
 (HOOKING CLUTCH CABLE)

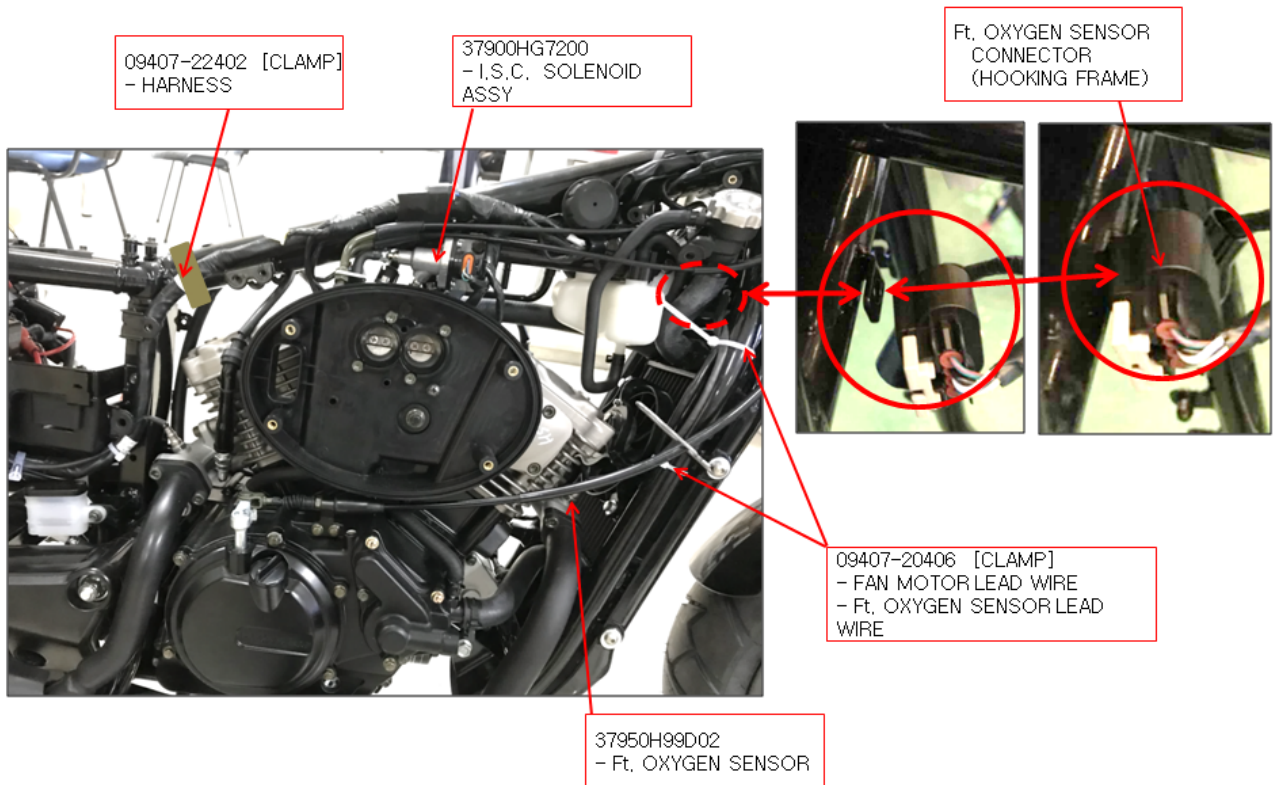
