

SUZUKI RM-Z250 SERVICE MANUAL



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FRAME COVER INSTALLATION

SUZUKI

RM-Z250

SERVICE MANUAL



FOREWORD

This manual contains an introductory description on the SUZUKI RM-Z250 and procedures for its inspection, service and overhaul of its main components.

Other information considered as generally known is not included.

Read the GENERAL INFORMATION section to familiarize yourself with the motorcycle and its maintenance. Use this section as well as other sections as a guide for proper inspection and service.

This manual will help you know the motorcycle better so that you can assure your customers of fast and reliable service.

* This manual has been prepared on the basis of the latest specifications at the time of publication. If modifications have been made since then, differences may exist between the content of this manual and the actual motorcycle.

* Illustrations in this manual are used to show the basic principles of operation and work procedures. They may not represent the actual motorcycle exactly in detail.

* This manual is written for persons who have enough knowledge, skills and tools, including special tools, for servicing SUZUKI motorcycles. If you do not have the proper knowledge and tools, ask your authorized SUZUKI motorcycle dealer to help you.

⚠ WARNING

Inexperienced mechanics or mechanics without the proper tools and equipment may not be able to properly perform the services described in this manual. Improper repair may result in injury to the mechanic and may render the motorcycle unsafe for the rider.

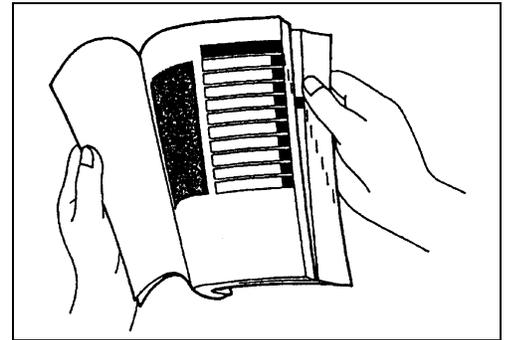
SUZUKI MOTOR CORPORATION

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HOW TO USE THIS MANUAL TO LOCATE WHAT YOU ARE LOOKING FOR:

1. The text of this manual is divided into sections.
2. The section titles are listed in the GROUP INDEX.
3. Holding the manual as shown at the right will allow you to find the first page of the section easily.
4. The contents are listed on the first page of each section to help you find the item and page you need.



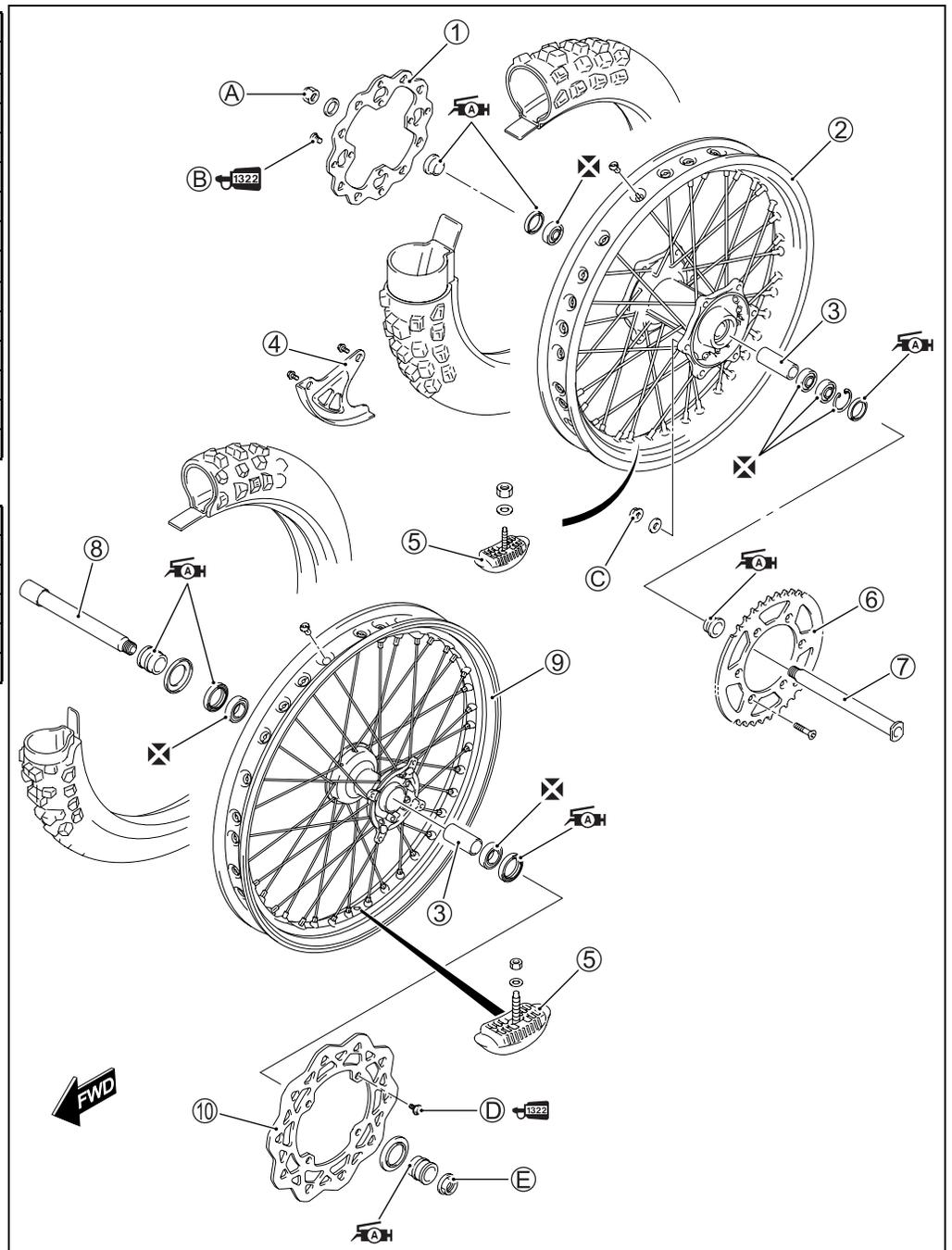
COMPONENT PARTS AND WORK TO BE DONE

Under the name of each system or unit, is its exploded view. Work instructions and other service information such as the tightening torque, lubricating points and locking agent points, are provided.

Example: Front and rear wheels

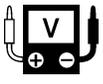
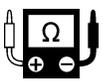
①	Rear disc plate
②	Rear wheel (1.85 × 19)
③	Spacer
④	Disc cover
⑤	Bead stopper
⑥	Rear sprocket
⑦	Rear axle shaft
⑧	Front axle shaft
⑨	Front wheel (1.60 × 21)
⑩	Front disc plate
A	Rear axle nut
B	Disc plate bolt (Rear)
C	Rear sprocket nut
D	Disc plate bolt (Front)
E	Front axle nut

ITEM	N-m	kgf-m	lbf-ft
A	90	9.0	65.0
B	26	2.6	19.0
C	30	3.0	21.5
D	11	1.1	8.0
E	35	3.5	25.5



SYMBOL MARKS AND MATERIALS

Listed in the table below are the symbols indicating instructions and other information. The meaning of each symbol is also included in the table.

SYMBOL	DEFINITION	SYMBOL	DEFINITION
	Torque control required. Data beside it indicates specified torque.		Apply THREAD LOCK SUPER "1360" or equivalent. 99000-32130
	Apply oil. Use engine oil or transmission oil unless otherwise specified.		Use SUZUKI FORK OIL SS-05 or equivalent. 99000-99001-SS5
	Apply molybdenum oil solution. (Mixture of engine oil and SUZUKI MOLY PASTE in a ratio of 1:1)		Use REAR SUSPENSION OIL SS-25 or equivalent.
	Apply SUZUKI SUPER GREASE "A" or equivalent. 99000-25010		Use engine coolant or equivalent.
	Apply SUZUKI SILICONE GREASE or equivalent. 99000-25100		Apply or use brake fluid. (DOT 4)
	Apply SUZUKI MOLY PASTE or equivalent. 99000-25140		Measure in voltage range.
	Apply SUZUKI BOND "1215" or equivalent. 99000-31110		Measure in resistance range.
	Apply SUZUKI BOND "1207B" or equivalent. 99000-31140		Measure in diode test range.
	Apply THREAD LOCK SUPER "1303" or equivalent. 99000-32030		Use special tool.
	Apply THREAD LOCK SUPER "1322" or equivalent. 99000-32110		Indication of service data.
	Apply THREAD LOCK "1342" or equivalent. 99000-32050		Replace a part with a new one when reassembling.

ABBREVIATIONS USED IN THIS MANUAL

A

AC : Alternating Current
API : American Petroleum Institute

B

BTDC : Before Top Dead Center
B+ : Battery Positive Voltage

C

CKP Sensor : Crankshaft Position Sensor (CKPS)

D

DC : Direct Current
DTC : Diagnostic Trouble Code

E

ECM : Engine Control Module
Engine Control Unit (ECU)
(FI Control Unit)
ECT Sensor : Engine Coolant Temperature
Sensor (ECTS), Water Temp.
Sensor (WTS)

F

FI : Fuel Injection, Fuel Injector
FP : Fuel Pump
FP Relay : Fuel Pump Relay

G

GND : Ground
GP Switch : Gear Position Switch

I

IAP Sensor : Intake Air Pressure Sensor (IAPS)
(MAP Sensor)
IAT Sensor : Intake Air Temperature Sensor
(IATS)

J

JASO : Japanese Automobile Standards
Organization

L

LH : Left Hand

M

Max : Maximum
Min : Minimum

R

RH : Right Hand

S

SAE : Society of Automotive Engineers
SDS : Suzuki Diagnosis System

T

TO Sensor : Tip-Over Sensor (TOS)
TP Sensor : Throttle Position Sensor (TPS)

WIRE COLOR

B	: Black	Lg	: Light green
Bl	: Blue	O	: Orange
Br	: Brown	P	: Pink
Dg	: Dark green	R	: Red
G	: Green	Y	: Yellow
Gr	: Gray		

B/Bl	: Black with Blue tracer
B/Br	: Black with Brown tracer
B/R	: Black with Red tracer
B/W	: Black with White tracer
B/Y	: Black with Yellow tracer
Bl/B	: Blue with Black tracer
Bl/G	: Blue with Green tracer
Bl/R	: Blue with Red tracer
Bl/W	: Blue with White tracer
Bl/Y	: Blue with Yellow tracer
Br/W	: Brown with White tracer
G/B	: Green with Black tracer
G/W	: Green with White tracer
Gr/W	: Gray with White tracer
R/B	: Red with Black tracer
R/Bl	: Red with Blue tracer
R/W	: Red with White tracer
W/Bl	: White with Blue tracer
W/R	: White with Red tracer
Y/B	: Yellow with Black tracer
Y/R	: Yellow with Red tracer

SAE-TO-FORMER SUZUKI TERM

This table lists SAE (Society of Automotive Engineers) J1930 terms and abbreviations which may be used in this manual in compliance with SAE recommendations, as well as their former SUZUKI names.

SAE TERM		FORMER SUZUKI TERM
FULL TERM	ABBREVIATION	
A		
Air Cleaner	ACL	Air Cleaner, Air Cleaner Box
B		
Battery Positive Voltage	B+	Battery Voltage, +B
C		
Crankshaft Position Sensor	CKP Sensor	Crankshaft Position Sensor (CKPS), Crank Angle
D		
Data Link Connector	DLC	Mode Select Coupler
Diagnostic Test Mode	DTM	—
Diagnostic Trouble Code	DTC	Diagnostic Code, Malfunction Code
E		
Electronic Ignition	EI	—
Engine Control Module	ECM	Engine Control Module (ECM) FI Control Unit, Engine Control Unit (ECU)
Engine Coolant Level	ECL	Coolant Level
Engine Coolant Temperature	ECT	Coolant Temperature, Engine Coolant Temperature, Water Temperature
Engine Speed	RPM	Engine Speed (RPM)
F		
Fan Control	FC	—
Fuel Level Sensor	—	Fuel Level Sensor, Fuel Level Gauge
Fuel Pump	FP	Fuel Pump (FP)
G		
Generator	GEN	Generator
Ground	GND	Ground (GND, GRD)
I		
Ignition Control	IC	Electronic Spark Advance (ESA)
Ignition Control Module	ICM	—
Intake Air Temperature	IAT	Intake Air Temperature (IAT), Air Temperature
M		
Malfunction Indicator Lamp	MIL	Lamp Malfunction Indicator Lamp (MIL)
Manifold Absolute Pressure	MAP	Intake Air Pressure (IAP), Intake Vacuum

SAE TERM		FORMER SUZUKI TERM
FULL TERM	ABBREVIATION	
O On-Board Diagnostic	OBD	Self-Diagnosis Function Diagnostic
P Programmable Read Only Memory	PROM	—
R Random Access Memory	RAM	—
Read Only Memory	ROM	ROM
T Throttle Body	TB	Throttle Body (TB)
Throttle Body Fuel Injection	TBI	Throttle Body Fuel Injection (TBI)
Throttle Position Sensor	TP Sensor	TP Sensor (TPS)
V Voltage Regulator	VR	Voltage Regulator

GENERAL INFORMATION

1

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COUNTRY AND AREA CODES

The following codes stand for the applicable country(-ies) and area(-s).

CODE	COUNTRY or AREA	EFFECTIVE FRAME NO.
000	Japan	JS1RJ42A000 500001 –
E-03	U.S.A.	JS1RJ42C A2 100001 –
E-19	E.U.	JS1RJ42A000 500001 –
E-28	Canada	JS1RJ42C A2 100001 –

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.

⚠ WARNING

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

CAUTION

Indicates a potential hazard that could result in motorcycle damage.

NOTE:

Indicates special information to make maintenance easier or instructions clearer.

Please note, however, that the warnings 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 WARNINGS and CAUTIONS stated, you must use good judgement 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

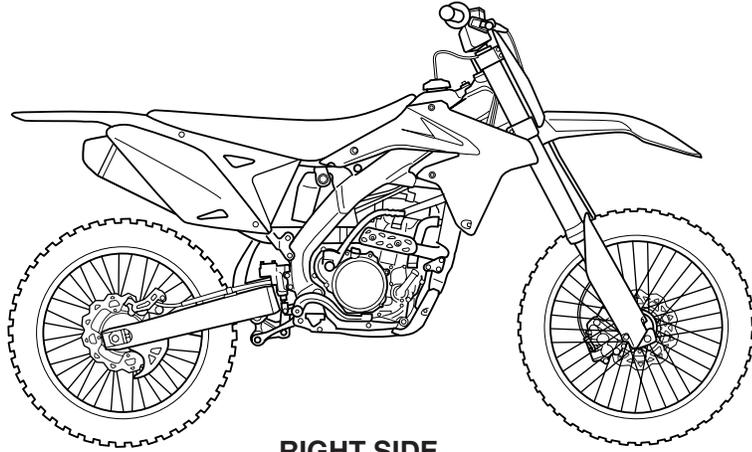
- * Proper service and repair procedures are important for the safety of the service mechanic and the safety and reliability of the motorcycle.
- * When 2 or more persons work together, pay attention to the safety of each other.
- * When it is necessary to run the engine indoors, make sure that exhaust 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, radiator and exhaust system until they have cooled.
- * After servicing the fuel, oil, water, exhaust or brake systems, check all lines and fittings related to the system for leaks.

CAUTION

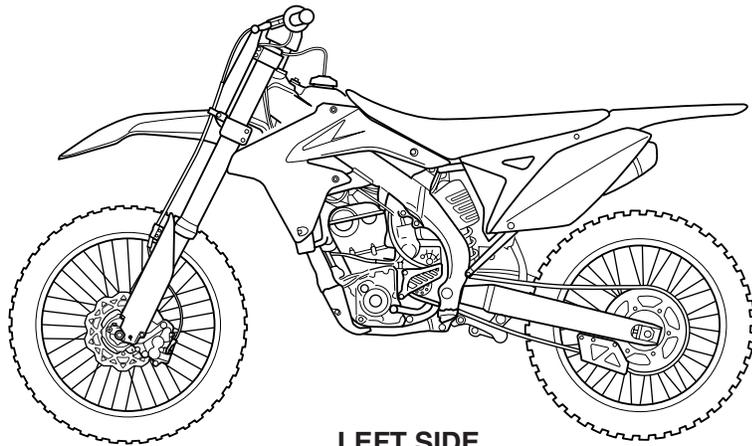
- * If parts replacement is necessary, replace the parts with Suzuki Genuine Parts or their equivalent.
- * When removing parts that are to be reused, keep them arranged in an orderly manner so that they may be reinstalled in the proper order and orientation.
- * Be sure to use special tools when instructed.
- * Make sure that all parts used in reassembly are clean. Lubricate them when specified.
- * Use the specified lubricant, bond, or sealant.
- * When removing the battery, disconnect the negative cable first and then the positive cable.
- * When reconnecting the battery, connect the positive cable first and then the 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 from the battery.
- * When tightening the cylinder head or case bolts and nuts, tighten the larger sizes first. Always tighten the bolts and nuts diagonally from the inside toward outside and to the specified tightening torque.
- * Whenever you remove oil seals, gaskets, packing, O-rings, locking washers, self-locking nuts, 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 left over 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.
- * Use a torque wrench to tighten fasteners to the specified torque. Wipe off grease and oil if a thread is smeared with them.
- * After reassembling, check parts for tightness and proper operation.

- * To protect the environment, do not unlawfully dispose of used motor oil, engine coolant and other fluids: batteries and tires.
- * To protect Earth's natural resources, properly dispose of used motorcycle and parts.

SUZUKI RM-Z250L0 ('10-MODEL)



RIGHT SIDE

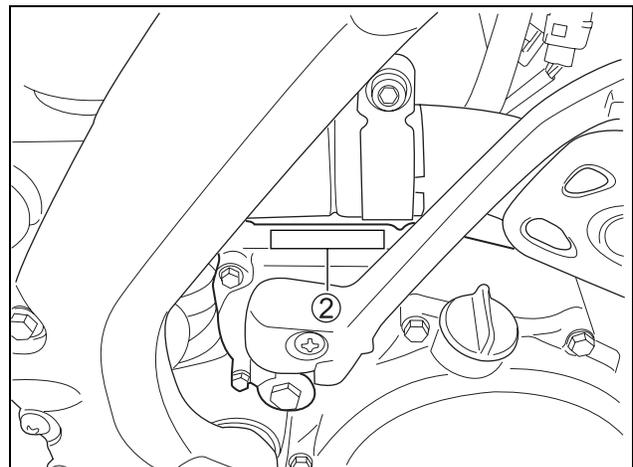
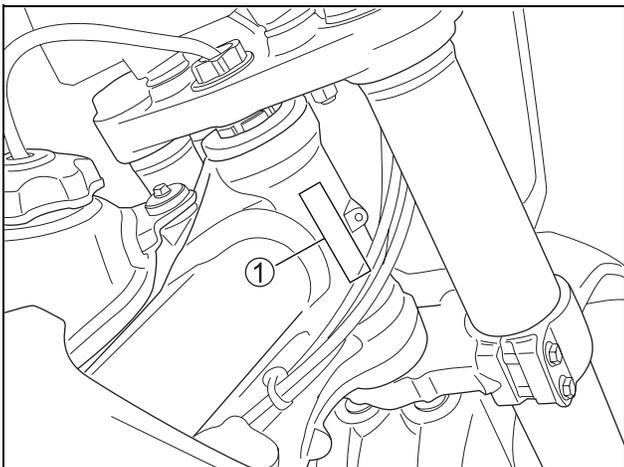


LEFT SIDE

- Difference between photograph and actual motorcycle may exist depending on the markets.

SERIAL NUMBER LOCATION

The frame serial number or V.I.N. (Vehicle Identification Number) ① is stamped on the right side of the steering head pipe. The engine serial number ② is located on the rear side of the crankcase. These numbers are required especially for registering the machine and ordering spare parts.



FUEL, OIL AND ENGINE COOLANT RECOMMENDATION

FUEL (FOR USA AND CANADA)

Use only unleaded gasoline of at least 90 pump octane (R/2 + M/2).

FUEL (FOR OTHER COUNTRIES)

Use only unleaded gasoline of at least 95 octane (Research Method).

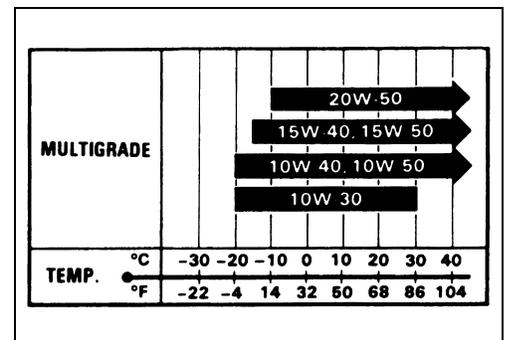
ENGINE OIL (FOR USA)

Suzuki recommends the use of SUZUKI PERFORMANCE 4 MOTOR OIL or equivalent engine oil. Use of SG/SH/SJ/SL in API with JASO MA/MA1/MA2.

Suzuki recommends the use of SAE 10W-40 engine oil. If SAE 10W-40 engine oil is not available, select an alternative according to the following chart.

ENGINE OIL (FOR OTHER COUNTRIES)

MOTUL 300V 10W-40 (recommendation) or use a premium quality 4-stroke motor oil to ensure longer service life of your motorcycle. Use of SG/SH/SJ/SL in API with JASO MA/MA1/MA2. The recommended viscosity is SAE 10W-40. If an SAE 10W-40 motor oil is not available, select an alternative according to the right chart.



BRAKE FLUID

Specification and classification: DOT 4

⚠ 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 SUZUKI FORK OIL SS-05 or an equivalent fork oil.

REAR SUSPENSION OIL

Use REAR SUSPENSION OIL SS-25 or an equivalent suspension oil.

ENGINE COOLANT

Use an anti-freeze/engine coolant compatible with an aluminum radiator, mixed with distilled water only.

CAUTION

Leaving the engine at idling speed after riding will cause engine overheat as this competition motorcycle does not have the radiator cooling fan and coolant reservoir. Riding the motorcycle under severe conditions such as muddy or sandy terrain with high ambient temperature can shorten time to be overheated.

WATER FOR MIXING

Use distilled water only. Water other than distilled water can corrode and clog the aluminum radiator.

ANTI-FREEZE/ENGINE COOLANT

The engine coolant performs as a corrosion and rust inhibitor as well as anti-freeze. Therefore, the engine coolant should be used at all times even though the atmospheric temperature in your area does not go down to freezing point.

Suzuki recommends the use of SUZUKI COOLANT anti-freeze/engine coolant. If this is not available, use an equivalent which is compatible with an aluminum radiator.

LIQUID AMOUNT OF WATER/ENGINE COOLANT

Solution capacity (total): Approx. 950 ml (1.0/0.8 US/Imp qt)

For engine coolant mixture information, refer to page 2-18.

CAUTION

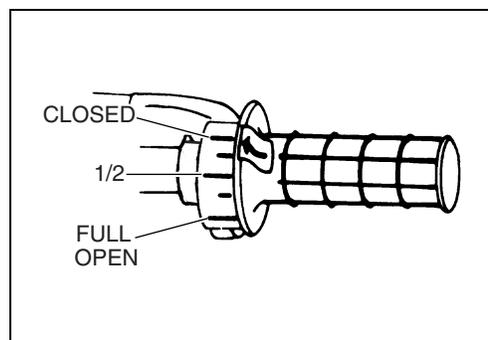
Mixing of anti-freeze/engine coolant should be limited to 60%. Mixing beyond it would reduce its efficiency. If the anti-freeze/engine coolant mixing ratio is below 50%, rust inhabiting performance is greatly reduced. Be sure to mix it above 50% even though the atmospheric temperature does not go down to the freezing point.

BREAK-IN (RUNNING-IN) WHEN THE MOTORCYCLE IS NEW

- 1) Warm up the engine before starting off.
- 2) Ride for 60 minutes using less than 1/2 throttle opening.
- 3) Ride for 60 minutes using less than 3/4 throttle opening.

NOTE:

- * The break-in (running-in) period is the period of greatest wear.
- * The bolts and nuts of the new machine can loosen quickly. Be sure to retighten the bolts and nuts during the break-in (running-in) period.



WHEN ENGINE PARTS ARE REPLACED

Follow the same procedure when any of the following parts are replaced:

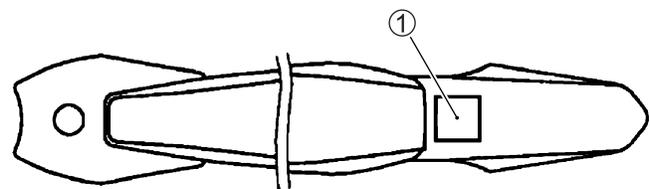
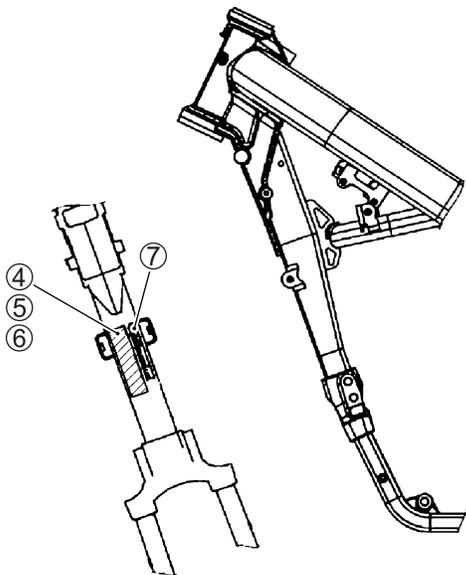
- Piston
- Piston ring
- Cylinder
- Crankshaft
- Crankshaft bearing

INFORMATION LABELS

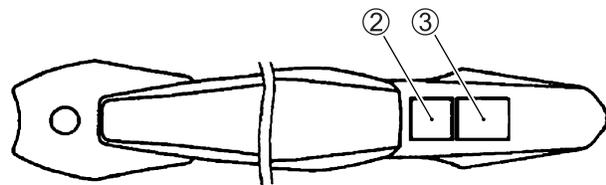
No.	LABEL or PLATE NAME	APPLIED SPECIFICATION		
		E-03	E-19	E-28
①	General warning label (E)	A		
②	General warning label (E)		A	A
③	General warning label (F)		A	A
④	EC approval mark label		A	
⑤	ICES Canada label (E/F)			A
⑥	EPA plate (E)	A		
⑦	Manufacture label (E)	A	A	A

(E): English (F): French

A: Attached



For E-03



For E-19, 28

SPECIFICATIONS

DIMENSIONS AND CURB MASS

Overall length	2 170 mm (85.4 in)
Overall width	830 mm (32.7 in)
Overall height	1 270 mm (50.0 in)
Wheelbase	1 475 mm (58.1 in)
Ground clearance	345 mm (13.6 in)
Seat height.....	955 mm (37.6 in)
Curb mass.....	105 kg (231 lbs)

ENGINE

Type	Four-stroke, liquid-cooled, DOHC
Number of cylinders	1
Bore	77.0 mm (3.03 in)
Stroke.....	53.6 mm (2.11 in)
Displacement	249 cm ³ (15.2 cu. in)
Compression ratio.....	13.5 : 1
Fuel system.....	Fuel injection
Air cleaner.....	Polyurethane foam element
Starter system.....	Primary kick
Lubrication system.....	Semi-dry sump
Idle speed	2 100 ± 50 r/min

TRANSMISSION

Clutch.....	Wet multi disc
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction ratio.....	3.316 (63/19)
Gear ratios, Low	2.153 (28/13)
2nd.....	1.764 (30/17)
3rd	1.470 (25/17)
4th.....	1.238 (26/21)
Top.....	1.090 (24/22)
Final reduction ratio	3.769 (49/13)
Drive chain	DID 520DMA2 114 links

CHASSIS

Front suspension	Upside-down telescopic fork
Rear suspension	Swingarm type
Front suspension stroke	310 mm (12.2 in)
Rear wheel travel	310 mm (12.2 in)
Caster.....	30° 20'
Trail.....	140 mm (5.5 in)
Steering angle	45° (right & left)
Front brake	Disc brake
Rear brake.....	Disc brake
Front tire size.....	80/100-21 51M, tube type
Rear tire size	100/90-19 57M, tube type

ELECTRICAL

Ignition type.....	Electronic Ignition (CDI)
Ignition timing	8° B.T.D.C. at 2 100 r/min
Spark plug	NGK CR8EIA-10

CAPACITIES

Fuel tank, including reserve	6.5 L (1.7/1.4 US/Imp gal)
Gear ratios, oil change	850 ml (0.9/0.7 US/Imp qt)
with filter change.....	900 ml (1.0/0.8 US/Imp qt)
overhaul.....	1 000 ml (1.1/0.9 US/Imp qt)
Coolant.....	950 ml (1.0/0.8 US/Imp qt)

These specifications are subject to change without notice.

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PERIODIC MAINTENANCE

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PERIODIC MAINTENANCE INSPECTION BEFORE PRACTICE

WHAT TO CHECK	CHECK FOR
Spark plug	<ul style="list-style-type: none"> • Heat range, fouled electrode, tightness • Loose high-tension cord
Air cleaner element	<ul style="list-style-type: none"> • Dust • Lubrication
Engine oil	Oil level
Coolant	Coolant level
Cooling system	<ul style="list-style-type: none"> • Radiator hose damage • Engine coolant leak
Clutch	<ul style="list-style-type: none"> • Play • Smooth operation
Throttle	<ul style="list-style-type: none"> • Play • Smooth operation
Crankcase breather hose	Breather hose clogging and bend
Engine idle speed	Revolution speed
Brake fluid	Fluid level
Brakes	<ul style="list-style-type: none"> • Brake lever position • Brake pedal height • Operation
Drive chain	Slack, lubrication
Drive chain guide/buffer	Wear, damage
Suspension	<ul style="list-style-type: none"> • Smooth operation • Front fork air pressure
Wheels	<ul style="list-style-type: none"> • Spoke tension • Rim lock tightness or damage
Tires	Tire pressure
Steering	Smoothness, play
Exhaust pipe and muffler	<ul style="list-style-type: none"> • Exhaust gas leakage • Tightening torque
Bolts and nuts	Tightening torque

INSPECTION BEFORE RACE**(All items of inspection before practice on previous page plus)**

WHAT TO CHECK	CHECK FOR
Clutch	Clutch disc plates wear and distortion
Brake pads	Wear
Sprockets	Wear
Fuel tank	Leakage
Fuel hose	<ul style="list-style-type: none">• Damage• Hoses are connected
Exhaust pipe and muffler	Damage
Cylinder head	Combustion chamber carbon deposit
Piston and Cylinder	<ul style="list-style-type: none">• Combustion chamber carbon deposit• Piston head carbon deposit• Piston and cylinder wear
Air cleaner	<ul style="list-style-type: none">• Damage• Loose outlet tube

PERIODIC MAINTENANCE CHART

It is very important to inspect and maintain the machine regularly. Follow the guideline in the chart. The life of parts varies depending on the riding conditions. Perform more often than shown in the chart if you use the motorcycle under severe conditions.

Service Item	Interval		Every race	Every 3 races	Every 6 races	Remarks
	hours	hours	Every 2 hours	Every 6 hours	Every 12 hours	
Spark plug			I	—	—	
Air cleaner			C	—	—	Replace air cleaner element as necessary.
Engine oil			—	R	—	Replace after 1st initial break-in.
Engine oil filter			—	—	R	
Oil strainers			—	I	—	Inspect after 1st initial break-in.
Cooling-system			I	—	—	Replace radiator hose and engine coolant every year. Flushing for overhaul or storage.
Clutch			I	—	—	Replace clutch plates as necessary.
Throttle cable and clutch cable			I & L	—	—	
Hot starter			I	—	—	
Throttle body			I	—	—	
Crankcase breather hose			I	—	—	
Fuel hose			I	—	—	Replace every 4 years.
Valve clearance			—	—	I	
Piston			—	—	R	
Piston ring			—	—	R	
Cylinder head, cylinder			—	—	I	
Muffler			I	—	—	
Silencer			I	—	R	
Drive chain			I & L	R	—	Adjust slack every 30 minutes.
Crankcase driveshaft oil seal			I	—	—	Inspect the oil seal frequently for abnormality (dust, stone or foreign materials). If necessary, replace it with a new one.
Engine sprocket			I	—	—	
Rear sprocket			I	—	—	Check and retighten sprocket bolts at initial and subsequent 10 minutes of riding and each race thereafter.
Drive chain buffer and guide			—	R	—	
Brake			I	—	—	Replace brake hose and fluid every year.

2-6 PERIODIC MAINTENANCE

Service Item	Interval	Every race	Every 3 races	Every 6 races	Remarks
	hours	Every 2 hours	Every 6 hours	Every 12 hours	
Front fork oil		—	R	—	Change after 1st initial break-in.
Front fork		I	—	—	Check front fork inner tube frequently for abnormality. Check the air pressure.
Rear suspension		I	—	—	Check rear suspension system frequently and apply the grease to the pivoting portion as necessary.
Tire		I	—	—	
Spoke nipple		I	—	—	Inspect every 20 min. up to initial 2 hours then check before each ride.
Steering		I	—	—	
Kick starter lever		I & L	—	—	
Bolts and nuts		T	—	—	Retighten every 1 hour.

NOTE: R = Replace, C = Clean, T = Tighten, I = Inspect and clean, adjust lubricate or replace if necessary, L = Lubricate

SPARK PLUG

- Remove the seat. (☞ 5-2)
- Remove the radiator covers and fuel tank. (☞ 13-2, -3)
- Hold the cylinder head cover bolt immovable with the wrench.
- Remove the ignition coil retainer ② by removing its bolts ①.
- Disconnect the lead wire coupler ④ from the ignition coil/plug cap ③.

CAUTION

Disconnect the lead wire coupler before removing the ignition coil/plug cap to avoid lead wire coupler damage.

- Remove the ignition coil/plug cap ③.

CAUTION

*** Do not pry up the ignition coil/plug cap with a screw driver or a bar to avoid its damage.**
*** Be careful not to drop the ignition coil/plug cap to prevent short/open circuit.**

- Remove the spark plug ⑤ with the spark plug wrench.

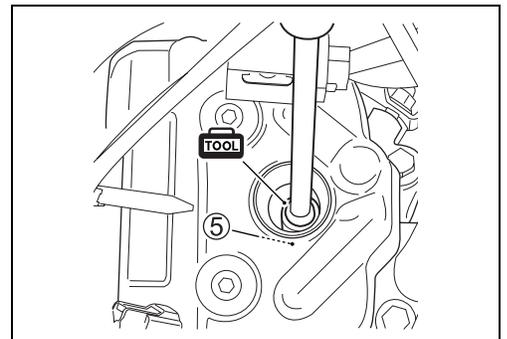
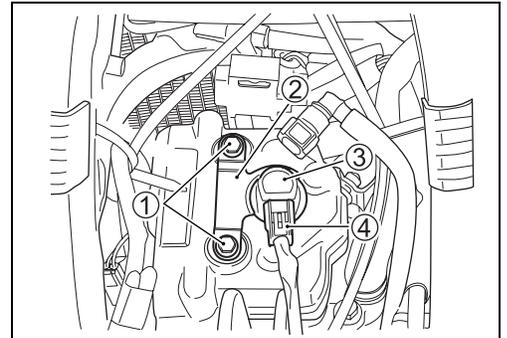
NOTE:

Remove the dirt around the spark plug before removing the spark plug to prevent dirt from entering the combustion chamber.

09930-10121: Spark plug wrench set

- Inspect the spark plug condition, electrode color, carbon deposits, spark plug gap and insulator damage.
- If it is extremely worn or burnt, replace the spark plug.
 Also, replace the spark plug if it has a broken insulator, damaged thread, etc.
- Inspect the porcelain tip color.

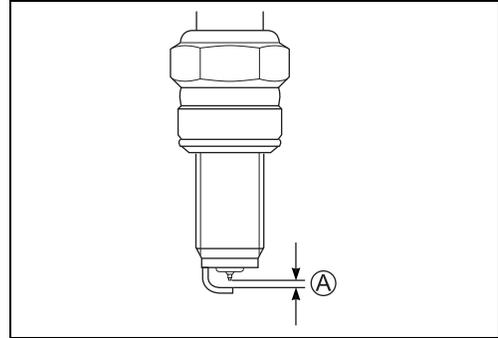
Porcelain tip color	Cause
White (overheated)	<ul style="list-style-type: none"> • Hot type spark plug • Advanced ignition timing • Lean air/fuel mixture • Deteriorated fuel
Black (fouled)	<ul style="list-style-type: none"> • Cold type spark plug • Retarded ignition timing • Rich air/fuel mixture



- Measure the spark plug gap **A** with a wire gauge.
- If it is not within the specification, replace the spark plug.

CAUTION

- * To prevent the damage of iridium center electrode, use a wire gauge to check the gap.
- * Never adjust the spark plug gap.
- * Changing the spark plug heat range improperly can damage the engine.



DATA Spark plug gap: 0.9 – 1.0 mm (0.035 – 0.039 in)

DATA Standard Spark plug

NGK	CR8EIA-10
-----	-----------

- Check that the ignition coil/plug cap and the spark plug installation recess on the cylinder head are clean and free of dirt or mud. If such fouling is found, wipe clean thoroughly.
- Tighten the spark plug with specified tightening torque after tightening the spark plug temporarily with fingers.

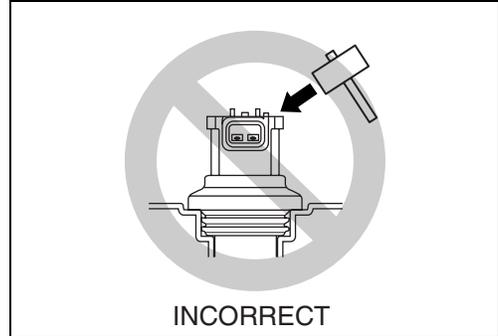
TOOL 09930-10121: Spark plug wrench set

WRENCH Spark plug: 11 N·m (1.1 kgf·m, 8.0 lbf·ft)

- Install the ignition coil plug cap securely.

CAUTION

Do not hit the ignition coil/plug cap with a plastic hammer when installing it.



- Connect the lead wire coupler **4**.

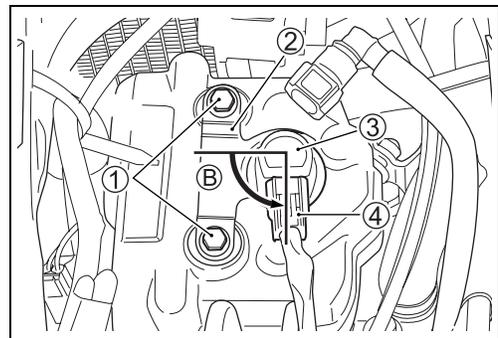
NOTE:

The coupler **4** of ignition coil/plug cap **3** faces backward.

- Install the ignition coil retainer **2**.
- Tighten the ignition coil retainer bolts **1** to the specified torque.

WRENCH Ignition coil retainer bolt: 11 N·m (1.1 kgf·m, 8.0 lbf·ft)

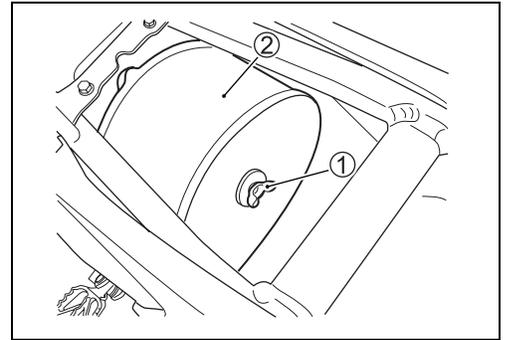
B 90° – 110°



AIR CLEANER

AIR CLEANER ELEMENT REMOVAL

- Remove the seat. (☞ 5-2)
- Remove the wing bolt ①.
- Remove the element ② from the element holder.



WASHING

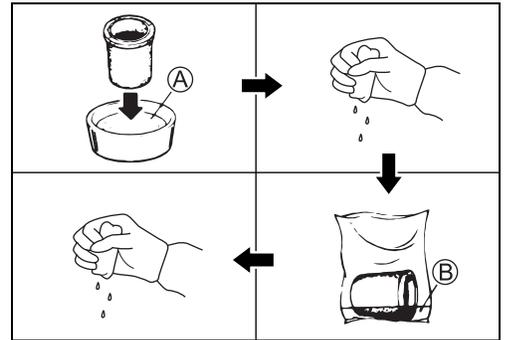
- Fill a washing pan large enough to hold the element with a non-flammable cleaning solvent ①. Immerse the element in the solvent and wash it.

①: MOTUL AIR FILTER CLEAN or equivalent cleaning solvent

- Squeeze the element by grasping it to remove excess solvent. Do not twist or wring the element or it will develop cracks.
- Dry the element in a plastic bag, pour in some foam filter oil ② and work the oil into the element.

②: MOTUL AIR FILTER OIL or equivalent filter oil

- Squeeze the element to remove excess oil.

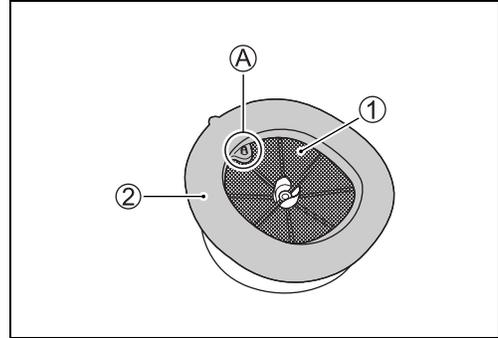


INSTALLATION

- Apply filter oil to the element base where it contacts the air cleaner body.
- Fit the element ② onto the element holder ①.

NOTE:

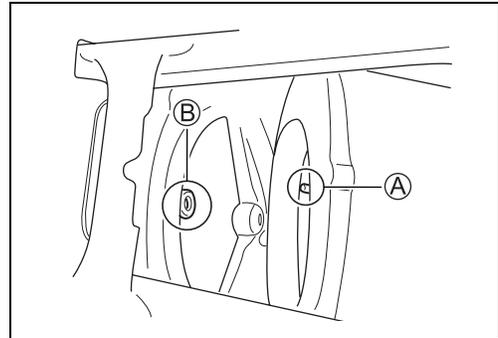
Fit the projection ① of the element holder to the hole of the element ②.



Install them in the air cleaner body by engaging the projection ① of the element holder with the hole ② of the air cleaner body.

CAUTION

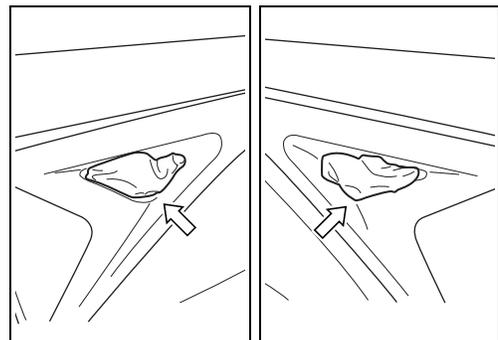
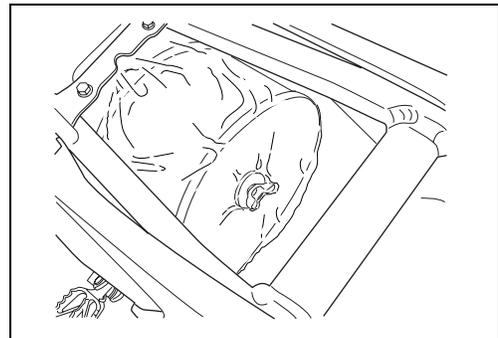
- * **Improper element installation allows dust and dirt to enter the combustion chamber. It can result in piston and cylinder wear.**
- * **Be sure to check the element seals properly after installing the element.**



NOTE:

Follow the instructions below to prevent water from entering the engine through the air cleaner element when cleaning the motorcycle.

- Cover the element with a plastic bag.
- Install the seat.
- Cover the inlet holes on the frame covers in order to prevent water from entering the air cleaner box.
- Do not spray high pressure water to the air cleaner box.



ENGINE OIL AND OIL FILTER

⚠ WARNING

- * Improper engine oil treatment is hazardous.
- * Read engine oil container instruction before replacing the engine oil.

CAUTION

- * Improper engine oil selection can cause clutch slip.
- * Do not use engine oil which has friction decrease additives.
- * In this engine, the engine oil is subjected to a high load. If the motorcycle is operated with the engine oil insufficient, deteriorated or dirtied, it may shorten the engine life considerably. Therefore, exercise the maintenance of engine oil properly according to the service manual instructions.

NOTE:

- * DO not mix engine oil. Use only good quality engine oil.
- * Be careful that dirt does not enter into crankcase through engine oil filter.
- * Wipe off spilled engine oil.
- * Improper engine oil level can affect engine performance.
- * Recycle or properly dispose of used oil.

INSPECTION BEFORE ENGINE OIL LEVEL CHECK

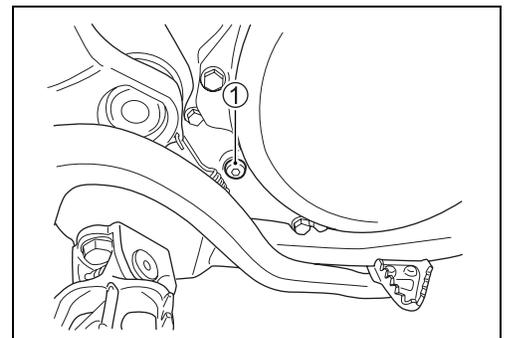
Before starting the engine, check that there is sufficient oil for operating the engine.

CAUTION

If the engine is started with insufficient or no oil, the engine components will possibly be damaged.

- Remove the engine oil check bolt ①.
- Tilt the motorcycle to the right and check that engine oil comes out from oil level check hole.
- Tighten the oil check bolt ①.

 **Engine oil check bolt: 11 N·m (1.1 kgf·m, 8.0 lbf·ft)**



ENGINE OIL LEVEL INSPECTION

- During inspection, hold the motorcycle in an upright position on a level surface.

NOTE:

The oil level measurement may become inaccurate unless the motorcycle is held upright as the motorcycle inclination affects the oil level.

- Warm up the engine. Start and run the engine at idle for three minutes.

NOTE:

Do not run the engine at a speed higher than idling, otherwise the oil level to be inspected may be affected.

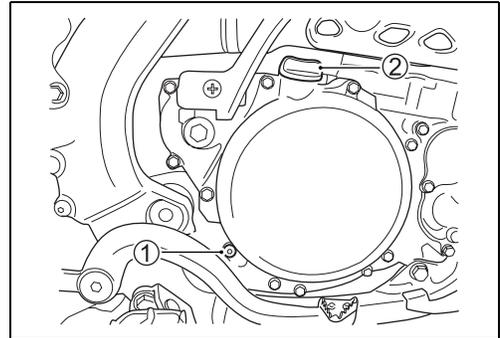
- Stop and leave the engine standstill for two minutes. Thereafter if oil flows out when the engine oil check bolt ① is removed, the oil level is appropriate.
- If oil is excessive, let oil flows out of the oil level hole.
- If oil still does not come out, tighten the engine oil check bolt ①, remove the oil filler cap ② and pour an adequate amount of recommended oil.

⚠ WARNING

When removing the oil filler cap to avoid the risk of being burned, do not touch the exhaust system when the system is hot.

- Repeat the above-mentioned procedure.
- Tighten the engine oil check bolt.

🔧 Engine oil check bolt: 11 N·m (1.1 kgf-m, 8.0 lbf-ft)



ENGINE OIL CHANGE

- During inspection, hold the motorcycle in an upright position on a level surface.
- Warm up the engine.
- Remove the filler cap, TDC plug ①, drain plug ② and drain No.2 plug ③. Drain engine oil.
- Replace the O-ring with a new one and tighten the TDC plug ①.

TDC plug: 14 N·m (1.4 kgf·m, 10.0 lbf·ft)

- Depress the kick starter lever ten times and more.

NOTE:

To avoid turn on the engine, push along the engine stop switch while depressing the kick starter lever.

- Swing the motorcycle to the right and left two times and more. Drain engine oil thoroughly.
- Replace the gasket washers with new ones and tighten the drain plugs.

Engine oil drain plug: 21 N·m (2.1 kgf·m, 15.0 lbf·ft)

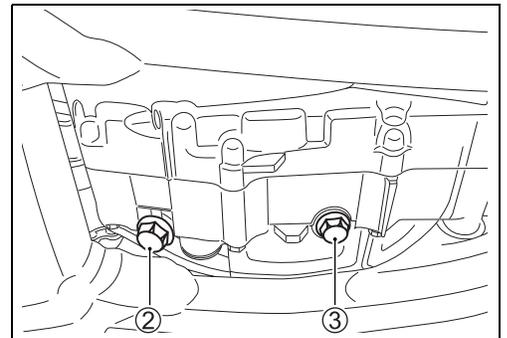
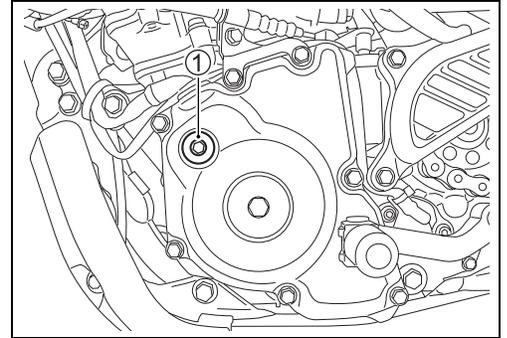
Engine oil drain No.2 plug: 12 N·m (1.2 kgf·m, 8.5 lbf·ft)

- Pour specified amount of engine oil.

 **SAE 10W-40, API SG/SH/SJ/SL with JASO MA/MA1/MA2 For E-03**
MOTUL 300V 10W-40 (Recommendation oil) or
SAE 10W-40, API SG/SH/SJ/SL with JASO MA/MA1/MA2 The others

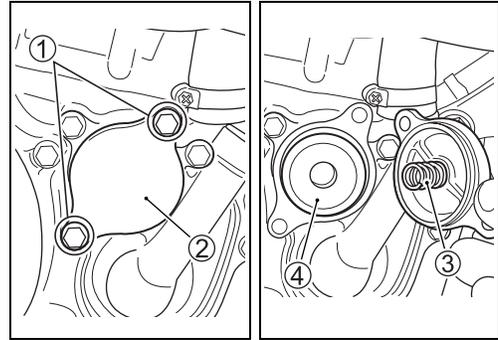
 **Oil change 850 ml (0.9/0.7 US/Imp qt)**
Filter change 900 ml (1.0/0.8 US/Imp qt)
Overhaul 1 000 ml (1.1/0.9 US/Imp qt)

- Tighten the filler cap.
- Run the engine for a few minutes and stop it. Wait a few minutes.
- Inspect the oil level. ( 2-12)



ENGINE OIL FILTER CHANGE

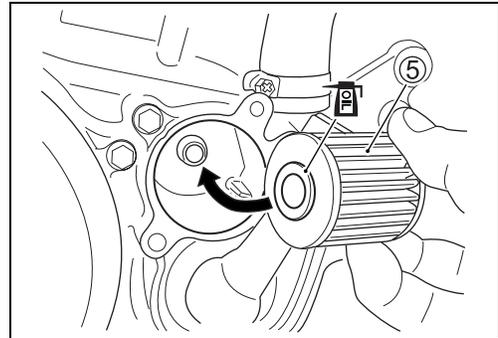
- Drain the engine oil as described in the engine oil replacement procedure.
- Remove the oil filter cap ② by removing its bolts ①.
- Remove the spring ③ with oil filter ④.



- Apply engine oil lightly to the gasket of new oil filter ⑤ before installation.
- Install the new oil filter ⑤.

CAUTION

Make sure that the oil filter is installed properly. If the filter is installed improperly, serious engine damage may result.



- Apply engine oil lightly to the new O-ring ⑥.

CAUTION

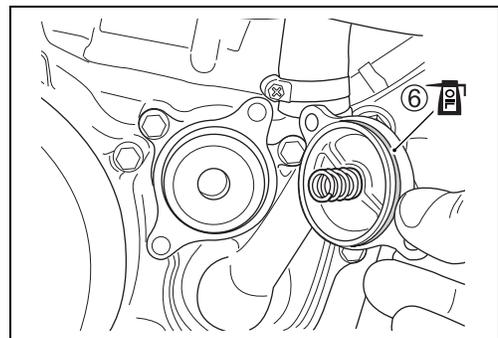
Replace the O-ring with a new one.

- Install the oil filter cap and tighten the bolts.

 **Oil filter cap bolt: 11 N·m (1.1 kgf-m, 8.0 lbf-ft)**

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

DATA Oil change..... 850 ml (0.9/0.7 US/Imp qt)
 Filter change..... 900 ml (1.0/0.8 US/Imp qt)
 Overhaul..... 1 000 ml (1.1/0.9 US/Imp qt)



OIL STRAINERS

OIL STRAINER (No.1) REMOVAL

- Drain engine oil. (☞ 2-13)
- Remove the engine oil strainer cap ①.

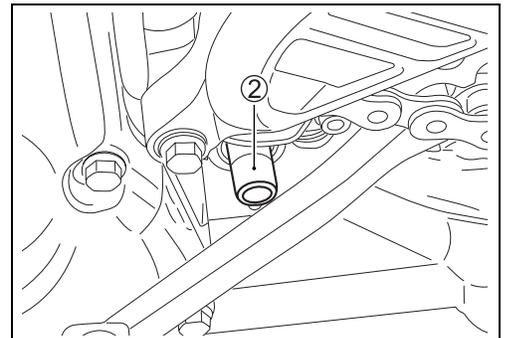
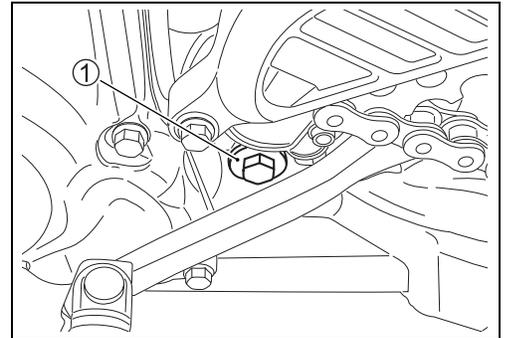
CAUTION

Do not lie the motorcycle to prevent dirty engine oil into the oil circuit when removing the oil strainer (No.1).

- Pull out the oil strainer ②.

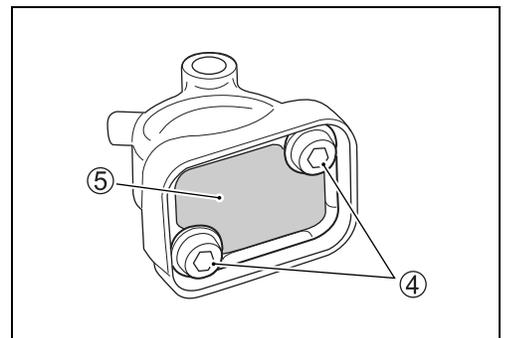
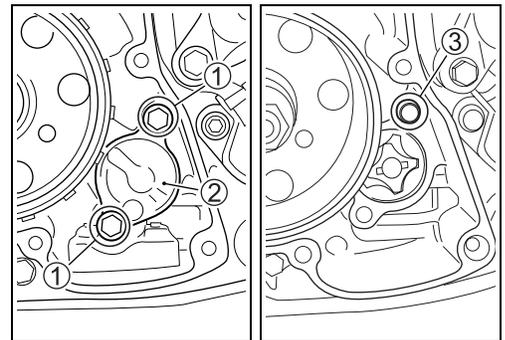
NOTE:

We recommend to inspect the oil strainer (No.1) every engine oil change.



OIL STRAINER (No.2) REMOVAL

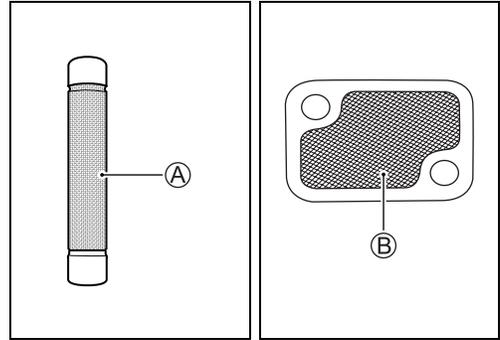
- Drain engine oil. (☞ 2-13)
- Remove the gearshift lever. (☞ 9-3)
- Remove the magneto cover. (☞ 15-17)
- Remove the oil pump No.2 cover ② by removing its bolts ①.
- Remove the dowel pin ③.
- Remove the oil strainer No.2 ⑤ by removing its bolts ④.



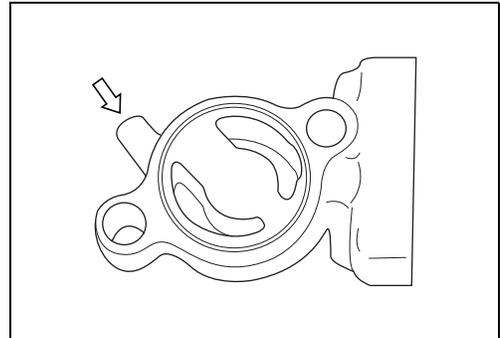
INSPECTION

- Check each oil strainer for any damage or clogging.
- If the oil strainer is clogging, clean the oil strainer with a compressed air.

- Ⓐ Oil strainer No.1
- Ⓑ Oil strainer No.2



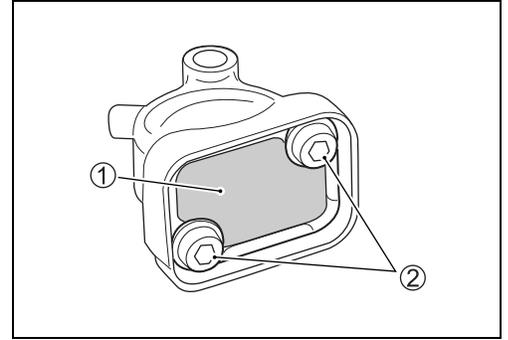
- Clean the oil nozzle by applying compressed air.



OIL STRAINER (No.2) INSTALLATION

- Install the oil strainer No.2 ① and tighten the oil strainer No.2 bolts ② to the specified torque.

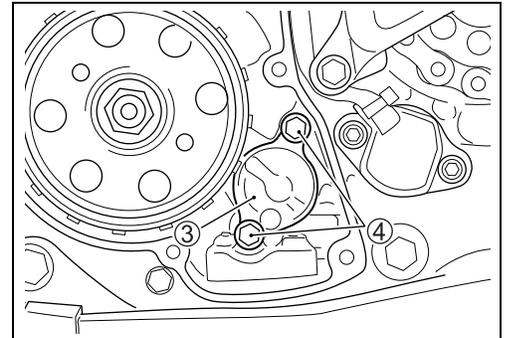
 **Oil strainer No.2 bolt: 5.5 N·m (0.55 kgf-m, 4.0 lbf-ft)**



- Install the oil pump No.2 cover ③ and tighten the oil pump No.2 bolts ④ to the specified torque.

 **Oil pump No.2 bolt: 11 N·m (1.1 kgf-m, 8.0 lbf-ft)**

- Install the magneto cover. (➡ 15-19)
- Install the gearshift lever. (➡ 9-7)



INSPECTION AFTER INSTALLATION

- Engine oil level and oil leakage (➡ 2-12)

OIL STRAINER (No.1) INSTALLATION

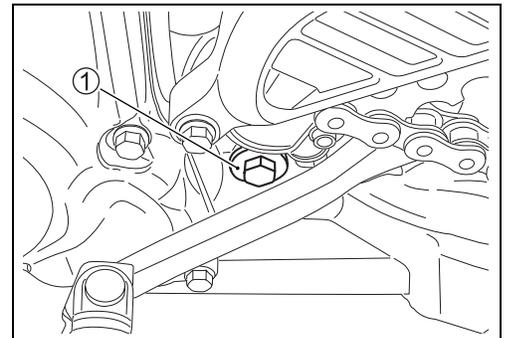
- Install the oil strainer and then tighten the engine oil strainer cap ① to the specified torque.

CAUTION

Replace the gasket washer with a new one.

 **Engine oil strainer cap: 21 N·m (2.1 kgf-m, 15.0 lbf-ft)**

- Add new engine oil and check the oil level. (➡ 2-12)



ENGINE COOLANT

ENGINE COOLANT LEVEL CHECK

⚠ WARNING

- * You can be injured by scalding fluid or steam if you open the radiator cap when the engine is hot.
- * Do not open the radiator cap when the engine is hot. Wait until engine cools.

- Remove the radiator cap ①.
- Check that the engine coolant level is at the bottom of the inlet hole. If not, replenish the radiator with specified engine coolant.
- Tighten the radiator cap securely.

CAUTION

- * Improperly tightening the radiator cap will prevent the cooling system from reaching the specified operating pressure and will cause coolant overflow.
- * Tighten the radiator cap until it locks firmly.

NOTE:

- * This motorcycle does not have an overflow tank at the end of breather hose. Therefore, engine coolant level may decrease while riding. Check the engine coolant level every time before riding.
- * When replenishing engine coolant, be sure to use engine coolant mixed with distilled water at the ratio of 50:50. Adding only water will dilute engine coolant and it may decrease cooling performance.
- * If the motorcycle is to be exposed to temperatures below -31°C (-24°F), the percentage of antifreeze should be increased to 55% or 60%, according to figure 1.

Antifreeze density	Freezing point
50%	-31°C (-24°F)
55%	-40°C (-40°F)
60%	-55°C (-67°F)

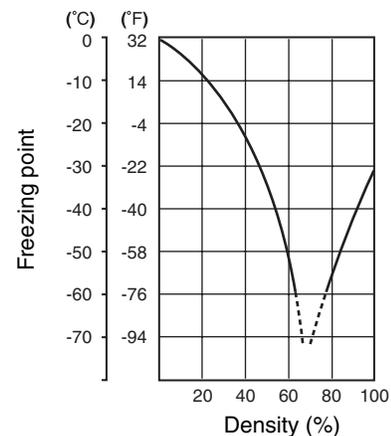
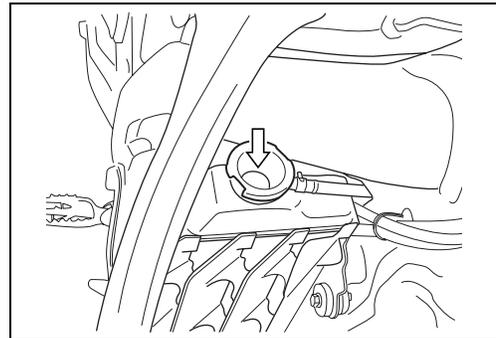


Fig. 1 Engine coolant density-freezing point

ENGINE COOLANT REPLENISHMENT

- Use an antifreeze/coolant compatible with aluminum radiator, mixed with distilled water only, at the ratio of 50:50.

NOTE:

The radiator, cylinder and cylinder head are made of aluminum alloy. Using non-recommended engine coolant may corrode aluminum alloy and may clog the coolant passageways.

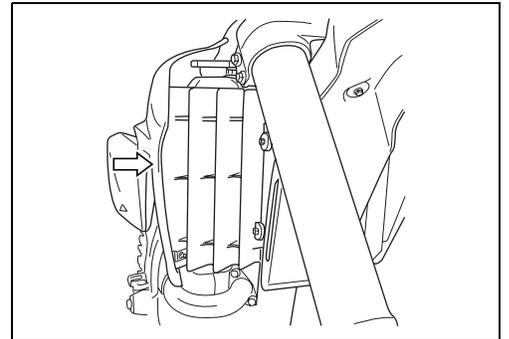
⚠ WARNING

- * Engine coolant is harmful if swallowed or if it comes in contact with your skin or eyes.
- * Keep engine coolant away from children and pets. Call your doctor immediately if engine coolant is swallowed and induce vomiting. Flush eyes or skin with water if engine coolant gets in eyes or comes in contact with skin.

COOLING SYSTEM INSPECTION

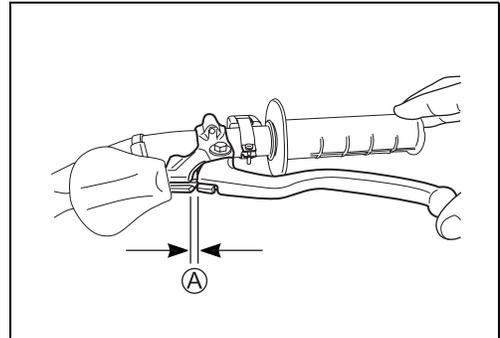
Inspect the following items before practice and races.

- Engine coolant leakage
- Radiator hose cracks and deterioration
- Radiator mounting condition
- Radiator over flow hose condition
- Radiator fin condition



CLUTCH CABLE

Adjust the clutch cable play as follows:

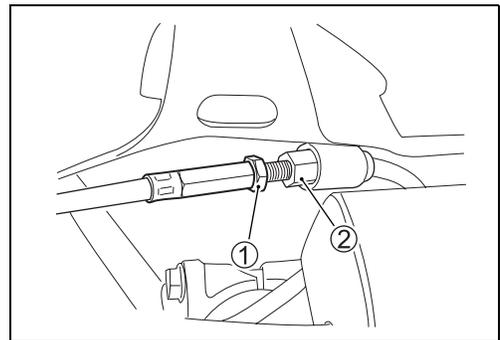


MAJOR ADJUSTMENT

- Loosen the lock-nut ①.
- Turn adjuster ② so the clutch lever clearance ④ measured at the lever holder obtains 2 – 3 mm (0.08 – 0.12 in) when squeezing the lever until pressure is felt.
- Tighten the lock-nut ① to the specified torque.

DATA Clutch lever clearance ④: 2 – 3 mm (0.08 – 0.12 in)

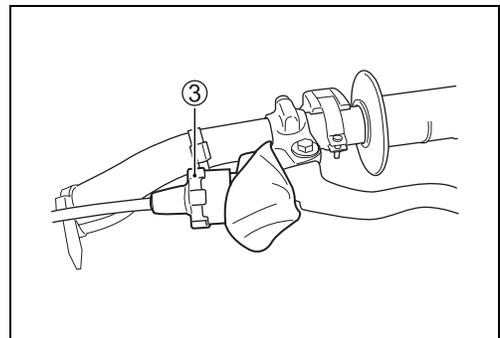
🔧 Cable adjuster lock-nut: 2.2 N·m (0.22 kgf-m, 1.60 lbf-ft)



MINOR ADJUSTMENT

- Turn adjuster ③ so the clutch lever clearance ④ measured at the lever holder obtains 2 – 3 mm (0.08 – 0.12 in) when squeezing the lever until pressure is felt.

DATA Clutch lever clearance ④: 2 – 3 mm (0.08 – 0.12 in)

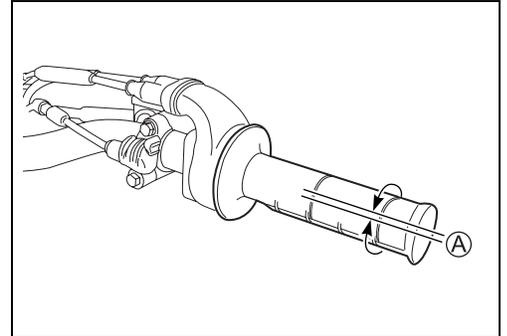


THROTTLE CABLE

⚠ WARNING

- * Inadequate throttle cable play can cause engine speed to rise suddenly when you turn the handlebars. This can lead to loss of rider control.
- * Adjust the throttle cable play so that engine speed does not rise due to handlebars movement.

Adjust the throttle cable play Ⓐ as follows:



THROTTLE CABLE ADJUSTMENT

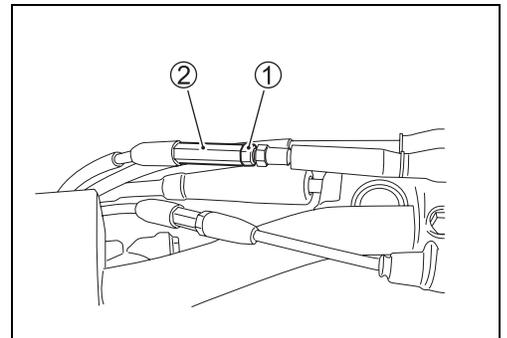
- Loosen the lock-nut ①.
- Turn adjuster ② so the throttle grip has 2 – 4 mm (0.08 – 0.16 in) play in circumference.
- Tighten the lock-nut ①.

DATA Throttle cable play Ⓐ: 2 – 4 mm (0.08 – 0.16 in)

🔧 Cable adjuster lock-nut: 2.2 N·m (0.22 kgf·m, 1.60 lbf·ft)

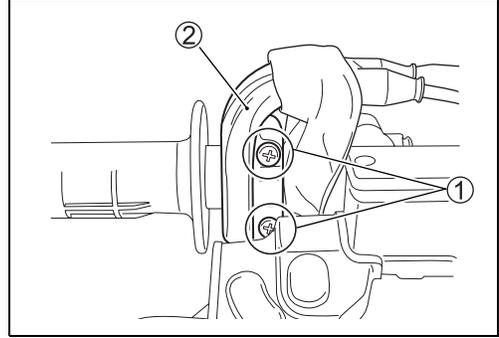
⚠ WARNING

After the adjustment is completed, check that handlebars movement does not raise the engine idle speed and that the throttle grip returns smoothly and automatically.



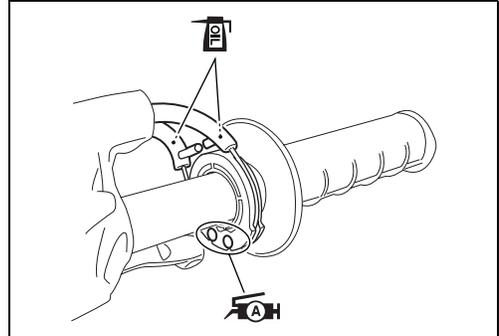
THROTTLE CABLE OIL SUPPLY

- Remove the throttle case ② by removing its screws ①.



- Apply oil to the throttle cable.
- Apply grease to the throttle cable spool.

 99000-25010: SUZUKI SUPER GREASE "A"
or equivalent



HOT STARTER

Adjust the hot starter cable play as follows:

NOTE:

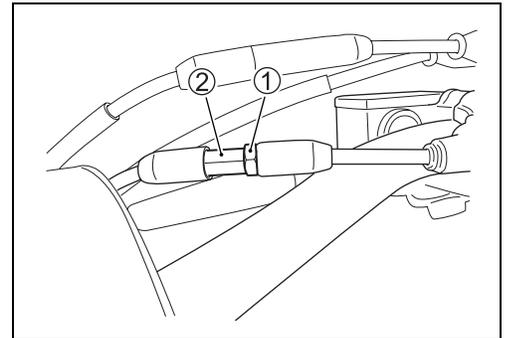
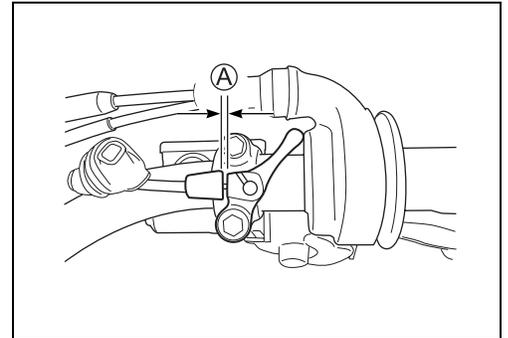
Be careful not to damage the lever cover when installing.

( 20-28)

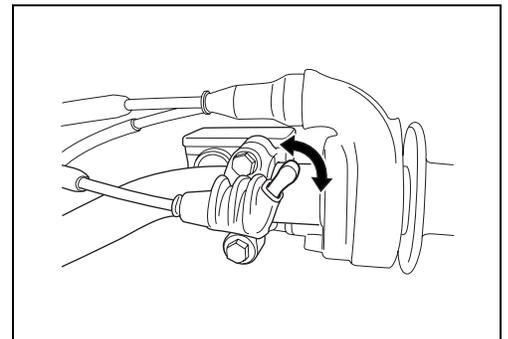
- Loosen the lock-nut ①.
- Turn adjuster ② so the hot starter lever clearance ③ measured at the lever holder obtains 2 – 3 mm (0.08 – 0.12 in) when squeezing the lever until pressure is felt.
- Tighten the lock-nut ①.

DATA Hot starter lever clearance ③: 2 – 3 mm (0.08 – 0.12 in)

🔧 Cable adjuster lock-nut: 2.2 N·m (0.22 kgf-m, 1.60 lbf-ft)

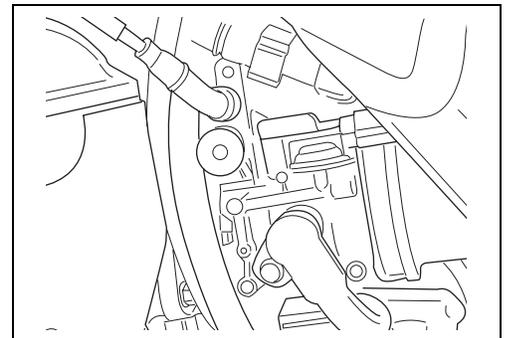


- Check that the hot starter lever moves smoothly from full open to full close.
- If it does not move smoothly, lubricate the hot starter cable.



THROTTLE BODY

- Inspect the throttle body for dirt or mud. If any dirt or mud is found, clean the throttle body.



ENGINE IDLE SPEED

- Adjust the throttle cable play. (☞ 2-21)
- Warm up the engine.

NOTE:

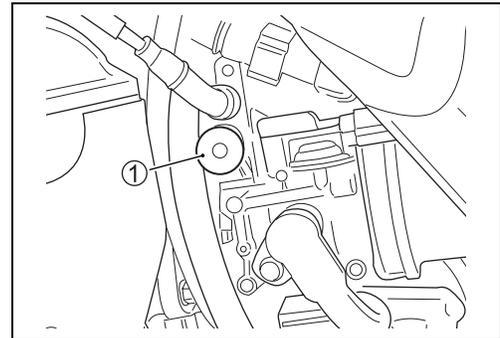
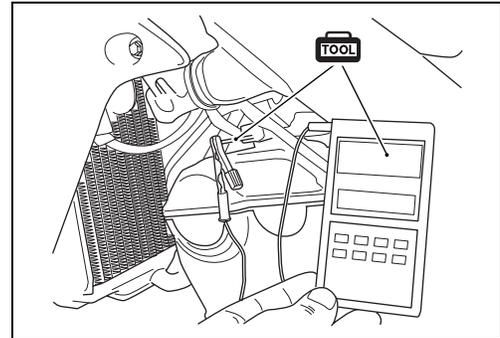
Make this adjustment when the engine is hot.

- Insert the needle-pointed probe to the lead wire coupler (W/BI).
- Connect the engine tachometer to the needle-pointed probe.

TOOL 09900-25009: Needle-pointed probe set
09900-26006: Engine tachometer

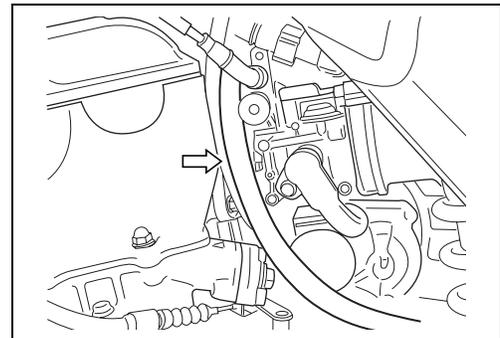
- Start the engine, turn the starter knob/idle screw ① and set the engine idle speed as follows.

DATA Engine idle speed: $2\ 100 \pm 50$ r/min



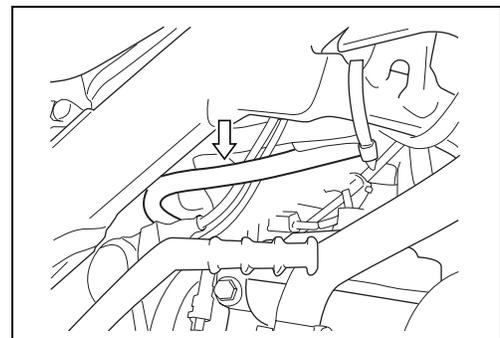
CRANKCASE BREATHER HOSE

- Inspect the crankcase breather hose for damage, clogging and bend. If any defects are found, the breather hose must be replaced.



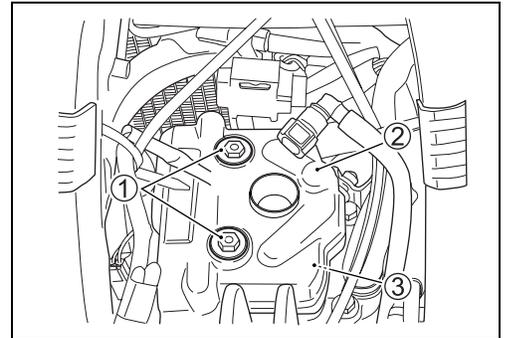
FUEL HOSE

- Inspect the fuel hose for damage and fuel leakage. If any defects are found, the fuel hose must be replaced.
- Replace the fuel hose every four years.



VALVE CLEARANCE

- Remove the seat. (☞ 5-2)
- Remove the radiator covers and fuel tank. (☞ 13-2, -3)
- Remove the spark plug. (☞ 2-7)
- Remove the cylinder head cover ② and gasket ③ by removing their bolts ①.



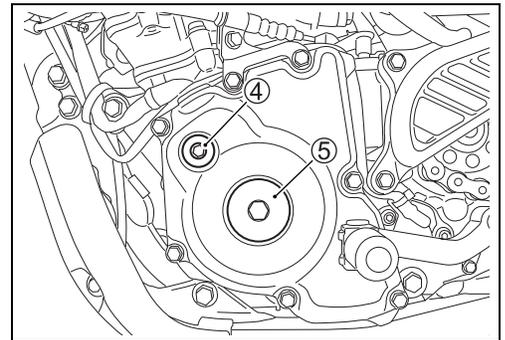
The valve clearance specification is different for both intake and exhaust valves.

Valve clearance adjustment must be checked and adjusted: 1) at the time of periodic maintenance, 2) when the valve mechanism is serviced, and 3) when the camshafts are removed for servicing.

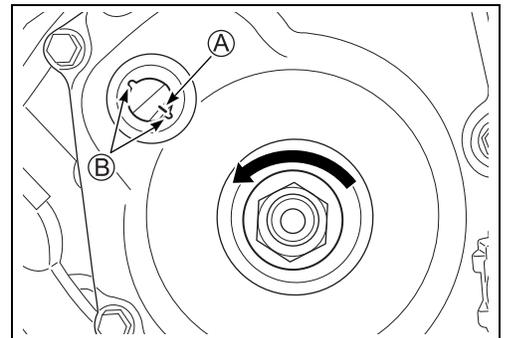
NOTE:

- * The piston must be at top dead center (TDC) on the compression stroke in order to check or adjust the valve clearance.
- * The valve clearance should only be checked when the engine is cold.

- Drain engine oil. (☞ 2-13)
- Remove the TDC plug ④ and crankshaft hole plug ⑤.



- Place a wrench over the crankshaft and turn it counter-clockwise to align the TDC mark ① with the center of the groove ② of the timing inspection hole.

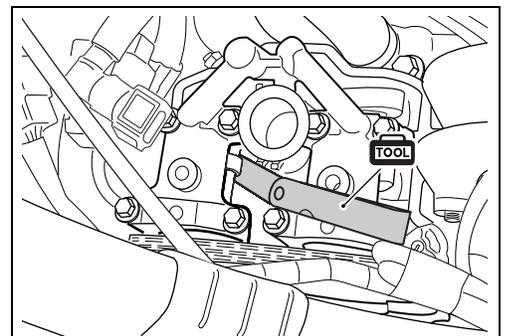


- Insert the thickness gauge between the tappet and cam. If the clearance is out of specification, adjust it to specification as follows.

TOOL 09900-20803: Thickness gauge

DATA Valve clearance (when cold):

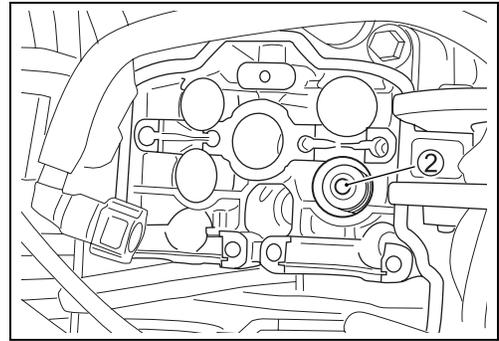
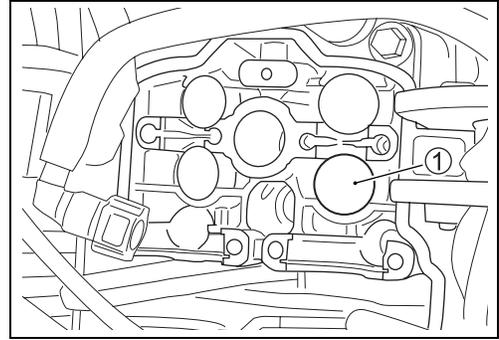
Standard: IN. : 0.09 – 0.16 mm (0.004 – 0.006 in)
EX. : 0.17 – 0.24 mm (0.007 – 0.009 in)



VALVE CLEARANCE ADJUSTMENT

The clearance is adjusted by replacing the existing tappet shim with a thicker or thinner one.

- Remove the intake or exhaust camshafts. (☞ 6-4 to -6)
- Remove the tappet ① and shim ② by fingers or magnetic hand.
- Check the figures printed on the shim. These figures indicate the thickness of the shim, as illustrated.
- Select a replacement shim that will provide a clearance within the specified range. For the purpose of this adjustment, tappet shim are available ranging from 1.200 to 2.200 mm in steps of 0.025 mm. Fit the selected shim to the valve stem end, with numbers toward tappet. Be sure to check shim size with micrometer to ensure its size. Refer to the tappet shim selection table (☞ 2-27, -28) for details.



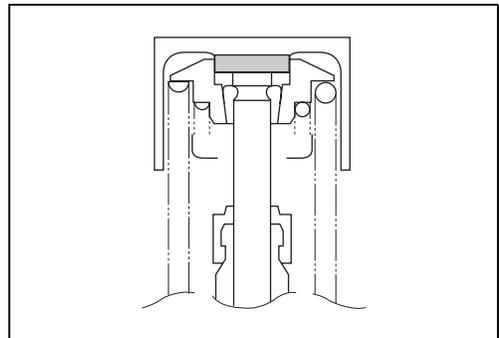
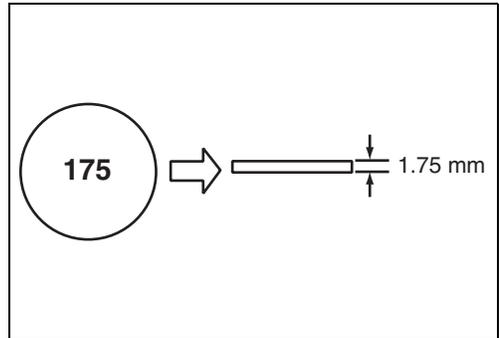
NOTE:

- * Be sure to apply engine oil to tappet shim top and bottom faces.
- * When seating the tappet shim, be sure the figure printed surface faces the tappet.

- Reinstall the camshafts in the specified manner. (☞ 6-30, -31)
- After replacing the tappet shim and camshafts, rotate the engine so that the tappet is depressed fully. This will squeeze out oil trapped between the shim and the tappet that could cause an incorrect measurement. Then check the clearance again to confirm that it is within the specified range.

After finishing the valve clearance adjustment, reinstall the following items.

- Cylinder head cover (☞ 6-34)
- Spark plug and ignition coil/plug cap (☞ 2-8)
- Radiator covers and fuel tank
- TDC plug and crankshaft hole plug (☞ 6-33)
- Pour engine oil (☞ 2-13)
- Seat



(EXHAUST SIDE)

TAPPET SHIM SELECTION TABLE [EXHAUST]
TAPPET SHIM NO. (12892-05C00-XXX)

TAPPET SHIM SET (12800-05850)

PRESENT SHIM SIZE (mm)	120	122	125	128	130	132	135	138	140	142	145	148	150	152	155	158	160	162	165	168	170	172	175	178	180	182	185	188	190	192	195	198	200	202	205	208	210	212	215	218	220
0.000 - 0.019	1.200	1.225	1.250	1.275	1.300	1.325	1.350	1.375	1.400	1.425	1.450	1.475	1.500	1.525	1.550	1.575	1.600	1.625	1.650	1.675	1.700	1.725	1.750	1.775	1.800	1.825	1.850	1.875	1.900	1.925	1.950	1.975	2.000	2.025	2.050	2.075	2.100	2.125	2.150	2.175	2.200
0.020 - 0.044	1.200	1.225	1.250	1.275	1.300	1.325	1.350	1.375	1.400	1.425	1.450	1.475	1.500	1.525	1.550	1.575	1.600	1.625	1.650	1.675	1.700	1.725	1.750	1.775	1.800	1.825	1.850	1.875	1.900	1.925	1.950	1.975	2.000	2.025	2.050	2.075	2.100	2.125	2.150	2.175	2.200
0.045 - 0.069	1.200	1.225	1.250	1.275	1.300	1.325	1.350	1.375	1.400	1.425	1.450	1.475	1.500	1.525	1.550	1.575	1.600	1.625	1.650	1.675	1.700	1.725	1.750	1.775	1.800	1.825	1.850	1.875	1.900	1.925	1.950	1.975	2.000	2.025	2.050	2.075	2.100	2.125	2.150	2.175	2.200
0.070 - 0.094	1.200	1.225	1.250	1.275	1.300	1.325	1.350	1.375	1.400	1.425	1.450	1.475	1.500	1.525	1.550	1.575	1.600	1.625	1.650	1.675	1.700	1.725	1.750	1.775	1.800	1.825	1.850	1.875	1.900	1.925	1.950	1.975	2.000	2.025	2.050	2.075	2.100	2.125	2.150	2.175	2.200
0.095 - 0.119	1.200	1.225	1.250	1.275	1.300	1.325	1.350	1.375	1.400	1.425	1.450	1.475	1.500	1.525	1.550	1.575	1.600	1.625	1.650	1.675	1.700	1.725	1.750	1.775	1.800	1.825	1.850	1.875	1.900	1.925	1.950	1.975	2.000	2.025	2.050	2.075	2.100	2.125	2.150	2.175	2.200
0.120 - 0.144	1.200	1.225	1.250	1.275	1.300	1.325	1.350	1.375	1.400	1.425	1.450	1.475	1.500	1.525	1.550	1.575	1.600	1.625	1.650	1.675	1.700	1.725	1.750	1.775	1.800	1.825	1.850	1.875	1.900	1.925	1.950	1.975	2.000	2.025	2.050	2.075	2.100	2.125	2.150	2.175	2.200
0.145 - 0.169	1.200	1.225	1.250	1.275	1.300	1.325	1.350	1.375	1.400	1.425	1.450	1.475	1.500	1.525	1.550	1.575	1.600	1.625	1.650	1.675	1.700	1.725	1.750	1.775	1.800	1.825	1.850	1.875	1.900	1.925	1.950	1.975	2.000	2.025	2.050	2.075	2.100	2.125	2.150	2.175	2.200
0.170 - 0.240	1.200	1.225	1.250	1.275	1.300	1.325	1.350	1.375	1.400	1.425	1.450	1.475	1.500	1.525	1.550	1.575	1.600	1.625	1.650	1.675	1.700	1.725	1.750	1.775	1.800	1.825	1.850	1.875	1.900	1.925	1.950	1.975	2.000	2.025	2.050	2.075	2.100	2.125	2.150	2.175	2.200
0.241 - 0.265	1.250	1.275	1.300	1.325	1.350	1.375	1.400	1.425	1.450	1.475	1.500	1.525	1.550	1.575	1.600	1.625	1.650	1.675	1.700	1.725	1.750	1.775	1.800	1.825	1.850	1.875	1.900	1.925	1.950	1.975	2.000	2.025	2.050	2.075	2.100	2.125	2.150	2.175	2.200	2.200	
0.266 - 0.290	1.275	1.300	1.325	1.350	1.375	1.400	1.425	1.450	1.475	1.500	1.525	1.550	1.575	1.600	1.625	1.650	1.675	1.700	1.725	1.750	1.775	1.800	1.825	1.850	1.875	1.900	1.925	1.950	1.975	2.000	2.025	2.050	2.075	2.100	2.125	2.150	2.175	2.200	2.200		
0.291 - 0.315	1.300	1.325	1.350	1.375	1.400	1.425	1.450	1.475	1.500	1.525	1.550	1.575	1.600	1.625	1.650	1.675	1.700	1.725	1.750	1.775	1.800	1.825	1.850	1.875	1.900	1.925	1.950	1.975	2.000	2.025	2.050	2.075	2.100	2.125	2.150	2.175	2.200	2.200			
0.316 - 0.340	1.325	1.350	1.375	1.400	1.425	1.450	1.475	1.500	1.525	1.550	1.575	1.600	1.625	1.650	1.675	1.700	1.725	1.750	1.775	1.800	1.825	1.850	1.875	1.900	1.925	1.950	1.975	2.000	2.025	2.050	2.075	2.100	2.125	2.150	2.175	2.200	2.200				
0.341 - 0.365	1.350	1.375	1.400	1.425	1.450	1.475	1.500	1.525	1.550	1.575	1.600	1.625	1.650	1.675	1.700	1.725	1.750	1.775	1.800	1.825	1.850	1.875	1.900	1.925	1.950	1.975	2.000	2.025	2.050	2.075	2.100	2.125	2.150	2.175	2.200	2.200					
0.366 - 0.390	1.375	1.400	1.425	1.450	1.475	1.500	1.525	1.550	1.575	1.600	1.625	1.650	1.675	1.700	1.725	1.750	1.775	1.800	1.825	1.850	1.875	1.900	1.925	1.950	1.975	2.000	2.025	2.050	2.075	2.100	2.125	2.150	2.175	2.200	2.200						
0.391 - 0.415	1.400	1.425	1.450	1.475	1.500	1.525	1.550	1.575	1.600	1.625	1.650	1.675	1.700	1.725	1.750	1.775	1.800	1.825	1.850	1.875	1.900	1.925	1.950	1.975	2.000	2.025	2.050	2.075	2.100	2.125	2.150	2.175	2.200	2.200							
0.416 - 0.440	1.425	1.450	1.475	1.500	1.525	1.550	1.575	1.600	1.625	1.650	1.675	1.700	1.725	1.750	1.775	1.800	1.825	1.850	1.875	1.900	1.925	1.950	1.975	2.000	2.025	2.050	2.075	2.100	2.125	2.150	2.175	2.200	2.200								
0.441 - 0.465	1.450	1.475	1.500	1.525	1.550	1.575	1.600	1.625	1.650	1.675	1.700	1.725	1.750	1.775	1.800	1.825	1.850	1.875	1.900	1.925	1.950	1.975	2.000	2.025	2.050	2.075	2.100	2.125	2.150	2.175	2.200	2.200									
0.466 - 0.490	1.475	1.500	1.525	1.550	1.575	1.600	1.625	1.650	1.675	1.700	1.725	1.750	1.775	1.800	1.825	1.850	1.875	1.900	1.925	1.950	1.975	2.000	2.025	2.050	2.075	2.100	2.125	2.150	2.175	2.200	2.200										
0.491 - 0.515	1.500	1.525	1.550	1.575	1.600	1.625	1.650	1.675	1.700	1.725	1.750	1.775	1.800	1.825	1.850	1.875	1.900	1.925	1.950	1.975	2.000	2.025	2.050	2.075	2.100	2.125	2.150	2.175	2.200	2.200											
0.516 - 0.540	1.525	1.550	1.575	1.600	1.625	1.650	1.675	1.700	1.725	1.750	1.775	1.800	1.825	1.850	1.875	1.900	1.925	1.950	1.975	2.000	2.025	2.050	2.075	2.100	2.125	2.150	2.175	2.200	2.200												
0.541 - 0.565	1.550	1.575	1.600	1.625	1.650	1.675	1.700	1.725	1.750	1.775	1.800	1.825	1.850	1.875	1.900	1.925	1.950	1.975	2.000	2.025	2.050	2.075	2.100	2.125	2.150	2.175	2.200	2.200													
0.566 - 0.590	1.575	1.600	1.625	1.650	1.675	1.700	1.725	1.750	1.775	1.800	1.825	1.850	1.875	1.900	1.925	1.950	1.975	2.000	2.025	2.050	2.075	2.100	2.125	2.150	2.175	2.200	2.200														
0.591 - 0.615	1.600	1.625	1.650	1.675	1.700	1.725	1.750	1.775	1.800	1.825	1.850	1.875	1.900	1.925	1.950	1.975	2.000	2.025	2.050	2.075	2.100	2.125	2.150	2.175	2.200	2.200															
0.616 - 0.640	1.625	1.650	1.675	1.700	1.725	1.750	1.775	1.800	1.825	1.850	1.875	1.900	1.925	1.950	1.975	2.000	2.025	2.050	2.075	2.100	2.125	2.150	2.175	2.200	2.200																
0.641 - 0.665	1.650	1.675	1.700	1.725	1.750	1.775	1.800	1.825	1.850	1.875	1.900	1.925	1.950	1.975	2.000	2.025	2.050	2.075	2.100	2.125	2.150	2.175	2.200	2.200																	

SPECIFIED CLEARANCE/NO ADJUSTMENT REQUIRED

HOW TO USE THIS CHART:
I. Measure valve clearance. "ENGINE IS COLD"
II. Measure present shim size.
III. Match clearance in vertical column with present shim size in horizontal column.

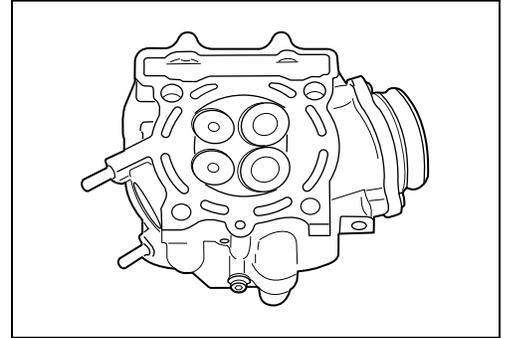
EXAMPLE

- Valve clearance is 0.250 mm
- Present shim size 1.650 mm
- Shim size to be used 1.700 mm

CYLINDER HEAD, CYLINDER AND PISTON

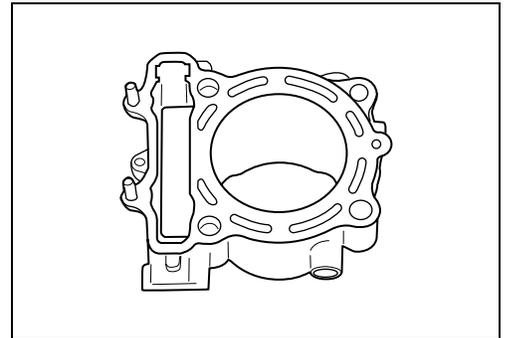
CYLINDER HEAD INSPECTION

- Remove the cylinder head. (☞ 6-6, -7)
- Decarbonize the combustion chambers.
- Inspect for pinholes, cracks and other damage.
- If any defects are found, replace the cylinder head with a new one.



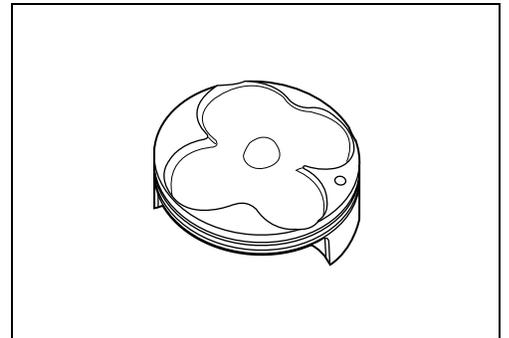
CYLINDER INSPECTION

- Remove the cylinder. (☞ 6-7)
- Inspect the cylinder wall for any scratches, nicks or other damage.
- If any defects are found, replace the cylinder with a new one.



PISTON INSPECTION

- Remove the piston. (☞ 6-8)
- Decarbonize the top surface of the piston.
- Check for scratches and cracks.
- Check piston ring wear. Remove carbon deposits from the piston ring groove.
- If any defects are found, replace the piston with a new one.

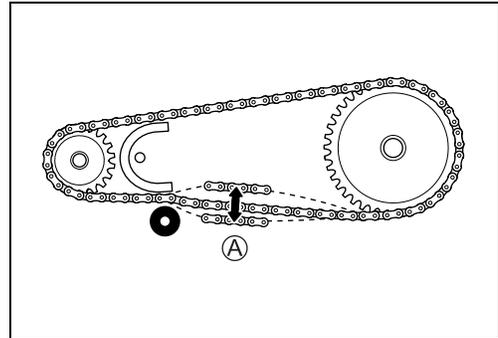


DRIVE CHAIN AND SPROCKETS

DRIVE CHAIN SLACK

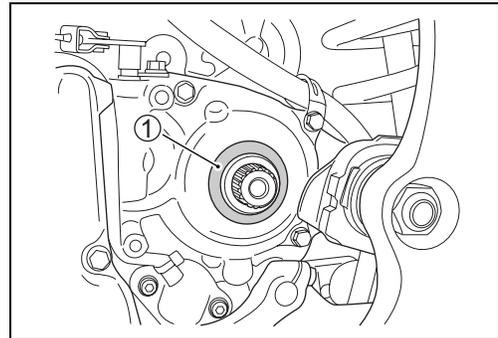
- Place the motorcycle on a block to lift the rear wheel off the ground.
- Inspect the drive chain slack at the middle point between the drive chain buffer and rear sprocket.

DATA Drive chain slack (A): 35 – 45 mm (1.4 – 1.8 in)



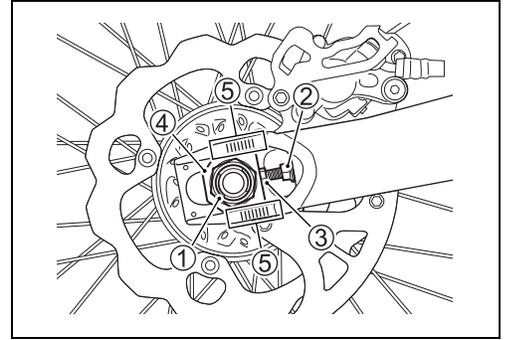
CRANKCASE DRIVESHAFT OIL SEAL

- Remove the engine sprocket. (5-5)
- Inspect the oil seal ① for abnormality (dust, stone or foreign materials).
- If necessary, replace it with a new one.



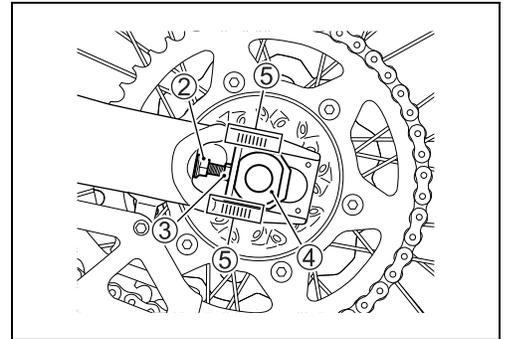
DRIVE CHAIN ADJUSTMENT

- Loosen the axle nut ①.
- Loosen the lock-nuts ② and adjust the drive chain slack to the specification by turning the adjusters ③. Make sure that the right and left adjuster washers ④ are at the same position on scales ⑤.
- With the adjusters ③ held in position, tighten the lock-nuts ②.
- Push the adjuster washers ④ to the adjusters ③ and tighten the axle nut ①.



Axle nut: 90 N-m (9.0 kgf-m, 65.0 lbf-ft)

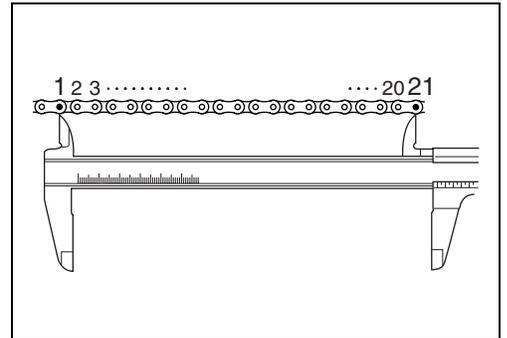
- Tighten the lock-nut ②.



20TH PITCH LENGTH

Pull the drive chain tight and measure the 20th pitch length.

DATA Drive chain 20th pitch length
 Service limit: 323.8 mm (12.75 in)



DRIVE CHAIN LUBRICATION

- Remove the chain clip ① and master link from the drive chain and remove the drive chain.

NOTE:

Be careful not to bend the chain clip ①.

- Inspect for wear and damage of the drive chain and replace it if necessary.

- Clean the drive chain with non-flammable cleaning solvent.

CAUTION

Do not use gasoline to clean the drive chain.

- Dry the drive chain.
- Apply Suzuki Chain Lube or equivalent to the link plates and rollers.

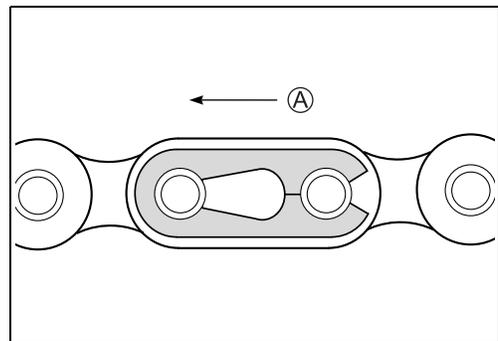
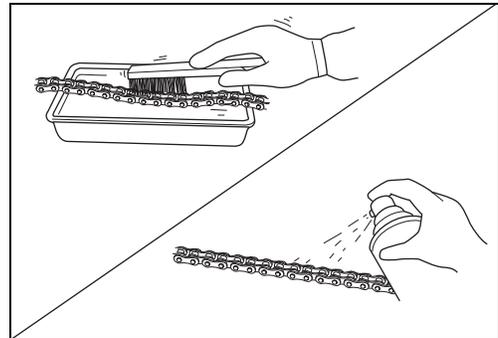
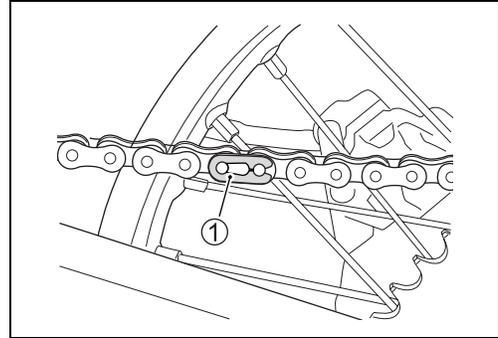
- Reassemble the drive chain.

NOTE:

Reassemble the drive chain clip so the slit end faces opposite the direction of rotation.

- Inspect the drive chain slack. (☞ 2-30)

Ⓐ Direction of travel



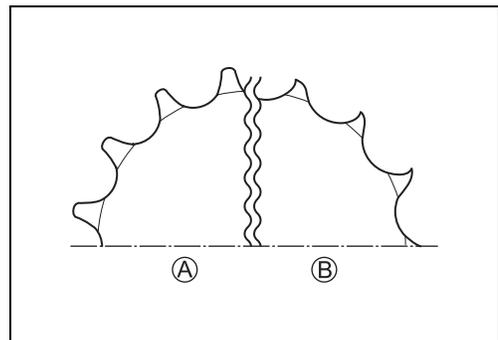
SPROCKET INSPECTION

Inspect the engine sprocket and rear sprocket for wear and cracks. Replace the sprockets as necessary.

NOTE:

When replacing a worn sprocket, it is likely that the drive chain will need to be replaced as well.

- Ⓐ Normal wear
- Ⓑ Excessive wear



DRIVE CHAIN GUIDE, BUFFER AND TENSIONER ROLLER

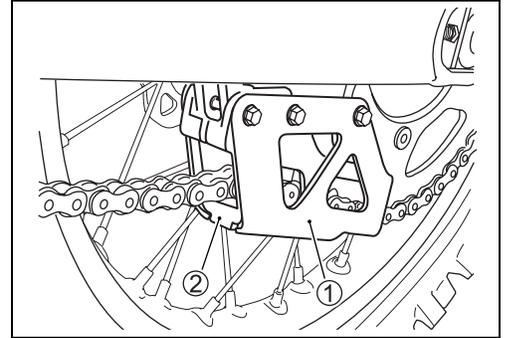
DRIVE CHAIN GUIDE INSPECTION

- Inspect the drive chain guide ① for bends and damage.

NOTE:

The drive chain can hit a bent guide causing noise and drive chain wear.

- Inspect the chain guide defense ② for wear.
- If necessary, replace the defective parts with a new one.

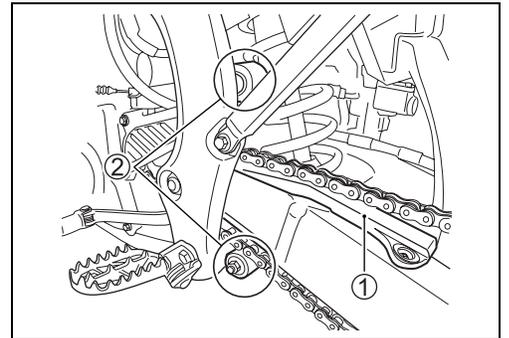


DRIVE CHAIN BUFFER AND ROLLER INSPECTION

- Inspect the drive chain buffer ① for wear and cracks.
- Inspect the drive chain rollers ② for wear.
- If necessary, replace the defective parts with a new one.

NOTE:

The drive chain can touch the swingarm directly if the chain guide buffer is worn out. This will cause drive chain and swing-arm damage.



- Inspect the drive chain roller bolt and nut for tightness.