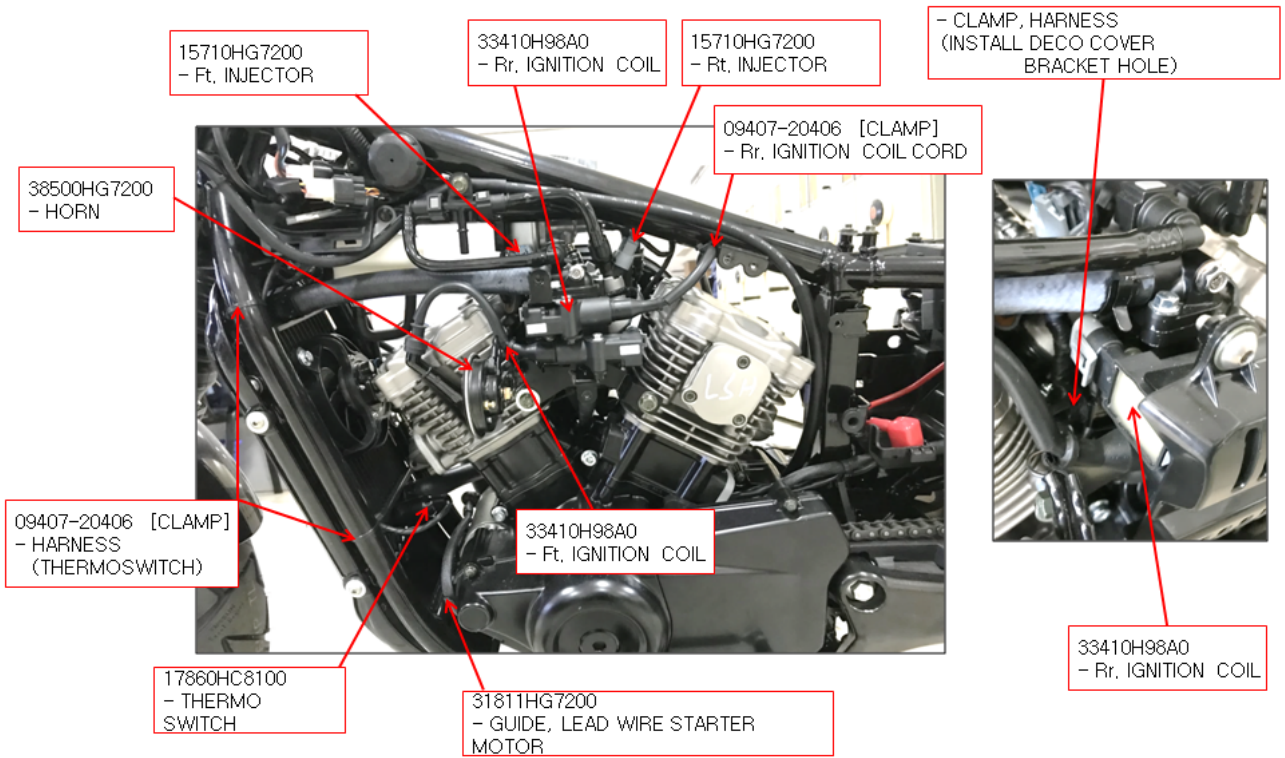
- 37200HG7200
 - HANDLE SWITCH Rh

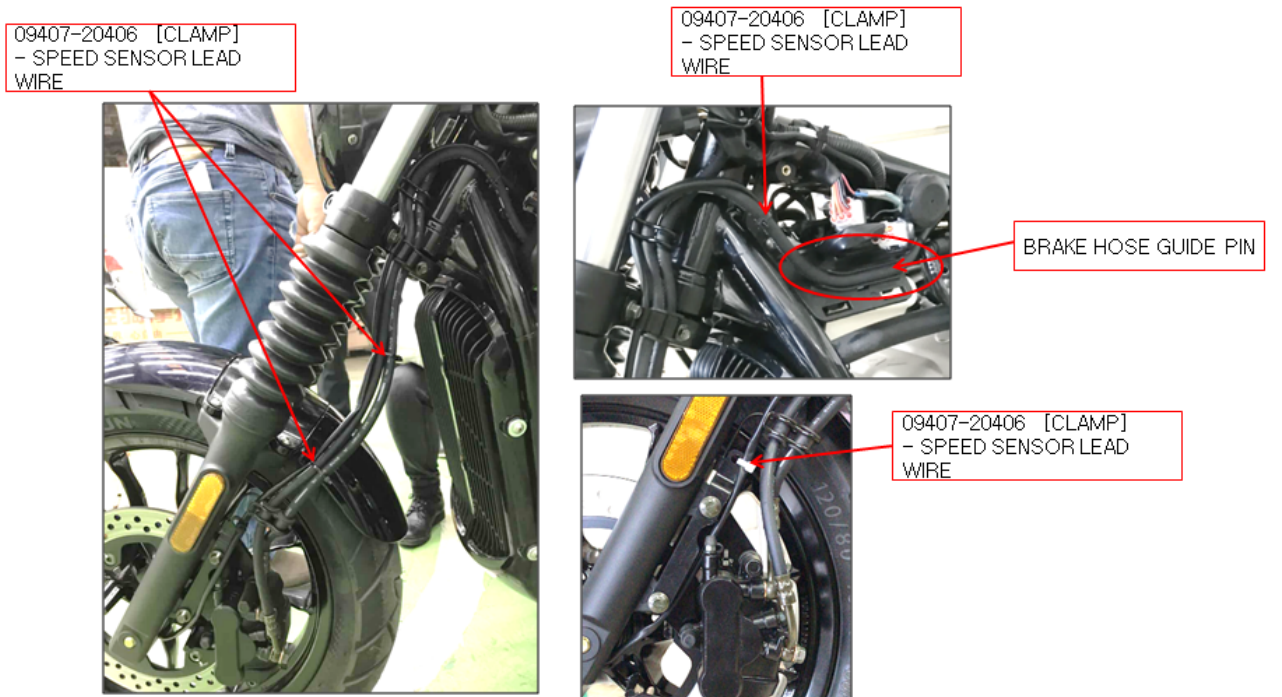
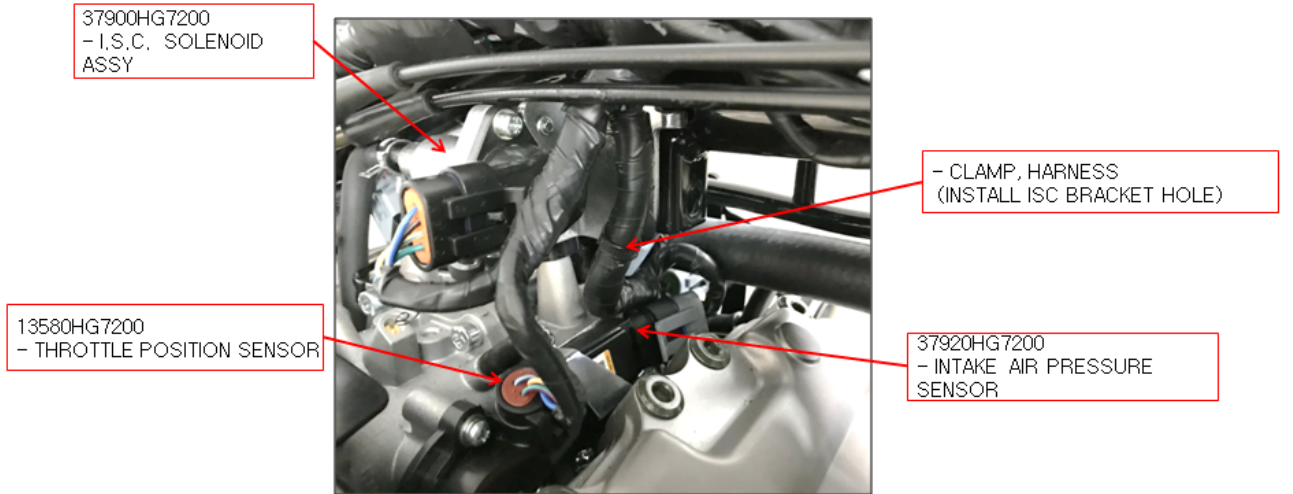
- # ROUTING (INSIDE KEY BOX)
 - HANDLE SWITCH Lh LEAD WIRE