🔧 Drive chain roller bolt and nut:

23 N·m (2.3 kgf-m, 16.5 lbf-ft)

BRAKES

BRAKE FLUID LEVEL

- Inspect the brake fluid level in both front and rear reservoirs. If the brake fluid level is lower than LOWER mark (A), replenish the reservoir with the specified brake fluid to the UPPER line. Inspect brake pad wear and brake fluid leakage if the brake fluid level decreases.

 **Brake fluid: DOT 4**

WARNING

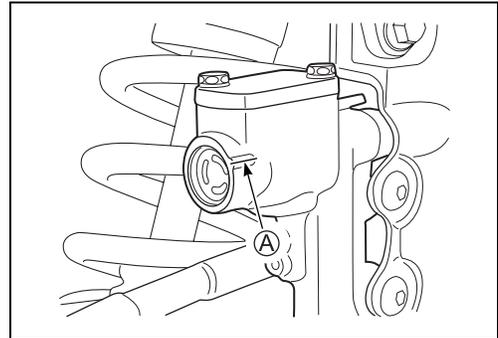
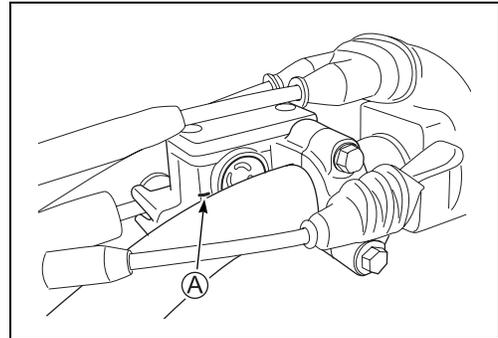
- * Brake fluid can be hazardous to humans and pets. Brake fluid is harmful or fatal if swallowed, and harmful if it comes in contact with your skin or eyes.
- * Keep brake fluid away from children. Call your doctor immediately if brake fluid is swallowed, and induce vomiting. Flush eyes or skin with water if brake fluid gets in eyes or comes in contact with skin.

WARNING

- * The use of any fluid except DOT 4 brake fluid from a sealed container can damage the brake system and lead to an accident.
- * Use only DOT 4 brake fluid from a sealed container. Never use or mix different types of brake fluid.

CAUTION

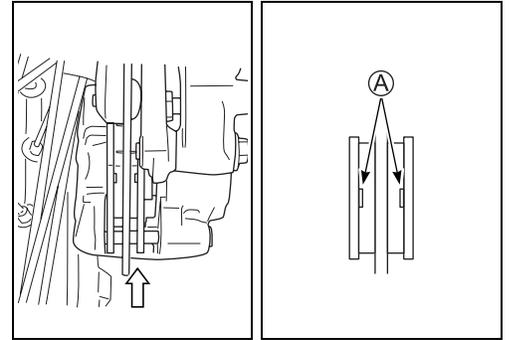
- * Spilled brake fluid can damage painted surfaces and plastic parts.
- * Be careful not to spill any fluid when filling the brake fluid reservoir. Wipe spilled fluid up immediately.



BRAKE PAD

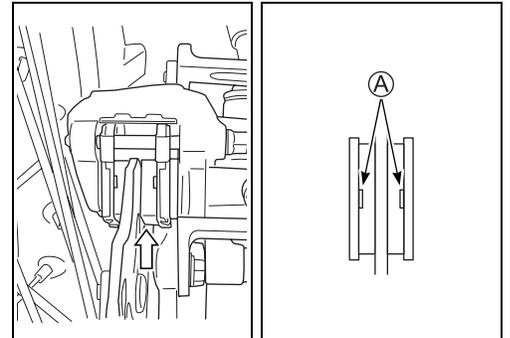
- Inspect the brake pads for wear. If the brake pads are worn, replace them with new ones. (☞ 17-6)

Ⓐ Wear limit



NOTE:

- * Pump the brake lever and pedal several times to restore the brake pads after replacing the brake pads.
- * Replace both right and left pads together when replacing the brake pads.

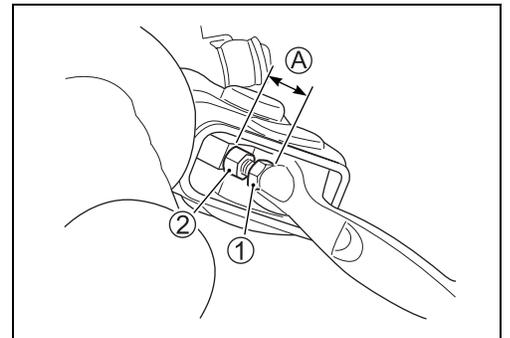


FRONT BRAKE LEVER ADJUSTMENT

Adjust the brake lever position as follows:

- Loosen the lock-nut ①.
- Turn in or out adjuster ② to obtain the proper brake lever position.
- The standard adjuster length Ⓐ is from 11 – 15 mm (0.4 – 0.6 in).
- Tighten the lock-nut ①.

DATA Adjuster length Ⓐ: 11 – 15 mm (0.4 – 0.6 in)



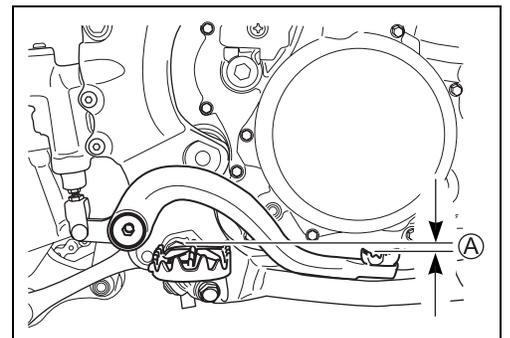
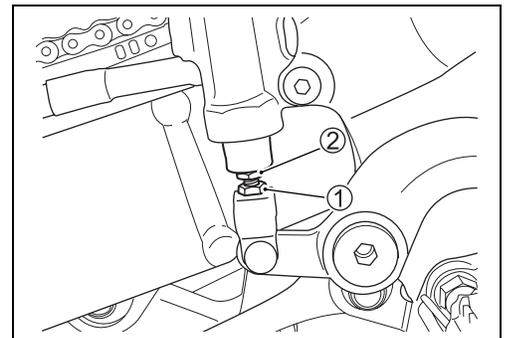
BRAKE PEDAL HEIGHT ADJUSTMENT

Adjust the rear brake pedal height as follows:

- Loosen the lock-nut ①.
- Adjust the brake pedal height Ⓐ by turning the adjuster ② to locate the pedal 0 – 10 mm (0 – 0.4 in) below the top face of the footrest.
- Tighten the lock-nut ①.

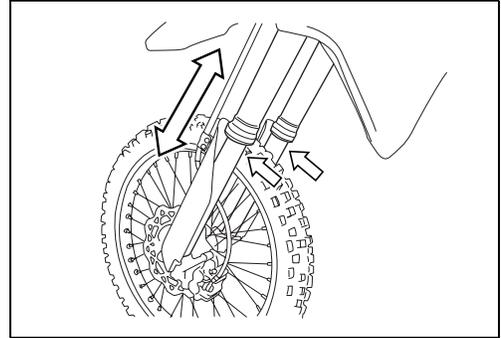
DATA Brake pedal height Ⓐ: 0 – 10 mm (0 – 0.4 in)

🔧 Rear brake master cylinder rod lock-nut:
6 N·m (0.6 kgf·m, 4.5 lbf·ft)



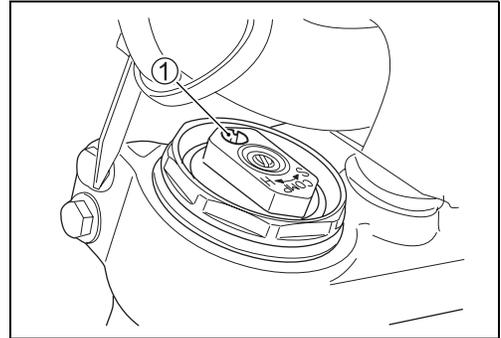
FRONT FORK

- Move the front fork up and down several times and inspect for smooth movement.
- Inspect for damage and oil leaks.
- Inspect the bolts and nuts for tightness.
- If any defects are found, replace the front fork with a new one.



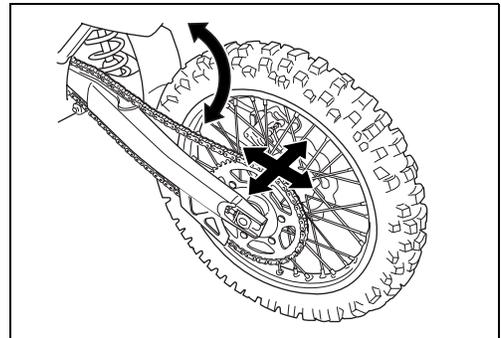
- Place a stand under the chassis tube to lift the front wheel off the ground.
- Remove the air bleeder valve ① and equalize the air pressure in the front forks to atmospheric pressure.
- Install the air bleeder valve ①.

 **Front fork air bleeder valve: 1.3 N·m (0.13 kgf-m, 1.0 lbf-ft)**



REAR SUSPENSION

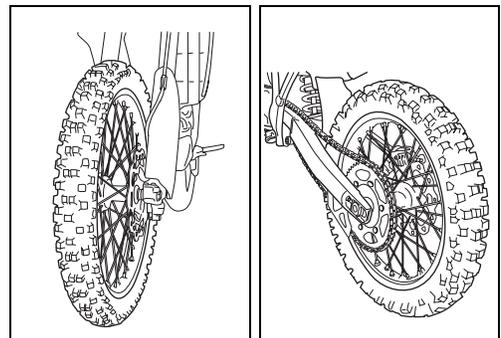
- Move the rear suspension up and down several times and inspect for smooth movement.
- Inspect for damage and oil leaks.
- Inspect the bolts and nuts for tightness.
- Inspect that the rear suspension has play or binds by moving the swingarm up and down, and right and left.
- If necessary, replace the defective parts with a new one.



WHEELS AND TIRES

WHEEL RIM AND TIRES INSPECTION

- Inspect the wheel and tires for damage.
- Inspect the wheel bearing for rattles. ( 16-4)
- Inspect the wheel rim runout. ( 16-4)
- If necessary, replace the defective parts with a new one.



SPOKE NIPPLE AND RIM LOCK INSPECTION

- Inspect the spokes for tension by squeezing the spoke nipples.
- Retighten the spoke nipples with a spoke nipple wrench so as all spokes have same tension.

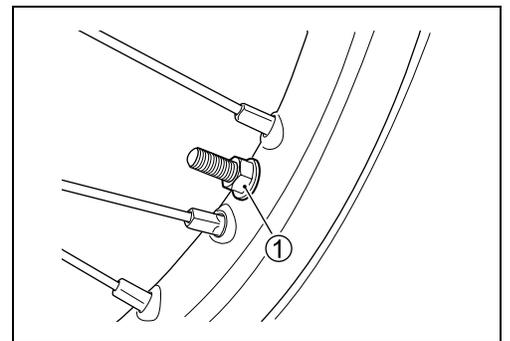
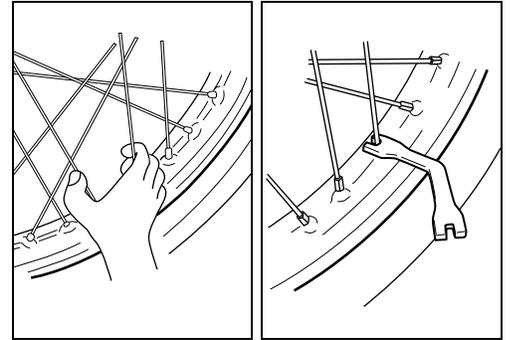
 **Spoke nipple: 6 N·m (0.6 kgf·m, 4.5 lbf·ft)**

CAUTION

- * Improperly tightening the spoke nipples can damage the wheel.
- * Tighten the spoke nipples less than 1/2 turn at a time. Inspect the spoke tension and then retighten the spoke nipple.

- Inspect the rim lock ① for tightness.

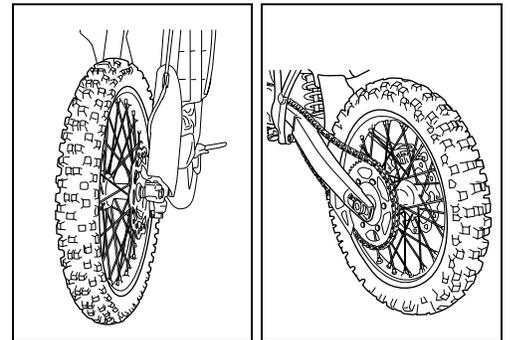
 **Front wheel rim lock: 13 N·m (1.3 kgf·m, 9.5 lbf·ft)**
Rear wheel rim lock: 17 N·m (1.7 kgf·m, 12.5 lbf·ft)



TIRE PRESSURE

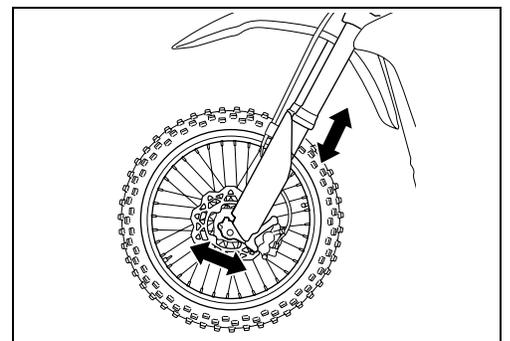
- Inspect front and rear tire pressure.

 **Tire pressure (cold): 70 – 110 kPa**
(0.7 – 1.1 kgf/cm², 10 – 16 psi)



STEERING

- Inspect the steering by moving the front forks up and down, and back and forward. If the steering has play or binds, inspect steering stem head nut tightness and steering bearings. (➡ 18-21, -23)



LUBRICATION

Apply grease or oil to the moving parts to increase durability and prevent wear.

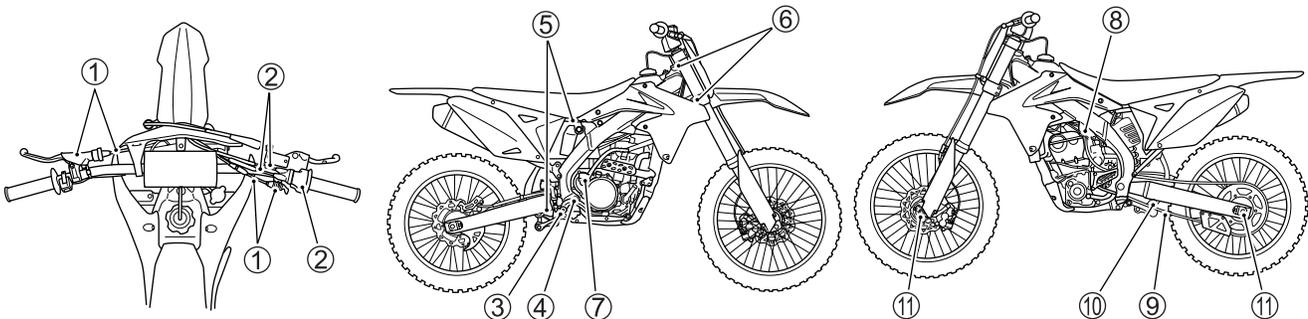
No.	ITEM	LUBRICANT	FREQUENCY	COMMENTS
①	Clutch inner cable, lever Hot starter inner cable, lever	A	Pre-race and between every race	Run oil through cables until it exits the lower end. Lube the cable ends where they pivot.
②	Throttle grip, throttle housing, cable	A	Pre-race	Lightly grease the inside of throttle spool. Keep free from dirt.
③	Rear brake pedal	C	Pre-race	Grease the brake pedal pivot.
④	Swingarm	C	Every 3 races/More often according to conditions	Clean and pack the bearings. Keep seals fresh. Grease the seals.
⑤	Rear suspension linkage pivot points	C	Every 1 race/More often according to conditions	Clean and pack the bearings. Keep seals fresh. Grease the seals.
⑥	Steering stem bearings	C	Every 5 races/More often according to conditions	Clean and pack the bearings. Keep seals fresh.
⑦	Kick starter lever	C	Pre-race	Grease the kick starter lever pivot.
⑧	Starter/idle adjuster shaft	A	Pre-race	Lightly oil the plunger shaft.
⑨	Drive chain	B	Pre-race and between every race	Keep chain thoroughly lubed at all times. Always check wear and alignment.
⑩	Cushion lever dust seals	A	Pre-race	Grease the seals.
⑪	Front and rear wheels	A	Pre-race	Grease the bearing and seals.

The following materials are necessary:

A. Lightweight oil such as WD-40 or penetrating oil

B. Aerosol type Chain Lube

C. SUZUKI SUPER GREASE "A" (or equivalent grease) or Water-proof wheel bearing grease

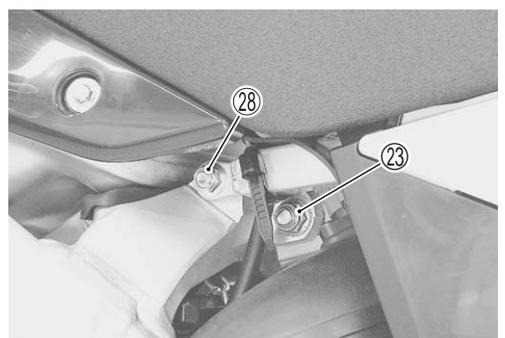
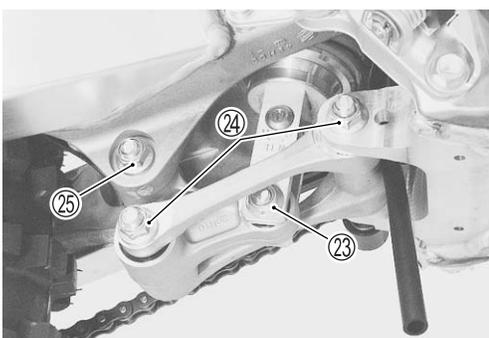
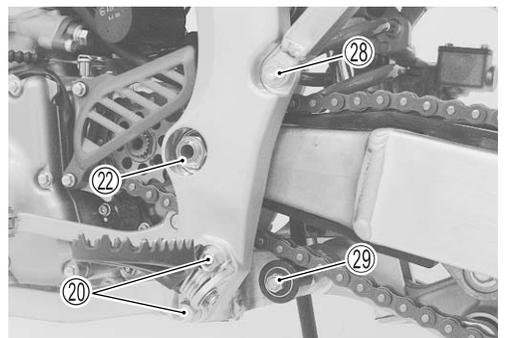
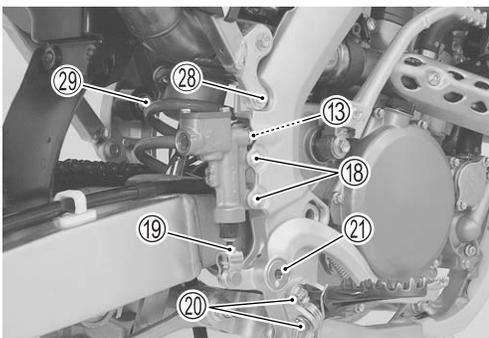
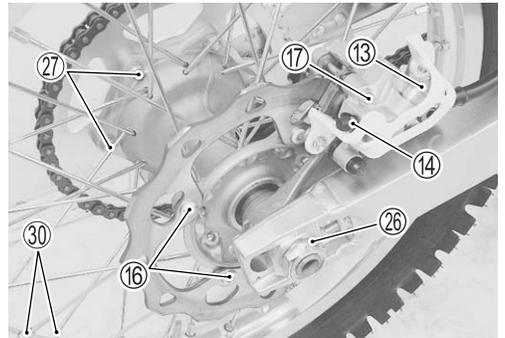
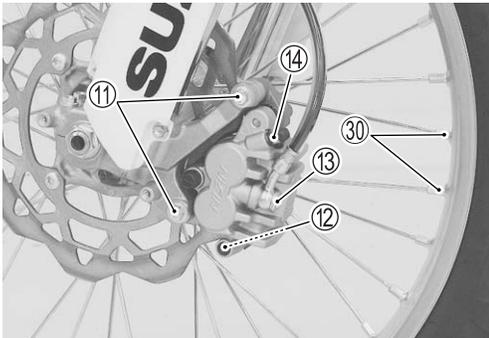
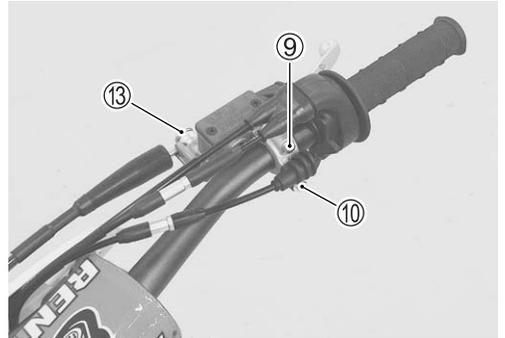
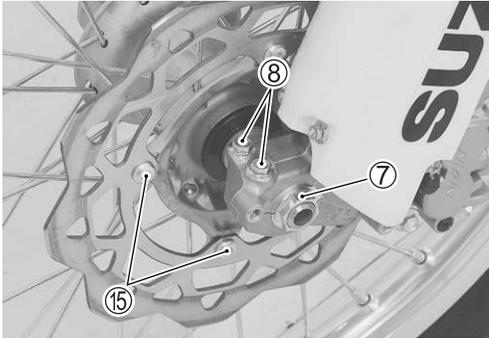
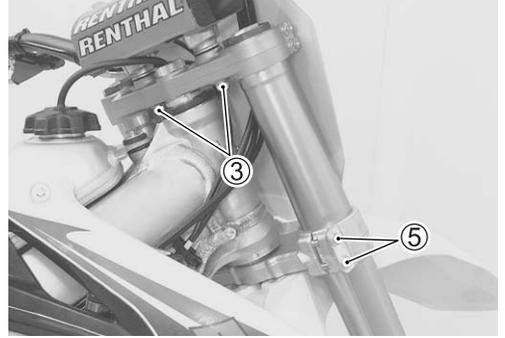
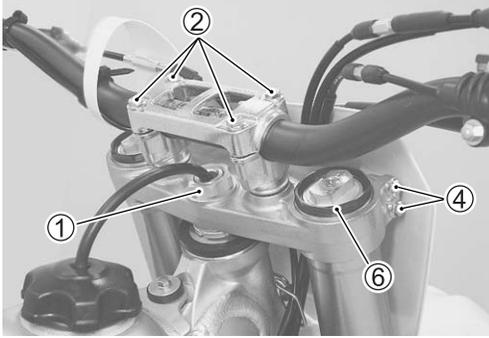


Follow the schedule closely. The disassembly necessary to lubricate many components is in itself valuable preventative maintenance. It allows you to inspect for wear, fatigue, adjustment and fastener tightness and it allows you to clean out the grit which otherwise cannot be gotten out.

CHASSIS BOLTS AND NUTS

Check that all chassis bolts and nuts are tightened to their specified torque. (Refer to page 2-40 for the locations of the following nuts and bolts on the motorcycle.)

ITEM	N-m	kgf-m	lbf-ft
① Steering stem head nut	100	10.0	72.5
② Handlebar clamp bolt	25	2.5	18.0
③ Handlebar holder set nut	44	4.4	32.0
④ Front fork upper clamp bolt	23	2.3	16.5
⑤ Front fork lower clamp bolt	23	2.3	16.5
⑥ Front fork cap bolt	34	3.4	24.5
⑦ Front axle bolt	35	3.5	25.5
⑧ Front axle holder bolt	18	1.8	13.0
⑨ Front brake master cylinder holder bolt (Upper)	10	1.0	7.0
⑩ Front brake master cylinder holder bolt (Lower)	12	1.2	8.5
⑪ Front brake caliper mounting bolt	26	2.6	19.0
⑫ Front brake pad mounting pin	18	1.8	13.0
⑬ Brake hose union bolt (Front & Rear)	23	2.3	16.5
⑭ Air bleeder valve (Front & Rear brake caliper)	6	0.6	4.5
⑮ Brake disc bolt (Front)	11	1.1	8.0
⑯ Brake disc bolt (Rear)	26	2.6	19.0
⑰ Rear brake pad mounting pin	18	1.8	13.0
⑱ Rear brake master cylinder mounting bolt	10	1.0	7.0
⑲ Rear brake master cylinder rod lock-nut	6	0.6	4.5
⑳ Footrest mounting bolt	35	3.5	25.5
㉑ Rear brake pedal pivot bolt	29	2.9	21.0
㉒ Swingarm pivot nut	70	7.0	50.5
㉓ Rear shock absorber mounting bolt/nut (Upper & Lower)	50	5.0	36.0
㉔ Cushion rod bolt/nut (Front & Rear)	80	8.0	58.0
㉕ Cushion lever bolt/nut	80	8.0	58.0
㉖ Rear axle nut	90	9.0	65.0
㉗ Rear sprocket nut	30	3.0	21.5
㉘ Seat rail bolt/nut	23	2.3	16.5
㉙ Chain roller bolt/nut	23	2.3	16.5
㉚ Spoke nipple	6	0.6	4.5



COMPRESSION PRESSURE CHECK

The compression pressure reading of a cylinder is a good indicator of its internal condition. The decision to replace the cylinder is often based on the results of a compression test.

COMPRESSION PRESSURE SPECIFICATION (Automatic decomp. actuated)

Standard
400 – 800 kPa (4.0 – 8.0 kgf/cm ² , 57 – 114 psi)

Low compression pressure can indicate any of the following conditions:

- * Excessively worn cylinder walls
- * Worn piston or piston rings
- * Piston rings stuck in grooves
- * Poor valve seating
- * Ruptured or otherwise defective cylinder head gasket
- * Decomp. trouble
- * Valve clearance out of adjustment

COMPRESSION TEST PROCEDURE

NOTE:

- * Before testing the engine for compression pressure, make sure that the cylinder head nuts are tightened to the specified torque values and the valves are properly adjusted.
- * Warm up the engine before testing.

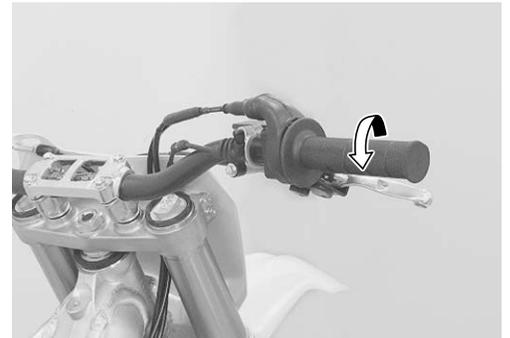
Remove the related parts and test the compression pressure in the following manner:

- Remove the seat. (☞ 5-2)
- Remove the fuel tank. (☞ 13-2, -3)
- Remove the spark plug. (☞ 2-7)
- Install the compression gauge and adaptor in the spark plug hole. Make sure that the connection is tight.
- Keep the throttle grip in the fully opened position.
- Kick energetically the kick starter lever about 5 times to turn the engine.
- Record the maximum gauge reading as the cylinder compression.

TOOL 09915-64512: Compression gauge

09913-10750: Compression gauge adaptor

- Reinstall the removed parts.



OIL PRESSURE CHECK

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

DATA Oil pressure

25 kPa (0.25 kgf/cm², 3.6 psi) at 6 000 r/min, oil temp. at 50 °C (122 °F)

Low or high oil pressure can indicate any of the following conditions:

LOW OIL PRESSURE

- * Clogged oil filter
- * Oil leakage from the oil passage
- * Damaged oil seal
- * Defective oil pump
- * Combination of the above items

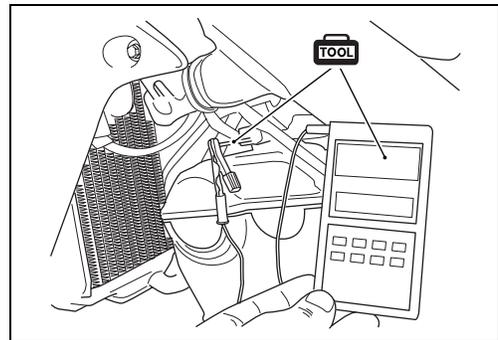
HIGH OIL PRESSURE

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

OIL PRESSURE TEST PROCEDURE

- Insert the needle-pointed probe to the lead wire coupler (W/BI).
- Connect the engine tachometer to the needle-pointed probe.

TOOL 09900-25009: Needle-pointed probe set
09900-26006: Engine tachometer



- Remove the exhaust pipe cover ② by removing its bolts ①.
- Remove the oil gallery plug ③.
- Install the oil pressure gauge and adaptor into the oil gallery.
- Warm up the engine.
- After warming up the engine, increase the engine speed to 6 000 r/min (observe the tachometer), and read the oil pressure gauge.

⚠ WARNING

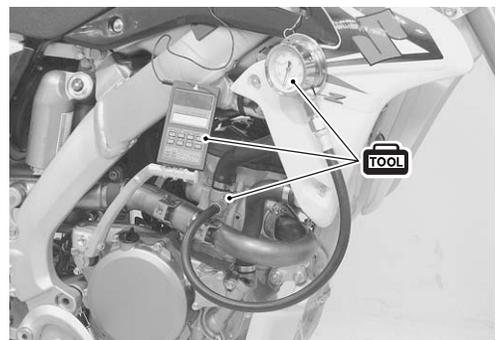
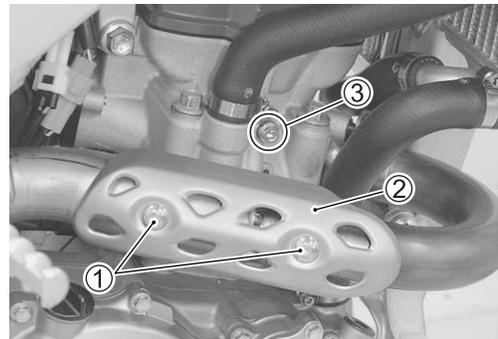
Do not remove the oil pressure gauge adapter when the engine is hot. Wait until engine cools.

- Install the oil gallery plug ③ to the specified torque.
- Install the exhaust pipe cover ②.
- Tighten the exhaust pipe cover bolts ① to the specified torque.

🔧 Oil gallery plug: 10 N·m (1.0 kgf·m, 7.0 lbf·ft)

Exhaust pipe cover bolt: 11 N·m (1.1 kgf·m, 8.0 lbf·ft)

TOOL 09915-74511: Oil pressure gauge (600 kPa)
09940-40211: Fuel pressure gauge adaptor



TROUBLESHOOTING

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Complaint	Symptom and possible causes	Remedy
Engine idles poorly.	<ul style="list-style-type: none"> • Valve clearance out of adjustment • Valve timing out of adjustment • Poor seating of valves • Worn valve guide • Worn down camshafts • Incorrect spark plug gap • Defective ignition coil/plug cap • Defective CKP sensor • Defective ECM • Defective TP sensor • Defective fuel pump • Insufficient throttle cable play 	Adjust Adjust Repair Replace Replace Adjust Replace Replace Replace Adjust or replace Replace Adjust
Engine stalls often.	<p>Incorrect fuel/air mixture</p> <ul style="list-style-type: none"> • Defective IAP sensor or circuit • Clogged fuel filter • Defective fuel pump • Defective fuel pressure regulator • Defective ECT sensor • Defective IAT sensor <p>Fuel injector improperly operating</p> <ul style="list-style-type: none"> • Defective fuel injector • Defective ECM • Open or short circuited wiring connections • Defective magneto <p>Control circuit or sensor improperly operating</p> <ul style="list-style-type: none"> • Defective ECM • Defective fuel pressure regulator • Defective TP sensor • Defective CKP sensor • Defective ECT sensor • Defective IAT sensor • Defective TO sensor <p>Engine internal parts improperly operating</p> <ul style="list-style-type: none"> • Fouled spark plug • Defective CKP sensor or ECM • Clogged fuel hose • Valve clearance out of adjustment 	Repair or replace Replace Replace Replace Replace Replace Replace Replace Repair or replace Replace Replace Replace Replace Replace Replace Replace Replace Clean Replace Clean Adjust

Complaint	Symptom and possible causes	Remedy
Noisy engine	Excessive valve chatter	
	• Too large valve clearance	Adjust
	• Weakened or broken valve springs	Replace
	• Worn tappet or cam surface	Replace
	• Worn and burnt camshaft journal	Replace
	Noise seems to come from piston	
	• Worn down piston or cylinder	Replace
	• Combustion chambers fouled with carbon	Clean
	• Worn piston pin or piston pin bore	Replace
	• Worn piston ring or ring groove	Replace
	Noise seems to come from timing chain	
	• Stretched cam chain	Replace
	• Worn sprockets	Replace
• Tension adjuster not working	Repair or replace	
Noise seems to come from clutch		
• Worn splines of countershaft or clutch sleeve hub	Replace	
• Worn teeth of clutch plates	Replace	
• Distorted clutch plates, driven and drive	Replace	
• Worn clutch release bearing	Replace	
Noise seems to come from crankshaft		
• Rattling bearings due to wear	Replace	
• Worn and burnt big-end bearing	Replace	
• Worn and burnt journal bearings	Replace	
Noise seems to come from transmission		
• Worn or rubbing gears	Replace	
• Worn splines	Replace	
• Worn bearings	Replace	
Noise seems to come from water pump		
• Worn or damaged impeller shaft	Replace	
• Worn or damaged oil seal	Replace	
• Contact between pump case and impeller	Replace	

Complaint	Symptom and possible causes	Remedy
Engine lacks power.	<p>Defective engine internal/electrical parts</p> <ul style="list-style-type: none"> • Loss of valve clearance • Weakened valve springs • Valve timing out of adjustment • Worn piston ring or cylinder • Poor seating of valves • Fouled spark plug • Incorrect spark plug • Clogged fuel injector • Clogged air cleaner element • Sucking air from throttle body joint or intake pipe • Too much engine oil • Defective fuel pump or ECM • Defective CKP sensor or ignition coil/plug cap <p>Defective control circuit or sensor</p> <ul style="list-style-type: none"> • Low fuel pressure • Defective TP sensor • Defective CKP sensor • Defective IAP sensor • Defective IAT sensor • Defective ECM • Defective GP switch 	<p>Adjust Replace Adjust Replace Repair Clean or replace Adjust or replace Replace Clean or replace Retighten or replace Drain out excess oil Replace Replace Replace Replace Replace Replace Replace Replace Replace</p>
Engine overheats	<p>Defective engine internal parts</p> <ul style="list-style-type: none"> • Heavy carbon deposit on piston crown • Not enough oil in the engine • Defective oil pump or clogged oil circuit • Sucking air from throttle body joint or intake pipe • Use incorrect engine oil • Defective cooling system <p>Lean fuel/air mixture</p> <ul style="list-style-type: none"> • Short-circuited IAP sensor/lead wire • Short-circuited IAT sensor/lead wire • Sucking air from throttle body joint or intake pipe • Defective fuel injector • Defective ECT sensor <p>Other factors</p> <ul style="list-style-type: none"> • Ignition timing is too advanced due to defective timing advance system (ECT sensor, GP switch, CKP sensor and ECM) • Drive chain is too tight 	<p>Clean Add oil Replace or clean Retighten or replace Change See cooling section Repair or replace Repair or replace Retighten or replace Replace Replace Replace Adjust</p>

Complaint	Symptom and possible causes	Remedy
Dirty or heavy exhaust smoke	<ul style="list-style-type: none"> • Too much engine oil in the engine • Worn piston ring or cylinder • Worn valve guides • Scored or scuffed cylinder wall • Worn valves stems • Defective stem seal • Worn oil ring side rails 	Drain out excess oil Replace Replace Replace Replace Replace Replace
Slipping clutch	<ul style="list-style-type: none"> • Weakened clutch springs • Worn or distorted pressure plate • Worn or distorted clutch plates • Insufficient clutch cable play 	Replace Replace Replace Adjust
Dragging clutch	<ul style="list-style-type: none"> • Some clutch spring weakened while others are not • Distorted pressure plates or clutch plates 	Replace Replace
Transmission will not shift.	<ul style="list-style-type: none"> • Broken gearshift cam • Distorted gearshift forks • Worn gearshift pawl 	Replace Replace Replace
Transmission will not shift back.	<ul style="list-style-type: none"> • Broken return spring on shift shaft • Rubbing or stickily shift shaft • Distorted or worn gearshift forks 	Replace Repair or replace Replace
Transmission jumps out of gear.	<ul style="list-style-type: none"> • Worn shifting gears on driveshaft or countershaft • Distorted or worn gearshift forks • Weakened stopper spring on gearshift stopper • Worn gearshift cam plate 	Replace Replace Replace Replace

RADIATOR (COOLING SYSTEM)

Complaint	Symptom and possible causes	Remedy
Engine overheats	<ul style="list-style-type: none">• Not enough engine coolant• Radiator core clogged with dirt or scale• Clogged water passage• Air trapped in the cooling circuit• Defective water pump• Use incorrect coolant• Defective ECM• Defective ECT sensor	Add coolant Clean Clean Bleed air Replace Replace Replace Replace
Engine overcools	<ul style="list-style-type: none">• Extremely cold weather	Put on the radiator cover

CHASSIS

Complaint	Symptom and possible causes	Remedy
Heavy steering	<ul style="list-style-type: none"> • Overtightened steering stem nut • Broken bearing in steering stem • Distorted steering stem • Not enough pressure in tires 	Adjust Replace Replace Adjust
Wobbly handlebars	<ul style="list-style-type: none"> • Loss of balance between right and left front forks • Distorted front fork • Distorted front axle or crooked tire • Loose steering stem nut • Worn or incorrect tire or wrong tire pressure • Worn bearing/race in steering stem 	Adjust Repair or replace Replace Adjust Adjust or replace Replace
Wobbly front wheel	<ul style="list-style-type: none"> • Distorted wheel rim • Worn front wheel bearings • Defective or incorrect tire • Loose axle or axle pinch bolt • Incorrect front fork oil level • Incorrect front wheel weight balance • Loose spork nipple 	Replace Replace Replace Retighten Adjust Adjust Retighten
Front suspension too soft	<ul style="list-style-type: none"> • Weakened springs • Not enough fork oil • Wrong weight fork oil • Improperly set front fork damping force adjuster 	Replace Replenish Replace Adjust
Front suspension too stiff	<ul style="list-style-type: none"> • Too viscous fork oil • Too much fork oil • Bent front fork • Improperly set front fork damping force adjuster 	Replace Drain excess oil Replace Adjust
Noisy front suspension	<ul style="list-style-type: none"> • Not enough fork oil • Loose bolts on suspension • Broken spring 	Replenish Retighten Replace
Wobbly rear wheel	<ul style="list-style-type: none"> • Distorted wheel rim • Worn rear wheel bearing or swingarm bearings • Defective or incorrect tire • Worn swingarm and rear suspension bearings • Loose nuts or bolts on rear suspensions 	Replace Replace Replace Replace Retighten
Rear suspension too soft	<ul style="list-style-type: none"> • Weakened spring of shock absorber • Improperly set shock absorber spring force adjuster • Leakage of oil or gas shock absorber • Improperly set shock absorber damping force adjuster 	Replace Adjust Repair or replace Adjust
Rear suspension too stiff	<ul style="list-style-type: none"> • Bent shock absorber shaft • Improperly set shock absorber spring force adjuster • Bent swingarm pivot shaft • Worn swingarm and rear suspension bearings • Improperly set shock absorber damping force adjuster 	Replace Adjust Replace Replace Adjust
Noisy rear suspension	<ul style="list-style-type: none"> • Loose nuts or bolts on rear suspension • Worn swingarm and suspension bearings 	Retighten Replace

BRAKES

Complaint	Symptom and possible causes	Remedy
Insufficient brake power	<ul style="list-style-type: none"> • Leakage of brake fluid from hydraulic system • Worn pads • Oil adhesion of engaging surface of pads • Worn disc • Air in hydraulic system • Not enough brake fluid in the reservoir 	Repair or replace Replace Clean disc and pads Replace Bleed air Replenish
Brake squeaking	<ul style="list-style-type: none"> • Carbon adhesion on pad surface • Tilted pads • Worn pads • Damaged wheel bearing • Loosen front wheel axle or rear wheel axle • Foreign material in brake fluid • Clogged return port of master cylinder 	Repair surface with sandpaper Correct pad fitting or replace Replace Replace Tighten to specified torque Replace brake fluid Disassemble and clean master cylinder
Excessive brake lever stroke	<ul style="list-style-type: none"> • Air in hydraulic system • Insufficient brake fluid • Improper quality of brake fluid 	Bleed air Replenish fluid to specified level; bleed air Replace with correct fluid
Leakage of brake fluid	<ul style="list-style-type: none"> • Insufficient tightening of connection joints • Cracked hose • Worn piston or seal • Worn cylinder or cup 	Tighten to specified torque Replace Replace piston or seal Replace cylinder or cup
Brake drags	<ul style="list-style-type: none"> • Rusty part • Insufficient brake lever or brake pedal pivot lubrication 	Clean and lubricate Lubricate

ELECTRICAL

Complaint	Symptom and possible causes	Remedy
No sparking or poor sparking	<ul style="list-style-type: none"> Fouled spark plug Wet spark plug Incorrect spark plug gap Defective spark plug Defective ignition coil/plug cap Defective ECM Defective CKP sensor Open-circuited wiring connections Defective magneto 	Clean Clean and dry Replace Replace Replace Replace Replace Repair or replace Replace
Spark plug soon become fouled with carbon.	<ul style="list-style-type: none"> Mixture too rich Idling speed set too high Incorrect gasoline Dirty air cleaner elements Too cold spark plug 	Inspect FI system Adjust idle screw Change Clean or replace Replace with hot type plug
Spark plug become fouled too soon.	<ul style="list-style-type: none"> Worn piston ring Worn piston or cylinder Excessive clearance of valve stems in valve guides Worn valve stem seal 	Replace Replace Replace Replace
Spark plug electrodes overheat or burn	<ul style="list-style-type: none"> Too hot spark plug Overheated the engine Loose spark plug Too lean mixture 	Replace with cold type plug Tune up Retighten Inspect FI system
Magneto does not charge.	<ul style="list-style-type: none"> Open- or short-circuited lead wires, or loose lead connections Short-circuited, grounded or open charge coil Short-circuited or punctured regulator/rectifier 	Repair or replace or retighten Replace Replace
Magneto does charge, but charging rate is below the specification.	<ul style="list-style-type: none"> Lead wires tend to get shorted or open-circuited or loosely connected at terminals Grounded or open-circuited charge coil Defective regulator/rectifier 	Repair or retighten Replace Replace
Magneto overcharges	<ul style="list-style-type: none"> Damaged or defective regulator/rectifier Poorly grounded regulator/rectifier 	Replace Clean and tighten ground connection
Unstable charging	<ul style="list-style-type: none"> Lead wire insulation frayed due to vibration, resulting in intermittent short-circuiting Internally shorted magneto Defective regulator/rectifier 	Repair or replace Replace Replace

MACHINE TUNING

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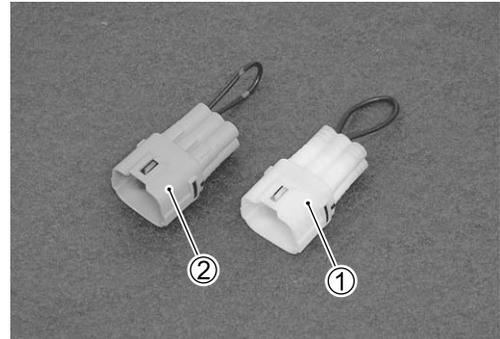
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SELECTION OF ECM TUNING MAP

In the ECM of this model, there are three different maps provided, a standard map and two modified maps (injection map for slightly leaner mixture and that for slightly richer mixture).

Select the appropriate short wire among those that come supplied in the motorcycle shipping crate and connect it to the mode select coupler. This can change the ECM setting to the modified map (either injection map for slightly leaner mixture or that for slightly richer mixture depending on the selected shunt wire).

	Coupler color	Injection map
①	White	Lean
②	Gray	Rich
		STD



NOTE:

The changeover is executed immediately after the engine has been started.

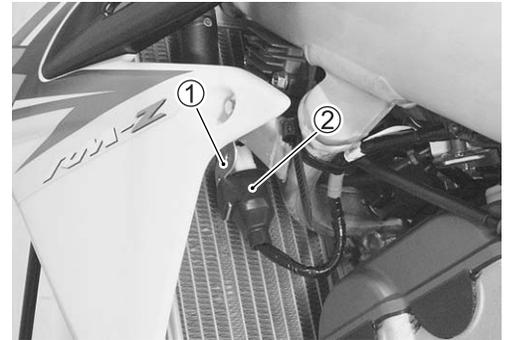
- Select White short wire (map for slightly leaner mixture) when:
 - 1) Raining
 - 2) In highly humidity
- Select Gray short wire (map for slightly richer mixture) when:
 - 1) In low humidity
 - 2) At continuous high speed

NOTE:

The above information is provided only as a guide. To determine the setting, make sure to check also for drivability and spark plug firing end condition.

SHORT WIRE CONNECTING PROCEDURE

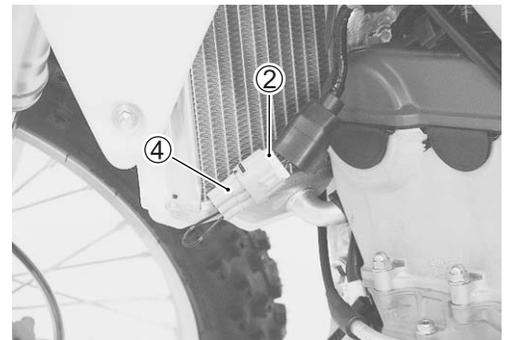
- Disconnect the mode select coupler ② from the bracket ①.



- Disconnect the mode select coupler cap ③.



- Connect the short wire ④ to the mode select coupler ②.



- Reinstall the mode select coupler.
- Start the engine.

CAUTION

Keep the mode select coupler dry when connecting it.

FRONT FORK TUNING

The front fork compression and rebound damping force, and oil capacity are adjustable for rider's preference, rider's weight and course condition.

NOTE:

- * Break-in new front forks before attempting adjustment.
- * Be sure to adjust both right and left front forks equally.
- * Inspect the following items before attempting adjustment.
 - Front fork air pressure adjustment. (🔧 2-36)
 - Front fork damage and oil leakage. (🔧 2-36)
 - Tire pressure. (🔧 2-37)
 - Tire and wheel damage. (🔧 2-36)
 - Spoke nipple tension and rim lock tightness. (🔧 2-37)
 - Steering movement. (🔧 2-37)

COMPRESSION DAMPING FORCE ADJUSTMENT

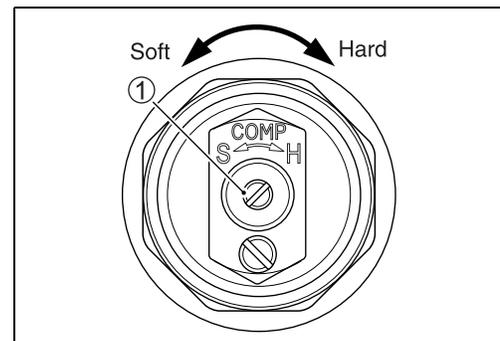
- Turn the adjust screw clockwise until it stops (full hard position).

NOTE:

To set the adjuster, you must gently turn the adjuster screw clockwise until it stops, then back it out the recommended number of turns. Do not force the adjuster screw past the stopped position or you may damage the adjuster.

- Turn the adjust screw ① counterclockwise and the 10th click is the standard position.

DATA Compression damping force adjuster
Standard setting: 10 clicks turn back



REBOUND DAMPING FORCE ADJUSTMENT

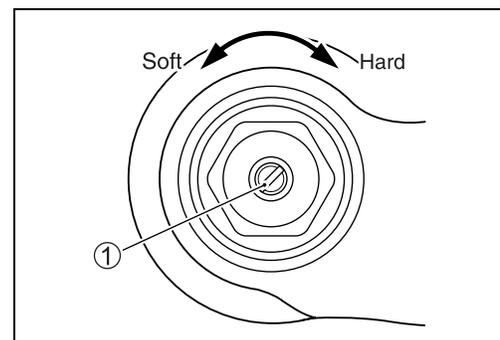
- Turn the adjuster screw clockwise until it stops (full hard position).

NOTE:

To set the adjuster, you must gently turn the adjuster screw clockwise until it stops, then back it out the recommended number of turns. Do not force the adjuster screw past the stopped position or you may damage the adjuster.

- Turn the adjust screw ① counterclockwise and the 9th click is the standard position.

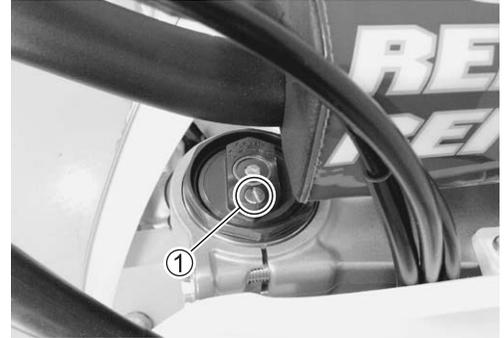
DATA Rebound damping force adjuster
Standard setting: 9 clicks turn back



OIL QUANTITY MINOR ADJUSTMENT

ADDING THE FORK OIL

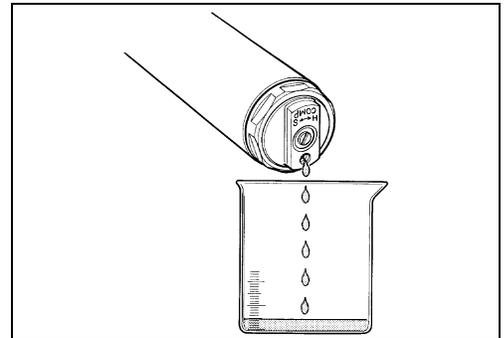
- Remove the air bleeder valve ①.
- Add the fork oil with a injector from the air bleed hole.



REDUCING THE FORK OIL

- Remove the front forks. (↖ 18-5)
- Remove the air bleeder valve.
- Leaning the front fork, reduce the fork oil from the air bleed hole.

Front fork tuning procedure (↖ 4-10)



CAUTION

- * The fork oil quantity must be adjusted equally on both fork legs to provide equal performance.
- * Operating the motorcycle with the fork oil quantity unevenly adjusted can cause handling instability.
- * Never mix different types of fork oil. Different oils may cause chemical reaction and deteriorate.

FORK 99000-99001-SS5: SUZUKI FORK OIL SS-05
or equivalent

U Front fork air bleeder valve: 1.3 N·m (0.13 kgf·m, 1.0 lbf·ft)

OIL CHANGE (Only for outer tube oil chamber)

- Remove the front forks. (🔧 18-5)
- Thoroughly clean the fork before disassembly.

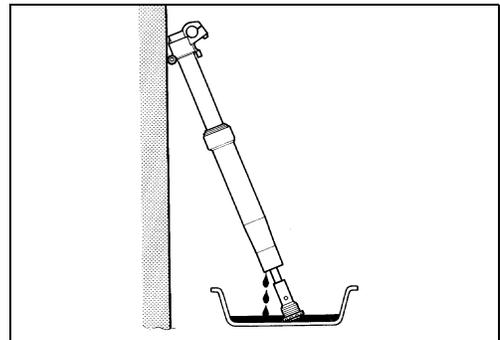
CAUTION

- * The fork oil quantity must be adjusted equally on both fork legs to provide equal performance.
- * Scratches or other damage on the inner tube or on the oil seal lip will cause oil leak.
- * Avoid scratching or damaging the inner tube or the oil seal. Use a mild detergent or car wash soap and sponge out dirt with plenty of water.

- Clamp the outer tube with a vise. Protect the outer tube with a rag when using a vise. (🔧 18-6)
- Loosen and remove the fork cap bolt (sub-tank) from the outer tube and slowly slide down the outer tube. (🔧 18-6)

09941-53630: Front fork top cap wrench

- Hold the front fork inverted position for more than 20 minutes to allow the fork oil to fully drain.

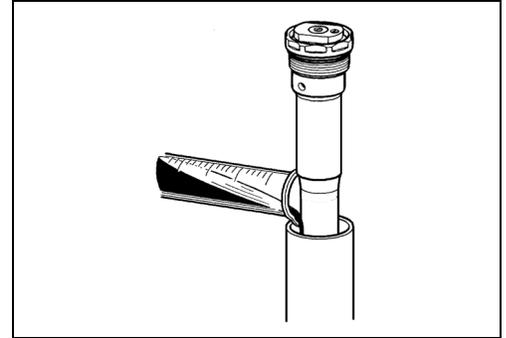


- Force out the remaining oil using compressed air completely.



- Slide down the outer tube.
- Pour the specified amount of fork oil into the outer tube.

FORK 99000-99001-SS5: SUZUKI FORK OIL SS-05 or equivalent



	Parts No.	Spring rate	Identification (Slit mark on the spring end)	STD Oil quantity	Oil quantity adjustable range
Soft	51171-28H10	4.5 N/mm (0.45 kgf/mm)	45°: I 120°: II (See Fig.1 below)	375 ml (12.68/13.20 US/Imp oz)	312 – 411 ml (10.55/10.99 – 13.89/14.47 US/Imp oz)
STD	51171-28H00	4.7 N/mm (0.47 kgf/mm)	45°: III 120°: II (See Fig.2 below)	375 ml (12.68/13.20 US/Imp oz)	312 – 411 ml (10.55/10.99 – 13.89/14.47 US/Imp oz)
Hard	51171-28H20	4.9 N/mm (0.49 kgf/mm)	45°: II 120°: II (See Fig.3 below)	375 ml (12.68/13.20 US/Imp oz)	312 – 411 ml (10.55/10.99 – 13.89/14.47 US/Imp oz)

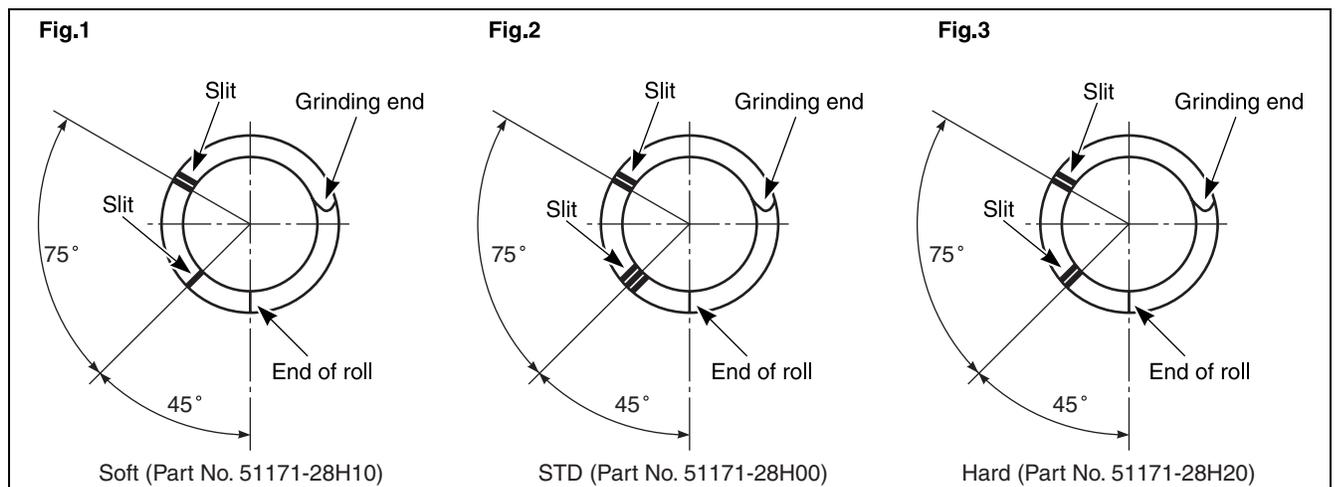
NOTE:

Be sure to adjust the fork oil quantity within the above-mentioned range.

- Raise the outer tube and temporarily tighten the fork cap bolt (sub-tank). (🔧 18-17)

TOOL 09941-53630: Front fork top cap wrench

- Install the front forks. (🔧 18-18)



SPRING CHANGE

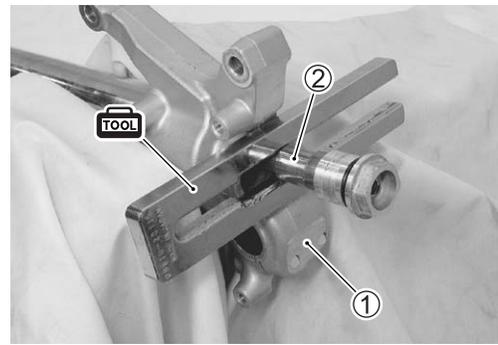
- Remove the front forks. (☞ 18-5)
- Thoroughly clean the fork before disassembly.

CAUTION

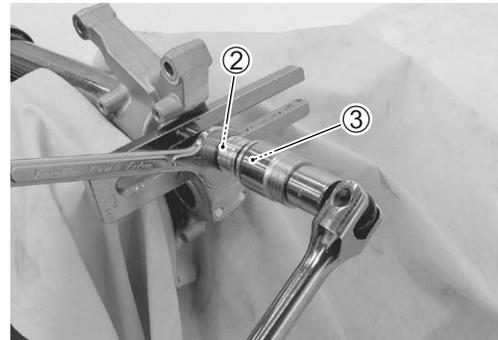
- * The fork oil quantity must be adjusted equally on both fork legs to provide equal performance.
- * Scratches or other damage on the inner tube or on the oil seal lip will cause oil leakage.
- * Avoid scratching or damaging the inner tube or the oil seal. Use a mild detergent or car wash soap and sponge out dirt with plenty of water.

- Remove the fork cap bolt and drain fork oil. (☞ 18-6)
- Loosen the center bolt completely. (☞ 18-7)
- Compress the outer tube by hands and install the piston holder (special tool) between the axle holder ① and lock-nut ②.

 09910-20115: Piston holder



- Hold the lock-nut ② with a wrench and remove the center bolt ③.
- Remove the push rod. (☞ 18-7)
- Remove the damper rod assembly and fork spring. (☞ 18-8)
- Hold the front fork inverted position for more than 20 minutes to allow the fork oil to fully drain. (☞ 4-6)
- Force out the remaining oil using compressed air completely. (☞ 4-6)



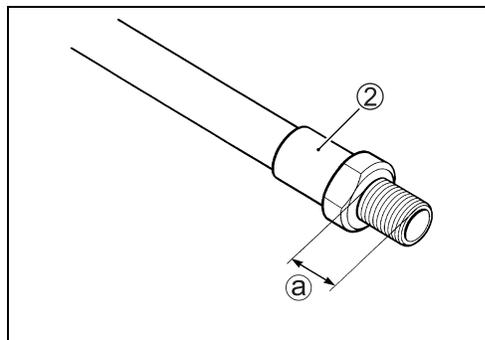
- Replace the spring.

	SPRING/No.	SPRING RATE	Identification (Slit mark on the spring end)
Soft	51171-28H10	4.5 N/mm (0.45 kgf/mm)	(☞ 4-7)
STD	51171-28H00	4.7 N/mm (0.47 kgf/mm)	(☞ 4-7)
Hard	51171-28H20	4.9 N/mm (0.49 kgf/mm)	(☞ 4-7)

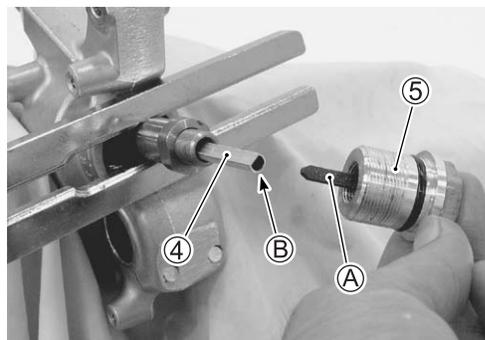


- Make sure approx. 10 mm (0.39 in) of inner rod thread is exposed on the end.

- ② Lock-nut
- Ⓐ Approx. 10 mm (0.39 in)



- Install the damper rod assembly. (🔧 18-15)
- Insert the push rod ④ into the inner rod.
- Insert the  shaped projection ① of center bolt ⑤ into the push rod ③. (🔧 18-16)



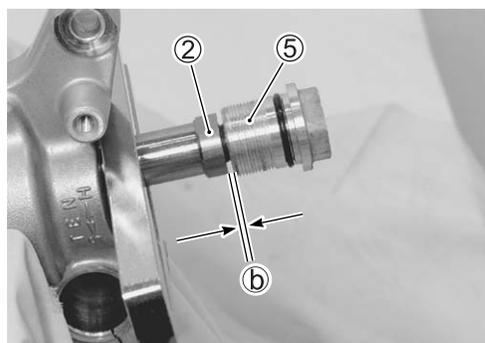
- Check or adjust the clearance between the lock-nut ② and center bolt ⑤ to provide more than 1 mm (0.04 in) and more. (🔧 18-16)
- Tighten the lock-nut/center bolt to the specified torque.

 **Lock-nut/center bolt: 22 N·m (2.2 kgf·m, 16.0 lbf·ft)**

- Tighten the center bolt to the specified torque.

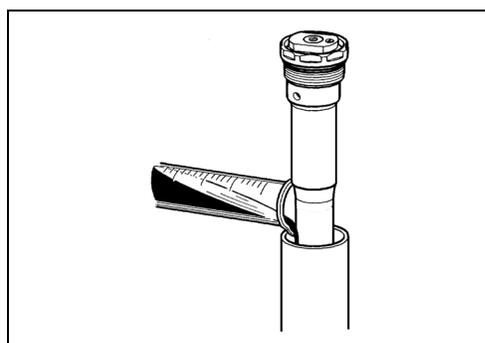
 **Center bolt: 69 N·m (6.9 kgf·m, 50.0 lbf·ft)**

- Ⓑ 1 mm (0.04 in) and more



- Pour the specified amount fork oil into the outer tube in accordance with the following table.

	SPRING	STD OIL QUANTITY	OIL QUANTITY ADJ. RANGE
Soft	51171-28H10	375 ml (12.68/13.20 US/Imp oz)	312 – 411 ml (10.55/10.99 – 13.89/14.47 US/Imp oz)
STD	51171-28H00	375 ml (12.68/13.20 US/Imp oz)	312 – 411 ml (10.55/10.99 – 13.89/14.47 US/Imp oz)
Hard	51171-28H20	375 ml (12.68/13.20 US/Imp oz)	312 – 411 ml (10.55/10.99 – 13.89/14.47 US/Imp oz)



 **99000-99001-SS5: SUZUKI FORK OIL SS-05**
or equivalent

FRONT FORK TUNING PROCEDURE

Test ride the motorcycle and find out how the front suspension reacts on various types of surface. According to the symptom noticed, adjust the front fork to the best setting for rider and race track conditions. To adjust, attempt changing fork oil capacity and compression and rebound damping force following the instructions below.

SYMPTOM	SECTION	ADJUSTMENT PROCEDURE
Feels too hard overall	<ul style="list-style-type: none"> • Jump • Large bumps • Series of medium bumps 	<ol style="list-style-type: none"> 1. Adjust both compression and rebound damping force to a softer setting. 2. Decrease fork oil capacity. 3. Change the spring with an optional softer one.
Feels too soft overall and bottoms	<ul style="list-style-type: none"> • Jump • Large bump • When braking 	<ol style="list-style-type: none"> 1. Adjust the compression damping force to a stiffer setting. 2. Increase fork oil capacity. 3. Change the spring with an optional stiffer one.
Feels too hard near end of travel	<ul style="list-style-type: none"> • Jump 	<ol style="list-style-type: none"> 1. Decrease fork oil capacity.
Feels too soft near end of travel and bottoms harshly	<ul style="list-style-type: none"> • Jump • Large bump 	<ol style="list-style-type: none"> 1. Adjust the compression damping force to a stiffer setting. 2. Increase fork oil capacity.
Feels too hard in the beginning of stroke	<ul style="list-style-type: none"> • Jump • Large bump • Series of medium bumps • Series of small bumps 	<ol style="list-style-type: none"> 1. Adjust the compression damping force to a softer setting.
Feels too soft and unstable	<ul style="list-style-type: none"> • Series of medium bumps • Series of small bumps 	<ol style="list-style-type: none"> 1. Adjust the rebound damping force to a stiffer setting.
Bounces	<ul style="list-style-type: none"> • Jump • Large bump 	<ol style="list-style-type: none"> 1. Adjust the rebound damping force to a stiffer setting.
Bounces	<ul style="list-style-type: none"> • Series of small bumps 	<ol style="list-style-type: none"> 1. Adjust the rebound damping force to a softer setting.

NOTE:

When adjusting the front fork oil capacity, make sure that the oil capacity is within the specified range. Also, the capacity should be increased or decreased by 1 ml (0.034/0.035 US/Imp oz).

When adjusting the damping force, attempt turning the adjuster 1 to 2 click stops at a time for each adjustment.

REAR SUSPENSION TUNING

The rear suspension compression and rebound damping force, and spring pre-load are adjustable for rider's preference, rider's weight and course condition.

NOTE:

- * Break-in the rear suspension when riding with a new rear cushion unit. (🔧 1-6)
- * Inspect the following items before attempting adjustment.
 - Rear shock absorber damage and oil leakage. (🔧 2-36)
 - Swingarm and links tightness. (🔧 2-36)
 - Tire pressure. (🔧 2-37)
 - Tire and wheel damage. (🔧 2-36)
 - Spoke nipple tension and rim lock tightness. (🔧 2-37)

COMPRESSION DAMPING FORCE ADJUSTMENT

NOTE:

To set the adjuster, you must gently turn the adjust screw or bolt clockwise until it stops, then back it out the recommended number of turns. Do not force the adjust screw or bolt past the stopped position, or you may damage the adjuster.

Low-side

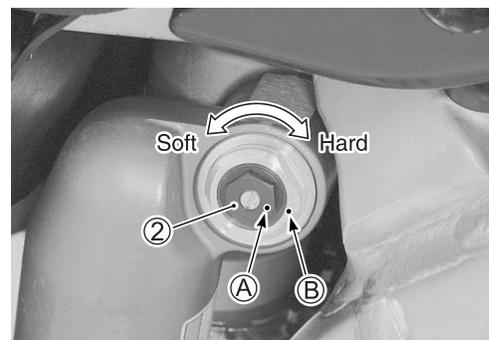
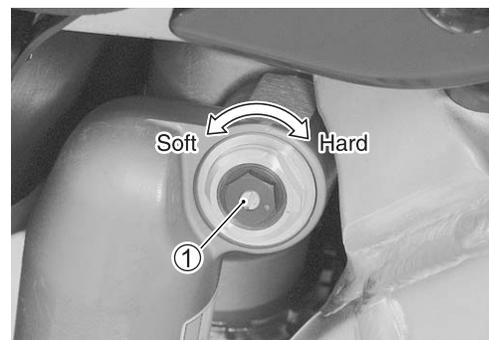
- Turn the adjust screw ① clockwise until it stops (full hard position).
- Turn the adjust screw ① counterclockwise about 12 clicks.

DATA Standard setting: (Lo-side) 12 clicks turn back

High-side

- Turn the adjust bolt ② clockwise until it stops (full hard position).
- Turn the adjust bolt ② counterclockwise about 2 turns until the two punch marks (A, B) align.

DATA Standard setting: (Hi-side) 2 turns back



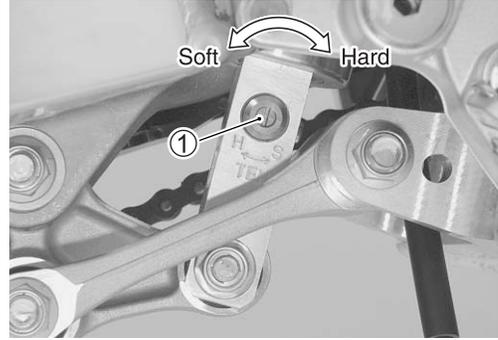
REBOUND DAMPING FORCE ADJUSTMENT

NOTE:

To set the adjuster, you must gently turn the adjust screw clockwise until it stops, then back it out the recommended number of turns. Do not force the adjust screw past the stopped position, or you may damage the adjuster.

- Turn the adjust screw ① clockwise until it stops (full hard position).
- Turn the adjust screw ① counterclockwise about 14 clicks until the two punch marks align.

DATA Standard setting: 14 clicks turn back



SPRING PRE-LOAD ADJUSTMENT

- Place a block under the chassis tube.
- Remove the muffler and seat rail assembly. (☞ 19-3)
- Loosen the lock-nut ① with the special tool.

TOOL 09910-60611: Universal clamp wrench

- Turn the adjuster ② clockwise or counterclockwise to change the spring pre-load.
- Tighten the lock-nut ①.

DATA Standard spring set length: 4.2 mm (0.17 in) compressed from spring free length

Spring set length adjustable range:

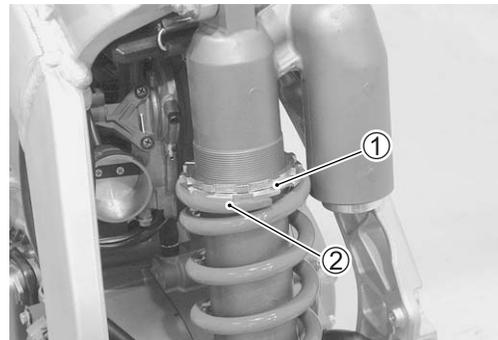
248 – 263 mm (9.76 – 10.35 in)

[at spring free length 265 mm (10.43 in)]

W Spring adjuster lock-nut: 44 N·m (4.4 kgf·m, 32.0 lbf·ft)

NOTE:

Turning the adjuster ② without loosening the lock-nut ① can damage the rear cushion unit.

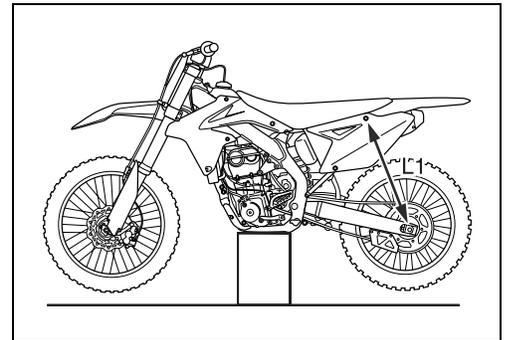


REAR SUSPENSION TUNING PROCEDURE

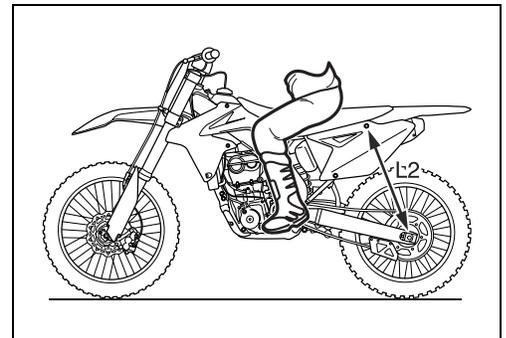
- Adjust the rear suspension according to the rider's weight and preference by referring to the table below.

Spring	Part No.	Spring rate	Marking paint	Set-length adjustable range
Soft	62211-37FK0	53 N/mm (5.3 kgf/mm)	Orange	248 – 263 mm (9.76 – 10.35 in) [at spring free length 265 mm (10.43 in)]
	62211-37FL0	55 N/mm (5.5 kgf/mm)	Red × 2	
Standard	62211-35G30	57 N/mm (5.7 kgf/mm)	Pink × 2	
Hard	62211-35G40	59 N/mm (5.9 kgf/mm)	Blue	

- Measure the distance L1 from the seat bolt to the chain adjuster lock-nut with the motorcycle on the stand and the rear wheel lifted off the ground.



- Measure the distance L2 from the seat bolt to the chain adjuster lock-nut with the motorcycle off the stand and riding the motorcycle normally in full riding gear.
- Find the sag by subtracting L2 from L1. Standard sag range is 100 mm (3.94 in).



When the sag measured is:	Adjustment procedure
Less than 100 mm (3.94 in)	Reduce spring pre-set length by turning the spring adjuster nut.
More than 100 mm (3.94 in)	Increase spring pre-set length by turning the spring adjuster nut.

After the sag measurement has been set 100 mm (3.94 in), test ride the motorcycle and adjust the suspension for the rider and track conditions referring to the guide below.

SYMPTOM	SECTION	ADJUSTMENT PROCEDURE
Feels too hard overall	<ul style="list-style-type: none"> • Jump • Series of bumps 	<ol style="list-style-type: none"> 1. Adjust the low-speed compression damping force to a softer setting. (See note below.) 2. Adjust the rebound damping force to a softer setting. (See note below.) 3. Change the spring with an optional softer one. (☞ 4-13) 4. Adjust the high-speed compression damping force to a softer setting. (See note below.)
Kicks up	<ul style="list-style-type: none"> • Medium to large bumps 	<ol style="list-style-type: none"> 1. Adjust the low-speed compression damping force and rebound damping force to a harder setting. (See note below.) 2. Adjust the high-speed compression damping force to a harder setting. (See note below.)
Bottom feeling or feels too soft and unstable	<ul style="list-style-type: none"> • Jump • Large bump • Series of bumps 	<ol style="list-style-type: none"> 1. Adjust the low-speed compression damping force to a harder setting. (See note below.) 2. Adjust the rebound damping force to a harder setting. (See note below.) 3. Change the spring with an optional stiffer one. (☞ 4-13)
Feels harsh and hits bumps too harshly	<ul style="list-style-type: none"> • Jump • Large bump • Series of bumps 	<ol style="list-style-type: none"> 1. Adjust the low-speed compression damping force to a harder setting. (See note below.) 2. Adjust the rebound damping force to a harder setting. (See note below.) 3. If the suspension feels bottom even with the above adjustment, adjust the high-speed compression damping to a harder setting. (See note below.)
Provides poor traction	<ul style="list-style-type: none"> • Accelerating • Series of small bumps 	<ol style="list-style-type: none"> 1. Adjust the rebound damping force to a harder setting. (See note below.) 2. If traction feeling does not improve after adjusting above mention, adjust the low-speed compression damping force to a softer setting. (See note below.) 3. If the suspension feels bottom even with the above adjustment, adjust the high-speed compression damping to a harder setting. (See note below.)
Tends to sink front than rear	<ul style="list-style-type: none"> • Decelerating or braking 	<ol style="list-style-type: none"> 1. Adjust the high-speed compression damping force to a softer setting. (See note below.) 2. Adjust the rebound damping force to a harder setting. (See note below.)

NOTE:

When adjusting the damping force setting, attempt turning the adjuster 1 to 2 click stops at a time for each adjustment.

SUSPENSION BALANCE

Balancing the front to rear suspension properly is the most critical adjustment for suspension performance. If the front forks are adjusted harder than the rear suspension, such as changing to heavier front fork oil, stiffer compression and rebound setting, air pressure build up in the forks and so on, the front forks will collapse less on bumps. This transfers more of the motorcycle and rider weight rearward, possibly causing the rear suspension to bottom, where as it felt fine before the front fork adjustment was made.

BALANCE TEST

Stand next to the motorcycle on level ground. Place one foot on the foot rest closest to you. Sharply push down. The front and rear suspensions should both collapse equally.

BALANCING TIPS

- Check for air pressure build-up in front forks. Heat and altitude will increase air pressure in the front forks.
- Always stay within sag measurement limits, 100 mm (3.94 in), when using spring pre-set to stiffen or soften rear suspension. If this is not possible, the next stiffer or softer accessory spring is needed.
- The rear shock compression damping can be used to fine tune suspension balance and is easy to access.

ENGINE REMOVAL AND INSTALLATION

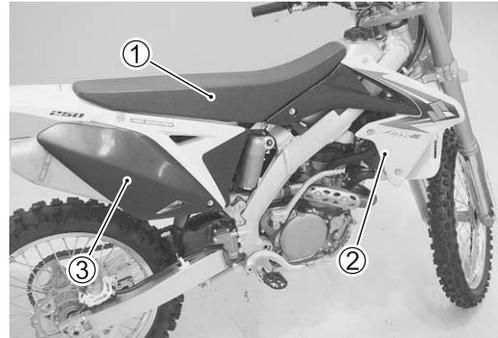
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<i>REMOVAL</i>	<i>5- 2</i>
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ENGINE REMOVAL AND INSTALLATION

REMOVAL

- Drain engine oil. (☞ 2-13)
- Drain engine coolant. (☞ 14-3)
- Remove the seat ①.
- Remove the radiator covers ②, left and right.
- Remove the right frame cover ③.



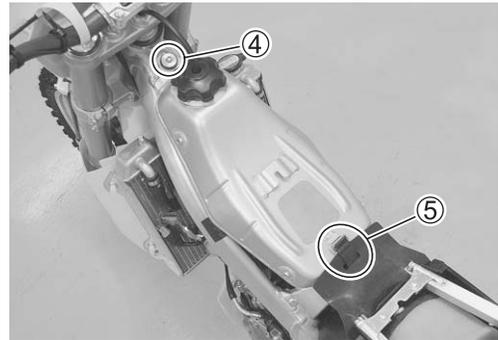
- Place the jack under the frame to support the motorcycle.

⚠ WARNING

To prevent the motorcycle from falling, make sure to support the frame with a jack.



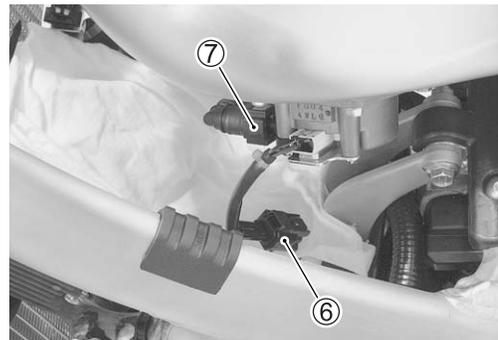
- Remove the fuel tank bolt ④ and rubber band ⑤.



- Lift and hold the fuel tank.
- Disconnect the fuel pump coupler ⑥.
- Place a rag under the fuel hose ⑦ and disconnect the fuel hose ⑦ from the fuel pump.

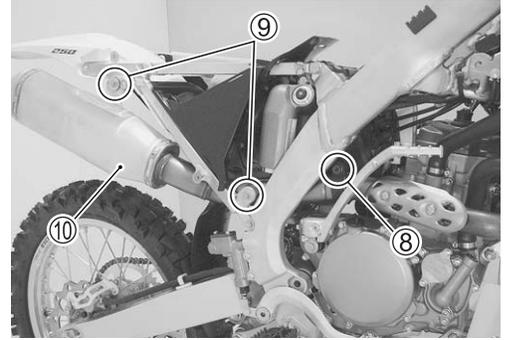
CAUTION

- * Be sure to disconnect the fuel hose ⑦ by hand. Do not disconnect the fuel hose ⑦ with any tool.
- * When removing the fuel tank, do not leave the fuel hose ⑦ on the fuel tank side.

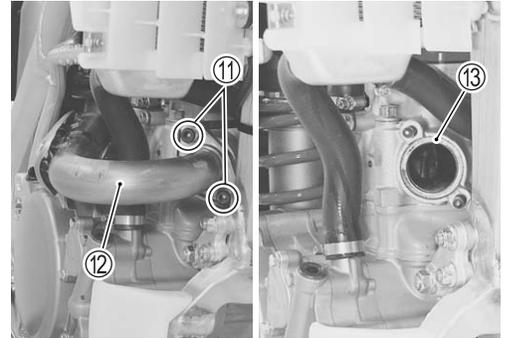


- Remove the fuel tank assembly.

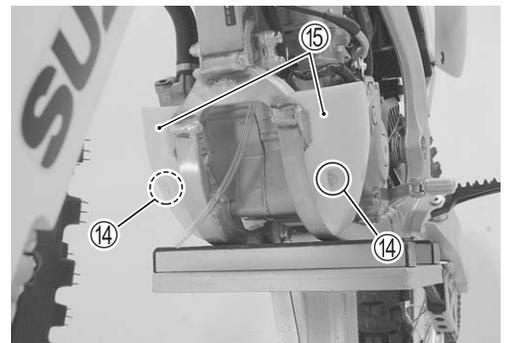
- Loosen the muffler connector clamp bolt ⑧.
- Remove the muffler ⑩ by removing its bolts ⑨.



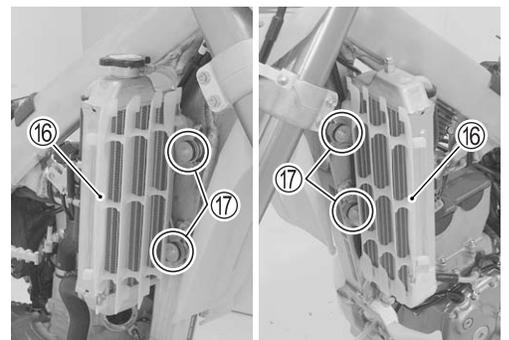
- Remove the exhaust pipe ⑫ by removing their nuts ⑪.
- Remove the exhaust pipe gasket ⑬.



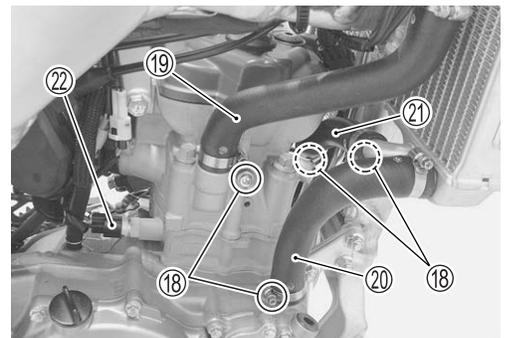
- Remove the front protectors ⑮ by removing their bolts ⑭.



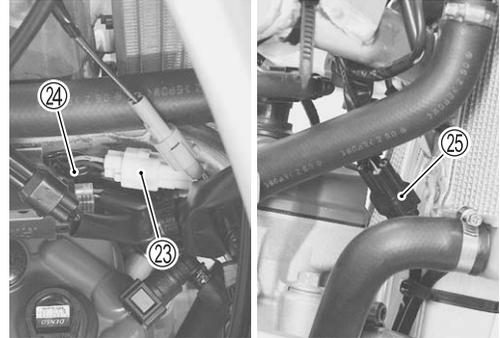
- Remove the radiator louvers ⑯, left and right.
- Remove the radiator mounting bolts ⑰, left and right.



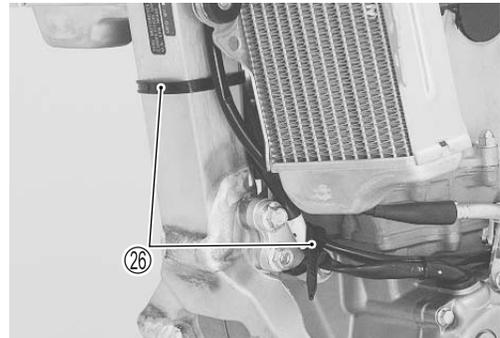
- Loosen the radiator hose clamps ⑱.
- Disconnect the radiator hoses ⑲ and ⑳.
- Remove the radiator hose ㉑.
- Disconnect the ECT sensor coupler ㉒.



- Disconnect the GP switch coupler ②③.
- Remove the GP switch lead wire from the clamp ②④.
- Disconnect the magneto lead wire coupler ②⑤.



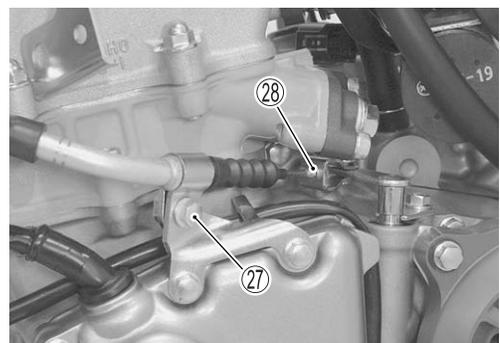
- Remove the clamps ②⑥.



- Remove the clutch cable bracket bolt ②⑦ and disconnect the clutch cable ②⑧.

NOTE:

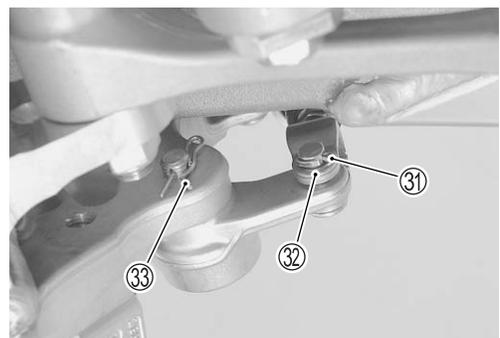
Loosen the clutch cable adjuster when disconnecting.



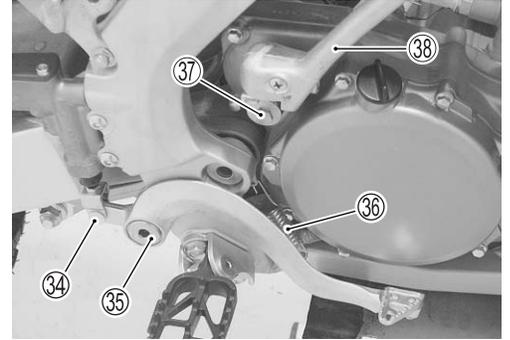
- Remove the throttle body ②⑨. (☞ 13-8, -9)
- Remove the ignition coil/plug cap ③⑩. (☞ 2-7)



- Remove the cotter pin ③①, washer ③② and clip ③③.



- Remove the master cylinder rod pin ③④.
- Remove the brake pedal pivot bolt ③⑤ and return spring ③⑥.
- Remove the kick starter lever ③⑧ by removing its bolt ③⑦.

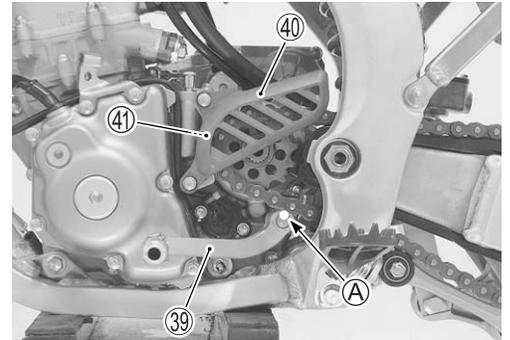


- Remove the gearshift lever ③⑨. (➡ 9-3)

NOTE:

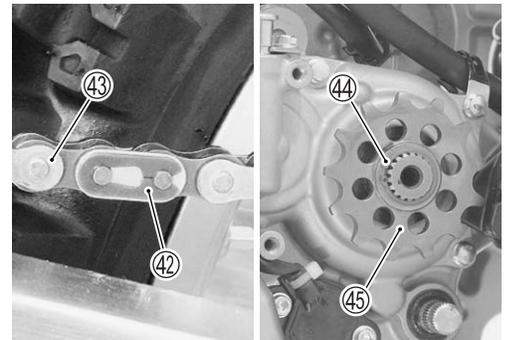
Mark **A** the gearshift shaft head at which the gearshift lever slit set for correct reinstallation.

- Remove the engine sprocket cover ④① and front chain guide plate ④②.



- Remove the drive chain clip ④②, and release the drive chain ④③.
- Remove the snap ring ④④ and engine sprocket ④⑤.

TOOL 09900-06107: Snap ring remover (Open type)

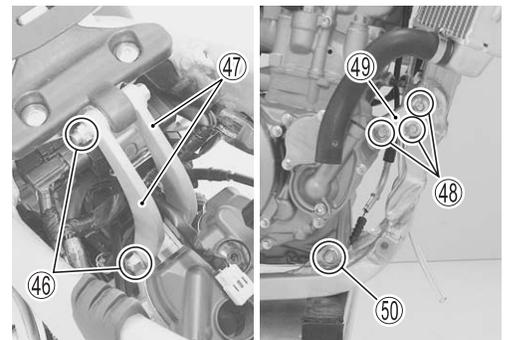


- Remove the engine mounting upper brackets ④⑦ by removing their bolts and nut ④⑥.
- Remove the engine mounting front brackets ④⑨, by removing their bolts and nuts ④⑧.

NOTE:

Do not lose the shim between left engine mounting front bracket ④⑨ and engine.

- Remove the engine mounting bolt and nut ⑤①.

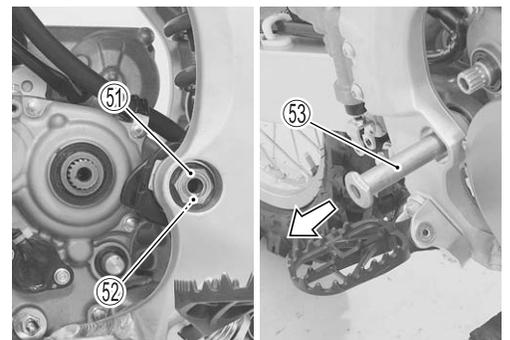


- Remove the swingarm pivot shaft nut ⑤① and washer ⑤②.
- Extract three quarters of the swingarm pivot shaft ⑤③ so as to keep the swingarm in position.

NOTE:

The swingarm will come off when the swingarm pivot shaft ⑤③ is completely removed.

- Remove the engine from the frame.



INSTALLATION

Install the engine in the reverse order of removal. Pay attention to the following points:

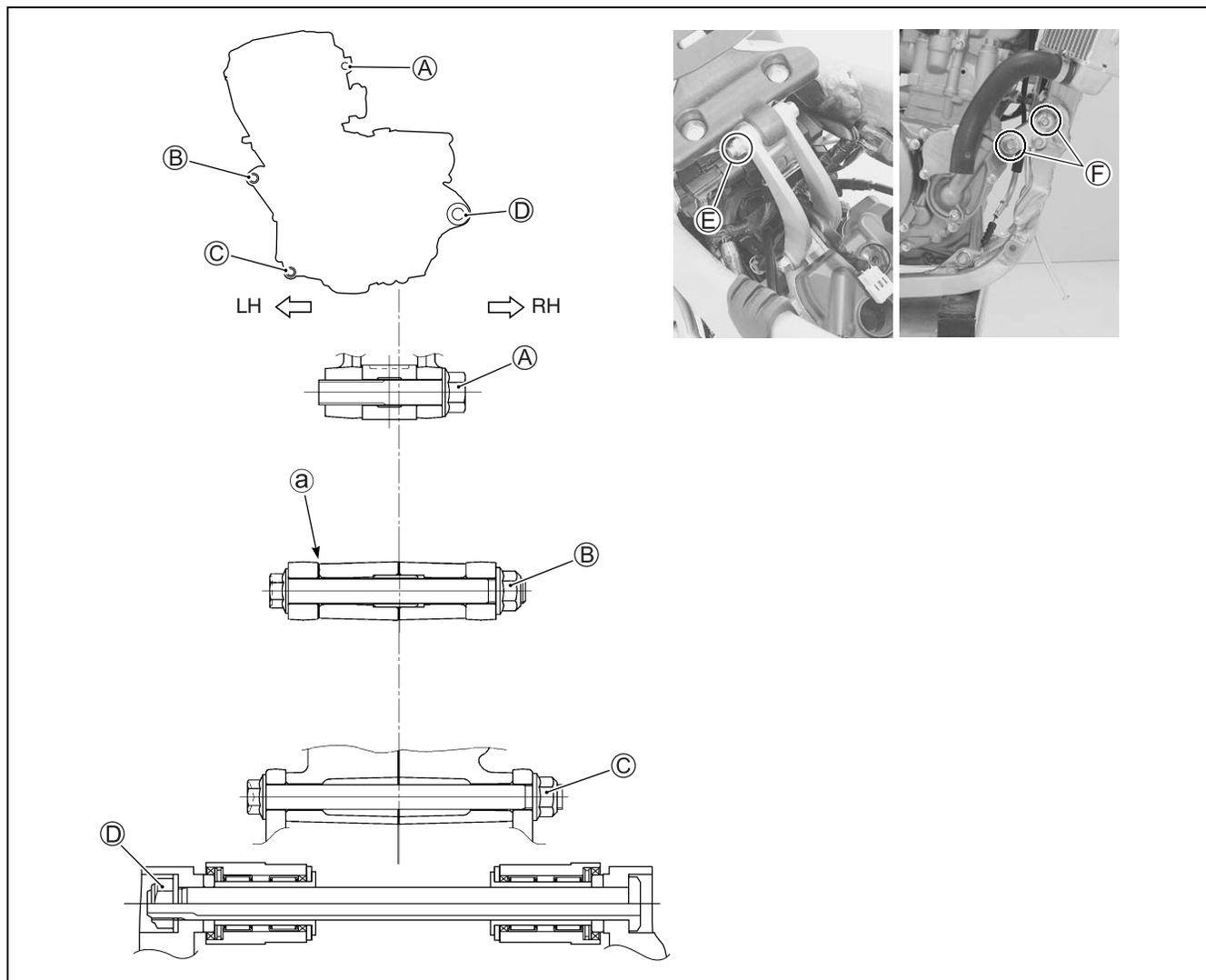
- Fit the swingarm in its position and hold it with the swingarm pivot shaft.
- Mount the engine on the frame.
- Tighten the engine mounting bolts, nuts and swingarm pivot shaft nut to the specified torque.

CAUTION

The engine mounting nut is the self-lock type and cannot be used repeatedly. If the self-lock effect is lost, replace it with a new one.

NOTE:

After the engine has been installed and run, make sure to retighten the fasteners as they are subject to becoming loose.



Ⓐ Shim

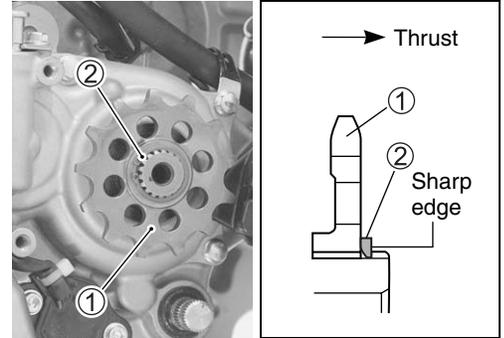
ITEM	N-m	kgf-m	lbf-ft
Ⓐ	45	4.5	32.5
ⒷⒸ	66	6.6	47.5
Ⓓ	70	7.0	50.5
ⒺⒻ	40	4.0	29.0

- Install the engine sprocket ① and snap ring ②.

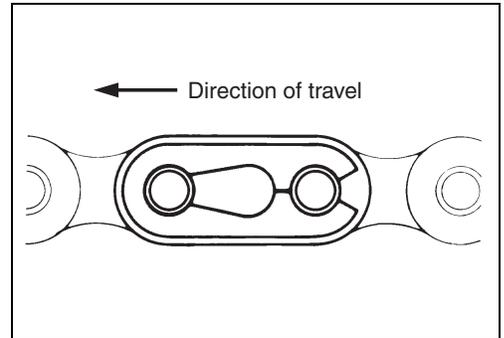
CAUTION

- * Replace the snap ring ② with a new one.
- * Seat the snap ring ② in the groove and locate its end as shown in the illustration.

 **09900-06107: Snap ring remover (Open type)**



- Reassemble the drive chain clip so the slit end faces opposite the direction of travel.



- Install the front chain guide plate ③ and engine sprocket cover ④.

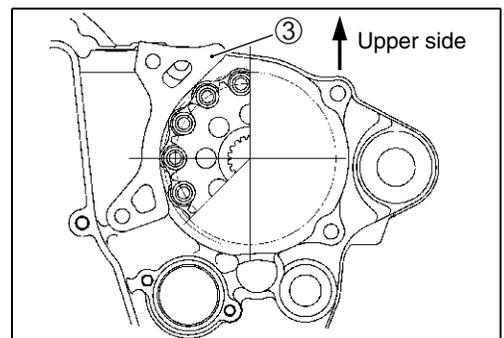
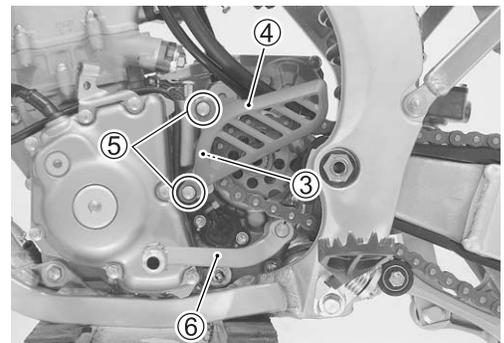
CAUTION

- When installing the front chain guide plate ③, pay attention to its direction.

- Tighten the engine sprocket cover bolts ⑤ to the specified torque.

 **Engine sprocket cover bolt: 11 N·m (1.1 kgf·m, 8.0 lbf·ft)**

- Install the gearshift lever ⑥ in the correct position.

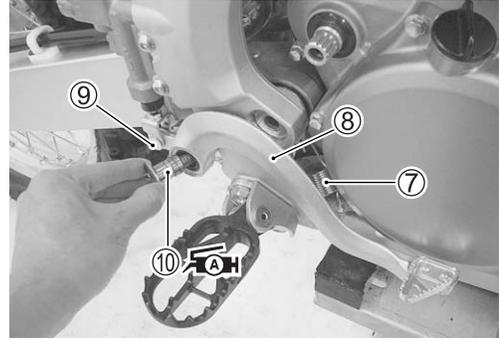


- Install the return spring ⑦, brake pedal ⑧ and master cylinder rod pin ⑨.
- Apply grease to the brake pedal pivot bolt ⑩.

 **99000-25010: SUZUKI SUPER GREASE "A" or equivalent**

- Tighten the brake pedal pivot bolt ⑩ to the specified torque.

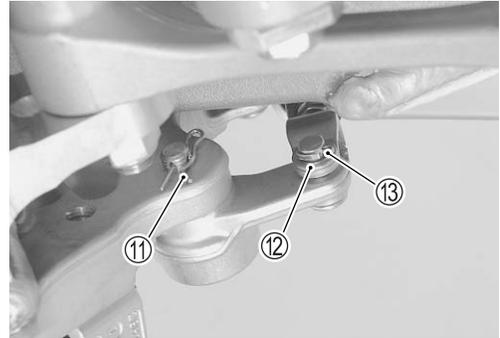
 **Brake pedal pivot bolt: 29 N·m (2.9 kgf-m, 21.0 lbf-ft)**



- Install the clip ⑪, washer ⑫ and cotter pin ⑬.

CAUTION

Replace the cotter pin ⑬ with a new one.



- Install the kick starter lever ⑭ in the correct position. (☞ 8-7, -8)
- Tighten the kick starter lever bolt ⑮ to the specified torque.

 **Kick starter lever bolt: 29 N·m (2.9 kgf-m, 21.0 lbf-ft)**

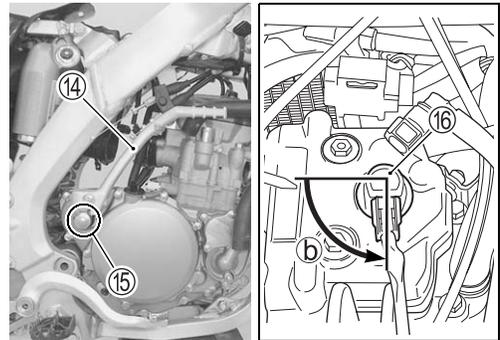
- Install the ignition coil/plug cap ⑯ securely. (☞ 2-8)

NOTE:

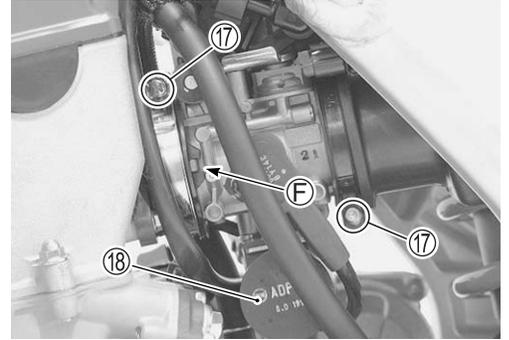
The coupler of ignition coil/plug cap faces backward.

ⓑ 90° – 110°

- Install the ignition coil retainer. (☞ 2-8)

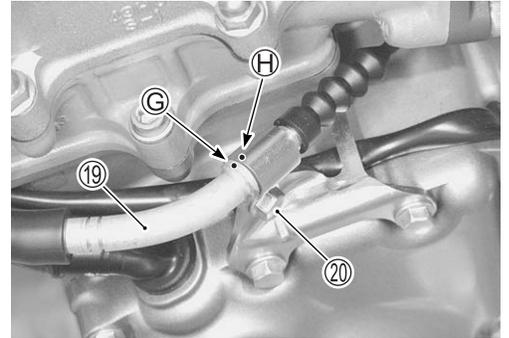


- Fit the projection ⑥ of the throttle body to the depression of intake pipe.
- Position the clamps ⑰ correctly. (☞ 20-23)
- Install the condenser ⑱.



- Align the matching mark ③ on the clutch cable ⑲ with the matching mark ④ on the clutch cable bracket.
- Tighten the clutch cable bracket bolt ⑳ to the specified torque.

Clutch cable bracket bolt: 6 N·m (0.6 kgf-m, 4.5 lbf-ft)



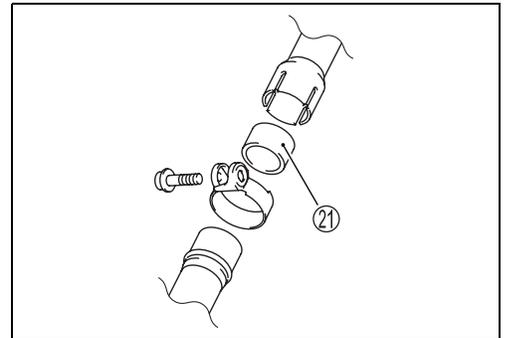
- Install the muffler joint connector ㉑ and exhaust pipe gasket ㉒.

CAUTION

Replace the connector ㉑ and gasket ㉒ with new ones to prevent exhaust gas leakage.

NOTE:

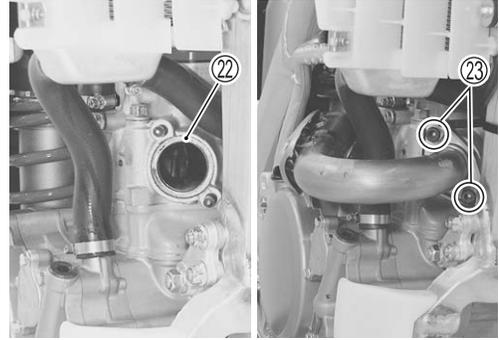
When installing a new connector ㉑, clean the exhaust pipe and joint of the muffler.



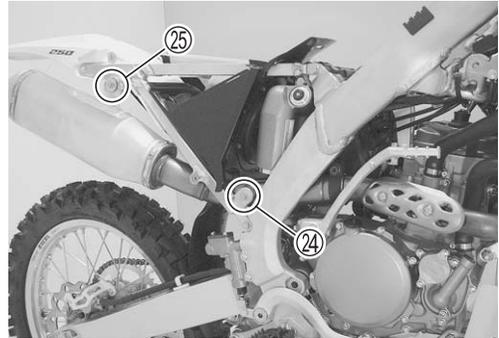
- Temporarily tighten the exhaust pipe nuts ②③.

NOTE:

Degrease the stud bolts and exhaust pipe nuts ②③.



- Insert the muffler to the exhaust pipe.
- Temporarily tighten the muffler mounting front bolt ②④ and rear bolt ②⑤.



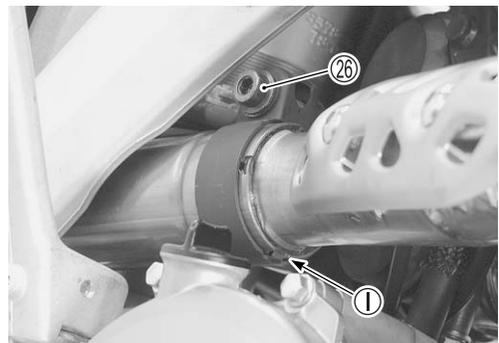
- Temporarily tighten the muffler connector clamp bolt ②⑥.

NOTE:

When installing the connector clamp, fit the convex part ① of the connector clamp onto the concave part of muffler.

- Check the clearance between exhausted pipe and radiator hose.
- Be sure to tighten the bolts and nuts in the following order.