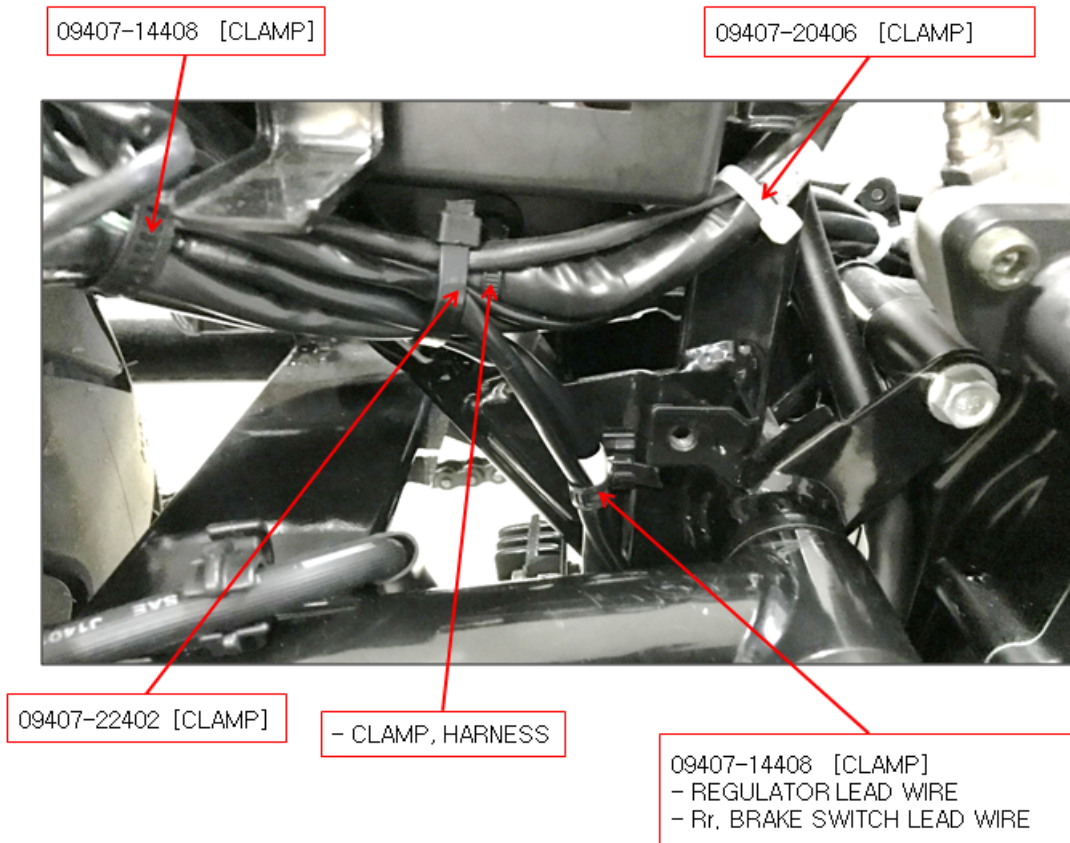
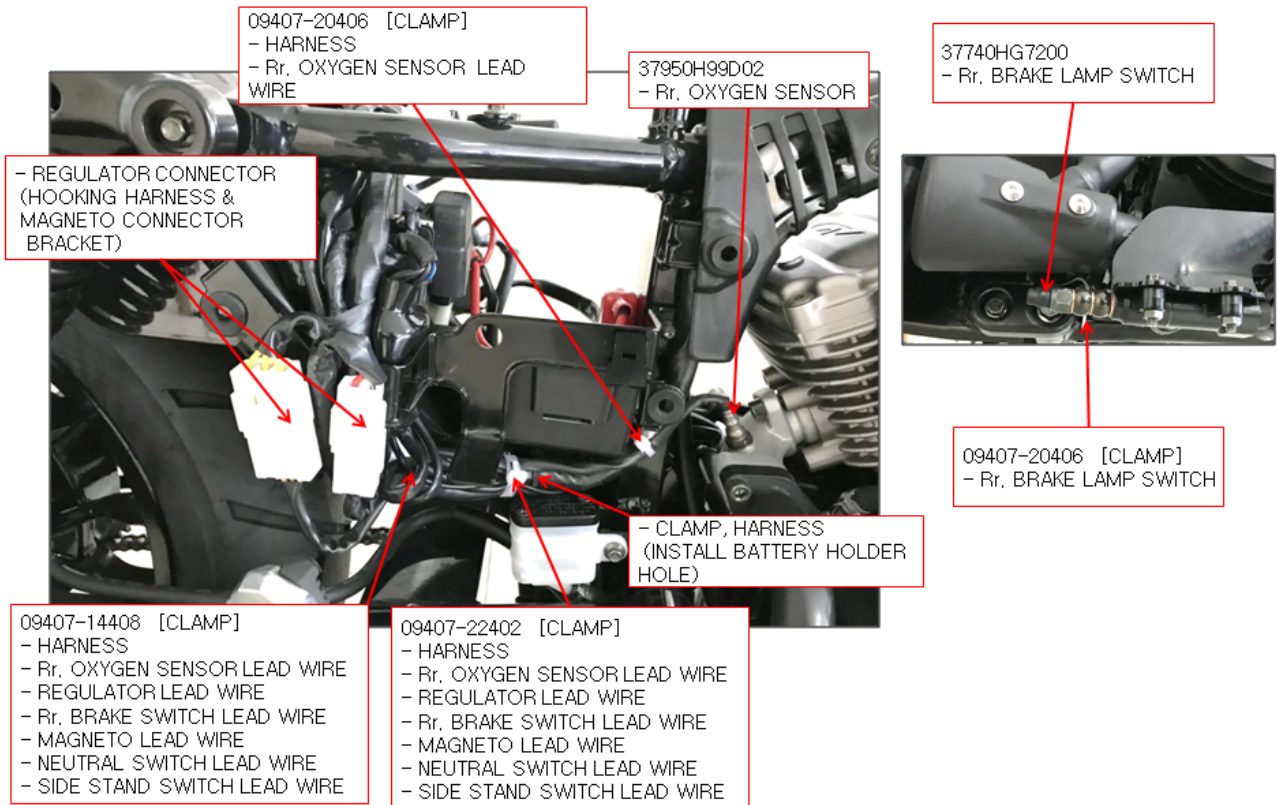
- # ROUTING (INSIDE KEY BOX)
 - Ft. BRAKE HOSE
 - HANDLE SWITCH Rh LEAD WIRE

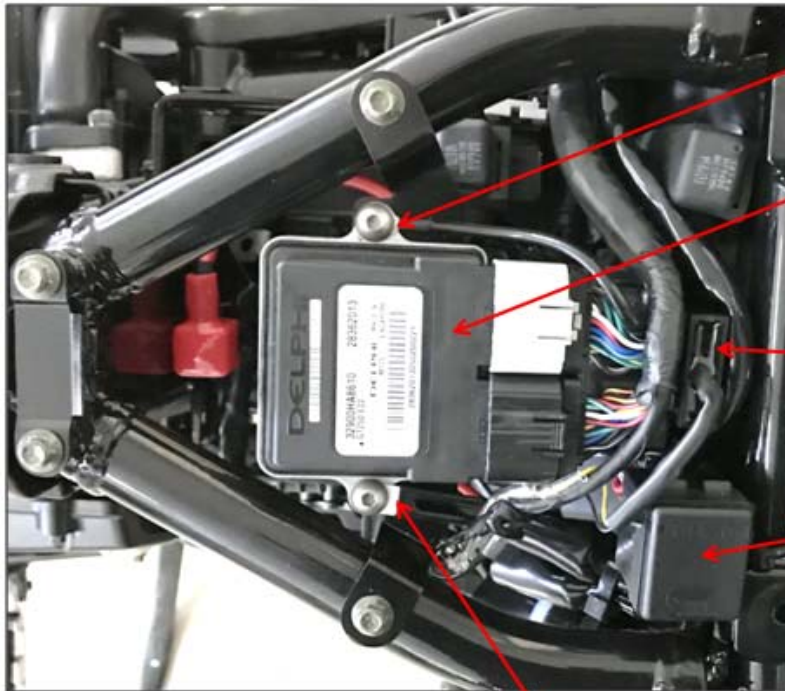
8-31 SERVICING INFORMATION





8-33 SERVICING INFORMATION





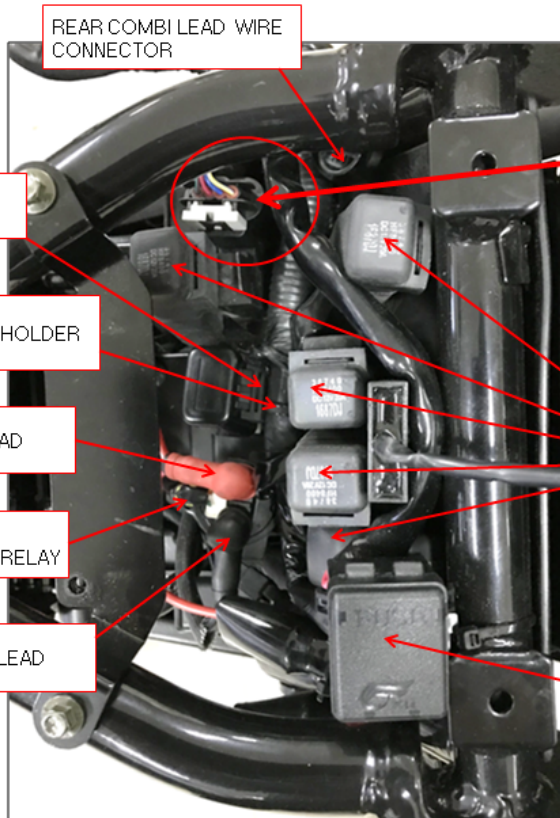
ECU GROUND

32900HG7200
- ENGINE CONTROL UNIT (ECU)

37890HG7200
- TIP OVER SENSOR

36741HG7200
- FUSE BOX

09404-06404 [CLAMP]
- TIP OVER SENSOR LEAD WIRE



REAR COMBI LEAD WIRE CONNECTOR

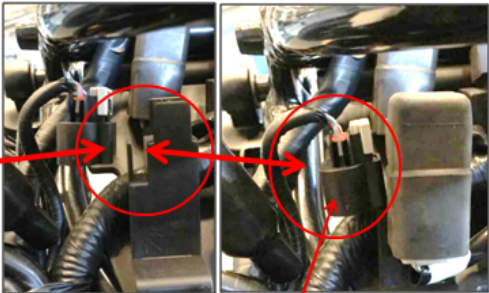
38610HF8400
- TURN SIGNAL RELAY

- CLAMP, HARNESS (INSTALL BATTERY HOLDER HOLE)