- 1) Muffler mounting front bolt ②④ and rear bolt ②⑤
- 2) Exhaust pipe nuts
- 3) Connector clamp bolt ②⑥



- **Exhaust pipe nut: 18 N·m (1.8 kgf-m, 13.0 lbf-ft)**
- **Muffler mounting bolt (front and rear): 23 N·m (2.3 kgf-m, 16.5 lbf-ft)**
- **Muffler connector clamp bolt: 18 N·m (1.8 kgf-m, 13.0 lbf-ft)**

INSPECTION AFTER INSTALLATION

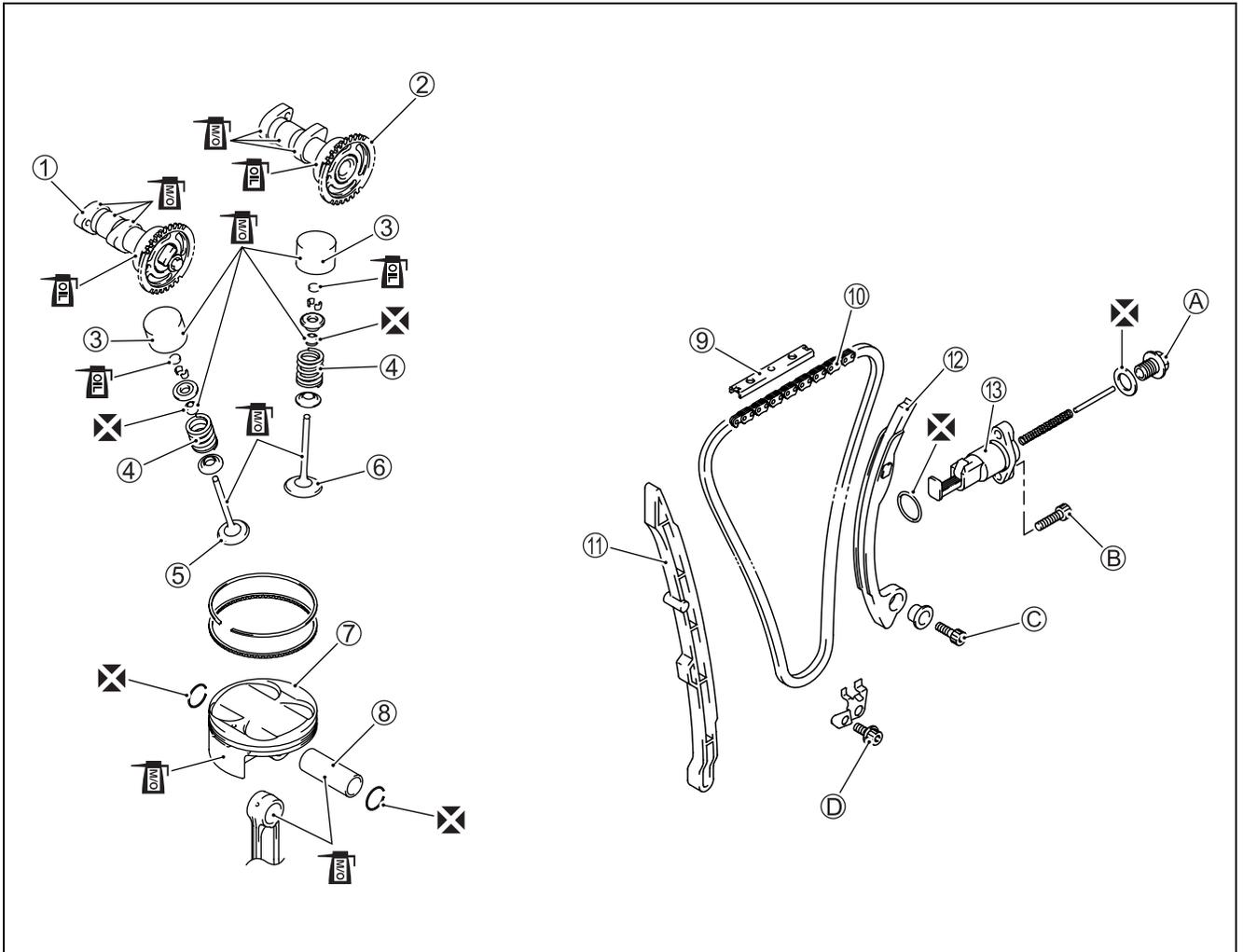
- Engine oil level (☞ 2-12)
- Engine coolant level and coolant leakage (☞ 2-18, -19)
- Fuel leakage
- Exhaust gas leakage
- Throttle cable play (☞ 2-21)
- Clutch cable play (☞ 2-20)
- Drive chain slack (☞ 2-30)
- Brake pedal height (☞ 2-35)
- Wiring harness, cable and hose routing (☞ 20-18 to -24)

CYLINDER HEAD, CYLINDER AND PISTON

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CAMSHAFT, CAM CHAIN AND PISTON



①	Exhaust camshaft	⑩	Cam chain
②	Intake camshaft	⑪	Cam chain No.1 guide
③	Tappet	⑫	Cam chain tensioner
④	Valve spring	⑬	Cam chain tension adjuster
⑤	Exhaust valve	Ⓐ	Cam chain tension adjuster cap bolt
⑥	Intake valve	Ⓑ	Cam chain tension adjuster mounting bolt
⑦	Piston	Ⓒ	Cam chain tensioner bolt
⑧	Piston pin	Ⓓ	Cam chain guide retainer bolt
⑨	Cam chain No.2 guide		

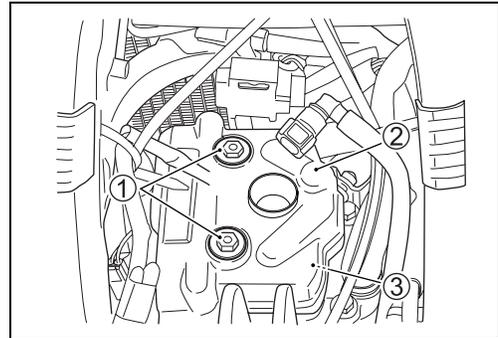


ITEM	N·m	kgf·m	lbf·ft
Ⓐ	23	2.3	16.5
ⒷⒸⒹ	10	1.0	7.0

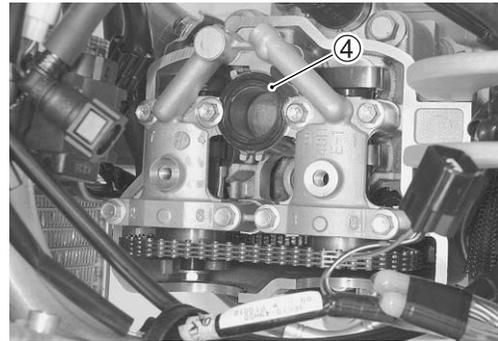
ENGINE TOP SIDE DISASSEMBLY

CYLINDER HEAD COVER REMOVAL

- Remove the seat. (☞ 5-2)
- Remove the radiator covers and fuel tank. (☞ 13-2, -3)
- Remove the ignition coil/plug cap and spark plug. (☞ 2-7)
- Remove the cylinder head cover ② and gasket ③ by removing their bolts ①.

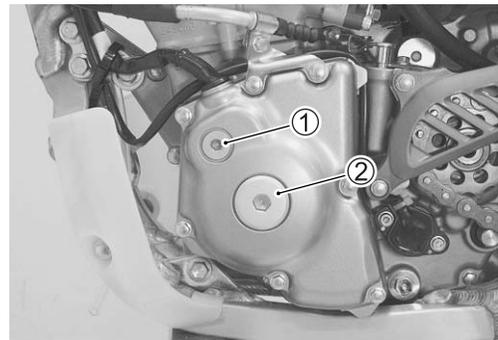


- Remove the cylinder head cover No.2 gasket ④.



CAMSHAFTS (AUTOMATIC DECOMP.) AND CAM CHAIN TENSION ADJUSTER REMOVAL

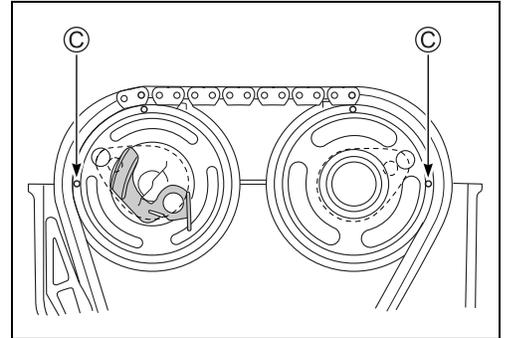
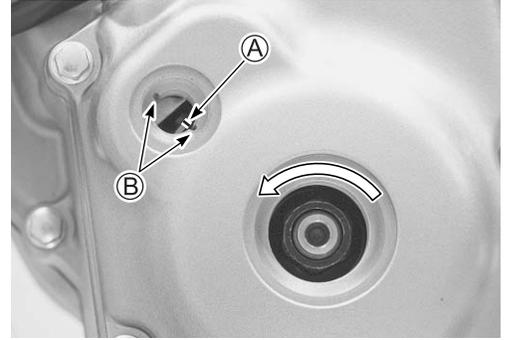
- Remove the cylinder head cover. (☞ above)
- Drain engine oil. (☞ 2-13)
- Remove the TDC plug ① and crankshaft hole plug ②.



- Place a wrench over the crankshaft and turn it counter clockwise to align the TDC mark (A) with the center of the groove (B) of the timing inspection hole.

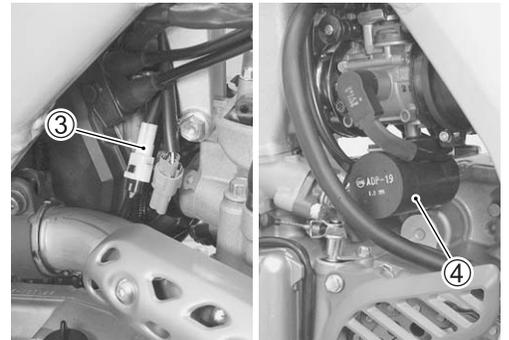
NOTE:

- The piston must be at TDC on the compression stroke.*
- Make sure that the cylinder is at TDC on compression stroke and also the timing mark (C) on the camshafts are aligned with the mating surface of the cylinder head.*

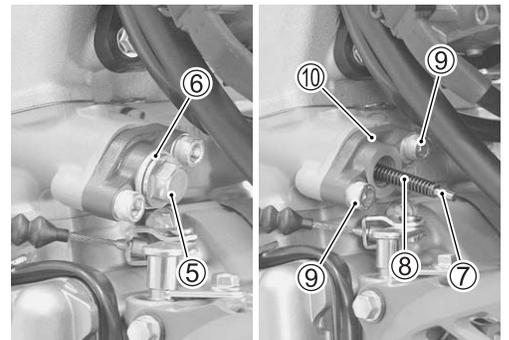


© Timing mark

- Disconnect the condenser coupler (3) and remove the condenser (4).



- Remove the cam chain tension adjuster cap bolt (5), gasket (6), bar (7) and spring (8).
- Remove the cam chain tension adjuster (10) by removing its bolts (9).



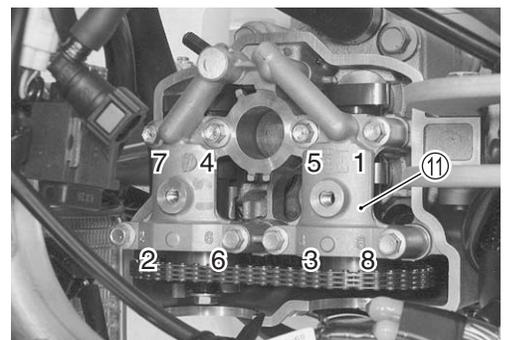
- Remove the camshaft journal holder (11).

CAUTION

Be sure to loosen the camshaft journal holder bolts evenly by shifting the wrench in the descending order of numbers.

NOTE:

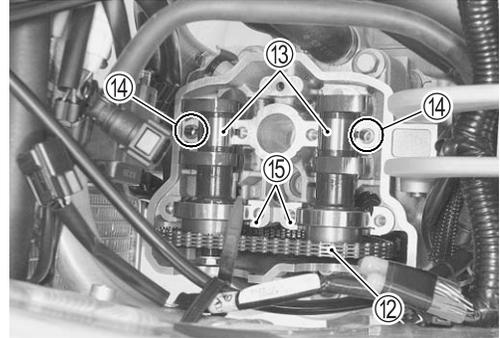
The descending order of numbers are indicated on the camshaft journal holder.



- Disengage the camshafts ⑬ from cam chain ⑫.
- Remove the dowel pins ⑭ and C-rings ⑮.

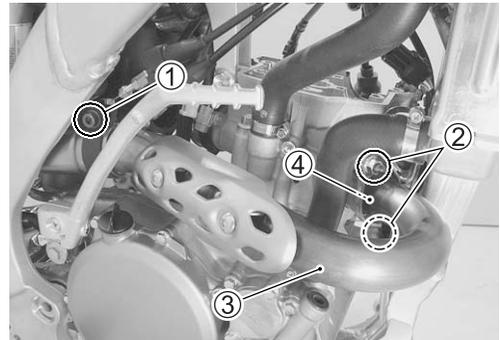
CAUTION

Do not drop the cam chain ⑫, dowel pins ⑭ and C-rings ⑮ into the crankcase.

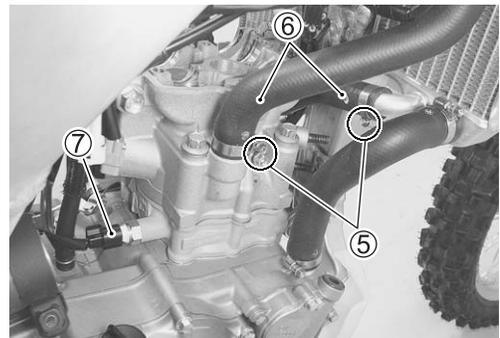


CYLINDER HEAD REMOVAL

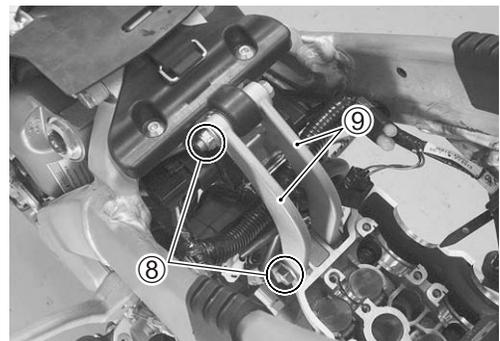
- Remove the camshafts. (☞ 6-4, -5)
- Remove the spark plug. (☞ 2-7)
- Remove the throttle body. (☞ 13-8, -9)
- Drain engine coolant. (☞ 14-3)
- Loosen the muffler connector clamp bolt ①.
- Remove the exhaust pipe ③ by removing their nuts ②.
- Remove the exhaust pipe gasket ④



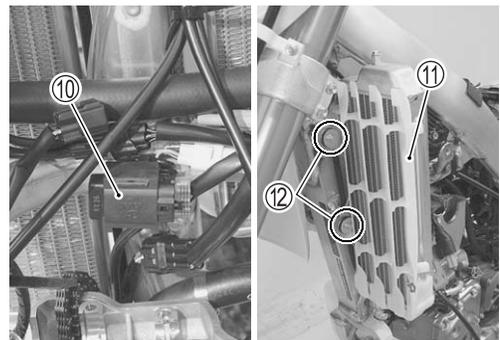
- Disconnect the radiator hoses ⑥ by loosening their clamp screws ⑤.
- Disconnect the ECT sensor coupler ⑦.



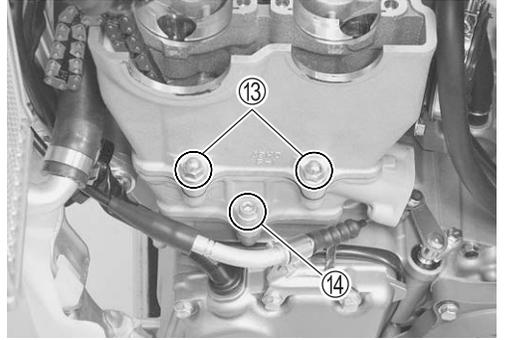
- Remove the engine mounting upper brackets ⑨ by removing their bolts and nut ⑧.



- Remove the TO sensor ⑩.
- Remove the left radiator louver ⑪.
- Remove the left radiator mounting bolts ⑫.



- Remove the cylinder head base nuts ⑬.
- Loosen the cylinder base bolt ⑭.



- Remove the cylinder head bolts ⑮.

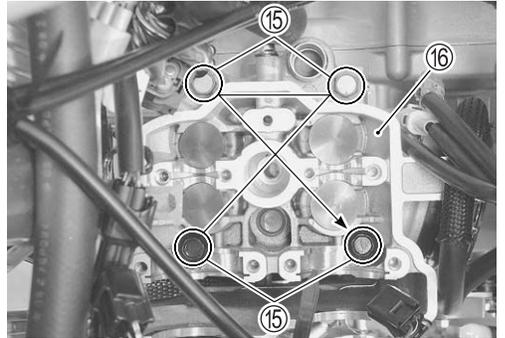
NOTE:

When loosening the cylinder head bolts ⑮, loosen each bolt little by little diagonally.

- Remove the cylinder head ⑯.

NOTE:

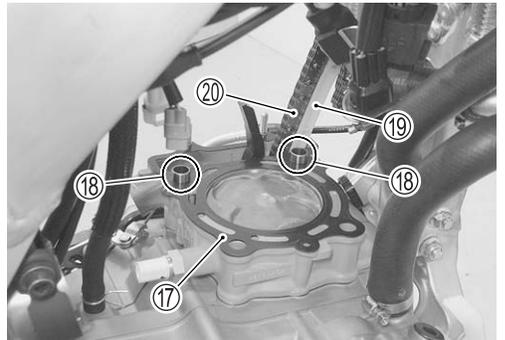
If the cylinder head does not come off easily, lightly tap it using a plastic hammer.



- Remove the cylinder head gasket ⑰, dowel pins ⑱ and cam chain No.1 guide ⑲.

CAUTION

Do not drop the dowel pins ⑱ and cam chain ⑳ into the crankcase.



CYLINDER REMOVAL

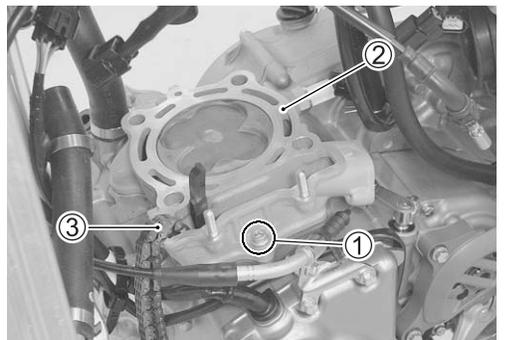
- Remove the cylinder head. (☞ 6-6)
- Remove the cylinder ② by removing the cylinder base bolt ①.

CAUTION

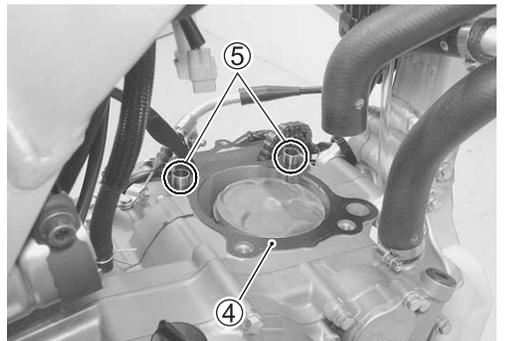
Do not drop the cam chain ③ into the crankcase.

NOTE:

If the cylinder does not come off easily, lightly tap it using a plastic hammer.



- Remove the cylinder gasket ④ and dowel pins ⑤.

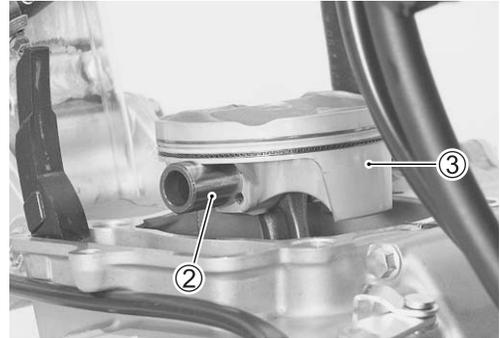


PISTON AND PISTON RING REMOVAL

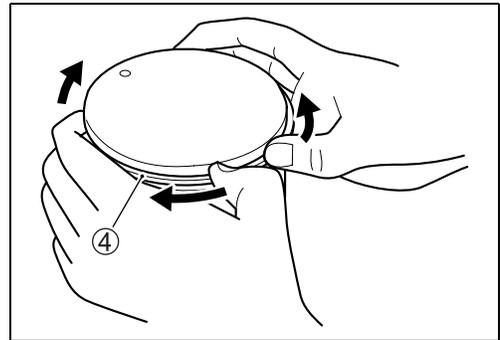
- Remove the cylinder. (☞ 6-7)
- Place a clean rag over the cylinder base to prevent the piston pin circlip ① from dropping into the crankcase.
- Remove the piston pin circlip ①.



- Remove the piston pin ② and piston ③.

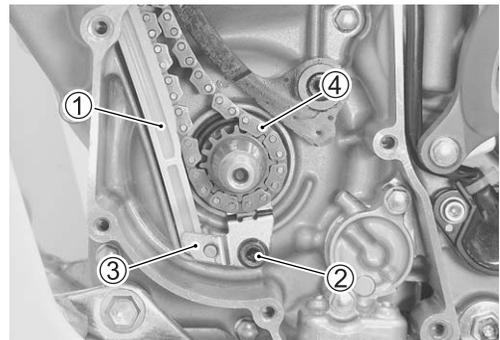


- Carefully spread the ring opening with your thumbs and then push up the opposite side of the ring ④ to remove it.
- Remove the oil ring in the same procedure.

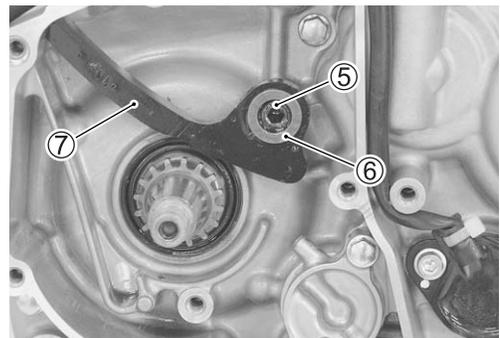


CAM CHAIN, CAM CHAIN TENSIONER AND CAM CHAIN No.1 GUIDE REMOVAL

- Remove the cylinder head. (☞ 6-6, -7)
- Remove the magneto cover and magnet rotor. (☞ 15-17, -18)
- Remove the cam chain No.1 guide ①.
- Remove the cam chain guide retainer ③ by removing its bolt ②.
- Remove the cam chain ④.



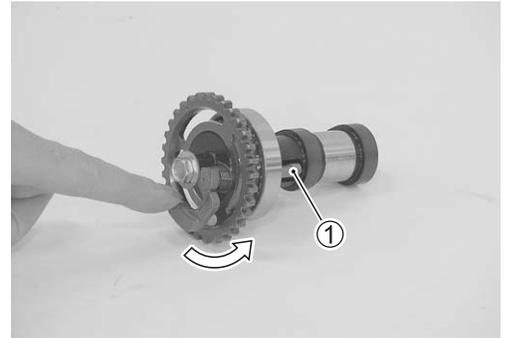
- Remove the spacer ⑥ and cam chain tensioner ⑦ by removing the bolt ⑤.



ENGINE TOP COMPONENTS INSPECTION AND SERVICE

AUTOMATIC DECOMP. INSPECTION

- Check the decomp. cam moves smoothly and shaft ① rotates together.
- If any abnormal condition are found, replace the camshaft assembly.



CAMSHAFT INSPECTION

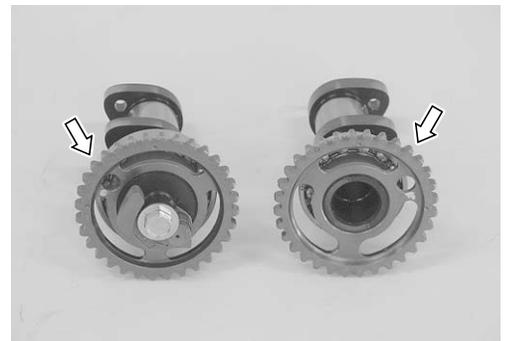
CAUTION

The camshaft assembly can not be disassembled.



CAM SPROCKET

- Inspect the sprocket teeth for wear.
- If they are worn, replace the camshafts, crankshaft and cam chain as a set.



CAMSHAFT BEARING

- Inspect the bearings for play, discoloration, wear and seizure.
- Move the outer race by finger and inspect for smooth movement.
- If there is anything unusual, replace the camshaft assembly.



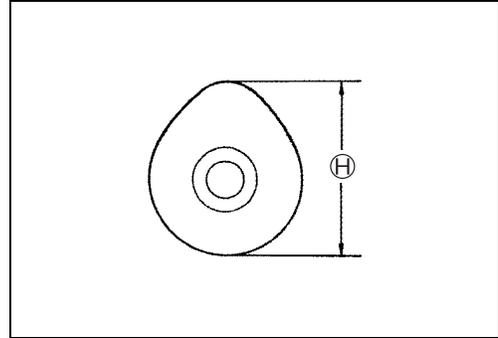
CAM WEAR

- Measure the cam height \ominus using the micrometer.
- Replace a camshaft if the cams are worn to the service limit.

DATA Cam height \ominus

Service Limit IN.: 34.48 mm (1.357 in)
EX.: 33.64 mm (1.324 in)

TOOL 09900-20202: Micrometer (25 – 50 mm)



CAMSHAFT JOURNAL WEAR

- Determine whether or not each journal is worn down to the limit by measuring the oil clearance with the camshaft installed in place.
- Use the plastigauge to read the clearance at the widest portion, which is specified as follows:

TOOL 09900-22301: Plastigauge (0.025 – 0.076 mm)
 09900-22302: Plastigauge (0.051 – 0.152 mm)

- Tighten the camshaft journal holder in ascending order of numbers to the specified torque. (6-32)

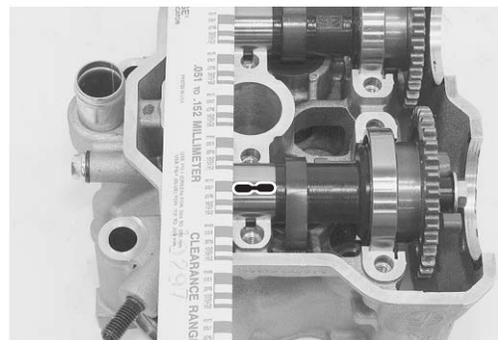
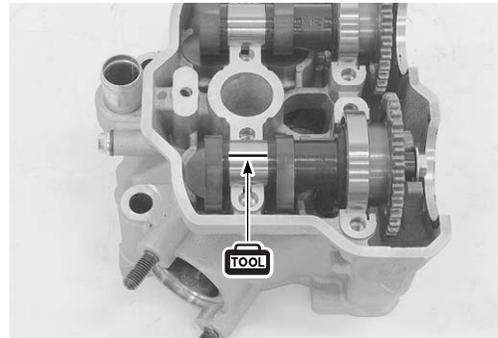
Camshaft journal holder bolt:
10 N·m (1.0 kgf·m, 7.0 lbf·ft)

NOTE:

Do not rotate the camshaft with the plastigauge in place.

- Remove the camshaft journal holder, and read the width of the compressed plastigauge with envelope scale. This measurement should be taken at the widest part.

DATA Camshaft journal oil clearance:
Service Limit (IN. & EX.): 0.150 mm (0.0059 in)



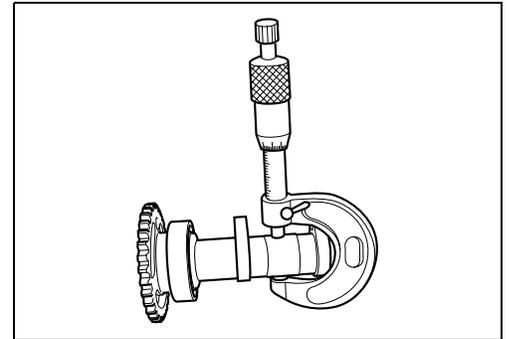
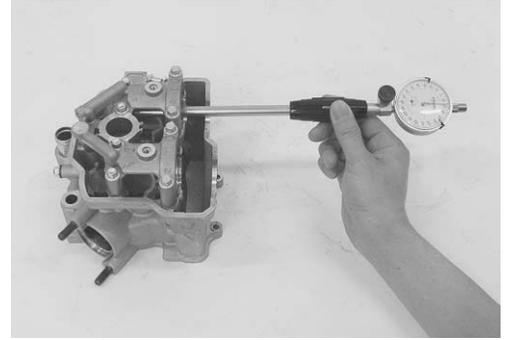
- If the camshaft journal oil clearance measured exceeds the limit, measure the inside diameter of the camshaft journal holder and outside diameter of the camshaft journal.
- Replace the camshaft or the cylinder head depending upon which one exceeds the specification.

DATA Camshaft journal holder I.D.:
Standard (IN. & EX.): 22.003 – 22.025 mm
(0.8663 – 0.8671 in)

TOOL 09900-20602: Dial gauge
09900-22403: Small bore gauge (18 – 35 mm)

DATA Camshaft journal O.D.:
Standard (IN. & EX.): 21.959 – 21.980 mm
(0.8645 – 0.8654 in)

TOOL 09900-20205: Micrometer (0 – 25 mm)



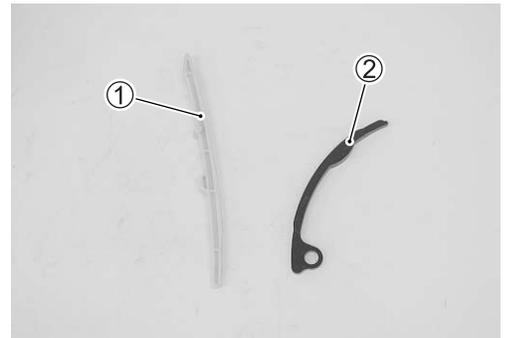
CAM CHAIN TENSION ADJUSTER INSPECTION

- Remove the cam chain tension adjuster cap bolt and spring.
- Check that the push rod slides smoothly when releasing stopper ①.
- If it does not slide smoothly, replace the cam chain tension adjuster with a new one.



CAM CHAIN No.1 GUIDE, CAM CHAIN No.2 GUIDE AND CAM CHAIN TENSIONER INSPECTION

- Inspect the contacting surface of the cam chain No.1 guide ①, cam chain tensioner ② and cam chain No.2 guide ③.
- If it is worn or damaged, replace it with a new one.



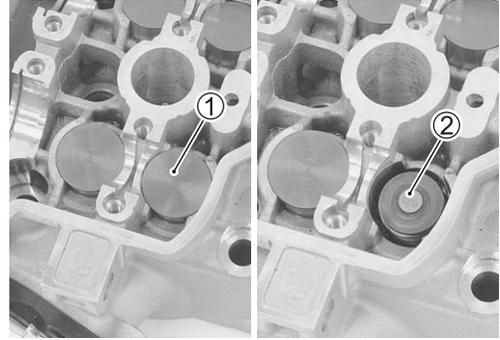
CYLINDER HEAD AND VALVE INSPECTION

VALVE DISASSEMBLY

- Remove the tappet ① and shim ② by fingers or magnetic hand.

CAUTION

Identify the position of each removed part.

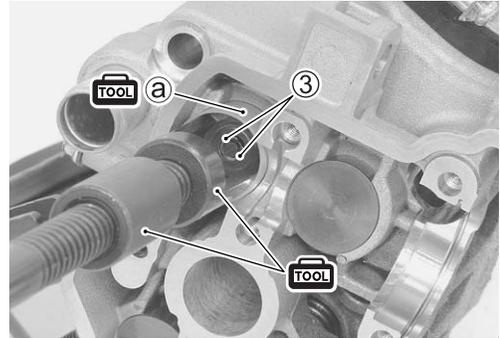


(Intake side)

- Install the sleeve protector (a) between the valve spring and cylinder head.
- Using the special tools, compress the valve spring and remove the two cotter halves (3) from the valve stem.

CAUTION

To prevent damage of the tappet sliding surface with the special tool, use the sleeve protector (a).



TOOL 09916-14510: Valve lifter

09916-14522: Valve lifter attachment

09916-84511: Tweezer

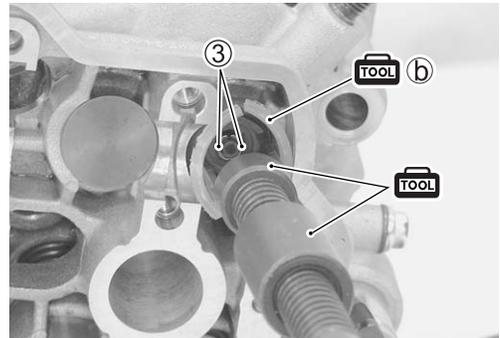
09919-28620: Sleeve protector

(Exhaust side)

- Install the sleeve protector (b) between the valve spring and cylinder head.
- Using the special tools, compress the valve spring and remove the two cotter halves (3) from the valve stem.

CAUTION

To prevent damage of the tappet sliding surface with the special tool, use the sleeve protector (b).



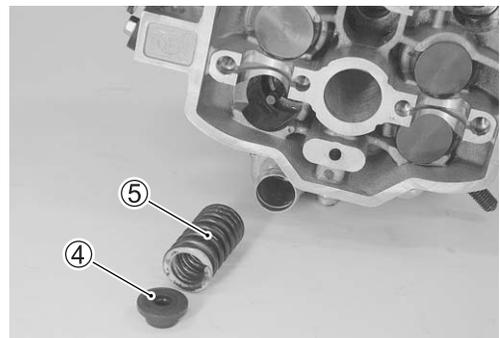
TOOL 09916-14510: Valve lifter

09916-14530: Valve lifter attachment

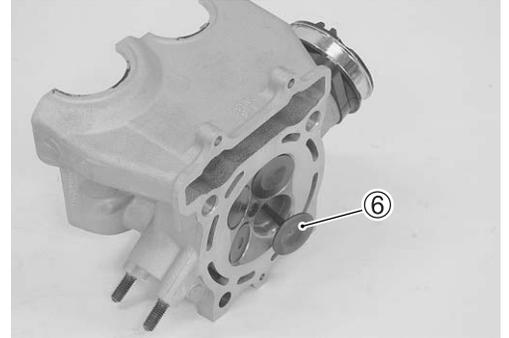
09916-84511: Tweezer

09919-28610: Sleeve protector

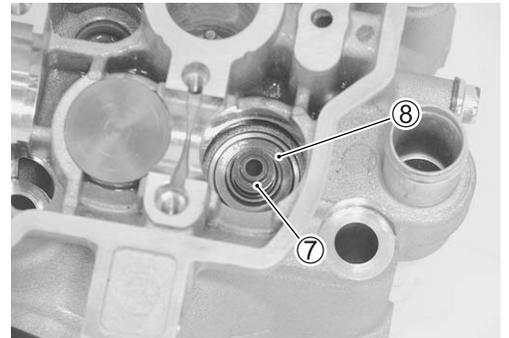
- Remove the valve spring retainer (4) and valve spring (5).



- Remove the valve ⑥ from the combustion chamber side.

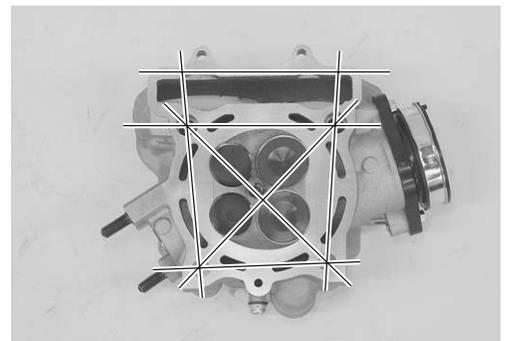


- Remove the valve stem seal ⑦ and spring seat ⑧.
- Remove the other valves in the same manner as described previously.



CYLINDER HEAD DISTORTION

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



DATA Cylinder head distortion:
Service Limit: 0.05 mm (0.002 in)

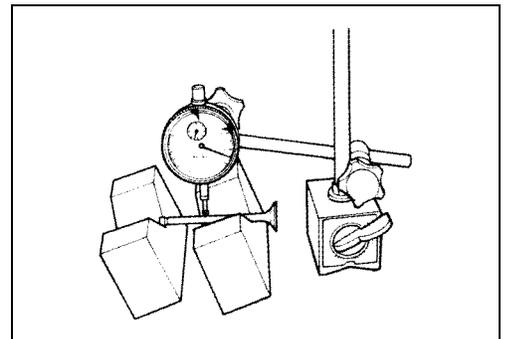
TOOL 09900-20803: Thickness gauge

VALVE STEM RUNOUT

- Support the valve using V blocks and check its runout using the dial gauge as shown.
- If the runout exceeds the service limit, replace the valve.

DATA Valve stem runout (IN. & EX.):
Service Limit: 0.05 mm (0.002 in)

TOOL 09900-20607: Dial gauge
09900-20701: Dial gauge chuck
09900-21304: V blocks



CAUTION

Be careful not to damage the valve head and valve stem when handling it.

VALVE HEAD RADIAL RUNOUT

- Place the dial gauge at a right angle to the valve head face and measure the valve head radial runout.
- If it measures more than the service limit, replace the valve.

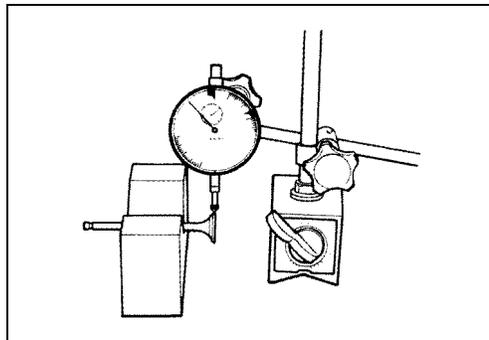
DATA Valve head radial runout (IN. & EX.):

Service Limit: 0.03 mm (0.001 in)

- TOOL** 09900-20607: Dial gauge
 09900-20701: Dial gauge chuck
 09900-21304: V blocks

CAUTION

Be careful not to damage the valve head and valve stem when handling it.

**VALVE STEM AND VALVE FACE WEAR CONDITION**

- Visually inspect each valve stem and valve face for wear and pitting.
- If it is worn or damaged, replace the valve with a new one.

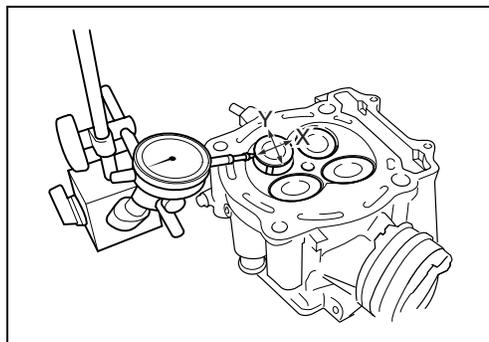
**VALVE STEM DEFLECTION**

- Lift the valve about 10 mm (0.39 in) from the valve seat.
- Measure the valve stem deflection in two directions, perpendicular to each other, by positioning the dial gauge as shown.
- If the deflection measured exceeds the limit, then determine whether the valve or the guide should be replaced with a new one.

DATA Valve stem deflection (IN. & EX.):

Service Limit: 0.25 mm (0.010 in)

- TOOL** 09900-20607: Dial gauge
 09900-20701: Dial gauge chuck



VALVE STEM WEAR

- If the valve stem is worn down to the limit, as measured with a micrometer, replace the valve.
- If the stem is within the limit, then replace the guide.
- After replacing valve or guide, be sure to recheck the deflection.

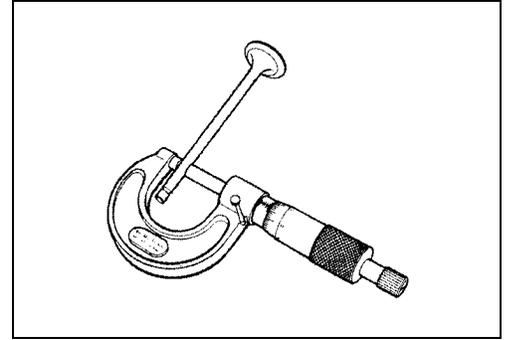
DATA Valve stem O.D.:

Standard (IN.) : 4.475 – 4.490 mm (0.1762 – 0.1768 in)

(EX.) : 4.455 – 4.470 mm (0.1754 – 0.1760 in)

TOOL 09900-20205: Micrometer (0 – 25 mm)**NOTE:**

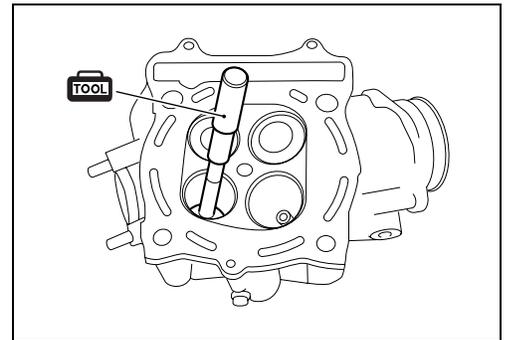
If valve guides have to be removed for replacement after inspecting related parts, carry out the steps shown in valve guide servicing.

**VALVE GUIDE SERVICING**

- Drive the valve guide out toward the intake or exhaust camshaft side with the special tool.

TOOL 09916-43211: Valve guide remover&installer**NOTE:**

- * Discard the removed valve guide subassemblies.
- * Only oversized valve guides are available as replacement parts. (Part No. 11115-10H70)



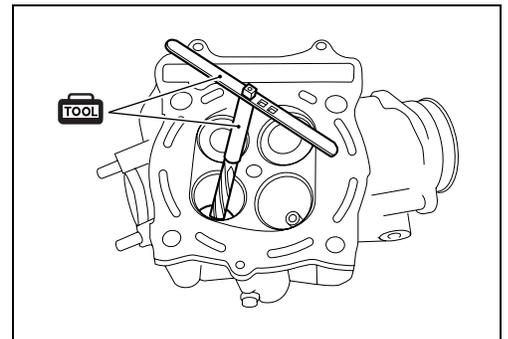
- Re-finish the valve guide holes in cylinder head with the reamer and handle.

CAUTION

When refinishing or removing the reamer from the valve guide hole, always turn it clockwise.

TOOL 09916-33320: Valve guide reamer (9.8 mm)

09916-34542: Reamer handle



- Cool down the new valve guides in a freezer for about one hour and heat the cylinder head to 100 – 150 °C (212 – 302 °F) with a hot plate.

CAUTION

Do not use a burner to heat the valve guide hole to prevent cylinder head distortion.

- Apply engine oil to the valve guide hole.
- Drive the valve guide into the hole with the special tools (①, ②).

CAUTION

Failure to oil the valve guide hole before driving the new guide into place may result in a damaged guide or head.

NOTE:

Install the valve guide until the attachment contacts with the cylinder head ③.

Ⓐ 15 mm (0.59 in)

- TOOL 09916-43211: Valve guide remover&installer ①**
- 09916-44920: Valve guide installer attachment ②**

- After installing the valve guides, re-finish their guiding bores using the reamer.
- Clean and engine oil the guides after reaming.

- TOOL 09916-33210: Valve guide reamer (4.5 mm)**
- 09916-34542: Reamer handle**

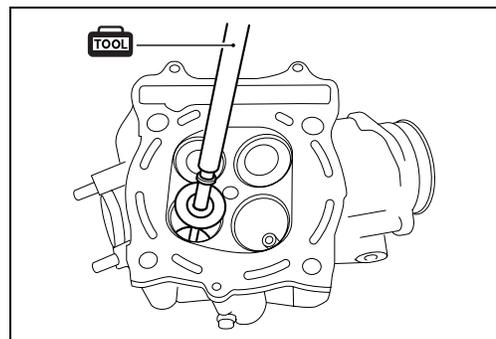
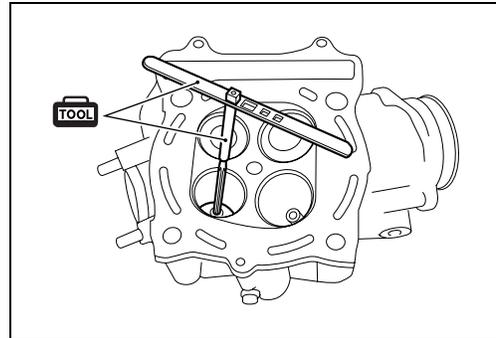
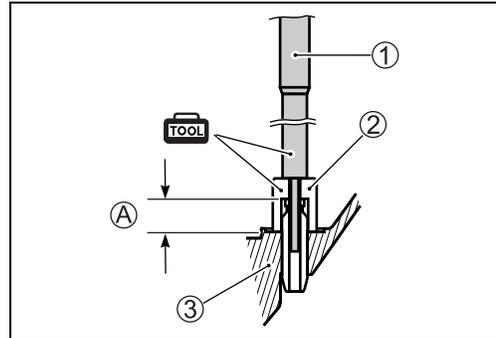
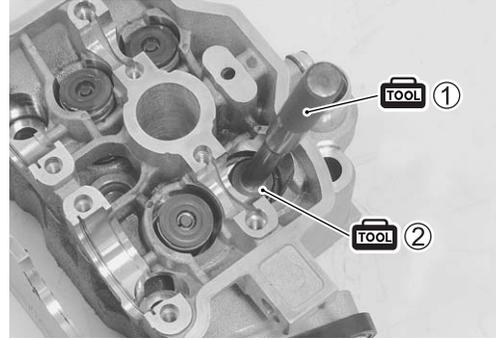
NOTE:

- * Be sure to cool down the cylinder head to ambient air temperature.
- * Insert the reamer from the combustion chamber and always turn the reamer handle clockwise.

VALVE SEAT WIDTH INSPECTION

- Visually check for valve seat width on each valve face.
- If the valve face has worn abnormally, replace the valve.
- Coat the valve seat with Prussian Blue and set the valve in place. Rotate the valve with light pressure.
- Check that the transferred blue on the valve face is uniform all around and in center of the valve face.

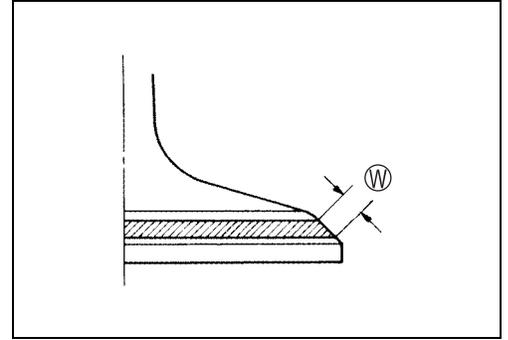
- TOOL 09916-10911: Valve lapper set**



- If the seat width W measured exceeds the standard value or seat width is not uniform, refuse the seat using the seat cutter.

DATA Valve seat width W :

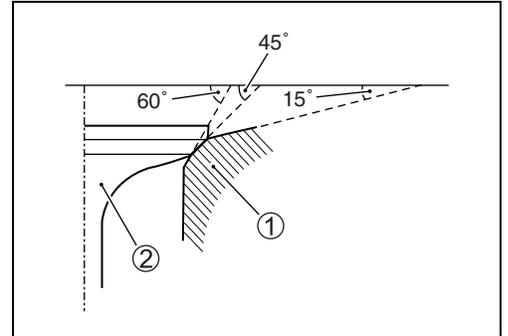
Standard: 0.9 – 1.1 mm (0.035 – 0.043 in)



VALVE SEAT SERVICING

The valve seats ① for both the intake and exhaust valves ② are machined to three different angles. The seat contact surface is cut at 45°.

	INTAKE	EXHAUST
Seat angle	15°, 45°, 60°	←
Seat width	0.9 – 1.1 mm (0.035 – 0.043 in)	←
Valve diameter	31 mm (1.22 in)	25 mm (0.98 in)
Valve guide I.D.	4.500 – 4.512 mm (0.1772 – 0.1776 in)	←



CAUTION

- * The valve seat contact area must be inspected after each cut.
- * Do not use lapping compound after the final cut is made. The finished valve seat should have a velvety smooth finish but not a highly polished or shiny finish. This will provide a soft surface for the final seating of the valve which will occur during the first few seconds of engine operation.

CAUTION

The titanium valves are coated with an oxidized membrane treatment to resist wear but the membrane tend to be removed if lapped after valve seat servicing.

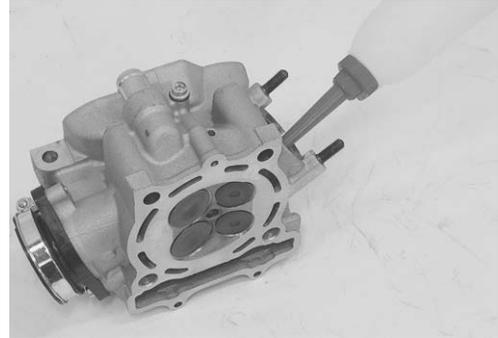
NOTE:

After servicing the valve seats, be sure to check the valve clearance after the cylinder head has been reinstalled. (☞ 2-25)

- Clean and assemble the head and valve components. Fill the intake and exhaust ports with gasoline to check for leaks.
- If any leaks occur, inspect the valve seat and face for burrs or other things that could prevent the valve from sealing.

⚠ WARNING

Always use extreme caution when handling gasoline.



VALVE SPRING

- Check the valve spring for proper strength by measuring its free length and also by the force required to compress it.
- If the spring length is less than the service limit, or if the force required to compress the spring does not fall within the range specified, replace the spring.

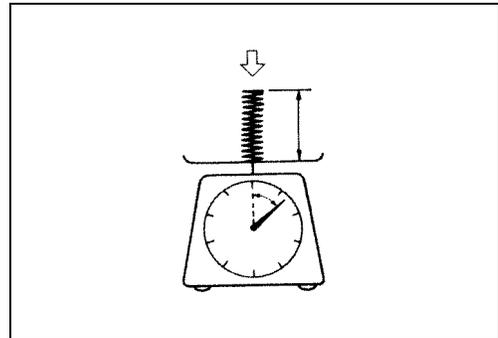
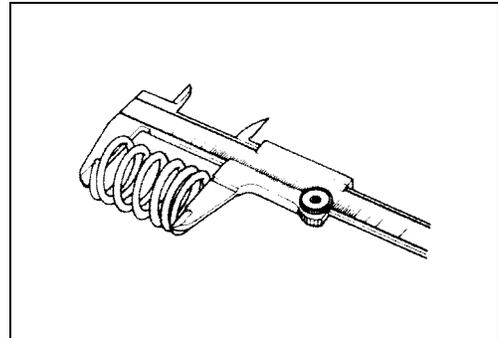
DATA Valve spring free length:

Service limit (IN.): 37.1 mm (1.46 in)
(EX.): 37.5 mm (1.48 in)

TOOL 09900-20101: Vernier calipers (150 mm)

DATA Valve spring tension:

Standard (IN.): 142 – 157 N (14.5 – 16.0 kgf)/
33.55 mm(31.9 – 35.3 lbs/1.321 in)
(EX.): 137 – 157 N (14.0 – 16.0 kgf)/
33.55 mm(30.8 – 35.3 lbs/1.321 in)

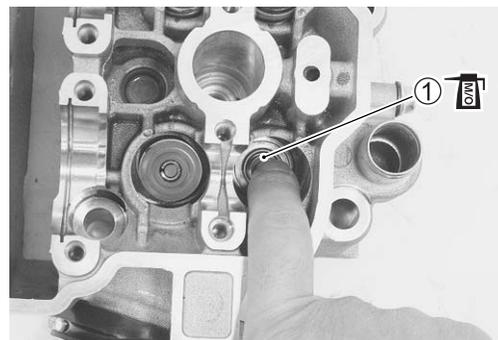


VALVE REASSEMBLY

- Install the valve spring seat.
- Apply MOLYBDENUM OIL SOLUTION to the stem seal ①, and press-fit it into position.

CAUTION

Replace the stem seal ① with a new one.

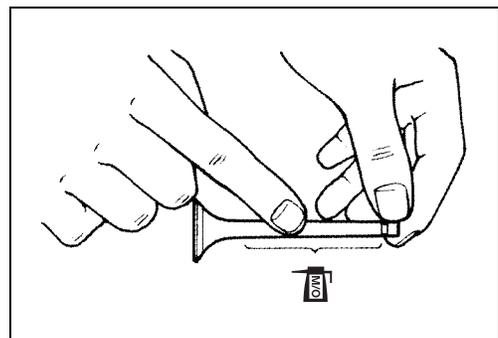


MOLYBDENUM OIL SOLUTION

- Insert the valve, with its stem coated with MOLYBDENUM OIL SOLUTION all around and along the full stem length without any break.

CAUTION

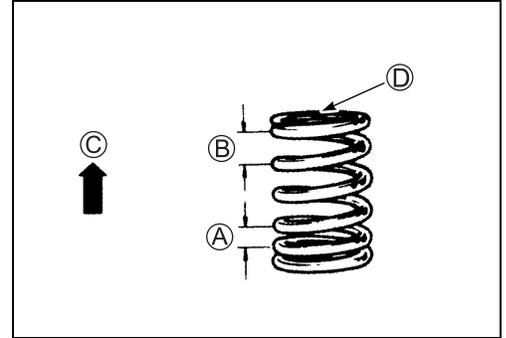
When inserting the valve, take care not to damage the lip of the stem seal.



MOLYBDENUM OIL SOLUTION

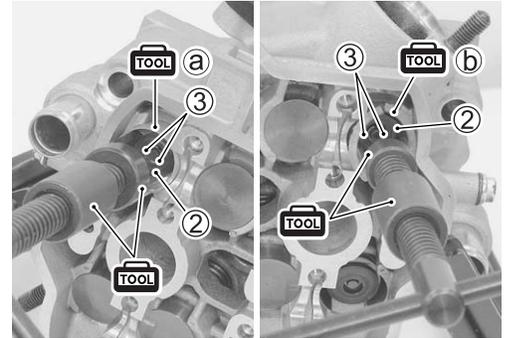
- Install the valve spring with the small-pitch portion (A) facing cylinder head.

- (A) Small-pitch portion
- (B) Large-pitch portion
- (C) UPWARD
- (D) Paint



- Put on the valve spring retainer (2), and using the valve lifter (special tool) and sleeve protector (a or b) (special tool), press down the spring, fit the valve cotter halves to the stem end, and release the lifter to allow the valve cotter (3) to wedge in between retainer and stem.

- TOOL** 09916-14510: Valve lifter
- 09916-14522: Valve lifter attachment (For IN. side)
- 09919-28620: Sleeve protector (For IN. side)
- 09916-14530: Valve lifter attachment (For EX. side)
- 09919-28610: Sleeve protector (For EX. side)
- 09916-84511: Tweezer

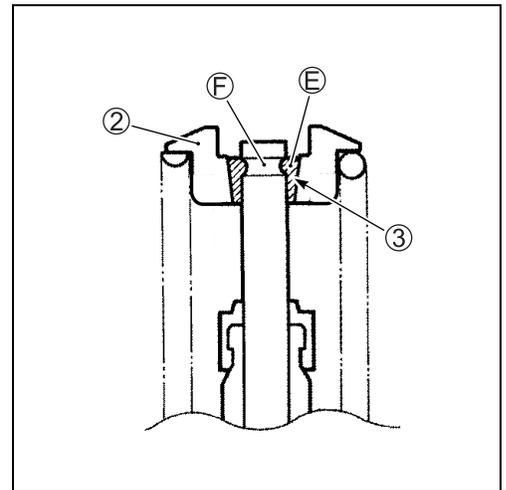


- Be sure that the rounded lip (E) of the cotter fits snugly into the groove (F) in the stem end.
- Install the other valves and springs in the same manner as described previously.

CAUTION

- * Be sure to restore each spring and valve to their original positions.
- * Be careful not to damage the valve and valve stem when handling it.

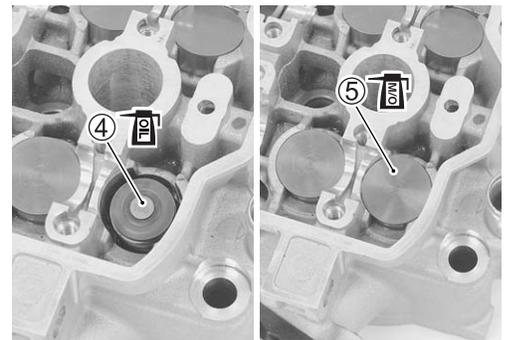
- (2) Valve spring retainer
- (3) Valve cotter



- Install the tappet shims (4) and the tappets (5) to their original positions.

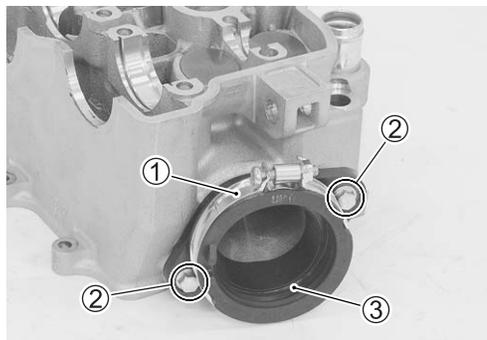
NOTE:

- * Apply engine oil to the stem end and shim.
- * Apply MOLYBDENUM OIL SOLUTION to the tappets before fitting them.
- * When seating the tappet shim, be sure the figure printed surface faces the tappet.



INTAKE PIPE REMOVAL

- Remove the intake pipe clamp ①.
- Remove intake pipe ③ by removing its bolts ②.



INTAKE PIPE INSTALLATION

- Apply grease to O-ring of the intake pipe.

 99000-25010: SUZUKI SUPER GREASE "A"
or equivalent

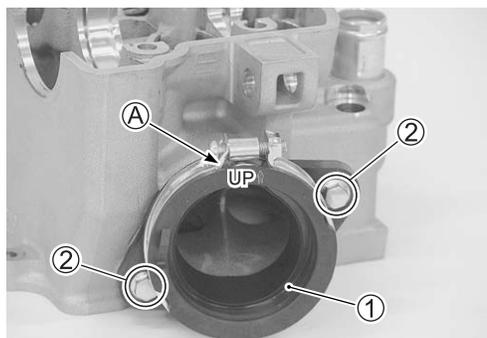


- Install the intake pipe ① and tighten the intake pipe bolts ② to the specified torque.

NOTE:

Make sure that the "UP" mark  faces up.

 Intake pipe bolt: 10 N·m (1.0 kgf·m, 7.0 lbf·ft)



CYLINDER INSPECTION

CYLINDER DISTORTION

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

DATA Cylinder distortion:
Service Limit: 0.05 mm (0.002 in)

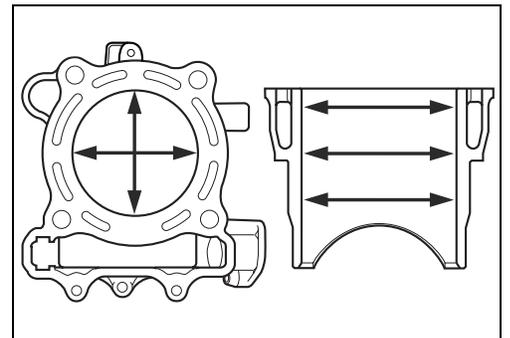
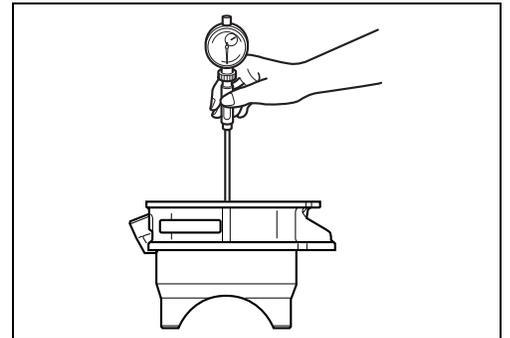
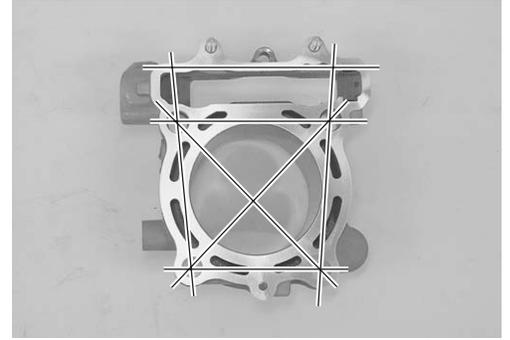
TOOL 09900-20803: Thickness gauge

CYLINDER BORE

- Inspect the cylinder wall for any scratches, nicks or other damage.
- Measure the cylinder bore diameter at six places.

DATA Cylinder bore:
Standard: 77.000 – 77.015 mm (3.0301 – 3.0307 in)

TOOL 09900-20530: Cylinder gauge set



ECT SENSOR REMOVAL

(12-62)

ECT SENSOR INSPECTION

(12-62)

ECT SENSOR INSTALLATION

(12-63)



PISTON AND PISTON RING INSPECTION

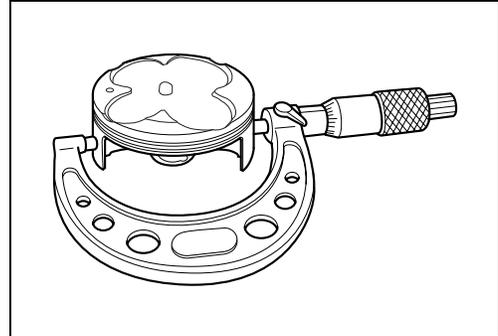
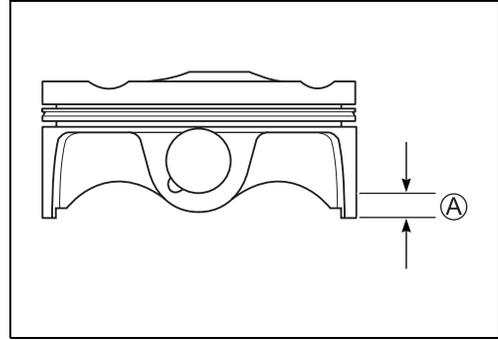
PISTON DIAMETER

- Using a micrometer, measure the piston outside diameter at 8.0 mm (0.31 in) $\text{\textcircled{A}}$ from the piston skirt end.
- If the measurement is less than the limit, replace the piston.

DATA Piston diameter:

Service Limit: 76.880 mm (3.0268 in)
at 8.0 mm (0.31 in) from the skirt end

TOOL 09900-20204: Micrometer (75 – 100 mm)



PISTON-TO-CYLINDER CLEARANCE

- Subtract the piston diameter from the cylinder bore diameter.
 (☞ above)
- If the piston-to-cylinder clearance exceeds the service limit, replace the cylinder or the piston, or both.

DATA Piston-to-cylinder clearance:

Service Limit: 0.120 mm (0.0047 in)

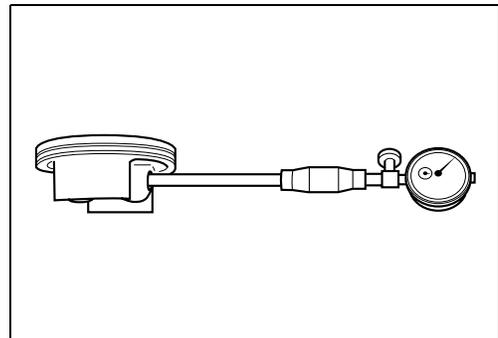
PISTON PIN AND PIN BORE

- Measure the piston pin bore inside diameter using the small bore gauge.
- If the measurement is out of specifications replace the piston.

DATA Piston pin bore:

Service Limit: 16.030 mm (0.6311 in)

TOOL 09900-20602: Dial gauge
 09900-22403: Small bore gauge (18 – 35 mm)

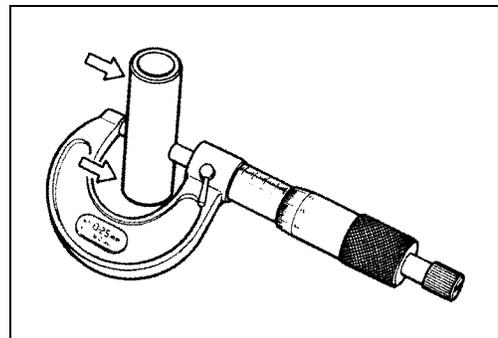


- Measure the piston pin outside diameter at three positions using the micrometer.
- If any of the measurements are out of specification, replace the piston pin.

DATA Piston pin O.D.:

Service Limit: 15.980 mm (0.6291 in)

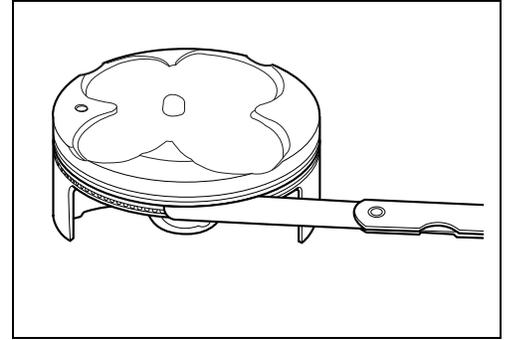
TOOL 09900-20205: Micrometer (0 – 25 mm)



PISTON RING-TO-GROOVE CLEARANCE

- Decarbonize the piston ring and piston ring groove.
- Measure the side clearances of the 1st piston ring using the thickness gauge.
- If any of the clearances exceed the limit, replace both the piston and piston ring.

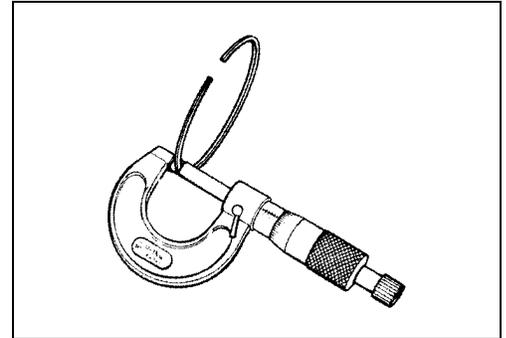
TOOL 09900-20803: Thickness gauge
09900-20205: Micrometer (0 – 25 mm)



DATA Piston ring-to-groove clearance:
Service Limit (1st): 0.180 mm (0.007 in)

DATA Piston ring groove width:
Standard (1st) : 1.01 – 1.03 mm (0.0398 – 0.0406 in)
(Oil) : 1.51 – 1.53 mm (0.0594 – 0.0602 in)

DATA Piston ring thickness:
Standard (1st) : 0.97 – 0.99 mm (0.0382 – 0.0390 in)

**PISTON RING FREE END GAP AND PISTON RING END GAP**

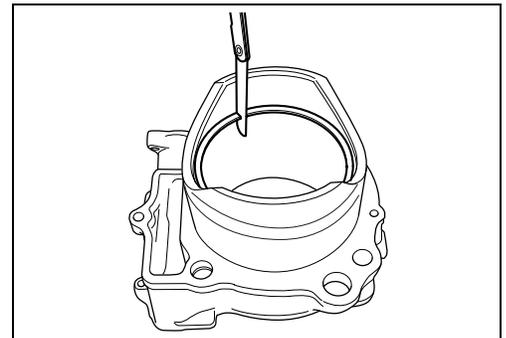
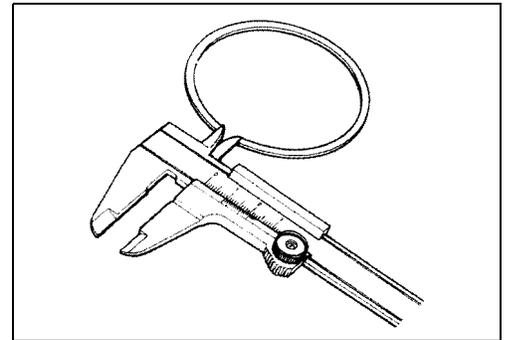
- Measure the piston ring free end gap using the vernier calipers.
- Next, fit the piston ring squarely into the cylinder and measure the piston ring end gap using the thickness gauge.
- If any of the measurements exceed the service limit, replace the piston ring with a new one.

DATA Piston ring free end gap:
Service Limit (1st): 5.7 mm (0.22 in)

TOOL 09900-20101: Vernier calipers (150 mm)

DATA Piston ring end gap:
Service Limit (1st): 0.50 mm (0.020 in)

TOOL 09900-20803: Thickness gauge



CRANKSHAFT AND CONROD INSPECTION

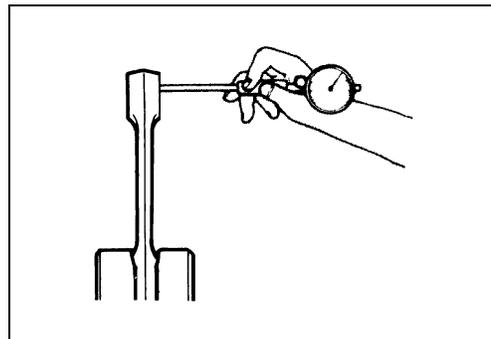
For inspection other than the following, refer to page 10-8.

CONROD SMALL END I.D.

- Using a small bore gauge, measure the inside diameter of the conrod small end.
- If the inside diameter of the conrod small end exceeds the limit, replace the conrod.

DATA Conrod small end I.D.:
Service Limit: 16.040 mm (0.6315 in)

TOOL 09900-20602: Dial gauge
09900-22403: Small bore gauge (18 – 35 mm)

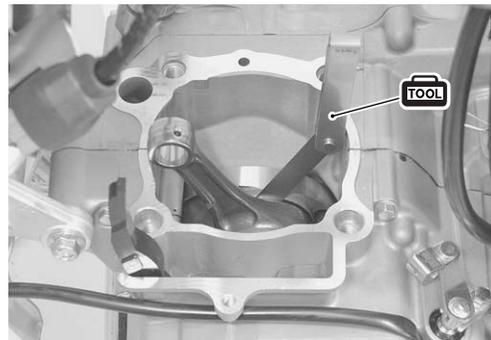


CONROD BIG END SIDE CLEARANCE

- Inspect the conrod side clearance by using a thickness gauge.
- If the clearance exceeds the service limit, replace crankshaft assembly or bring the deflection and side clearance into specification by replacing the worn parts. (e.g., conrod, big end bearing and crank pin)

DATA Conrod big end side clearance:
Service Limit: 1.0 mm (0.04 in)

TOOL 09900-20803: Thickness gauge



ENGINE TOP SIDE ASSEMBLY

CAM CHAIN, CAM CHAIN TENSIONER AND CAM CHAIN No.1 GUIDE INSTALLATION

Install the cam chain and cam chain tensioner in the reverse order of removal. Pay attention to the following points:

- Install the cam chain tensioner ①, spacer ② and cam chain tensioner bolt ③.
- Tighten the cam chain tensioner bolt ③ to the specified torque.

 **Cam chain tensioner bolt: 10 N·m (1.0 kgf-m, 7.0 lbf-ft)**

- Install the cam chain ④ to the crankshaft sprocket.

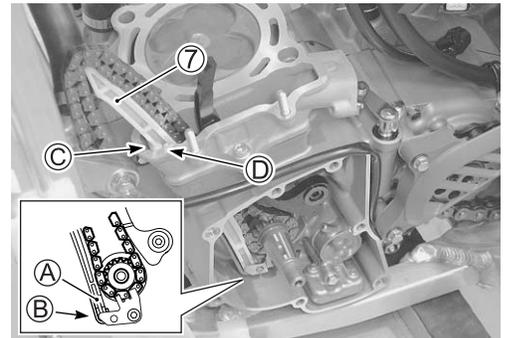
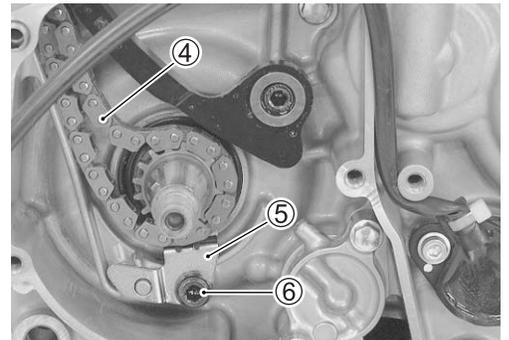
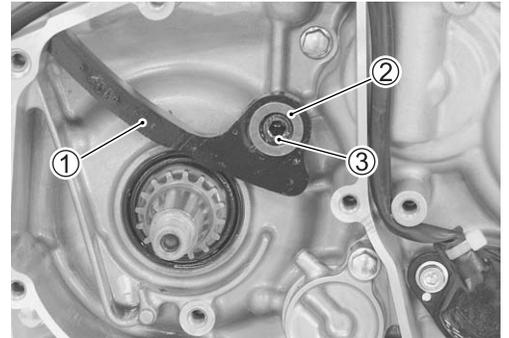
CAUTION

Make sure that cam chain engages properly to the cam chain drive sprocket.

- Install the cam chain guide retainer ⑤ and tighten the cam chain guide retainer bolt ⑥ to the specified torque.

 **Cam chain guide retainer bolt: 10 N·m (1.0 kgf-m, 7.0 lbf-ft)**

- Insert the cam chain No.1 guide end ① into the recess ② of the crankcase securely.
- Fit the projection ③ of the cam chain No.1 guide ④ in the groove ⑤ of the cylinder.
- Install the magneto cover and magneto rotor.
( 15-18, -19)
- Install the cylinder head and cylinder head cover.
( 6-28 to -34)



PISTON AND PISTON RING INSTALLATION

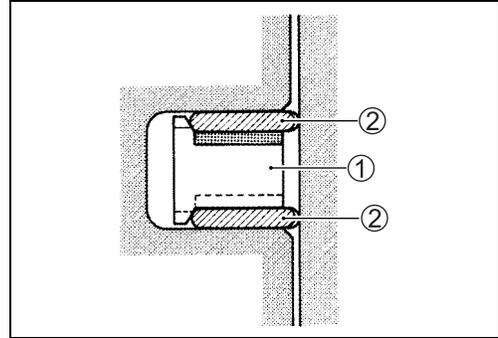
Install the piston and piston ring in the reverse order of removal. Pay attention to the following points:

PISTON RING

- Install the piston rings in the order of oil ring and 1st ring.
- The first member to go into the oil ring groove is a spacer ①. After placing the spacer, fit the two side rails ②.

NOTE:

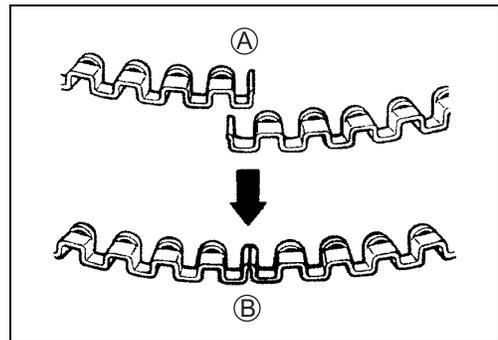
Side designations, top and bottom, are not applied to the spacer and side rails: you can position each either way.



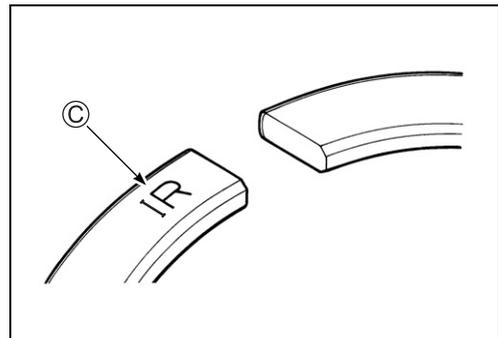
CAUTION

When installing the spacer ①, be careful not to allow its two ends to overlap in the groove.

- Ⓐ INCORRECT
- Ⓑ CORRECT

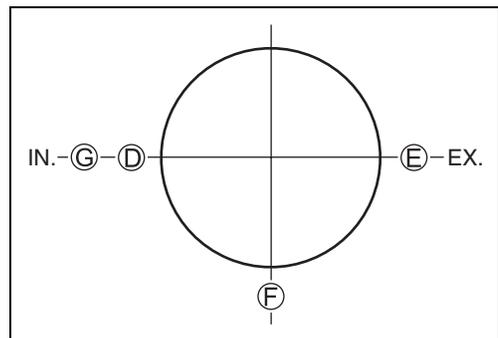


- Install the 1st ring so that the "IR" mark ③ faces up.



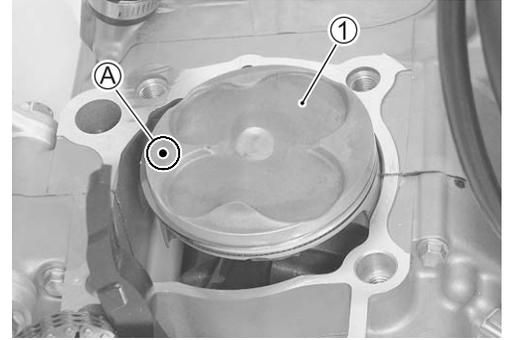
- Position the gaps of the two ring as shown. Before inserting a piston into the cylinder, check that the gaps are so located.

- Ⓓ 1st ring
- Ⓔ Upper side rail
- Ⓕ Spacer
- Ⓖ Lower side rail

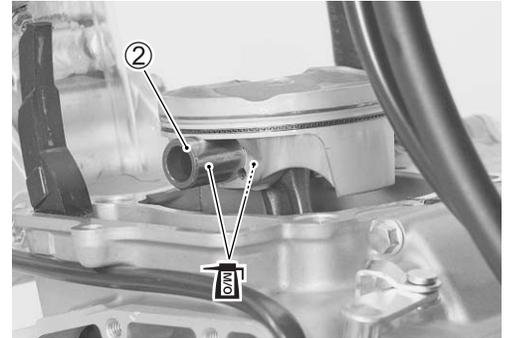


PISTON

- Install the piston ① with the punch mark ① facing towards the exhaust side.



- Before installing the piston pin ②, apply MOLYBDENUM OIL SOLUTION onto its surface.


MOLYBDENUM OIL SOLUTION


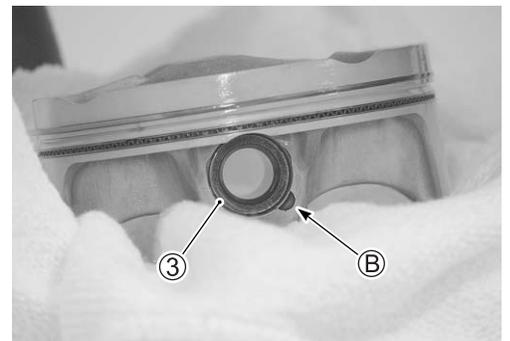
- Place a clean rag over the cylinder base to prevent the piston pin circlip ③ from dropping into crankcase. Install the piston pin circlip ③.

CAUTION

Replace the piston pin circlip ③ with a new one.

NOTE:

End gap of the piston pin circlip ③ should not be aligned with the cutaway ③ in the piston pin bore.



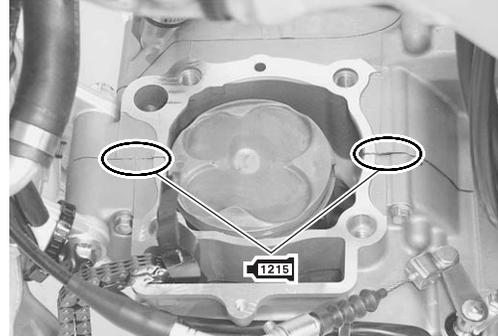
CYLINDER AND CYLINDER HEAD INSTALLATION

Install the cylinder and cylinder head in the reverse order of removal. Pay attention to the following points:

CYLINDER

- Thoroughly wipe off oil from the fitting surface of the crankcase.
- Apply SUZUKI BOND “1215” to the crankcase as shown.

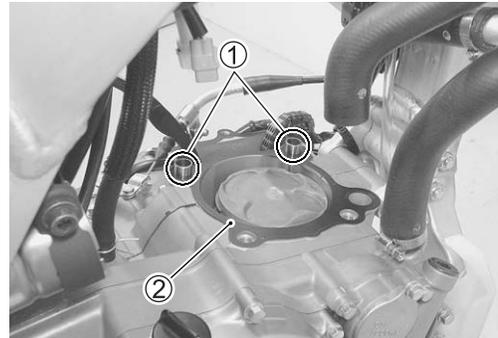
 99000-31110: SUZUKI BOND “1215” or equivalent



- Install the dowel pins ① into the crankcase and then install the cylinder gasket ②.

CAUTION

Replace the cylinder gasket ② with a new one.



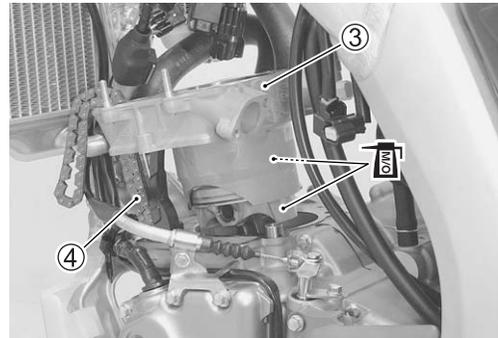
- Apply MOLYBDENUM OIL SOLUTION to the sliding surface of the piston and cylinder bore.

MOLYBDENUM OIL SOLUTION

- Hold each piston ring with the piston ring sections positioned correctly and put it into the cylinder.
- Make sure that the piston rings are caught by the cylinder skirt.
- Place the cylinder ③ on the crankcase.

CAUTION

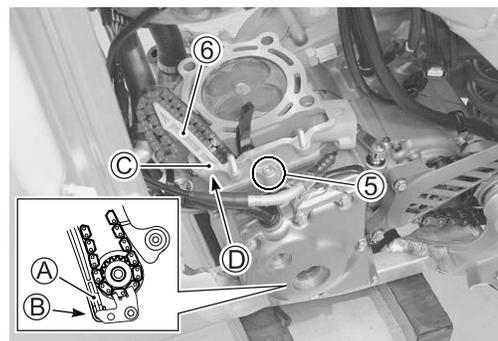
Do not drop the cam chain ④ into the crankcase.



- Temporarily tighten the cylinder base bolt ⑤.
- Insert the cam chain No.1 guide end ① into the recess ② of the crankcase securely.
- Fit the projection ③ of the cam chain No.1 guide ④ in the groove ⑤ of the cylinder.

CAUTION

Make sure that cam chain engages properly to the cam chain drive gear.



CYLINDER HEAD

- Install the dowel pins ① into the cylinder and then install the cylinder head gasket ② onto the cylinder.

CAUTION

Replace the cylinder head gasket ② with a new one.

- Place the cylinder head ③ on the cylinder.

CAUTION

Do not drop the cam chain ④ into the crankcase.

- Apply engine oil to the washers and thread portion of the bolts before installing the cylinder head bolts.

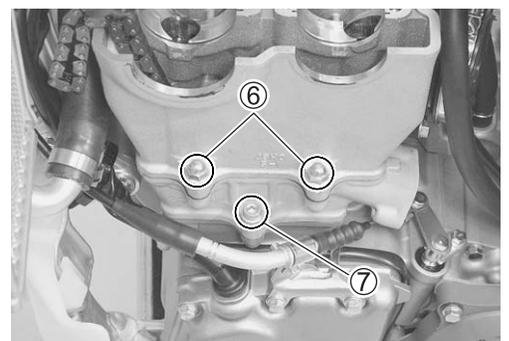
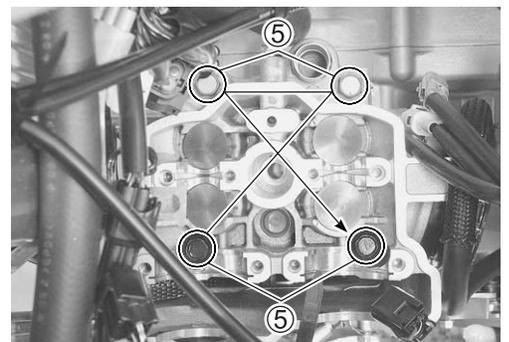
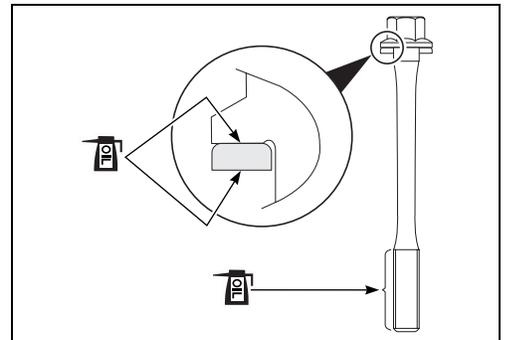
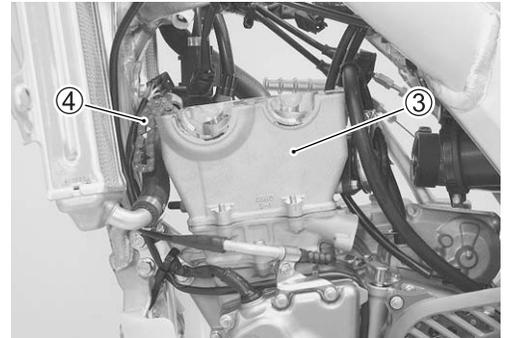
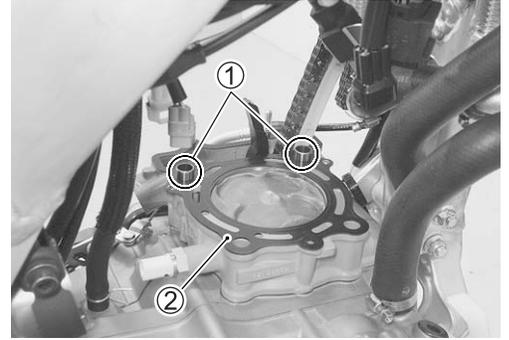
- With the cylinder head snugly seated on the cylinder, secure it by tightening the cylinder head bolts ⑤ in diagonal stages.
- Tighten the cylinder head bolts ⑤ to the specified torque.

**🔧 Cylinder head bolt: Initial 25 N·m (2.5 kgf-m, 18.0 lbf-ft)
Final 51 N·m (5.1 kgf-m, 37.0 lbf-ft)**

- After tightening the cylinder head bolts to specification, tighten the cylinder head base nuts ⑥ and cylinder base bolt ⑦ to the specified torque.

**🔧 Cylinder head base nut: 10 N·m (1.0 kgf-m, 7.0 lbf-ft)
Cylinder base bolt: 12 N·m (1.2 kgf-m, 8.5 lbf-ft)**

- Install the engine mounting upper brackets. (🔧 5-6)
- Connect the ECT sensor coupler.
- Connect the radiator hose. (🔧 20-24)
- Install the exhaust pipe. (🔧 5-9, -10)
- Install the throttle body. (🔧 13-15)
- Install the TO sensor.



CAMSHAFT (AUTOMATIC DECOMP.) AND CAM CHAIN TENSION ADJUSTER INSTALLATION

Install the camshaft and cam chain tension in the reverse order of removal. Pay attention to the following points:

CAMSHAFT (AUTOMATIC DECOMP.)

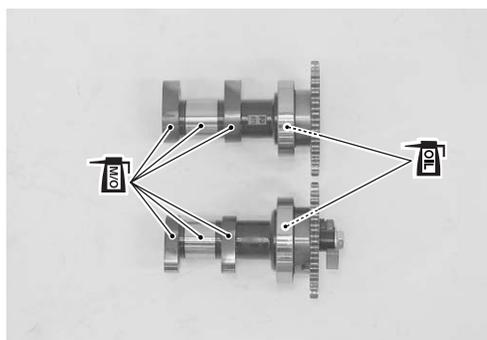
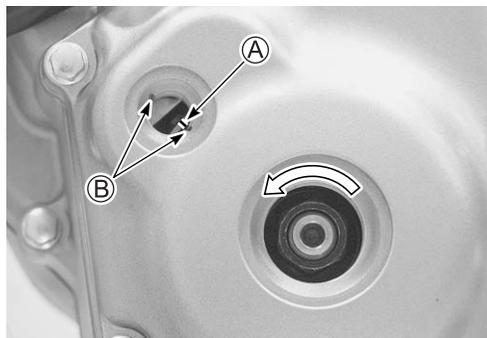
- Place a wrench over the crankshaft and turn it counter clockwise to align the TDC mark (A) with the center of the groove (B) of the timing inspection hole.

CAUTION

- * Pull the cam chain upward, or the chain will be caught between crankcase and cam drive sprocket.
- * To adjust the camshaft timing correctly, be sure to align the TDC mark (A) with the index mark (B) and hold this position when installing the camshafts.

- Just before installing the camshaft into the cylinder head, apply MOLYBDENUM OIL SOLUTION to the camshaft journals, camshaft journal holders and cam faces. Also, apply engine oil to the camshaft bearings.

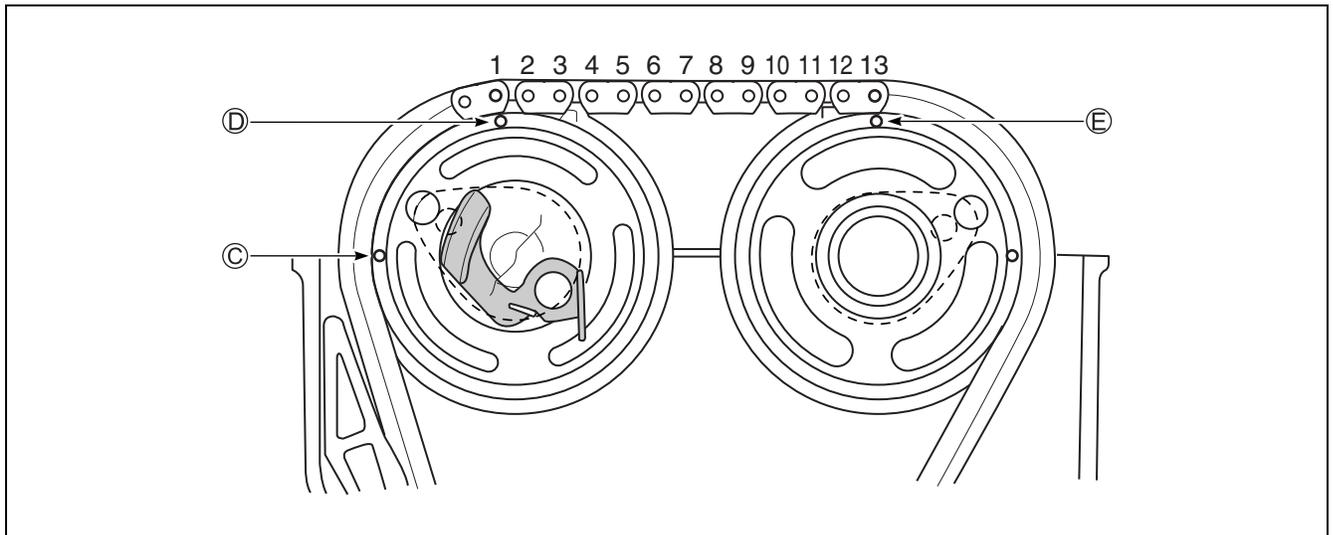
MOLYBDENUM OIL SOLUTION



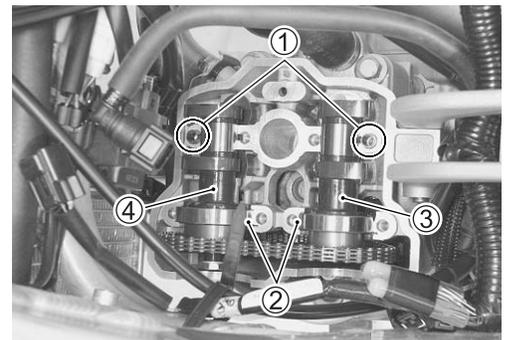
- Pull the exhaust side of the cam chain taut to install the camshaft sprocket (exhaust side).
- Turn the exhaust camshaft so that the timing mark ③ is aligned with the gasket surface of the cylinder head. Engage the cam chain with the exhaust camshaft sprocket.
- The other timing marked ④ should now be pointing straight up. Starting from the roller pin that is directly above the timing marked ④, count out 13 roller pins (from the exhaust camshaft side going towards the intake camshaft side).
- Engage the 13th roller pin on the cam chain with the timing marked ⑤ on the camshaft sprocket (intake side). Refer to the following illustrations.

NOTE:

The cam chain should now be on all three sprockets. Be careful not to move the crankshaft until the camshaft journal holder and cam chain tension adjuster are secured.



- Install the dowel pins ① and C-rings ②.
- Install the camshafts, intake ③ and exhaust ④.

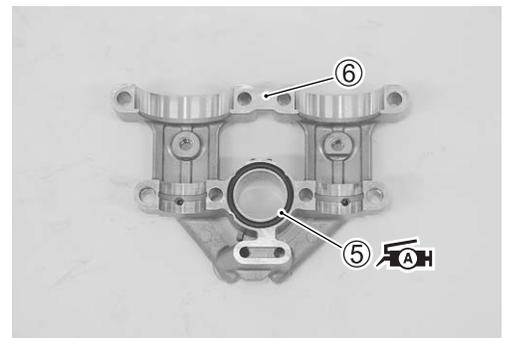


- Apply grease to the new O-ring ⑤ and install it to the camshaft journal holder ⑥.

CAUTION

Replace the O-ring ⑤ with a new one.

 99000-25010: SUZUKI SUPER GREASE "A"
or equivalent



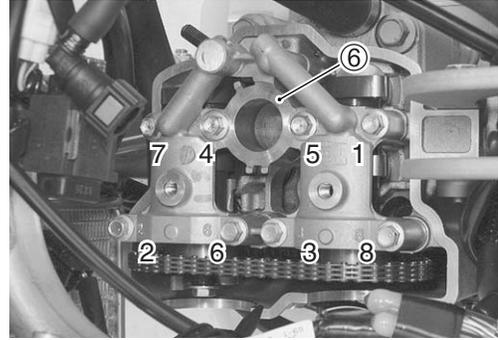
- Install the camshaft journal holder ⑥.
- Have the camshaft journal holder evenly by tightening the camshaft journal holder bolts lightly, in the ascending order of numbers.

NOTE:

* When tightening the camshaft journal holder bolts, the piston position must be at TDC on the compression stroke.

* The ascending order of numbers are indicated on the camshaft journal holder.

- Tighten the camshaft journal holder bolts in ascending order of numbers to the specified torque.



**🔧 Camshaft journal holder bolt: 10 N·m
(1.0 kgf-m, 7.0 lbf-ft)**

CAM CHAIN TENSION ADJUSTER

- Retract the push rod by pushing the stopper ①.
- Apply grease to the O-ring ②.

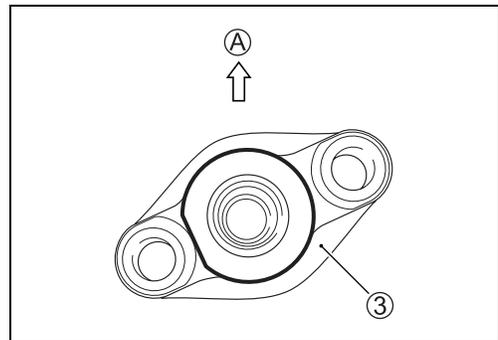
CAUTION

Replace the O-ring ② with a new one.

**🔧 99000-25010: SUZUKI SUPER GREASE “A”
or equivalent**



- Install the cam chain tension adjuster ③ as shown.

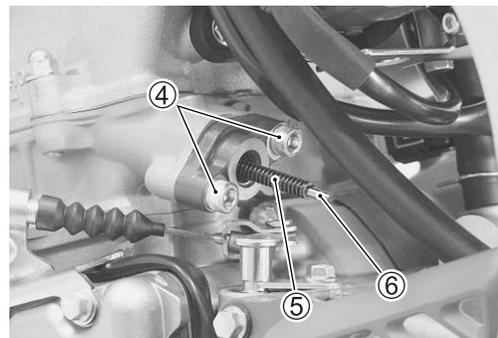


Ⓐ Upward

- Tighten the cam chain tension adjuster mounting bolts ④ to the specified torque.

**🔧 Cam chain tension adjuster mounting bolt:
10 N·m (1.0 kgf-m, 7.0 lbf-ft)**

- Install the spring ⑤ and bar ⑥.



- Install the gasket ⑦ and cam chain tension adjuster cap bolt ⑧.

CAUTION

Replace the gasket ⑦ with a new one.

NOTE:

Click sound is heard when the cam chain tension adjuster cap bolt ⑧ is installed.

- Tighten the cam chain tension adjuster cap bolt ⑧ to the specified torque.

**Cam chain tension adjuster cap bolt:**

23 N·m (2.3 kgf-m, 16.5 lbf-ft)

CAUTION

After installing the cam chain tension adjuster, check to be sure that the adjuster works properly by checking the slack of cam chain.

- After installing the cam chain tension adjuster, rotate the crankshaft (two turns), and recheck the positions of the camshafts. (↖ 6-31)

CAUTION

After this procedure, if any resistance is felt while turning over the crankshaft, stop immediately, and check the camshaft chain timing.

- Inspect the valve clearance. (↖ 2-25)
- Apply grease to the O-rings ⑨.

CAUTION

Replace the O-rings ⑨ with new ones.



99000-25010: SUZUKI SUPER GREASE "A"

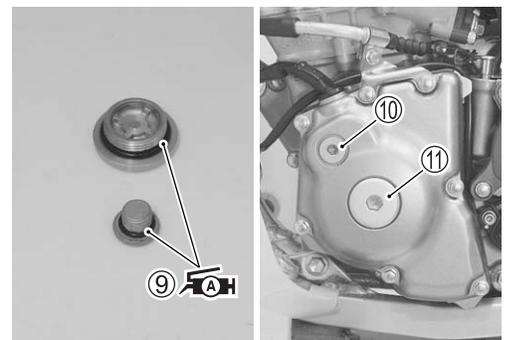
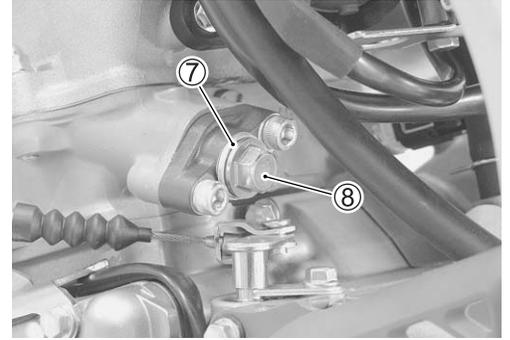
or equivalent

- Tighten the TDC plug ⑩ and crankshaft hole plug ⑪ to the specified torque.

**TDC plug: 14 N·m (1.4 kgf-m, 10.0 lbf-ft)**

Crankshaft hole plug: 11 N·m (1.1 kgf-m, 8.0 lbf-ft)

- Install the condenser.



CYLINDER HEAD COVER INSTALLATION

Install the cylinder head cover in the reverse order of removal. Pay attention to the following points:

- Install the new cylinder head cover gasket ① to the cylinder head cover ②.

CAUTION

- * Check to be sure that the cam chain No.2 guide ③ is securely installed on the cylinder head cover ②.
- * Replace the cylinder head cover gasket ① with a new one.

- Apply bond to the end caps of the cylinder head cover gasket ① as shown.

 99000-31140: SUZUKI BOND “1207B” or equivalent

- Install the cylinder head cover No.2 gasket ④.

CAUTION

- Replace the cylinder head cover No.2 gasket ④ with a new one.

NOTE:

Fit the protrusion (A) of the cylinder head cover No.2 gasket ④ to the stopper groove (B).

- Place the cylinder head cover on the cylinder head.
- Apply engine oil to both sides of gaskets ⑤.

CAUTION

- Replace the gaskets ⑤ with new ones.

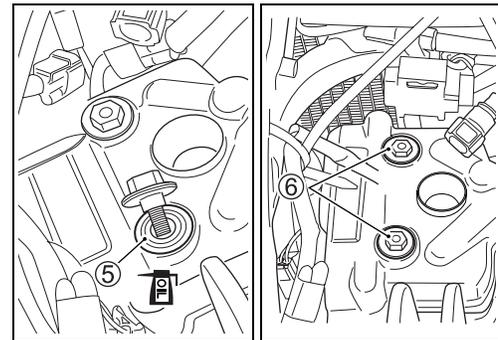
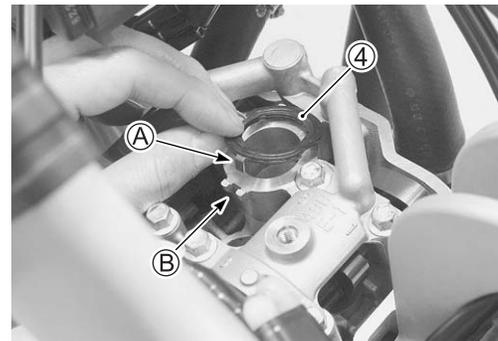
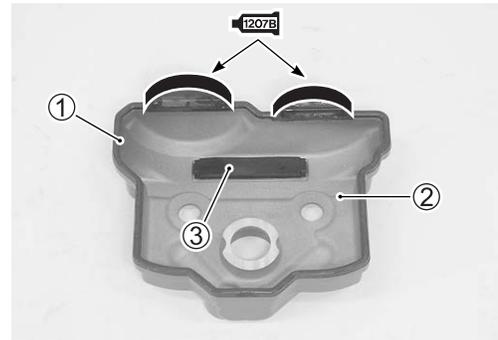
- Tighten the cylinder head cover bolts ⑥ to the specified torque.

 Cylinder head cover bolt: 14 N·m (1.4 kgf-m, 10.0 lbf-ft)

- Install the spark plug and ignition coil/plug cap. (☞ 2-8)
- Install the radiator covers and fuel tank.
- Install the seat.

INSPECTION AFTER INSTALLATION

- Engine oil level and oil leakage (☞ 2-12)
- Engine coolant level and coolant leakage (☞ 2-18, -19)
- Fuel leakage
- Exhaust gas leakage
- Throttle cable play (☞ 2-21)
- Clutch lever play (☞ 2-20)
- Wiring harness, cable and hose routing (☞ 20-18 to -24)

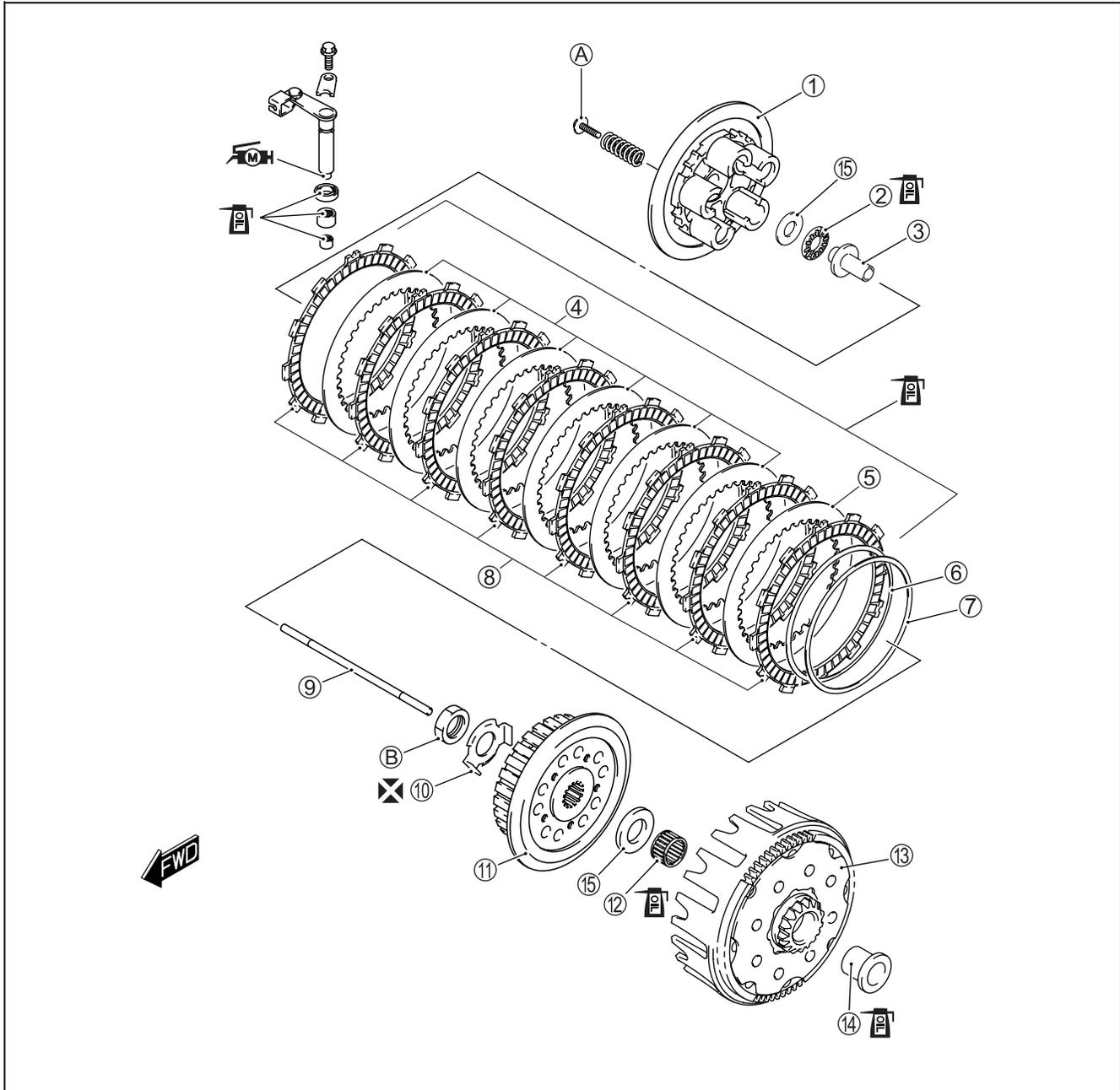


CLUTCH

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CONSTRUCTION CLUTCH



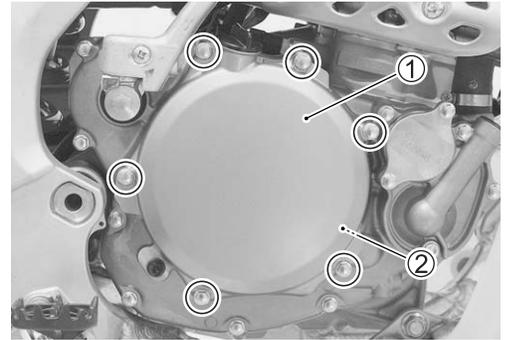
①	Clutch pressure plate	⑩	Lock washer
②	Bearing	⑪	Clutch sleeve hub
③	Push piece	⑫	Needle bearing
④	Clutch driven No.1 plate (Silver)	⑬	Primary driven gear
⑤	Clutch driven No.1 plate (Gray)	⑭	Spacer
⑥	Spring washer	⑮	Washer
⑦	Spring washer seat	Ⓐ	Clutch spring set bolt
⑧	Clutch drive plate	Ⓑ	Clutch sleeve hub nut
⑨	Push rod		

ITEM	N·m	kgf·m	lbf·ft
Ⓐ	10	1.0	7.0
Ⓑ	90	9.0	65.0

CLUTCH PLATE

REMOVAL

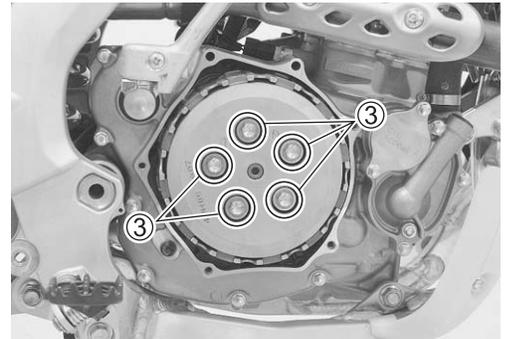
- Drain engine oil. (☞ 2-13)
- Remove the brake pedal. (☞ 17-20)
- Remove the clutch cover ① and its gasket ②.