33840HG7200
- BATTERY PLUS LEAD WIRE

31800HG5100
- STARTER MOTOR RELAY

33850HG7200
- STARTER MOTOR LEAD WIRE

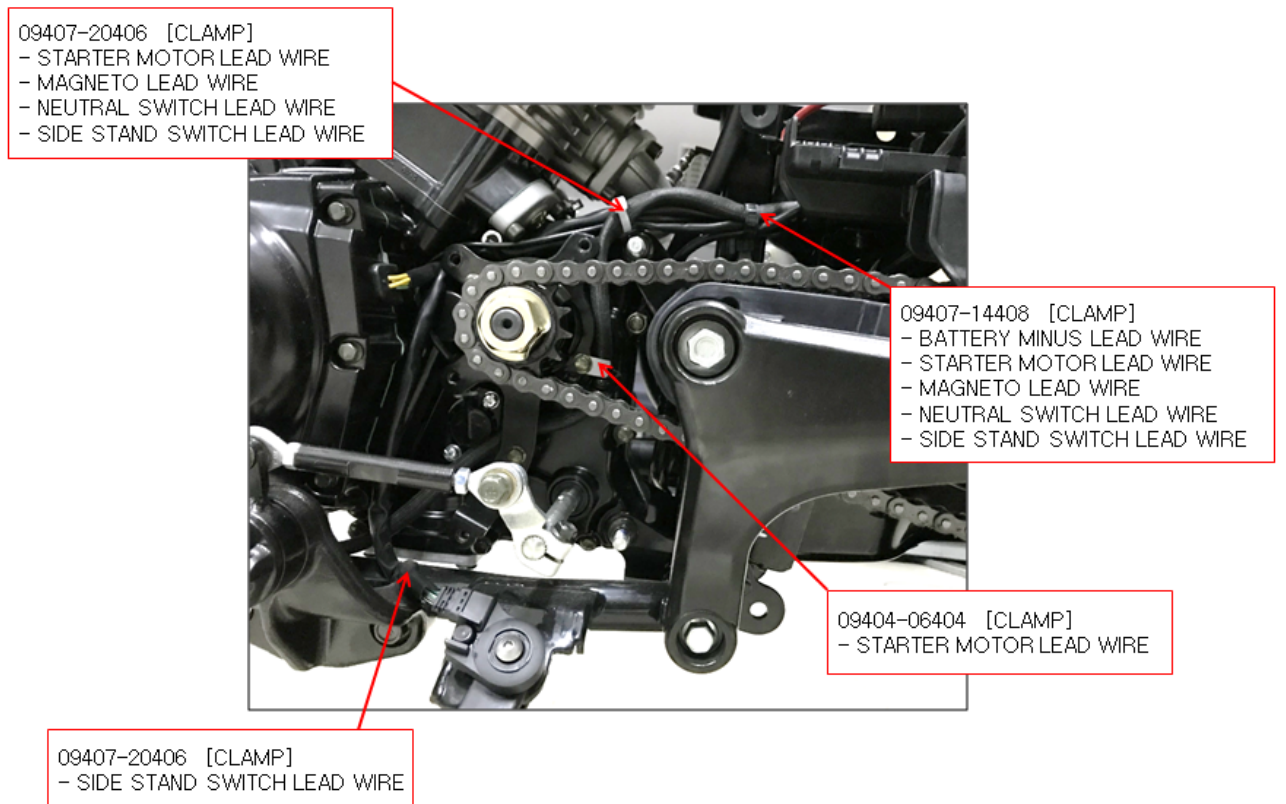
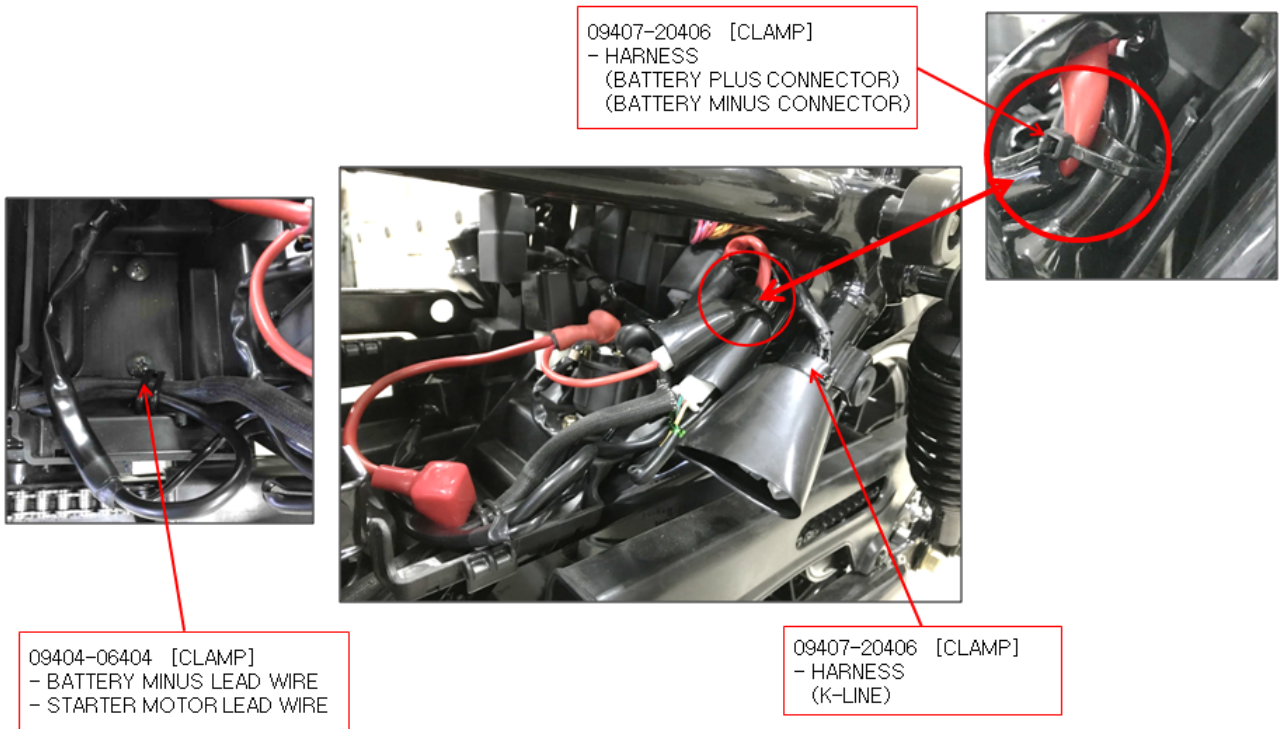


Rr. OXYGEN SENSOR CONNECTOR (HOOKING BATTERY HOLDER)

38740HF8400
- RELAY, 12V 20A

36741HG7200
- FUSE BOX

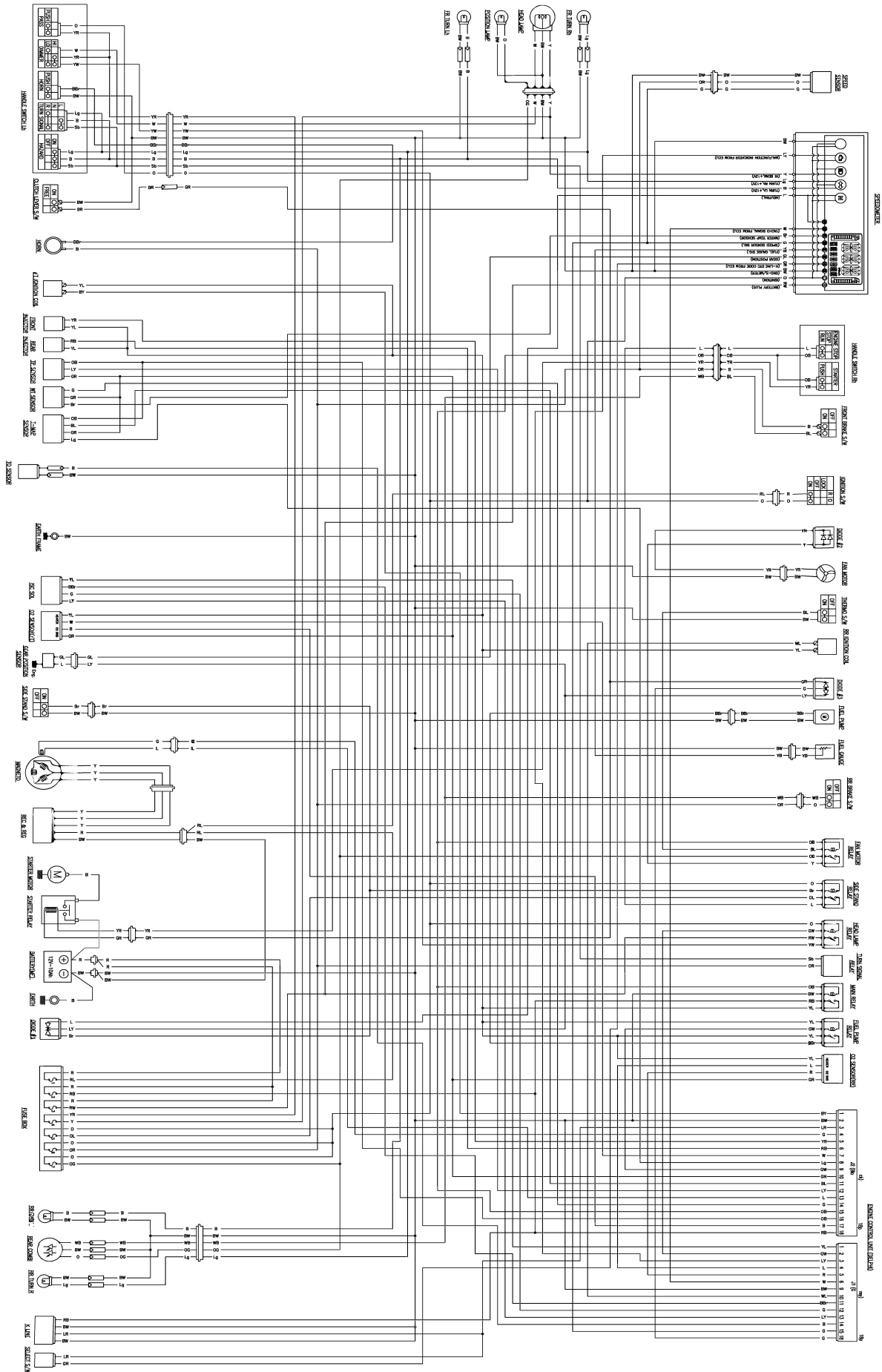
8-35 SERVICING INFORMATION





WHITE TAPE

WIRING DIAGRAM



HYOSUNG

1st Ed.Dec.2020

99000HB8110