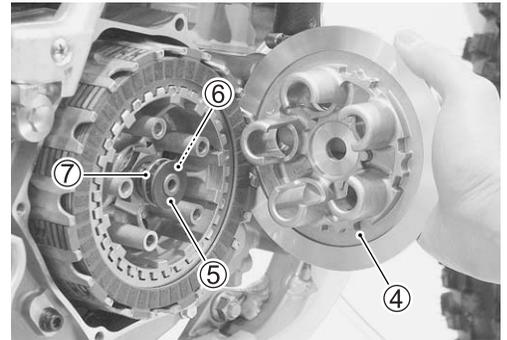
- Remove the clutch spring set bolts ③ and clutch springs.

NOTE:

Loosen the clutch spring set bolts ③ little by little and diagonally.



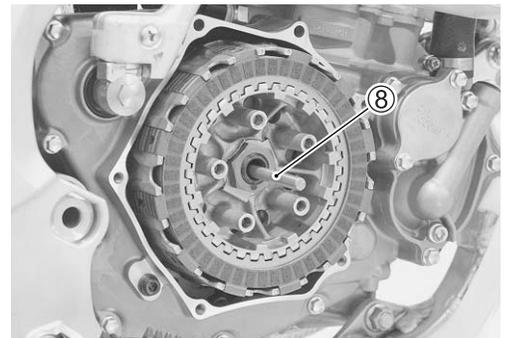
- Remove the clutch pressure plate ④, washer ⑤ bearing ⑥ and push piece ⑦.



- Remove the push rod ⑧.

NOTE:

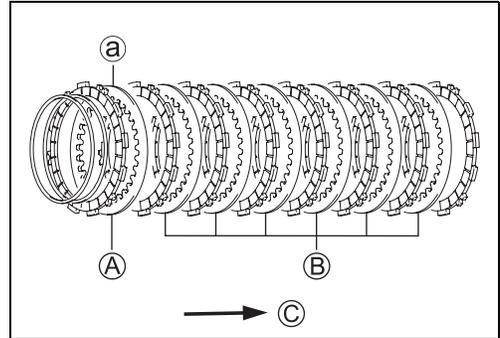
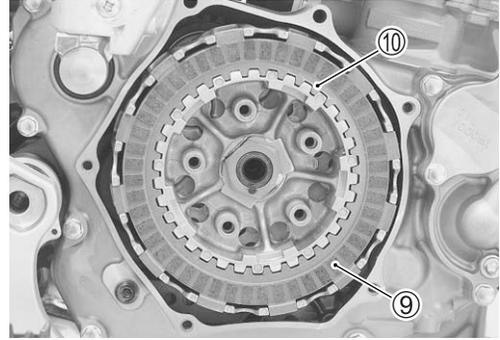
If it is difficult to pull out the push rod ⑧, use a magnetic hand or a wire.



- Remove the clutch drive plates ⑨ and driven plates ⑩.

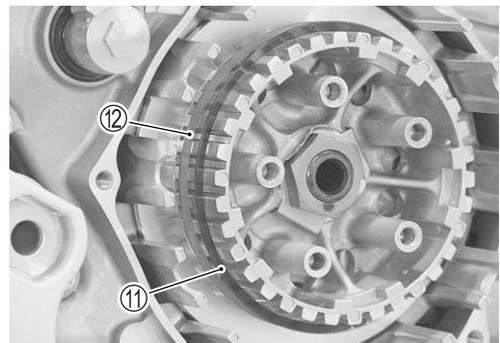
NOTE:

Mark the paint mark ㉑ to the clutch driven No. 2 plate.



- Ⓐ Clutch driven No. 2 plate
- Ⓑ Clutch driven No. 1 plate
- Ⓒ Direction of outside

- Remove the spring washer ⑪ and spring washer seat ⑫.



INSPECTION

DRIVE PLATE

- Measure the drive plate thickness.

DATA Drive plate thickness
Service Limit: 2.42 mm (0.095 in)

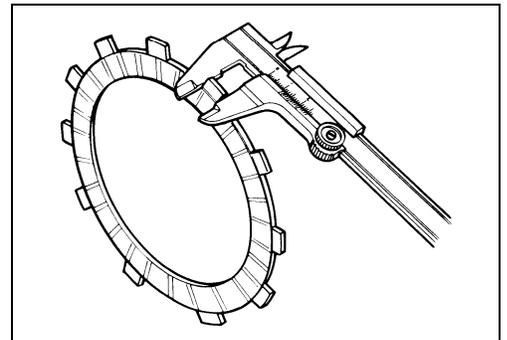
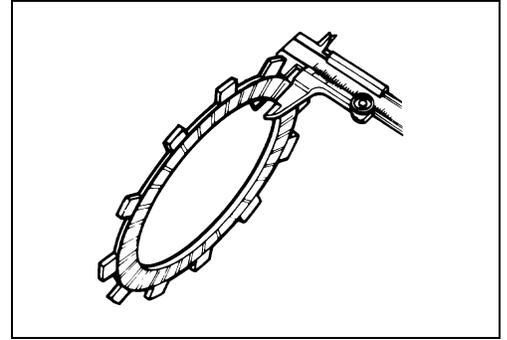
TOOL 09900-20101: Vernier calipers

- Inspect the drive plates for wear, distortion and discoloration.
- If the drive plate thickness is found to have reached the limit, replace it with a new one.

- Measure the drive plate claw width.
- Replace the drive plates found to have worn down to the limit.

DATA Drive plate claw width
Service Limit: 13.05 mm (0.514 in)

TOOL 09900-20101: Vernier calipers



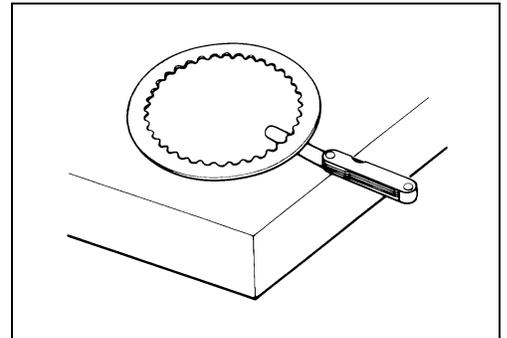
DRIVEN PLATE

- Measure the driven plate distortion.

DATA Driven plate distortion
Service Limit: 0.10 mm (0.004 in)

TOOL 09900-20803: Thickness gauge

- Inspect the driven plates for wear and discoloration.
- Replace driven plates which exceed the limit.



CLUTCH SPRING

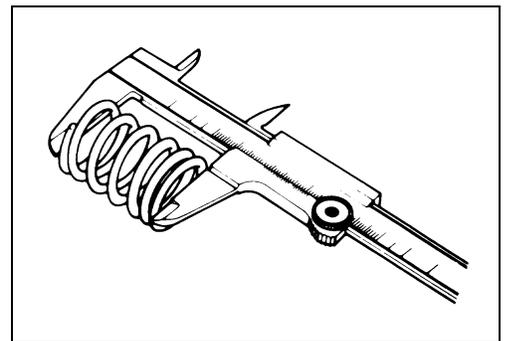
- Measure the clutch spring free length.
- Replace all the springs if any spring is not within the limit.

DATA Clutch spring free length
Service Limit: 48.2 mm (1.90 in)

TOOL 09900-20101: Vernier calipers

NOTE:

Replace five clutch springs together even if only one spring is beyond the service limit.



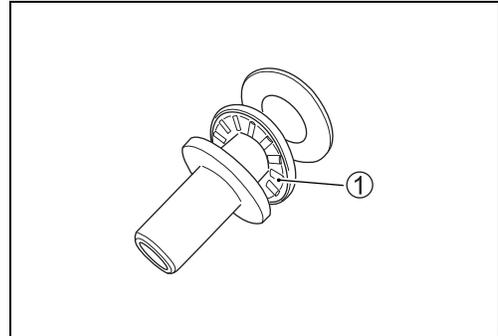
PUSH ROD

- Inspect the push rod for wear and damage.
- If any defects are found, replace the push rod with a new one.



RELEASE BEARING

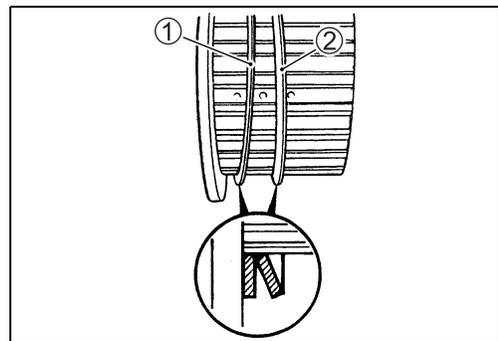
- Inspect the clutch release bearing ① for any abnormality, particularly cracks, to decide whether it can be reused or should be replaced.
- Smooth engagement and disengagement of the clutch depends on the condition of this bearing.
- If any defects are found, replace the clutch release bearing with a new one.



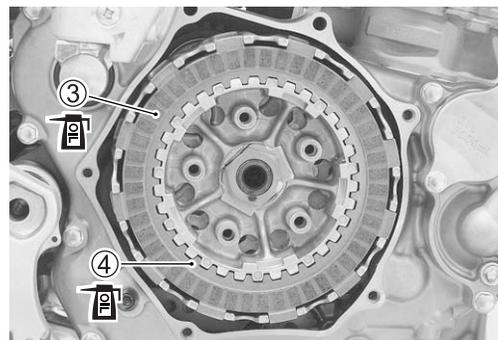
INSTALLATION

Install the clutch plates in the reverse order of removal. Pay attention to the following points:

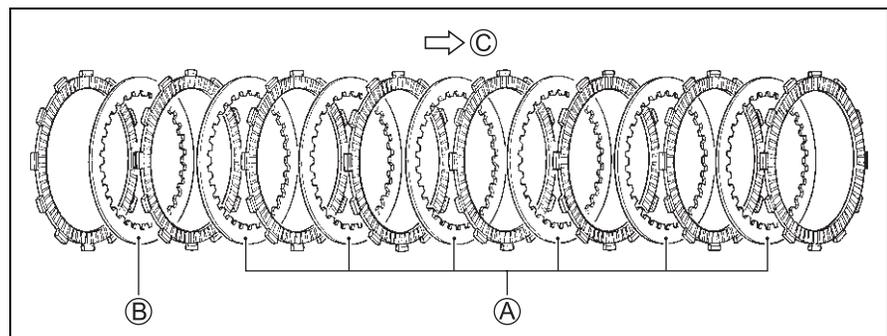
- Install the spring washer seat ① and spring washer ② onto the clutch sleeve hub correctly.



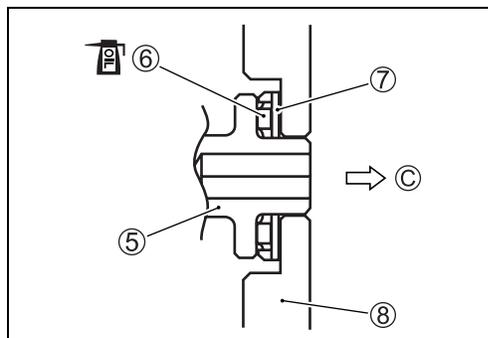
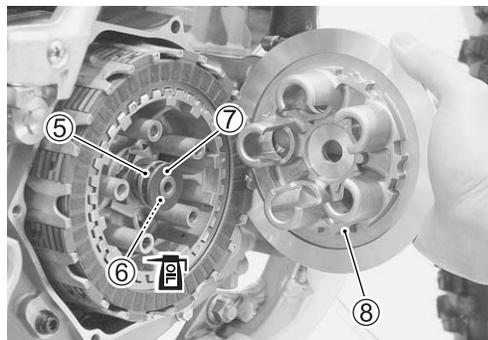
- Apply engine oil to the drive plates ③ and driven plates ④.
- Install the clutch drive plates and driven plates one by one into the clutch sleeve hub in the prescribed order as show in illustration.



	Color
Ⓐ Driven No. 1 plate	Silver
Ⓑ Driven No. 2 plate	Gray
Ⓒ Direction of outside	



- Install the push rod and push piece ⑤.
- Apply engine oil to the release bearing ⑥.
- Install the release bearing ⑥ and washer ⑦.
- Fit the clutch pressure plate ⑧.



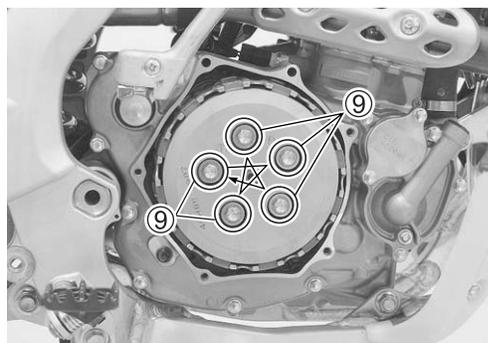
© Direction of outside

- Install the clutch springs and clutch spring set bolts ⑨.
- Tighten the clutch spring set bolts ⑨ to the specified torque.

NOTE:

Tighten the clutch spring set bolts ⑨ diagonally.

🔧 Clutch spring set bolt: 10 N·m (1.0 kgf-m, 7.0 lbf-ft)



- Install the gasket ⑩ and clutch cover ⑪.

CAUTION

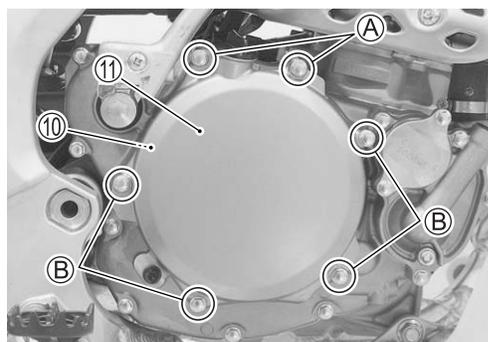
Replace the gasket ⑩ with a new one.

- Tighten the clutch cover bolts (A, B) diagonally to the specified torque.

🔧 Clutch cover bolt: 11 N·m (1.1 kgf-m, 8.0 lbf-ft)

Ⓐ Length: 60 mm (2.4 in)

Ⓑ Length: 25 mm (1.0 in)



- Install the brake pedal. (🔧 17-20)

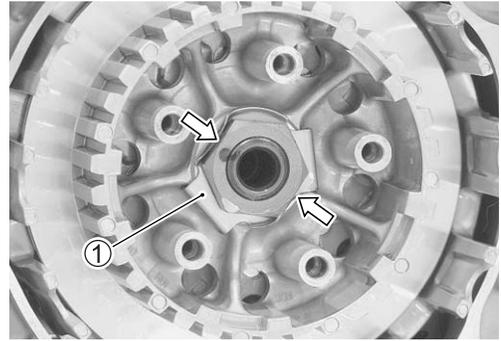
INSPECTION AFTER INSTALLATION

- Engine oil level and oil leakage (🔧 2-12)
- Clutch cable play (🔧 2-20)
- Smooth operation of clutch system

PRIMARY DRIVEN GEAR AND CLUTCH SLEEVE HUB

REMOVAL

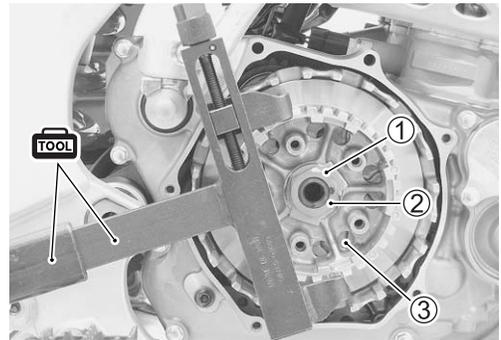
- Remove the clutch cover. (☞ 7-3)
- Remove the pressure plate and clutch plates. (☞ 7-3, -4)
- Flatten the lock washer ①.



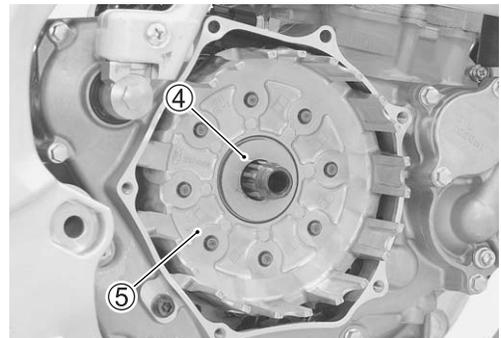
- Hold the clutch sleeve hub ③ with the special tool and loosen the clutch sleeve hub nut ②.

TOOL 09920-53740: Clutch sleeve hub holder
09920-31020: Extension handle

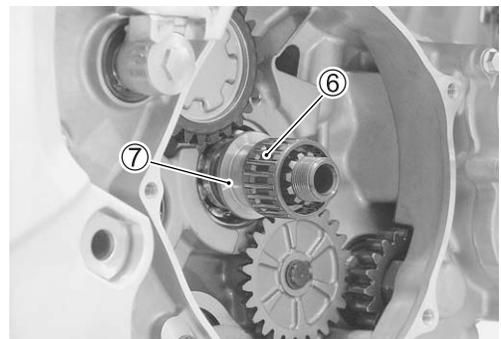
- Remove the nut ②, lock washer ① and clutch sleeve hub ③.



- Remove the washer ④ and primary driven gear ⑤.



- Remove the needle bearing ⑥ and spacer ⑦.



INSPECTION

- Inspect the clutch sleeve hub and primary driven gear for wear and cracks.
- If any defects are found, replace the sleeve hub or driven gear with a new one.



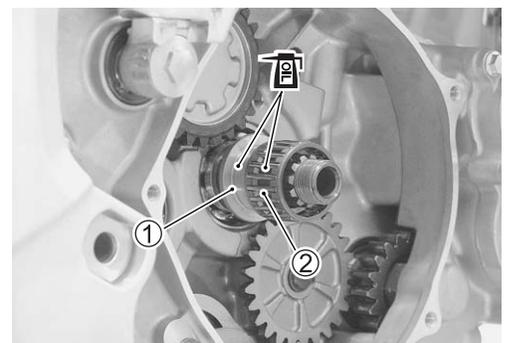
- Inspect the needle bearing and spacer for damage and wear.
- If any defects are found, replace the bearing or spacer with a new one.



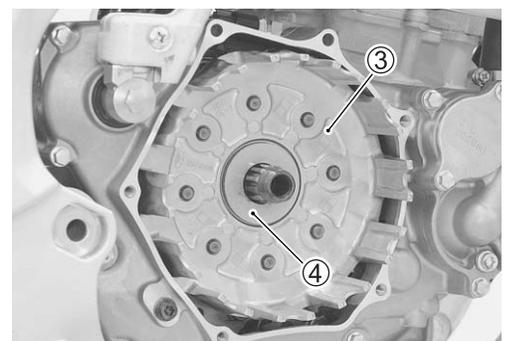
INSTALLATION

Install the primary driven gear and clutch sleeve hub in the reverse order of removal. Pay attention to the following points:

- Apply engine oil to the spacer ① and needle bearing ②.
- Install the spacer ① and needle bearing ②.



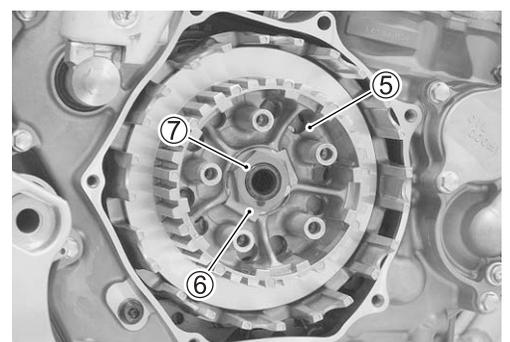
- Install the primary driven gear ③.
- Install the washer ④.



- Fit the clutch sleeve hub ⑤, new lock washer ⑥ and clutch sleeve hub nut ⑦.

CAUTION

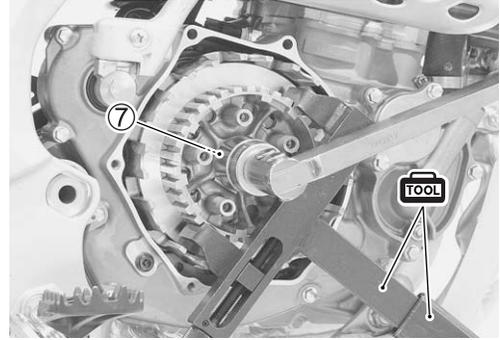
Replace the lock washer ⑥ with a new one.



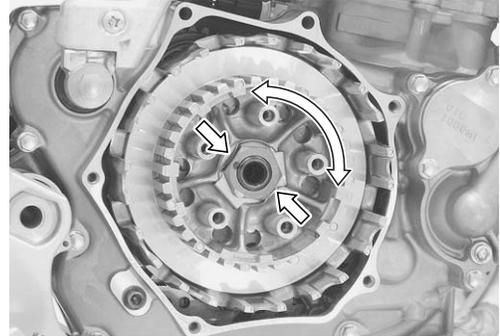
- Tighten the clutch sleeve hub nut ⑦ with the special tool to the specified torque.

TOOL 09920-53740: Clutch sleeve hub holder
09920-31020: Extension handle

U Clutch sleeve hub nut: 90 N·m (9.0 kgf·m, 65.0 lbf·ft)



- Make sure the clutch sleeve hub for smooth movement.
- Bend the lock washer to secure the nut.



- Reassemble the clutch plates and pressure plate. (☞ 7-6, -7)
- Install the gasket ⑧ and clutch cover ⑨.

CAUTION

Replace the gasket with a new one.

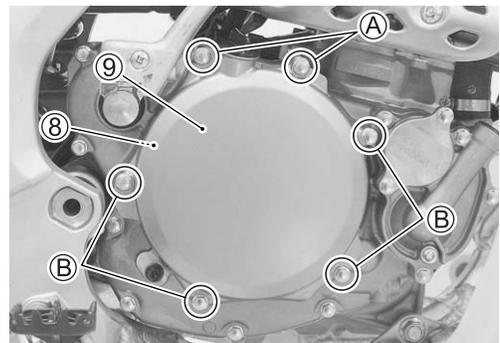
- Tighten the clutch cover bolts (A, B) diagonally to the specified torque.

U Clutch cover bolt: 11 N·m (1.1 kgf·m, 8.0 lbf·ft)

Ⓐ Length: 60 mm (2.4 in)

Ⓑ Length: 25 mm (1.0 in)

- Install the brake pedal. (☞ 17-20)



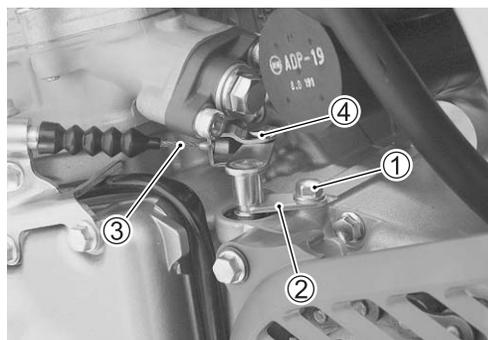
INSPECTION AFTER INSTALLATION

- Engine oil level and oil leakage (☞ 2-12)
- Clutch cable play (☞ 2-20)
- Smooth operation of clutch system

CLUTCH RELEASE CAMSHAFT

REMOVAL

- Remove the clutch cover and its gasket. (☞7-3)
- Remove the pressure plate and push rod. (☞7-3)
- Remove the retainer ② by removing its bolt ①.
- Disconnect the clutch cable ③.
- Pull the clutch release camshaft ④ out of crankcase.



INSPECTION

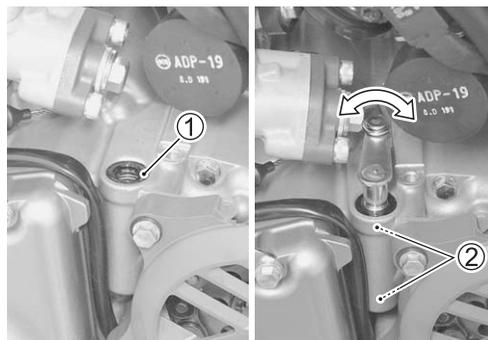
CLUTCH RELEASE CAMSHAFT

- Inspect the clutch release camshaft for abnormal deflection and damage.
- If any defects are found, replace the release camshaft with a new one.



OIL SEAL AND BEARING

- Inspect the oil seal ① for oil leakage and oil seal lip damage.
- Inspect the bearings ② for play and smooth movement.
- If necessary, replace the defective parts with a new one.
(☞10-9 to -12)



INSTALLATION

Install the clutch release camshaft ① in the reverse order of removal. Pay attention to the following points:

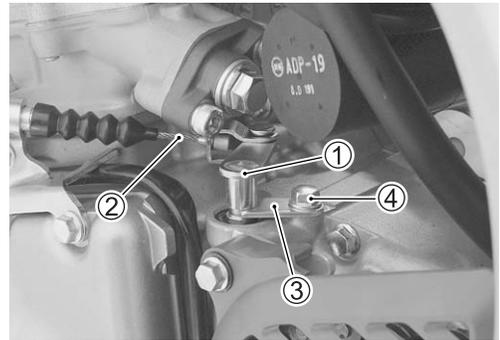
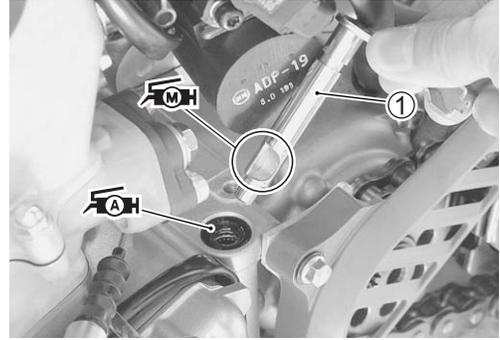
- Apply SUZUKI MOLY PASTE to the clutch release camshaft.

 99000-25140: SUZUKI MOLY PASTE or equivalent

- Apply grease to the oil seal lip.

 99000-25010: SUZUKI SUPER GREASE "A"
or equivalent

- Install the clutch release camshaft ① and connect the clutch cable ②.
- Install the push rod and pressure plate. (☞ 7-7)
- Install the clutch cover and its gasket. (☞ 7-7)
- Install the retainer ③ and tighten the retainer bolt ④.



INSPECTION AFTER INSTALLATION

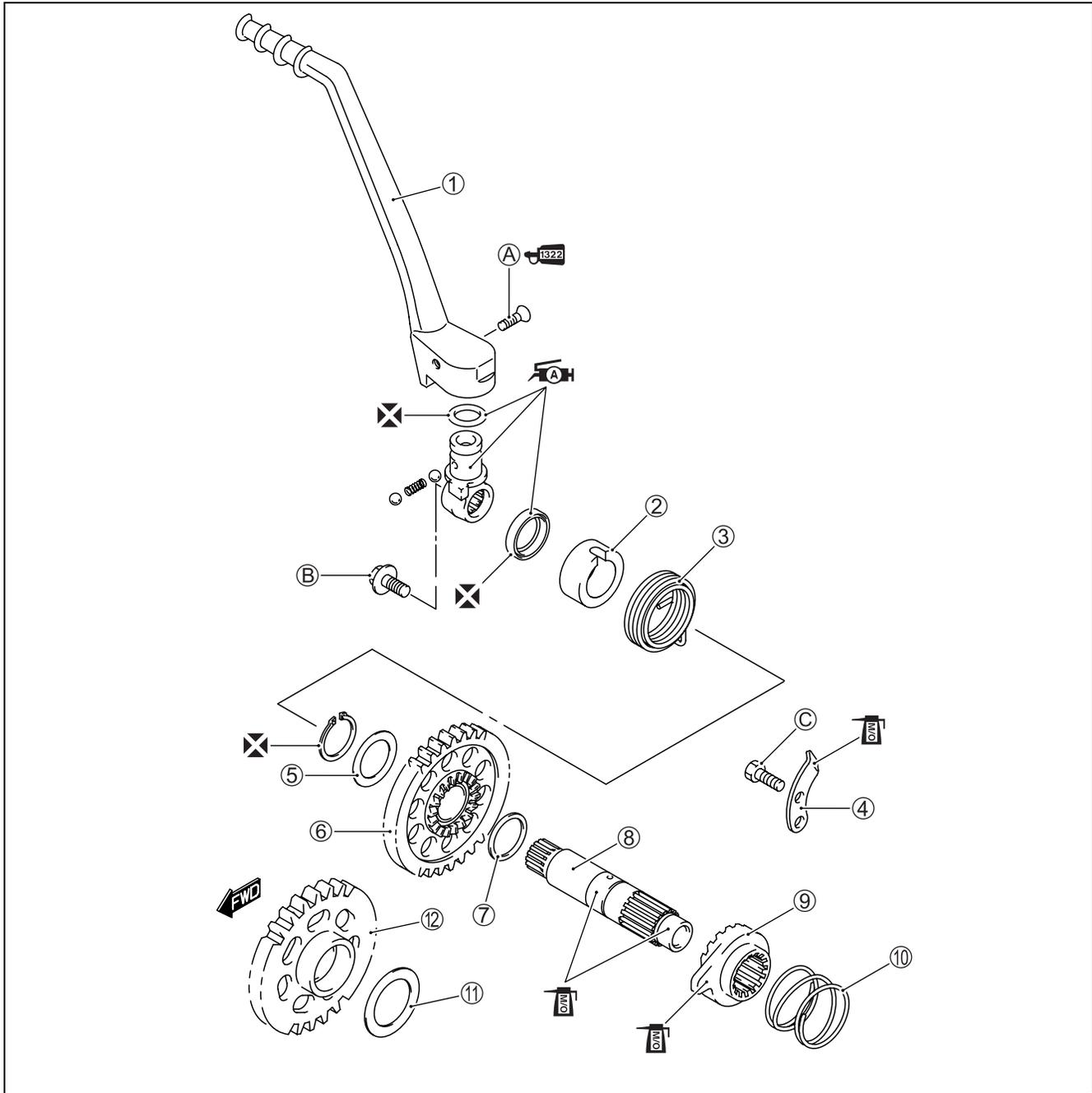
- Engine oil level and oil leakage (☞ 2-12)
- Clutch cable play (☞ 2-20)
- Smooth operation of clutch system

KICK STARTER

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CONSTRUCTION KICK STARTER



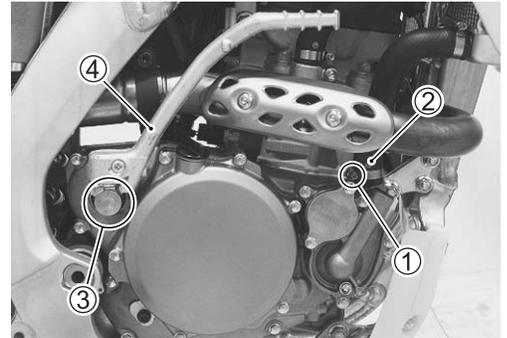
① Kick starter lever	⑨ Kick starter
② Spring guide	⑩ Spring
③ Spring	⑪ Wave washer
④ Kick starter guide	⑫ Kick starter idle gear
⑤ Washer	Ⓐ Kick starter lever screw
⑥ Kick starter drive gear	Ⓑ Kick starter lever bolt
⑦ Washer	Ⓒ Kick starter guide bolt
⑧ Kick starter shaft	

ITEM	N-m	kgf-m	lbf-ft
Ⓐ Ⓒ	10	1.0	7.0
Ⓑ	29	2.9	21.0

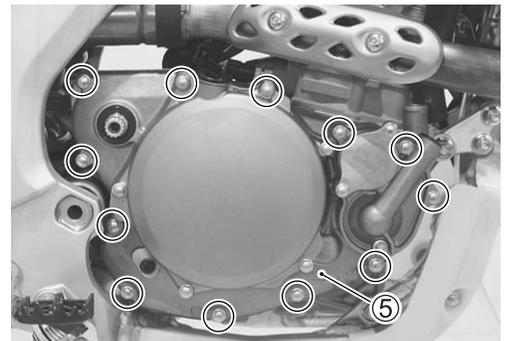
KICK STARTER

REMOVAL

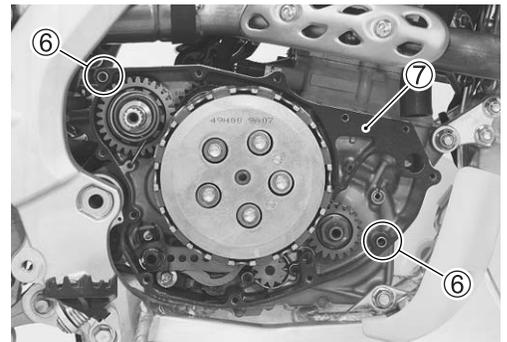
- Drain engine oil. (☞ 2-13)
- Drain engine coolant. (☞ 14-3)
- Remove the brake pedal. (☞ 17-20)
- Disconnect the radiator hose ② by loosening its clamp screw ①.
- Remove the kick starter lever ④ by removing its bolt ③.



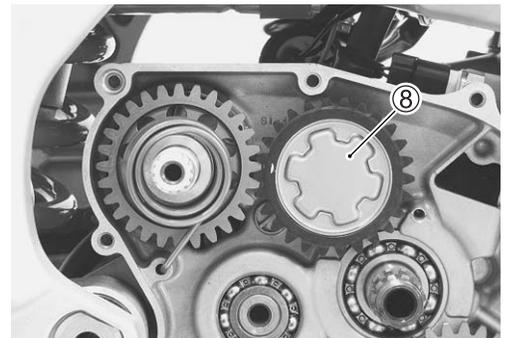
- Remove the right crankcase cover ⑤ by removing its bolts.



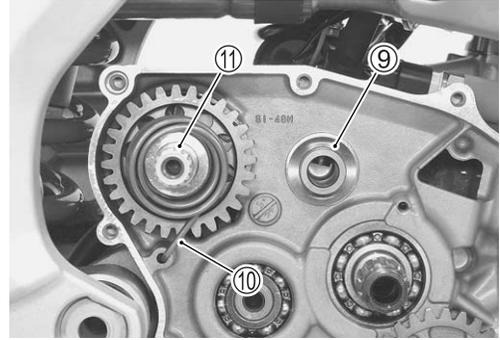
- Remove the dowel pins ⑥ and gasket ⑦.
- Remove the clutch component parts. (☞ 7-8)



- Remove the kick starter idle gear ⑧.

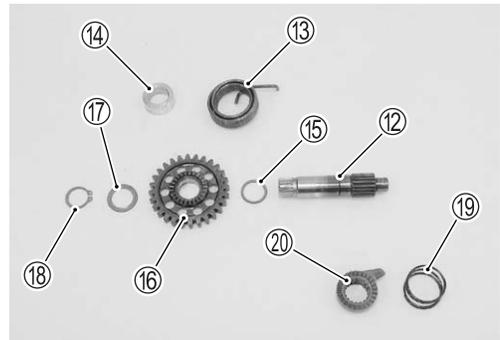


- Remove the wave washer ⑨.
- Unhook the end of return spring ⑩.
- Remove the kick starter shaft assembly ⑪.



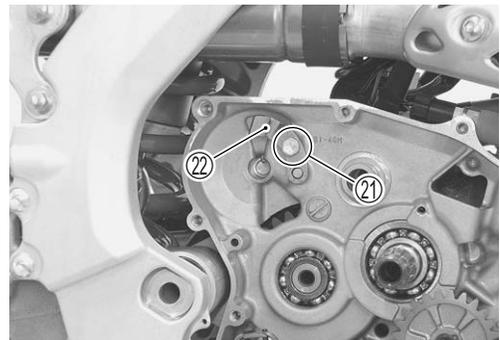
- Remove the following parts from the kick starter shaft assembly ⑪.

- | | |
|---------------------------|----------------|
| Starter shaft ⑫ | Washer ⑰ |
| Return spring ⑬ | Snap ring ⑱ |
| Spring guide ⑭ | Spring ⑲ |
| Washer ⑮ | Kick starter ⑳ |
| Kick starter drive gear ⑯ | |



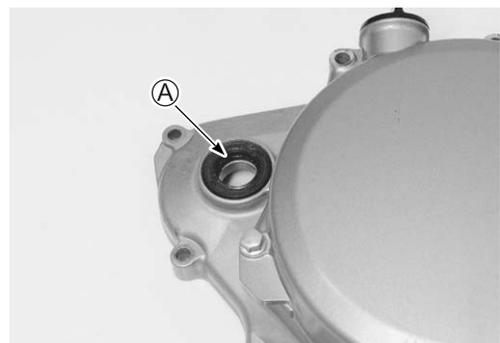
 **09900-06107: Snap ring remover (Open type)**

- Remove the kick starter guide ⑳ by removing its bolt ㉑.



INSPECTION

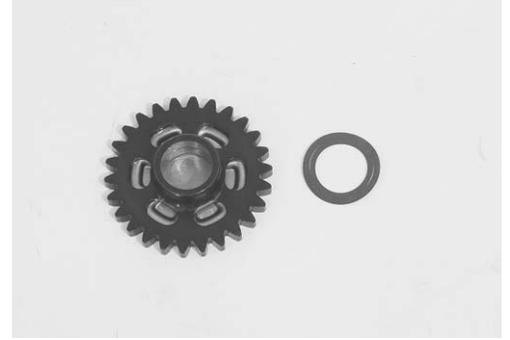
- Inspect the oil seal lip ㉒ for wear and damage.
- If any defects are found, replace the oil seal with a new one.



- Inspect the kick starter drive gear teeth for damage.
- Inspect the kick starter drive gear ratchet part for wear and damage.
- Inspect the kick starter shaft and drive gear for contact surface wear.
- Inspect the return spring for damage.
- If necessary, replace the defective parts with a new one.



- Inspect the kick starter idle gear teeth for wear and damage.
- Inspect the kick starter idle gear and its shaft contact surface for wear and damage.
- Inspect the wave washer for wear and damage.
- If any defects are found, replace the gear with a new one.

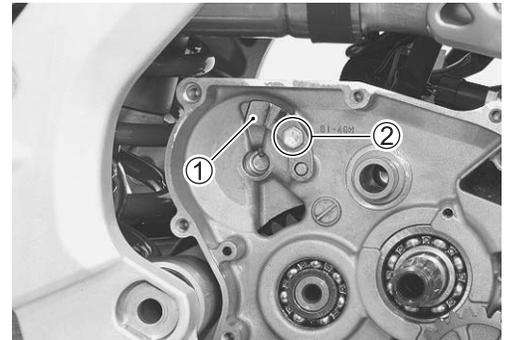


INSTALLATION

Install the kick starter in the reverse order of removal. Pay attention to the following points:

- Install the kick starter guide ① and tighten the kick starter guide bolt ② to the specified torque.

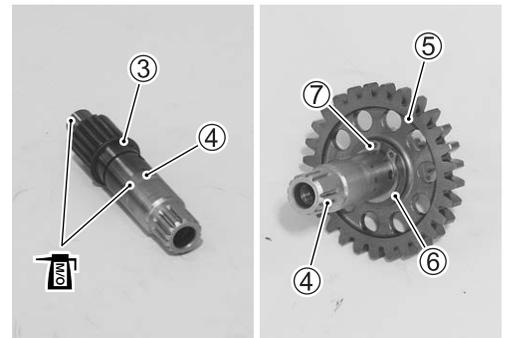
 **Kick starter guide bolt: 10 N·m (1.0 kgf·m, 7.0 lbf·ft)**



- Install the washer ③ onto the kick starter shaft ④.
- Apply MOLYBDENUM OIL SOLUTION to the kick starter shaft ④.

 **MOLYBDENUM OIL SOLUTION**

- Install the kick starter drive gear ⑤, washer ⑥ and snap ring ⑦ onto the kick starter shaft ④.

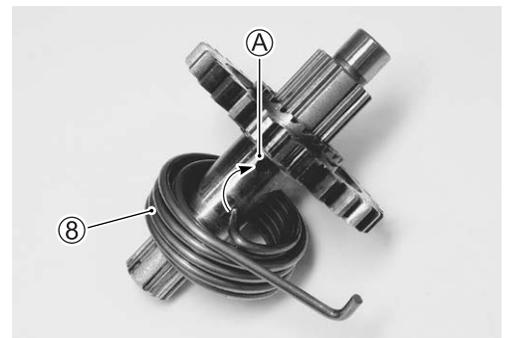


CAUTION

Replace the snap ring ⑦ with a new one.

 **09900-06107: Snap ring remover (Open type)**

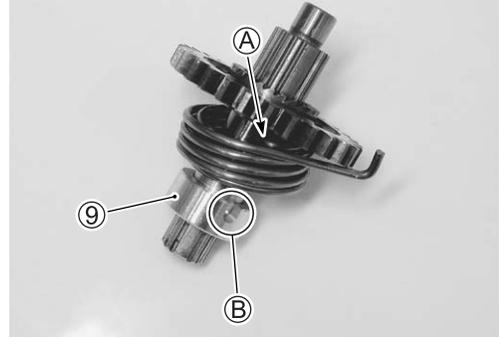
- Install the return spring ⑧ into the kick starter shaft hole (A).



- Install the guide ⑨ to the kick starter shaft.

NOTE:

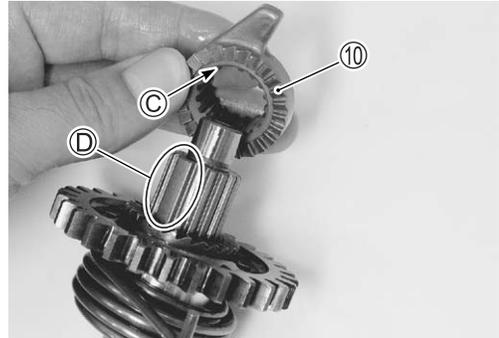
Align the concave ② of guide with kick starter shaft hole ①.



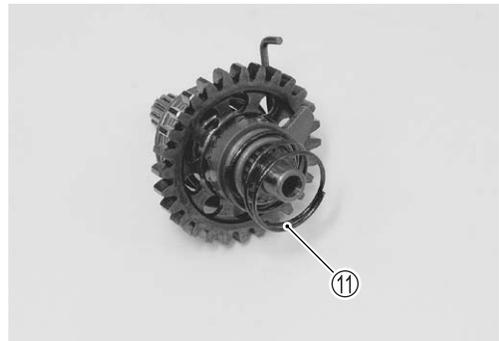
- Install the kick starter ⑩ onto the kick starter shaft.

NOTE:

When installing the kick starter ⑩, align the wide spline teeth ③ and ④.



- Install the spring ⑪ to the kick starter shaft.



- Apply MOLYBDENUM OIL SOLUTION to the stopper portion ⑤ of the kick starter and ⑥ of the stopper guide.

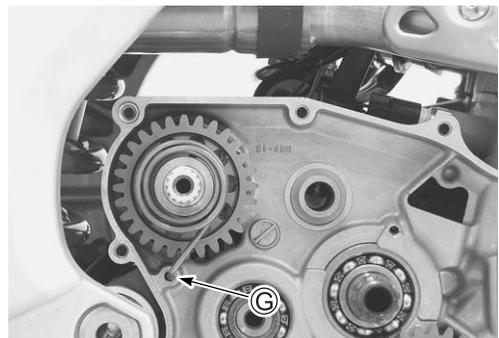
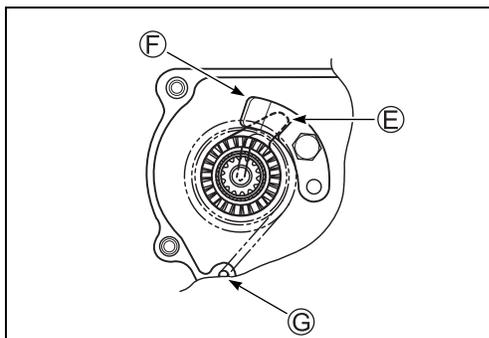
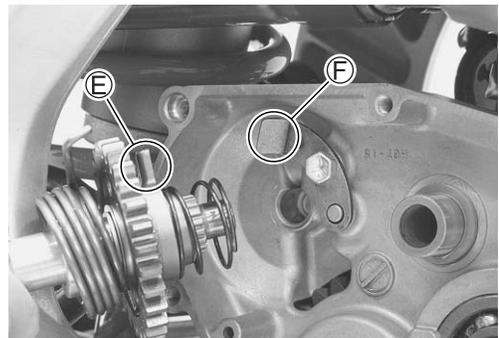
MOLYBDENUM OIL SOLUTION

- Install the kick starter shaft assembly onto the crankcase.

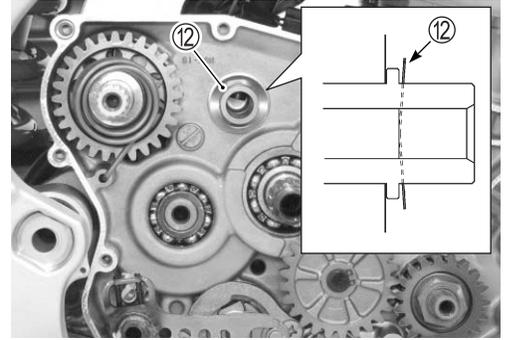
NOTE:

Securely engage the stopper portion ⑤ of the kick starter with the stopper guide ⑥.

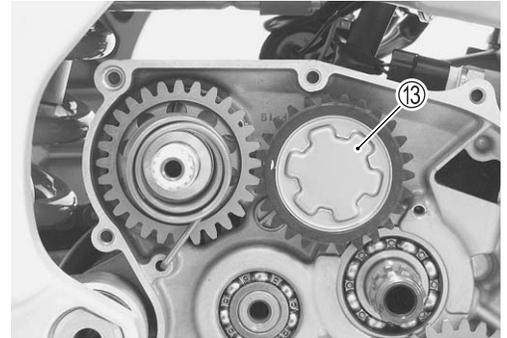
- Hook the end of return spring to the crankcase hole ⑦.



- Install the wave washer ⑫ with convex side inside onto the kick starter idle shaft.



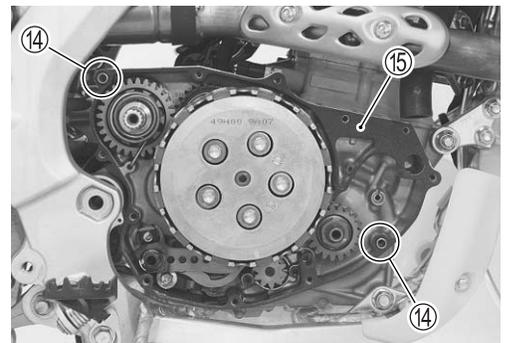
- Install the kick starter idle gear ⑬.
- Reassemble the clutch component parts. (☞ 7-9, -10)



- Install the dowel pins ⑭ and gasket ⑮.

CAUTION

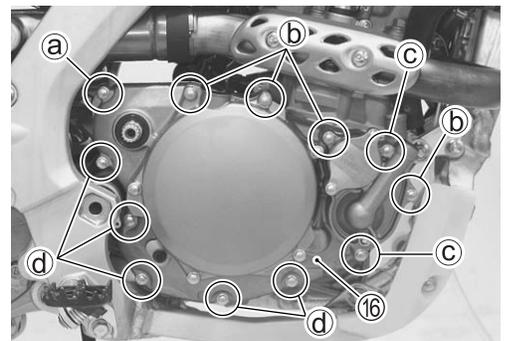
Replace the gasket ⑮ with a new one.



- Install the right crankcase cover ⑯.
- Tighten the right crankcase cover bolts (a, b, c, d) to the specified torque.

🔧 Right crankcase cover bolt: 11 N·m (1.1kgf·m, 8.0 lbf·ft)

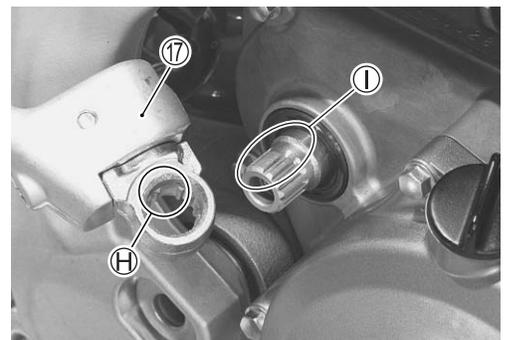
- ① Length: 30 mm (1.2 in)
- ② Length: 60 mm (2.4 in)
- ③ Length: 65 mm (2.6 in)
- ④ Length: 25 mm (1.0 in)



- Install the kick starter lever ⑰ onto the kick starter shaft.

NOTE:

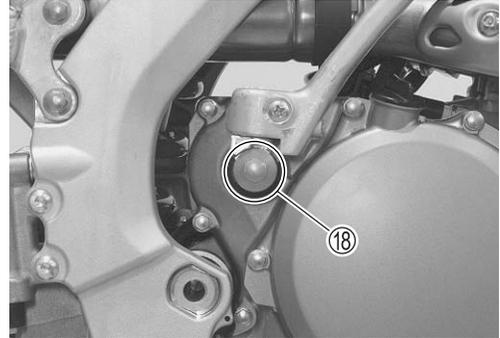
When installing the kick starter lever ⑰, align the wide spline teeth ① and ②.



- Tighten the kick starter lever bolt ⑱ to the specified torque.

 **Kick starter lever bolt: 29 N·m (2.9 kgf-m, 21.0 lbf-ft)**

- Install the brake pedal. ( 17-20)
- Connect the radiator hose. ( 20-24)



INSPECTION AFTER INSTALLATION

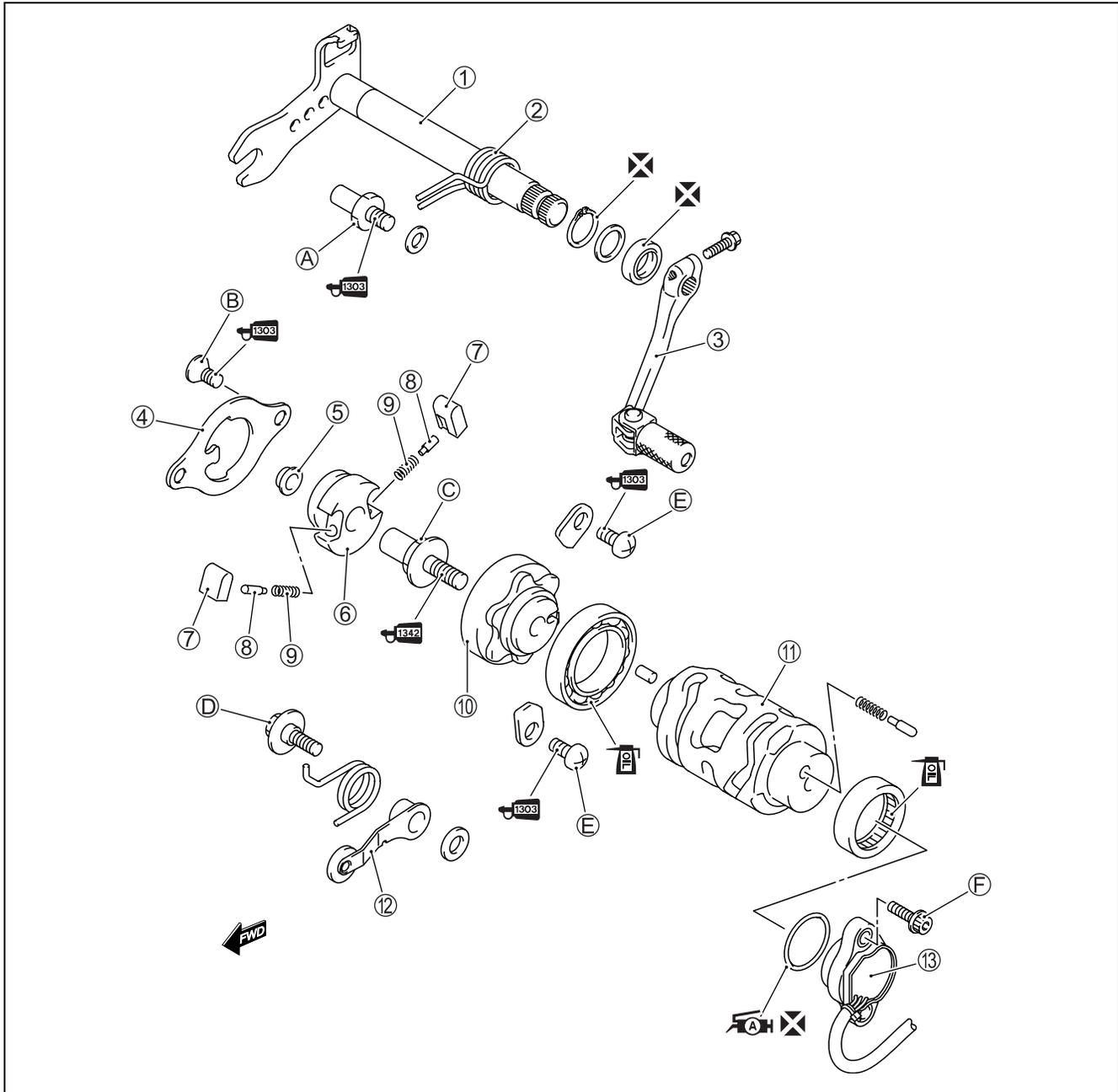
- Engine oil level and oil leakage ( 2-12)
- Engine coolant level and coolant leakage ( 2-18, -19)
- Smooth movement of kick starter system

GEARSHIFTING

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CONSTRUCTION	9- 2
GEARSHIFT LINKAGE	9- 2
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CONSTRUCTION GEARSHIFT LINKAGE



①	Gearshift shaft	⑪	Gearshift cam
②	Return spring	⑫	Gearshift cam stopper
③	Gearshift lever	⑬	GP switch
④	Gearshift pawl lifter	Ⓐ	Gearshift arm stopper
⑤	Gearshift roller	Ⓑ	Pawl lifter screw
⑥	Gearshift cam driven gear	Ⓒ	Gearshift cam driven gear pin
⑦	Gearshift pawl	Ⓓ	Shift cam stopper bolt
⑧	Pin	Ⓔ	Bearing retainer screw
⑨	Spring	Ⓕ	GP switch mounting bolt
⑩	Gearshift cam stopper plate		



ITEM	N·m	kgf·m	lbf·ft
Ⓐ	23	2.3	16.5
Ⓑ	8.5	0.85	6.0
Ⓒ	24	2.4	17.5
Ⓓ	10	1.0	7.0
Ⓔ	8.5	0.85	6.0
Ⓕ	6.5	0.65	4.7

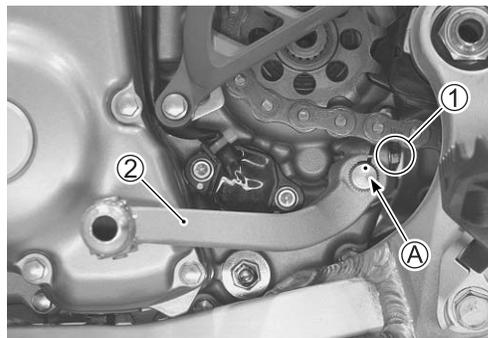
GEARSHIFT LINKAGE

REMOVAL

- Drain engine oil. (☞ 2-13)
- Drain engine coolant. (☞ 14-3)
- Remove the gearshift lever ② by removing its bolt ①.

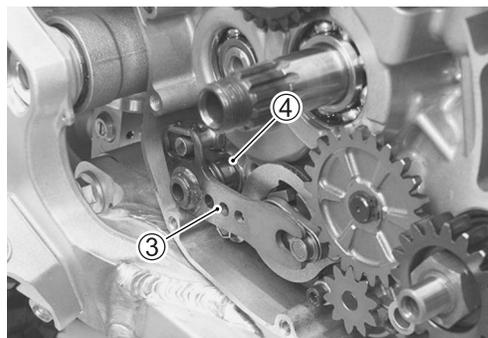
NOTE:

Mark the gearshift shaft head **A** at which the gearshift lever slit set for correct reinstallation.



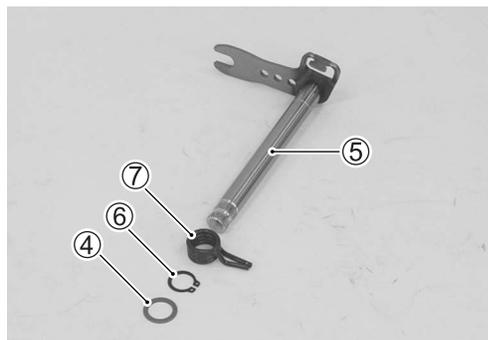
- Remove the right crankcase cover and clutch component parts. (☞ 7-9, 8-3)

- Remove the gearshift shaft assembly ③ and washer ④.



- Remove the washer ④, snap ring ⑥ and return spring ⑦ from the gearshift shaft ⑤.

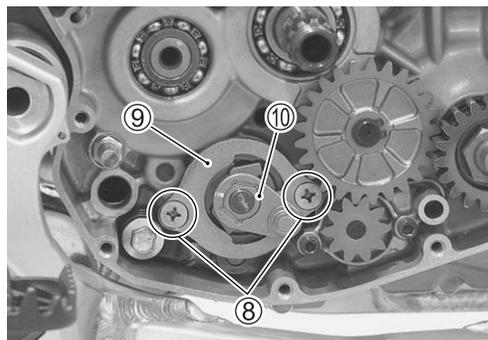
TOOL 09900-06107: Snap ring remover (Open type)



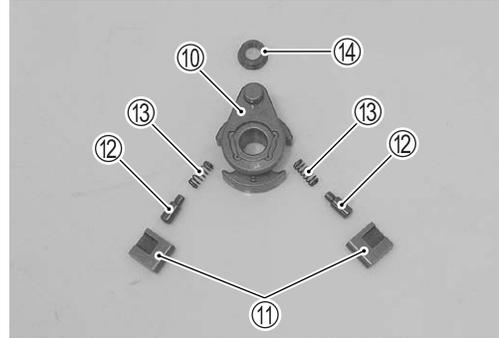
- Remove the gearshift pawl lifter ⑨ by removing its screws ⑧.
- Remove the gearshift cam driven gear ⑩.

NOTE:

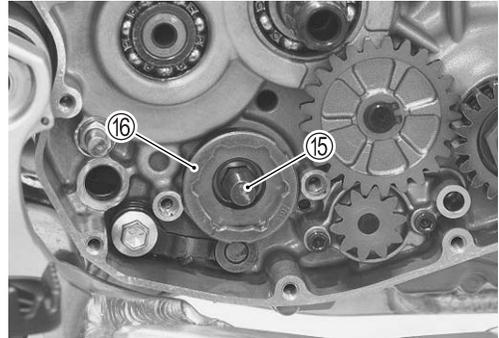
Be careful not to drop the pins and springs when removing the gearshift cam driven gear.



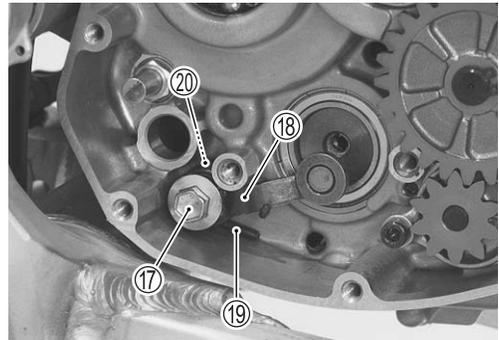
- Remove the gearshift pawls ⑪, pins ⑫, springs ⑬ and gearshift roller ⑭ from the gearshift cam driven gear ⑩.



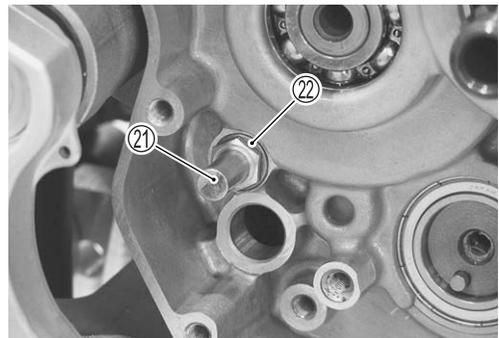
- Remove the gearshift cam driven gear pin ⑮ and gearshift cam stopper plate ⑯.



- Remove the gearshift cam stopper ⑱, spring ⑲ and washer ⑳ by removing is bolt ⑰.

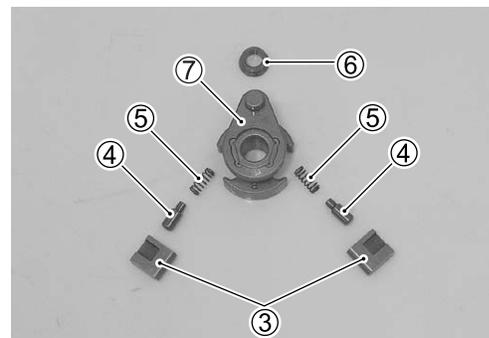
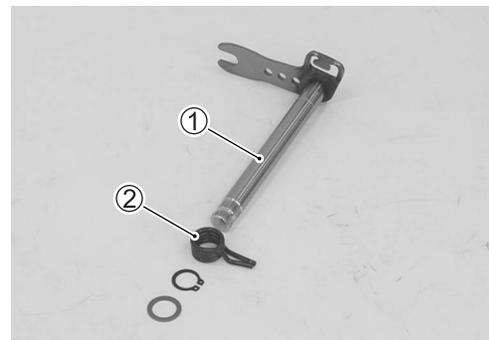


- Remove the gearshift arm stopper ㉑ and washer ㉒.



INSPECTION

- Inspect the gearshift shaft ① for bends and damage.
 - Inspect the return spring ② for damage.
 - If necessary, replace the defective parts with a new one.
-
- Inspect the pawls ③, pins ④, springs ⑤, gearshift roller ⑥ and gearshift cam driven gear ⑦ for damage.
 - If necessary, replace the defective parts with a new one.



INSTALLATION

Install the gearshift in the reverse order of removal. Pay attention to the following points:

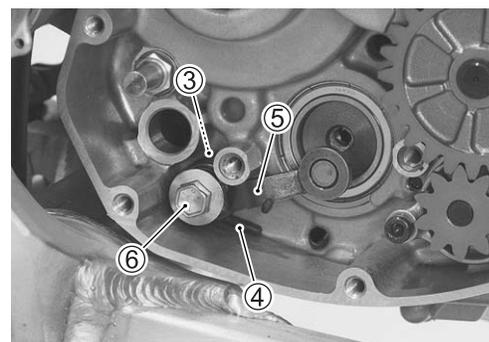
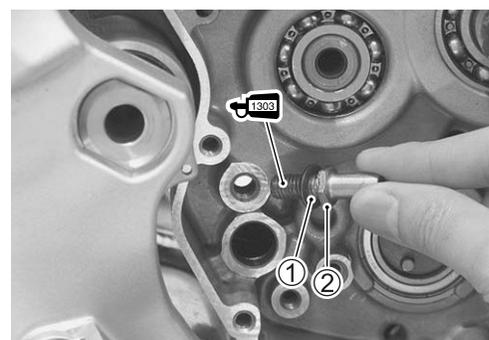
- Install the washer ① and gearshift arm stopper ②.
- Apply a small quantity of THREAD LOCK SUPER to the gearshift arm stopper ② and tighten it to the specified torque.

 **99000-32030: THREAD LOCK SUPER “1303”**
or equivalent

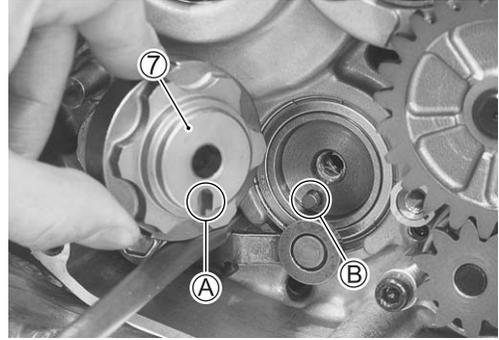
 **Gearshift arm stopper: 23 N·m (2.3 kgf-m, 16.5 lbf-ft)**

- Install the washer ③, spring ④ and gearshift cam stopper ⑤.
- Tighten the shift cam stopper bolt ⑥ to the specified torque.

 **Shift cam stopper bolt: 10 N·m (1.0 kgf-m, 7.0 lbf-ft)**



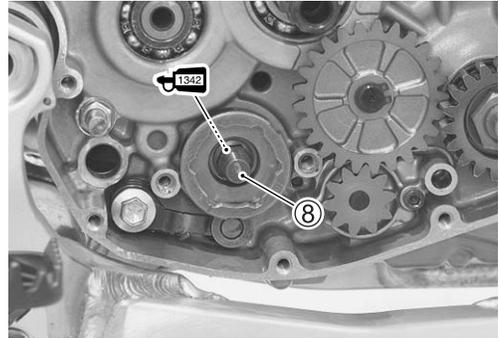
- Align the pin groove (A) with the pin (B) when installing the stopper plate (7).



- Apply a small quantity of THREAD LOCK to the gearshift cam driven gear pin (8) and tighten it to the specified torque.

 99000-32050: THREAD LOCK "1342" or equivalent

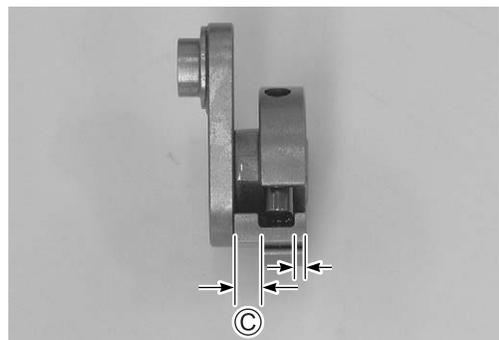
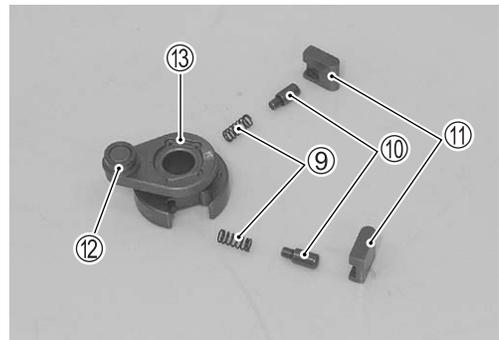
 Gearshift cam driven gear pin:
24 N·m (2.4 kgf-m, 17.5 lbf-ft)



- Fit the springs (9), pins (10), pawls (11) and gearshift roller (12) to the gearshift cam driven gear (13).

NOTE:

Wider side (C) of pawl should be positioned outside.



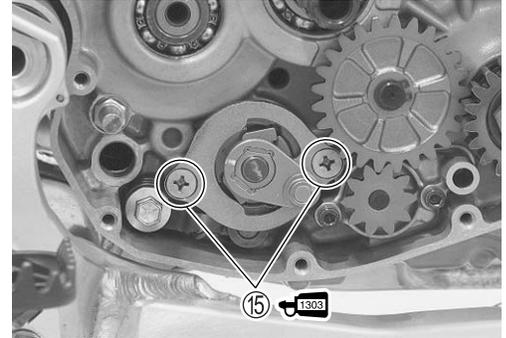
- With the pawls held in pushed position, install the pawl lifter (14).



- Install the gearshift cam driven gear and pawl lifter.
- Apply THREAD LOCK SUPER to the screws ⑮ and tighten them to the specified torque.

 **99000-32030: THREAD LOCK SUPER “1303”**
or equivalent

 **Pawl lifter screw: 8.5 N·m (0.85 kgf·m, 6.0 lbf·ft)**



- Install the gearshift return spring ⑯, snap ring ⑰ and washer ⑱ onto the gearshift shaft ⑲ properly.

CAUTION

Replace the snap ring ⑰ with a new one.

NOTE:

When installing the return spring, position the stopper ④ of gearshift arm between the return spring ends ⑤.

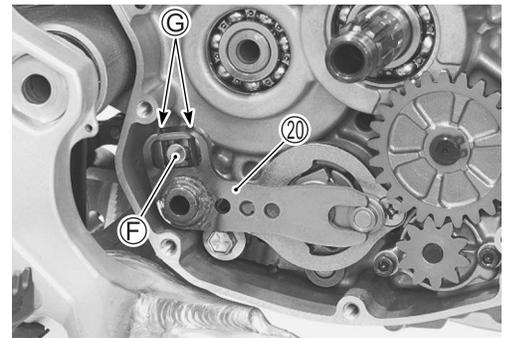
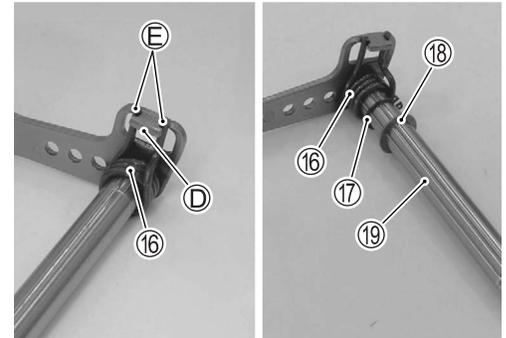
 **09900-06107: Snap ring remover (Open type)**

- Install the gearshift shaft assembly ⑳.

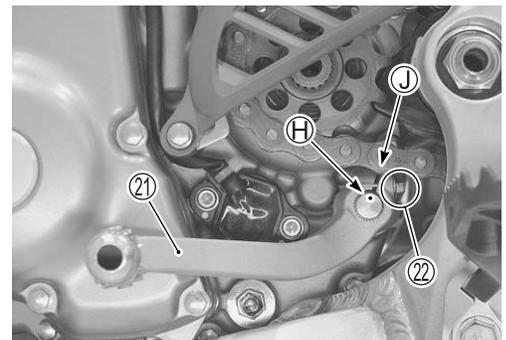
NOTE:

Pinch the gearshift arm stopper ⑤ with return spring ends ③.

- Install the clutch components parts and right crankcase cover. (☞ 7-9, -10, 8-7)



- Align the matching mark ⑧ on the gearshift shaft head with slit ⑩ of the gearshift lever ⑳.
- Tighten the gearshift lever bolt ㉑.



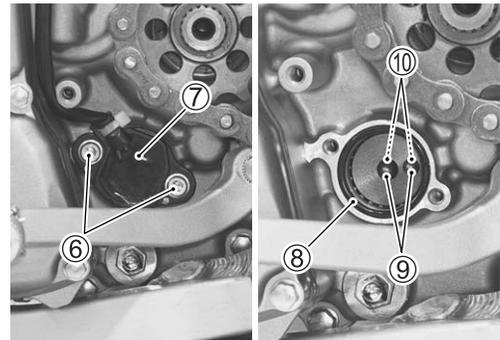
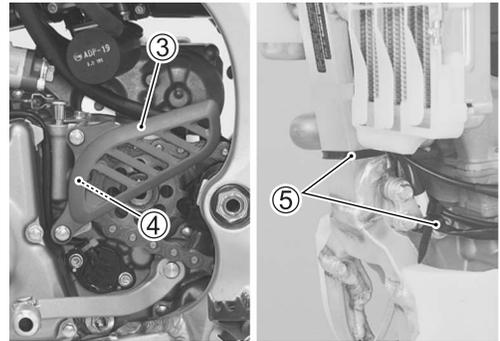
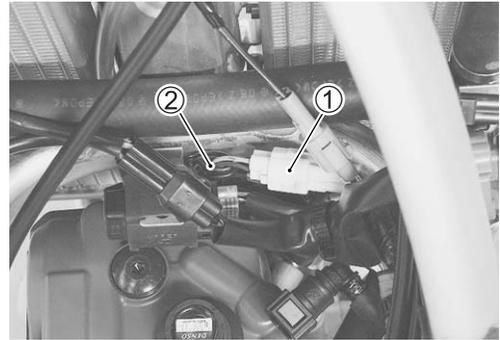
INSPECTION AFTER INSTALLATION

- Engine oil level and oil leakage (☞ 2-12)
- Engine coolant level and coolant leakage (☞ 2-18, -19)
- Smooth operation of gearshift system

GEAR POSITION (GP) SWITCH

REMOVAL

- Drain engine oil. (☞ 2-13)
- Remove the seat, radiator covers and fuel tank. (☞ 5-2, 13-2, -3)
- Disconnect the GP switch lead wire coupler ①.
- Remove the GP switch lead wire from the clamp ②.
- Remove the engine sprocket cover ③ and front chain guide plate ④.
- Remove the clamps ⑤.
- Remove the GP switch ⑦ by removing its bolts ⑥.
- Remove the O-ring ⑧, switch contacts ⑨ and springs ⑩.



INSPECTION

Refer to page 12-52, -53 for details.

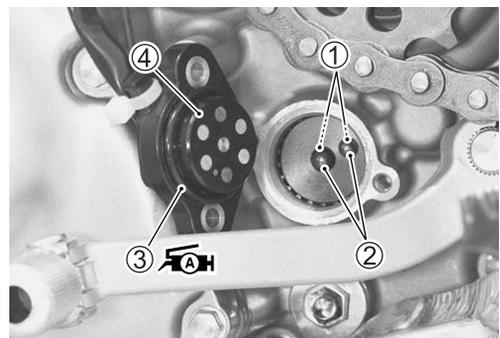
INSTALLATION

Install the gear position switch in the reverse order of removal. Pay attention to the following points:

- Install the springs ① and switch contacts ②.
- Fit the new O-ring ③ to GP switch ④ and apply grease to it.

CAUTION

Replace the O-ring ③ with a new one.



 99000-25010: SUZUKI SUPER GREASE "A"
or equivalent

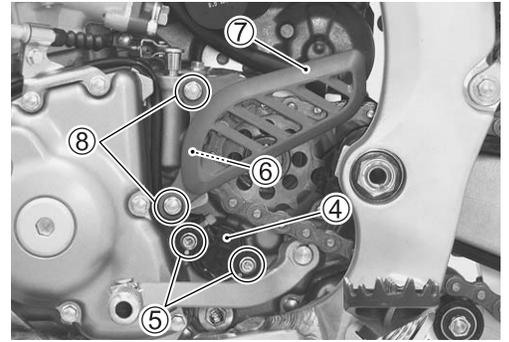
- Install the GP switch ④ and tighten the bolts ⑤ to the specified torque.

 **GP switch mounting bolt: 6.5 N·m (0.65 kgf·m, 4.7 lbf·ft)**

- Install the front chain guide plate ⑥ and engine sprocket cover ⑦.
- Tighten the engine sprocket cover bolts ⑧ to specified torque.

 **Engine sprocket cover bolt: 11 N·m (1.1 kgf·m, 8.0 lbf·ft)**

- Route the GP switch lead wire properly. ( 20-20)

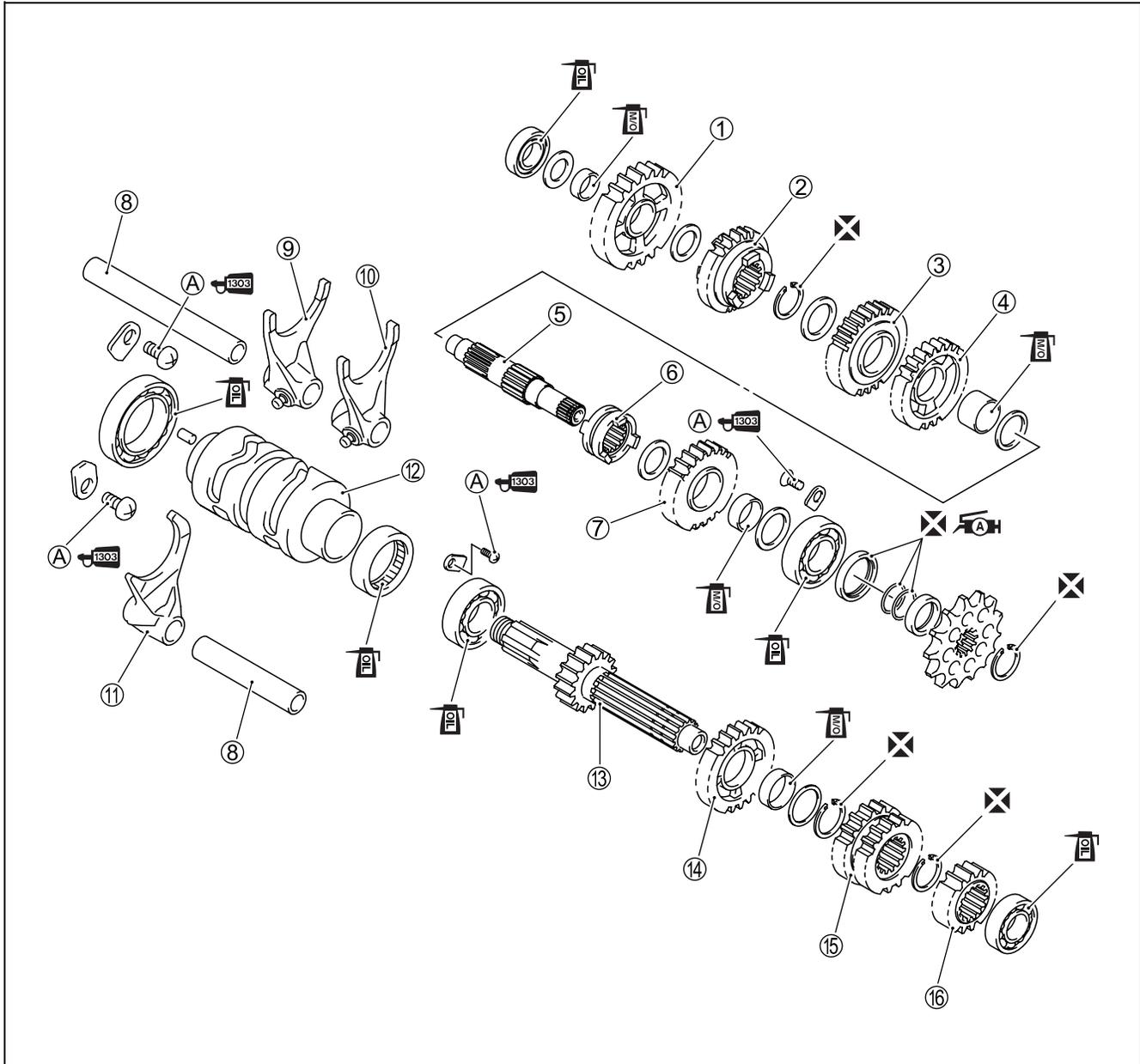


TRANSMISSION AND CRANKSHAFT

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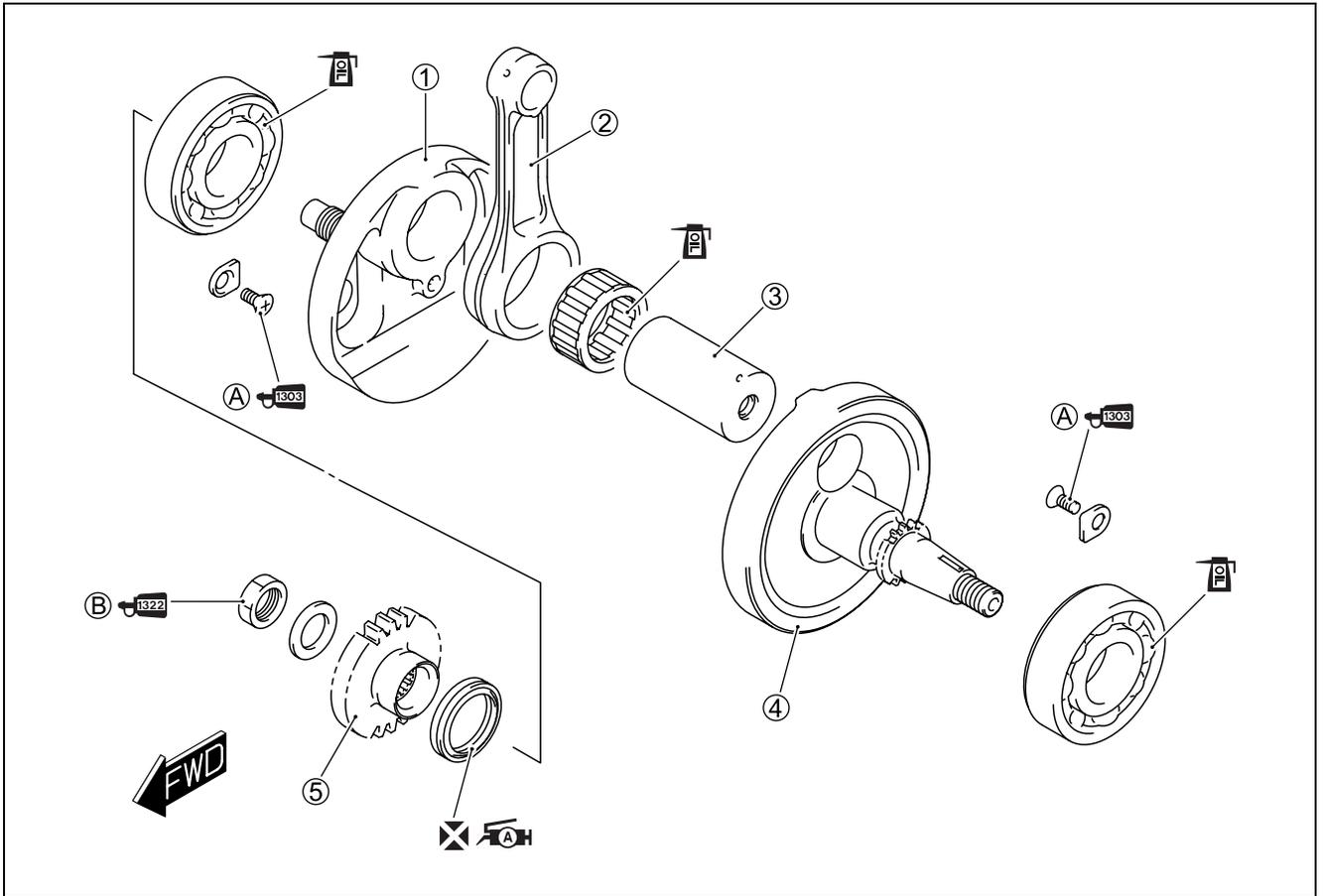
CONSTRUCTION TRANSMISSION



①	1st driven gear	⑩	Gearshift fork No.2
②	5th driven gear	⑪	Gearshift fork No.3
③	4th driven gear	⑫	Gearshift cam
④	3rd driven gear	⑬	Countershaft
⑤	Driveshaft	⑭	5th drive gear
⑥	Sliding dog	⑮	3rd & 4th drive gear
⑦	2nd driven gear	⑯	2nd drive gear
⑧	Gearshift fork shaft	A	Bearing retainer screw
⑨	Gearshift fork No.1		

ITEM	N-m	kgf-m	lbf-ft
A	8.5	0.85	6.0

CRANKSHAFT



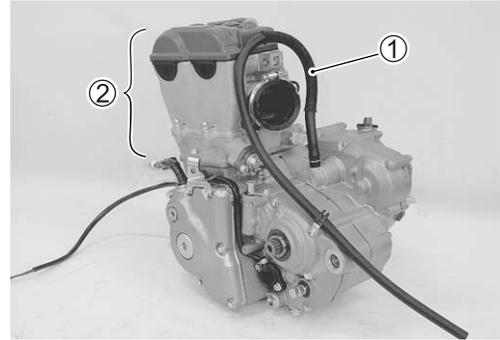
①	Right crankshaft	⑤	Primary drive gear
②	Conrod	Ⓐ	Bearing retainer screw
③	Crank pin	Ⓑ	Primary drive gear nut
④	Left crankshaft		



ITEM	N·m	kgf·m	lbf·ft
Ⓐ	8.5	0.85	6.0
Ⓑ	90	9.0	65.0

ENGINE BOTTOM SIDE

- Remove the engine assembly. (☞ 5-2 to -5)
- Disconnect the crankcase breather hose ①.
- Remove the engine top side ② (cylinder head, cylinder and piston). (☞ 6-4 to -8)
- Remove the magneto rotor and key. (☞ 15-17, -18)
- Remove the cam chain guide retainer, cam chain and cam chain tensioner. (☞ 6-8)
- Remove the right crankcase cover. (☞ 8-3)



PRIMARY DRIVE GEAR REMOVAL

- Hold the crankshaft immovable with the special tool.

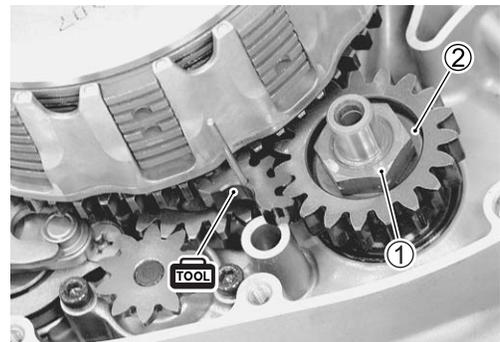
TOOL 09914-61010: Gear holder

- Remove the primary drive gear nut ① and washer ②.

CAUTION

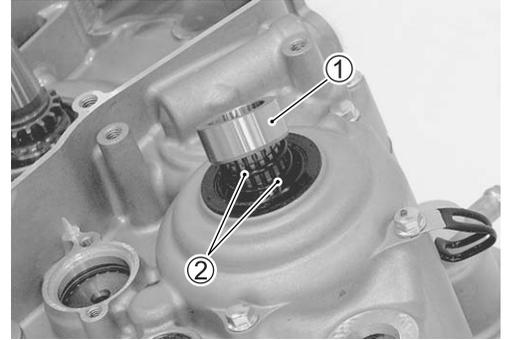
The primary drive gear nut ① has left-hand threads.

- Remove the clutch component parts. (☞ 7-8)
- Remove the primary drive gear.
- Remove the kick starter idle gear and kick starter shaft assembly. (☞ 8-3, -4)
- Remove the gearshift linkage and GP switch. (☞ 9-3, -4, -8)
- Remove the oil pump No.1, No.2 and oil pump idle gear. (☞ 11-4, -5)

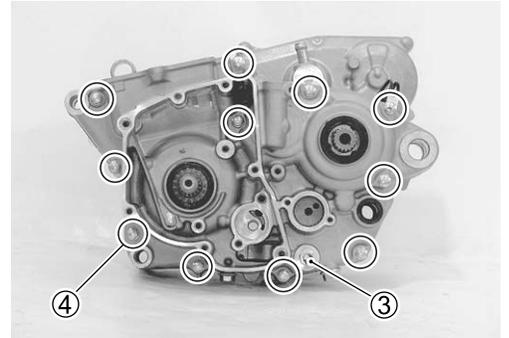


CRANKCASE SEPARATION

- Remove the engine sprocket spacer ① and two O-rings ②.



- Remove the oil strainer cap ③ and oil strainer (No.1). (Fig. 2-15)
- Remove the crankcase bolts ④.



- Separate the crankcase with the special tool.

TOOL 09920-13120: Crankshaft remover

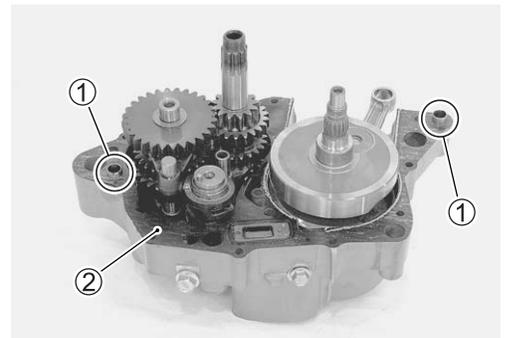
NOTE:

- * Set the crankcase separating tool to the clutch side of the crankcase.
- * Separate the crankcase gradually while hitting the crankcase boss and countershaft softly with a plastic hammer.



TRANSMISSION REMOVAL

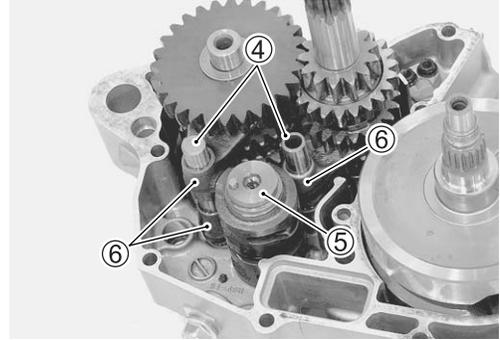
- Remove the dowel pins ① and crankcase gasket ②.



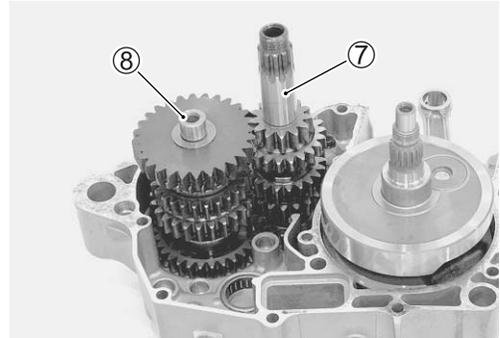
- Remove the oil reed valve ③.



- Remove the gearshift fork shafts ④.
- Remove the gearshift cam ⑤.
- Remove the gearshift forks ⑥.



- Remove the countershaft assembly ⑦ and driveshaft assembly ⑧.



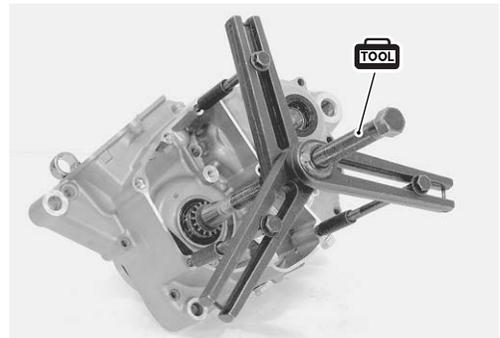
CRANKSHAFT REMOVAL

- Remove the crankshaft with the special tool.

CAUTION

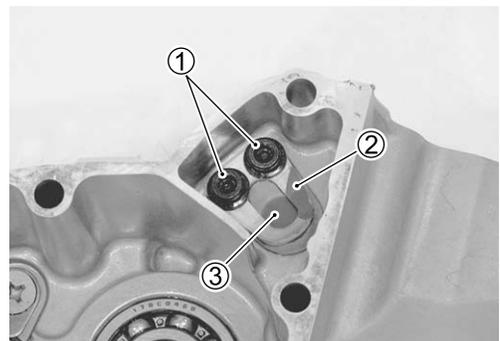
Be careful not to damage the thread part of the crankshaft.

 09920-13120: Crankshaft remover



CRANKCASE REED VALVE REMOVAL

- Remove the reed valve guide ② and crankcase reed valve ③ by removing their bolts ①.



TRANSMISSION INSPECTION

- Inspect the gear teeth, dogs, and gearshift grooves for abnormal wear and damage.
- Inspect the bushings and splines for abnormal wear and discoloration.
- If necessary, replace defective parts with a new one.



- Inspect the gearshift cam groove for abnormal wear and damage.
- If any defects are found, replace the gearshift cam with a new one.



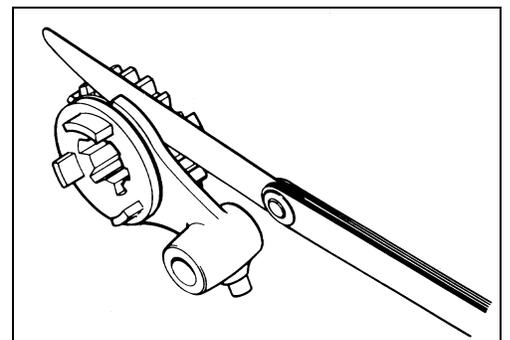
- Inspect the gearshift forks and shaft for wear and damage.
- If any defects are found, replace the gearshift fork or shaft.



- Measure the gearshift fork to groove clearance with a thickness gauge.
- If the clearance checked is noted to exceed the limit, replace the fork or dog.

DATA Gearshift fork to groove clearance
Service Limit: 0.50 mm (0.020 in)

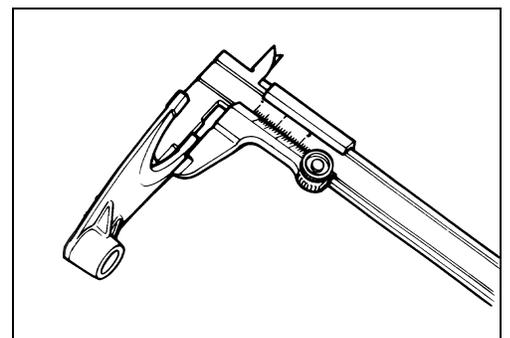
TOOL 09900-20803: Thickness gauge



- Measure the gearshift fork thickness with a vernier calipers.

DATA Gearshift fork thickness
Standard: 4.80 – 4.90 mm (0.189 – 0.193 in)

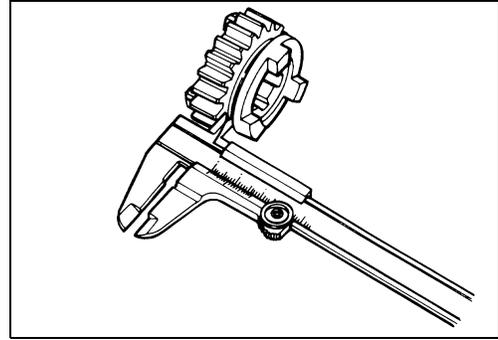
TOOL 09900-20101: Vernier calipers



- Measure the gearshift fork groove width with a vernier calipers.

DATA Gearshift fork groove width
Standard: 5.00 – 5.10 mm (0.197 – 0.201 in)

TOOL 09900-20101: Vernier calipers

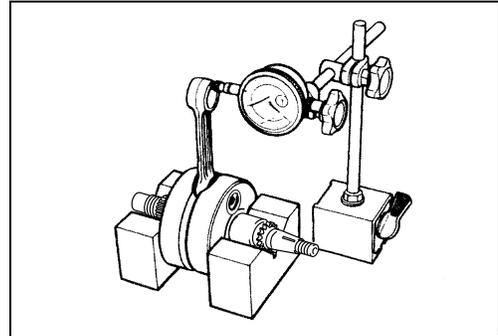


CONROD INSPECTION

- For conrod inspection other than the following, refer to page 6-24.
- Measure the conrod deflection with the special tools.

DATA Conrod deflection
Service Limit: 3.0 mm (0.12 in)

TOOL 09900-20607: Dial gauge
09900-20701: Dial gauge chuck
09900-21304: V blocks



CRANKSHAFT INSPECTION

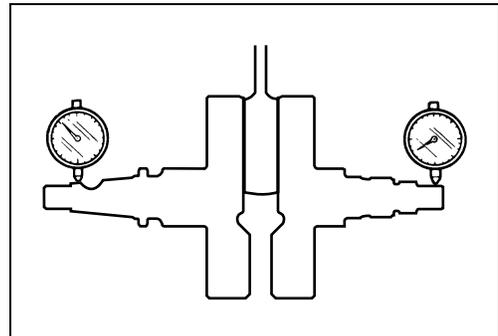
- Measure the crankshaft runout with V blocks and dial gauge.

NOTE:

Place the crankshaft onto the V blocks so that it becomes horizontally.

DATA Crankshaft runout
Service Limit: 0.08 mm (0.003 in)

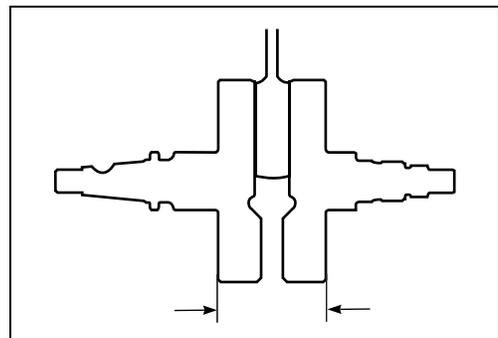
TOOL 09900-20607: Dial gauge
09900-20701: Dial gauge chuck
09900-21304: V blocks



- Measure the crankshaft web to web width with a vernier calipers.

DATA Crank web to web width
Standard: 55.9 – 56.1 mm (2.20 – 2.21 in)

TOOL 09900-20101: Vernier calipers (150 mm)

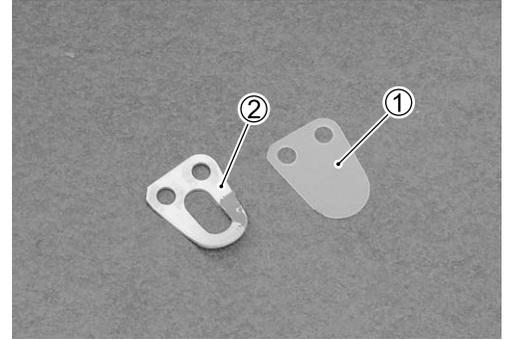


OIL REED VALVE INSPECTION

(11-3)

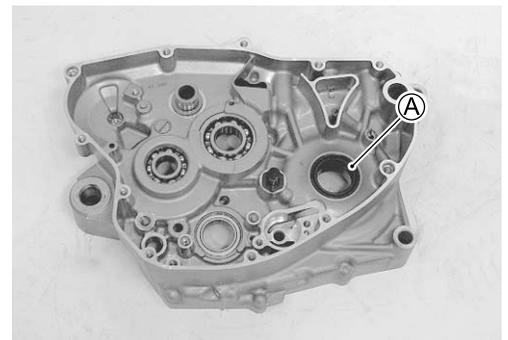
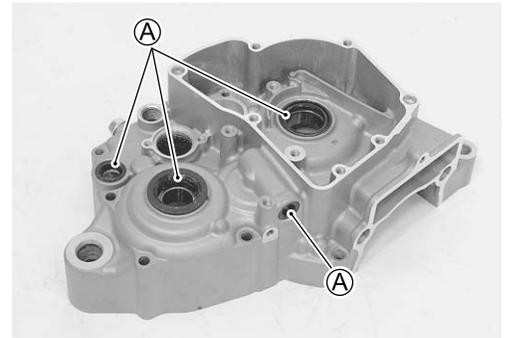
CRANKCASE REED VALVE INSPECTION

- Inspect the crankcase reed valve ① and reed valve guide ② for crack and damage.
- If any defects are found, replace the crankcase reed valve and reed valve guide with a new one.



OIL SEAL INSPECTION

- Inspect each oil seal lip (A) for wear and damage.
- If any defects are found, replace the oil seal with a new one.



OIL SEAL REMOVAL AND INSTALLATION

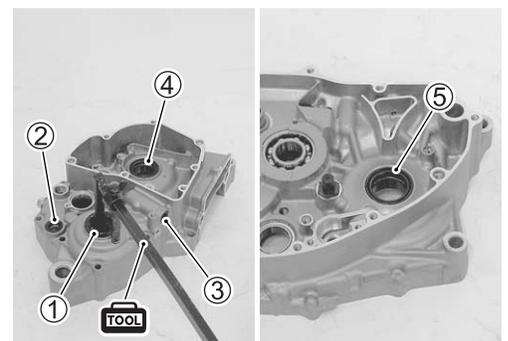
CAUTION

The removed oil seal should be discard.

- Remove the oil seals (①, ②, ⑤) with the special tool.

TOOL 09913-50121: Oil seal remover

- Remove the oil seal (③, ④) with the suitable tool.



- Install each new oil seal (①, ②, ③, ⑤) with the special tool.

NOTE:

After installing the crankshaft, install the oil seal ④ with special tool. (☞ 10-13, -14)

TOOL 09913-70210: Bearing installer set (10 – 75 ϕ)

Oil seal ①, ⑤: ϕ 40 Attachment

Oil seal ②: ϕ 22 Attachment

Oil seal ③: ϕ 17 Attachment

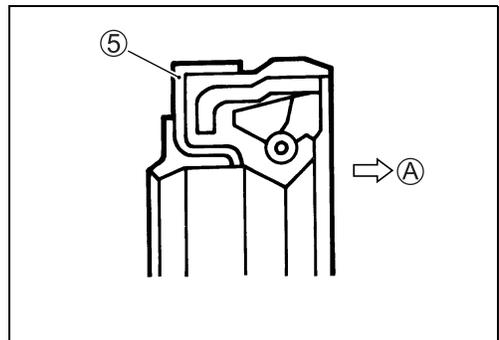
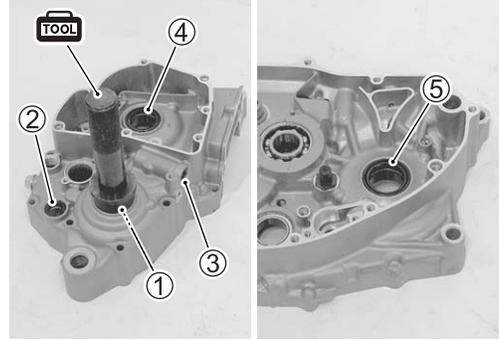
- Apply grease to each oil seal lip.

TOOL 99000-25010: SUZUKI SUPER GREASE “A”

or equivalent

NOTE:

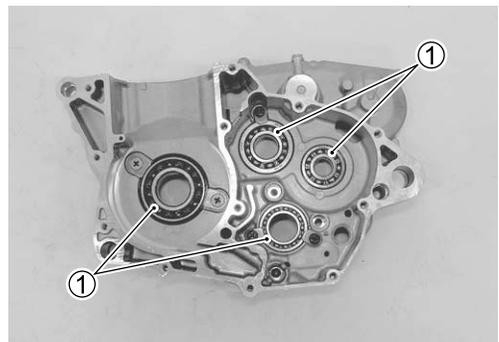
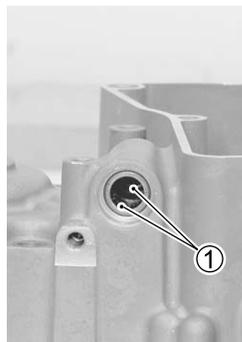
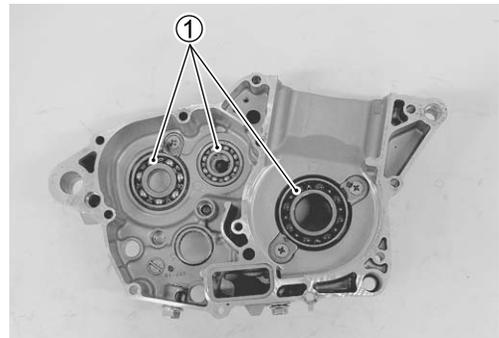
Be sure to check the direction of the crankshaft bearing oil seal ⑤ before installing them.



Ⓐ Primary drive gear side

BEARING INSPECTION

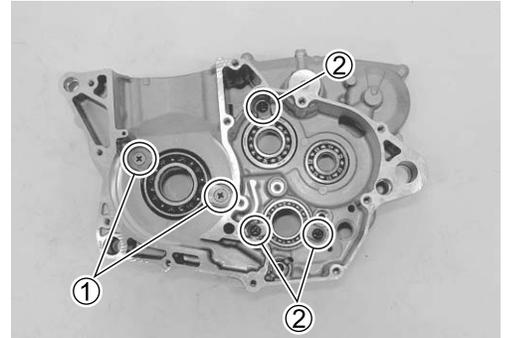
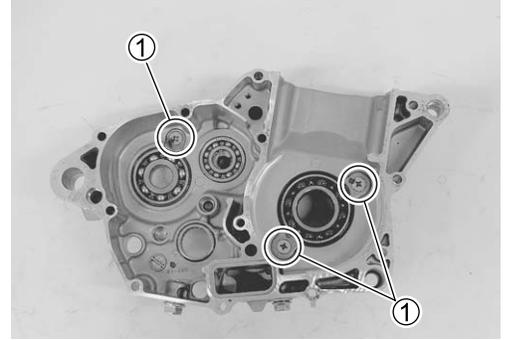
- Inspect the bearings ① for play, discoloration, wear and seizure.
- Move the inner race by finger and inspect for smooth movement.
- If it does not move smoothly, replace the bearing with a new one.



BEARING REMOVAL AND INSTALLATION

REMOVAL

- Remove the oil seals. (☞ 10-9)
- Remove the bearing retainers ①, ②.



CAUTION

Replace the bearing with new a one.

- Remove the bearings (③, ④, ⑤, ⑥, ⑦, ⑧) with the special tool.

Bearing ③, ⑦: ϕ 37 Attachment

Bearing ④, ⑧: ϕ 40 Attachment

Bearing ⑤: ϕ 42 Attachment

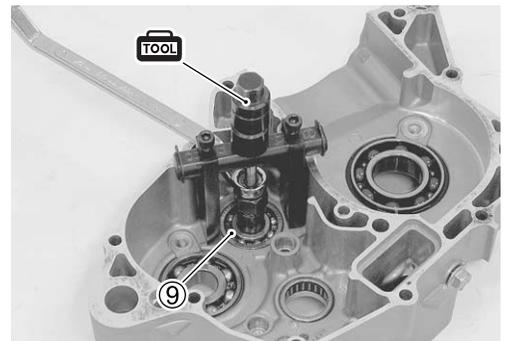
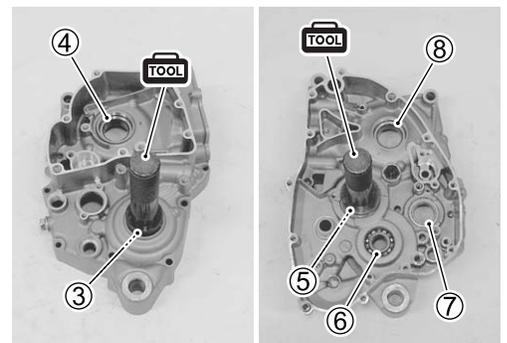
Bearing ⑥: ϕ 32 Attachment

TOOL 09913-70210: Bearing installer set (10 – 75 ϕ)

- Remove the bearing ⑨ with the special tool.

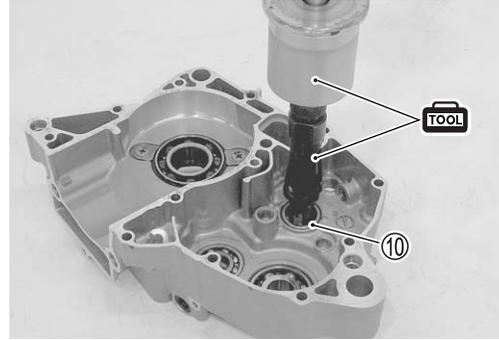
TOOL 09921-20240: Bearing remover set

Bearing ⑨: Remover 17 mm



- Remove the bearing ⑩ with the special tools.

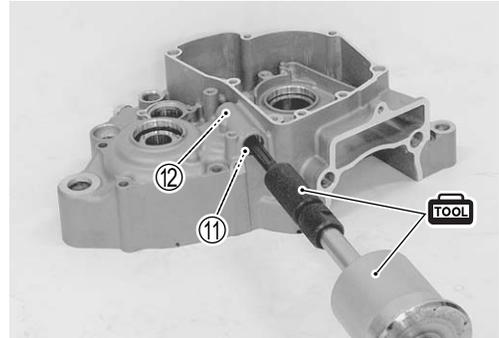
TOOL 09923-74511: Bearing puller
 09930-30104: Rotor remover sliding shaft



- Remove the bearing ⑪ with the special tools.

TOOL 09921-20200: Bearing remover (10 mm)
 09930-30104: Rotor remover sliding shaft

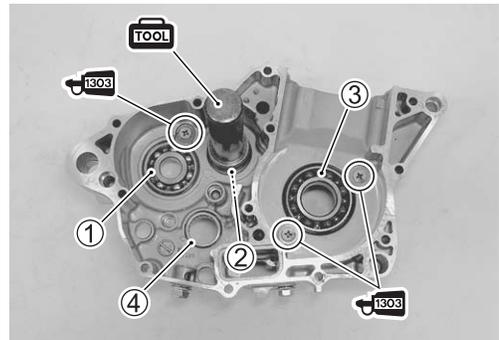
- Remove the bearing ⑫.



INSTALLATION

- Press the new bearings with the special tool.

TOOL 09913-70210: Bearing installer set
Bearing ①: ϕ 52 Attachment
Bearing ②, ⑧: ϕ 40 Attachment
Bearing ③, ⑥: ϕ 62 Attachment
Bearing ④: ϕ 32 Attachment
Bearing ⑤: ϕ 47 Attachment
Bearing ⑦: ϕ 42 Attachment
Bearing ⑨: ϕ 15 Attachment

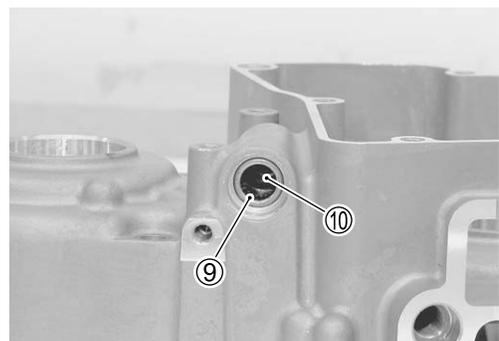
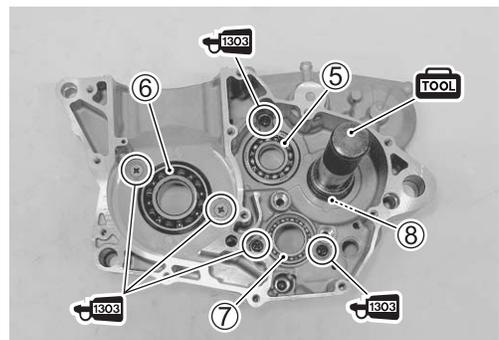


- Press the bearing ⑩ with the appropriate steel rod.

NOTE:

* Press the bearings (②, ④, ⑤, ⑧) into the crankcase, so that the stamped mark side faces inside of the crankcase.

* Press the bearings (⑨, ⑩) into the crankcase, so that the stamped mark side faces outside of the crankcase.



NOTE:

- * Press the bearings (①, ③, ⑥) into the crankcase, so that the stepped side Ⓐ faces inside of the crankcase.
- * Press the bearing ⑦ into the crankcase, so that the sealed side Ⓒ faces outside of the crankcase.

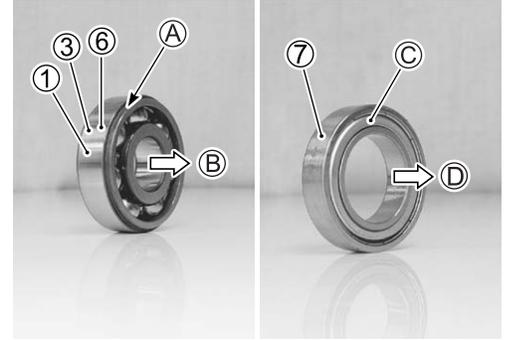
- Ⓑ Inside of the crankcase
- Ⓓ Outside of the crankcase

- Apply THREAD LOCK SUPER to the bearing retainer screws.

 **99000-32030: THREAD LOCK SUPER “1303”**
or equivalent

- Tighten the bearing retainer screws to the specified torque.

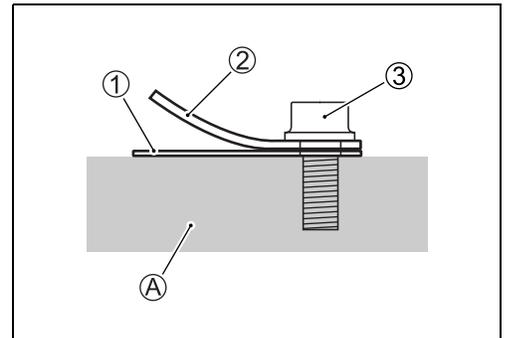
 **Bearing retainer screw: 8.5 N·m (0.85 kgf·m, 6.0 lbf·ft)**



CRANKCASE REED VALVE INSTALLATION

- Install the crankcase reed valve ① and reed valve guide ② direction as shown.
- Tighten the reed valve guide bolts ③ to the specified torque.

 **Reed valve guide bolt: 4.5 N·m (0.45 kgf·m, 3.0 lbf·ft)**



Ⓐ Crankcase

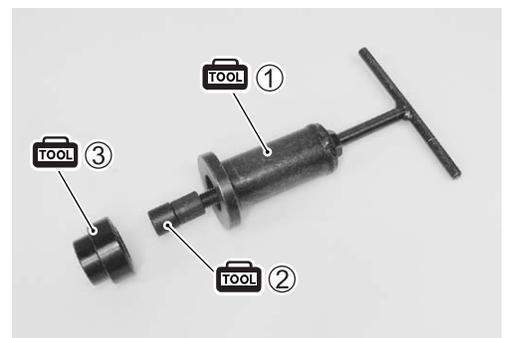
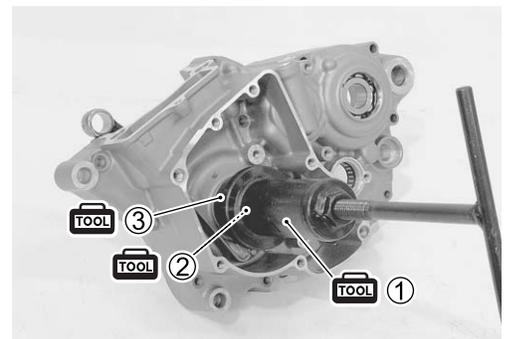
CRANKSHAFT INSTALLATION

- Fit the crankshaft into the left crankcase with the special tools.

NOTE:

Use the attachment (inner driver attachment ③) for crankshaft bearing inside diameter.

-  **09910-32812: Crankshaft installer ①**
- 09911-11310: Crankshaft installer attachment C ②**
- 09913-70210: Bearing installer set (10 – 75 φ)**
(Inner driver attachment 30 mm ③)



- Apply grease to the oil seal lip.

CAUTION

Replace the oil seal ④ with a new one.

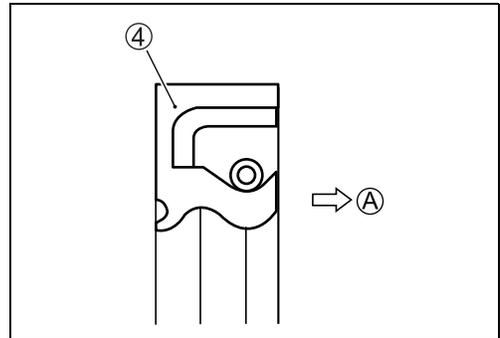
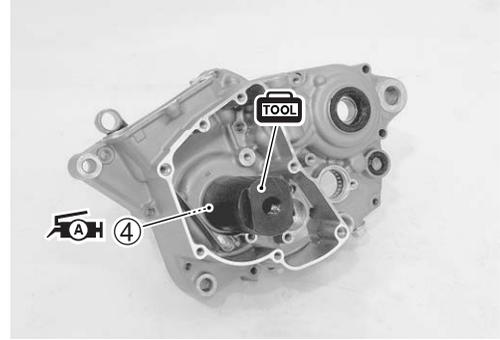
 99000-25010: SUZUKI SUPER GREASE "A"
or equivalent

- Install a new oil seal ④ with the special tool.

 09930-35010: Rotor remover

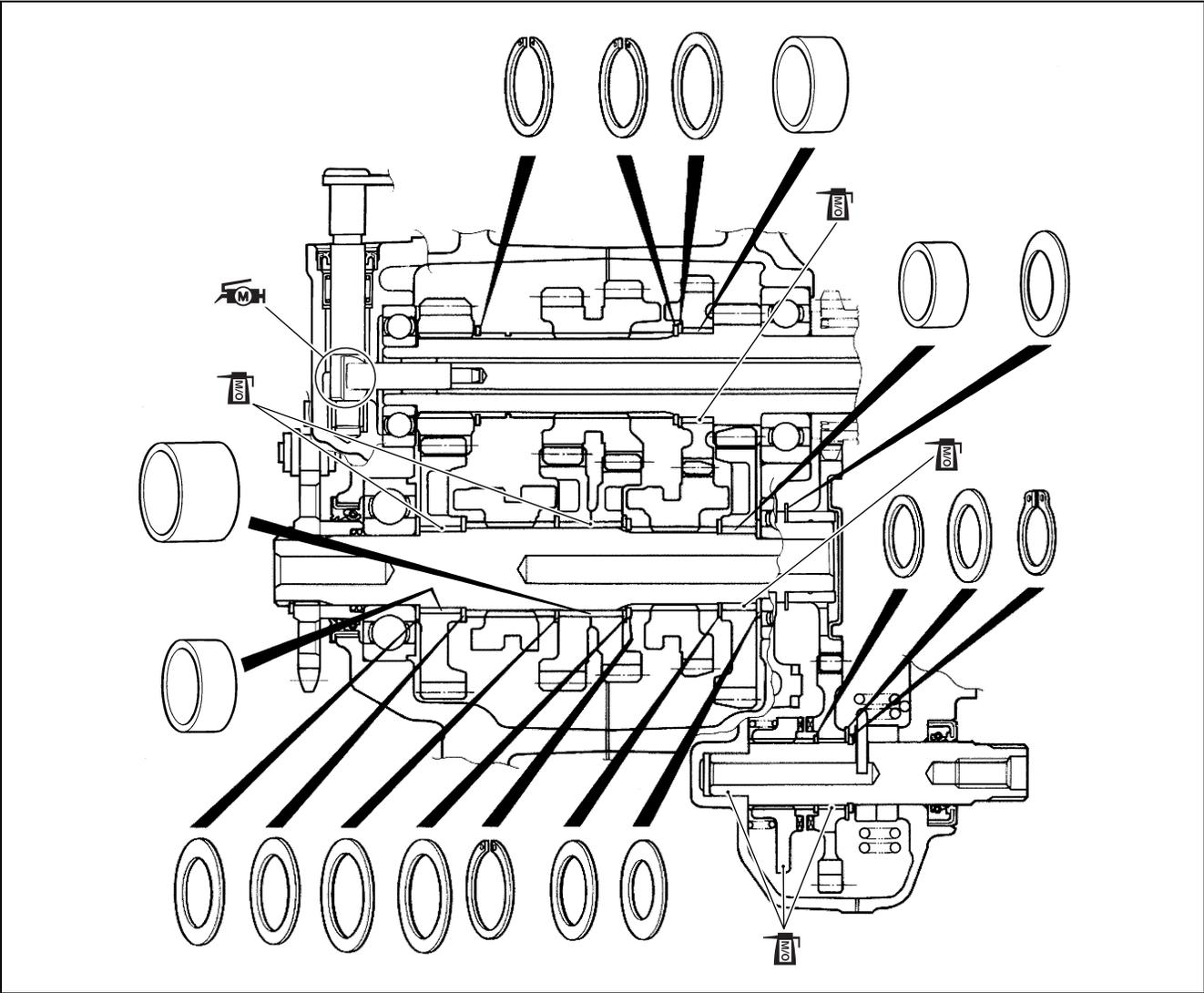
NOTE:

Be sure to check the direction of the crankshaft bearing oil seal ④ before installing them.



Ⓐ Magneto side

TRANSMISSION INSTALLATION

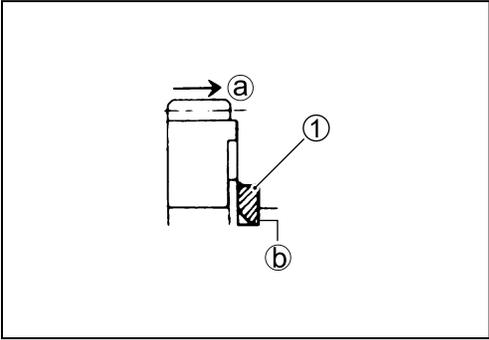


CAUTION

Replace the snap ring ① with a new one.

NOTE:
Install the snap ring ① in the groove and locate its end as shown in the illustration.

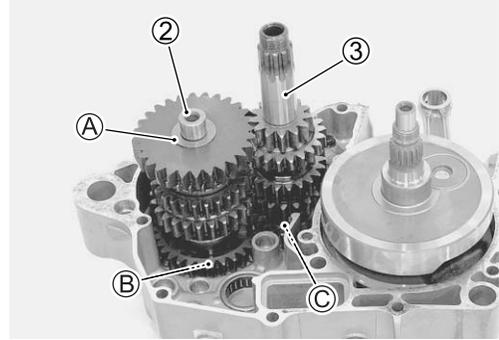
- ① Thrust
- ② Sharp edge



- Apply engine oil to the following parts: driveshaft, countershaft, transmission gears, bearings.
- Install the driveshaft ② and countershaft ③ with gears installed.

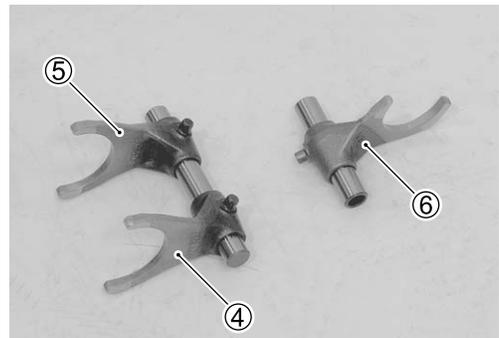
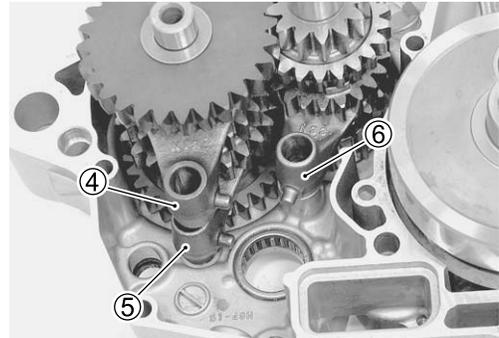
NOTE:

- * Install the washers ①, ② located in both ends of the driveshaft positively.
- * Install the washer ③ located in end of the countershaft ④ positively



- Install the gearshift forks (4, 5, 6) as shown.

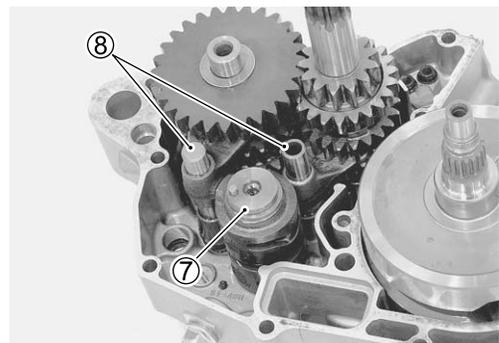
- ④ For 5th driven gear
- ⑤ For sliding dog
- ⑥ For 3rd/4th drive gear



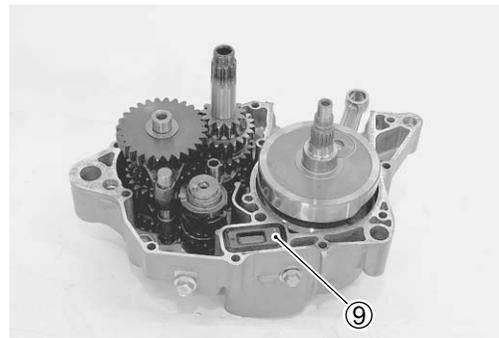
- Install the gearshift cam ⑦ and gearshift fork shafts ⑧.

NOTE:

Turn the gearshift cam to the neutral position and confirm that the driveshaft and countershaft turn without resistance.



- Install the oil reed valve ⑨.



CRANKCASE INSTALLATION

- Fit the dowel pins ① and gasket ②.

CAUTION

Replace the gasket ② with a new one.

- Fit the right crankcase on the left crankcase.
- Install the clamp A to the bolt.
- Tighten the crankcase bolts (a, b, c) to the specified torque.

 **Crankcase bolt: 11 N·m (1.1 kgf·m, 8.0 lbf·ft)**

NOTE:

If it is hard to tighten the bolts, separate the crankcase and confirm that the transmission parts are assembled correctly.

- Install the oil strainer (No.1) and oil strainer cap ③. (☞ 2-17)

a Length: 40 mm (1.6 in)

b Length: 50 mm (2.0 in)

c Length: 70 mm (2.8 in)

- Inspect the crankshaft, countershaft and driveshaft for smooth movement.

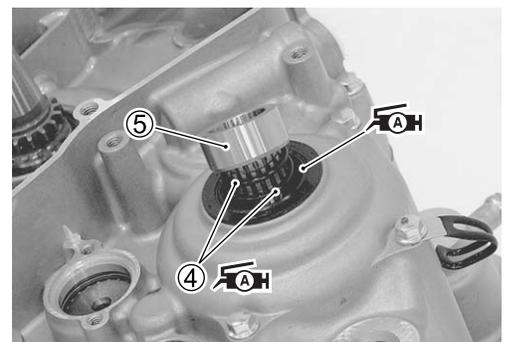
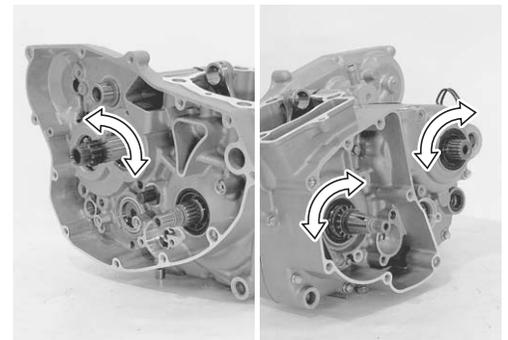
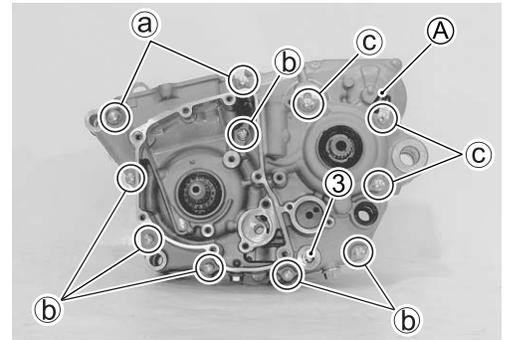
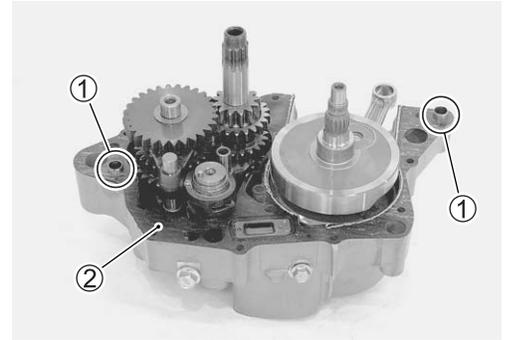
- Apply grease to the oil seal lip and O-rings ④.

CAUTION

Replace the O-rings ④ with new ones.

 99000-25010: SUZUKI SUPER GREASE "A"
or equivalent

- Fit the O-rings ④ and spacer ⑤ to the driveshaft.



PRIMARY DRIVE GEAR INSTALLATION

- Install the oil pump No.1, No.2 and oil pump idle gear. (☞ 11-6 to -8)
- Install the gearshift linkage and GP switch. (☞ 9-5 to -9)
- Install the kick starter idle gear and kick starter shaft assembly. (☞ 8-6, 7)
- Apply grease to the oil seal lip.

 **99000-25010: SUZUKI SUPER GREASE "A"**
or equivalent

- Install the primary drive gear ① and washer ②.

NOTE:

The washer is directional. Assemble the washer ② as shown in the illustration.

- Install the clutch component parts. (☞ 7-9, -10)
- Apply THREAD LOCK SUPER to the primary drive gear nut ③.

 **99000-32110: THREAD LOCK SUPER "1322"**
or equivalent

- Hold the magneto rotor with the special tool and tighten the primary drive gear nut ③ to the specified torque.

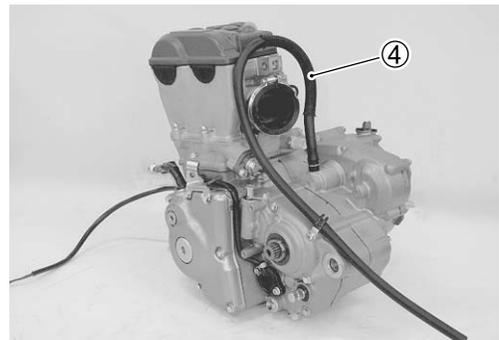
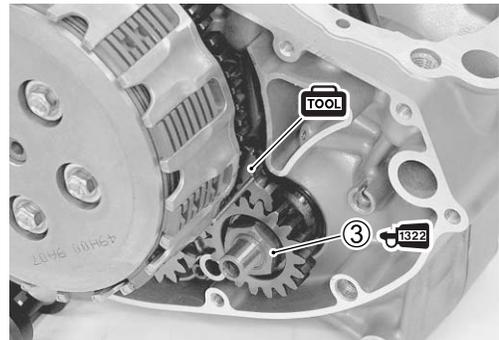
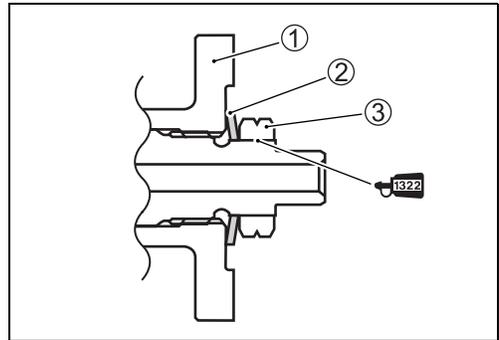
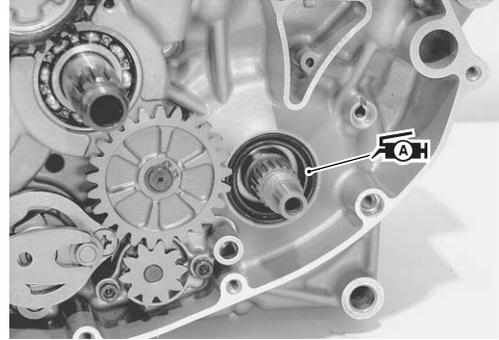
CAUTION

The primary drive gear nut has left-hand threads.

 **09914-61010: Gear holder**

 **Primary drive gear nut: 90 N-m (9.0 kgf-m, 65.0 lbf-ft)**

- Install the cam chain, cam chain tensioner and cam chain guide retainer. (☞ 6-25)
 - Install the key and magneto rotor. (☞ 15-18)
 - Install the magneto cover. (☞ 15-19)
 - Install the engine top side (piston, cylinder and cylinder head). (☞ 6-26 to -34)
 - Connect the crankcase breather hose ④. (☞ 20-23)
-
- Mount the engine assembly. (☞ 5-6 to -10)



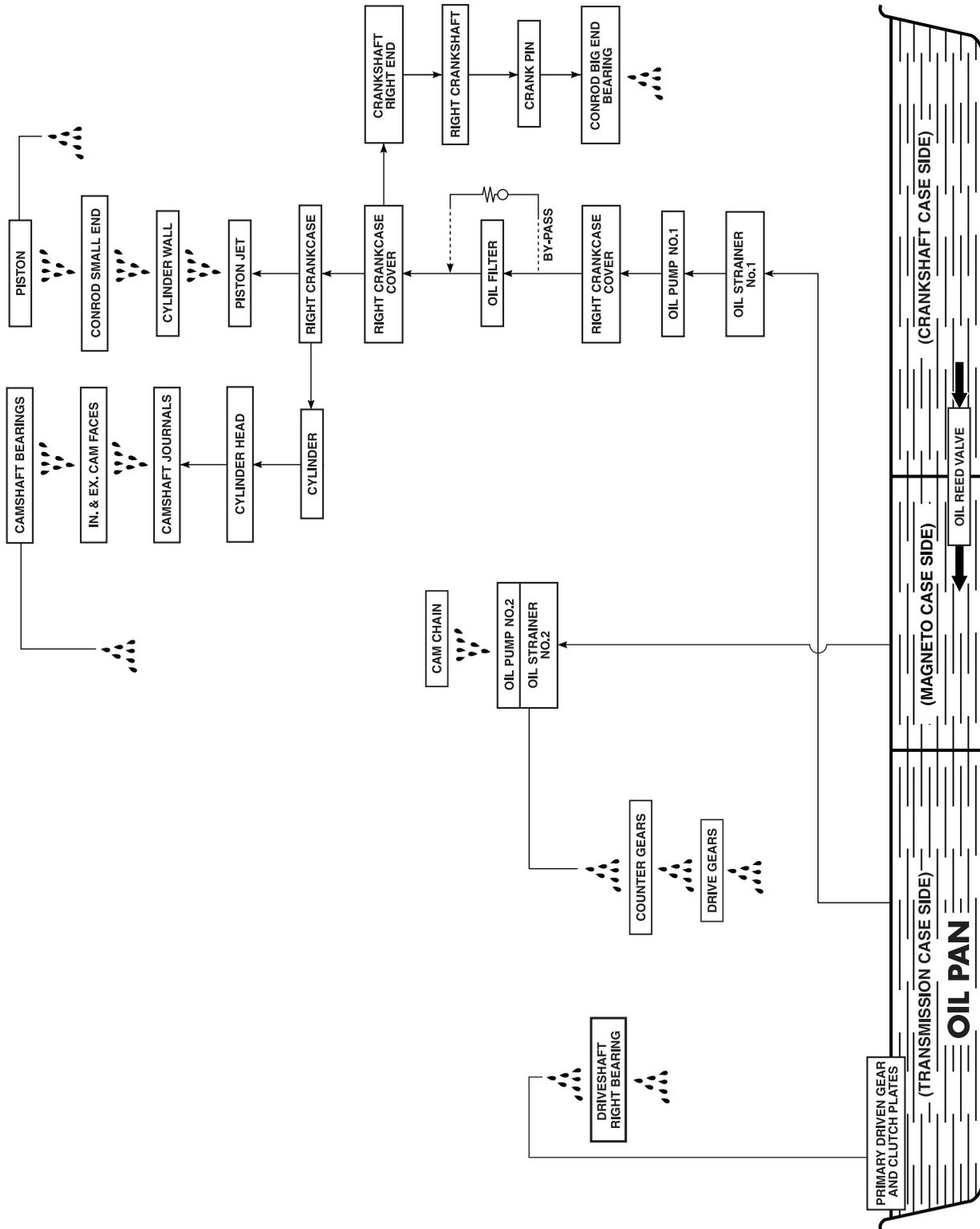
LUBRICATION SYSTEM

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ENGINE LUBRICATION SYSTEM

ENGINE LUBRICATION SYSTEM CHART



ENGINE OIL LEVEL INSPECTION

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OIL STRAINER REMOVAL

OIL STRAINER No.1 ( 2-15)

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OIL STRAINER No.1 ( 2-17)

OIL STRAINER No.2 ( 2-17)

OIL REED VALVE REMOVAL

( 10-5)

OIL REED VALVE INSPECTION

- Inspect the oil reed valve for wear and damage.
- If any defects are found, replace the oil reed valve with a new one.



OIL REED VALVE INSTALLATION

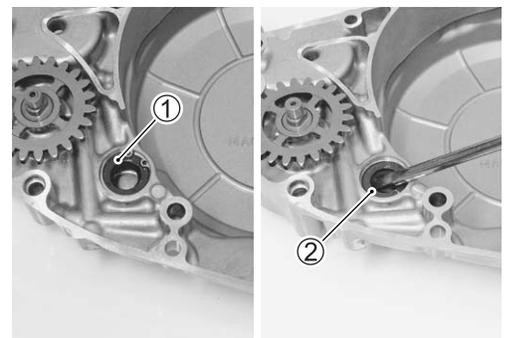
( 10-16)

OIL SEAL REMOVAL

- Remove the right crankcase cover. ( 8-3)
- Remove the snap ring ①.

 **09900-06108: Snap ring remover (Close type)**

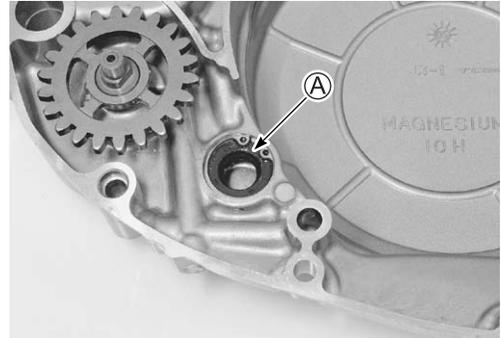
- Remove the oil seal ②.



OIL SEAL INSPECTION

For oil seal inspection other than the following, refer to page 10-9.

- Inspect the oil seal lip (A) for wear and damage.
- If any defects are found, replace the oil seal with a new one.



OIL SEAL INSTALLATION

- Install the oil seal (1) and snap ring (2) with the special tool.

CAUTION

Replace the oil seal and snap ring (2) with new ones.

NOTE:

Take care not to scratch the oil seal by the snap ring pliers when installing the snap ring.

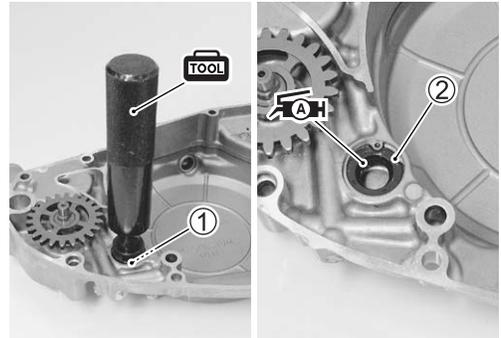
 09913-70210: Bearing installer set (10 – 75 φ)

Oil seal: φ 22 Attachment

09900-06108: Snap ring remover (Close type)

- Apply grease to the oil seal lip.

 99000-25010: SUZUKI SUPER GREASE “A”
or equivalent



OIL PUMP No.1 AND No.2 REMOVAL

OIL PUMP No.1

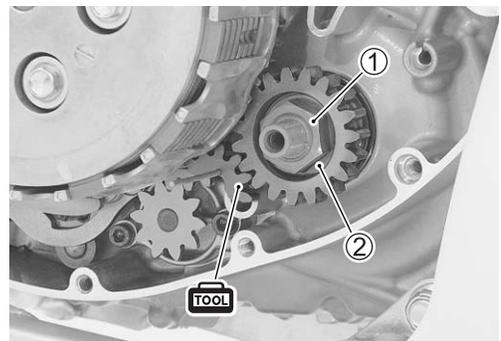
- Drain engine oil. (☞ 2-13)
- Drain engine coolant. (☞ 14-3)
- Remove the brake pedal. (☞ 17-20)
- Remove the kick starter lever and right crankcase cover. (☞ 8-3)
- Hold the crankshaft immovable with the special tool.

 09914-61010: Gear holder

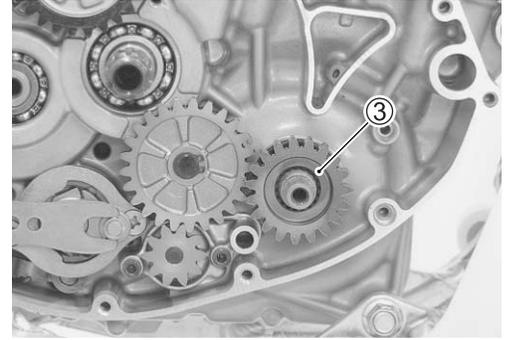
- Remove the primary drive gear nut (1) and washer (2).

CAUTION

The primary drive gear nut (1) has left-hand threads.



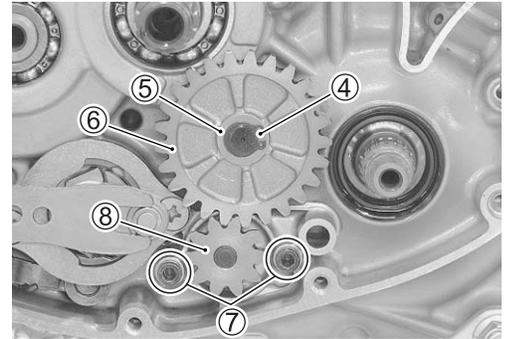
- Remove the clutch component parts. (☞ 7-8)
- Remove the primary drive gear ③.



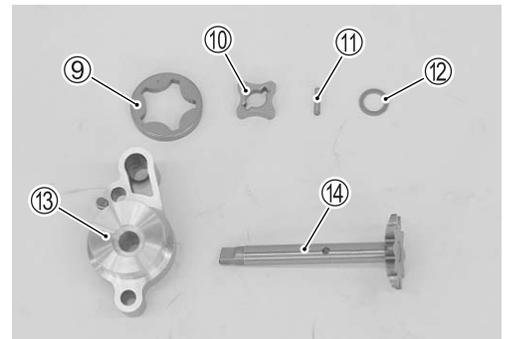
- Remove the snap ring ④, washer ⑤ and oil pump idle gear ⑥.

TOOL 09900-06107: Snap ring remover (Open type)

- Remove the oil pump No.1 ⑧ by removing its bolts ⑦.

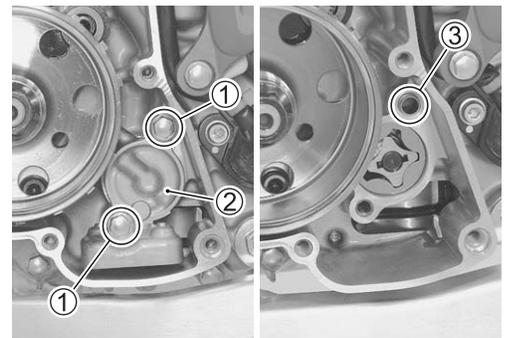


- Remove the following parts from the oil pump No.1.
 - Outer rotor ⑨
 - Inner rotor ⑩
 - Pin ⑪
 - Washer ⑫
 - Oil pump No.1 cover ⑬
 - Oil pump driven gear shaft ⑭



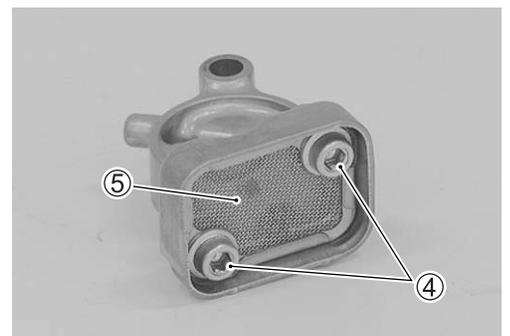
OIL PUMP No.2

- Drain engine oil. (☞ 2-13)
- Remove the gearshift lever. (☞ 9-3)
- Remove the magneto cover. (☞ 15-17)
- Remove the oil pump No.2 cover ② by removing its bolts ①.
- Remove the dowel pin ③.

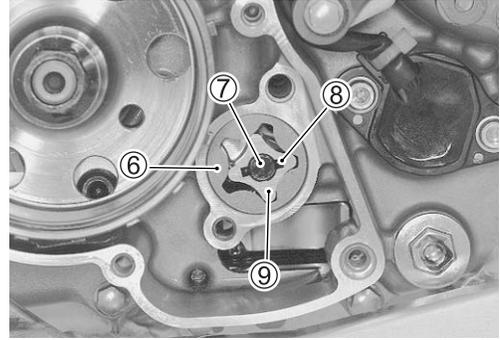


- Remove the oil strainer No.2 ⑤ by removing its bolts ④.

Oil strainer inspection (☞ 2-16)

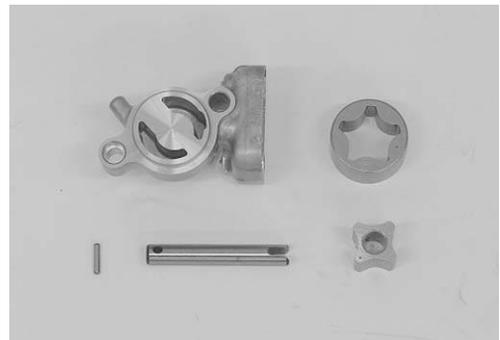
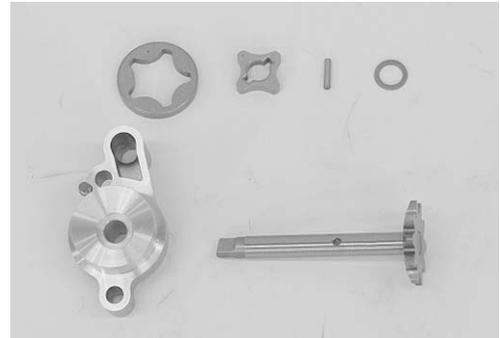


- Remove the outer rotor ⑥, oil pump No.2 shaft ⑦, pin ⑧ and inner rotor ⑨.



OIL PUMP No.1 AND No.2 INSPECTION

- Check the oil pump with each part for any defects or wear.
- If necessary, replace the defective parts with a new one.

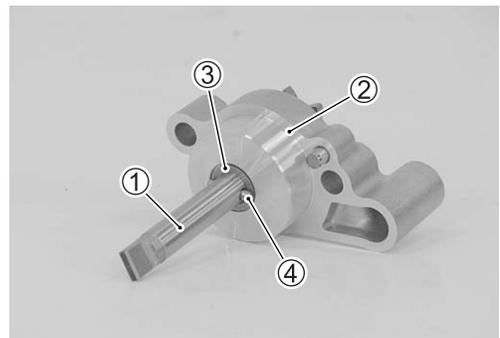


OIL PUMP No.1 AND No.2 INSTALLATION

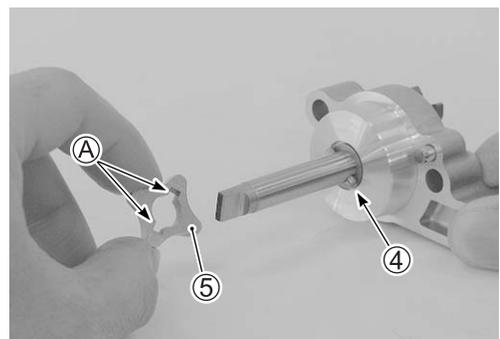
OIL PUMP No.1

Install the oil pump No.1 in the reverse order of removal. Pay attention to the following points:

- Install the oil pump No.1 cover ②, washer ③ and pin ④ onto the oil pump driven gear shaft ①.



- Fit the slot (A) of the inner rotor ⑤ onto the pin ④.



- Install the outer rotor ⑥.

CAUTION

Face the punch mark **(B)** on inner rotor ⑤ outer rotor ⑥ to the crankcase.

- Apply engine oil to the oil pump driven gear shaft, outer rotor and inner rotor.

- Install the oil pump No.1 ⑦ and tighten the oil pump No.1 bolts ⑧ to the specified torque.

 **Oil pump No.1 bolt: 5.5 N·m (0.55 kgf·m, 4.0 lbf·ft)**

- Install the oil pump idle gear ⑨, washer ⑩ and snap ring ⑪.

CAUTION

Replace the snap ring with a new one.

 **09900-06107: Snap ring remover (Open type)**

- Install the primary drive gear. (☞ 10-18)
- Install the clutch component parts. (☞ 7-6, -7, -9, -10)
- Apply THREAD LOCK SUPER to the primary drive gear nut ⑫.

 **99000-32110: THREAD LOCK SUPER “1322”**

or equivalent

- Hold the crankshaft immovable with the special tool and tighten the primary drive gear nut ⑫ to the specified torque.

 **09914-61010: Gear holder**

 **Primary drive gear nut: 90 N·m (9.0 kgf·m, 65.0 lbf·ft)**

- Install the right crankcase cover and kick starter lever. (☞ 8-7, -8)
- Install the brake pedal. (☞ 17-20)

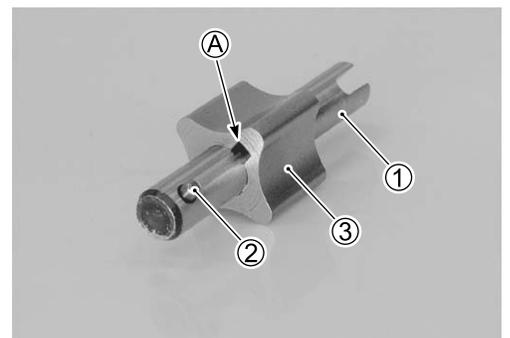
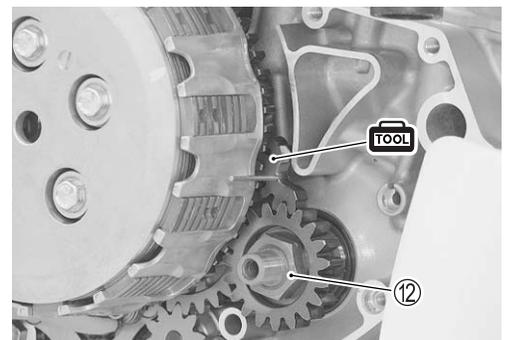
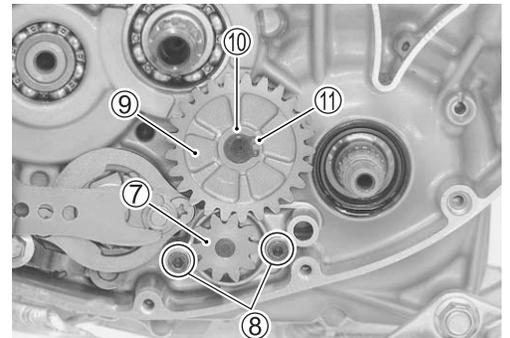
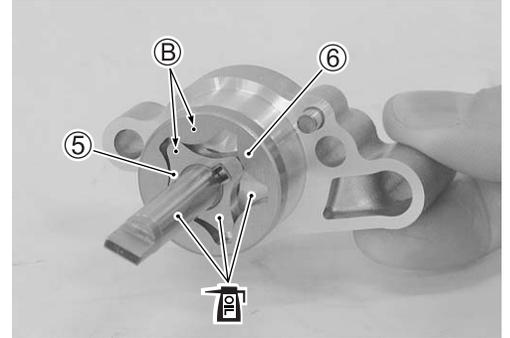
OIL PUMP No.2

Install the oil pump No.2 in the reverse order of removal. Pay attention to the following points:

- Install the pin ② into the oil pump No.2 shaft ①.
- Install the inner rotor ③ onto the oil pump No.2 shaft ①.

NOTE:

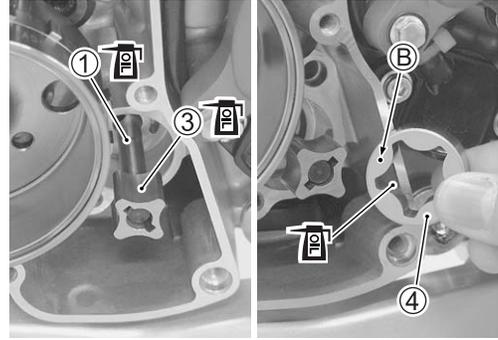
Fit the slot **(A)** of the inner rotor onto the pin ②.



- Apply engine oil to the oil pump No.2 shaft ①, outer rotor ④ and inner rotor ③.
- Install the oil pump No.2 shaft ① and inner rotor ③ onto the crankcase.
- Install the outer rotor ④ onto the crankcase.

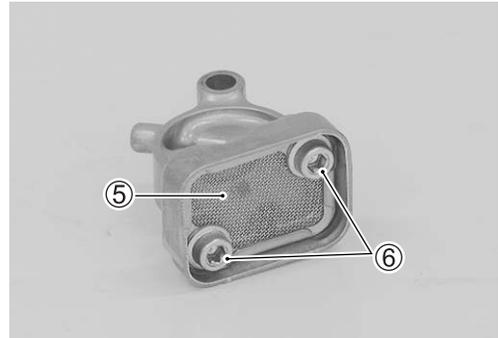
CAUTION

Face the punch mark ⑧ on outer rotor ④ to the crankcase.



- Install the oil strainer No.2 ⑤ and tighten the oil strainer No.2 bolts ⑥ to the specified torque.

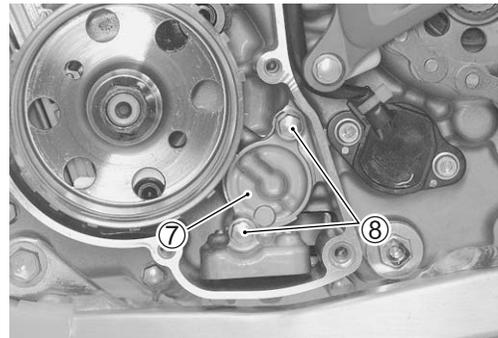
 Oil strainer No.2 bolt: 5.5 N-m (0.55 kgf-m, 4.0 lbf-ft)



- Install the oil pump No.2 cover ⑦ and tighten the oil pump No.2 bolts ⑧ to the specified torque.

 Oil pump No.2 bolt: 11 N-m (1.1 kgf-m, 8.0 lbf-ft)

- Install the magneto cover. (☞ 15-19)
- Install the gearshift lever. (☞ 9-7)



INSPECTION AFTER INSTALLATION

- Engine oil level and oil leakage (☞ 2-12)
- Engine coolant level and coolant leakage (☞ 2-18, -19)
- Oil pressure (☞ 2-42)

FI SYSTEM DIAGNOSIS

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FI SYSTEM DIAGNOSIS

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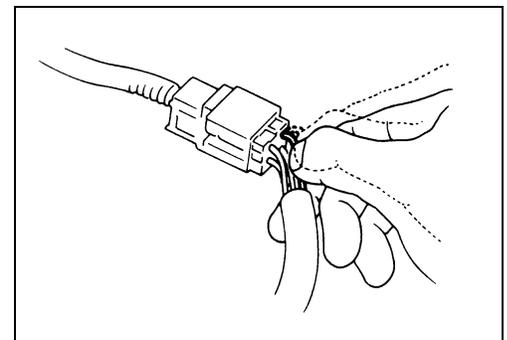
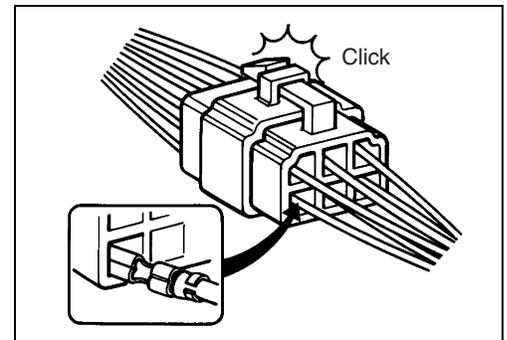
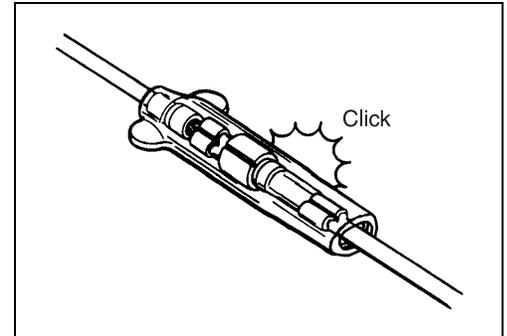
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PRECAUTIONS IN SERVICING

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

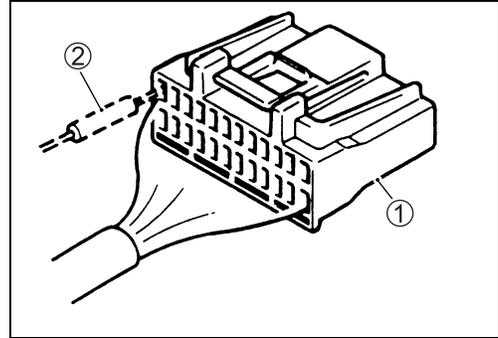
CONNECTOR/COUPLER

- Faulty FI system is often related to poor electrical contact of connector/coupler. Before servicing individual electronic part, check electrical contact of 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 in fully to engage the lock when connecting.
- 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.
- Push in the coupler straightly. An angled or skewed insertion may cause the terminal to be deformed, possibly resulting in poor electrical contact.
- Inspect each terminal for corrosion and contamination. The terminals must be clean and free of any foreign material which could impede proper terminal contact.
- Before refitting the sealed coupler, make sure its seal rubber is positioned properly. The seal rubber may possibly come off the position during disconnecting work and if the coupler is refitted with the seal rubber improperly positioned, it may result in poor water sealing.
- 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.

- ① Coupler
- ② Probe

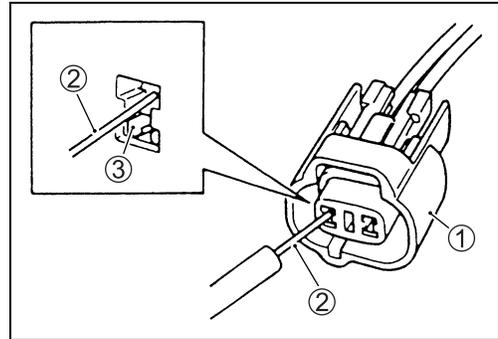


- When connecting meter probe from the terminal side of the coupler (where connection from harness side not being possible), use extra care not to force and cause the male terminal to bend or the female terminal to open. Connect the probe as shown to avoid opening of female terminal.

Never push in the probe where male terminal is supposed to fit.

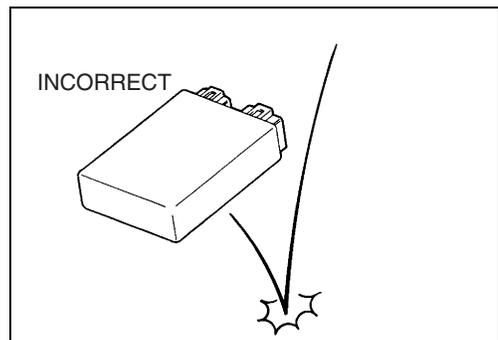
- Check the male connector for bend and female connector for excessive opening. Also check the coupler for locking (looseness), corrosion, dust, etc.

- ① Coupler
- ② Probe
- ③ Where male terminal fits

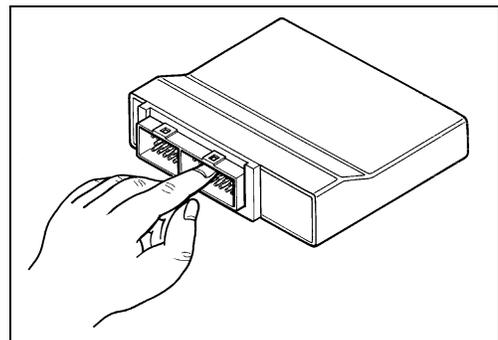


ECM/VARIOUS SENSORS

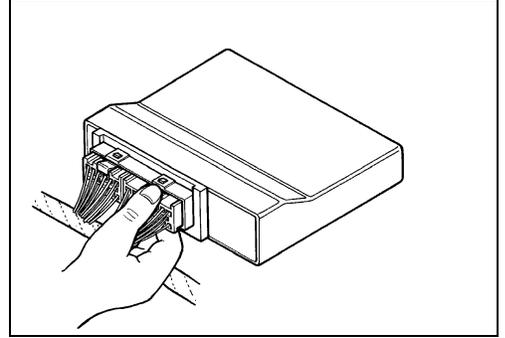
- Since each component is a high-precision part, great care should be taken not to apply any sharp impacts during removal and installation.



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

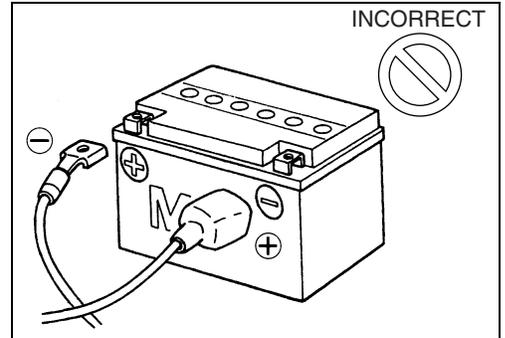


- When disconnecting and connecting the ECM, make sure to stop the engine, or electronic parts may get damaged.



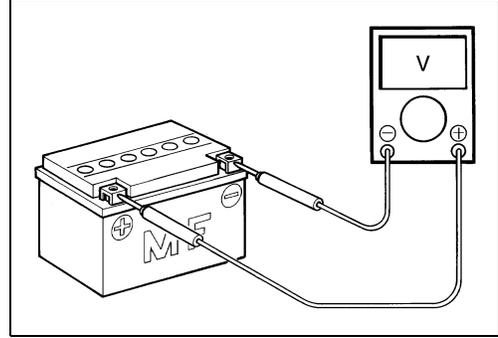
WHEN USING THE BATTERY LEAD WIRE (Optional part: 36890-28H00)

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



- Removing the condenser coupler of a running engine is strictly prohibited. The moment such removal is made, damaging counter electromotive force will be applied to the ECM 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 with a low voltage battery will lead to erroneous diagnosis.



- Never connect any tester (voltmeter, ohmmeter, or whatever) to the ECM when its coupler is disconnected. Otherwise, damage to ECM may result.
- Never connect an ohmmeter to the ECM with its coupler connected. If attempted, damage to ECM or sensors may result.
- Be sure to use a specified voltmeter/ohmmeter. Otherwise, accurate measurements may not be obtained and personal injury may result.

ELECTRICAL CIRCUIT INSPECTION PROCEDURE

While there are various methods for electrical circuit inspection, described here is a general method to check for open and short circuit using an ohmmeter and a voltmeter.

OPEN CIRCUIT CHECK

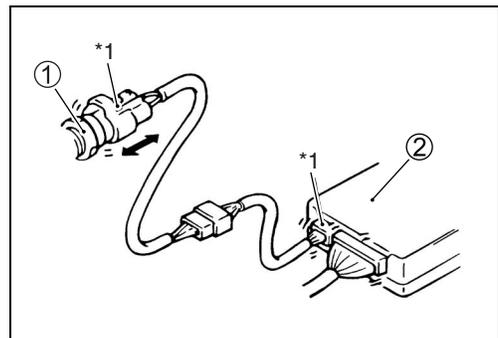
Possible causes for the open circuits are as follows. As the cause can exist in the connector/coupler or terminal, they need to be checked carefully.

- Loose connection of connector/coupler.
- Poor contact of terminal (due to dirt, corrosion or rust, poor contact tension, entry of foreign object etc.).
- Wire harness being open.
- Poor terminal-to-wire connection.
- Check each connector/coupler at both ends of the circuit being checked for loose connection. Also check for condition of the coupler lock if equipped.

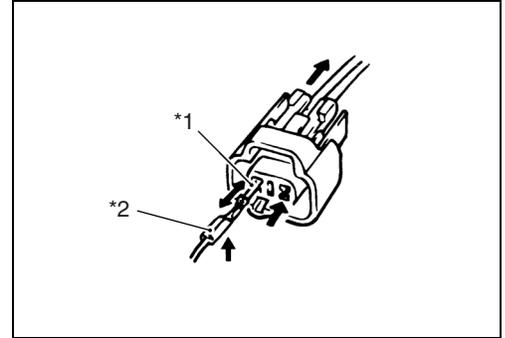
① Sensor

② ECM

*1 Check for loose connection.



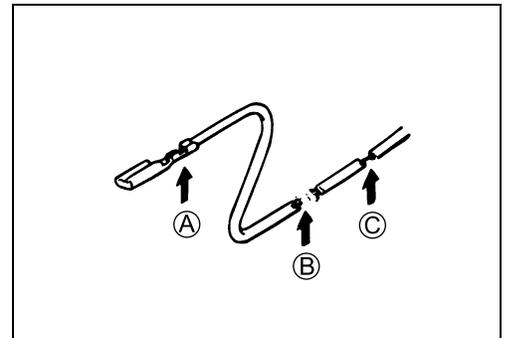
- Using a test male terminal, check the female terminals of the circuit being checked for contact tension. Check each terminal visually for poor contact (possibly caused by dirt, corrosion, rust, entry of foreign object, etc.). At the same time, check to make sure that each terminal is fully inserted in the coupler and locked. If contact tension is not enough, rectify the contact to increase tension or replace. The terminals must be clean and free of any foreign material which could impede proper terminal contact.



- *1 Check contact tension by inserting and removing.
- *2 Check each terminal for bend and proper alignment.

- Using continuity inspect or voltage check procedure as described below, inspect the wire harness terminals for open circuit and poor connection. Locate abnormality, if any.

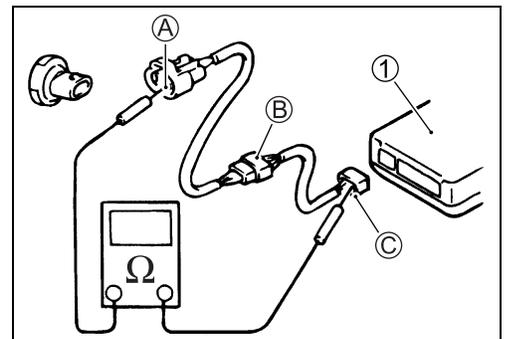
- Ⓐ Looseness of crimping
- Ⓑ Open
- Ⓒ Thin wire (a few strands left)



Continuity check

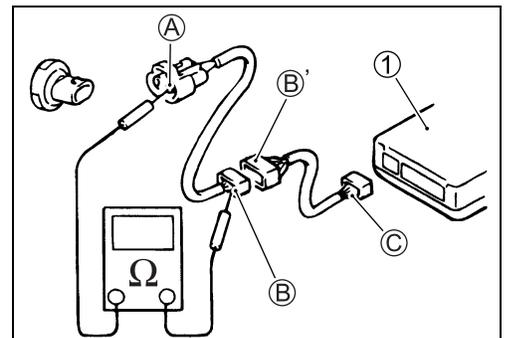
- Measure resistance across coupler Ⓑ (between Ⓐ and Ⓒ in the figure). If no continuity is indicated (infinity or over limit), the circuit is open between terminals Ⓐ and Ⓒ.

① ECM



- Disconnect the coupler Ⓑ and measure resistance between couplers Ⓐ and Ⓑ. If no continuity is indicated, the circuit is open between couplers Ⓐ and Ⓑ. If continuity is indicated, there is an open circuit between couplers Ⓑ' and Ⓒ or an abnormality in coupler Ⓑ' or coupler Ⓒ.

① ECM



VOLTAGE CHECK

If voltage is supplied to the circuit being checked, voltage check can be used as circuit check.

- With all connectors/couplers connected and voltage applied to the circuit being checked, measure voltage between each terminal and body ground.

If measurements were taken as shown in the figure at the right and results are as listed below, it means that the circuit is open between terminals (A) and (B).

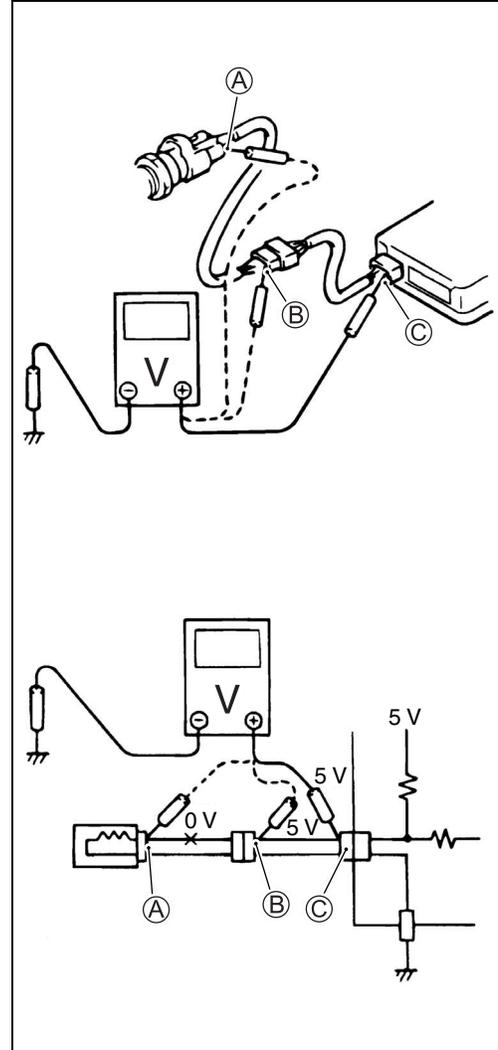
Voltage Between:

- (C) and body ground: Approx. 5 V
- (B) and body ground: Approx. 5 V
- (A) and body ground: 0 V

Also, if measured values are as listed below, a resistance (abnormality) exists which causes the voltage drop in the circuit between terminals (A) and (B).

Voltage Between:

- (C) and body ground: Approx. 5 V
 - (B) and body ground: Approx. 5 V
 - (A) and body ground: 3 V
- } 2 V voltage drop



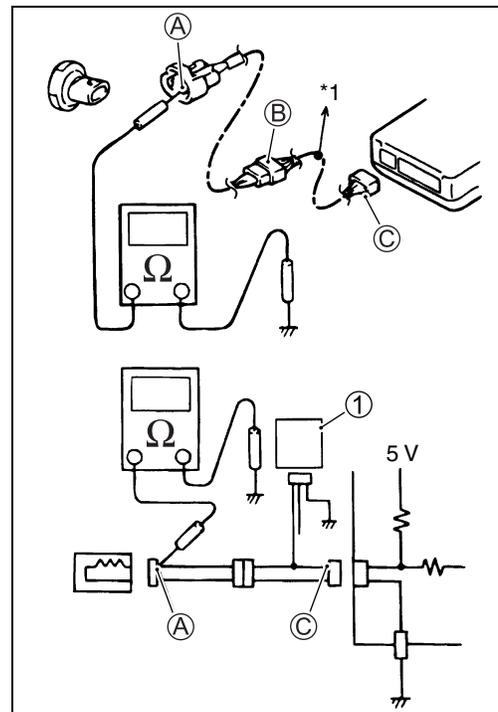
SHORT CIRCUIT CHECK (WIRE HARNESS TO GROUND)

- Disconnect the connectors/couplers at both ends of the circuit to be checked.

NOTE:

If the circuit to be checked branches to other parts as shown, disconnect all connectors/couplers of those parts. Otherwise, diagnosis will be misled.

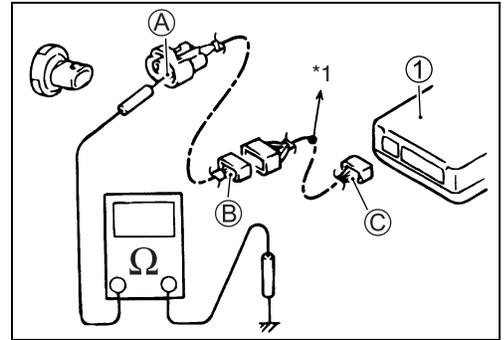
- Measure resistance between terminal at one end of circuit (A terminal in figure) and body ground. If continuity is indicated, there is a short circuit to ground between terminals (A) and (C).



① Other parts
*1 To other parts

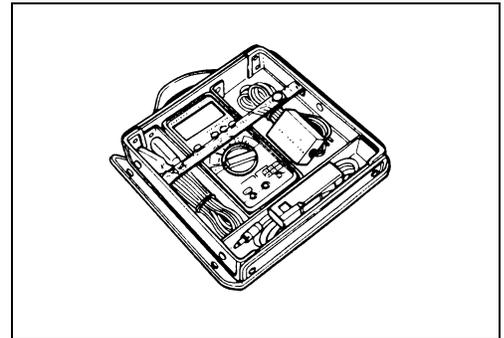
- Disconnect the connector/coupler included in circuit (coupler ②) and measure resistance between terminal ① and body ground.
If continuity is indicated, the circuit is shorted to the ground between terminals ① and ②.

① ECM
*1 To other parts



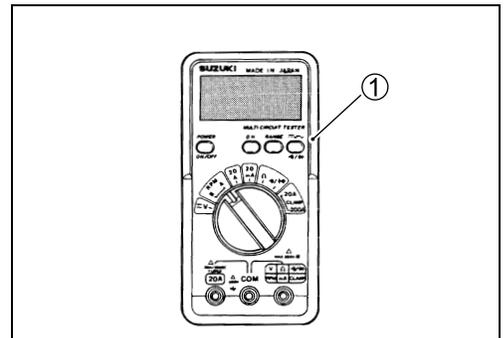
USING THE MULTI CIRCUIT TESTER

- Use the Suzuki multi circuit tester set (09900-25008).
- Use well-charged batteries in the tester.
- Be sure to set the tester to the correct testing range.



USING THE TESTER

- Incorrectly connecting the \oplus and \ominus probes may cause the inside of the tester to burnout.
- If the voltage and current are not known, make measurements using the highest range.
- When measuring the resistance with the multi circuit tester ①, ∞ will be shown as 10.00 M Ω and "1" flashes in the display.
- Check that no voltage is applied before making the measurement. If voltage is applied the tester may be damaged.
- After using the tester, turn the power off.

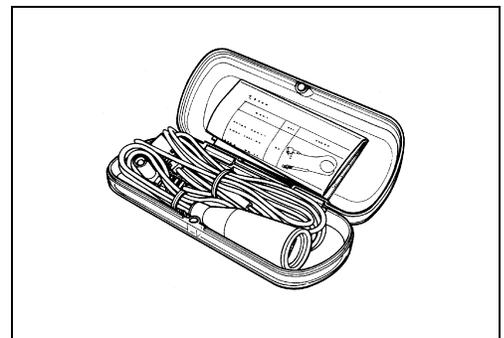


TOOL 09900-25008: Multi circuit tester set

NOTE:

- * When connecting the multi circuit tester, use the needle-point probe to the back side of the lead wire coupler and connect the probes of tester to them.
- * Use the needle-point probe to prevent the rubber of the water proof coupler from damage.
- * When using the multi circuit tester, do not strongly touch the terminal of the ECM coupler with a needle-point tester probe to prevent the terminal damage or terminal bend.

TOOL 09900-25009: Needle-point probe set

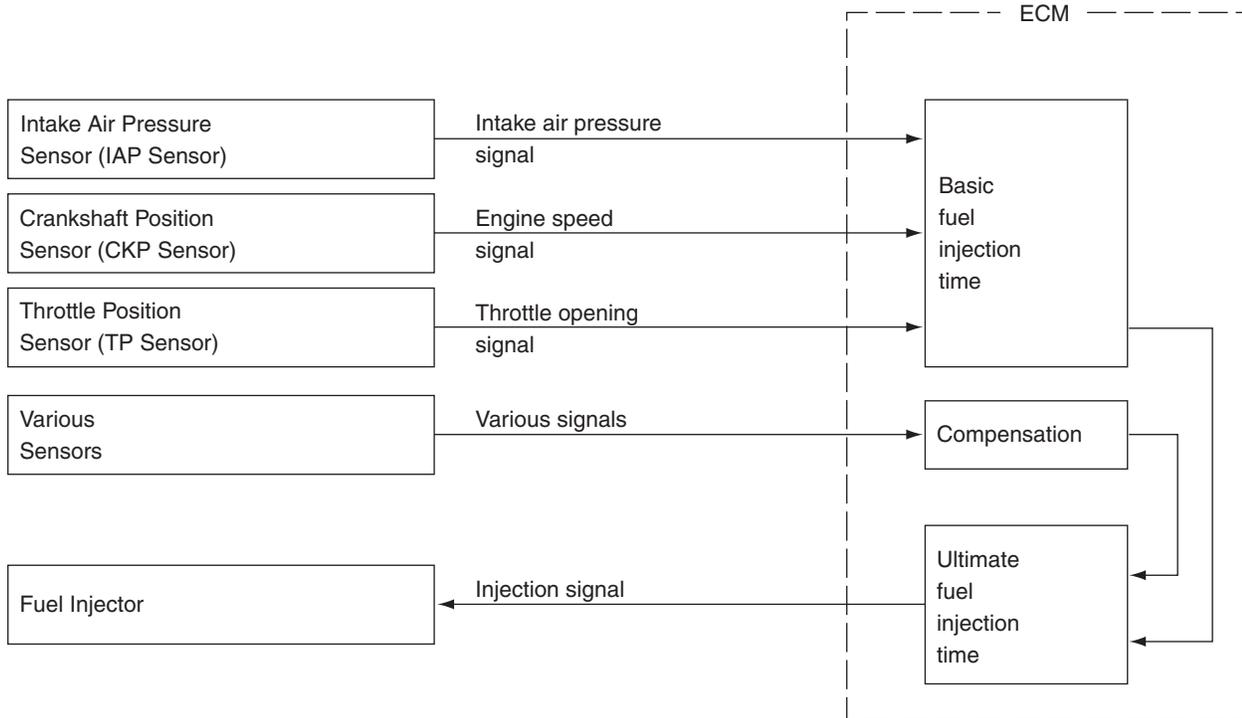


FI SYSTEM TECHNICAL FEATURES

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.



COMPENSATION OF INJECTION TIME (VOLUME)

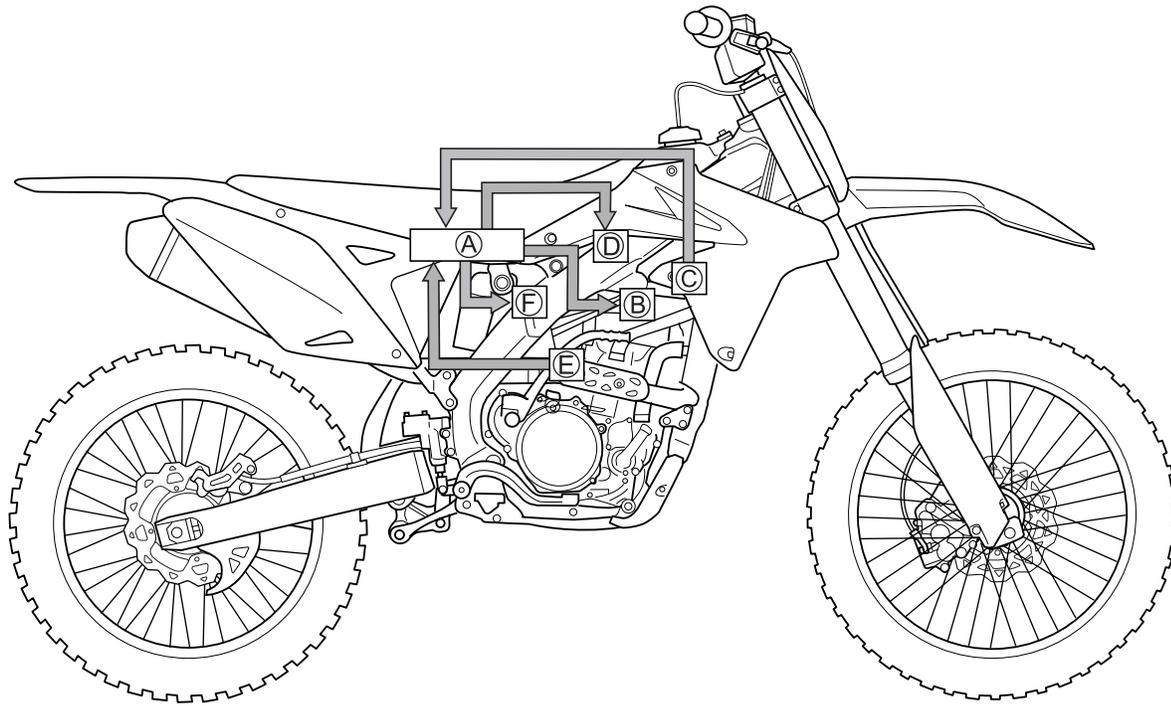
The following different signals are output from the respective sensors for compensation of the fuel injection time (volume).

SIGNAL	DESCRIPTION
ENGINE COOLANT TEMPERATURE SENSOR SIGNAL	When engine coolant temperature is low, injection time (volume) is increased.
INTAKE AIR TEMPERATURE SENSOR SIGNAL	When intake air temperature is low, injection time (volume) is increased.
POWER SUPPLY VOLTAGE SIGNAL	ECM operates on the power generation 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.
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
TIP-OVER SENSOR SIGNAL (FUEL SHUT-OFF)	When the motorcycle tips over, the tip-over sensor sends a signal to the ECM. Then, this signal cuts OFF current supplied to the fuel pump, fuel injector and ignition coil.
OVER-REV. LIMITER SIGNAL	The fuel injector and ignition signal stop operation when engine rpm reaches rev. limit rpm.

FI SYSTEM PARTS LOCATION



Ⓐ ECM

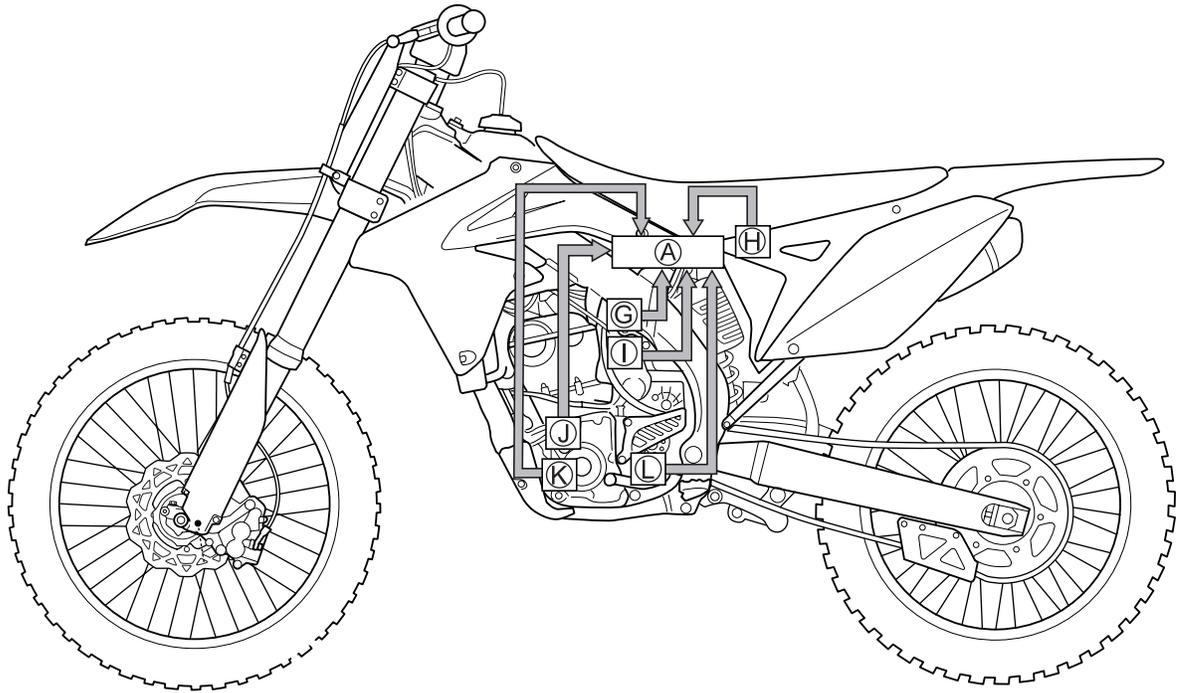
Ⓑ Ignition coil/plug cap

Ⓒ TO sensor

Ⓓ Fuel pump

Ⓔ ECT sensor

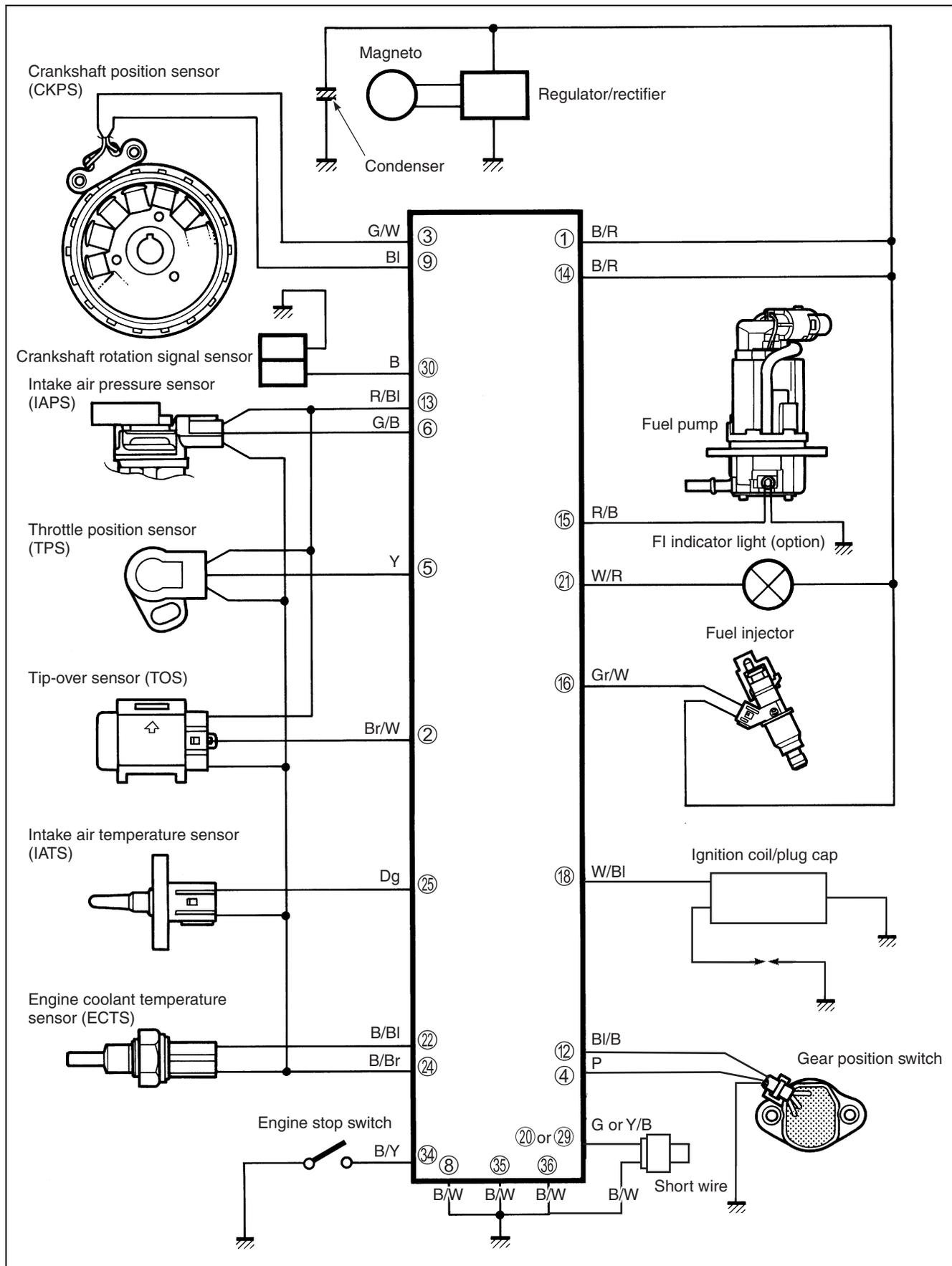
Ⓕ Fuel injector



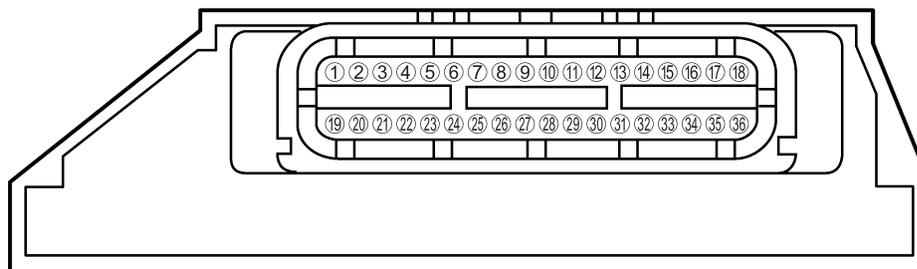
- Ⓐ ECM
- Ⓒ IAP Sensor
- Ⓓ IAT Sensor
- Ⓛ TP Sensor

- Ⓜ CKP sensor
- Ⓨ Crankshaft rotation signal sensor
- Ⓦ GP switch

FI SYSTEM WIRING DIAGRAM



ECM TERMINAL



TERMINAL NO.	CIRCUIT	TERMINAL NO.	CIRCUIT
①	Power source (+B)	⑱	—
②	TO sensor signal (TOS)	⑳	Map select input (MAP 1)
③	CKP sensor signal (CKP+)	㉑	FI indicator
④	GP switch signal (GP)	㉒	ECT sensor signal (ECTS)
⑤	TP sensor signal (TPS)	㉓	—
⑥	IAP sensor signal (IAPS)	㉔	Sensor ground (E2)
⑦	—	㉕	IAT sensor signal (IATS)
⑧	Ground (E1)	㉖	—
⑨	CKP sensor signal (CKPS-)	㉗	—
⑩	Serial data for self-diagnosis	㉘	—
⑪	Blank	㉙	Map select input (MAP 2)
⑫	Neutral switch (NT)	⑳	Crankshaft rotation signal (SIG)
⑬	Power source for sensors (VCC)	㉑	Blank
⑭	Power source for fuel pump (FPP)	㉒	Blank
⑮	Fuel pump (FP)	㉓	Blank
⑯	Fuel injector (#11)	㉔	Engine stop switch
⑰	Blank	㉕	Ground (E01)
⑱	Ignition coil	㉖	Ground (E02)

SELF-DIAGNOSIS FUNCTION

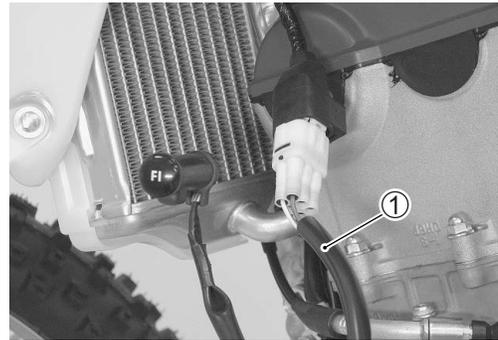
The self-diagnosis function is incorporated in the ECM. It can be notified by using the FI indicator light assy (option). To check the function of the individual FI system devices, the dealer mode is provided. In this check, the tool is necessary to read the DTC (Diagnostic Trouble Code) that identify malfunction location.

DEALER MODE

Connect the FI indicator light assy ① to the mode select coupler. Also, connect a 12 volt battery to the service coupler using the battery lead wire ②. The DTC is displayed by flashing pattern of FI indicator light. This means that the ECM has not received signals indicating a correct condition from the sensors or device concerned.

36380-28H00: FI indicator light assy (option)

36890-28H00: Battery lead wire (option)



CAUTION

**Before checking the DTC, do not disconnect the ECM lead wire coupler.
If the coupler from the ECM is disconnected, the DTC is erased and the DTC can not be checked.**

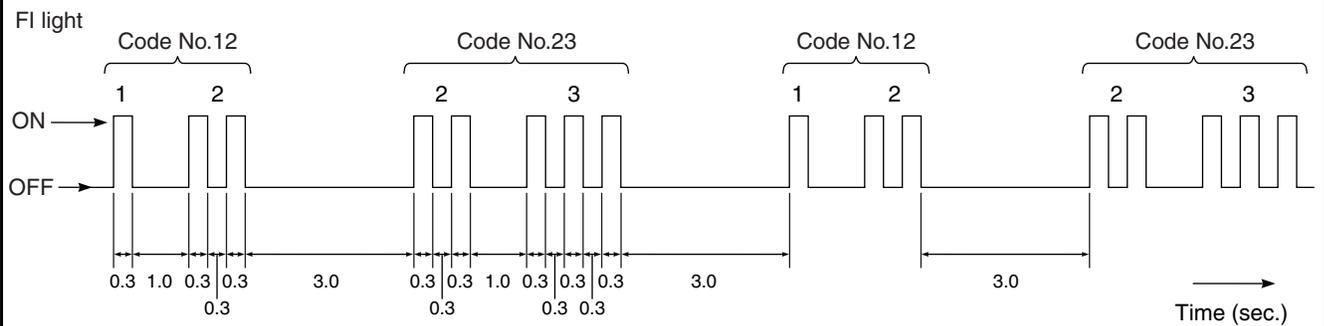
MALFUNCTION	FI INDICATOR LIGHT INDICATION
"NO"	FI indicator light turns OFF.
"YES"	FI indicator light turns ON and blinks. (Code is indicated from small numeral to large one.)

NOTE:

The FI indicator light turns ON for about 2 seconds after connecting the battery.

DIAGNOSTIC TROUBLE CODE TABLE

EXAMPLE: When CKP sensor and TO sensor defective (DTC No.12 and 23)



DTC No.	FI LIGHT FLASHING PATTERN	MALFUNCTION PART	REMARKS
00	00	None	
12		CKP sensor (👉 12-29)	Pick-up coil signal, signal generator
14		TP sensor (👉 12-31)	
15		ECT sensor (👉 12-35)	
17		IAP sensor (👉 12-39)	
21		IAT sensor (👉 12-44)	
23		TO sensor (👉 12-48)	
24		Ignition signal (👉 12-51)	Ignition coil/plug cap
31		Gear position signal (👉 12-52)	GP switch
32		Fuel injector signal (👉 12-54)	Fuel injector
41		Fuel pump control system (👉 12-56)	ECM
63		Crankshaft rotation signal sensor (👉 12-58)	

In the FI indicator light, the DTC is indicated from small code to large code.

TP SENSOR ADJUSTMENT

1. Connect a 12 volt battery using the battery lead wire to service coupler. (📄 12-19)

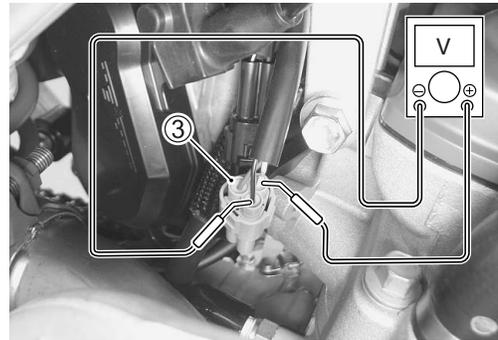
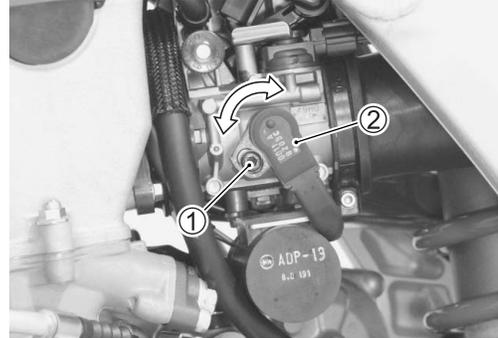
36890-28H00: Battery lead wire (option)

2. Loosen the screw ① with the special tool.
3. Turn the TP sensor ②.
4. Insert the needle-point probes to the TP sensor lead wire coupler ③.
5. Adjust the TP sensor ② until the output voltage comes within the specified value.
6. Then, tighten the screw ① with the special tool to fix the TP sensor ②.

DATA TP sensor output voltage: **Approx. 0.6 V**
(⊕ Y – ⊖ B/Br)

TOOL 09900-25008: Multi circuit tester set
09900-25009: Needle-point probe set
09930-11950: Torx wrench (T25H)

7. Check the engine idle speed. (📄 2-24)



FAIL-SAFE FUNCTION

FI system is provided with fail-safe function to allow the engine to start and the motorcycle to run in a minimum performance necessary even under malfunction condition.

ITEM	FAIL-SAFE MODE	STARTING ABILITY	RUNNING ABILITY
IAP sensor	Intake air pressure is fixed to 106 kPa (795 mmHg).	“YES”	“YES”
TP sensor	The throttle opening is fixed to close position. Ignition timing is also fixed.	“YES”	“YES”
ECT sensor	Engine coolant temperature value is fixed to 80 °C (176 °F).	“YES”	“YES”
IAT sensor	Intake air temperature value is fixed to 15 °C (86 °F).	“YES”	“YES”
Gear position signal	Gear position signal is fixed to 1st gear.	“YES”	“YES”

The engine can start and can run even if the above signal is not received from each sensor. But, the engine running condition is not complete, providing only emergency help (by fail-safe circuit). In this case, it is necessary to bring the motorcycle to the workshop for complete repair.

FI SYSTEM TROUBLESHOOTING

VISUAL INSPECTION

Prior to diagnosis using the FI indicator light assy, perform the following visual inspections. The reason for visual inspection is that mechanical failures (such as oil leakage) cannot be displayed on the FI indicator light assy.

- * Engine oil level and leakage (☞ 2-12)
- * Engine coolant level and leakage (☞ 2-18, -19)
- * Fuel level and leakage
- * Clogged air cleaner element
- * Throttle cable play (☞ 2-21)
- * Exhaust gas leakage and noise
- * Each coupler disconnection
- * Clogged radiator fins (☞ 14-5)

SELF-DIAGNOSTIC PROCEDURES

NOTE:

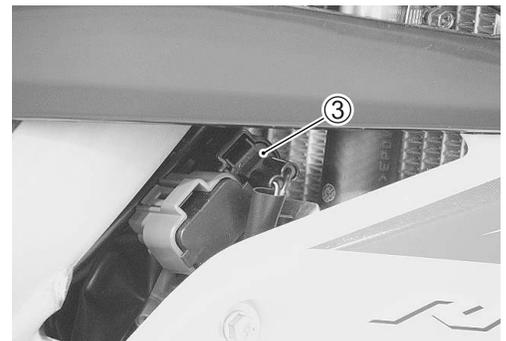
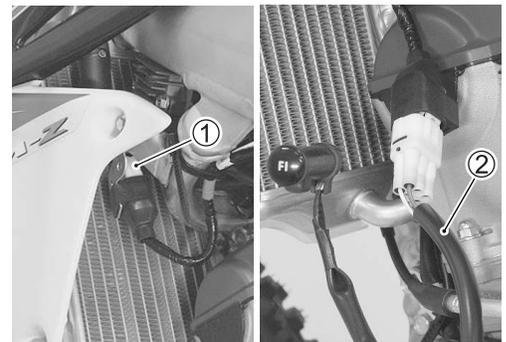
- * Do not disconnect the ECM coupler or battery lead wire before checking the DTC (Diagnostic Trouble Code). Such disconnection will erase the DTC.
 - * DTC can be checked by the FI indicator light assy.
 - * Before checking DTC, read SELF-DIAGNOSIS FUNCTION (☞ 12-16) carefully to have good understanding of the functions available and how to use them.
 - * Be sure to read "PRECAUTIONS IN SERVICING" (☞ 12-3) before inspection and observe what is written there.
- Connect the FI indicator light assy ② to the mode select coupler ① on the wiring harness.
 - Connect a 12 volt battery to the service coupler ③ using the battery lead wire ④.
 - Depress the kick starter lever at least ten times or run the engine for more than 3 seconds.
 - Check the DTC to determine the malfunction part.

36380-28H00: FI indicator light assy (option)

36890-28H00: Battery lead wire (option)

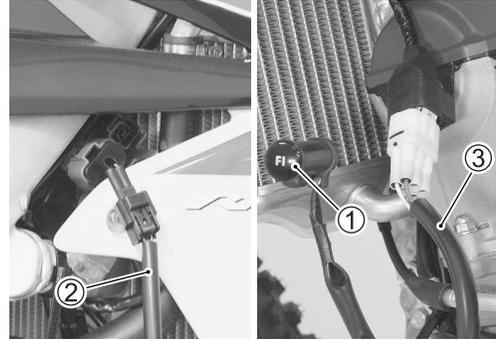
NOTE:

ECM detects the malfunction part by the cranking or the engine start.



SELF-DIAGNOSIS RESET PROCEDURE

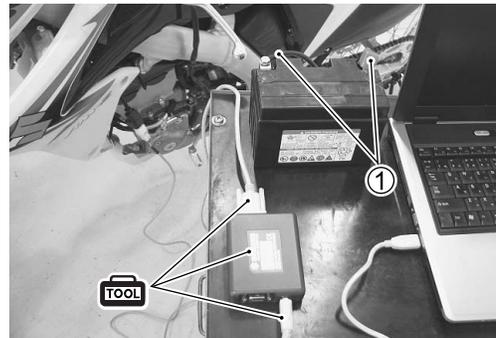
- After repairing the trouble, disconnect the battery \ominus lead wire and connect it again.
- If the DTC does not indicate ①, the malfunction is cleared.
- Disconnect the battery lead wire ② and FI indicator light assy ③.



USE OF SDS DIAGNOSTIC PROCEDURES

NOTE:

- * Do not disconnect couplers from the ECM and ECM ground wire harness from the engine before confirming the DTC (Diagnostic Trouble Code) stored in memory. Such disconnection will erase the memorized information in ECM memory.
- * Malfunction code stored in ECM memory can be checked by the SDS.
- * Be sure to read "PRECAUTIONS IN SERVICING" (12-3) before inspection and observe what is written there.



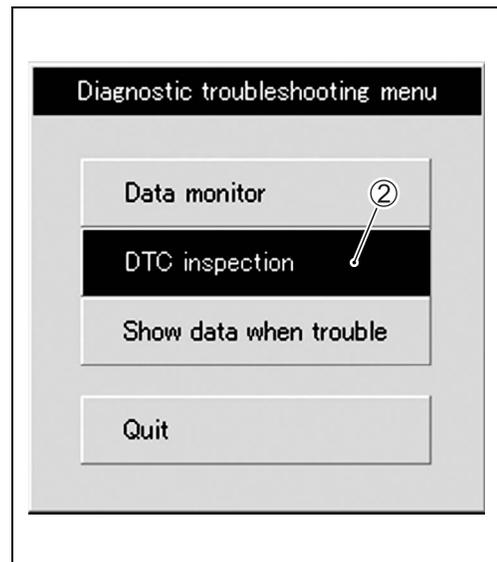
- Connect a 12 volts battery by using the battery lead wire ① to the service coupler. (12-19)

36890-28H00: Battery lead wire (option)

NOTE:

The DTC (Diagnostic Trouble Code) check does not require the battery to be connected during running of the engine, but it needs the battery power when the engine is at stop.

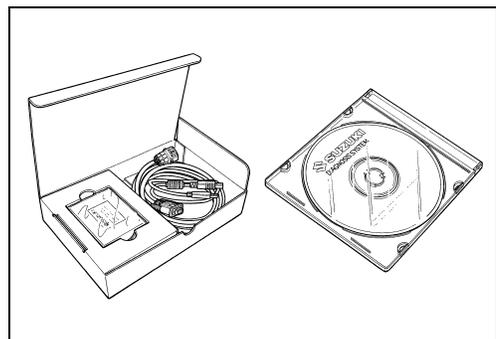
- Set up the SDS tool. (Refer to the SDS operation manual for further details.)
- Click the DTC inspection button ②.
- Depress the kick starter lever at least ten times or run the engine for more than 3 seconds.
- Check the DTC to determine the malfunction part. (12-27, -28)



NOTE:

- * Read the DTC (Diagnostic Trouble Code) and show data when trouble (displaying data at the time of DTC) according to instructions displayed on SDS. (12-22)
- * Not only is SDS used for detecting Diagnostic Trouble Codes but also for reproducing and checking on screen the failure condition as described by customers using the trigger.
- * How to use trigger. (Refer to the SDS operation manual for further details.)

TOOL 09904-41010: SUZUKI Diagnostic system set
99565-01010-021: CD-ROM Ver.21

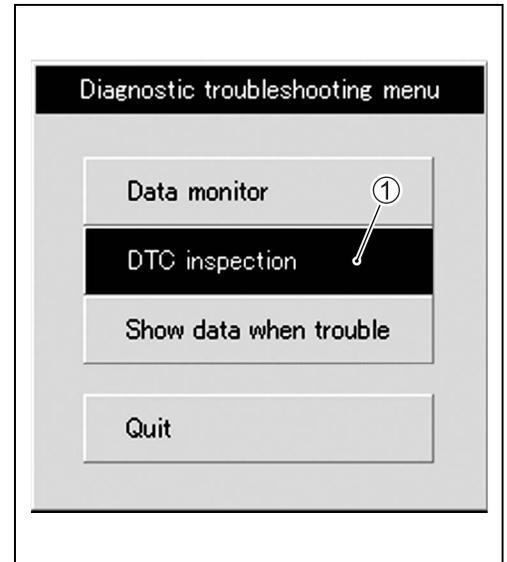


USE OF SDS DIAGNOSIS RESET PROCEDURE

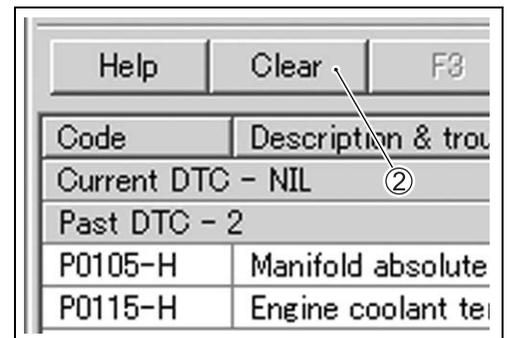
- After repairing the trouble, disconnect the battery lead wire coupler connect it again.
- Click the DTC inspection button ①.
- Check the DTC.
- The previous malfunction history code (Past DTC) still remains stored in the ECM. Therefore, erase the history code memorized in the ECM using SDS tool.

NOTE:

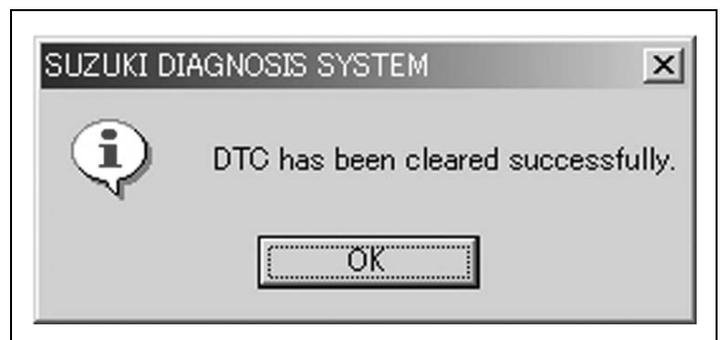
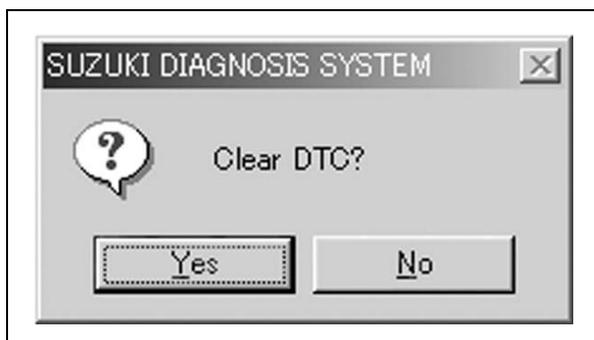
The malfunction code is memorized in the ECM also when the wire coupler of any sensor is disconnected. Therefore, when a wire coupler has been disconnected at the time of diagnosis, erase the stored malfunction history code using SDS.



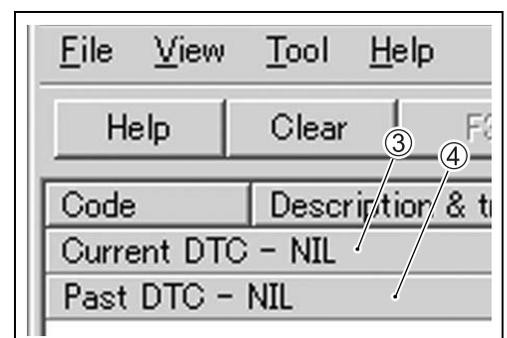
- Click "Clear" ② to delete history code (Past DTC).



- Follow the displayed instructions.



- Check that both "Current DTC" ③ and "Past DTC" ④ are deleted (NIL).



SHOW DATA WHEN TROUBLE (DISPLAING DATA AT THE TIME OF DTC)

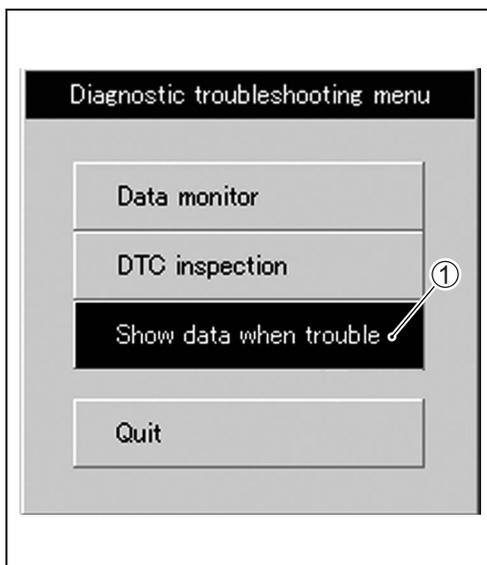
ECM stores the engine and driving conditions (in the form of data as shown in the figure) at the moment of the detection of a malfunction in its memory. This data is called “Show data when trouble”.

Therefore, it is possible to know engine and driving conditions (e.g., whether the engine was warm or not, where the vehicle was running or stopped) when a malfunction was detected by checking the show data when trouble. This show data when trouble function can record the maximum of two Diagnostic Trouble Codes in the ECM.

Also, ECM has a function to store each show data when trouble for two different malfunctions in the order as the malfunction is detected. Utilizing this function, it is possible to know the order of malfunctions that have been detected. Its use is helpful when rechecking or diagnosing a trouble.

Failure #1					
P0115-H Engine coolant / oil temperature circuit malfunction					
Item	Pre-detect	Detect poi...	Post-dete...	Fix point	
Engine speed	0	0	0	0	
Throttle position	0.5	0.5	0.5	0.5	
Manifold absolute pressure 1	100.9	100.9	100.9	100.9	
Engine coolant / oil temperature	-30.0	-30.0	-30.0	-30.0	

- Click “Show data when trouble” ① to display the data. By clicking the drop down button ②, either “Failure #1” or “Failure #2” can be selected.



Failure #2	
P0110-H Intake air temperature circuit malfunction ②	
Item	Pre-d
Engine speed	
Throttle position	
Manifold absolute pressure 1	
Engine coolant / oil temperature	

SDS CHECK

Using SDS, sample the data at the time of new and periodic vehicle inspections.

After saving the sampled data in the computer, file them by model and by user.

The periodically filed data help improve the accuracy of troubleshooting since they can indicate the condition of vehicle functions that has changed with time.

For example, when a vehicle is brought in for service but the troubleshooting of a failure is not easy, comparing the current data value to the past filed data value at time of normal condition can allow the specific engine failure to be determined.

Also, in the case of a customer vehicle which is not periodically brought in for service with no past data value having been saved, if the data value of a good vehicle condition have been already saved as a master (STD), comparison between the same models helps facilitate the troubleshooting.

- Set up the SDS tools. (☞ 12-20)

TOOL 09904-41010: SUZUKI Diagnostic system set
99565-01010-021: CD-ROM Ver.21

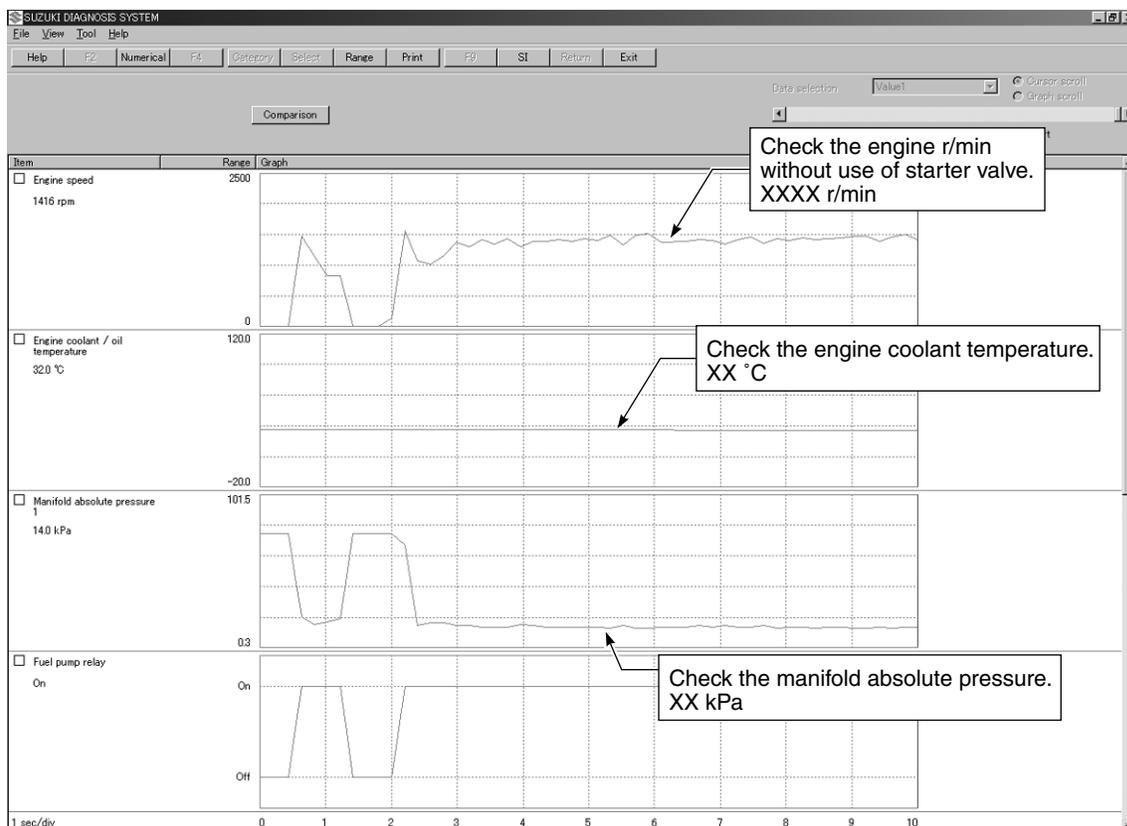
NOTE:

* Before taking the sample of data, check and clear the Past DTC. (☞ 12-21)

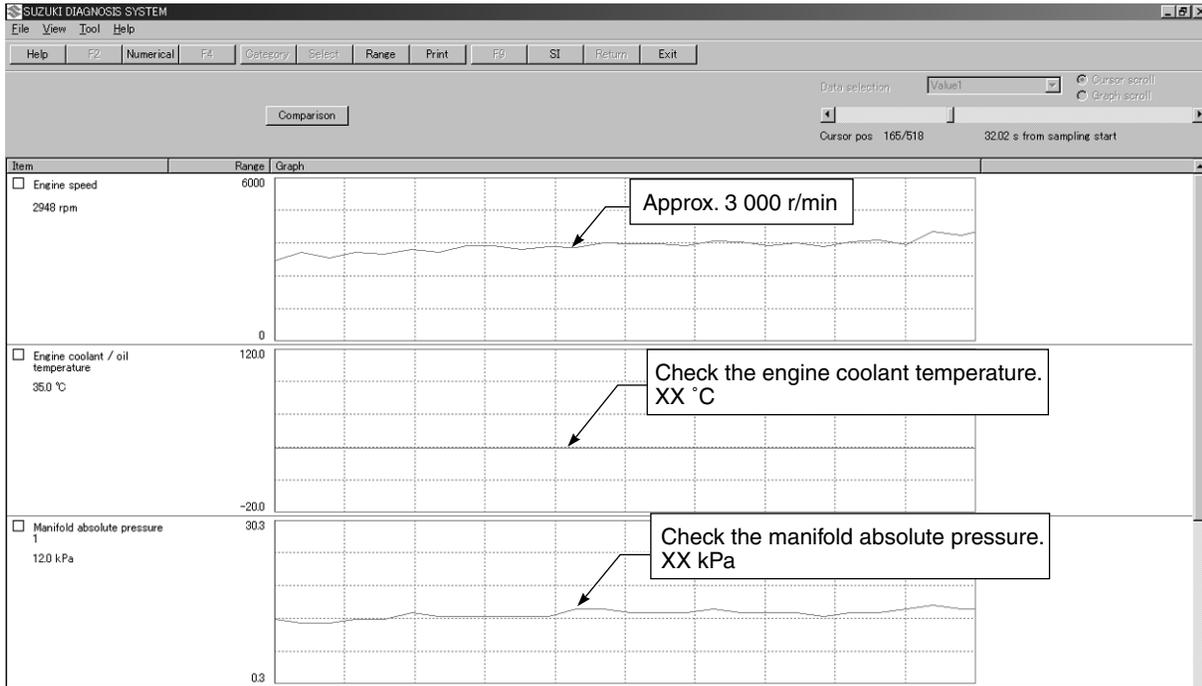
* A number of different data under a fixed condition as shown below should be saved or filed as sample.

SAMPLE:

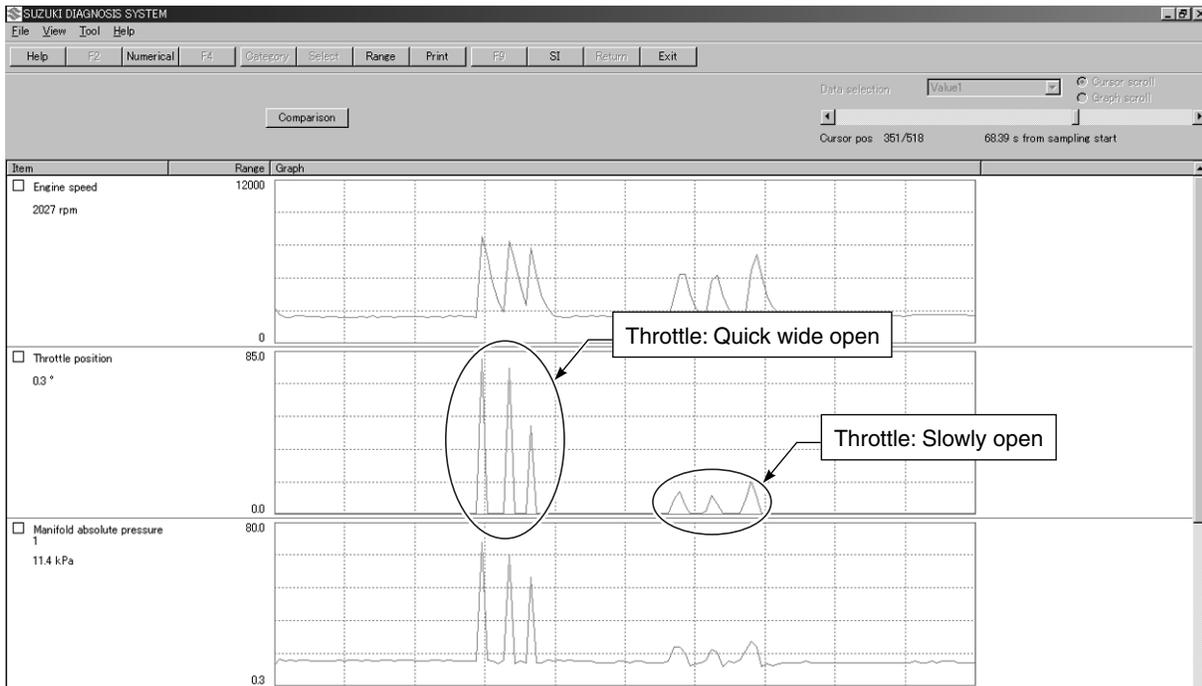
Data sampled from cold starting through warm-up



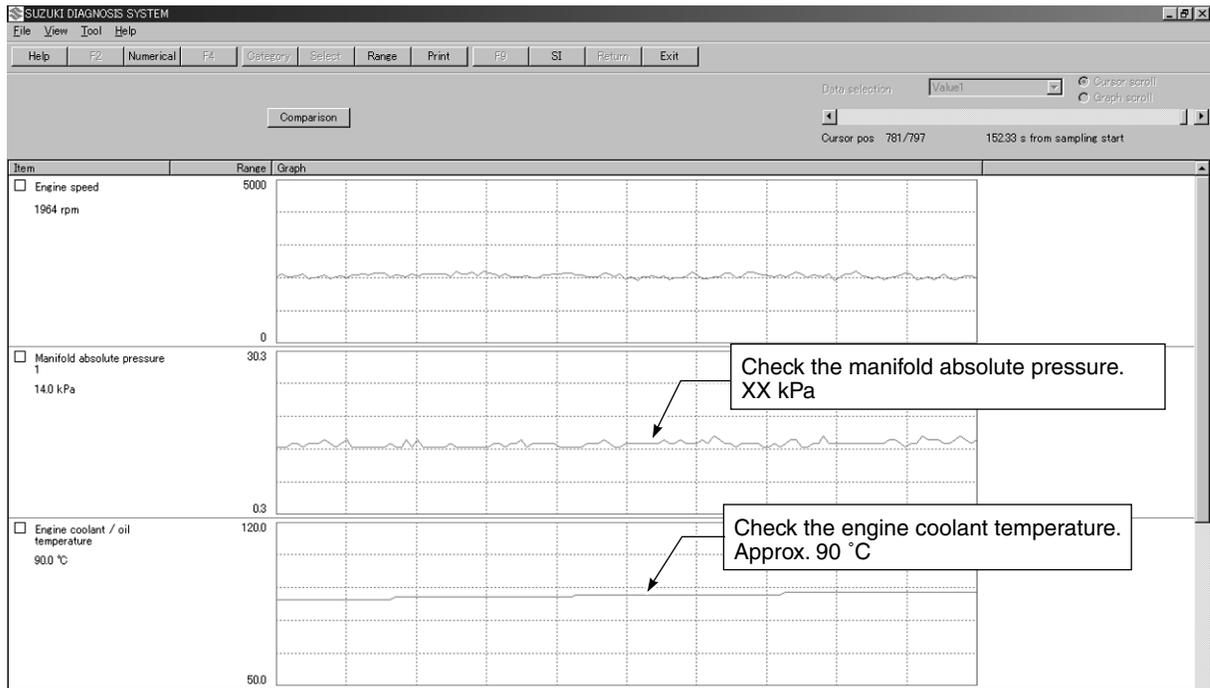
Data at 3 000 r/min under no load



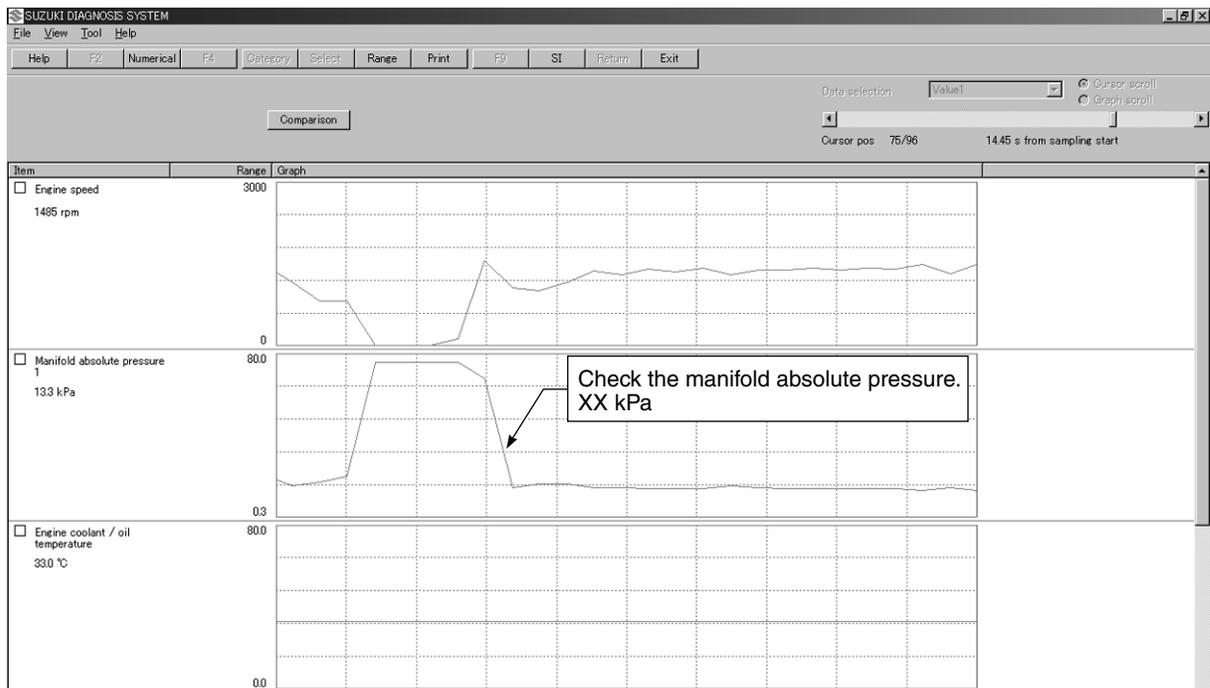
Data at the time of racing



Data of intake negative pressure during idling (90 °C)



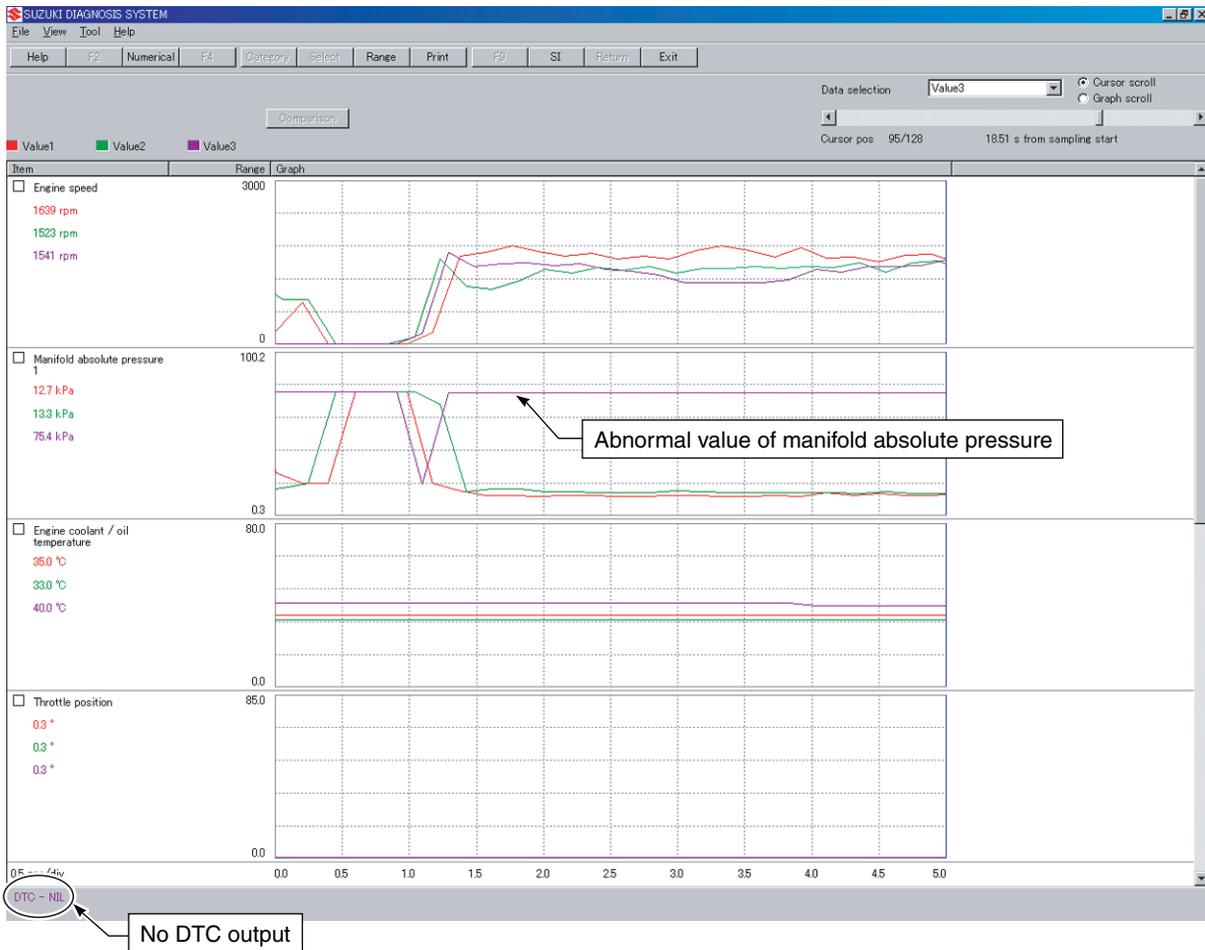
Data of manifold absolute pressure operation at the time of starting



Example of trouble

Three data; value 1 (past data 1), value 2 (past data 2) and value 3 (current data 3); can be made in comparison by showing them in the graph. Read the change of value by comparing the current data to the past data that have been saved under the same condition, then you may determine how changes have occurred with the pass of time and identify what problem is currently occurring.

With DTC not output, if the intake negative pressure is found to be higher than the data saved previously, the possible cause may probably lie in the hardware side such as O-ring damage, etc.



DTC AND DEFECTIVE CONDITION

DTC No.		DETECTED ITEM	DETECTED FAILURE CONDITION	CHECK FOR
12	P0335	CKP sensor	The signal does not reach ECM for 1 second or more, after receiving the IAP sensor input signal.	CKP sensor wiring and mechanical parts CKP sensor, lead wire/coupler connection
14	P0120	TP sensor	The sensor should produce following voltage. $0.39\text{ V} \leq \text{sensor voltage} < 4.51\text{ V}$ In other than the above range, 14 (P0120) is indicated.	TP sensor, lead wire/coupler connection
H			Sensor voltage is higher than specified value.	TP sensor circuit shorted to VCC or ground circuit open
L			Sensor voltage is lower than specified value.	TP sensor circuit open or shorted to ground or VCC circuit open
15	P0115	ECT sensor	The sensor voltage should be the following. $0.2\text{ V} \leq \text{sensor voltage} < 4.9\text{ V}$ In other than the above range, 15 (P0115) is indicated.	ECT sensor, lead wire/coupler connection
H			Sensor voltage is higher than specified value.	ECT sensor circuit open or ground circuit open
L			Sensor voltage is lower than specified value.	ECT sensor circuit shorted to ground
17	P0105	IAP sensor	The sensor should produce following voltage. $0.23\text{ V} \leq \text{sensor voltage} < 4.11\text{ V}$ In other than the above range, 17 (P0105) is indicated.	IAP sensor, lead wire/coupler connection
H			Sensor voltage is higher than specified value.	IAP sensor circuit shorted to VCC or ground circuit open
L			Sensor voltage is lower than specified value.	IAP sensor circuit open or shorted to ground or VCC circuit open
21	P0110	IAT sensor	The sensor voltage should be the following. $0.19\text{ V} \leq \text{sensor voltage} < 4.93\text{ V}$ In other than the above range, 21 (P0110) is indicated.	IAT sensor, lead wire/coupler connection
H			Sensor voltage is higher than specified value.	IAT sensor circuit open or ground circuit open
L			Sensor voltage is lower than specified value.	IAT sensor circuit shorted to ground

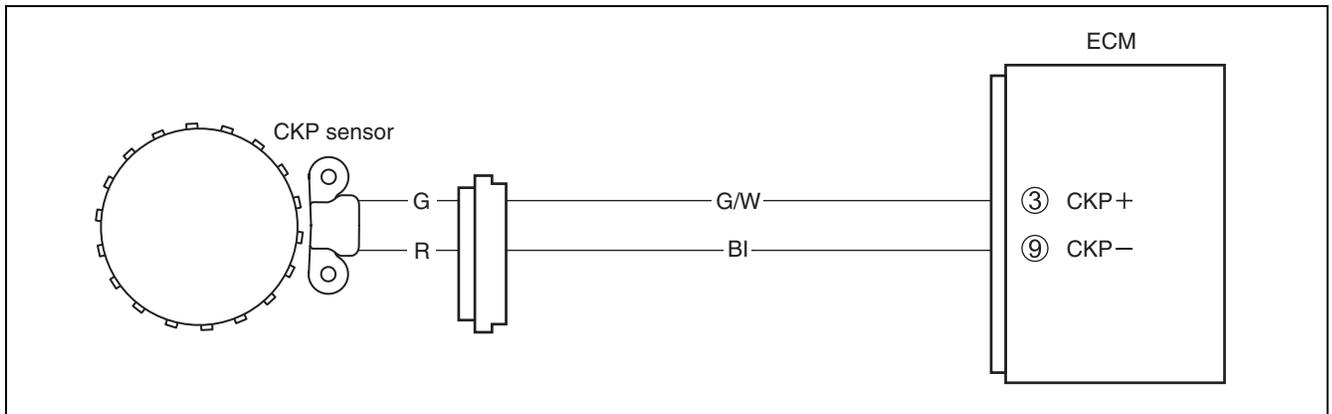
DTC No.		DETECTED ITEM	DETECTED FAILURE CONDITION	CHECK FOR
23		TO sensor	The sensor voltage should be the following for 1 second and more. $0.17 \text{ V} \leq \text{sensor voltage} < 4.73 \text{ V}$ In other than the above value, 23 (P1651) is indicated.	TO sensor, lead wire/coupler connection
P1651	H		Sensor voltage is higher than specified value.	TO sensor circuit shorted to VCC or ground circuit open
	L		Sensor voltage is lower than specified value.	TO sensor circuit open or shorted to ground or VCC circuit open
24		Ignition signal	CKP sensor (pick-up coil) signal is produced, but signal from ignition coil is interrupted 5 times or more continuously. In this case, the code 24 (P0351) is indicated.	Ignition coil, wiring/coupler connection, power supply from the battery
P0351				
31		Gear position signal	Gear position signal voltage should be higher than the following. Gear position switch voltage $\geq 0.89 \text{ V}$ If lower than the above value for 3 seconds or more, 31 (P0705) is indicated.	GP switch, wiring/coupler connection, gearshift cam, etc.
P0705				
32		Fuel injector	CKP sensor (pickup coil) signal is produced, but fuel injector signal is interrupted 8 times or more continuously. In this case, the code 32 (P0201) is indicated.	Fuel injector, wiring/coupler connection, power supply to the injector
P0201				
41		FP relay	No voltage is applied to the fuel pump, although FP relay is turned ON.	FP relay, lead wire/coupler connection, power source to FP relay
P0230				
63		Crankshaft rotation signal sensor	CKP sensor (pick-up coil) signal is produced, but signal from crankshaft rotation signal sensor is not input for 3 seconds or more.	Crankshaft rotation signal sensor wiring and mechanical parts Crankshaft rotation signal sensor, lead wire/coupler connection
P1771				

NOTE:

The FP relay is incorporated in the ECM.

“12” (P0335) CKP SENSOR CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
The signal does not reach ECM for 1 second or more, after receiving the IAP sensor input signal.	<ul style="list-style-type: none"> • Metal particles or foreign material being stuck on the CKP sensor and rotor tip. • CKP sensor circuit open or short. • CKP sensor malfunction. • ECM malfunction.



CAUTION

When using the multi circuit tester, do not strongly touch the terminal of the ECM coupler with a needle-pointed tester probe to prevent the terminal damage or terminal bend.

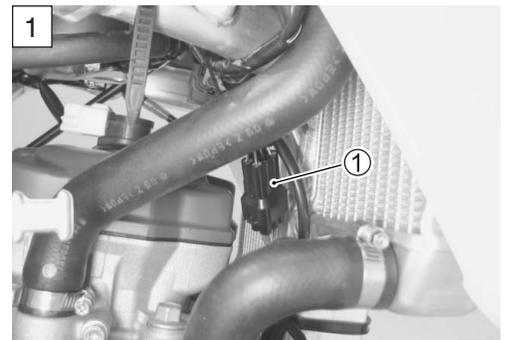
NOTE:

After repairing the trouble, clear the DTC using SDS tool. (🔧 12-21)

INSPECTION

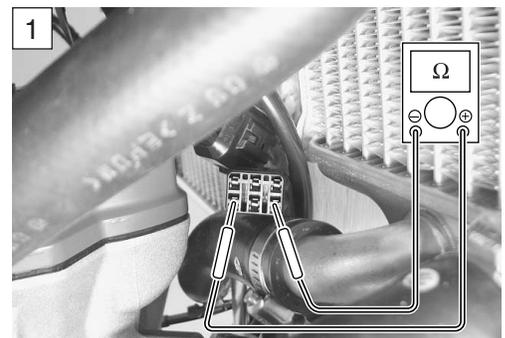
Step 1

- 1) Stop the engine.
- 2) Check the CKP sensor coupler ① for loose or poor contacts.
If OK, then measure the CKP sensor resistance.



- 3) Disconnect the CKP sensor coupler and measure the resistance.

DATA CKP sensor resistance: 80 – 120 Ω
(Green – Red)



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

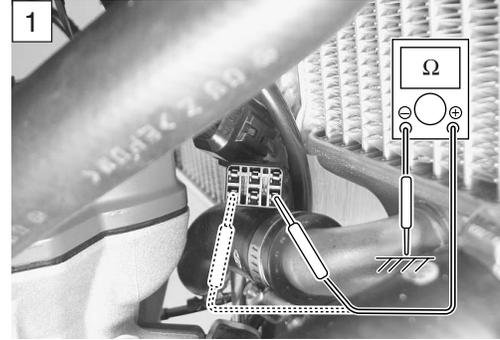
DATA CKP sensor resistance: $\infty \Omega$ (Infinity)
 (Green – Ground)
 (Red – Ground)

TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Resistance (Ω)

Are the resistance and continuity OK?

YES	Go to step 2.
NO	Replace the CKP sensor with a new one.



Step 2

- 1) Measure the CKP sensor peak voltage by depressing the kick starter lever several times forcefully.
- 2) Repeat the above test procedure a few times and measure the highest peak voltage.

DATA CKP sensor peak voltage: 2.8 V and more
 (+ Green – - Red)

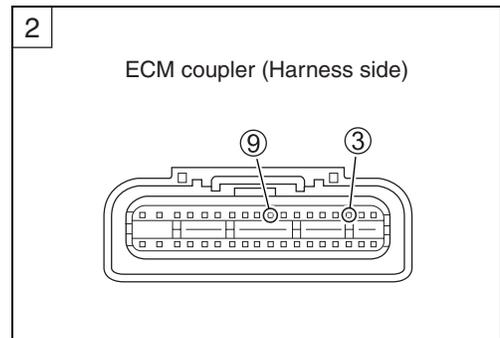
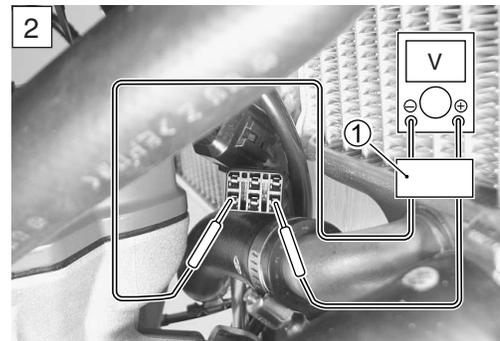
① Peak volt adaptor

TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Voltage (V)

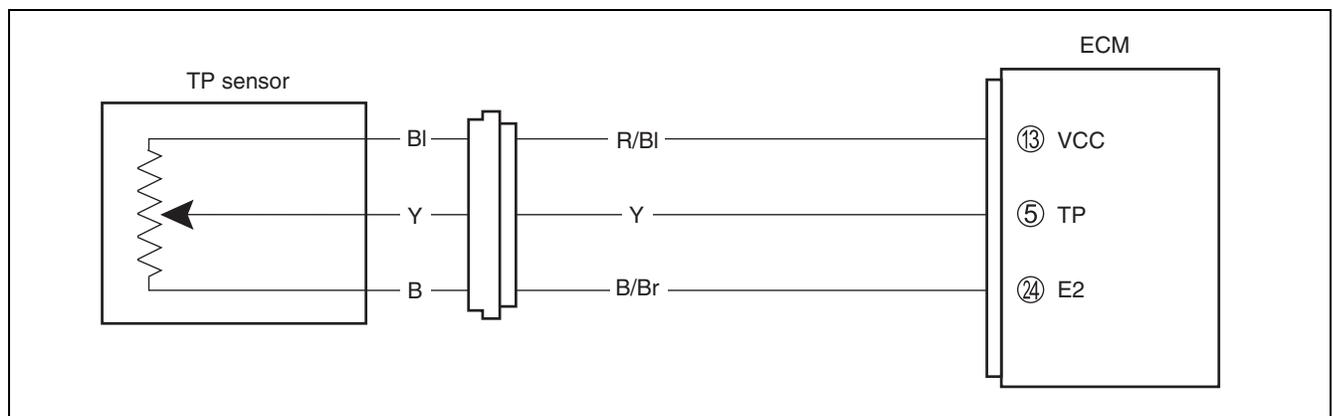
Is the voltage OK?

YES	<ul style="list-style-type: none"> • G/W or BI wire open or shorted to ground. • Loose or poor contacts on the CKP sensor coupler or ECM coupler (terminal ③ or ⑨). • If wire and connection are OK, intermittent trouble or faulty ECM. • Recheck each terminal and wire harness for open circuit and poor connection. • Replace the ECM with a known good one, and inspect it again.
NO	<ul style="list-style-type: none"> • Inspect that metal particles or foreign material stuck on the CKP sensor and rotor tip. • If there are no metal particles and foreign material, then replace the CKP sensor with a new one.



“14” (P0120-H/L) TP SENSOR CIRCUIT MALFUNCTION

DETECTED CONDITION		POSSIBLE CAUSE
14	Output voltage is not within the following range. Difference between actual throttle opening and opening calculated by ECM is larger than specified value. $0.39\text{ V} \leq \text{Sensor voltage} < 4.51\text{ V}$	<ul style="list-style-type: none"> TP sensor maladjusted. TP sensor circuit open or short. TP sensor malfunction. ECM malfunction.
P0120	H	<ul style="list-style-type: none"> TP sensor circuit shorted to VCC or ground circuit open. TP sensor circuit open or shorted to ground or VCC circuit open.
	L	



CAUTION

When using the multi circuit tester, do not strongly touch the terminal of the ECM coupler with a needle-pointed tester probe to prevent the terminal damage or terminal bend.

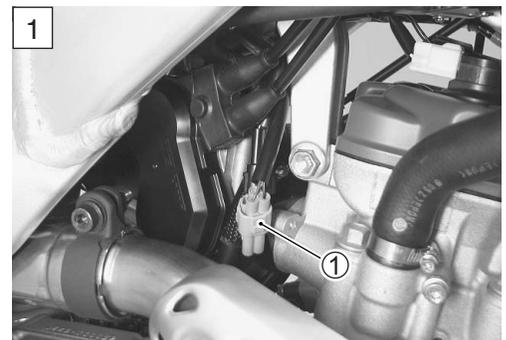
NOTE:

After repairing the trouble, clear the DTC using SDS tool. (🔧 12-21)

INSPECTION

Step 1 (When indicating 14:)

- Stop the engine.
- Check the TP sensor coupler ① for loose or poor contacts.
If OK, then measure the TP sensor input voltage.
- Disconnect the TP sensor coupler ①.
- Connect a 12 volts battery by using the battery lead wire to the service coupler. (🔧 12-19)



- 5) Measure the voltage at the R/BI wire (A) and ground.
- 6) If OK, then measure the voltage at the R/BI wire (A) and B/Br wire (B).

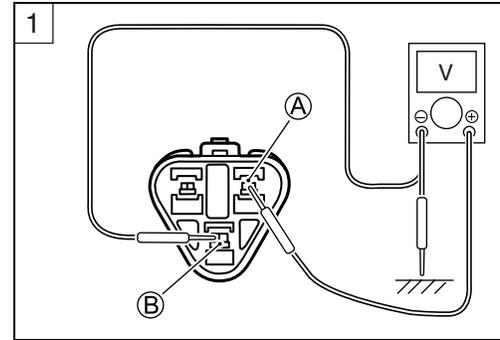
DATA TP sensor input voltage: 4.5 – 5.5 V
 (+ R/BI – (–) Ground)
 (+ R/BI – (–) B/Br)

TOOL 09900-25008: Multi circuit tester set
 36890-28H00: Battery lead wire (option)

V Tester knob indication: Voltage (---)

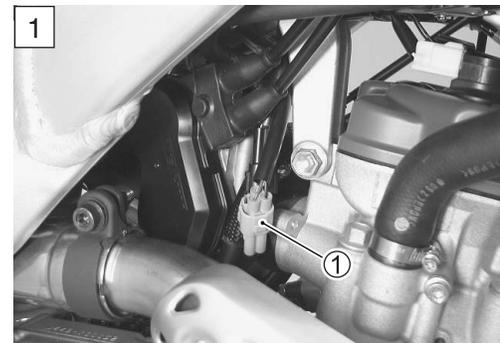
Is the voltage OK?

YES	Go to Step 2.
NO	<ul style="list-style-type: none"> • Loose or poor contacts on the ECM coupler (terminal ⑬ or ⑭). • Open or short circuit in the R/BI wire or B/Br wire.

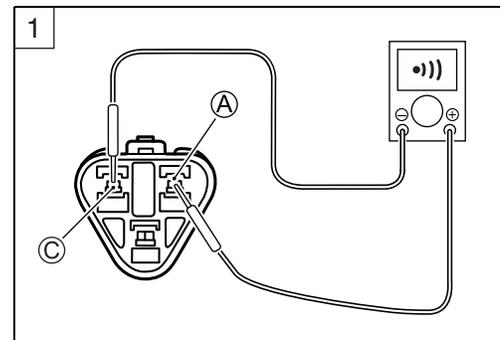


Step 1 (When indicating P0120-H:)

- 1) Stop the engine.
- 2) Check the TP sensor coupler ① for loose or poor contacts.
 If OK, then check the TP sensor lead wire continuity.



- 3) Disconnect the TP sensor coupler.
 - 4) Remove the fuel tank. (13-2, -3)
 - 5) Disconnect the ECM coupler. (12-60)
 - 6) Check the continuity between R/BI wire (A) and Yellow wire (C).
- If the sound is not heard from the tester, the circuit condition is OK.



- 7) Insert the needle-pointed probes to the lead wire coupler.
- 8) Check the continuity between Yellow wire ③ and terminal ⑤.
- 9) Also, check the continuity between B/Br wire ② and terminal ④.

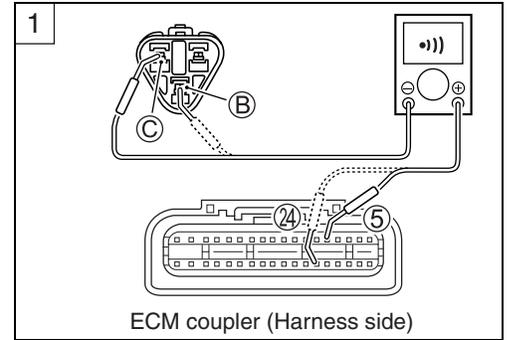
DATA TP sensor lead wire continuity: Continuity (•••)

- TOOL** 09900-25008: Multi circuit tester set
- 09900-25009: Needle-pointed probe set

Tester knob indication: Continuity test (•••)

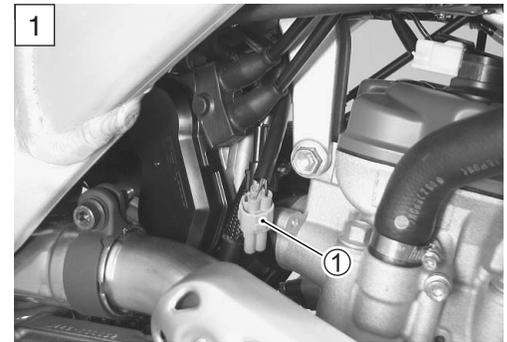
Is the continuity OK?

YES	Go to Step 2.
NO	Yellow wire shorted to VCC, or B/Br wire open.

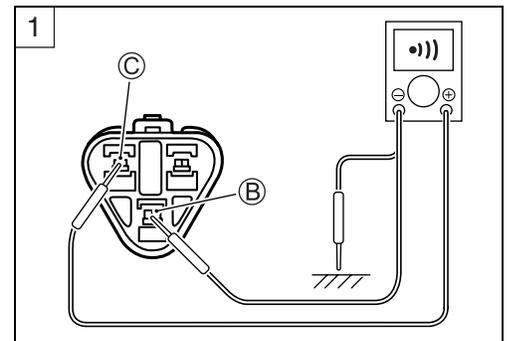


Step 1 (When indicating P0120-L:)

- 1) Stop the engine.
- 2) Check the TP sensor coupler ① for loose or poor contacts.
If OK, then check the TP sensor lead wire continuity.



- 3) Disconnect the TP sensor coupler.
- 4) Remove the fuel tank. (☞ 13-2, -3)
- 5) Disconnect the ECM coupler. (☞ 12-60)
- 6) Check the continuity between Yellow wire ③ and ground.
- 7) Also, check the continuity between Yellow wire ③ and B/Br wire ②. If the sound is not heard from the tester, the circuit condition is OK.



- 8) Insert the needle-pointed probes to the lead wire coupler.
- 9) Check the continuity between Yellow wire ③ and terminal ⑤.
- 10) Also, check the continuity between R/BI wire ① and terminal ⑬.

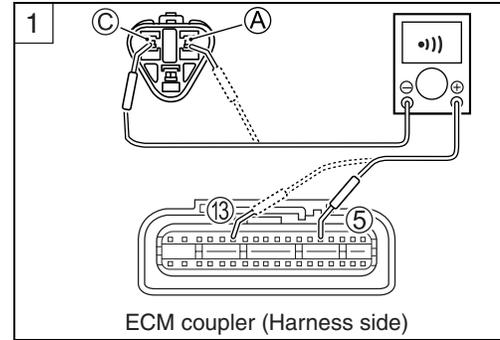
DATA TP sensor lead wire continuity: Continuity (•••)

TOOL 09900-25008: Multi circuit tester set
09900-25009: Needle-pointed probe set

Tester knob indication: Continuity test (•••)

Is the continuity OK?

YES	Go to Step 1. (↗ 12-31)
NO	R/BI wire or Yellow wire open, or Yellow wire shorted to ground.



Step 2

- 1) Connect the ECM coupler and TP sensor coupler.
- 2) Connect a 12 volts battery by using the battery lead wire to the service coupler. (↗ 12-19)
- 3) Insert the needle-pointed probes to the lead wire coupler.
- 4) Measure the TP sensor output voltage at the coupler (between ⊕ Yellow and ⊖ B/Br) by turning the throttle grip.

DATA TP sensor output voltage

Throttle valve is closed: Approx. 0.6 V

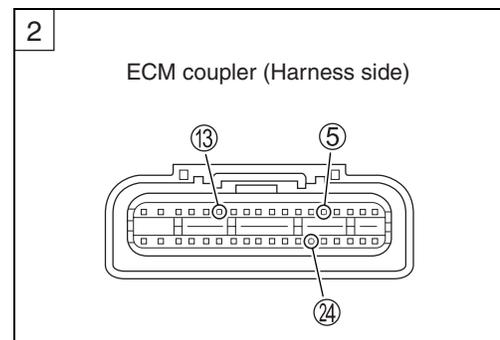
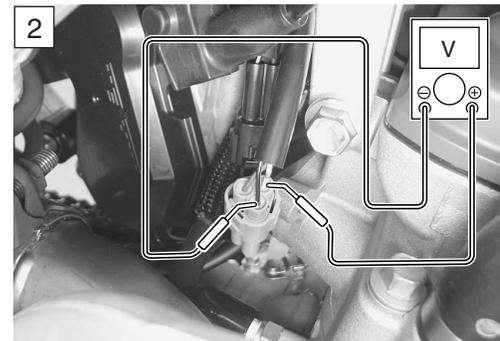
Throttle valve is opened: Approx. 3.8 V

TOOL 09900-25008: Multi circuit tester set
09900-25009: Needle-pointed probe set
36890-28H00: Battery lead wire (option)

Tester knob indication: Voltage (---)

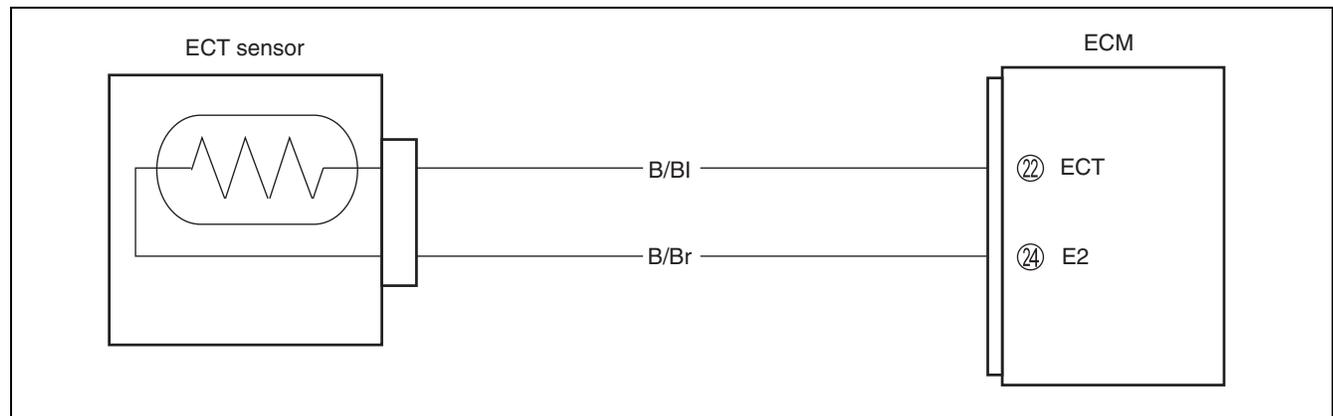
Is the voltage OK?

YES	<ul style="list-style-type: none"> • Yellow, R/BI or B/Br wire open or shorted to ground, or poor ⑤, ⑬ or ⑭ connection. • If wire and connection are OK, intermittent trouble or faulty ECM. • Recheck each terminal and wire harness for open circuit and poor connection. • Replace the ECM with a known good one, and inspect it again.
NO	<ul style="list-style-type: none"> • Short circuit in the Yellow wire. • If check result is not satisfactory, replace TP sensor with a new one.



“15” (P0115-H/L) ECT SENSOR CIRCUIT MALFUNCTION

DETECTED CONDITION		POSSIBLE CAUSE
15	Output voltage is not within the following range. $0.2\text{ V} \leq \text{Sensor voltage} < 4.9\text{ V}$	<ul style="list-style-type: none"> ECT sensor circuit open or short. ECT sensor malfunction. ECM malfunction.
P0115	H Sensor voltage is higher than specified value.	<ul style="list-style-type: none"> ECT sensor circuit open or ground circuit open.
	L Sensor voltage is lower than specified value.	<ul style="list-style-type: none"> ECT sensor circuit shorted to ground.

**CAUTION**

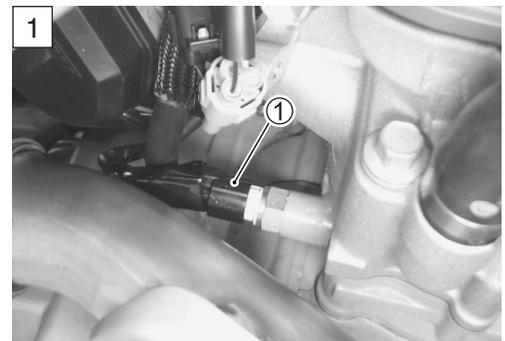
When using the multi circuit tester, do not strongly touch the terminal of the ECM coupler with a needle-pointed tester probe to prevent the terminal damage or terminal bend.

NOTE:

After repairing the trouble, clear the DTC using SDS tool. (🔧 12-21)

INSPECTION**Step 1 (When indicating 15:)**

- 1) Stop the engine.
- 2) Check the ECT sensor coupler ① for loose or poor contacts.
If OK, then measure the ECT sensor voltage at the wire side coupler.
- 3) Disconnect the ECT sensor coupler ①.
- 4) Connect a 12 volts battery by using the battery lead wire to the service coupler. (🔧 12-19)



- 5) Insert the needle-pointed probes to the lead wire coupler.
- 6) Measure the voltage between B/BI wire terminal (A) and ground.
- 7) If OK, then measure the voltage between B/BI wire terminal (A) and B/Br wire terminal (B).

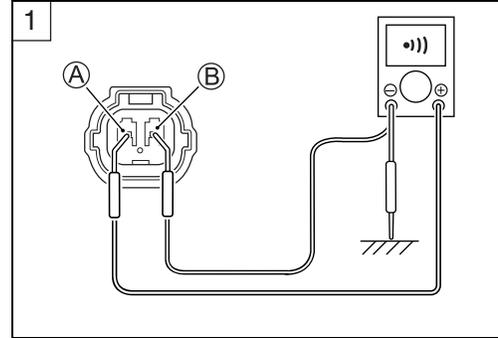
DATA ECT sensor voltage: 4.5 – 5.5 V
 (+ B/BI – (–) Ground)
 (+ B/BI – (–) B/Br)

TOOL 09900-25008: Multi circuit tester set
 09900-25009: Needle-pointed probe set
 36890-28H00: Battery lead wire (option)

Tester knob indication: Voltage (V)

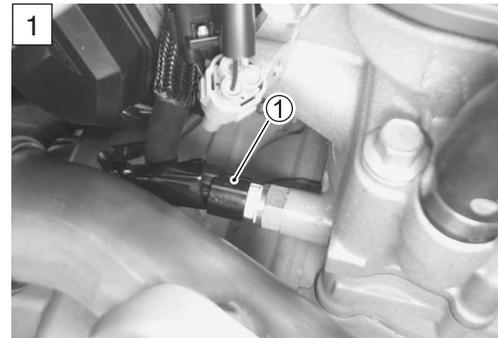
Is the voltage OK?

YES	Go to Step 2.
NO	<ul style="list-style-type: none"> • Loose or poor contacts on the ECM coupler (terminal 22 or 24). • Open or short circuit in the B/BI wire or B/Br wire.



Step 1 (When indicating P0115-H:)

- 1) Stop the engine.
- 2) Check the ECT sensor coupler ① for loose or poor contacts.
 If OK, then check the ECT sensor lead wire continuity.



- 3) Remove the fuel tank. (➡ 13-2, -3)
- 4) Disconnect the ECT sensor coupler and ECM coupler.
- 5) Insert the needle-pointed probes to the lead wire coupler.
- 6) Check the continuity between B/BI wire (A) and terminal 22.
- 7) Also, check the continuity between B/Br wire (B) and terminal 24.

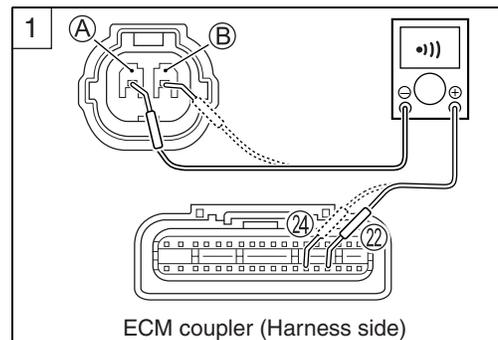
DATA ECT sensor lead wire continuity: Continuity (•••)

TOOL 09900-25008: Multi circuit tester set
 09900-25009: Needle-pointed probe set

Tester knob indication: Continuity test (•••)

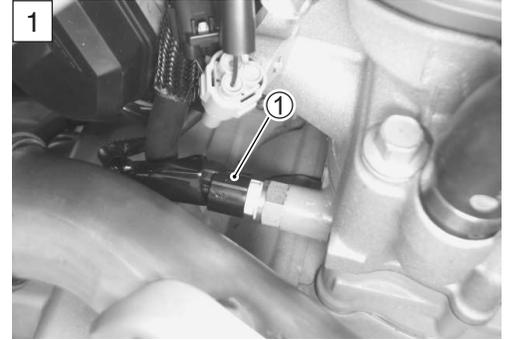
Is the continuity OK?

YES	Go to Step 2.
NO	B/BI or B/Br wire open.



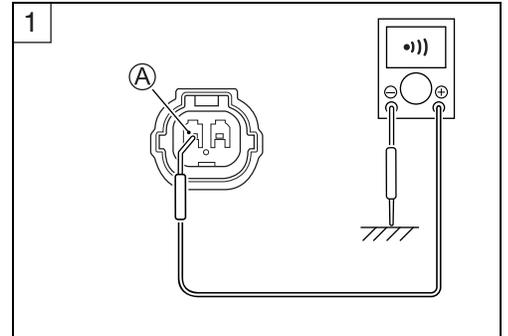
Step 1 (When indicating P0115-L:)

- 1) Stop the engine.
- 2) Check the ECT sensor coupler ① for loose or poor contacts.
If OK, then measure the output voltage.



- 3) Remove the fuel tank. (☞ 13-2, -3)
- 4) Disconnect the ECT sensor coupler and ECM coupler.
- 5) Insert the needle-pointed probes to the lead wire coupler.
- 6) Check the continuity between B/BI wire (A) and ground.
If the sound is not heard from the tester, the circuit condition is OK.

Tester knob indication: Continuity test (•••)

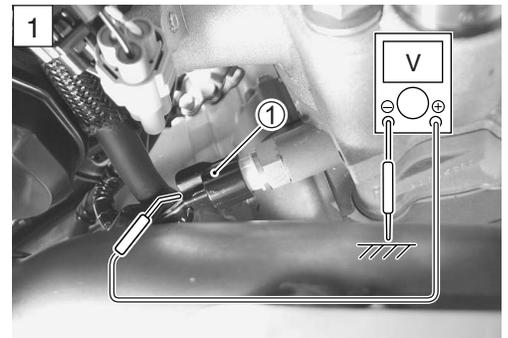


- 7) Connect the ECT sensor coupler ① and ECM coupler.
- 8) Insert the needle-pointed probe to the lead wire coupler.
- 9) Connect a 12 volts battery by using the battery lead wire to the service coupler. (☞ 12-19)
- 10) Measure the voltage between B/BI wire and ground.

ECT sensor output voltage: 0.20 – 4.90 V
(⊕ B/BI – ⊖ Ground)

- 09900-25008: Multi circuit tester set**
09900-25009: Needle-pointed probe set
36890-28H00: Battery lead wire (option)

Tester knob indication: Voltage (---)



Are the continuity and voltage OK?

YES	Go to Step 2.
NO	<ul style="list-style-type: none"> • B/BI wire shorted to ground. • If wire is OK, go to Step 2.

Step 2

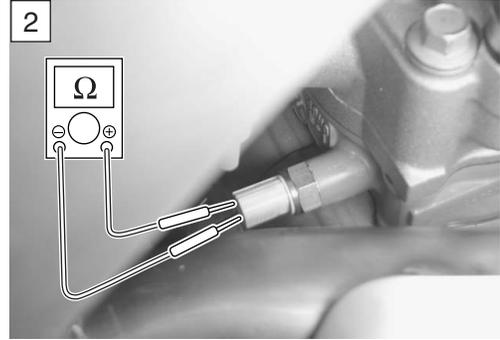
- 1) If necessary, connect the ECM coupler.
- 2) Disconnect the ECT sensor coupler.
- 3) Measure the ECT sensor resistance.

DATA ECT sensor resistance:

Approx. 2.58 kΩ at 20 °C (68 °F)
(Terminal – Terminal)

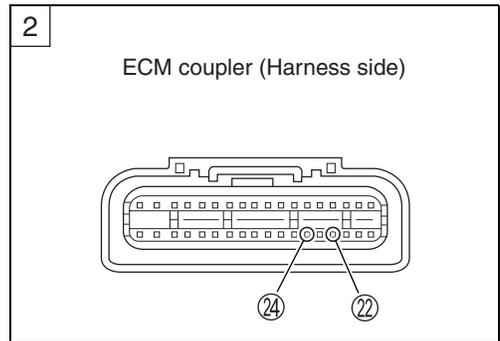
TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Resistance (Ω)



Is the resistance OK?

YES	<ul style="list-style-type: none"> • B/Bl or B/Br wire open or shorted to ground, or poor ② or ④ connection. • If wire and connection are OK, intermittent trouble or faulty ECM. • Recheck each terminal and wire harness for open circuit and poor connection. • Replace the ECM with a known good one, and inspect it again.
NO	Replace the ECT sensor with a new one.

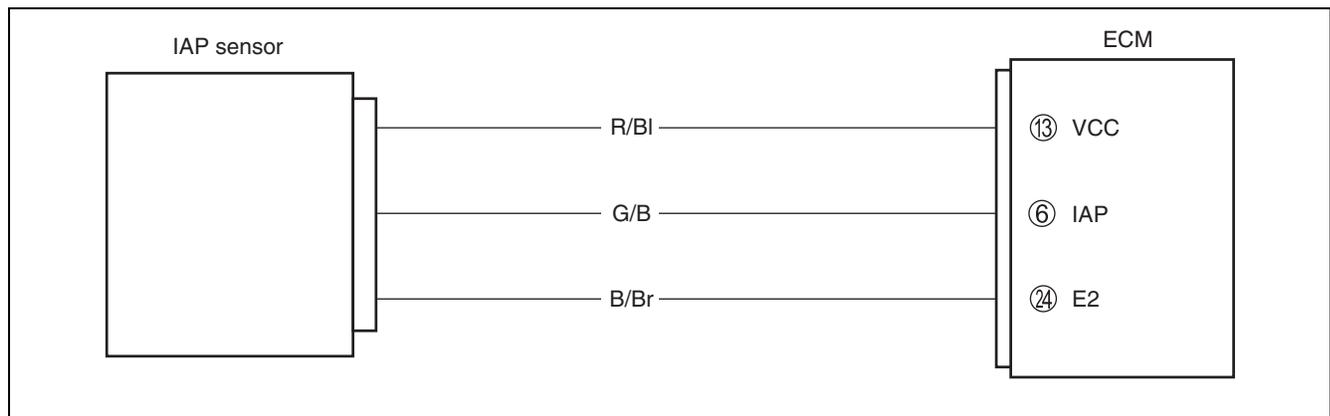


DATA ECT sensor specification

Engine Coolant Temp.	Resistance
20 °C (68 °F)	Approx. 2.58 kΩ
50 °C (122 °F)	Approx. 0.77 kΩ
80 °C (176 °F)	Approx. 0.28 kΩ
110 °C (230 °F)	Approx. 0.12 kΩ

“17” (P0105-H/L) IAP SENSOR CIRCUIT MALFUNCTION

DETECTED CONDITION		POSSIBLE CAUSE
17	IAP sensor voltage is not within the following range. $0.23\text{ V} \leq \text{Sensor voltage} < 4.11\text{ V}$ NOTE: <i>Note that atmospheric pressure varies depending on weather conditions as well as altitude.</i> <i>Take that into consideration when inspecting voltage.</i>	<ul style="list-style-type: none"> • Clogged vacuum passage between throttle body and IAP sensor. • Air being drawn from vacuum passage between throttle body and IAP sensor. • IAP sensor circuit open or shorted to ground. • IAP sensor malfunction. • ECM malfunction.
P0105	H	<ul style="list-style-type: none"> • IAP sensor circuit shorted to VCC or ground circuit open.
	L	<ul style="list-style-type: none"> • IAP sensor circuit open or shorted to ground or VCC circuit open.



CAUTION

When using the multi circuit tester, do not strongly touch the terminal of the ECM coupler with a needle-pointed tester probe to prevent the terminal damage or terminal bend.

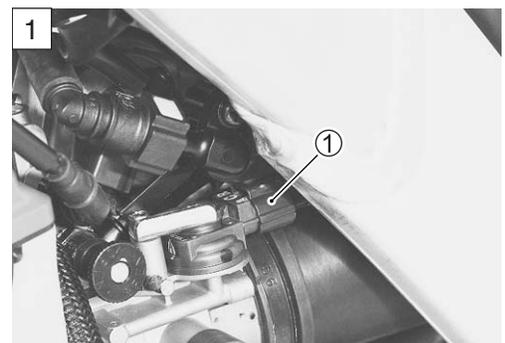
NOTE:

After repairing the trouble, clear the DTC using SDS tool. (📄 12-21)

INSPECTION

Step 1 (When indicating 17:)

- 1) Stop the engine.
- 2) Check the IAP sensor coupler ① for loose or poor contacts.
If OK, then measure the IAP sensor input voltage.
- 3) Disconnect the IAP sensor coupler ①.



- 4) Connect a 12 volts battery by using the battery lead wire to the service coupler. (☞ 12-19)
- 5) Insert the needle-pointed probes to the lead wire coupler.
- 6) Measure the voltage at the R/BI wire (A) and ground.
- 7) If OK, then measure the voltage at the R/BI wire (A) and B/Br wire (B).

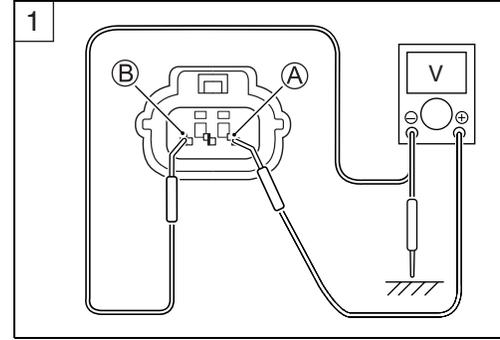
DATA IAP sensor input voltage: 4.5 – 5.5 V
 (+ R/BI – (–) Ground)
 (+ R/BI – (–) B/Br)

TOOL 09900-25008: Multi circuit tester set
 09900-25009: Needle-pointed probe set
 36890-28H00: Battery lead wire (option)

TESTER Tester knob indication: Voltage (V)

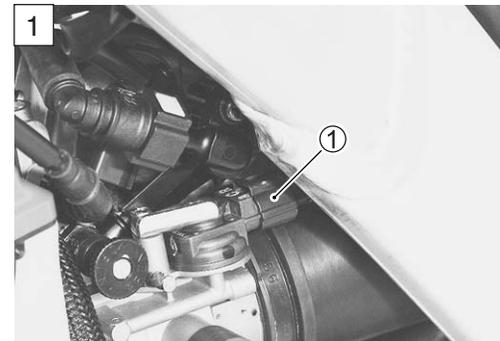
Is the voltage OK?

YES	Go to Step 2.
NO	<ul style="list-style-type: none"> • Loose or poor contacts on the ECM coupler (terminal ⑬ or ⑭). • Open or short circuit in the R/BI wire or B/Br wire.

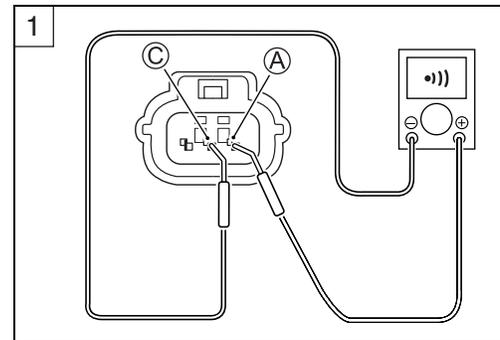


Step 1 (When indicating P0105-H:)

- 1) Stop the engine.
- 2) Check the IAP sensor coupler ① for loose or poor contacts.
 If OK, then check the IAP sensor lead wire continuity.



- 3) Disconnect the IAP sensor coupler.
- 4) Insert the needle-pointed probes to the lead wire coupler.
- 5) Check the continuity between R/BI wire (A) and G/B wire (C).
 If the sound is not heard from the tester, the circuit condition is OK.



- 6) Remove the fuel tank. (☞ 13-2, -3)
- 7) Disconnect the ECM coupler. (☞ 12-60)
- 8) Insert the needle-pointed probes to the lead wire coupler.
- 9) Check the continuity between G/B wire ③ and terminal ⑥.
- 10) If OK, then check the continuity between B/Br wire ② and terminal ④.

DATA IAP sensor lead wire continuity: Continuity (•••)

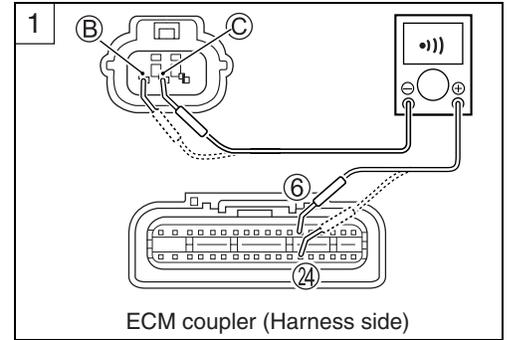
TOOL 09900-25008: Multi circuit tester set

09900-25009: Needle-pointed probe set

Tester knob indication: Continuity test (•••)

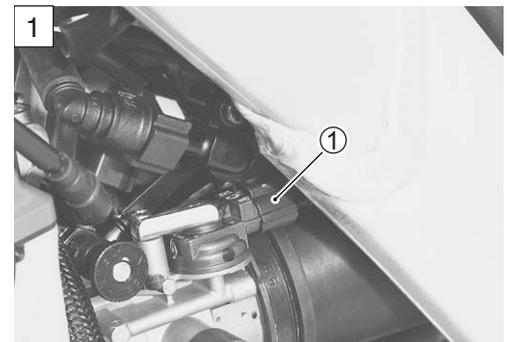
Is the continuity OK?

YES	Go to Step 2.
NO	G/B wire shorted to VCC, or B/Br wire open.

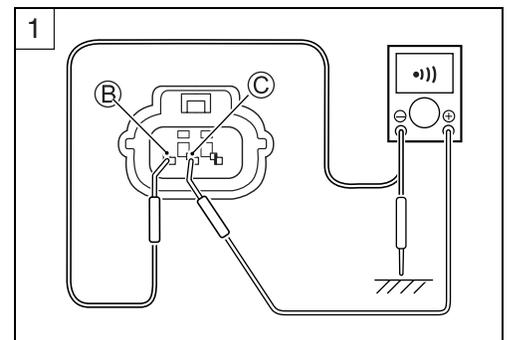


Step 1 (When indicating P0105-L:)

- 1) Stop the engine.
- 2) Check the IAP sensor coupler ① for loose or poor contacts.
If OK, then check the IAP sensor lead wire continuity.



- 3) Disconnect the IAP sensor coupler.
- 4) Insert the needle-pointed probes to the lead wire coupler.
- 5) Check the continuity between G/B wire ③ and ground.
- 6) Also, check the continuity between G/B wire ③ and B/Br wire ②. If the sound is not heard from the tester, the circuit condition is OK.

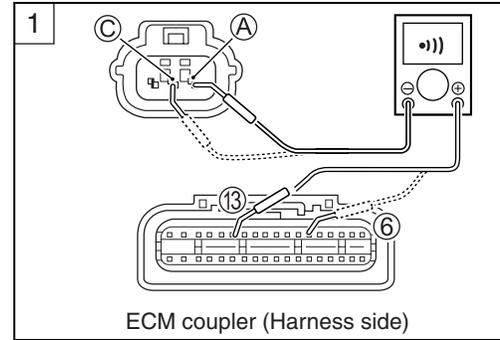


- 7) Remove the fuel tank. (☞ 13-2, -3)
- 8) Disconnect the ECM coupler. (☞ 12-60)
- 9) Check the continuity between R/BI wire (A) and terminal (13).
- 10) Also, check the continuity between G/B wire (C) and terminal (6).

DATA IAP sensor lead wire continuity: Continuity (•••)

TOOL 09900-25008: Multi circuit tester set
 09900-25009: Needle-pointed probe set

Tester knob indication: Continuity test (•••)



Is the continuity OK?

YES	Go to Step 1. (☞ 12-39)
NO	R/BI wire or G/B wire open, or G/B wire shorted to ground.

Step 2

- 1) Remove the seat rail assembly. (☞ 19-3)

NOTE:

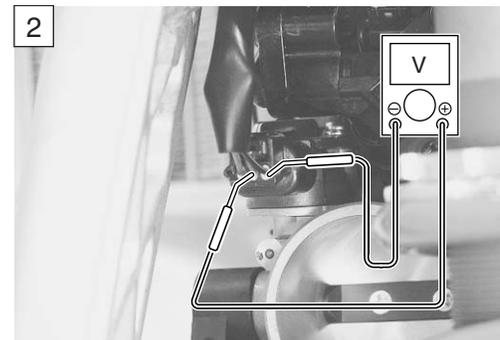
Do not remove the muffler, when measuring the IAP sensor output voltage.

- 2) Connect the ECM coupler and IAP sensor coupler.
- 3) Insert the needle-pointed probes to the lead wire coupler.
- 4) Kickstart the engine at idle speed.
- 5) Measure the IAP sensor output voltage at the wire side coupler (between G/B and B/Br wires).

DATA IAP sensor output voltage: 0.23 – 4.10 V at idle speed
 (+ G/B – – B/Br)

TOOL 09900-25008: Multi circuit tester set
 09900-25009: Needle-pointed probe set

Tester knob indication: Voltage (---)

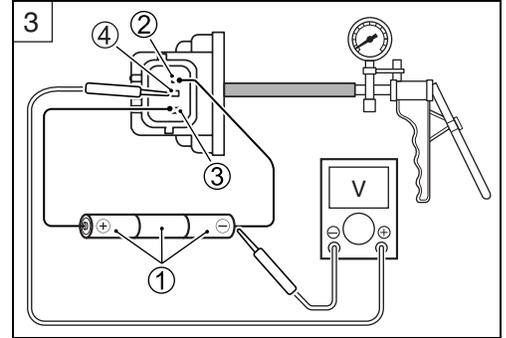


Is the voltage OK?

YES	Go to Step 3.
NO	<ul style="list-style-type: none"> • Open or short circuit in the G/B wire. • If the wire is OK, replace the IAP sensor with a new one.

Step 3

- 1) Remove the throttle body. (☞ 13-8, -9)
- 2) Remove the IAP sensor. (☞ 12-61)
- 3) Connect the vacuum pump gauge to the vacuum port of the IAP sensor.
- 4) Arrange 3 new 1.5 V batteries in series ① (check that total voltage is 4.5 – 5.0 V) and connect ⊖ terminal to the ground terminal ② and ⊕ terminal to the VCC terminal ③.
- 5) Check the voltage between Vout ④ and ground. Also, check if voltage reduces when vacuum is applied by using vacuum pump gauge.

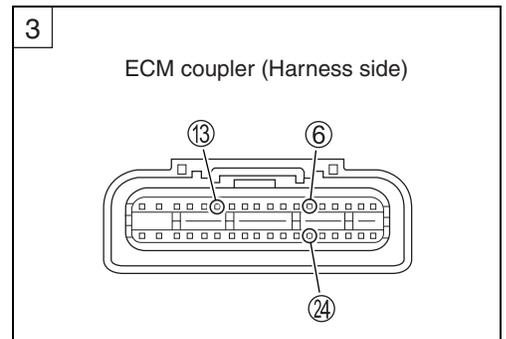


TOOL 09917-47011: Vacuum pump gauge
 09900-25008: Multi circuit tester set

Tester knob indication: Voltage (---)

Is the voltage OK?

YES	<ul style="list-style-type: none"> • G/B, R/BI or B/Br wire open or shorted to ground, or poor ⑥, ⑬ or ⑳ connection. • If wire and connection are OK, intermittent trouble or faulty ECM. • Recheck each terminal and wire harness for open circuit and poor connection. • Replace the ECM with a known good one, and inspect it again.
NO	If check result is not satisfactory, replace the IAP sensor with a new one.



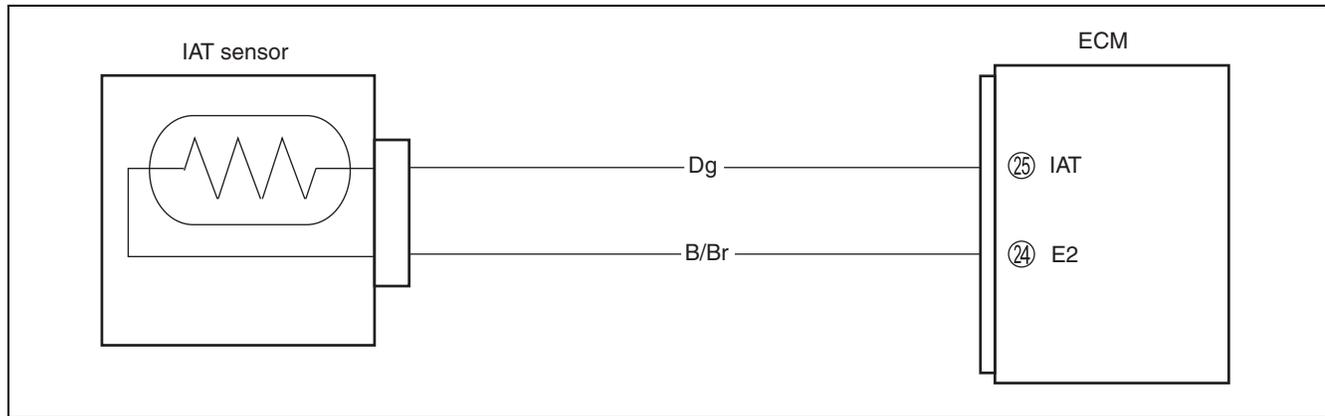
Output voltage

(VCC voltage 4.5 – 5.0 V, ambient temp. 25 °C, 77 °F)

ATMOSPHERIC PRESSURE		OUTPUT VOLTAGE
(mmHg)	kPa	(V)
760	100	Approx. 2.86
707	94	Approx. 2.70
634	85	Approx. 2.45
567	76	Approx. 2.21
526	70	Approx. 2.05

“21” (P0110-H/L) IAT SENSOR CIRCUIT MALFUNCTION

DETECTED CONDITION		POSSIBLE CAUSE
21	Output voltage is not within the following range. $0.19 \text{ V} \leq \text{Sensor voltage} < 4.93 \text{ V}$	<ul style="list-style-type: none"> IAT sensor circuit open or short. IAT sensor malfunction. ECM malfunction.
P0110	H Sensor voltage is higher than specified value.	<ul style="list-style-type: none"> IAT sensor circuit open or ground circuit open.
	L Sensor voltage is lower than specified value.	<ul style="list-style-type: none"> IAT sensor circuit shorted to ground.

**CAUTION**

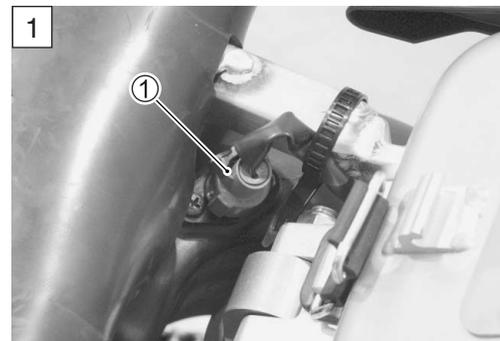
When using the multi circuit tester, do not strongly touch the terminal of the ECM coupler with a needle-pointed tester probe to prevent the terminal damage or terminal bend.

NOTE:

After repairing the trouble, clear the DTC using SDS tool. (☞ 12-21)

INSPECTION**Step 1 (When indicating 21:)**

- 1) Stop the engine.
- 2) Remove the seat and fuel tank rubber band. (☞ 5-2, 13-2)
- 3) Check the IAT sensor coupler ① for loose or poor contacts.
If OK, then measure the IAT sensor voltage at the wire side coupler.
- 4) Disconnect the IAT sensor coupler ①.
- 5) Connect a 12 volts battery by using the battery lead wire to the service coupler. (☞ 12-19)

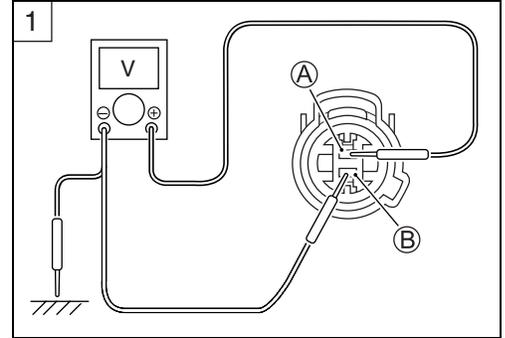


- 6) Measure the voltage between Dg wire terminal ① and ground.
- 7) If OK, then measure the voltage between Dg wire terminal ① and B/Br wire terminal ②.

DATA IAT sensor input voltage: 4.5 – 5.5 V
 (+ Dg – (–) Ground)
 (+ Dg – (–) B/Br)

TOOL 09900-25008: Multi circuit tester set
 36890-28H00: Battery lead wire (option)

Tester knob indication: Voltage (V)

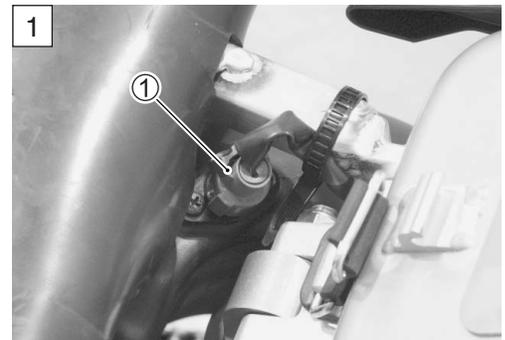


Is the voltage OK?

YES	Go to Step 2.
NO	<ul style="list-style-type: none"> • Loose or poor contacts on the ECM coupler (terminal ②④ or ②⑤). • Open or short circuit in the Dg wire or B/Br wire.

Step 1 (When indicating P0110-H:)

- 1) Stop the engine.
- 2) Remove the seat and fuel tank rubber band. (↖ 5-2, 13-2)
- 3) Check the IAT sensor ① coupler for loose or poor contacts.
 If OK, then check the IAT sensor lead wire continuity.

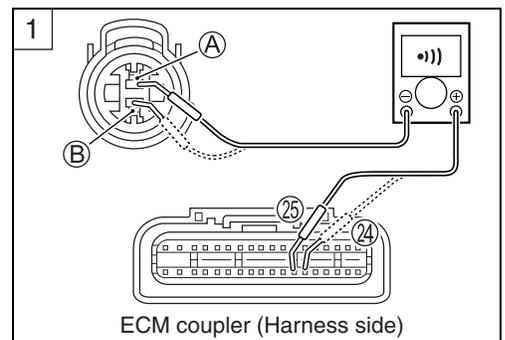


- 4) Remove the fuel tank. (↖ 13-2, -3)
- 5) Disconnect the IAT sensor coupler and ECM coupler. (↖ 12-60)
- 6) Insert the needle-pointed probes to the lead wire coupler.
- 7) Check the continuity between Dg wire ① and terminal ②⑤.
- 8) Also, check the continuity between B/Br wire ② and terminal ②④.

DATA IAT sensor lead wire continuity: Continuity (•••)

TOOL 09900-25008: Multi circuit tester set
 09900-25009: Needle-pointed probe set

Tester knob indication: Continuity test (•••)

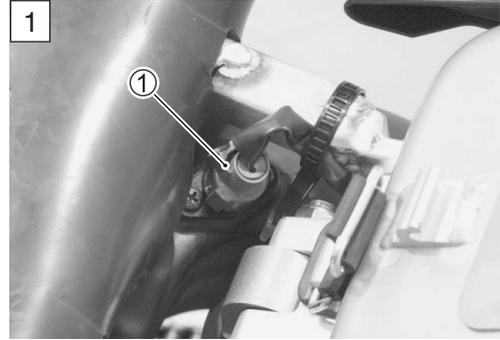


Is the continuity OK?

YES	Go to Step 2.
NO	Dg wire or B/Br wire open.

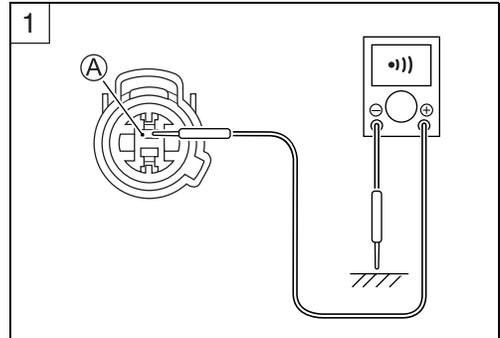
Step 1 (When indicating P0110-L:)

- 1) Stop the engine.
- 2) Remove the seat and fuel tank rubber band. (☞ 5-2, 13-2)
- 3) Check the IAT sensor coupler ① for loose or poor contacts.
If OK, then check the IAT sensor lead wire continuity.



- 4) Remove the fuel tank. (☞ 13-2, -3)
- 5) Disconnect the IAT sensor coupler and ECM coupler. (☞ 12-60)
- 6) Check the continuity between Dg wire (A) and ground. If the sound is not heard from the tester, the circuit condition is OK.

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

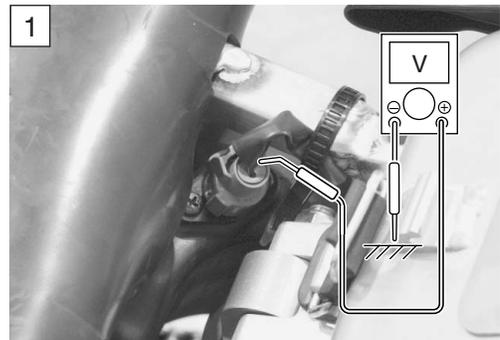


- 7) Connect the IAT sensor coupler.
- 8) Insert the needle-pointed probe to the lead wire coupler.
- 9) Connect a 12 volts battery by using the battery lead wire to the service coupler. (☞ 12-19)
- 10) Measure the voltage between Dg wire (A) and ground.

DATA IAT sensor output voltage: 0.19 – 4.92 V
(+ Dg – - Ground)

-  **09900-25008: Multi circuit tester set**
- 09900-25009: Needle-pointed probe set**
- 36890-28H00: Battery lead wire (option)**

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



Are the continuity and voltage OK?

YES	Go to Step 2.
NO	<ul style="list-style-type: none"> • Dg wire shorted to ground. • If wire is OK, go to Step 2.

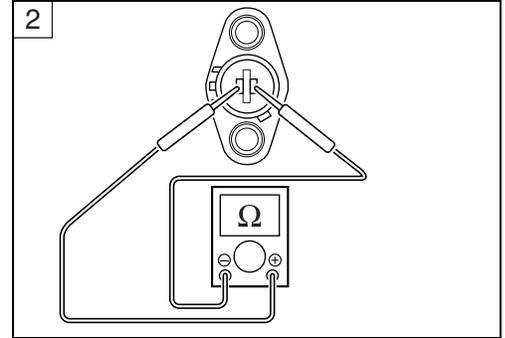
Step 2

- 1) Connect the ECM coupler.
- 2) Disconnect the IAT sensor coupler.
- 3) Measure the IAT sensor resistance.

DATA IAT sensor resistance: **Approx. 2.58 kΩ at 20 °C (68 °F)**
(Terminal – Terminal)

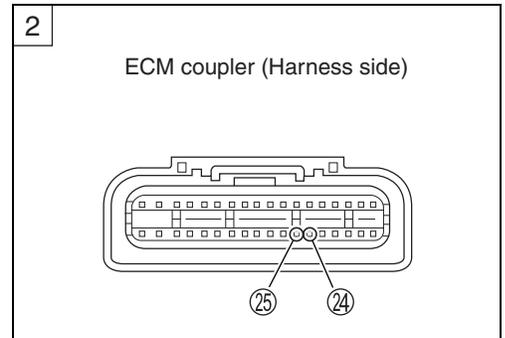
TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Resistance (Ω)



Is the resistance OK?

YES	<ul style="list-style-type: none"> • Dg or B/Br wire open or shorted to ground, or poor ②⑤ or ②④ connection. • If wire and connection are OK, intermittent trouble or faulty ECM. • Recheck each terminal and wire harness for open circuit and poor connection. • Replace the ECM with a known good one, and inspect it again.
NO	Replace the IAT sensor with a new one.



DATA IAT sensor specification

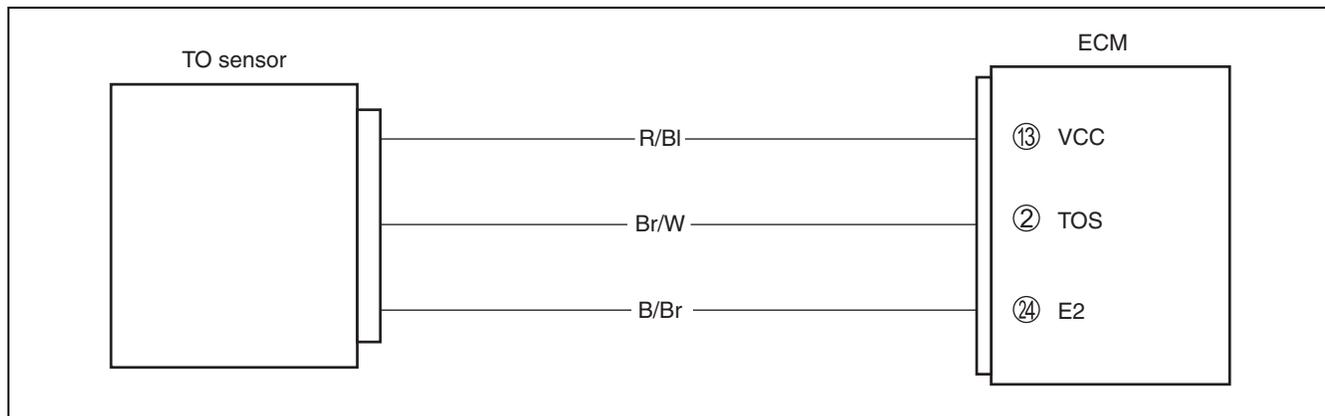
Intake Air Temp.	Resistance
20 °C (68 °F)	Approx. 2.58 kΩ
50 °C (122 °F)	Approx. 0.77 kΩ
80 °C (176 °F)	Approx. 0.28 kΩ
110 °C (230 °F)	Approx. 0.12 kΩ

NOTE:

IAT sensor resistance measurement method is the same way as that of the ECT sensor. (📄 12-62)

“23” (P1651-H/L) TO SENSOR CIRCUIT MALFUNCTION

DETECTED CONDITION		POSSIBLE CAUSE
23	The sensor voltage should be the following for 1 second and more. $0.17\text{ V} \leq \text{Sensor voltage} < 4.73\text{ V}$	<ul style="list-style-type: none"> • TO sensor circuit open or short. • TO sensor malfunction. • ECM malfunction.
P1651	H Sensor voltage is higher than specified value.	
	L Sensor voltage is lower than specified value.	

**CAUTION**

When using the multi circuit tester, do not strongly touch the terminal of the ECM coupler with a needle-pointed tester probe to prevent the terminal damage or terminal bend.

NOTE:

After repairing the trouble, clear the DTC using SDS tool. (☞ 12-21)

INSPECTION**Step 1 (When indicating 23:)**

- 1) Stop the engine.
- 2) Remove the fuel tank. (☞ 13-2, -3)
- 3) Check the TO sensor coupler ① for loose or poor contacts.
If OK, then measure the TO sensor resistance.



- 4) Remove the TO sensor.
- 5) Measure the resistance between terminal (A) and terminal (B).

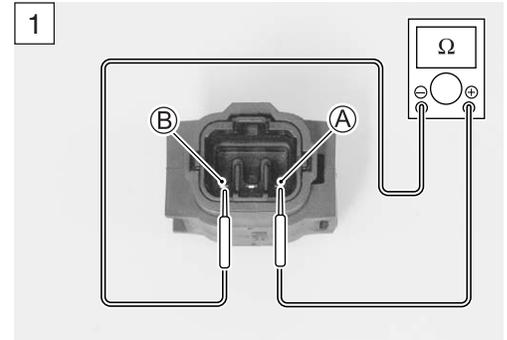
DATA TO sensor resistance: 16.5 – 22.3 kΩ
(Terminal (A) – Terminal (B))

TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Resistance (Ω)

Is the resistance OK?

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

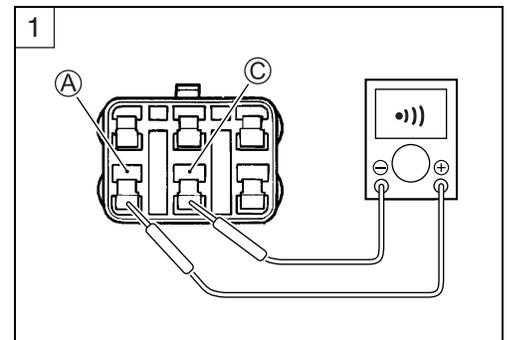


Step 1 (When indicating P1651-H:)

- 1) Stop the engine.
- 2) Remove the fuel tank. (🔧 13-2, -3)
- 3) Check the TO sensor coupler ① for loose or poor contacts.
If OK, then check the TO sensor lead wire continuity.



- 4) Disconnect the TO sensor coupler and ECM coupler.
- 5) Check the continuity between R/BI wire (A) and Br/W wire (C).
If the sound is not heard from the tester, the circuit condition is OK.



- 6) Insert the needle-pointed probes to the lead wire coupler.
- 7) Check the continuity between Br/W wire (C) and terminal (2).
- 8) Also, check the continuity between B/Br wire (B) and terminal (24).

DATA TO sensor lead wire continuity: Continuity (•||)

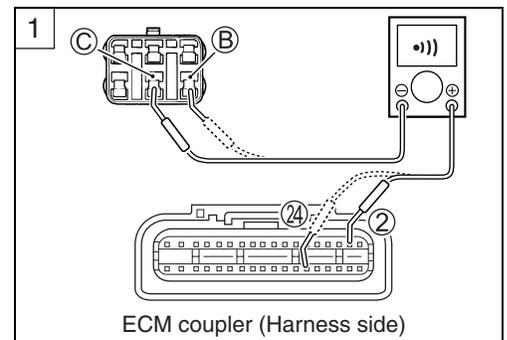
TOOL 09900-25008: Multi circuit tester set

09900-25009: Needle-pointed probe set

Tester knob indication: Continuity test (•||)

Is the continuity OK?

YES	Go to Step 2.
NO	Br/W wire shorted to VCC, or B/Br wire open.

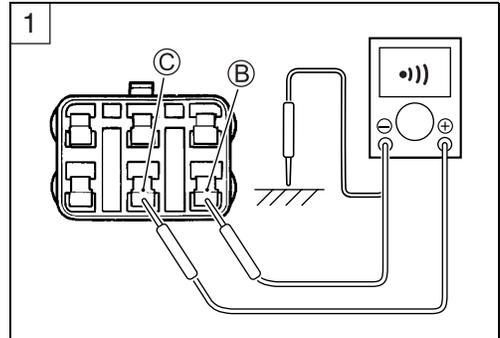


Step 1 (When indicating P1651-L:)

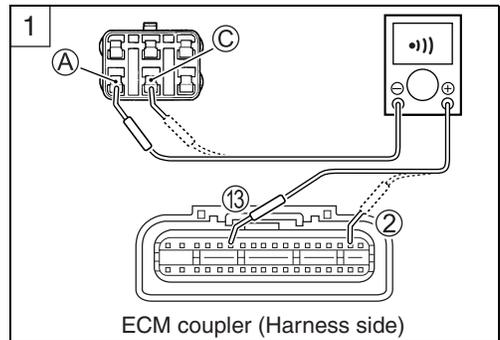
- 1) Stop the engine.
- 2) Remove the fuel tank. (☞ 13-2, -3)
- 3) Check the TO sensor coupler ① for loose or poor contacts.
If OK, then check the TO sensor lead wire continuity.



- 4) Disconnect the TO sensor coupler and ECM coupler.
- 5) Check the continuity between Br/W wire ③ and ground.
- 6) Also, check the continuity between Br/W wire ③ and B/Br wire ④. If the sound is not heard from the tester, the circuit condition is OK.



- 7) Insert the needle-pointed probes to the lead wire coupler.
- 8) Check the continuity between R/BI wire ① and terminal ⑬.
- 9) Also, then check the continuity between Br/W wire ③ and terminal ②.



DATA TO sensor lead wire continuity: Continuity (•••)

TOOL 09900-25008: Multi circuit tester set

09900-25009: Needle-pointed probe set

Tester knob indication: Continuity test (•••)

Is the continuity OK?

YES	Go to Step 2.
NO	R/BI or Br/W wire open, or Br/W wire shorted to ground.

Step 2

- 1) If necessary, connect the ECM coupler and TO sensor coupler.
- 2) Insert the needle-pointed probes to the lead wire coupler.
- 3) Connect a 12 volts battery by using the battery lead wire to the service coupler. (☞ 12-19)
- 4) Measure the voltage at the wire side coupler between Br/W and B/Br wires.

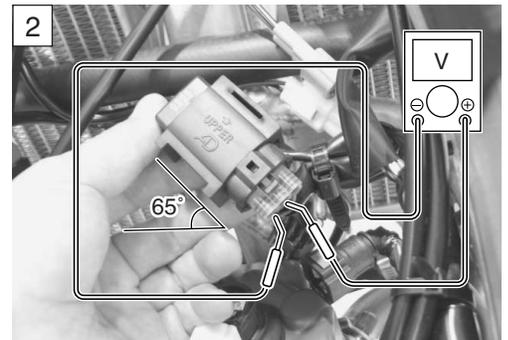
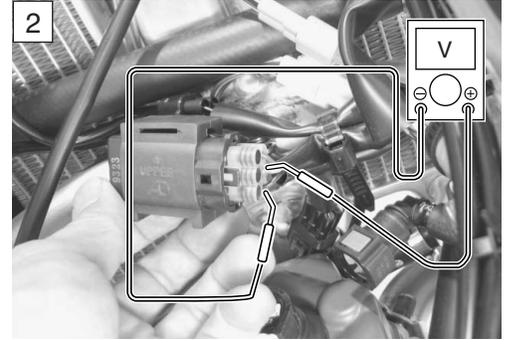
DATA TO sensor voltage (Normal): 0.4 – 1.4 V
(⊕ Br/W – ⊖ B/Br)

- 5) Also, measure the voltage when it is leaned 65° and more, left and right, from the horizontal level.

DATA TO sensor voltage (Leaning): 3.7 – 4.4 V
(⊕ Br/W – ⊖ B/Br)

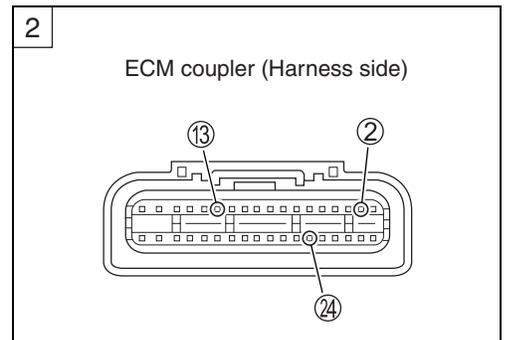
- TOOL** 09900-25008: Multi circuit tester set
- 09900-25009: Needle-pointed probe set
- 36890-28H00: Battery lead wire (option)

Tester knob indication: Voltage (V)



Is the voltage OK?

YES	<ul style="list-style-type: none"> • Br/W, R/BI or B/Br wire open or shorted to ground, or poor ②, ⑬ or ⑭ connection. • If wire and connection are OK, intermittent trouble or faulty ECM. • Recheck each terminal and wire harness for open circuit and poor connection. • Replace the ECM with a known good one, and inspect it again.
NO	<ul style="list-style-type: none"> • Loose or poor contacts on the ECM coupler. • Open or short circuit. • Replace the TO sensor with a new one.



“24” (P0351) IGNITION SYSTEM CIRCUIT MALFUNCTION

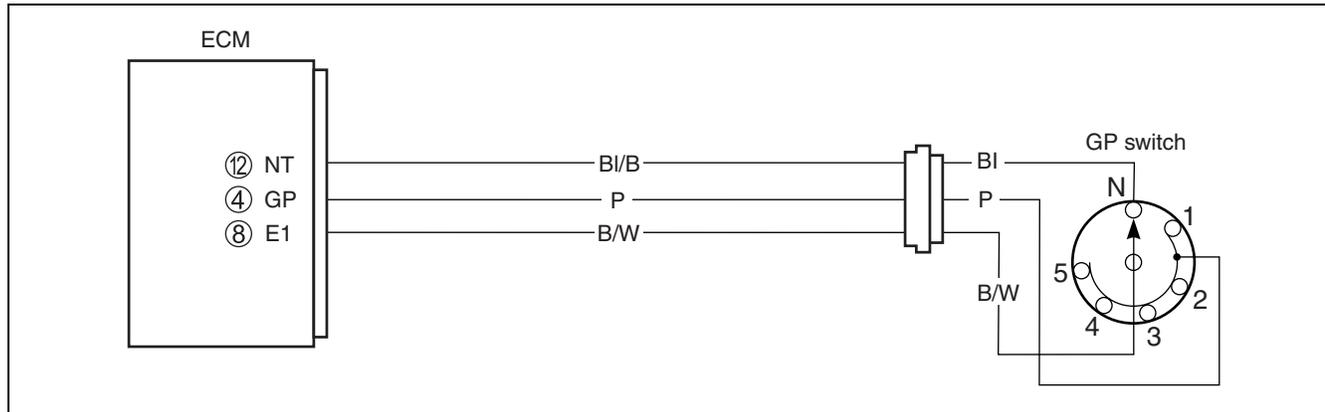
* Refer to the IGNITION SYSTEM for details. (☞ 15-11)

NOTE:

After repairing the trouble, clear the DTC using SDS tool. (☞ 12-21)

“31” (P0705) GP SWITCH CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
No GP switch voltage Switch voltage is not within the following range. Switch voltage ≥ 0.89 V	<ul style="list-style-type: none"> • GP switch circuit open or short. • GP switch malfunction. • ECM malfunction.

**CAUTION**

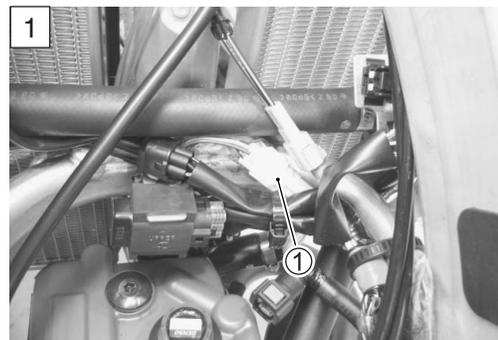
When using the multi circuit tester, do not strongly touch the terminal of the ECM coupler with a needle-pointed tester probe to prevent the terminal damage or terminal bend.

NOTE:

After repairing the trouble, clear the DTC using SDS tool. (☞ 12-21)

INSPECTION**Step 1**

- 1) Stop the engine.
- 2) Remove the fuel tank. (☞ 13-2, -3)
- 3) Check the GP switch coupler ① for loose or poor contacts.
If OK, then measure the GP switch voltage.



- 4) Insert the needle-point probes to the lead wire coupler.
- 5) Connect a 12 volt battery to the service coupler using the battery lead wire. (12-19)
- 6) Measure the voltage at the wire side coupler between Pink wire and B/W wire, when shifting the gearshift lever from 1st to Top.

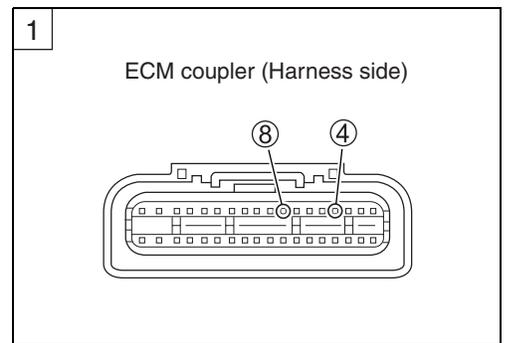
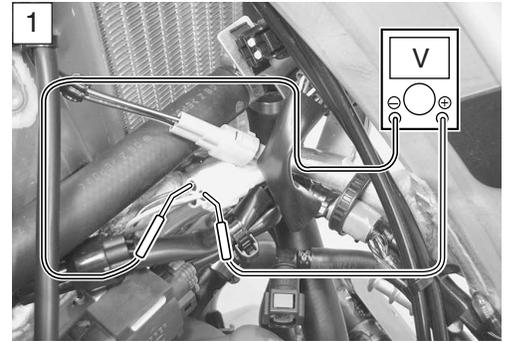
DATA GP switch voltage: 0.89 V and more
(+ Pink – B/W)

TOOL 09900-25008: Multi circuit tester set
09900-25009: Needle-point probe set
36890-28H00: Battery lead wire (option)

Tester knob indication: Voltage (---)

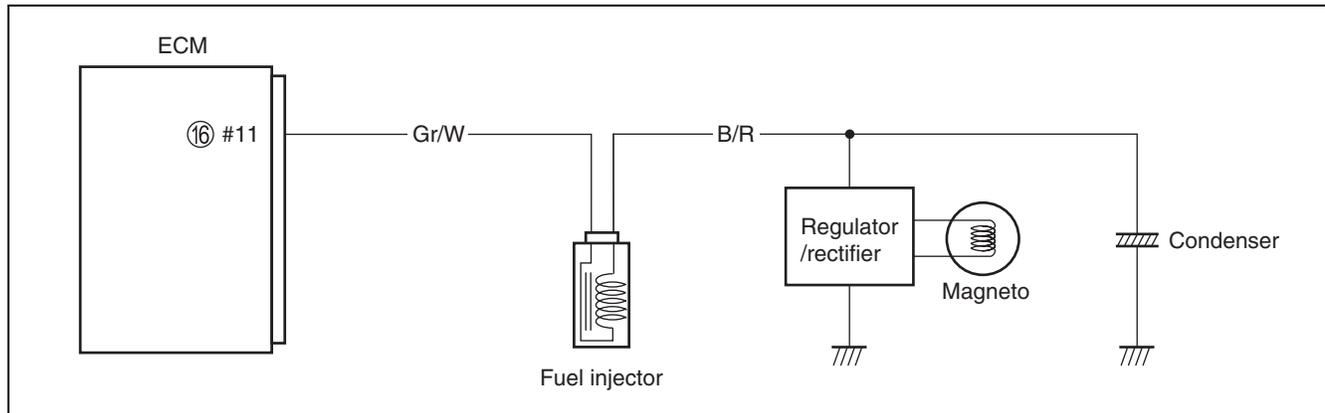
Is the voltage OK?

YES	<ul style="list-style-type: none"> • Pink wire open or shorted to ground. • If wire and connection are OK, intermittent trouble or faulty ECM. • Recheck each terminal and wire harness for open circuit and poor connection. • Replace the ECM with a known good one, and inspect it again.
NO	<ul style="list-style-type: none"> • Pink or B/W wire open, or Pink wire shorted to ground. • Loose or poor contacts on the ECM coupler (terminal ④ or ⑧). • If wire and connection are OK, replace the GP switch with a new one.



“32” (P0201) FUEL INJECTOR CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
CKP signal is produced but fuel injector signal is interrupted by 8 times or more continuously.	<ul style="list-style-type: none"> • Injector circuit open or short. • Injector malfunction. • ECM malfunction.

**CAUTION**

When using the multi circuit tester, do not strongly touch the terminal of the ECM coupler with a needle-pointed tester probe to prevent the terminal damage or terminal bend.

NOTE:

After repairing the trouble, clear the DTC using SDS tool. (☞ 12-21)

INSPECTION**Step 1**

- 1) Stop the engine.
- 2) Check the injector coupler ① for loose or poor contacts.
If OK, then measure the injector resistance.



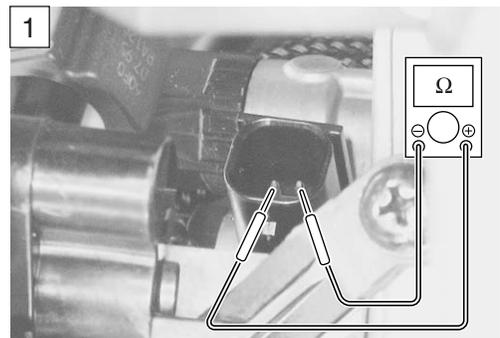
- 3) Remove the seat rail assembly.

NOTE:

It is not necessary to remove the muffler.

- 4) Disconnect the injector coupler and measure the resistance between terminals.

DATA Injector resistance: 10.0 – 11.0 Ω at 24 °C (75 °F)
(Terminal – Terminal)



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

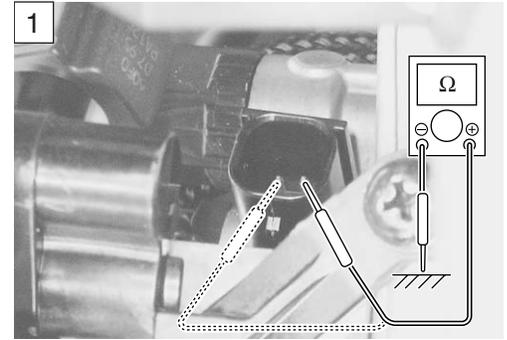
DATA **Injector resistance: $\infty \Omega$ (Infinity)**
(Terminal – Ground)

TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Resistance (Ω)

Are the resistance and continuity OK?

YES	Go to Step 2.
NO	Replace the injector with a new one. (📄 13-16)



Step 2

1) Connect a 12 volt battery to the service coupler using the battery lead wire. (📄 12-19)

2) Insert the needle-point probe to the lead wire coupler.

3) Measure the injector voltage between B/R wire and ground.

DATA **Injector voltage: Battery voltage**
(+ B/R – – Ground)

TOOL 09900-25008: Multi circuit tester set

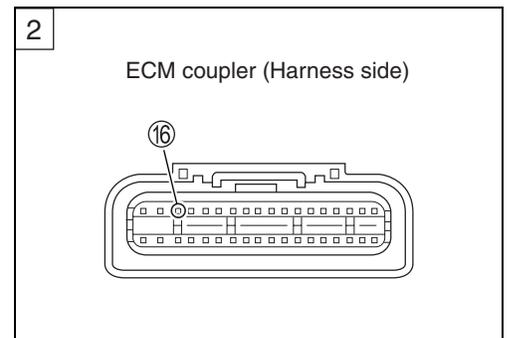
09900-25009: Needle-point probe set

36890-28H00: Battery lead wire (option)

Tester knob indication: Voltage (V)

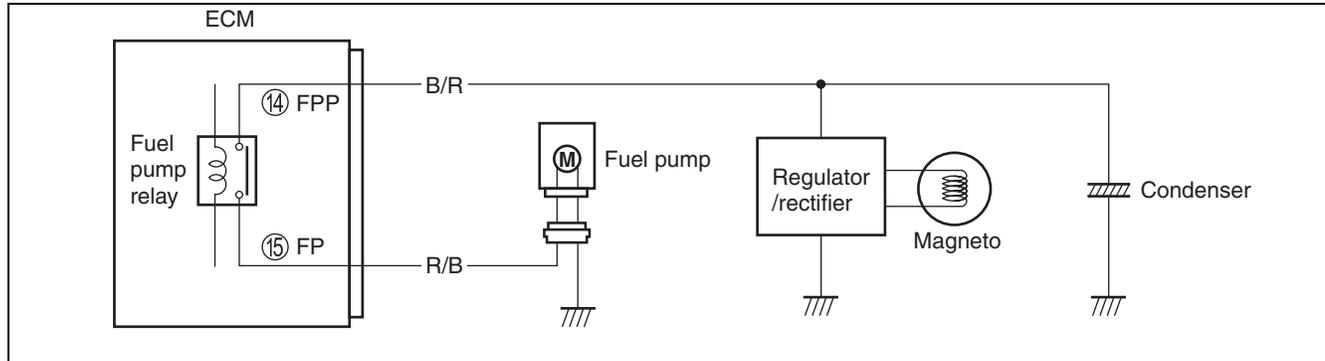
Is the voltage OK?

YES	<ul style="list-style-type: none"> • Gr/W wire open or shorted to ground, or poor ⑩ connection. • If wire and connection are OK, intermittent trouble or faulty ECM. • Recheck each terminal and wire harness for open circuit and poor connection. • Replace the ECM with a known good one, and inspect it again.
NO	Short circuit in the B/R wire.



“41” (P0230) FP RELAY CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
No voltage is applied to the fuel pump although FP relay is turned ON.	<ul style="list-style-type: none"> • FP relay circuit open or short. • FP relay (ECM) malfunction.

**CAUTION**

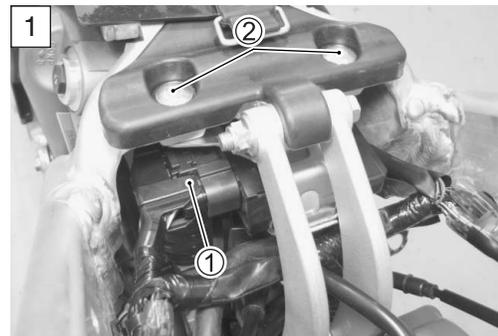
When using the multi circuit tester, do not strongly touch the terminal of the ECM coupler with a needle-pointed tester probe to prevent the terminal damage or terminal bend.

NOTE:

After repairing the trouble, clear the DTC using SDS tool. (☞ 12-21)

INSPECTION**Step 1**

- 1) Stop the engine.
- 2) Remove the fuel tank. (☞ 13-2, -3)
- 3) Check the ECM coupler ① for loose or poor contacts.
If OK, then measure the FP relay input voltage.
- 4) Remove the ECM bracket mounting bolts ②.
- 5) Disconnect the ECM coupler ①.



- 6) Connect a 12 volt battery to the service coupler using the battery lead wire. (↗ 12-19)
- 7) Insert the needle-point probe to the ECM coupler.
- 8) Measure the voltage between terminal ⑭ and ground.

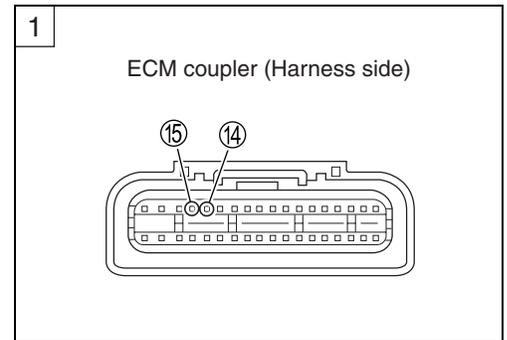
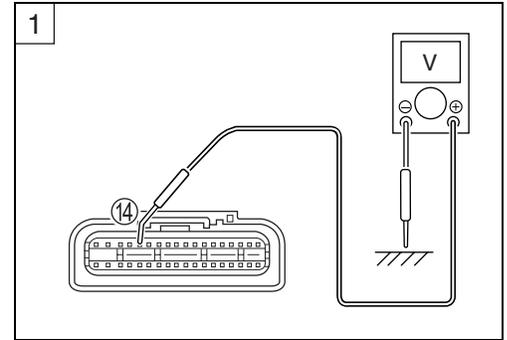
DATA FP relay input voltage: Battery voltage

- TOOL** 09900-25008: Multi circuit tester set
 09900-25009: Needle-point probe set
 36890-28H00: Battery lead wire (option)

Tester knob indication: Voltage (---)

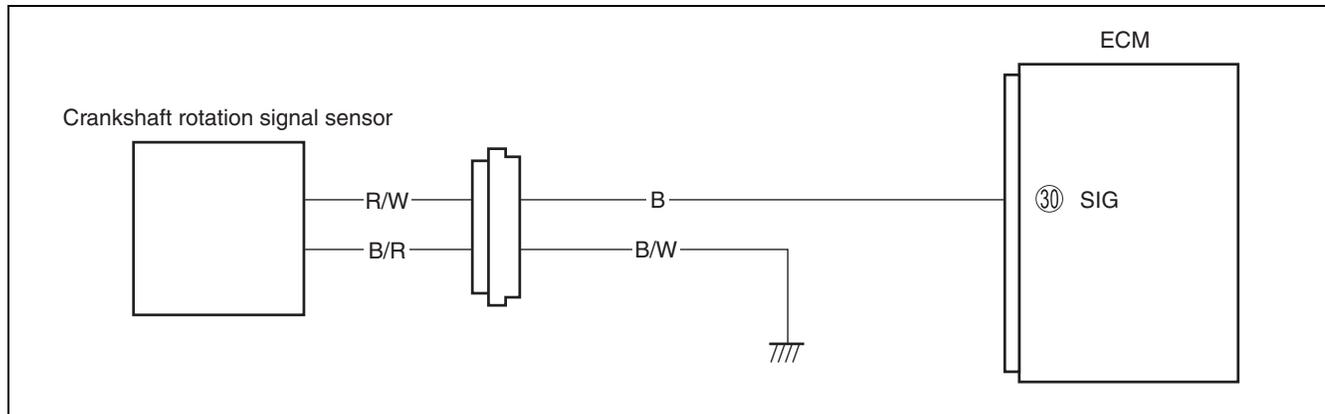
Is the voltage OK?

YES	<ul style="list-style-type: none"> • FP relay (ECM) malfunction. • B/R or R/B wire open or shorted, or poor terminal ⑭ or ⑮ connection. • If the wire and connection are OK. intermittent trouble or faulty ECM. • Recheck each terminal and wire harness for open circuit and poor connection. • Replace the ECM with a known good one, and inspect it again.
NO	Open or short circuit in the B/R wire.



“63” (P01771) CRANKSHAFT ROTATION SIGNAL CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
CKP sensor (pick-up coil) signal is produced, but signal from crankshaft rotation signal sensor is not input for 3 seconds or more.	<ul style="list-style-type: none"> • Metal particles or foreign material being stuck on the crankshaft rotation signal sensor and rotor tip. • Crankshaft rotation signal sensor circuit open or short. • Crankshaft rotation signal sensor malfunction. • ECM malfunction.

**CAUTION**

When using the multi circuit tester, do not strongly touch the terminal of the ECM coupler with a needle-pointed tester probe to prevent the terminal damage or terminal bend.

NOTE:

After repairing the trouble, clear the DTC using SDS tool. (☞ 12-21)

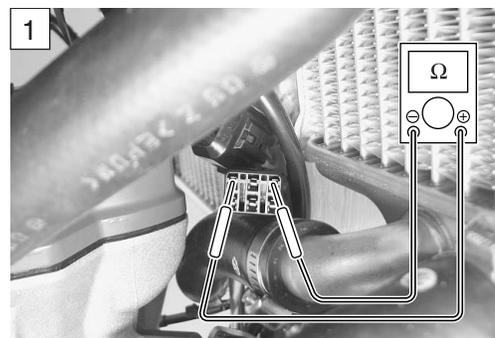
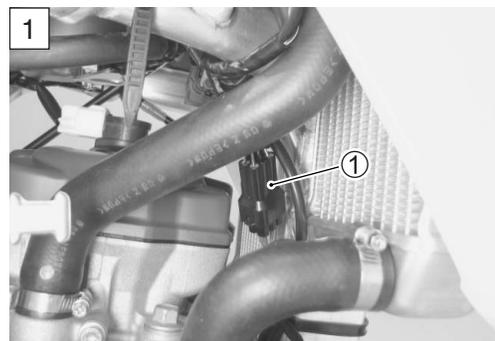
INSPECTION**Step 1**

- 1) Stop the engine.
- 2) Check the crankshaft rotation signal sensor coupler ① for loose or poor contacts.

If OK, then measure the crankshaft rotation signal sensor resistance.

- 3) Disconnect the crankshaft rotation signal sensor coupler and measure the resistance.

DATA Crankshaft rotation signal sensor resistance:
0.1 – 0.8 Ω (B/R – R/W)



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

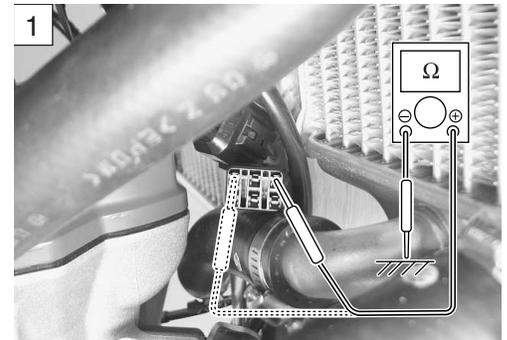
DATA Crankshaft rotation signal sensor resistance:
 $\infty \Omega$ (Infinity)
 (B/R – Ground)
 (R/W – Ground)

TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Resistance (Ω)

Are the resistance and continuity OK?

YES	Go to step 2.
NO	Replace the crankshaft rotation signal sensor with a new one.



Step 2

- 1) Measure the crankshaft rotation signal sensor peak voltage by depressing the kick starter several times forcefully.
- 2) Repeat the above test procedure a few times and measure the highest peak voltage.

DATA Crankshaft rotation signal sensor peak voltage:
 3.5 V and more (+ B/R – – R/W)

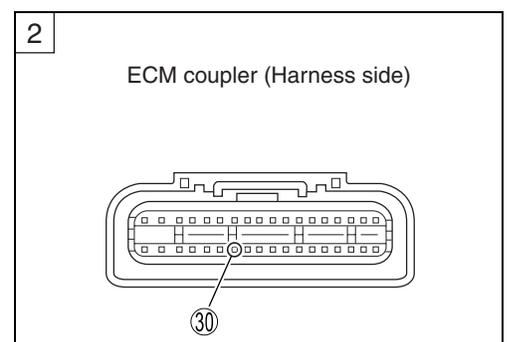
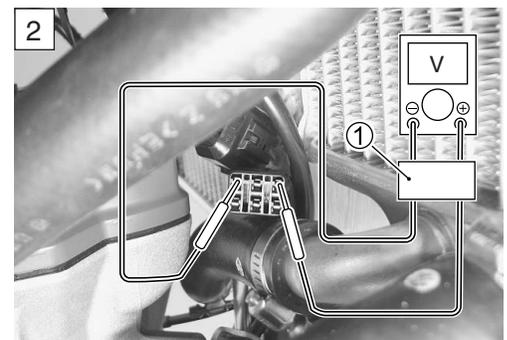
① Peak volt adaptor

TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Voltage (V)

Is the voltage OK?

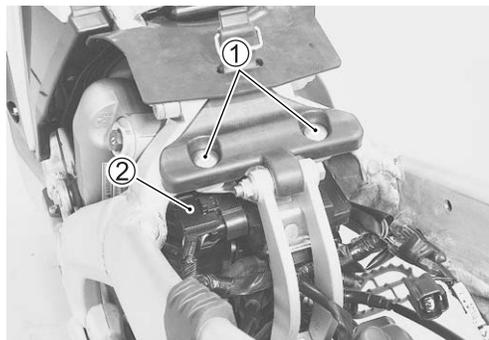
YES	<ul style="list-style-type: none"> • B/R or R/W wire open or short. • Loose or poor contacts on the crankshaft rotation signal sensor coupler or ECM coupler (terminal 30). • If wire and connection are OK, intermittent trouble or faulty ECM. • Recheck each terminal and wire harness for open circuit and poor connection. • Replace the ECM with a known good one, and inspect it again.
NO	<ul style="list-style-type: none"> • Inspect that metal particles or foreign material stuck on the crankshaft rotation signal sensor and rotor tip. • If there are no metal particles and foreign material, then replace the crankshaft rotation signal sensor with a new one.



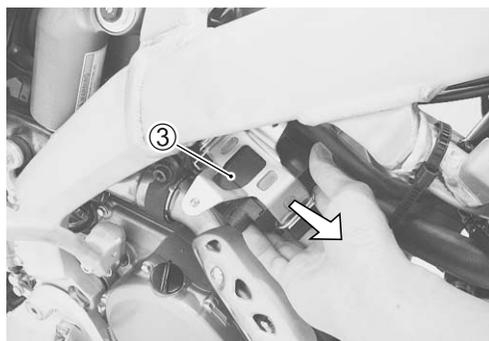
ECM (FI Control Unit)

REMOVAL

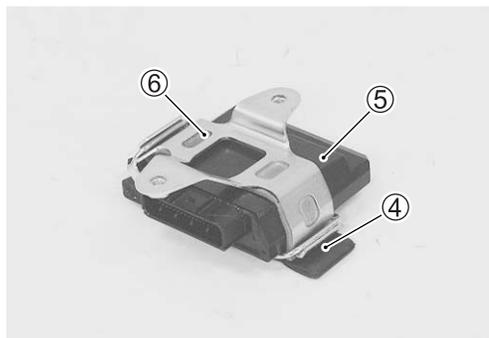
- Remove the fuel tank. (☞ 13-2, -3)
- Remove the ECM bracket mounting bolts ①.
- Disconnect the ECM coupler ②.



- Remove the ECM assembly ③.



- Disconnect the rubber band ④.
- Remove the ECM ⑤ from ECM bracket ⑥.



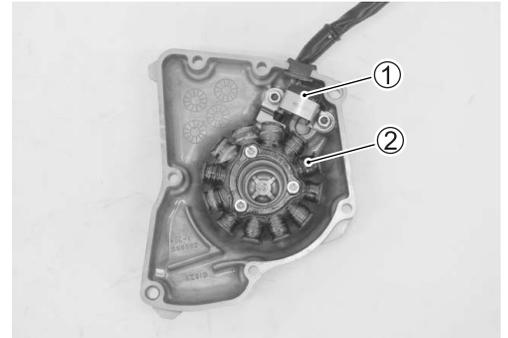
INSTALLATION

Install the ECM in the reverse order of removal.

SENSORS

CKP SENSOR/CRANKSHAFT ROTATION SIGNAL SENSOR INSPECTION

The CKP sensor ① and crankshaft rotation signal sensor ② are installed at the inside of the magneto cover. (☞ 12-29, -58)



CKP SENSOR/CRANKSHAFT ROTATION SIGNAL SENSOR REMOVAL AND INSTALLATION

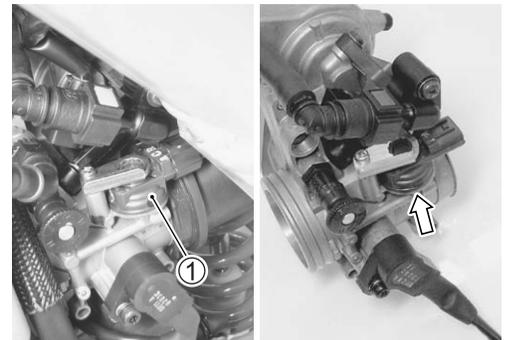
- Remove the magneto cover. (☞ 15-17)
- Remove the CKP sensor and crankshaft rotation signal sensor. (☞ 15-19)
- Install the CKP sensor and crankshaft rotation signal sensor in the reverse order of removal.

IAP SENSOR INSPECTION

The IAP sensor ① is installed on the throttle body. (☞ 12-39)

IAP SENSOR REMOVAL AND INSTALLATION

- Remove the fuel tank. (☞ 13-2, -3)
- Remove the IAP sensor from the throttle body. (☞ 13-10)
- Install the IAP sensor in the reverse order of removal.

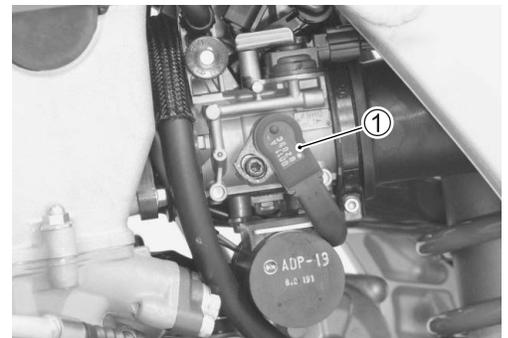


TP SENSOR INSPECTION

The TP sensor ① is installed at the left side of the throttle body. (☞ 12-31)

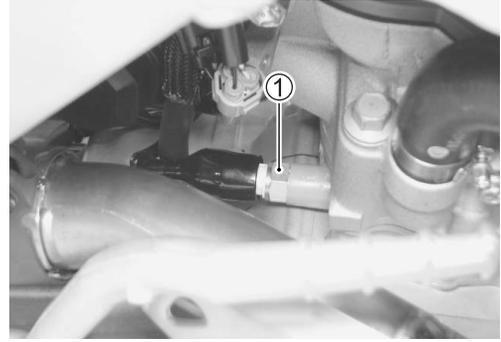
TP SENSOR REMOVAL AND INSTALLATION

- Remove the TP sensor. (☞ 13-9)
- Install the TP sensor in the reverse order of removal.
- Adjust the TP sensor. (☞ 12-18)

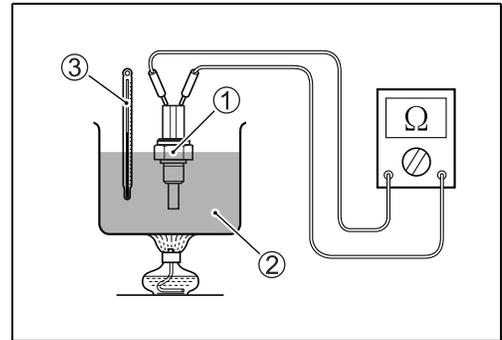


ECT SENSOR INSPECTION

The ECT sensor ① is installed on the cylinder head.



- Remove the ECT sensor. (☞ below)
- Check the ECT sensor by testing it at the bench as shown in the figure. Connect the ECT sensor ① to a circuit tester and place it in the oil ② contained in a pan, which is placed on a stove.
- Heat the oil to raise its temperature slowly and read the column thermometer ③ and the ohmmeter.
- If the ECT sensor ohmic value does not change in the proportion indicated, replace it with a new one.



DATA ECT sensor specification

Engine Coolant Temp.	Resistance
20 °C (68 °F)	Approx. 2.58 kΩ
50 °C (122 °F)	Approx. 0.77 kΩ
80 °C (176 °F)	Approx. 0.28 kΩ
110 °C (230 °F)	Approx. 0.12 kΩ

TOOL 09900-25008: Multi-circuit tester set

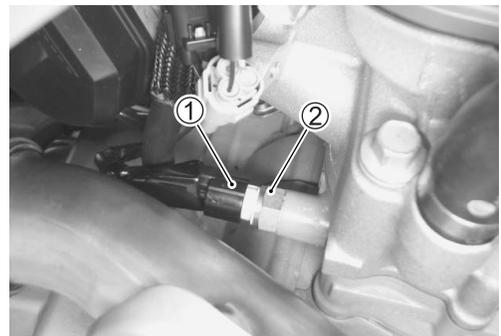
Tester knob indication: Resistance (Ω)

CAUTION

- * Take special care when handling the ECT sensor. It may cause damage if it gets a sharp impact.
- * Do not contact the ECT sensor and the column thermometer with a pan.

ECT SENSOR REMOVAL AND INSTALLATION

- Drain engine coolant. (☞ 14-3)
- Disconnect the ECT sensor coupler ①.
- Remove the ECT sensor ②.



- Apply engine coolant to the O-ring ③.

CAUTION

Replace the O-ring ③ with a new one.

- Tighten the ECT sensor to the specified torque.

 **ECT sensor: 12 N·m (1.2 kgf-m, 8.5 lbf-ft)**

- Connect the ECT sensor coupler.
- Pour engine coolant. (↗ 14-3)



IAT SENSOR INSPECTION

The IAT sensor is installed on the air cleaner. (↗ 12-44)

IAT SENSOR REMOVAL AND INSTALLATION

- Remove the seat and fuel tank rubber hand. (↗ 5-2, 13-2)
- Disconnect the IAT sensor coupler ①.
- Disconnect the IAT sensor screw ②.
- Remove the IAT sensor ③ from the air cleaner outlet tube.

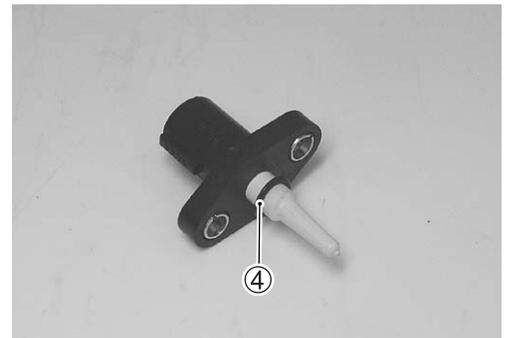
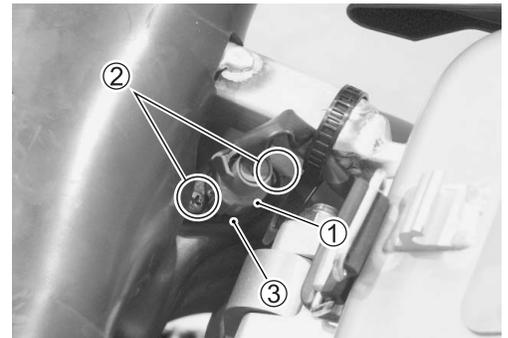
- Install the IAT sensor in the reverse order of removal.

CAUTION

Replace the O-ring ④ with a new one.

 **IAT sensor mounting screw:**

1.3 N·m (0.13 kgf-m, 0.95 lbf-ft)



TO SENSOR INSPECTION

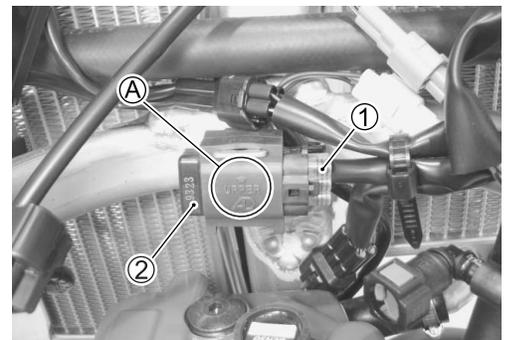
The TO sensor is installed on the frame bridge. (↗ 12-48)

TO SENSOR REMOVAL AND INSTALLATION

- Remove the fuel tank. (↗ 13-2, -3)
- Disconnect the TO sensor coupler ①.
- Remove the TO sensor ②.
- Install the TO sensor in the reverse order of removal.

NOTE:

When installing the TO sensor, the arrow mark **A** must be pointed upward.



FUEL SYSTEM AND THROTTLE BODY

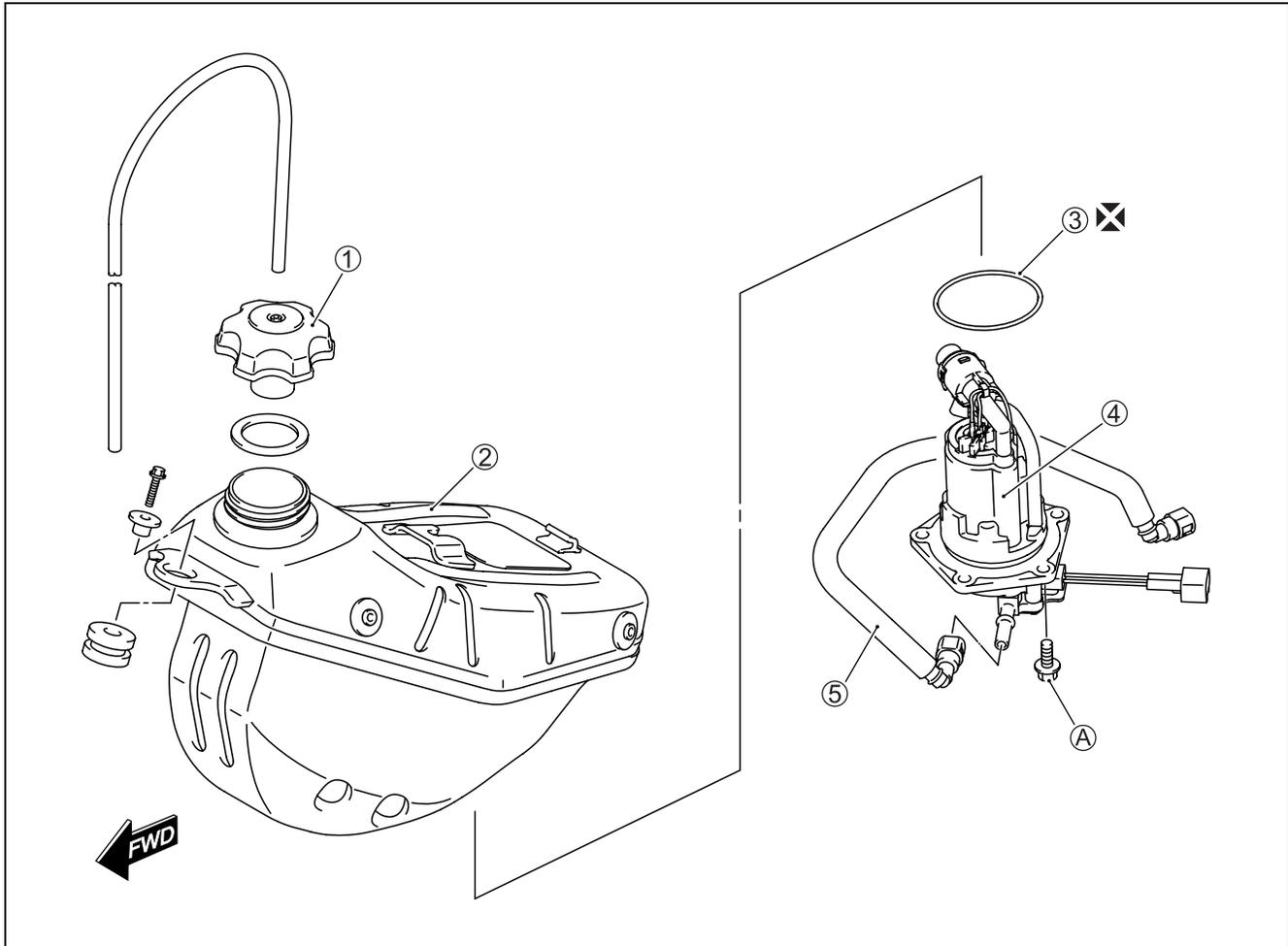
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⚠ WARNING

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

FUEL SYSTEM CONSTRUCTION



①	Fuel tank filler cap	④	Fuel pump
②	Fuel tank	⑤	Fuel hose
③	O-ring	A	Fuel pump mounting bolt



ITEM	N·m	kgf·m	lbf·ft
A	10	1.0	7.0

FUEL TANK AND FUEL PUMP REMOVAL

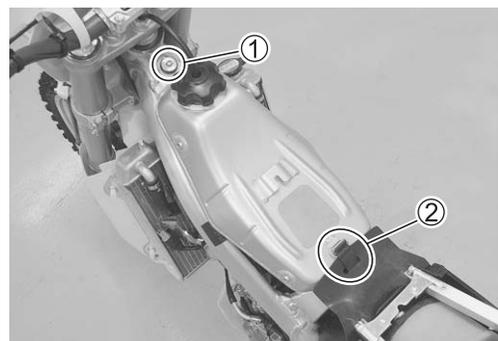
⚠ WARNING

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

CAUTION

Drain out the gasoline before removing the fuel tank.

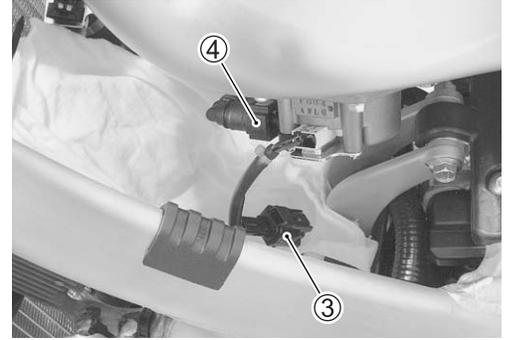
- Remove the seat. (➡ 5-2)
- Remove the radiator covers, left and right. (➡ 5-2)
- Remove the fuel tank bolt ① and rubber band ②.



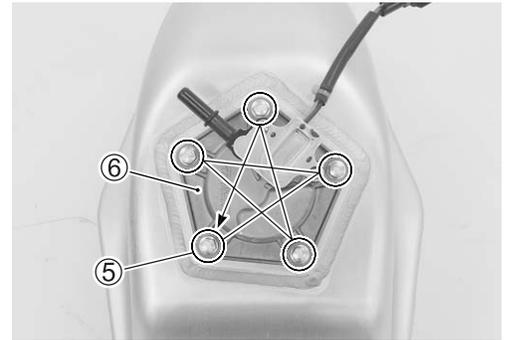
- Lift and hold the fuel tank.
- Disconnect the fuel pump coupler ③.
- Place a rag under the fuel hose ④ and disconnect the fuel hose ④ from the fuel pump.

CAUTION

* Be sure to disconnect the fuel hose ④ by hand. Do not disconnect the fuel hose ④ with any tool.
 * When removing the fuel tank, do not leave the fuel hose ④ on the fuel tank side.

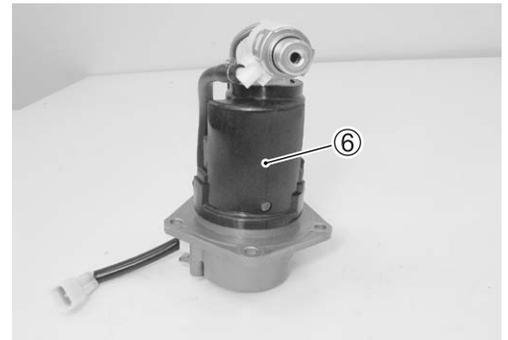


- Remove the fuel tank assembly.
- Remove the fuel pump assembly ⑥ by removing its mounting bolts ⑤ diagonally.



CAUTION

Never disassemble the fuel pump assembly ⑥.



FUEL TANK AND FUEL PUMP INSTALLATION

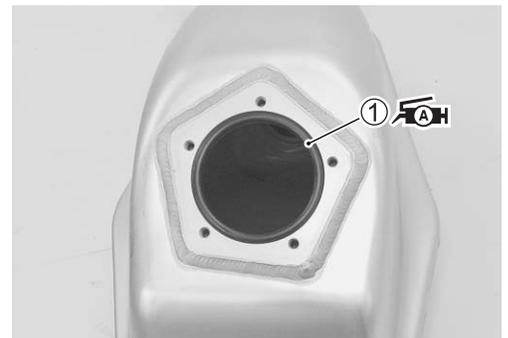
Install the fuel pump and fuel tank in the reverse order of removal. Pay attention to the following points:

- Install a new O-ring ① and apply grease to it.

CAUTION

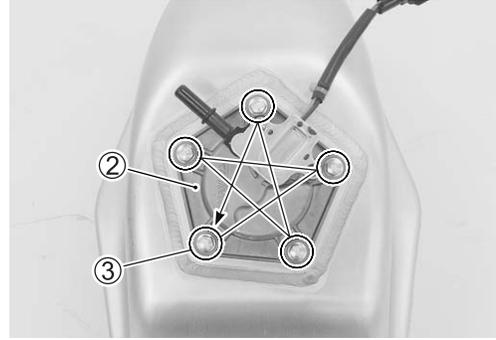
Replace the O-ring ① with a new one.

 99000-25010: SUZUKI SUPER GREASE "A" or equivalent



- When installing the fuel pump assembly ②, first tighten all the fuel pump mounting bolts ③ lightly and then to the specified torque.

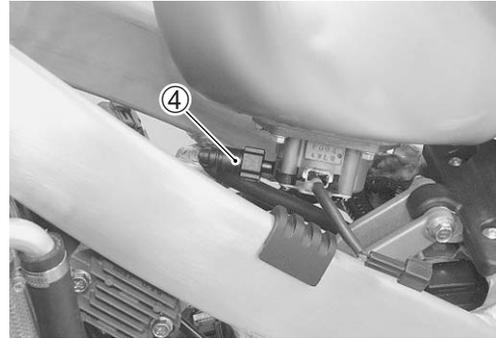
🔧 Fuel pump mounting bolt: 10 N·m (1.0 kgf-m, 7.0 lbf-ft)



- Connect the fuel hose ④ to the fuel pump until it locks securely (a click is heard).

CAUTION

Be sure to connect the fuel hose ④ by your hand. You may not connect the fuel hose ④ with any tool.

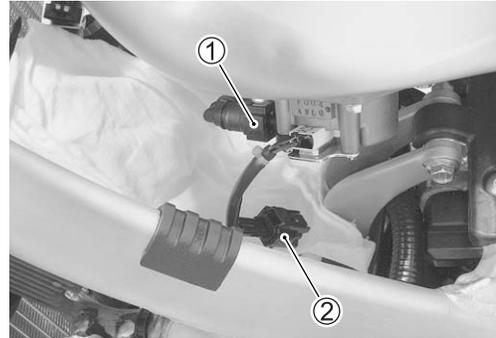


FUEL PRESSURE INSPECTION

- Remove the seat and radiator covers. (👉 5-2)
- Remove the fuel tank bolt and rubber band. (👉 13-2)
- Lift and hold the fuel tank.
- Place a rag under the fuel hose and remove the fuel hose ①.

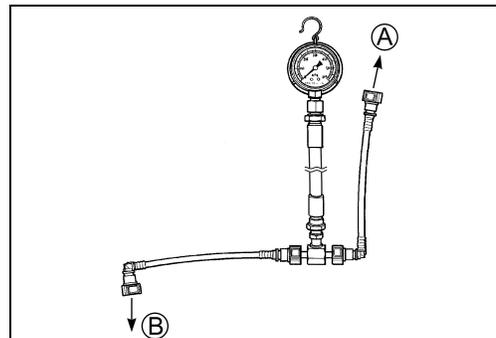
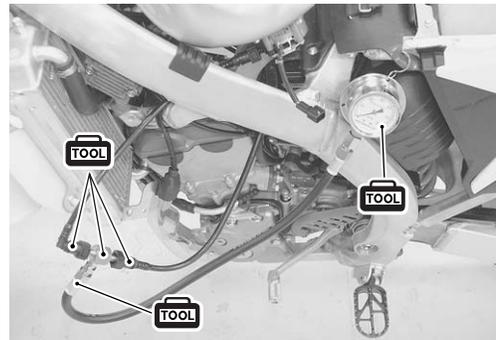
CAUTION

Be sure to disconnect the fuel hose ① by your hand. You may not disconnect the fuel hose ① with any tool.



- Disconnect the fuel pump coupler ②.
- Install the special tools between the fuel pump and fuel delivery pipe.

- 🔧 09915-74521: Adapter hose**
- 09915-77331: Oil pressure gauge (1 000 kPa)**
- 09940-40211: Fuel pressure gauge adaptor**
- 09940-40220: Fuel pressure gauge attachment**



- Ⓐ To fuel pump
- Ⓑ To fuel delivery pipe

- Connect a proper lead wire into the fuel pump coupler (fuel pump side) and apply 12 volts to the fuel pump (between terminal **A** and terminal **B**) and check the fuel pressure.
 Battery **+** terminal — terminal **A** (Red wire)
 Battery **-** terminal — terminal **B** (Black wire)

DATA Fuel pressure: Approx. 294 kPa (2.94 kgf/cm², 41.81 psi)

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

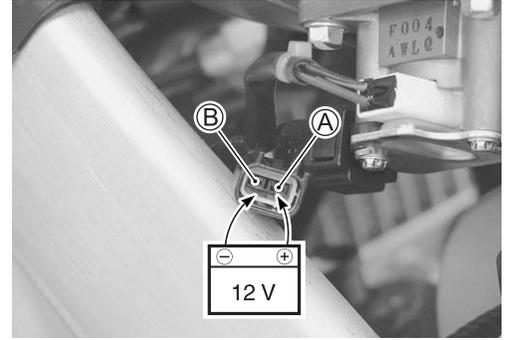
- * Fuel hose leakage
- * Clogged fuel filter
- * Pressure regulator
- * Fuel pump

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

- * Fuel pump
- * Pressure regulator

⚠ WARNING

- * Before removing the special tools, disconnect the battery and release the fuel pressure slowly.
- * Gasoline is highly flammable and explosive. Keep heat, sparks and flame away.



FUEL PUMP INSPECTION

Connect a proper lead wire into the fuel pump coupler (fuel pump side) and apply 12 volts to the fuel pump (☞ above) and check that the fuel pump operates.

If the fuel pump motor does not make operating sound, replace the fuel pump with a new one.

If the fuel pump is OK, the cause may lie in the TO sensor or TO sensor circuit. (☞ 12-48)

FUEL DISCHARGE AMOUNT INSPECTION

⚠ WARNING

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

- Remove the seat and radiator covers. (☞ 5-2)
- Remove the fuel tank bolt and rubber band. (☞ 13-2)
- Lift and hold the fuel tank.
- Disconnect the fuel pump coupler ①.
- Place a rag under the fuel hose and disconnect the fuel hose ② from the fuel pump.

CAUTION

**Be sure to disconnect the fuel hose ② by your hand.
You may not disconnect the fuel hose ② with any tool.**

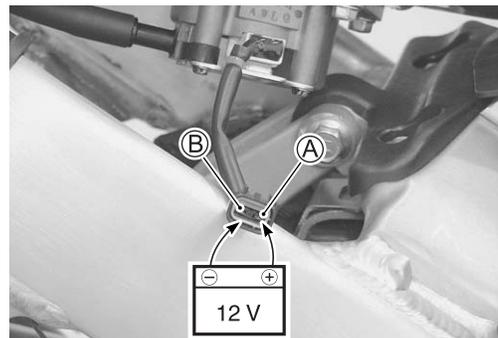
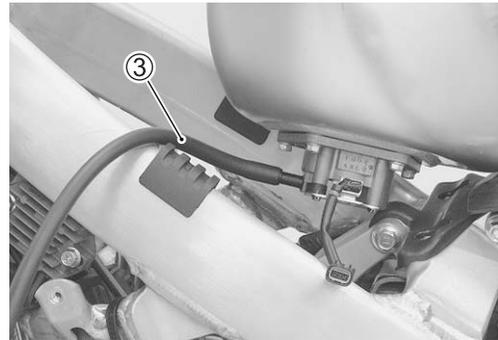
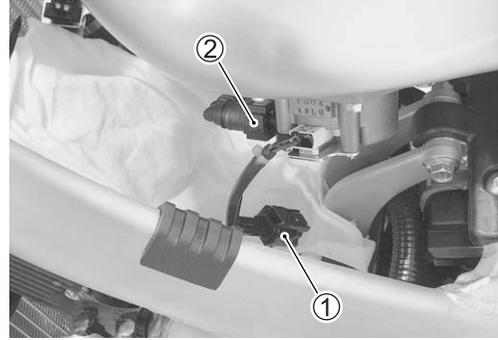
- Connect a proper fuel hose ③ to the fuel pump.
- Place the measuring cylinder and insert the fuel hose end into the measuring cylinder.
- Connect a proper lead wire into the fuel pump coupler (fuel pump side) and apply 12 volts to the fuel pump (between terminal ① and terminal ②) for 10 seconds and measure the amount of fuel discharged.
Battery ⊕ terminal — terminal ① (Red wire)
Battery ⊖ terminal — terminal ② (Black wire)

If the pump does not discharge the amount specified, it means that the fuel pump is defective or that the fuel filter is clogged. Replace the fuel pump assembly.

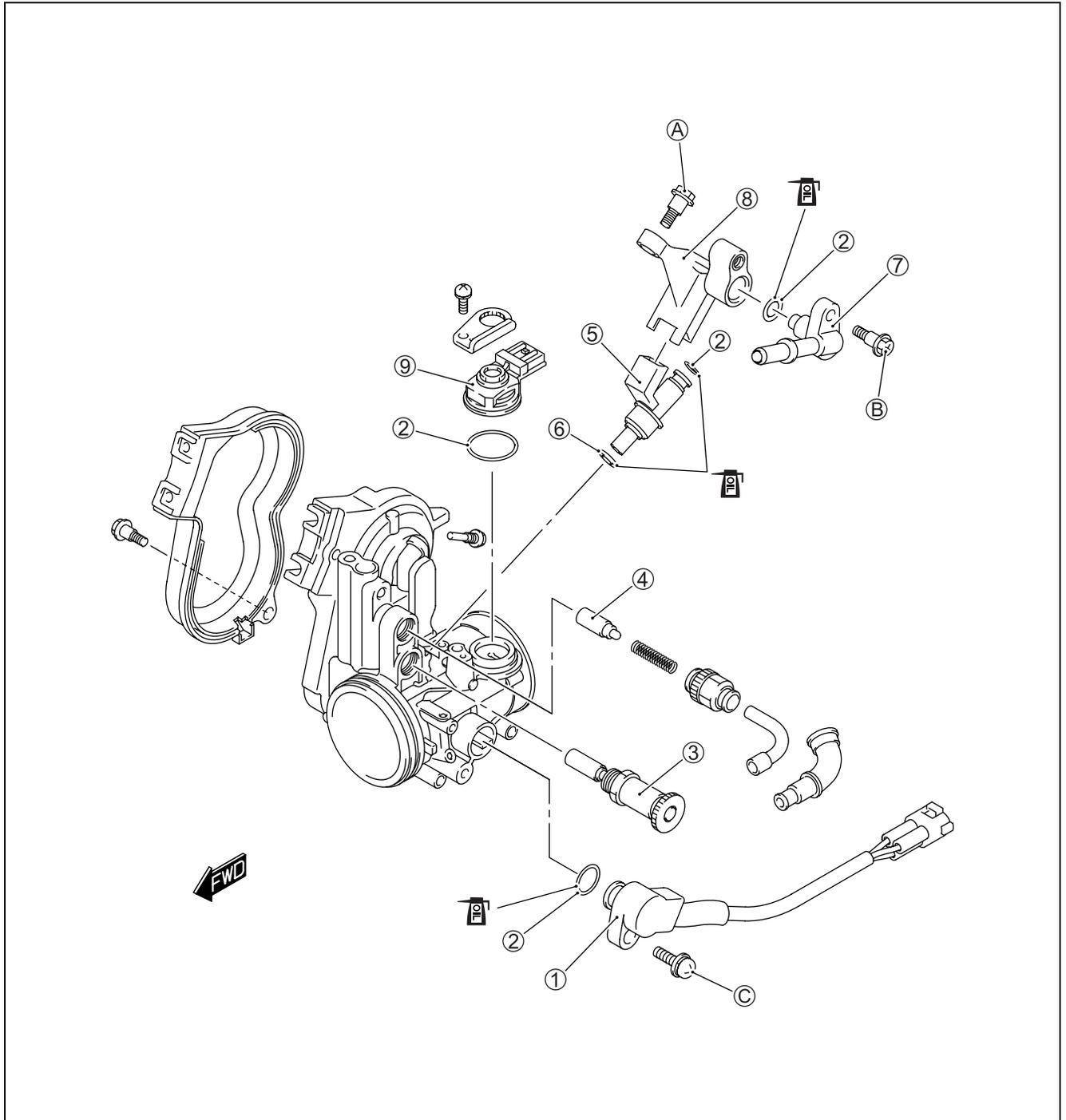
DATA Fuel discharge amount:
89 ml (3.0/3.1 US/Imp oz) and more/10 sec.

NOTE:

The battery must be in fully charged condition.



THROTTLE BODY CONSTRUCTION



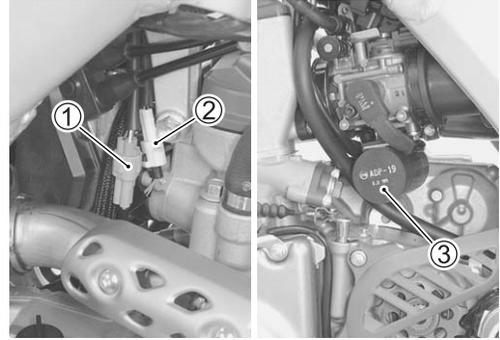
①	TP sensor	⑦	Fuel delivery pipe
②	O-ring	⑧	Fuel pipe
③	Starter knob/idle screw	⑨	IAP sensor
④	Hot starter valve	Ⓐ	Fuel pipe mounting screw
⑤	Fuel injector	Ⓑ	Fuel delivery pipe mounting screw
⑥	Cushion seal	Ⓒ	TP sensor mounting screw



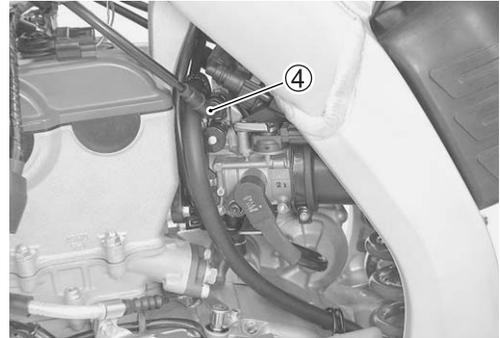
ITEM	N-m	kgf-m	lbf-ft
Ⓐ Ⓑ Ⓒ	3.5	0.35	2.5

REMOVAL

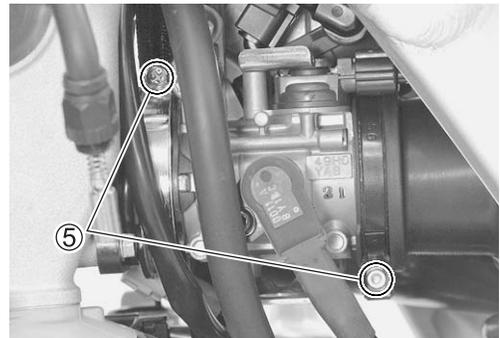
- Remove the seat and radiator covers. (☞ 5-2)
- Remove the fuel tank. (☞ 13-2, -3)
- Disconnect the TP sensor coupler ① and condenser coupler ②.
- Remove the condenser ③.



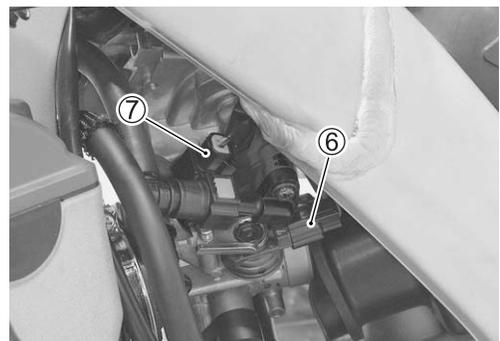
- Disconnect the hot starter cable ④ from the throttle body.



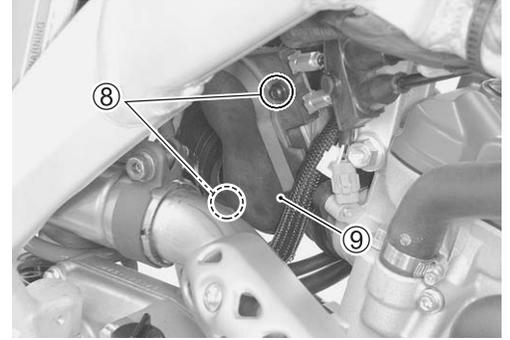
- Loosen the throttle body clamp screws ⑤.
- Move the air cleaner backward.
- Move the throttle body assembly left side.



- Disconnect the IAP sensor coupler ⑥ and fuel injector coupler ⑦.



- Remove the throttle cable cover ⑨ by removing its bolts ⑧.



- Loosen the lock-nuts ⑩.
- Disconnect the throttle cables from their pulley.
- Remove the throttle body assembly.

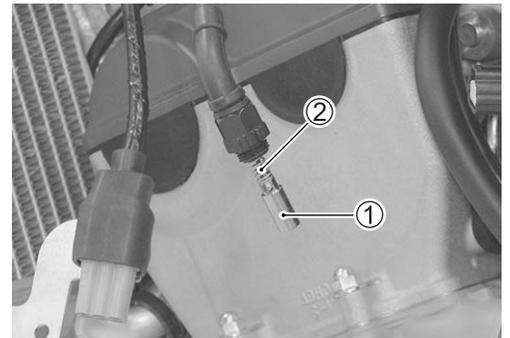
CAUTION

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.



DISASSEMBLY

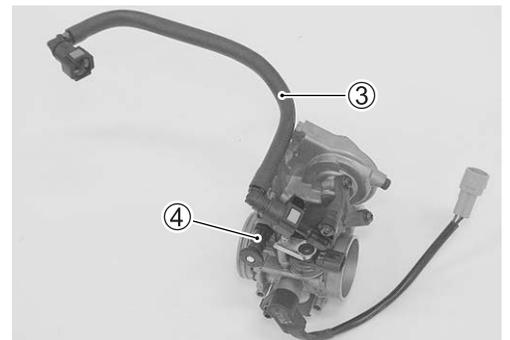
- Remove the hot starter valve ① and spring ② from the hot starter cable.



- Remove the fuel hose ③ and starter knob/idle screw ④.

CAUTION

*** Be sure to disconnect the fuel hose ③ by your hand. You may not disconnect the fuel hose ③ with any tool.**
*** Do not turn the starter knob/idle screw ④ unless it is necessary.**

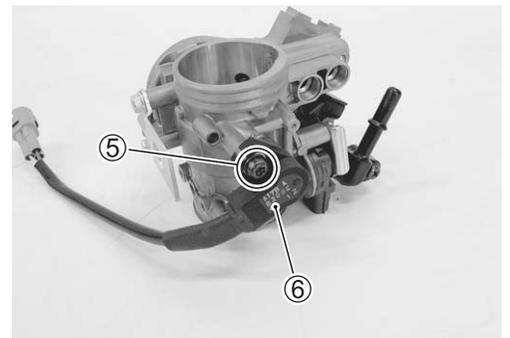


- Remove the TP sensor ⑥ by removing its bolt ⑤ with the special tool.

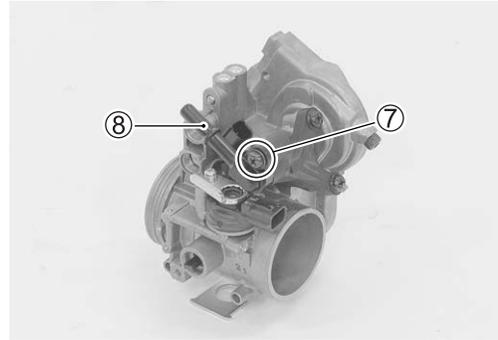
NOTE:

Prior to disassembly, mark the sensor original position with a paint or scribe for accurate reinstallation.

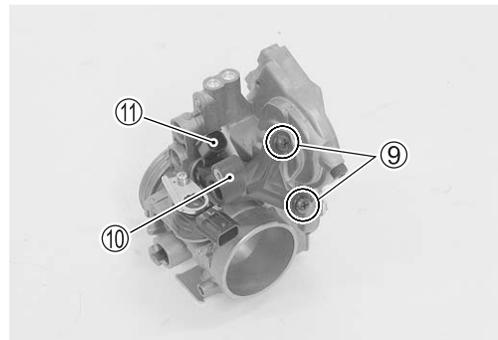
 **09930-11950: Torx wrench (T25H)**



- Remove the fuel delivery pipe ⑧ by removing its screw ⑦.



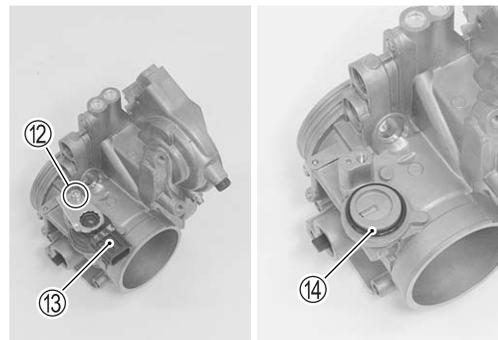
- Remove the fuel pipe ⑩ along with fuel injector ⑪ by removing their screws ⑨.



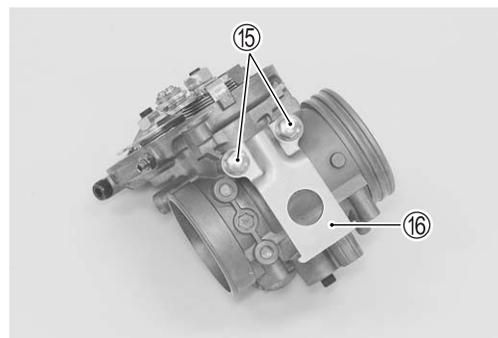
- Remove the fuel injector ⑪ from the fuel pipe ⑩.



- Remove the IAP sensor ⑬ by removing its screw ⑫.
- Remove the O-ring ⑭.

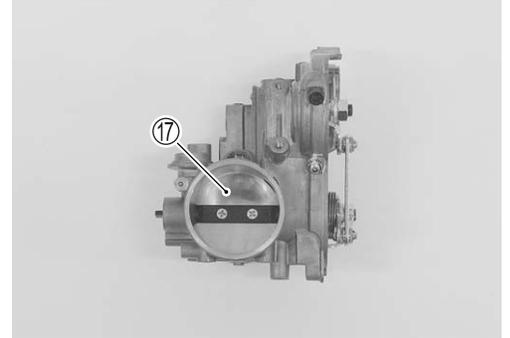


- Remove the condenser bracket ⑯ by removing its bolts ⑮.

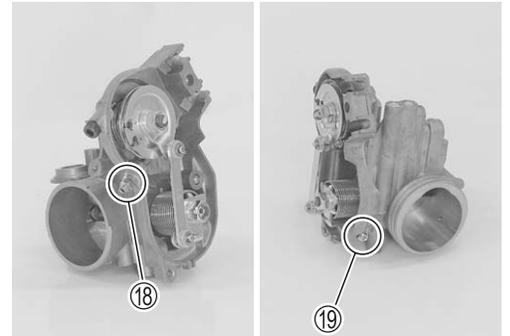


CAUTION

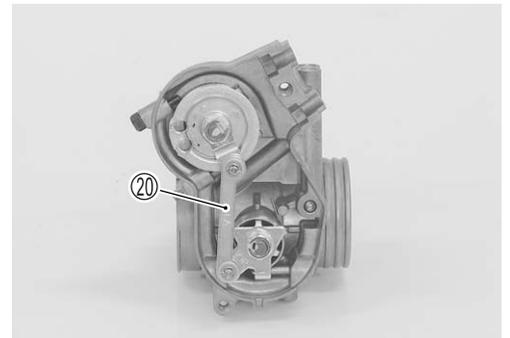
Never remove the throttle valve ⑰.

**CAUTION**

These adjusting screws (⑱, ⑲) are factory adjusted at the time of delivery and therefore avoid removing or turning them unless otherwise necessary.

**CAUTION**

Never remove the throttle valve linkage ⑳.



CLEANING

⚠ WARNING

Some carburetor 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.

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

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 carburetor cleaning chemicals to the rubber and plastic materials.

INSPECTION

Check following items for any damage or clogging.

- * O-ring
- * Throttle valve
- * Fuel pipe
- * Cushion seal
- * Fuel injector

REASSEMBLY

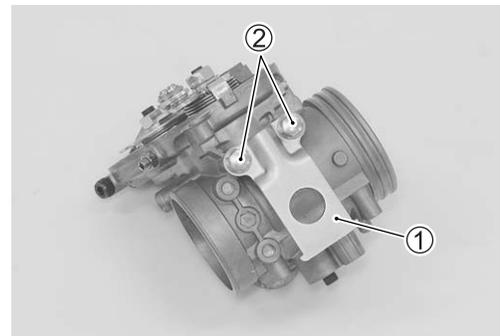
Reassemble the throttle body in the reverse order of disassembly. Pay attention to the following points:

- Install the condenser bracket ①.
- Tighten the condenser bracket bolts ② to the specified torque.

CAUTION

Replace the condenser bracket bolts ② with new ones.

 Condenser bracket bolt: 10 N·m (1.0 kgf·m, 7.0 lbf·ft)

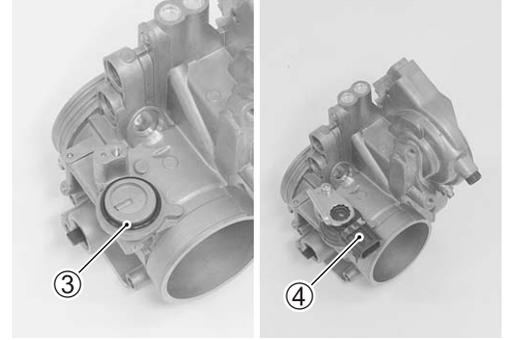


- Install a new O-ring ③.

CAUTION

Replace the O-ring ③ with a new one.

- Install the IAP sensor ④ as shown.



- Apply thin coat of engine oil to new O-ring ⑤ and cushion seal ⑥.

CAUTION

Replace the O-ring ⑤ and cushion seal ⑥ with new ones.



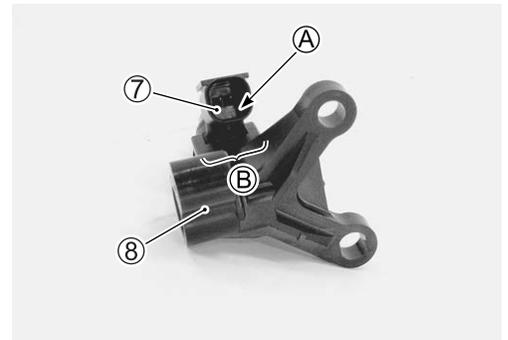
- Install the fuel injector ⑦ by pushing it straight to fuel pipe ⑧.

CAUTION

Never turn the injector ⑦ while pushing it.

NOTE:

Align the coupler A of the injector ⑦ with groove B of the fuel pipe ⑧.



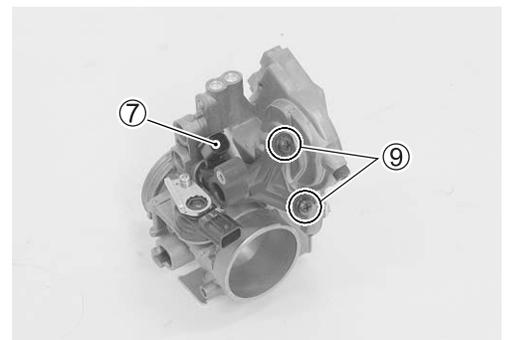
- Install the fuel injector ⑦ by pushing it straight to the throttle body.

CAUTION

Never turn the injector ⑦ while pushing it.

- Tighten the fuel pipe mounting screws ⑨ to the specified torque.

🔧 Fuel pipe mounting screw: 3.5 N·m (0.35 kgf·m, 2.5 lbf·ft)



- Apply thin coat of the engine oil to the new O-ring ⑩.
- Install the fuel delivery pipe ⑪ to the fuel pipe ⑧.

CAUTION

**Replace the O-ring ⑩ with a new one.
Never turn the fuel delivery pipe while pushing it.**

- Tighten the fuel delivery pipe mounting screw ⑫ to the specified torque.

🔩 Fuel delivery pipe mounting screw: 3.5 N·m (0.35 kgf-m, 2.5 lbf-ft)

- Apply thin coat of the engine oil to the O-ring ⑬.
- With the throttle valve fully closed, install the TP sensor ⑭ and tighten the TP sensor mounting screw to the specified torque.

CAUTION

Replace the O-ring with a new one.

NOTE:

- * Align the throttle shaft end ③ with the groove ④ of TP sensor.
- * Apply grease to the throttle shaft end ③ if necessary.

🛢️ 99000-25010: SUZUKI SUPER GREASE "A" or equivalent

🔧 09930-11950: Torx wrench (T25H)

🔩 TP sensor mounting screw: 3.5 N·m (0.35 kgf-m, 2.5 lbf-ft)

NOTE:

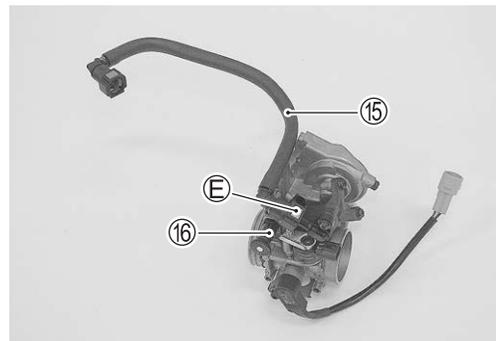
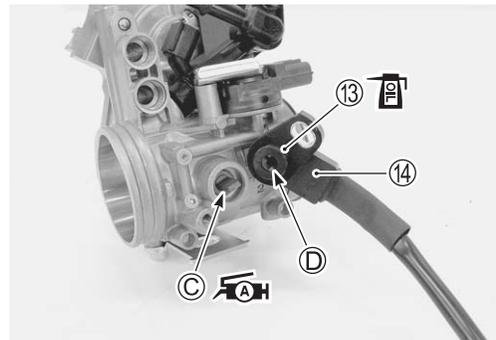
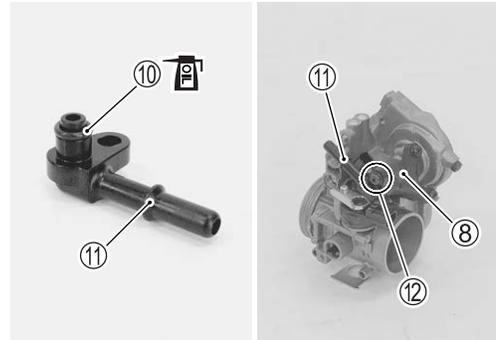
- * Make sure the throttle valve open or close smoothly.
- * TP sensor setting procedure. (📖 12-18)

- Connect the Yellow button ⑤ side of the fuel hose ⑮ to the throttle body side.

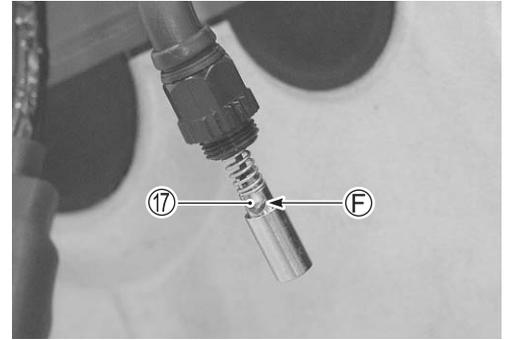
CAUTION

Be sure to connect the fuel hose ⑮ by your hand. You may not connect the fuel hose with any tool.

- Install the starter knob/idle screw ⑯ to the lower hole.



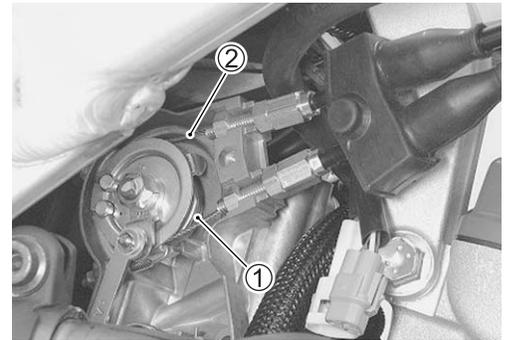
- Align the groove **F** of hot starter valve with the hot starter cable end **17**.



INSTALLATION

Install the throttle body assembly in the reverse order of removal. Pay attention to the following points:

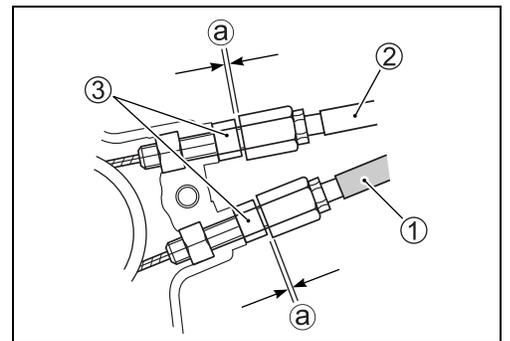
- Connect the throttle pulling cable **1** and throttle returning cable **2** to the pulley.



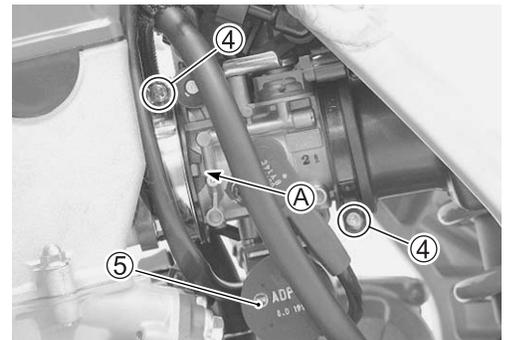
- Turn in each throttle cable adjuster fully and locate each outer cable so that the clearance **a** is 0 – 1.5 mm (0 – 0.06 in).
- Tighten each lock-nut **3** to the specified torque.

🔧 Cable adjuster lock-nut: 2.2 N·m (0.22 kgf·m, 1.60 lbf·ft)

a 0 – 1.5 mm (0 – 0.06 in)



- Fit the projection **A** on the throttle body in the depression of the intake pipe.
- Position the throttle body clamps **4** correctly. (🔧20-22)
- Install the condenser **5**.



INSPECTION AFTER INSTALLATION

- Wiring harness, cable and hose routing (🔧20-18 to -23)
- Fuel leakage
- Throttle cable play (🔧2-21)
- Engine idle speed (🔧2-24)
- TP sensor setting condition (🔧12-18)

FUEL INJECTOR REMOVAL

- Remove the throttle body assembly. (🔧 13-8, -9)
- Remove the fuel injector. (🔧 13-10)

FUEL INJECTOR INSPECTION

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.

NOTE:

The fuel injector can be checked without removing it from the throttle body. (🔧 12-54)



FUEL INJECTOR INSTALLATION

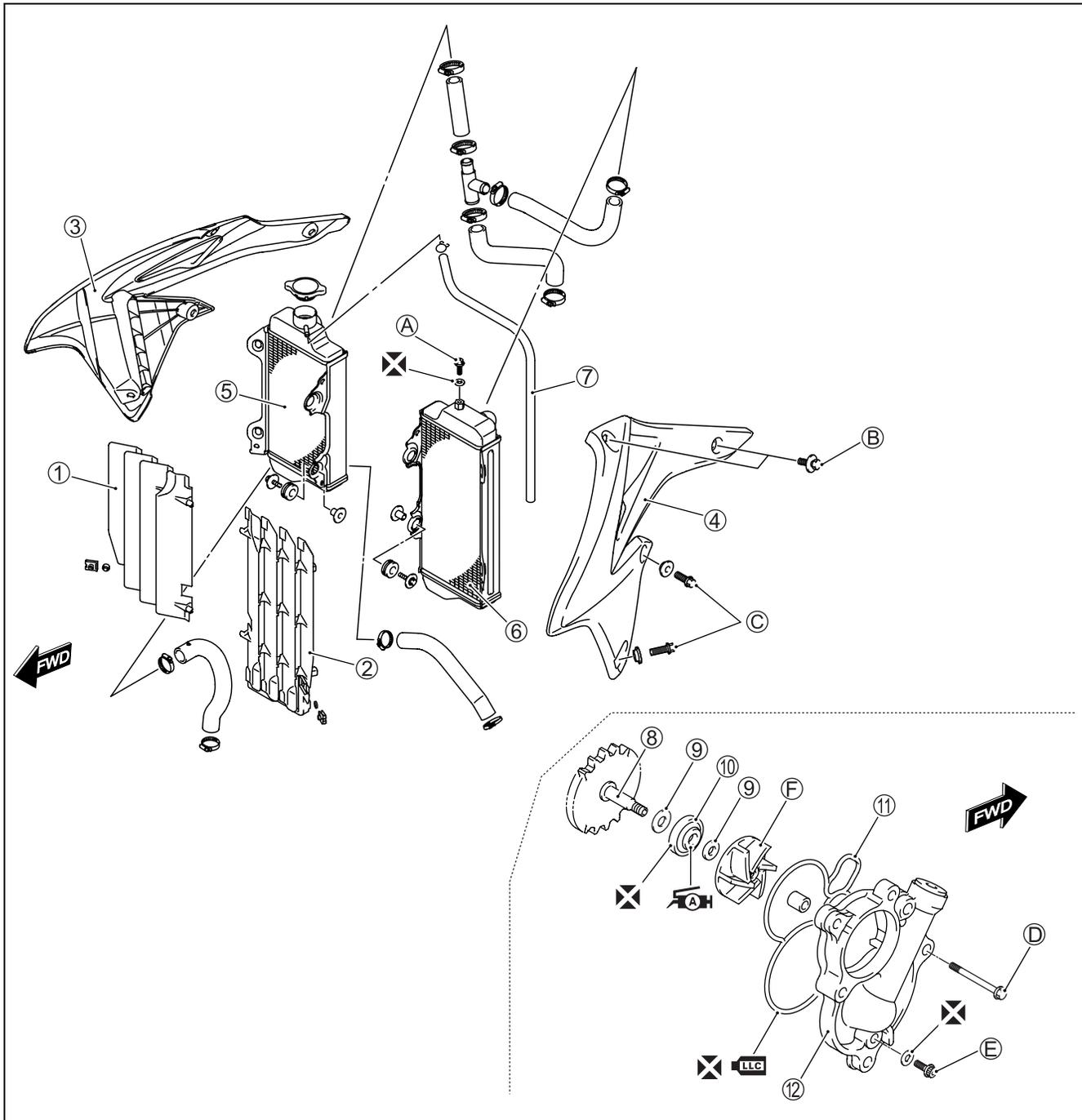
- Apply thin coat of the engine oil to new cushion seal and new O-ring. (🔧 13-13)
- Install the injector by pushing it straight. Never turn the injector while pushing it. (🔧 13-13)
- Install the throttle body assembly. (🔧 13-15)

COOLING SYSTEM

CONTENTS

CONSTRUCTION	14- 2
ENGINE COOLANT	14- 3
REPLACEMENT	14- 3
COOLING CIRCUIT	14- 4
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INSPECTION	14- 5
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INSTALLATION	14- 9

CONSTRUCTION



①	Right radiator louver	⑩	Oil seal
②	Left radiator louver	⑪	Gasket
③	Right radiator cover	⑫	Water pump case
④	Left radiator cover	(A)	Radiator air bleeder bolt
⑤	Right radiator	(B)	Radiator cover upper bolt
⑥	Left radiator	(C)	Radiator cover bolt
⑦	Radiator overflow hose	(D)	Water pump case bolt
⑧	Water pump shaft	(E)	Engine coolant drain bolt
⑨	Washer	(F)	Water pump impeller

ITEM	N·m	kgf·m	lbf·ft
(A)(C)	6	0.6	4.5
(B)	10	1.0	7.0
(D)(E)	11	1.1	8.0
(F)	8	0.8	6.0

ENGINE COOLANT REPLACEMENT

⚠ WARNING

- * Engine coolant may be harmful if swallowed or if it comes in contact with the skin or eyes. If engine coolant gets into the eyes or contacts the skin, flush the eyes or wash the skin thoroughly, with plenty of water. If engine coolant is swallowed, induce vomiting and call a physician immediately.
- * Do not open the radiator cap when the engine is hot, as you may be injured by escaping hot liquid or vapor.

- Open the radiator cap ①.
- Remove the engine coolant drain bolt ② and drain engine coolant.
- Install the gasket washer and tighten the engine coolant drain bolt ② to the specified torque.

CAUTION

Replace the gasket washer with a new one.

🔧 Engine coolant drain bolt: 11 N·m (1.1 kgf-m, 8.0 lbf-ft)

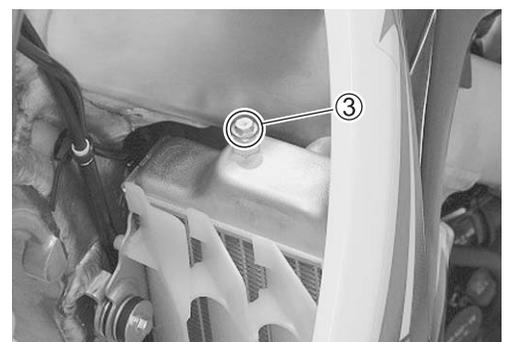
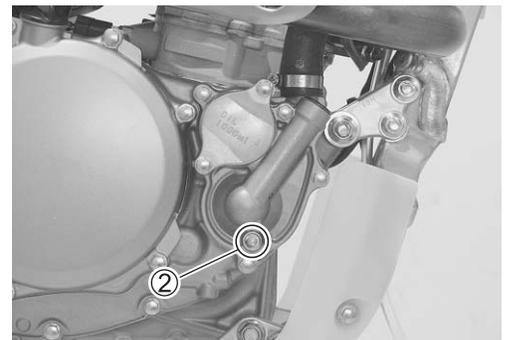
- Pour specified engine coolant up to the bottom of filler hole. (📖 2-18)

📊 DATA Engine coolant capacity: 950 ml (1.0/0.8 US/Imp qt)

- Bleed air from the air bleeder bolt ③.
- Tighten the air bleeder bolt ③ to the specified torque.

🔧 Radiator air bleeder bolt: 6 N·m (0.6 kgf-m, 4.5 lbf-ft)

- Add engine coolant up to the radiator inlet.
- Tighten the radiator cap securely.
- After warming up and cooling down the engine, add the specified engine coolant.



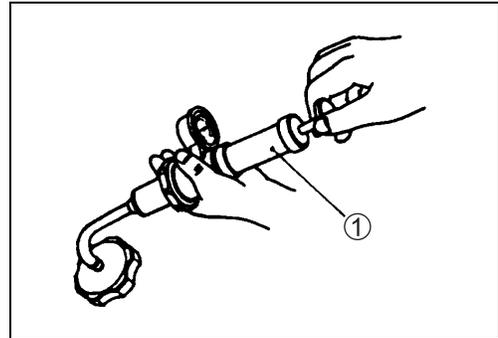
COOLING CIRCUIT

INSPECTION

- Remove the radiator cap.

⚠ WARNING

- * Engine coolant may be harmful if swallowed or if it comes in contact with the skin or eyes. If engine coolant gets into the eyes or contacts the skin, flush the eyes or wash the skin thoroughly, with plenty of water. If engine coolant is swallowed, induce vomiting and call a physician immediately.
- * Do not open the radiator cap when the engine is hot, as you may be injured by escaping hot liquid or vapor.



- Connect the tester ① to the filler.
- Give a pressure of about 120 kPa (1.2 kgf/cm², 17.0 psi) and see if the system holds this pressure for 10 seconds.
- If the pressure would fall during this 10-second interval, it means that there is a leaking point in the system. In such a case, inspect the entire system and replace the leaking component or part.

⚠ WARNING

When removing the radiator cap tester, put a rag on the filler to prevent spouting of engine coolant.

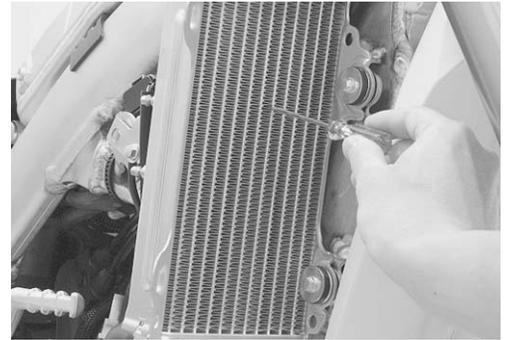
CAUTION

Do not allow the pressure to exceed the radiator cap release pressure, or the radiator can be damaged.

RADIATOR INSPECTION

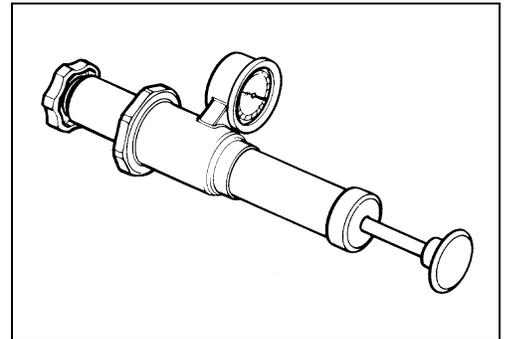
RADIATOR

- Visually inspect the radiators and hose for damage.
- Fins bent down or dented can be repaired by straightening them with the blade of a small screwdriver.



RADIATOR CAP

- Fit the cap to the radiator cap tester.
- Build up pressure slowly by operating the tester. Make sure that the pressure build-up stops at 95 – 125 kPa (0.95 – 1.25 kgf/cm², 14 – 18 psi) and that, with the tester held standstill, the cap is capable of holding that pressure for at least 10 seconds.
- Replace the cap if it is found not to satisfy either of these two requirements.



DATA Radiator cap valve release pressure

Standard: 95 – 125 kPa

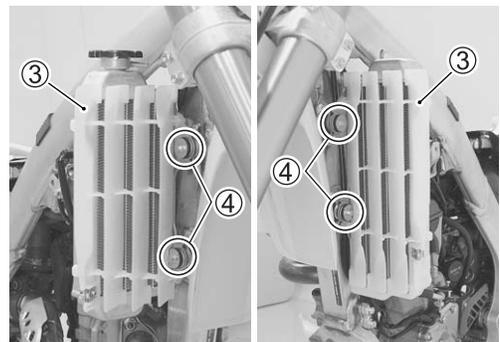
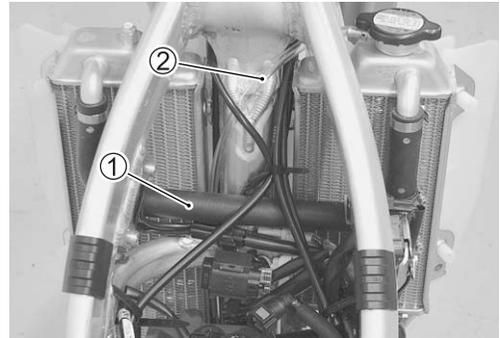
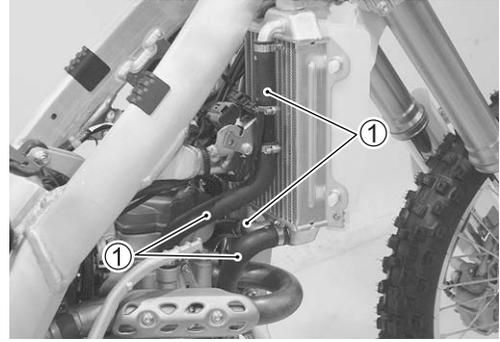
(0.95 – 1.25 kgf/cm², 14 – 18 psi)

REMOVAL

⚠ WARNING

- * Engine coolant may be harmful if swallowed or if it comes in contact with the skin or eyes. If engine coolant gets into the eyes or contacts the skin, flush the eyes or wash the skin thoroughly, with plenty of water. If engine coolant is swallowed, induce vomiting and call a physician immediately.
- * The engine must be cool before servicing the cooling system.

- Remove the seat, radiator covers and fuel tank.
(☞ 5-2, 13-2, -3)
- Drain engine coolant. (☞ 14-3)
- Remove the radiator hoses ① and radiator overflow hose ②.
- Remove the radiator louvers ③, left and right.
- Remove the left and right radiators by removing its bolts ④.



INSTALLATION

Install the radiator in the reverse order of removal.

- Connect the radiator hoses securely. (☞ 20-24)
- Inspect the engine coolant level and leakage. (☞ 2-18, -19)

WATER PUMP REMOVAL

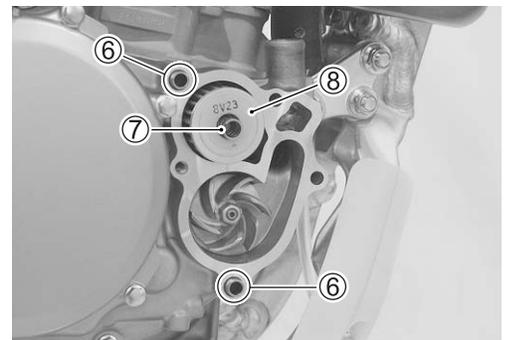
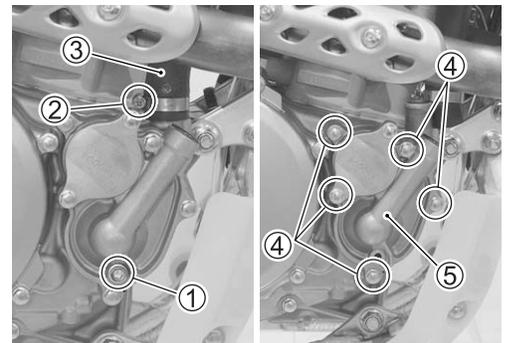
⚠ WARNING

- * Engine coolant may be harmful if swallowed or if it comes in contact with the skin or eyes. If engine coolant gets into the eyes or contacts the skin, flush the eyes or wash the skin thoroughly, with plenty of water. If engine coolant is swallowed, induce vomiting and call a physician immediately.
- * The engine must be cool before servicing the cooling system.

WATER PUMP CASE

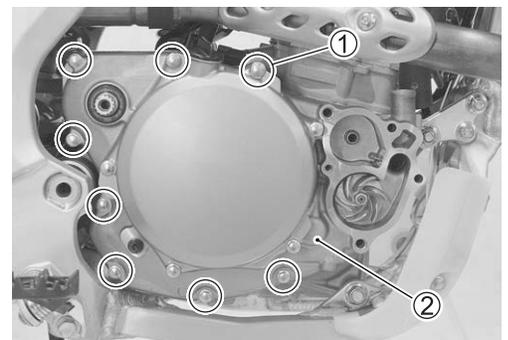
- Drain engine oil. (☞ 2-13)
- Drain engine coolant by removing the engine coolant drain bolt ①.
- Disconnect the radiator hose ③ by loosening its clamp screw ②.
- Remove the water pump case ⑤ by removing its bolts ④.

- Remove the dowel pins ⑥, spring ⑦ and oil filter ⑧.



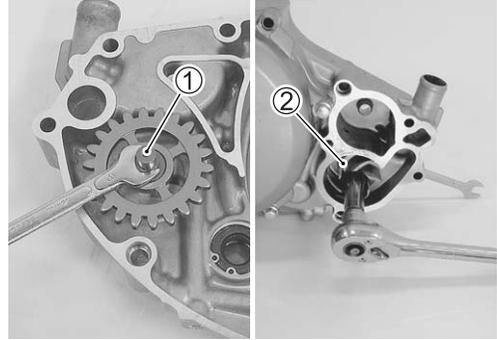
CRANKCASE COVER

- Remove the brake pedal. (☞ 17-20)
- Remove the kick starter lever. (☞ 8-3)
- Remove the right crankcase cover ②, dowel pins and gasket by removing crankcase bolts ①.

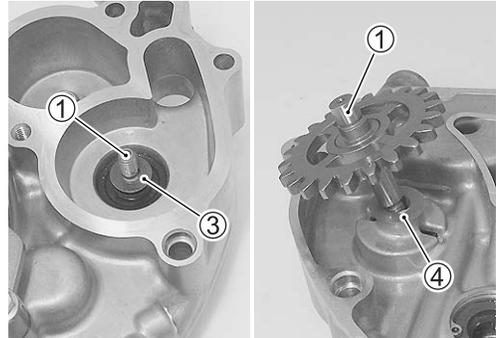


WATER PUMP IMPELLER AND WATER PUMP SHAFT

- Hold the water pump shaft ① with a wrench and remove the impeller ②.



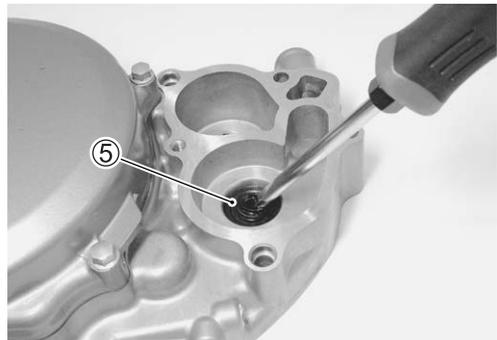
- Remove the washers (③, ④) and water pump shaft ①.



- Remove the oil seal ⑤.

NOTE:

If there is no abnormal condition, the oil seal removal is not necessary.



INSPECTION

WATER PUMP IMPELLER AND WATER PUMP SHAFT

- Inspect the water pump impeller and water pump shaft for damage.
- If necessary, replace the defective parts with a new one.



OIL SEAL

- Visually inspect the oil seal for damage.
- If any defects are found, replace the oil seal with a new one.



INSTALLATION

Install the water pump in the reverse order of removal. Pay attention to the following points:

OIL SEAL

- Press the oil seal ① with the suitable size socket wrench.

CAUTION

Replace the oil seal ① with a new one.

- Check engine oil flow before installing the water pump shaft.

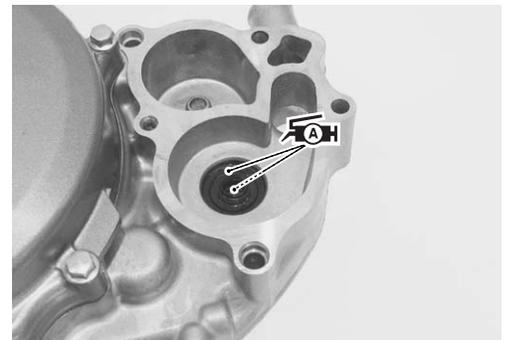
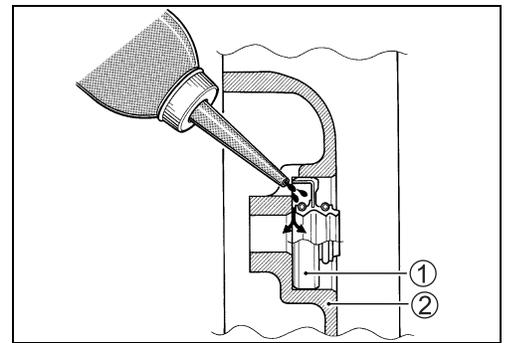
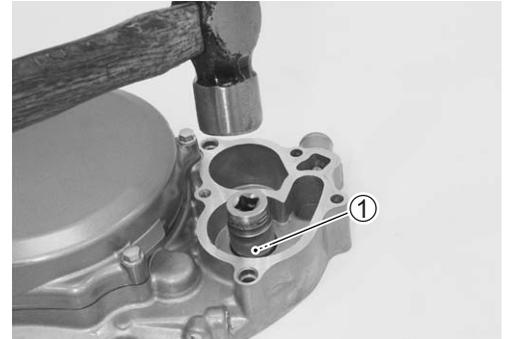
CAUTION

- * Make sure that engine oil flows to the bearing part of oil seal as shown in the illustration.
- * If the oil does not flow, replace the oil seal with a new one again.

- ① Oil seal
- ② Right crankcase cover

- Apply a small quantity of grease to the oil seal lips.

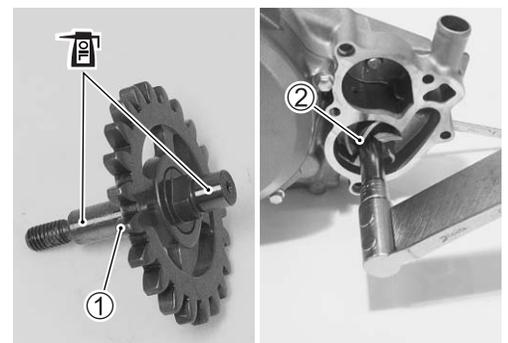
 99000-25010: SUZUKI SUPER GREASE "A"
or equivalent



WATER PUMP IMPELLER AND WATER PUMP SHAFT

- Apply engine oil to the water pump shaft ①.
- Hold the water pump shaft with a wrench and tighten the water pump impeller ② to the specified torque.

 Water pump impeller: 8 N·m (0.8 kgf-m, 6.0 lbf-ft)

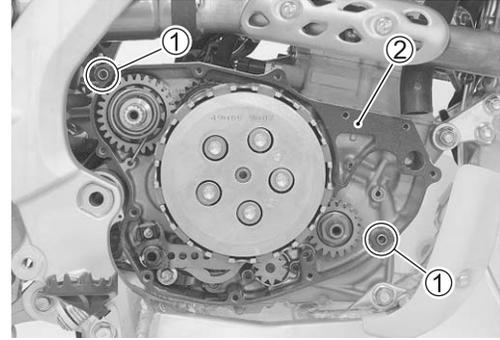


CRANKCASE COVER

- Install the dowel pins ① and gasket ②.

CAUTION

Replace the gasket ② with a new one.



- Fit the right crankcase cover ③.
- Tighten the right crankcase cover bolts (a, b, c) to the specified torque.

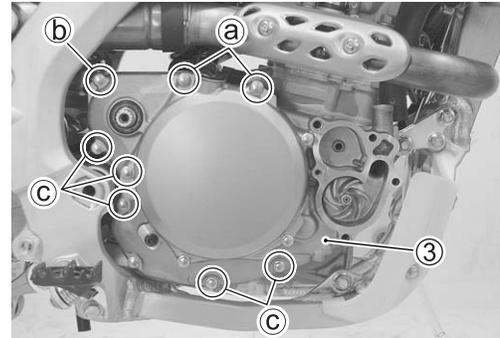
Right crankcase cover bolt: 11 N·m (1.1 kgf·m, 8.0 lbf·ft)

- Install the brake pedal. (☞ 17-20)
- Install the kick starter lever. (☞ 8-7, -8)

Ⓐ Length: 60 mm (2.4 in)

Ⓑ Length: 30 mm (1.2 in)

Ⓒ Length: 25 mm (1.0 in)

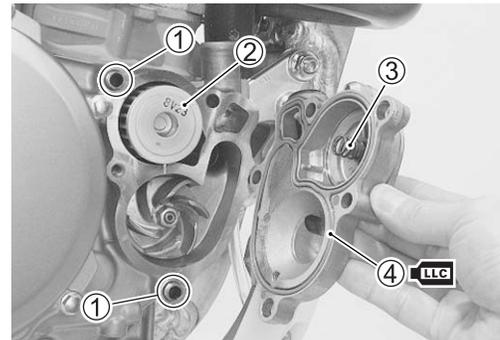


WATER PUMP CASE

- Install the dowel pins ① and oil filter ②.
- Install the spring ③ and gasket ④.
- Apply engine coolant to the gasket ④.

CAUTION

Replace the gasket ④ with a new one.



- Fit the water pump case ⑤.
- Tighten the water pump case bolts (d, e, f) and drain bolt ⑥ to the specified torque.

CAUTION

Replace the gasket washer A with a new one.

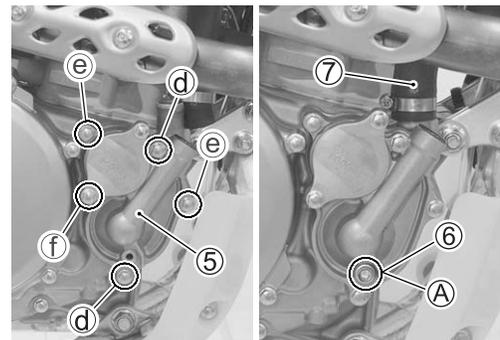
Water pump case bolt: 11 N·m (1.1 kgf·m, 8.0 lbf·ft) Engine coolant drain bolt: 11 N·m (1.1 kgf·m, 8.0 lbf·ft)

- Connect the radiator hose ⑦ and pour engine coolant. (☞ 14-3, 20-24)

Ⓓ Length: 65 mm (2.6 in)

Ⓔ Length: 60 mm (2.4 in)

Ⓕ Length: 35 mm (1.4 in)



INSPECTION AFTER INSTALLATION

- Engine oil level and leakage (☞ 2-12)
- Engine coolant level and leakage (☞ 2-18, -19)

ELECTRICAL SYSTEM

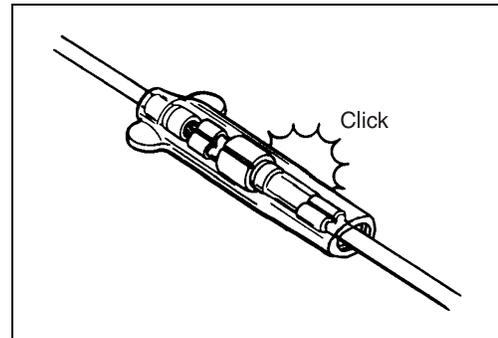
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CAUTIONS IN SERVICING

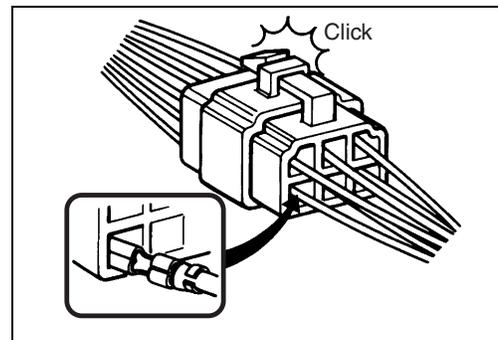
CONNECTOR

- When connecting a connector, be sure to push it in until a click is felt.
- Inspect the connector for corrosion, contamination and breakage in its cover.
- Avoid applying grease or other similar material to connector terminals to prevent electric trouble.



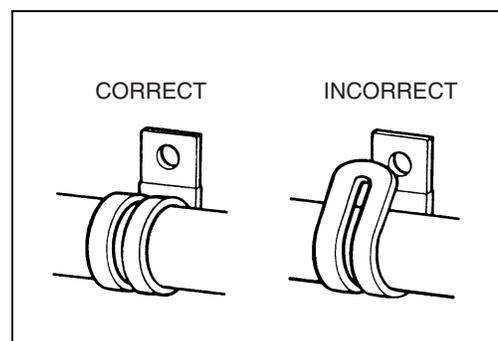
COUPLER

- With a lock type coupler, be sure to release the lock when disconnecting, and push in fully to engage the lock when connecting.
- When disconnecting the coupler, be sure to hold the coupler itself and do not pull the lead wires.
- Inspect each terminal on the coupler for being loose or bent.
- Push in the coupler straightly. An angled or skewed insertion may cause the terminal to be deformed, possibly resulting in poor electrical contact.
- Inspect each terminal for corrosion and contamination.
- Before refitting the sealed coupler, make sure its seal rubber is positioned properly. The seal rubber may possibly come off the position during disconnecting work and if the coupler is refitted with the seal rubber improperly positioned, it may result in poor water sealing.
- Avoid applying grease or other similar material to coupler terminals to prevent electric trouble.



CLAMP

- Clamp the wire harness at such positions as indicated in "WIRING HARNESS ROUTING". (☞ 20-18 to -20)
- Bend the clamp properly so that the wire harness is clamped securely.
- In clamping the wire harness, use care not to allow it to hang down.
- Do not use wire or any other substitute for the band type clamp.

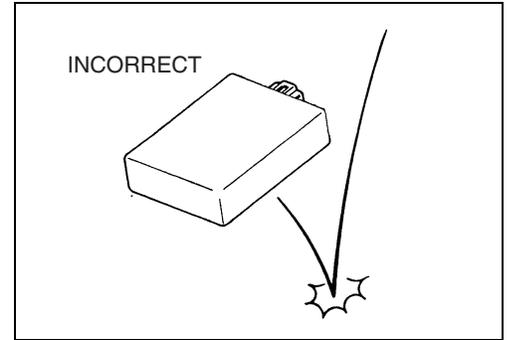


SWITCH

- Never apply grease material to switch contact points to prevent damage.

SEMI-CONDUCTOR EQUIPPED PART

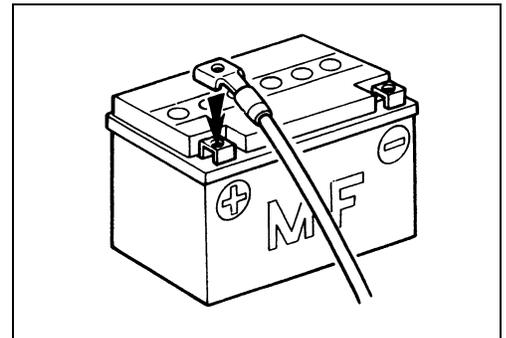
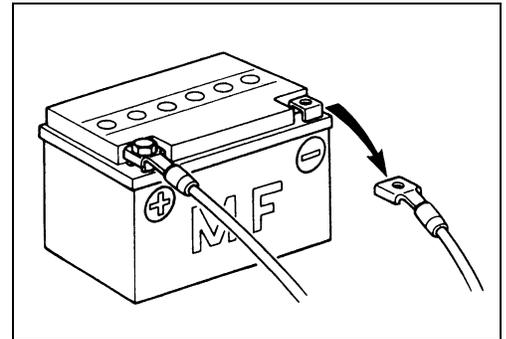
- Be careful not to drop the part with a semi-conductor built in such as a ECM.
- When inspecting this part, follow inspection instruction strictly. Neglecting proper procedure may cause damage to this part.



CONNECTING THE BATTERY

WHEN USING THE BATTERY LEAD WIRE (Optional part: 36890-28H00)

- When disconnecting terminals from the battery for servicing, be sure to disconnect the \ominus battery lead wire, first.
- When connecting the battery lead wires, be sure to connect the \oplus battery lead wire, first.



WIRING PROCEDURE

Properly route the wire harness according to the "WIRING HARENESS ROUTING" section. (☞ 20-18 to -20)

USING THE MULTI CIRCUIT TESTER

- Properly use the multi circuit tester \oplus and \ominus probes.
Improper use can cause damage to the motorcycle and tester.
- If the voltage and current values are not known, begin measuring in the highest range.
- When measuring the resistance, make sure that no voltage is applied. If voltage is applied, the tester will be damaged.
- After using the tester, be sure to turn the switch to the OFF.

 **09900-25008: Multi circuit tester set**

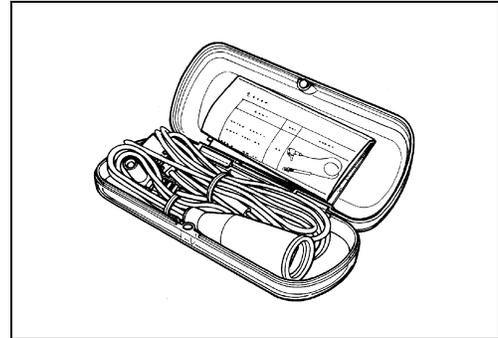
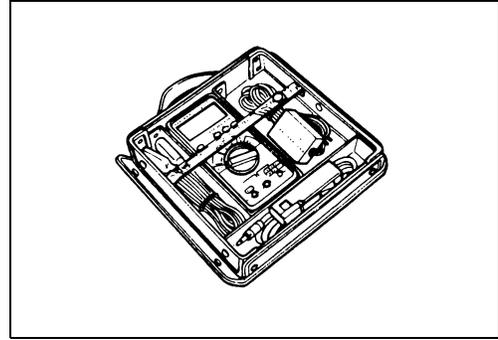
CAUTION

Before using the multi circuit tester, read its instruction manual.

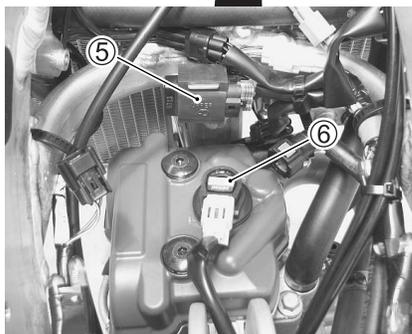
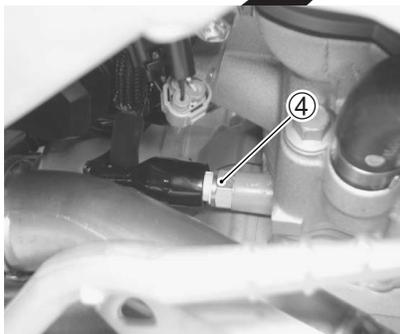
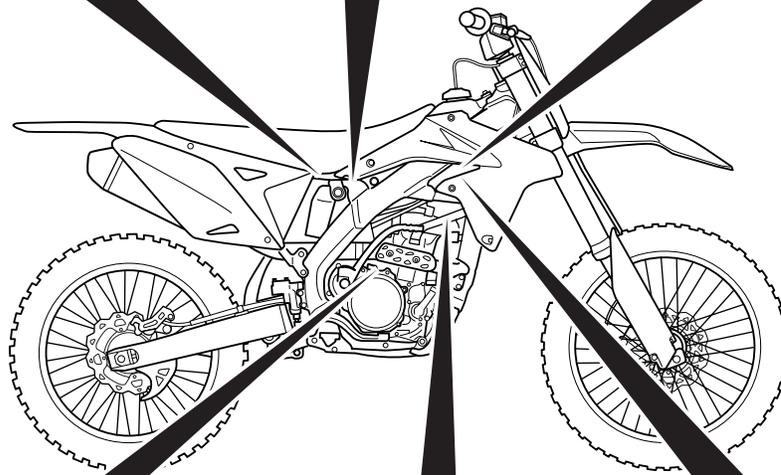
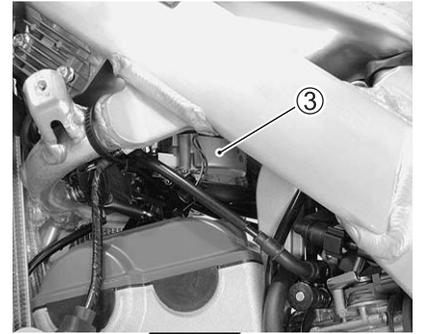
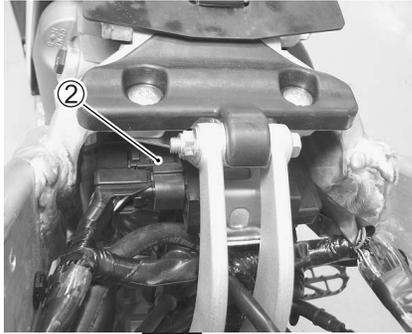
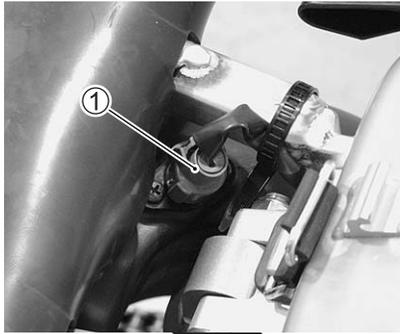
NOTE:

- * *When connecting the multi circuit tester, use the needle-point probe to the back side of the lead wire coupler and connect the probes of tester to them.*
- * *Use the needle-point probe to prevent the rubber of the water proof coupler from damage.*

 **09900-25009: Needle-point probe set**

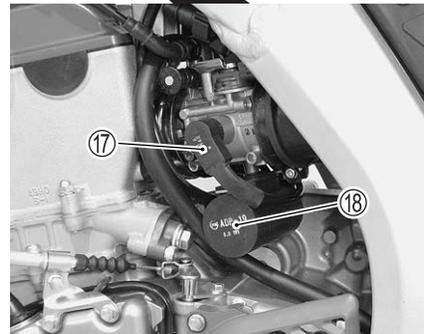
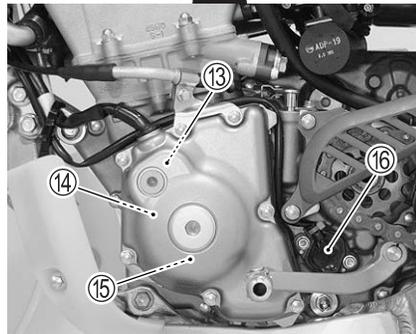
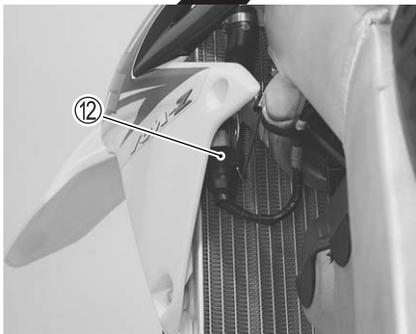
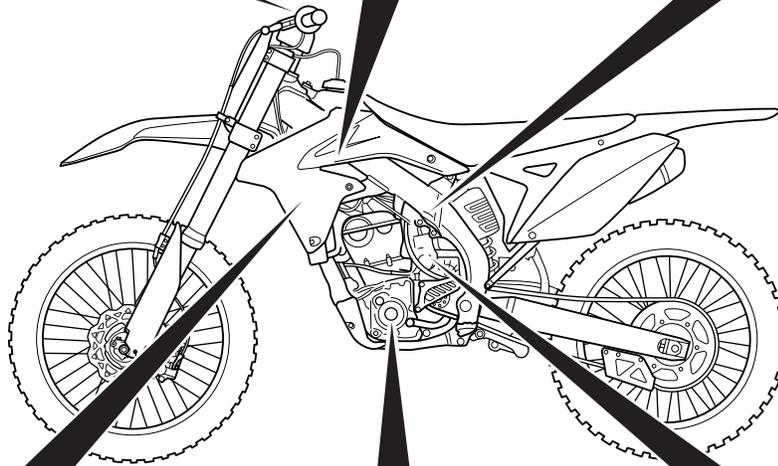
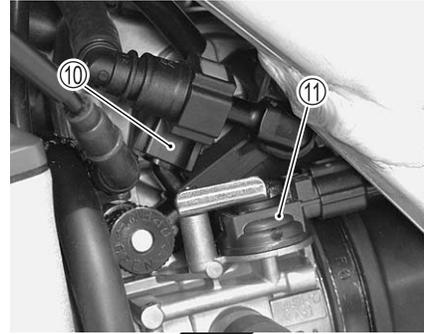
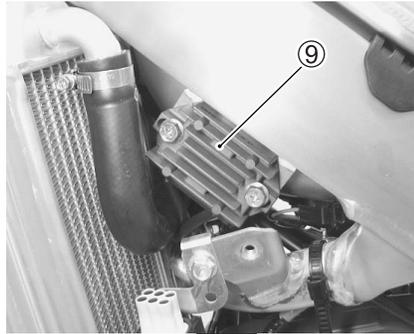
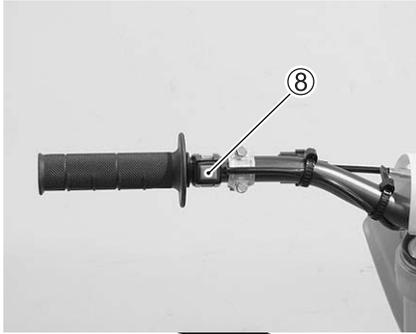


LOCATION OF ELECTRICAL COMPONENTS



- ① IAT sensor (👉 12-44)
- ② ECM
- ③ Fuel pump (👉 13-5)
- ④ ECT sensor (👉 12-35)

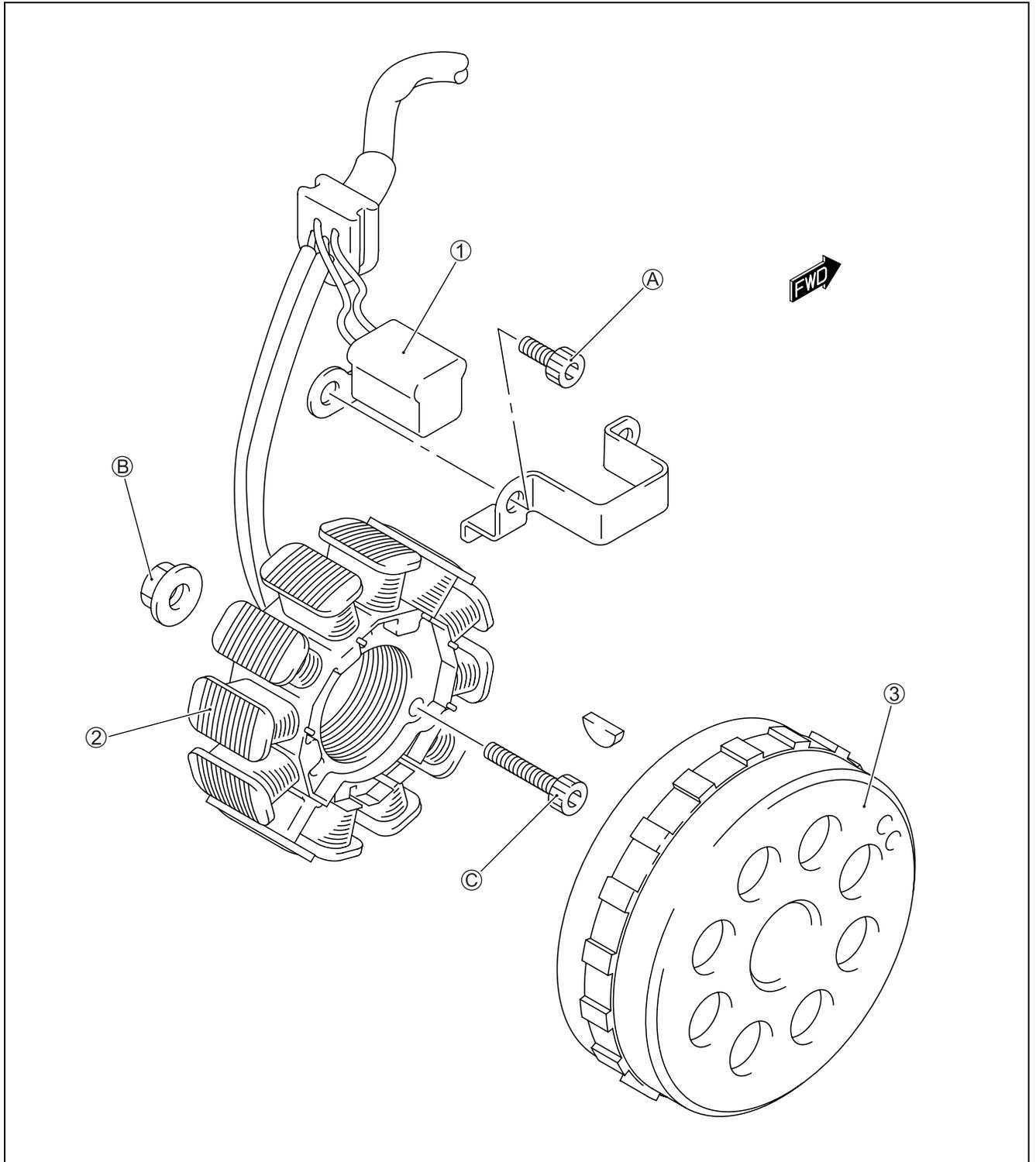
- ⑤ TO sensor (👉 12-48)
- ⑥ Ignition coil/Plug cap (👉 15-13)
- ⑦ Service coupler (👉 12-19)



- ⑧ Engine stop switch (☞ 15-16)
- ⑨ Regulator/Rectifier (☞ 15-10)
- ⑩ Fuel injector (☞ 12-54)
- ⑪ IAP sensor (☞ 12-39)
- ⑫ Mode select coupler (☞ 12-19)
- ⑬ CKP sensor (☞ 12-29)

- ⑭ Crankshaft rotation signal sensor (☞ 12-58)
- ⑮ Magneto (☞ 15-9)
- ⑯ GP switch (☞ 12-52)
- ⑰ TP sensor (☞ 12-31)
- ⑱ Condenser

CONSTRUCTION MAGNETO

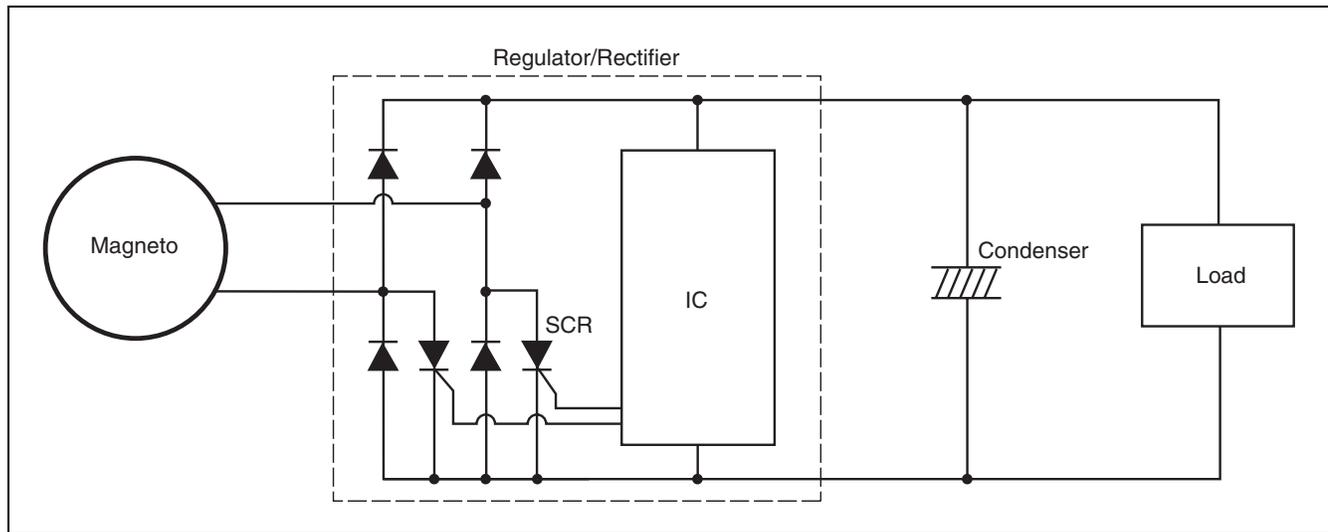


①	CKP sensor	Ⓐ	CKP sensor bolt
②	Stator coil	Ⓑ	Magneto rotor nut
③	Magneto rotor	Ⓒ	Stator coil mounting bolt



ITEM	N·m	kgf·m	lbf·ft
Ⓐ Ⓒ	5.5	0.55	4.0
Ⓑ	80	8.0	58.0

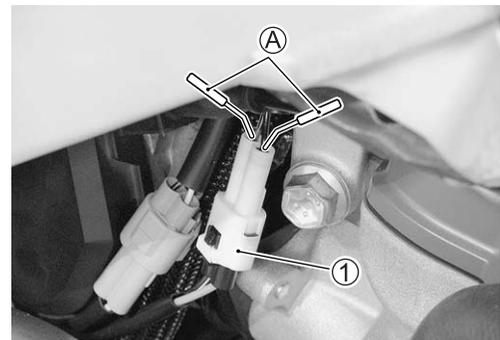
GENERATING SYSTEM



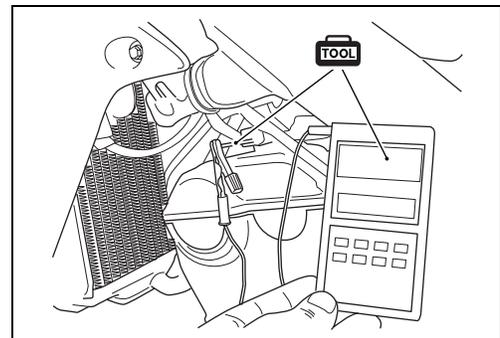
INSPECTION

REGULATED VOLTAGE

- Insert the needle-point probes (A) to the condenser coupler (1).
- Prove: Red lead wire (+)
- Prove: B/W lead wire (-)
- Kickstart the engine.



- Insert the needle-pointed probe to the lead wire coupler (W/BI).
- Connect the engine tachometer to the needle-pointed probe.
- Kickstart the engine and keep the engine running at 5 000 r/min.

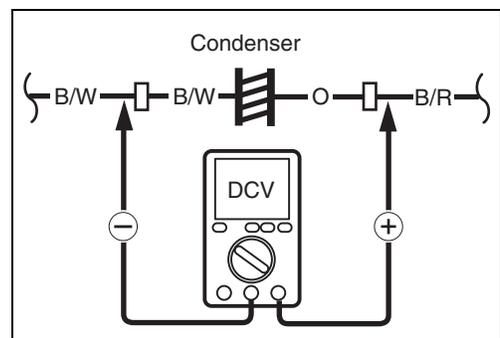


- Measure the DC voltage using the multi circuit tester. If the voltage is not within the specified value, inspect the magneto and regulator/rectifier. (15-9, -10)

DATA Regulated voltage (Charging output):
14.0 – 15.0 V at 5 000 r/min

- TOOL** 09900-25008: Multi circuit tester set
- 09900-25009: Needle-point probe set
- 09900-26006: Engine tachometer

TESTER Tester knob indication: Voltage (V)



CHARGE COIL RESISTANCE

- Disconnect the magneto lead wire coupler ①.
- Measure the charge coil resistance.
If the resistance is out of specified value, replace the stator with a new one. Also, check that the magneto core is insulated properly.

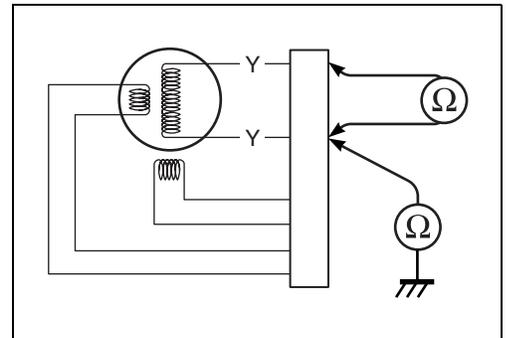
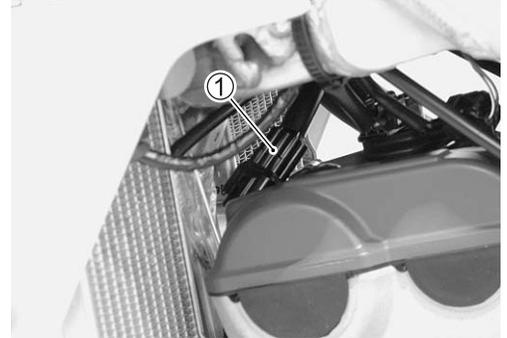
DATA Charge coil resistance: 1.0 – 2.5 Ω (Yellow – Yellow)
 $\infty \Omega$ (Yellow – Ground)

TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Resistance (Ω)

NOTE:

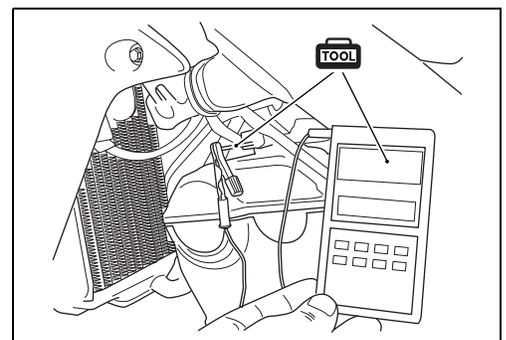
When making above test, it is not necessary to remove the magneto.

**MAGNETO NO-LOAD PERFORMANCE**

- Lift and hold the fuel tank. (☞ 13-4)
- Disconnect the regulator/rectifier coupler ①.
- Connect a 12 volt battery to the service coupler using the battery lead wire (optional part). (☞ 12-19)



- Insert the needle-pointed probe to the lead wire coupler (W/BI).
- Connect the engine tachometer to the needle-pointed probe.
- Kickstart the engine and keep the engine running at 5 000 r/min.

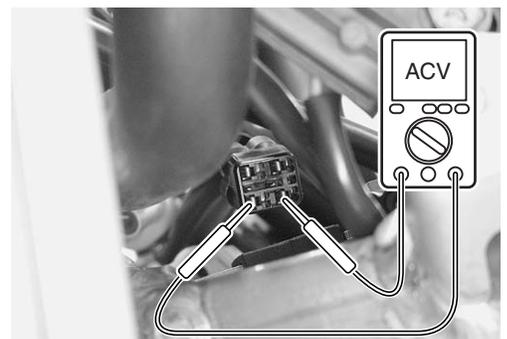


- Measure the AC voltage using the multi circuit tester. If the tester reads under the specified value, replace the magneto with a new one.

DATA Magneto no-load performance (When engine is cold):
95 V and more at 5 000 r/min (Yellow – Yellow)

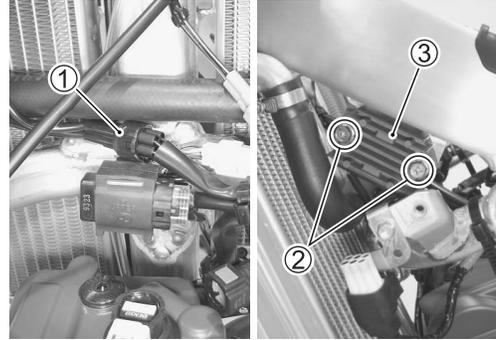
TOOL 09900-25008: Multi circuit tester set
36890-28H00: Battery lead wire (option)
09900-26006: Engine tachometer

Tester knob indication: Voltage (~)



REGULATOR/RECTIFIER

- Remove the seat, radiator covers and fuel tank.
(5-2, 13-2, -3)
- Disconnect the regulator/rectifier coupler ①.
- Remove the regulator/rectifier ③ by removing its bolts ②.
- Measure the voltage between the lead wires using the multi circuit tester as indicated in the table below. If the voltage is not within the specified value, replace the regulator/rectifier with a new one.



09900-25008: Multi circuit tester set

Tester knob indication: Diode test (←→)

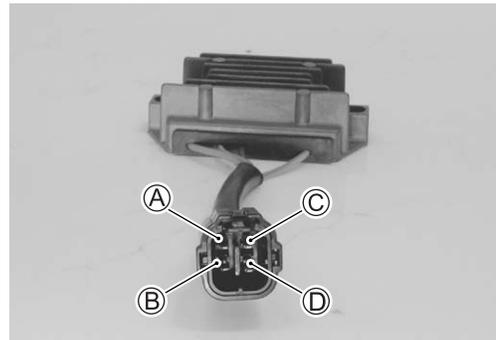
Unit: V

		⊕ Probe of tester to:			
		Ⓐ (Y/R)	Ⓑ (Y/R)	Ⓒ (Br)	Ⓓ (R)
⊖ Probe of tester to:	Ⓐ (Y/R)		*	0.1 – 0.8	*
	Ⓑ (Y/R)	*		0.1 – 0.8	*
	Ⓒ (Br)	*	*		*
	Ⓓ (R)	0.1 – 0.8	0.1 – 0.8	0.2 – 0.9	

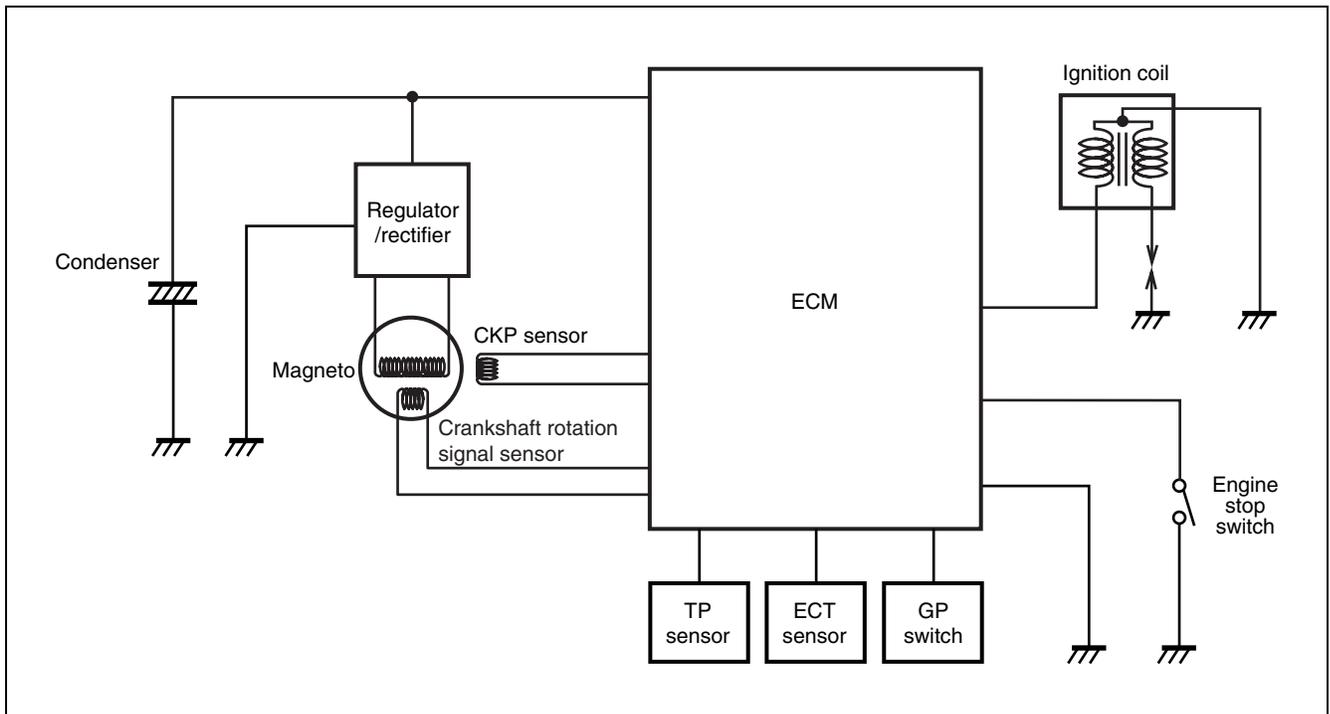
* More than 1.4 V (tester's battery voltage)

NOTE:

If the tester reads 1.4 V and below when the tester probes are not connected, replace its battery.



IGNITION SYSTEM



NOTE:

The fuel cut-off circuit is incorporated in this ECM in order to prevent over-running of engine.

TROUBLESHOOTING

No spark or poor spark

Step 1

1) Check the ignition system couplers for poor connections.

Is there connection in the ignition system couplers?

YES	Go to Step 2.
NO	Poor connection of couplers

Step 2

1) Measure the ignition coil primary peak voltage. (☞ 15-13)

Is the peak voltage OK?

YES	Go to Step 3.
NO	Go to Step 4.

Step 3

1) Inspect the spark plug. (☞ 2-7, -8)

Is the spark plug OK?

YES	<ul style="list-style-type: none"> • Poor connection of the spark plug • Go to Step 4.
NO	Faulty spark plug

Step 4

1) Measure the ignition coil/plug cap resistance. (☞ 15-14)

Is the ignition coil/plug cap resistance OK?

YES	Go to Step 5.
NO	Faulty ignition coil/plug cap

Step 5

1) Measure the CKP sensor peak voltage and its resistance. (☞ 15-15, -16)

Are the peak voltage and resistance OK?

YES	Go to Step 6.
NO	<ul style="list-style-type: none"> • Faulty CKP sensor • Metal particles or foreign material being stuck on the CKP sensor and rotor tip

Step 6

1) Measure the crankshaft rotation signal sensor peak voltage and its resistance. (☞ 15-15, -16)

Are the peak voltage and resistance OK?

YES	Go to Step 7.
NO	<ul style="list-style-type: none"> • Faulty crankshaft rotation signal sensor • Metal particles or foreign material being stuck on the crankshaft rotation signal sensor and rotor tip

Step 7

1) Check the stator. (☞ 15-9)

Is the stator OK?

YES	Go to Step 8.
NO	Faulty stator

Step 8

1) Measure the engine stop switch resistance. (☞ 15-16)

Is the resistance OK?

YES	<ul style="list-style-type: none"> • Faulty ECM • Open or short circuit in wire harness
NO	Faulty engine stop switch

INSPECTION

IGNITION COIL PRIMARY PEAK VOLTAGE

- Remove the seat, radiator covers and fuel tank.
( 5-2, 13-2, -3)
- Hold the cylinder head cover bolt immovable with the wrench.
- Remove the ignition coil retainer ② by removing its bolts ①.
- Disconnect the ignition coil/plug cap lead wire coupler ③ before removing the ignition coil/plug cap ④.

CAUTION

- * Do not remove the ignition coil/plug cap before disconnection the lead wire coupler, or the lead wire will be damaged.
- * Do not pry up the ignition coil/plug cap with a screwdriver or a bar to avoid damage.
- * Be careful not to drop the ignition coil/plug cap as it may open or short in a circuit.

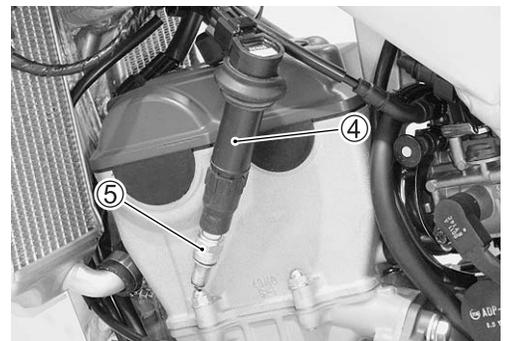
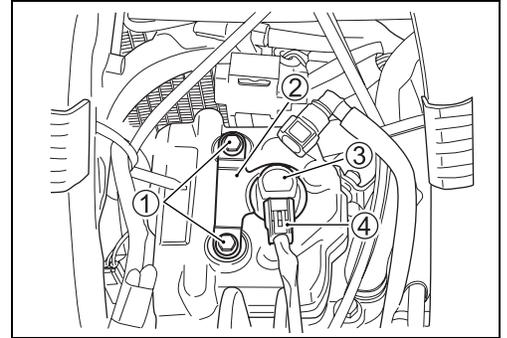
- Connect a new spark plug ⑤ to the ignition coil/plug cap ④.
- Connect the ignition coil/plug cap lead wire coupler to the ignition coil/plug cap, and ground it to the cylinder head.

CAUTION

- Avoid grounding the spark plug and supplying the electrical shock to the cylinder head cover (magnesium parts) to prevent the magnesium material from damage.

NOTE:

Be sure that the coupler and spark plug are connected properly.



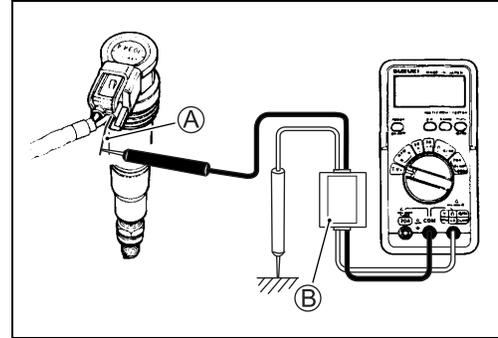
- Insert the needle pointed probe (A) to the lead wire coupler.

NOTE:

Use the special tool (needle-point probe), to prevent the rubber of the water proof coupler from damage.

- Measure the ignition coil primary peak voltage by depressing the kick starter lever several times forcefully.

(B) Peak volt adaptor



⚠ WARNING

Do not touch the tester probes and spark plugs to prevent an electric shock while testing.

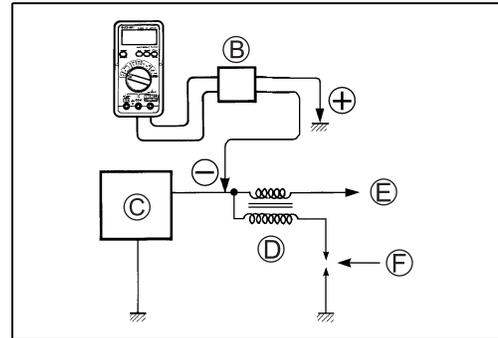
DATA Ignition coil primary peak voltage

+	Ground	-	White/Blue	175 V and more
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- TOOL** 09900-25008: Multi circuit tester set
- 09900-25009: Needle-point probe set

V Tester knob indication: Voltage (---)

If the peak voltage is lower than the standard range, check the ignition coil/plug cap as follow.



- (B) Peak volt adaptor
- (C) ECM
- (D) Ignition coil
- (E) To engine stop switch
- (F) New spark plug

IGNITION COIL/PLUG CAP INSPECTION

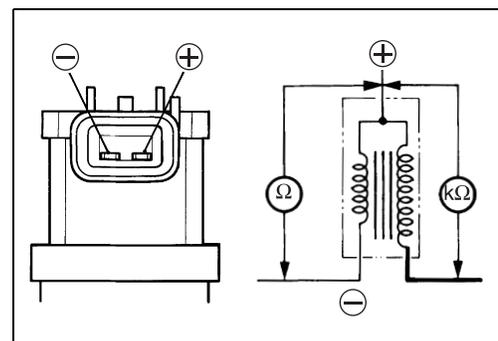
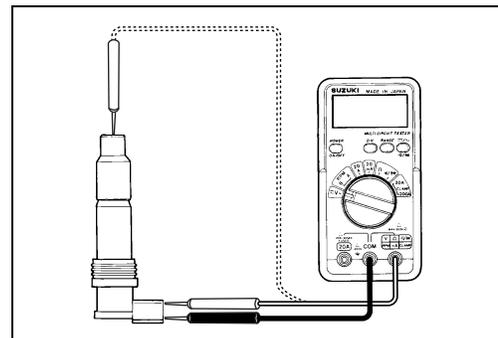
- Remove the seat, radiator covers and fuel tank. (5-2, 13-2, -3)
- Disconnect the ignition coil/plug cap lead wire coupler, and then remove the ignition coil/plug cap. (2-7)
- Measure the ignition coil/plug cap resistance.

DATA Ignition coil/plug cap resistance

Primary	⊕ terminal – ⊖ terminal	0.01 – 0.11 Ω at 20 °C (68 °F)
Secondary	Plug cap – ⊕ terminal	4.5 – 6.9 kΩ at 20 °C (68 °F)

- TOOL** 09900-25008: Multi circuit tester set
- Ω** Tester knob indication: Resistance (Ω)

If the resistance is not within the standard range, replace the ignition coil/plug cap with a new one.



CKP SENSOR AND CRANKSHAFT ROTATION SIGNAL SENSOR PEAK VOLTAGE

- Disconnect the magneto lead wire coupler ①.
- Connect the multi circuit tester with the peak volt adaptor ② as follows.

	CKP sensor	Crankshaft rotation signal sensor
⊕ probe	R	B/R
⊖ probe	G	R/W

 **09900-25008: Multi circuit tester set**

- Measure the highest peak voltage by depressing the kick starter lever several times forcefully.

CAUTION

When using the multi circuit tester and peak volt adaptor, refer to the appropriate instruction manual.

- Repeat the above procedure a few times and measure the highest sensor peak voltage.

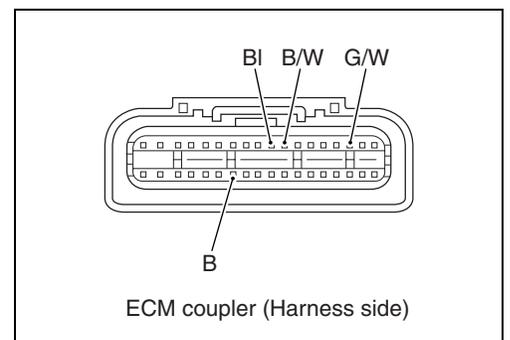
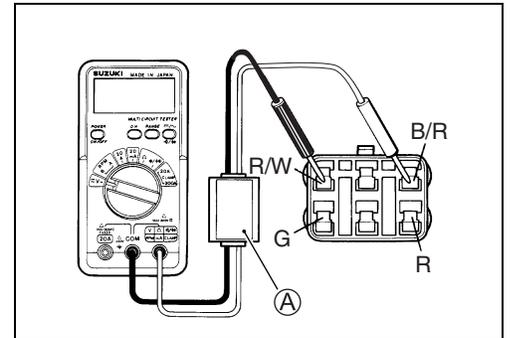
 **CKP sensor peak voltage: 2.8 V and more**
Crankshaft rotation signal sensor peak voltage:
3.5 V and more

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

If the peak voltage is within the specification, check the continuity between the magneto lead wire coupler and ECM coupler.

CAUTION

Normally, use the needle-point probe to the backside of the lead wire coupler to prevent the terminal bend and terminal alignment.

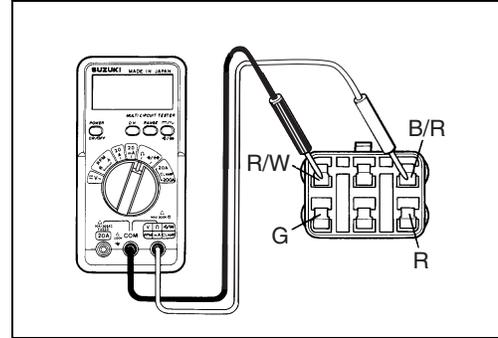


CKP SENSOR AND CRANKSHAFT ROTATION SIGNAL SENSOR RESISTANCE

- Disconnect the magneto lead wire coupler.
- Measure the resistance between the lead wires using the multi circuit tester. If the resistance is not within the specified value, replace the stator with a new one.

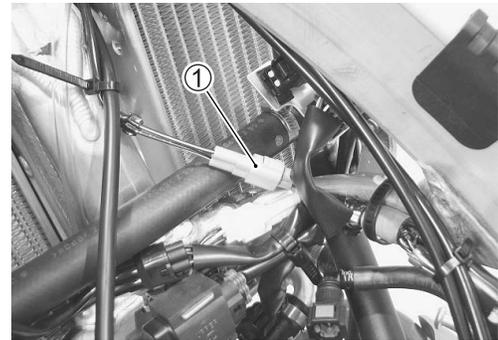
DATA CKP sensor resistance: 80 – 120 Ω (Red – Green)
 Crankshaft rotation signal sensor resistance:
 0.1 – 0.8 Ω (B/R – R/W)

- TOOL** 09900-25008: Multi circuit tester set
- TESTER** Tester knob indication: Resistance (Ω)



ENGINE STOP SWITCH

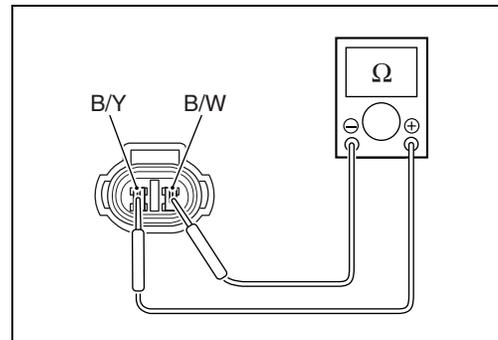
- Remove the seat, radiator covers and fuel tank.
 (☞ 5-2, 13-2, -3)
- Disconnect the engine stop switch lead wire coupler ①.



- Measure the engine stop switch resistance between B/Y lead wire and B/W lead wire.

DATA Engine stop switch resistance:
 ON: Under 1 Ω (B/Y – B/W)
 OFF: ∞ Ω (Infinity) (B/Y – B/W)

- TOOL** 09900-25008: Multi circuit tester set
- 09900-25009: Needle-point probe set
- TESTER** Tester knob indication: Resistance (Ω)

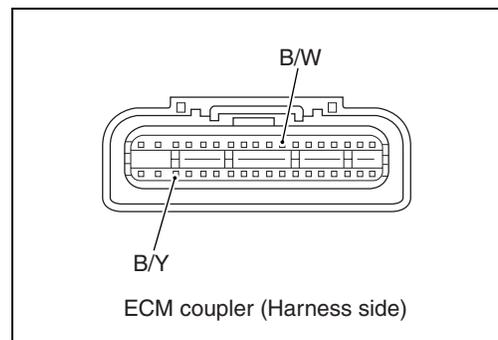


If the measurement is out of the specification, the cause may lie in the engine stop switch.

If the measurement is within the specification, check the continuity between the engine stop switch coupler and ECM coupler.

CAUTION

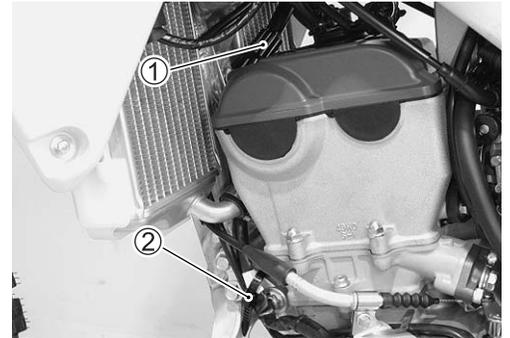
Normally, use the needle-point probe to the backside of the lead wire coupler to prevent the terminal bend and terminal alignment.



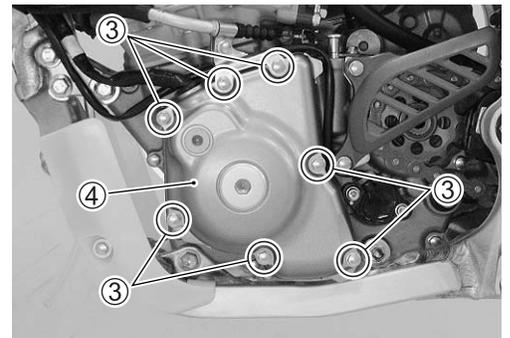
MAGNETO ROTOR

REMOVAL

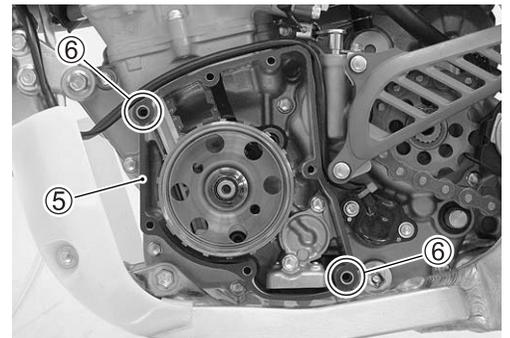
- Drain engine oil. (☞ 2-13)
- Disconnect the magneto lead wire coupler ①.
- Remove the clamp ②.



- Remove the gearshift lever. (☞ 9-3)
- Remove the magneto cover ④ by removing its bolts ③.



- Remove the gasket ⑤ and dowel pins ⑥.



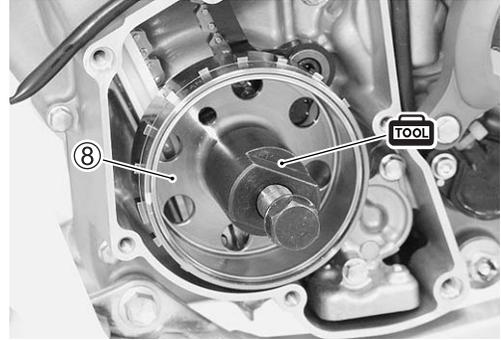
- Hold the magneto rotor with the special tool and remove the rotor nut ⑦.

TOOL 09930-44560: Rotor holder

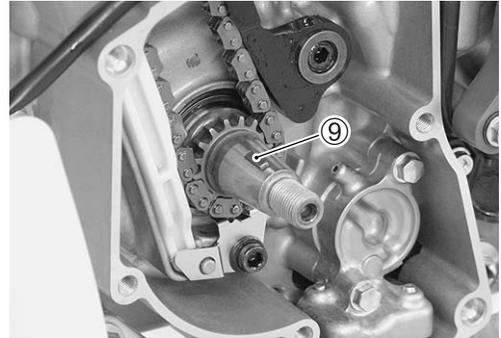


- Remove the magneto rotor ⑧ with the special tool.

 09930-34951: Rotor remover

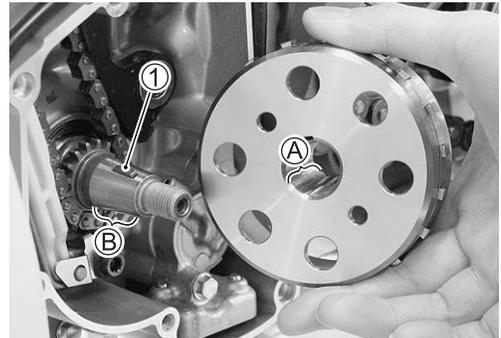


- Remove the magneto rotor key ⑨.



INSTALLATION

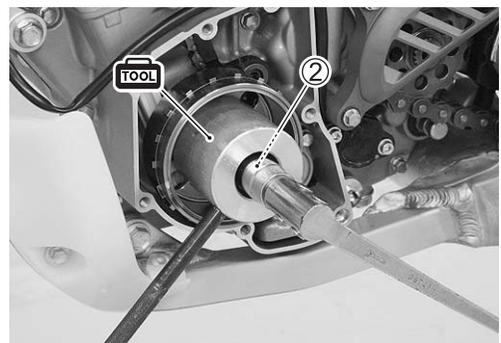
- Remove any grease from the tapered portion (A) of the magneto rotor and crankshaft (B).
- Fit the magneto rotor key ① to the crankshaft.



- Install the magneto rotor.
- Tighten the magneto rotor nut ② to the specified torque with the special tool.

 Magneto rotor nut: 80 N·m (8.0 kgf-m, 58.0 lbf-ft)

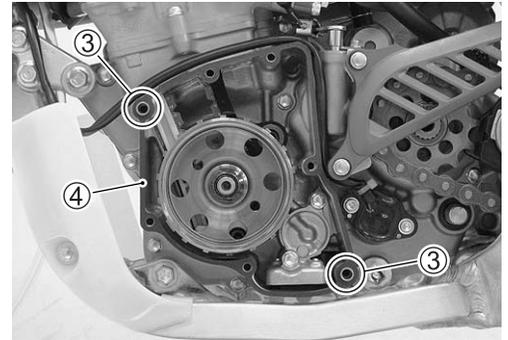
 09930-44560: Rotor holder



- Install the dowel pins ③ and gasket ④.

CAUTION

Replace the gasket ④ with a new one.



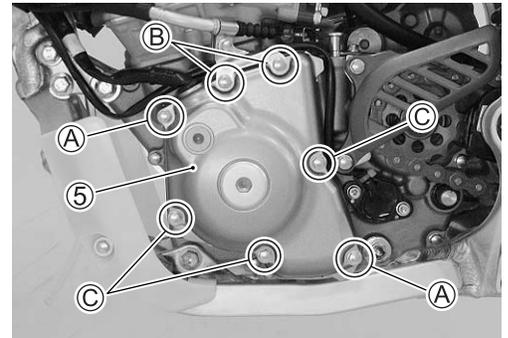
- Install the magneto cover ⑤.
- Tighten the magneto cover bolts (A, B, C) to the specified torque.

NOTE:

* The bolts (A) are 5 mm longer than the others.

* Fit the clutch cable bracket to the bolt (B).

 **Magneto cover bolt: 11 N·m (1.1 kgf-m, 8.0 lbf-ft)**

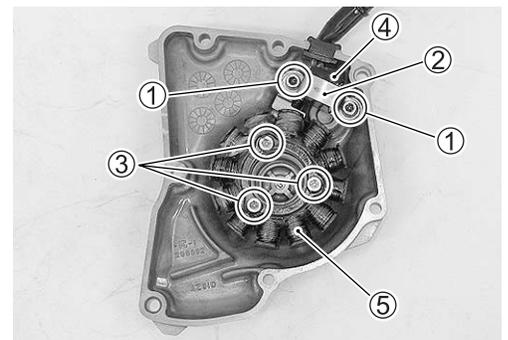


- Install the gearshift lever. (☞ 9-7)
- Pour engine oil. (☞ 2-13)

STATOR

REMOVAL

- Remove the magneto cover. (☞ 15-19)
- Remove the clamp ② by removing its bolts ①.
- Remove the CKP sensor ④ along with stator ⑤ by removing stator bolts ③.



INSTALLATION

- Install the stator ①, CKP sensor ② and clamp ③.

NOTE:

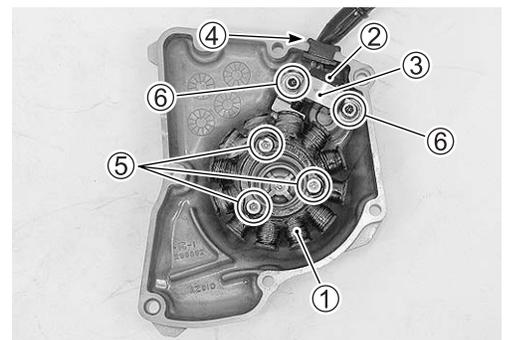
Be sure the grommet ④ is set to the magneto cover.

- Tighten the stator bolts ⑤ and CKP sensor bolts ⑥ to the specified torque.

 **Magneto stator bolt: 5.5 N·m (0.55 kgf-m, 4.0 lbf-ft)**

CKP sensor bolt: 5.5 N·m (0.55 kgf-m, 4.0 lbf-ft)

- Install the magneto cover. (☞ above)

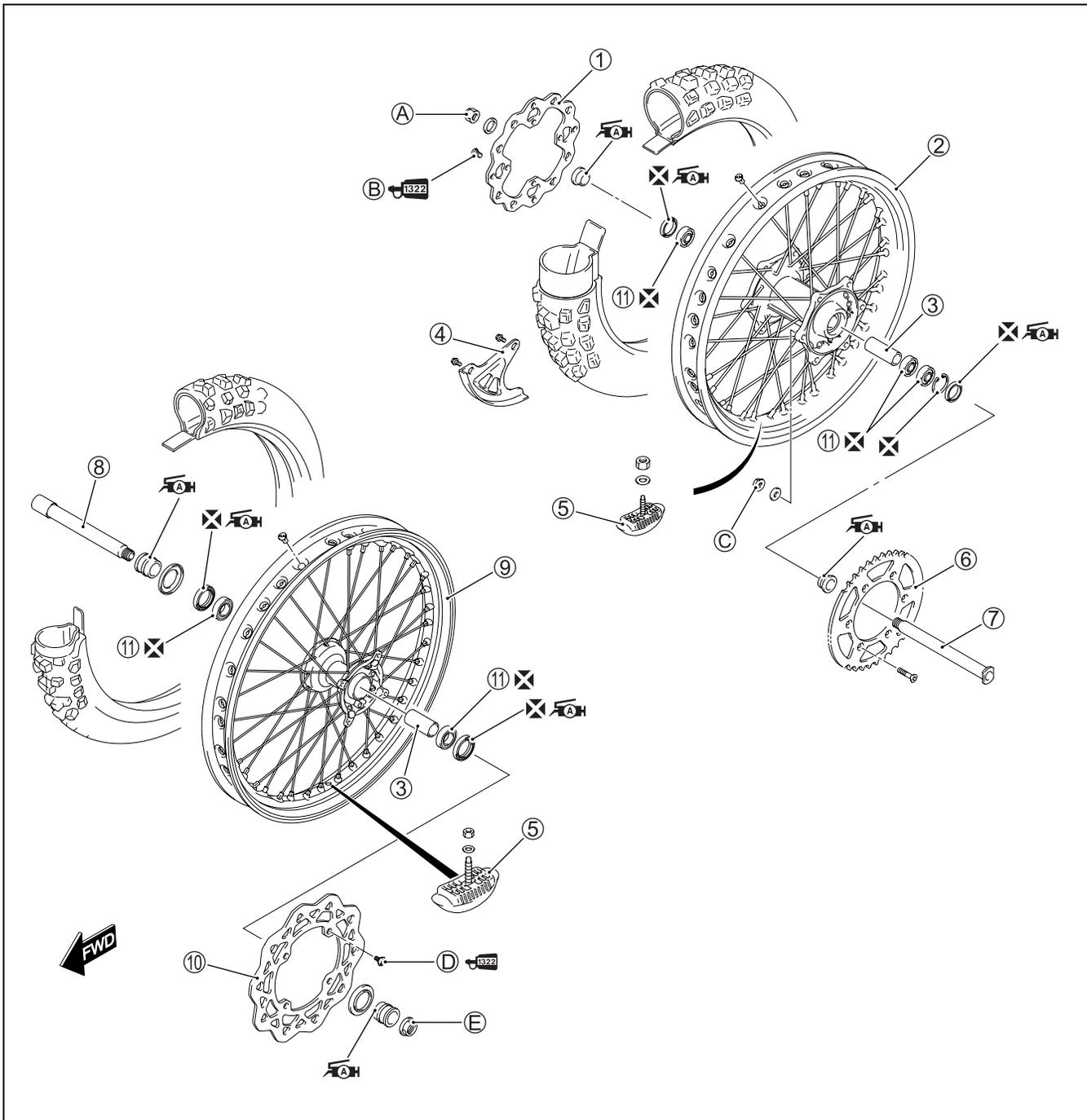


FRONT AND REAR WHEELS

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CONSTRUCTION



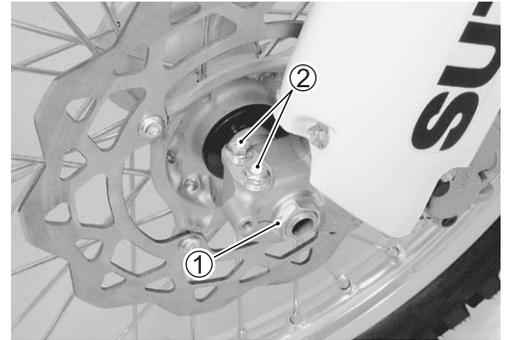
①	Rear disc plate	⑨	Front wheel (1.60 × 21)
②	Rear wheel (1.85 × 19)	⑩	Front disc plate
③	Spacer	⑪	Wheel bearing
④	Disc cover	A	Rear axle nut
⑤	Rim lock	B	Disc plate bolt (Rear)
⑥	Rear sprocket	C	Rear sprocket nut
⑦	Rear axle shaft	D	Disc plate bolt (Front)
⑧	Front axle shaft	E	Front axle nut

ITEM	N·m	kgf·m	lbf·ft
A	90	9.0	65.0
B	26	2.6	19.0
C	30	3.0	21.5
D	11	1.1	8.0
E	35	3.5	25.5

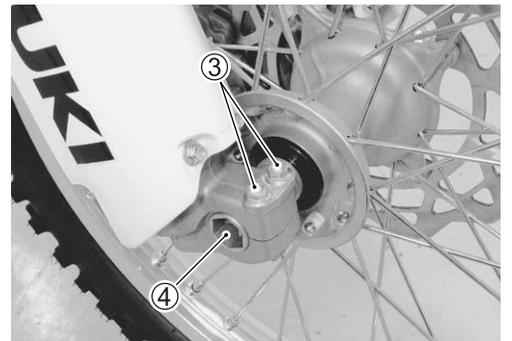
FRONT WHEEL

REMOVAL

- Remove the front axle nut ①.
- Loosen the left axle holder bolts ②.



- Place the motorcycle on a block to lift front wheel off the ground.
- Loosen the right axle holder bolts ③.
- Remove the front axle ④.
- Remove the front wheel.



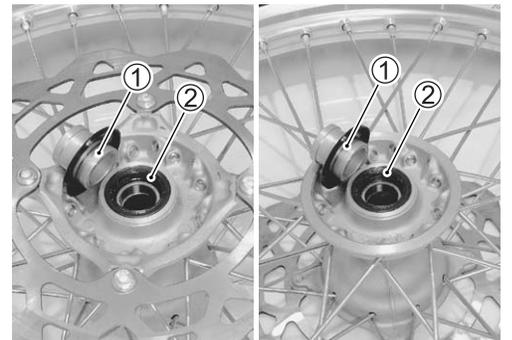
INSPECTION

SPACER AND DUST SEAL

- Remove the wheel spacers ① from the front wheel.
- Inspect the right and left wheel spacers ① and dust seals ② for wear and cracks.
- If any defects are found, replace the spacer ① together with the dust seal ②.

NOTE:

Apply grease to the spacers ① and dust seals ② before reassembling.

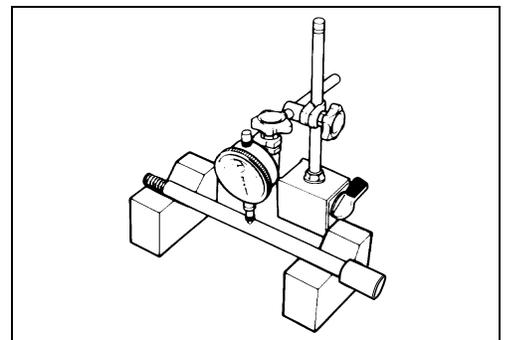


AXLE SHAFT

- Support the axle shaft with the V blocks and measure the axle shaft runout.
- If the runout exceeds the limit, replace the axle shaft with a new one.

DATA Front axle runout
Service Limit: 0.25 mm (0.010 in)

TOOL 09900-20607: Dial gauge
09900-20701: Dial gauge chuck
09900-21304: V blocks

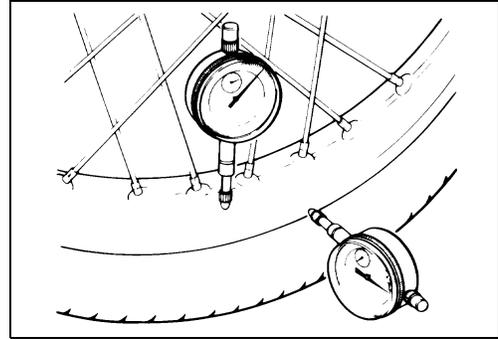


WHEEL RIM

- Measure the wheel rim runout with the dial gauge.
- If the runout exceeds the limit, replace the bearings or wheel.

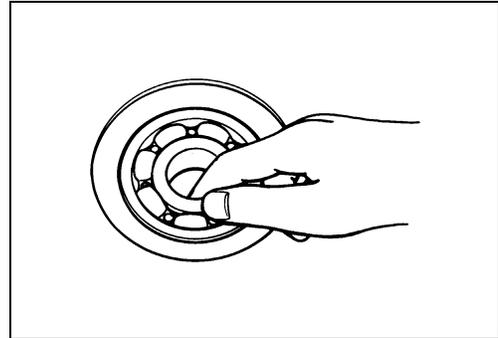
DATA Service Limit: 2.0 mm (0.08 in) ... axial and radial

- TOOL** 09900-20607: Dial gauge
- 09900-20701: Dial gauge chuck



WHEEL BEARING

- Turn the inner race by finger and inspect it for smooth movement.
- Inspect for bearing damage.
- If any defects are found, replace the bearing with a new one.



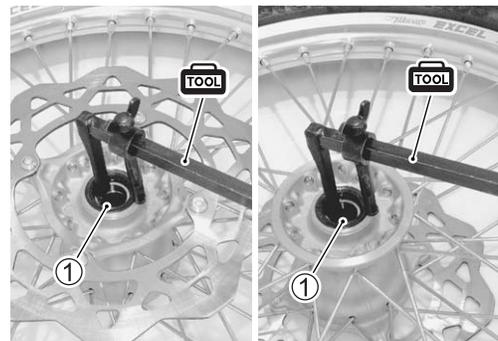
DUST SEAL AND BEARING REPLACEMENT

- Remove the dust seals ① with the special tool.

CAUTION

The removed dust seals ① must be replaced with new ones.

- TOOL** 09913-50121: Oil seal remover

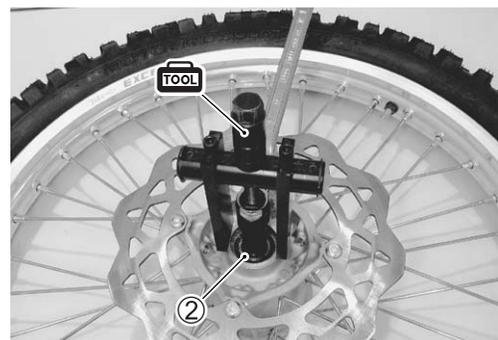
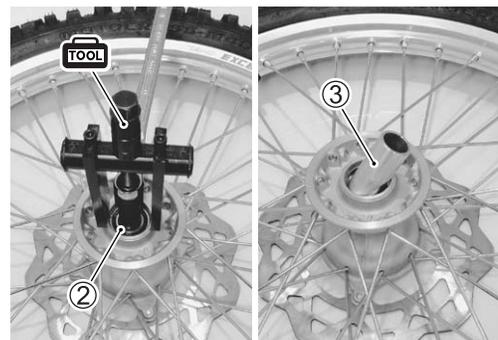


- Remove the bearing ② with the special tool.
- Remove the spacer ③ and bearing ② with the special tool.

CAUTION

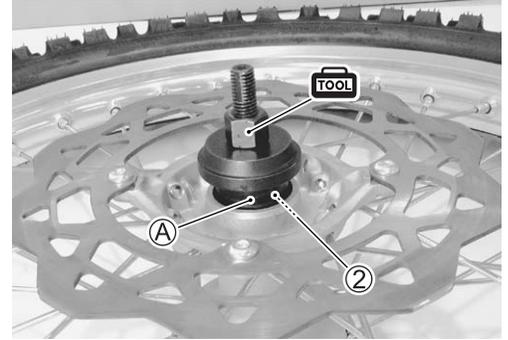
The removed bearings ② must be replaced with new ones.

- TOOL** 09921-20240: Bearing remover set



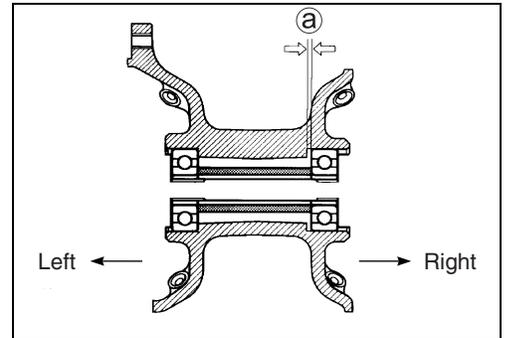
- Install new bearings ② with the special tool, using the suitable spacer ① match for the outside dimension of bearings.

TOOL 09924-84510: Bearing installer set



NOTE:

- * Install the left side (disc side) bearing first and then the right side bearing.
- * After installing the bearings, inspect the bearings for smooth movement.



① Clearance

- Install new dust seals ① and apply grease to their lips.

NOTE:

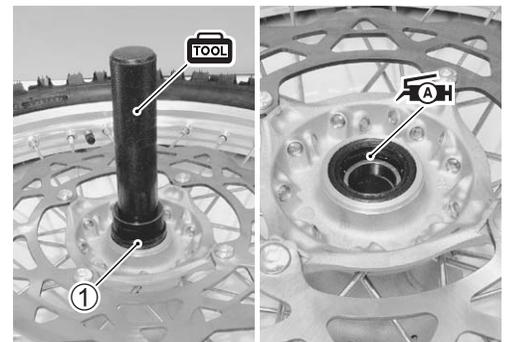
When installing the dust seal ①, place the manufacturer's code indicated side of the dust seal outside.

TOOL 09913-70210: Bearing installer set (10 – 75 φ)

Bearing: φ 40 Attachment

AH 99000-25010: SUZUKI SUPER GREASE "A"

or equivalent



DISC PLATE REPLACEMENT

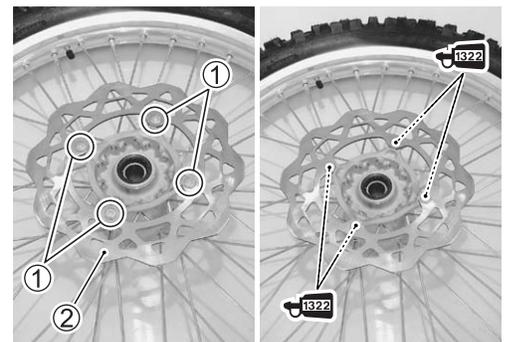
- Remove the disc plate ② by removing its bolts ①.
- Apply THREAD LOCK SUPER to the disc plate bolts ①.

1322 99000-32110: THREAD LOCK SUPER "1322"

or equivalent

- Tighten the disc plate bolts ① to the specified torque.

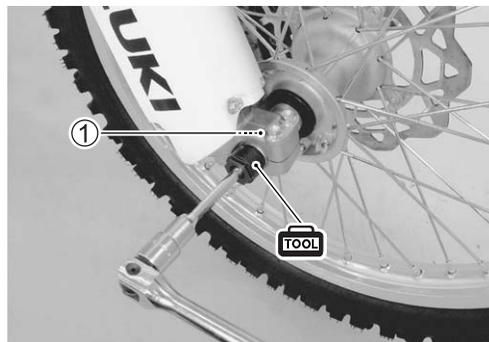
U Disc plate bolt: 11 N·m (1.1 kgf·m, 8.0 lbf·ft)



INSTALLATION

- Hold the front axle shaft ① with the special tool and tighten the front axle nut temporarily.

 **09940-34581: Front fork assembling attachment (F)**

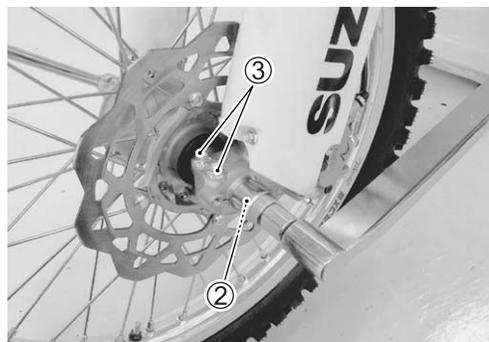


- Remove the block from under the chassis tube and move the front forks up and down several times.
- Tighten the front axle nut ② to the specified torque.

 **Front axle nut: 35 N·m (3.5 kgf-m, 25.5 lbf-ft)**

- Tighten the left and right axle holder bolts ③ to the specified torque.

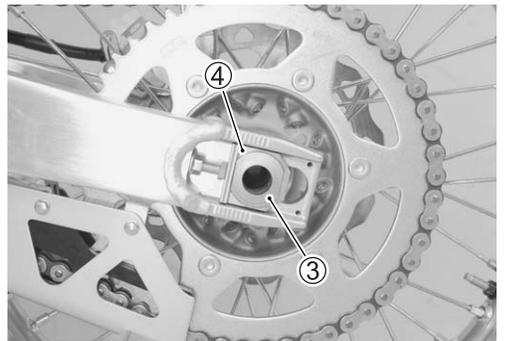
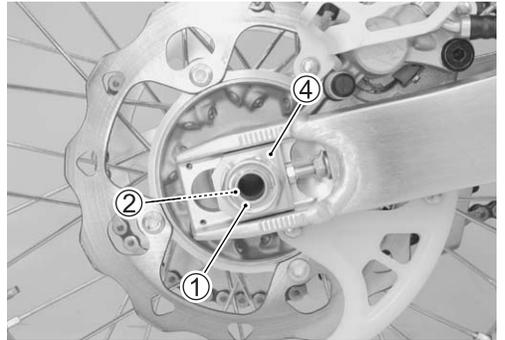
 **Axle holder bolt: 18 N·m (1.8 kgf-m, 13.0 lbf-ft)**



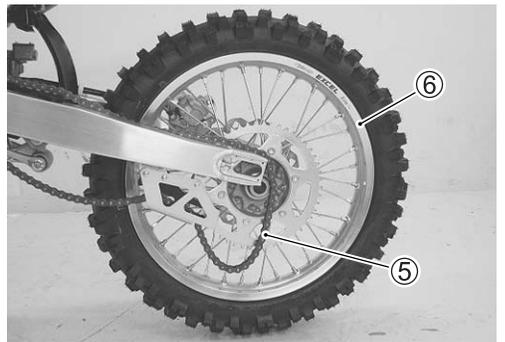
REAR WHEEL

REMOVAL

- Loosen the rear axle nut ①.
- Place the motorcycle on a block to lift the rear wheel off the ground.
- Remove rear axle nut ① and washer ②.
- Remove the rear axle shaft ③ and chain adjuster washers ④.



- Disengage the drive chain ⑤.
- Remove the rear wheel ⑥.



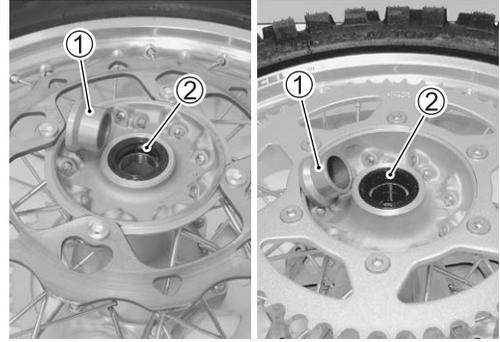
INSPECTION

WHEEL SPACER

- Remove the wheel spacers from the rear wheel.
- Inspect the rear wheel spacers ① and dust seals ② for wear and cracks.
- If any defects are found, replace the spacer ① together with the dust seal ②.

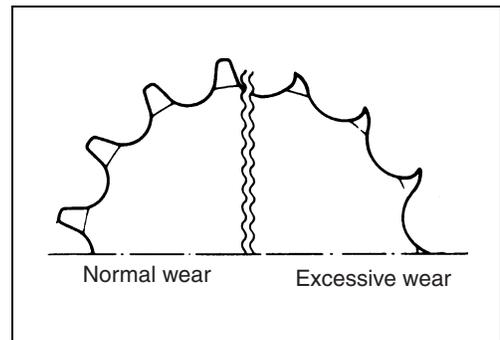
NOTE:

Apply grease on the spacers ① and dust seals ② before reassembling.



SPROCKET

- Inspect the sprocket teeth for wear.
- If they are worn as shown, replace the two sprockets and drive chain as a set.



AXLE SHAFT (👉 16-3)

WHEEL RIM (👉 16-4)

WHEEL BEARING (👉 16-4)

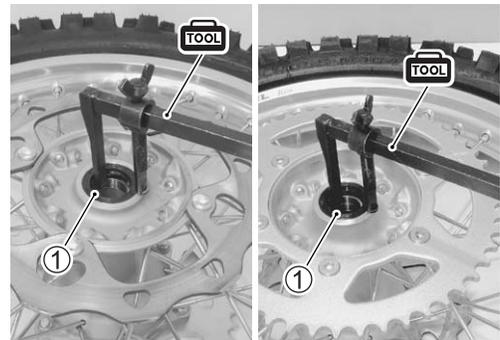
DUST SEAL AND BEARING REPLACEMENT

- Remove the dust seals ① with the special tool.

CAUTION

The removed dust seals ① must be replaced with new ones.

 09913-50121: Oil seal remover

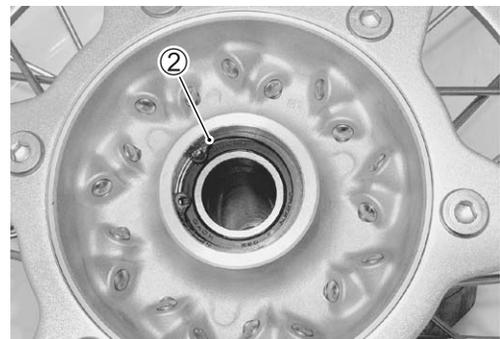


- Remove the snap ring ②.

CAUTION

The removed snap ring ② must be replaced with a new one.

 09900-06108: Snap ring pliers (Close type)

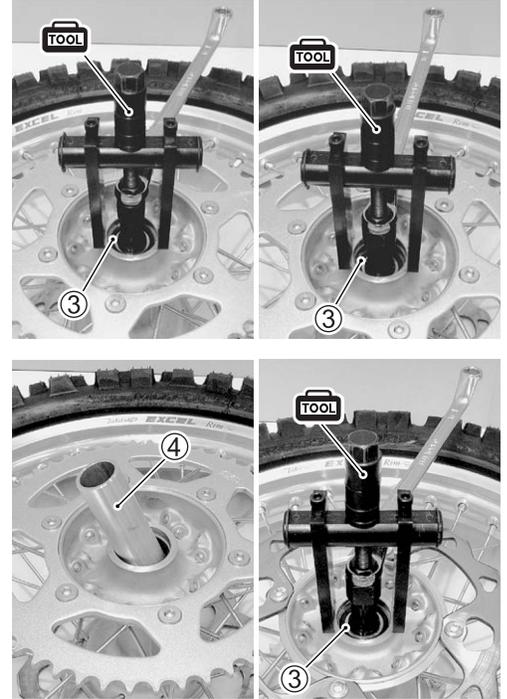


- Remove the bearings ③ with the special tool.
- Remove the spacer ④ and bearing ③ with the special tool.

CAUTION

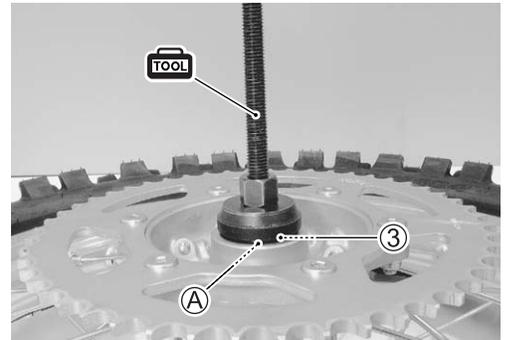
The removed bearings ③ must be replaced with new ones.

 **09921-20240: Bearing remover set**



- Install new bearings ③ with the special tool, using the suitable spacer ④ match for the outside dimension of bearings.

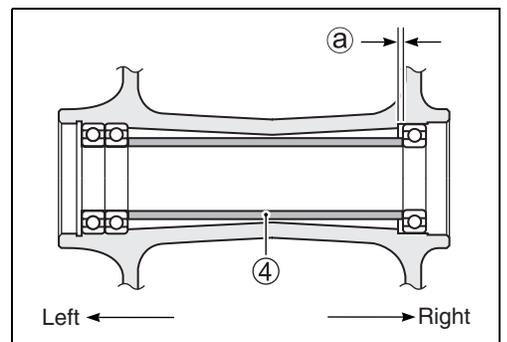
 **09941-34513: Bearing installer**



NOTE:

- * Install the left side (sprocket side) bearings first and then the right side bearing.
- * After installing the bearings, inspect the bearings for smooth movement.

- Ⓐ Clearance
- ④ Spacer

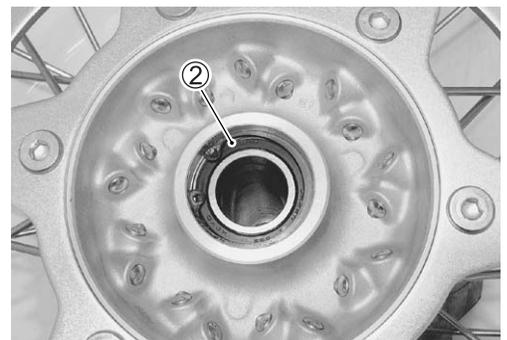


- Install a new snap ring ②.

NOTE:

Take care not to scratch the sealed bearing by the snap ring pliers when installing the snap ring.

 **09900-06108: Snap ring remover (Close type)**



- Install new dust seals ① and apply grease to their lips.

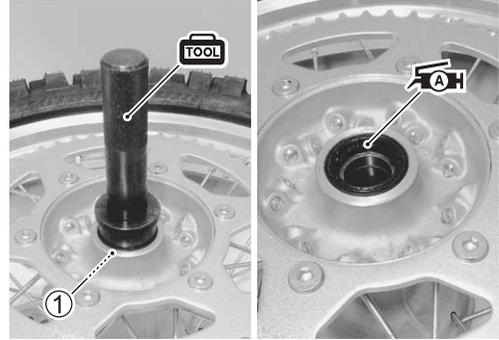
NOTE:

When installing the dust seal, place the manufacturer's code indicated side of the dust seal outside.

 **09913-70210: Bearing installer set (10 – 75 φ)**

Oil seal: φ 42 Attachment

 **99000-25010: SUZUKI SUPER GREASE "A"**
or equivalent



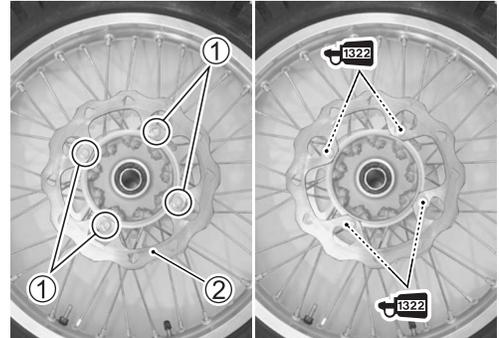
DISC PLATE REPLACEMENT

- Remove the disc plate ② by removing its bolts ①.
- Apply THREAD LOCK SUPER to the disc plate bolts ①.

 **99000-32110: THREAD LOCK SUPER "1322"**
or equivalent

- Tighten the disc plate bolts ① to the specified torque.

 **Disc plate bolt: 26 N·m (2.6 kgf-m, 19.0 lbf-ft)**



REAR SPROCKET REPLACEMENT

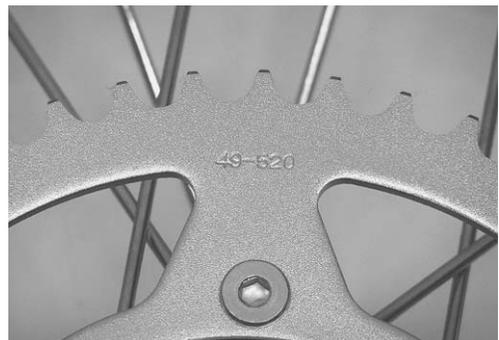
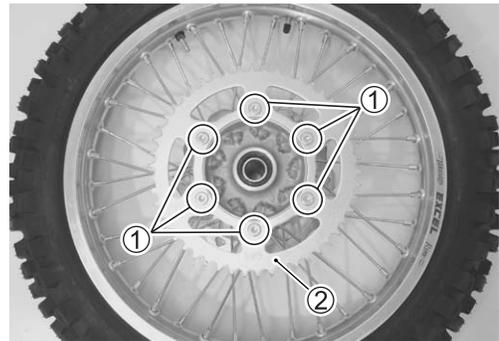
- Remove the rear sprocket ② by removing its bolts and nuts ①.

NOTE:

Install the rear sprocket as the letter on the sprocket surface faces outside.

- Tighten the rear sprocket bolts and nuts ① to the specified torque.

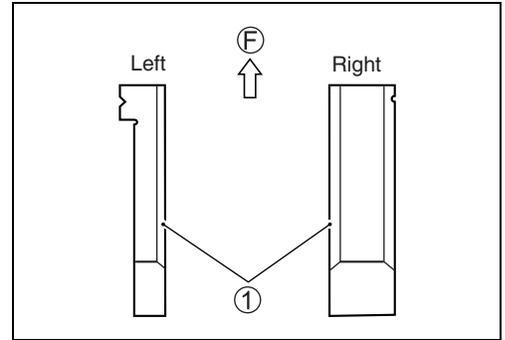
 **Rear sprocket nut: 30 N·m (3.0 kgf-m, 21.5 lbf-ft)**



INSTALLATION

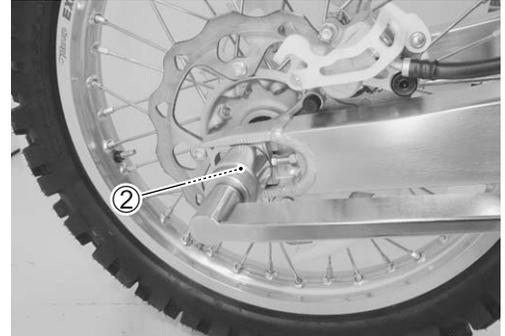
- Install the rear wheel, chain adjuster washers ① and axle shaft.
- Adjust the drive chain slack. (📖 2-31)

Ⓢ FWD



- Tighten the rear axle nut ② to the specified torque.

 **Rear axle nut: 90 N·m (9.0 kgf-m, 65.0 lbf-ft)**



REAR WHEEL SPOKES REPLACEMENT

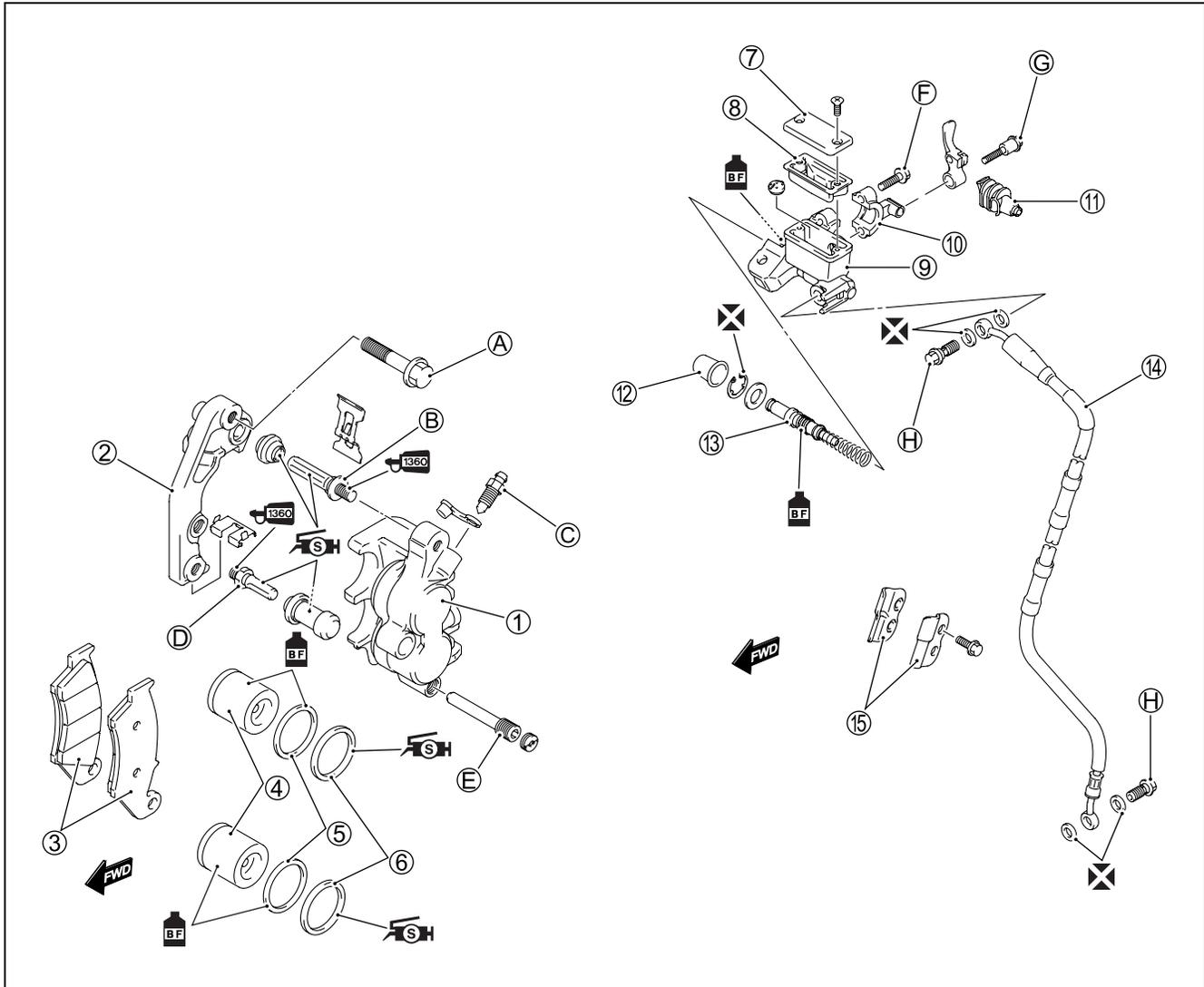
(📖 20-33)

FRONT AND REAR BRAKES

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CONSTRUCTION FRONT BRAKE

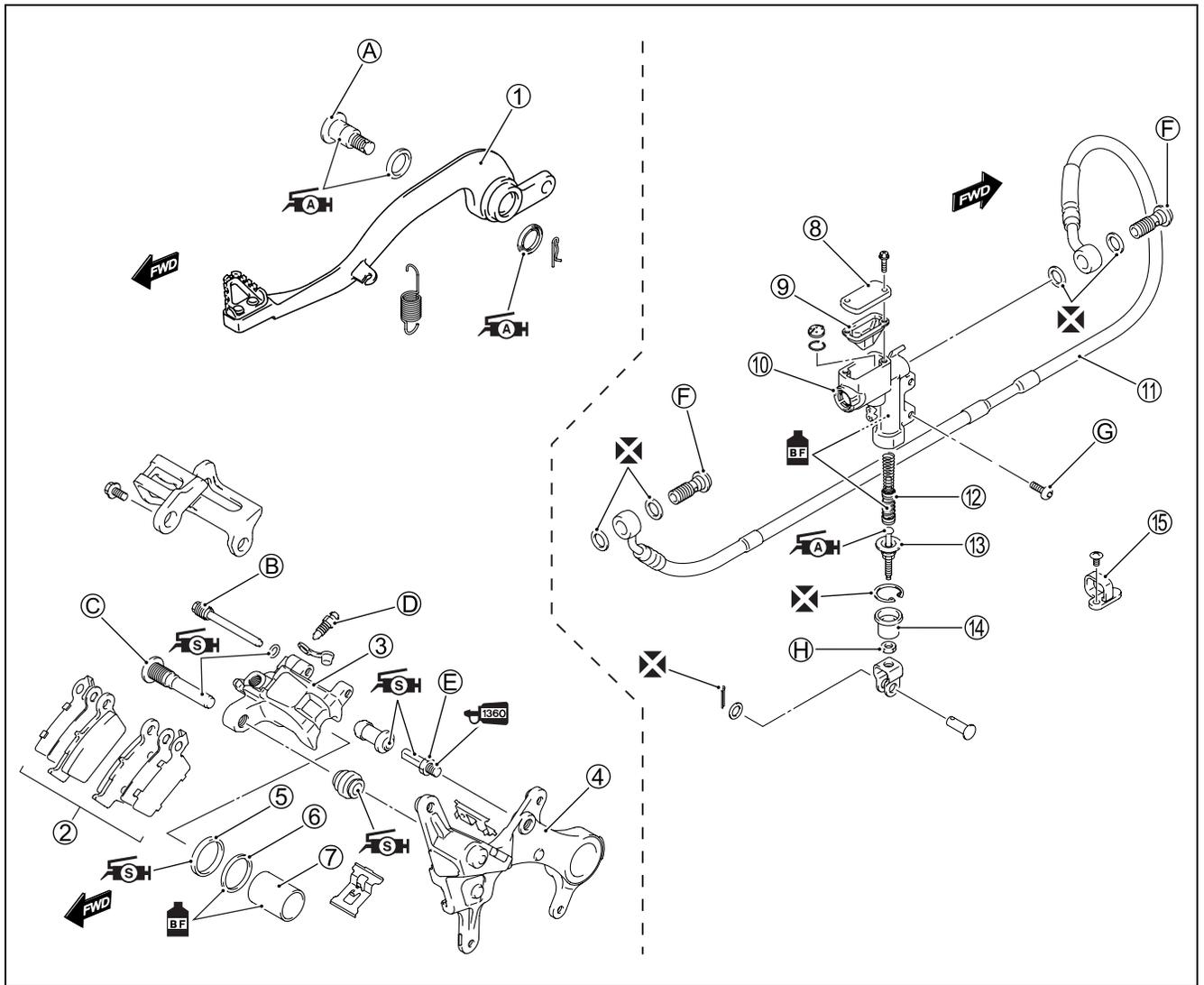


①	Front caliper	⑭	Front brake hose
②	Caliper bracket	⑮	Brake hose clamp
③	Pad set	A	Front brake caliper mounting bolt
④	Piston	B	Front brake caliper axle bolt (caliper)
⑤	Dust seal	C	Brake air bleeder valve
⑥	Piston seal	D	Front brake caliper axle bolt (bracket)
⑦	Reservoir cap	E	Brake pad mounting pin
⑧	Diaphragm	F	Front brake master cylinder holder bolt (upper)
⑨	Front master cylinder	G	Front brake master cylinder holder bolt (lower)
⑩	Master cylinder holder	H	Brake hose union bolt
⑪	Holder lever cover		
⑫	Dust boot		
⑬	Piston/cap set		



ITEM	N·m	kgf·m	lbf·ft
A	26	2.6	19.0
B	25	2.5	18.0
C	6	0.6	4.5
D	28	2.8	20.0
E	18	1.8	13.0
F	10	1.0	7.0
G	12	1.2	8.5
H	23	2.3	18.0

REAR BRAKE



①	Brake pedal	⑬	Push rod
②	Pad set	⑭	Dust boot
③	Rear caliper	⑮	Brake hose guide
④	Caliper bracket	A	Brake pedal pivot bolt
⑤	Piston seal	B	Brake pad mounting pin
⑥	Dust seal	C	Rear brake caliper axle bolt (caliper)
⑦	Piston	D	Brake air bleeder valve
⑧	Reservoir cap	E	Rear brake caliper axle bolt (bracket)
⑨	Diaphragm	F	Brake hose union bolt
⑩	Rear master cylinder	G	Rear master cylinder mounting bolt
⑪	Rear brake hose	H	Rear master cylinder rod lock-nut
⑫	Piston/cap set		



ITEM	N-m	kgf-m	lbf-ft
A	29	2.9	21.0
B	18	1.8	13.0
C	27	2.7	19.5
D/H	6	0.6	4.5
E	13	1.3	9.5
F	23	2.3	16.5
G	10	1.0	7.0

BRAKE FLUID AIR BLEEDING

⚠ WARNING

- * Brake fluid can be hazardous to humans and pets. Brake fluid is harmful or fatal if swallowed, and harmful if it comes in contact with your skin or eyes.
- * Keep brake fluid away from children. Call your doctor immediately if brake fluid is swallowed and induce vomiting. Flush eyes or skin with water if brake fluid gets in eyes or comes in contact with skin.

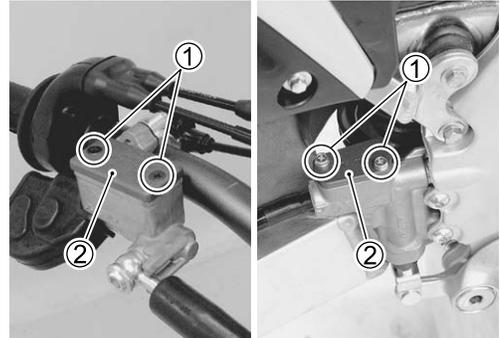
⚠ WARNING

- * The use of any fluid except DOT 4 brake fluid from a sealed container can damage the brake system and lead to an accident.
- * Use only DOT 4 brake fluid from sealed container. Never use or mix different types of brake fluid.

CAUTION

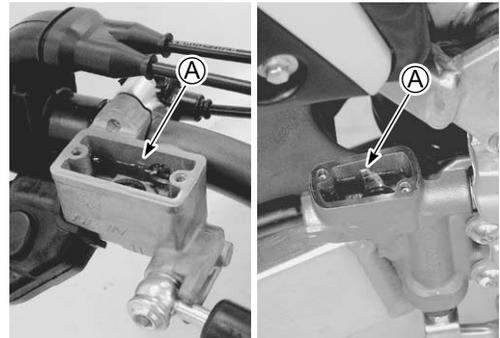
- * Spilled brake fluid can damage painted surfaces and plastic parts.
- * Be careful not to spill any brake fluid when servicing brake fluid. Wipe spilled fluid up immediately.

- Remove the reservoir cap ② by removing its bolts ①.

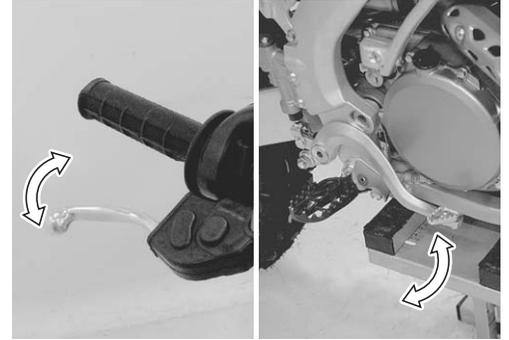


- Pour brake fluid up to the UPPER line ④.

 Specification and classification: DOT 4



- Connect a transparent tube to the bleeder valve and set the other end into a receptacle.
- Pump the brake lever/pedal until air bubbles stop coming out from the reservoir.
- Hold the brake lever/pedal in the squeezed position.
- Open the bleeder valve and tighten the bleeder valve.
- Release the brake lever/pedal.
- Repeat this sequence until air bubbles stop coming out from the bleeder valve.



NOTE:

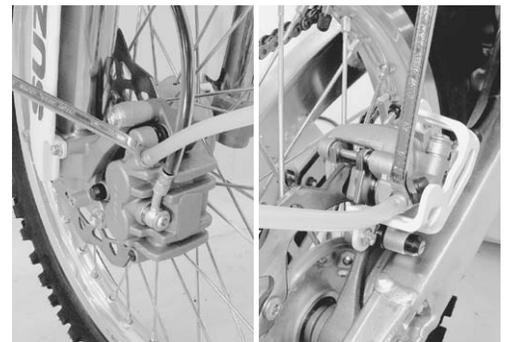
* *Do not release the brake lever/pedal while the bleeder valve is opened.*

* *Replenish brake fluid to the UPPER line when the brake fluid level drops below LOWER line.*

- Tighten the air bleeder valve.

 Air bleeder valve: 6 N·m (0.6 kgf·m, 4.5 lbf·ft)

- Pour brake fluid up to the UPPER line.
- Reassemble the reservoir cap.

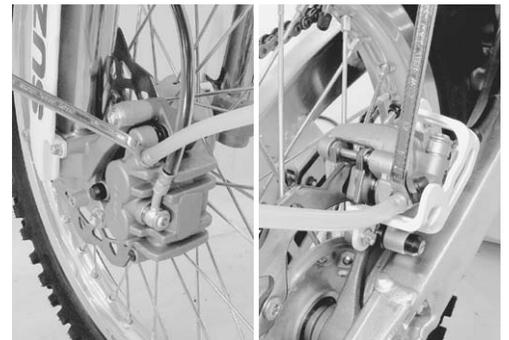


BRAKE FLUID REPLACEMENT

- Remove the reservoir cap. ( 17-4)
- Suck up the brake fluid as much as possible.
- Drain the old brake fluid as much as possible.
- Fill the reservoir with new brake fluid.



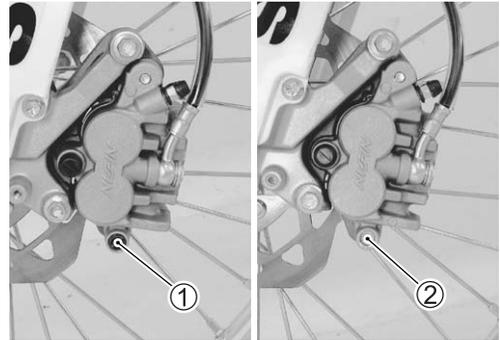
- Connect a transparent tube to the bleeder valve and set the other end into a receptacle.
- Loosen the bleeder valve and pump the brake lever/pedal until old brake fluid is completely out of the brake system.
- Bleed air from the brake system. ( 17-4)



BRAKE PADS REPLACEMENT

FRONT BRAKE PADS

- Remove the cap ① and pad mounting pin ②.



- Remove the brake pads ③.

NOTE:

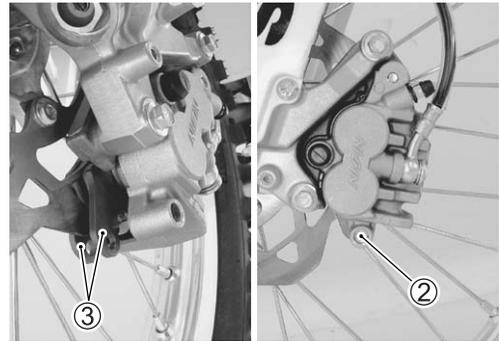
Replace the two brake pads as a set.

- Fit the new brake pads into the caliper.
- Tighten the pad mounting pin ② to the specified torque.

 **Brake pad mounting pin: 18 N·m (1.8 kgf-m, 13.0 lbf-ft)**

NOTE:

Pump the brake lever several times to seat the brake pads after reassembling.

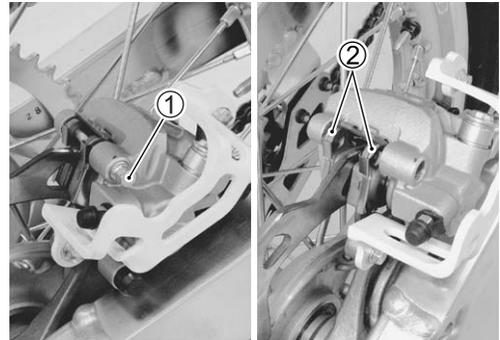


REAR BRAKE PADS

- Remove the pad mounting pin ①.
- Remove the brake pads ②.

NOTE:

Replace the two pads as a set.



- Fit the new brake pads into the caliper.
- Apply SUZUKI SILICONE GREASE to the O-ring.

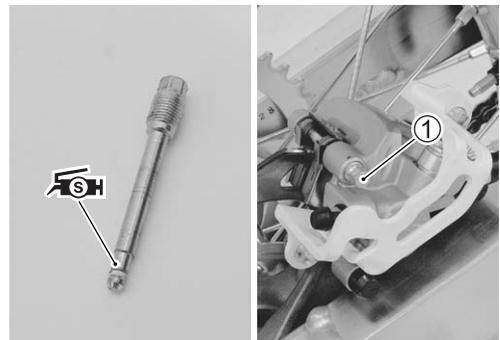
 **99000-25100: SUZUKI SILICONE GREASE**
or equivalent

- Tighten the brake pad mounting pin ① to the specified torque.

 **Brake pad mounting pin: 18 N·m (1.8 kgf-m, 13.0 lbf-ft)**

NOTE:

Pump the brake pedal several times to seat the brake pads after reassembling.



BRAKE DISC INSPECTION

- Inspect the brake discs for damage or cracks.
- Measure the front and rear brake disc thickness.
- Replace the disc if the thickness is less than the service limit or if damage is found.

DATA Brake disc thickness

Service limit (Front): 2.5 mm (0.10 in)
(Rear): 3.5 mm (0.14 in)

TOOL 09900-20205: Micrometer (0 – 25 mm)

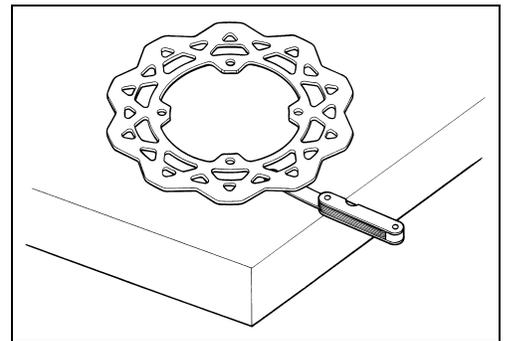
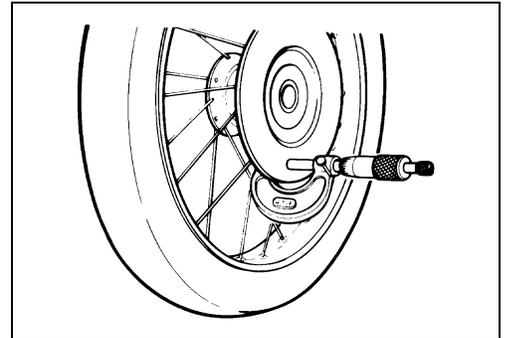
- Measure the front and rear brake disc distortion.
- Replace the disc if the distortion exceeds the service limit.

DATA Brake disc distortion

Service limit: 0.30 mm (0.012 in)

TOOL 09900-20803: Thickness gauge

BRAKE DISC REPLACEMENT (👉 16-5, -10)



CALIPER

⚠ WARNING

- * The use of any brake fluid except DOT 4 brake fluid from a sealed container can damage the brake system and lead to an accident.
- * Use only DOT 4 brake fluid from a sealed container. Never use or mix different types of brake fluid.

⚠ WARNING

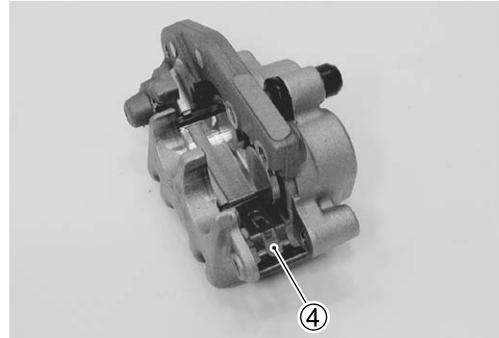
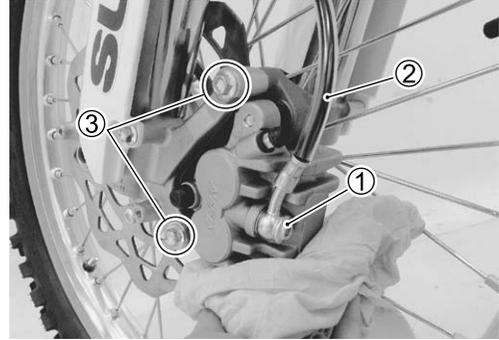
- * Brake fluid can be hazardous to humans and pets. Brake fluid is harmful or fatal if swallowed, and harmful if it comes in contact with your skin or eyes.
- * Keep brake fluid away from children. Call your doctor immediately if brake fluid is swallowed, and induce vomiting. Flush eyes or skin with water if brake fluid gets in eyes or comes in contact with skin.

CAUTION

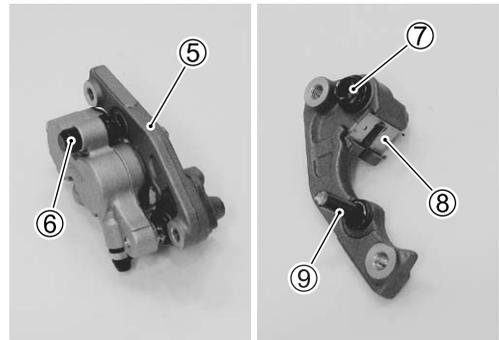
- * Spilled brake fluid can damage painted surfaces and plastic parts.
- * Be careful not to spill any fluid when servicing the caliper. Wipe spilled fluid up immediately.

FRONT CALIPER REMOVAL AND DISASSEMBLY

- Place a rag under the brake hose union bolt ① to catch spilled brake fluid.
 - Disconnect the brake hose ② by removing the union bolt ①.
 - Remove the caliper mounting bolts ③.
 - Remove the caliper.
-
- Remove the brake pads. (☞ 17-6)
 - Remove the spring ④.



- Remove the caliper bracket ⑤ from the caliper.
- Remove the boots ⑥ and ⑦.
- Remove the spring ⑧.
- Remove the front brake caliper axle bolt (bracket) ⑨.



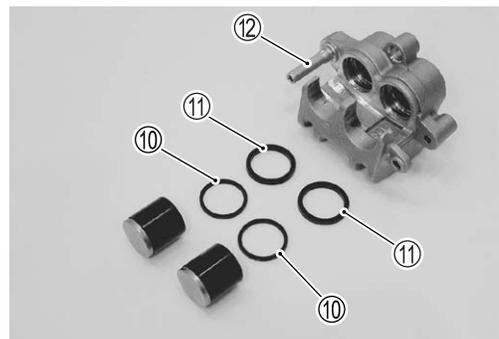
- Wrap the caliper with a rag to prevent brake fluid scatter and piston pop-out.
- Apply low-pressure air into the caliper through the hole to remove the pistons.



⚠ WARNING

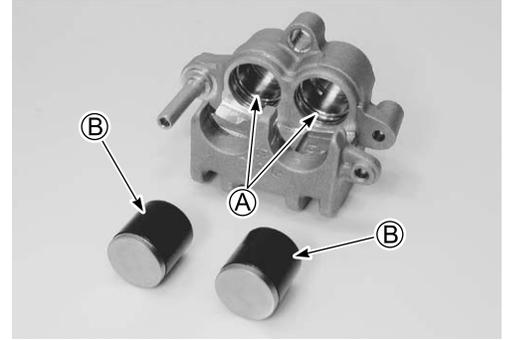
- * Fingers can get caught between piston and caliper body when removing the piston.
- * Do not place your fingers on the piston when removing the piston.

- Remove the dust seals ⑩ and piston seals ⑪.
- Remove the front brake caliper axle bolt (caliper) ⑫.



CALIPER INSPECTION

- Inspect the caliper cylinders (A) for scuffing, wear and damage.
- Inspect the pistons (B) for scuffing, wear and damage.
- If necessary, replace the defective parts with a new one.



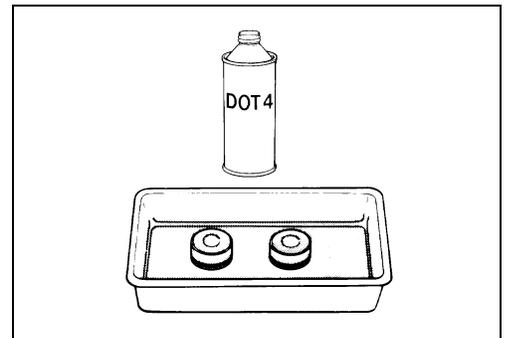
CALIPER CLEANING

- Flush the caliper ports with pressurized air.
- Wash the caliper pistons and cylinders with fresh brake fluid.

 **Specification and classification: DOT 4**

NOTE:

Do not use gasoline or other cleaning solvents to wash the caliper parts.



FRONT CALIPER REASSEMBLY AND INSTALLATION

Reassemble and install the brake caliper in the reverse order of removal and disassembly. Pay attention to the following points:

- Apply THREAD LOCK SUPER to the front brake caliper axle bolt (caliper) and tighten the bolt to the specified torque.

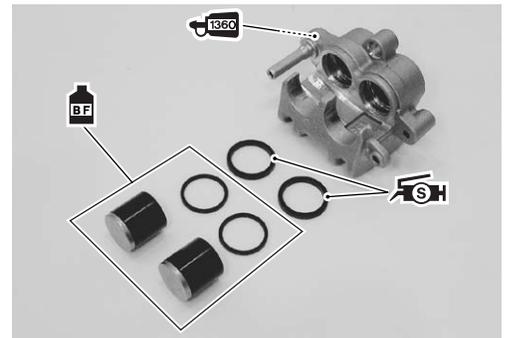
 **99000-32130: THREAD LOCK SUPER "1360"**
or equivalent

 **Front brake caliper axle bolt (caliper):**
25 N·m (2.5 kgf·m, 18.0 lbf·ft)

- Apply SUZUKI SILICONE GREASE to the new piston seals.
- Apply brake fluid to the new dust seals and pistons.
- Fit the piston seals, dust seals and pistons.

 **99000-25100: SUZUKI SILICONE GREASE**
or equivalent

 **Specification and classification: DOT 4**



- Apply THREAD LOCK SUPER to the front brake caliper axle bolt (bracket) and tighten the bolt to the specified torque.

 **99000-32130: THREAD LOCK SUPER “1360”**
or equivalent

 **Front brake caliper axle bolt (bracket):**
28 N·m (2.8 kgf-m, 20.0 lbf-ft)

- Install the springs and boots.
- Apply SUZUKI SILICONE GREASE to the caliper axles.

 **99000-25100: SUZUKI SILICONE GREASE**
or equivalent

- Install the caliper bracket ①.
- Install the brake pads.
- Temporarily tighten the brake pad mounting pin.
- Tighten the caliper mounting bolts ② to the specified torque.

 **Front brake caliper mounting bolt:**
26 N·m (2.6 kgf-m, 19.0 lbf-ft)

- Tighten the brake pad mounting pin ③ to the specified torque.

 **Brake pad mounting pin: 18 N·m (1.8 kgf-m, 13.0 lbf-ft)**

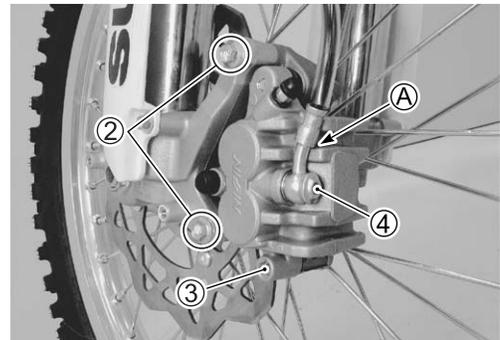
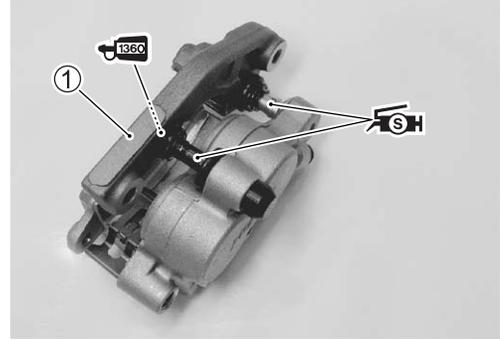
- Set the brake hose end between the hose stopper **A**, then tighten the brake hose union bolt ④ to the specified torque.

CAUTION

Replace the seal washers with new ones.

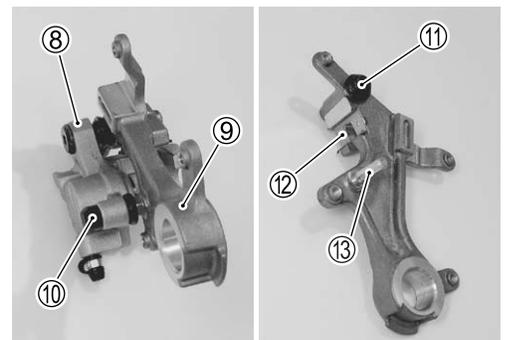
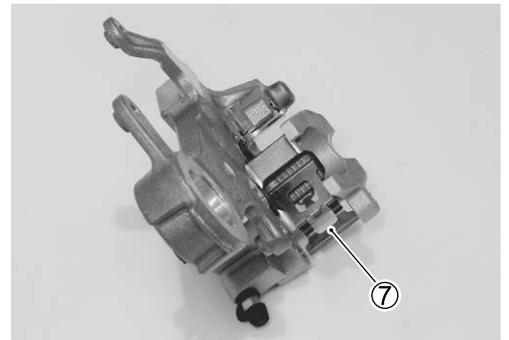
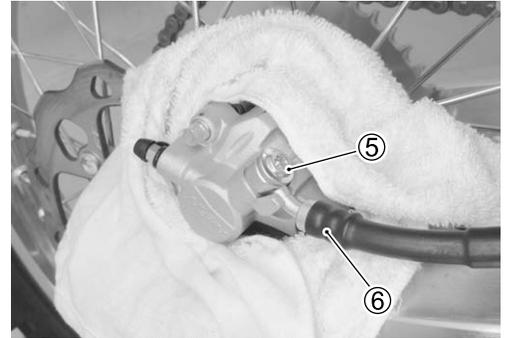
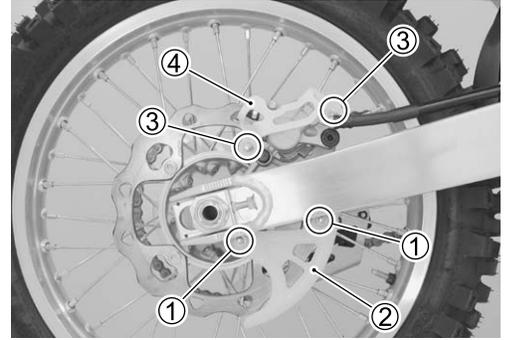
 **Brake hose union bolt: 23 N·m (2.3 kgf-m, 16.5 lbf-ft)**

- Install the pad mounting pin cap.
- Refill brake fluid and bleed air from the brake system.
( 17-4)



REAR CALIPER REMOVAL AND DISASSEMBLY

- Remove the disc cover ② by removing its bolts ①.
- Remove the caliper protector ④ by removing its bolts ③.
- Place a rag under the brake hose union bolt ⑤ to catch spilled brake fluid.
- Disconnect the brake hose ⑥ by removing the union bolt ⑤.
- Remove the rear wheel. (☞ 16-7)
- Remove the caliper.
- Remove the brake pad. (☞ 17-6)
- Remove the spring ⑦.
- Remove the caliper bracket ⑨ from the caliper ⑧.
- Remove the boots ⑩ and ⑪.
- Remove the spring ⑫.
- Remove the rear brake caliper axle bolt (bracket) ⑬.



- Wrap the caliper with a rag to prevent brake fluid scatter and piston pop-out.
- Apply low-pressure air into the caliper through the hole to remove the piston.

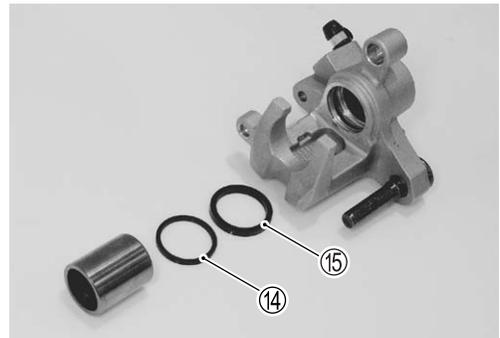
⚠ WARNING

- * **Fingers can get caught between piston and caliper body when removing the piston.**
- * **Do not place your fingers on the piston when removing the piston.**

- Remove the dust seal ⑭ and piston seal ⑮.

BRAKE CALIPER INSPECTION (👉 17-9)

CALIPER CLEANING (👉 17-9)



REAR CALIPER REASSEMBLY AND INSTALLATION

Reassemble and install the brake caliper in the reverse order of removal and disassembly. Pay attention to the following points:

- Apply SUZUKI SILICONE GREASE to the new piston seal.
- Apply brake fluid to the new dust seal and piston.
- Fit the piston seal, dust seal and piston.

 **99000-25100: SUZUKI SILICONE GREASE**
or equivalent

 **Specification and classification: DOT 4**

- Apply THREAD LOCK SUPER to the rear brake caliper axle bolt (bracket) and tighten the bolt to the specified torque.

 **99000-32130: THREAD LOCK SUPER "1360"**
or equivalent

 **Rear brake caliper axle bolt (bracket):**
13 N·m (1.3 kgf-m, 9.5 lbf-ft)

- Install the springs and boots.
- Apply SUZUKI SILICONE GREASE to the caliper axles.

 **99000-25100: SUZUKI SILICONE GREASE**
or equivalent

- Install the caliper bracket ①.

- Install the brake pads.
- Apply SUZUKI SILICONE GREASE to the O-ring.

 **99000-25100: SUZUKI SILICONE GREASE**
or equivalent

- Temporarily tighten the brake pad mounting pin.

- Install the caliper and rear wheel. (☞ 16-11)
- Tighten the brake pad mounting pin ② to the specified torque.

 **Brake pad mounting pin: 18 N·m (1.8 kgf-m, 13.0 lbf-ft)**

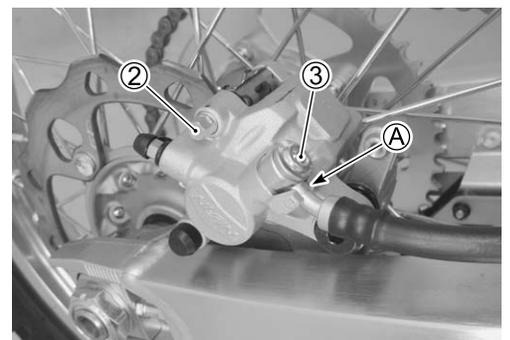
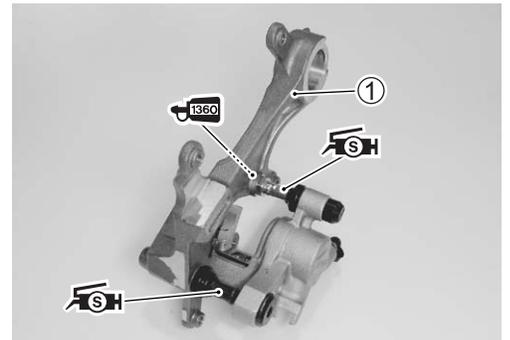
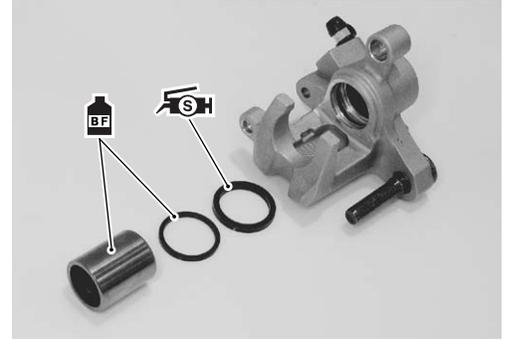
- Set the brake hose end between the hose stopper A, then tighten the brake hose union bolt ③ to the specified torque.

CAUTION

Replace the seal washers with new ones.

 **Brake hose union bolt: 23 N·m (2.3 kgf-m, 16.5 lbf-ft)**

- Refill brake fluid and bleed air from the brake system. (☞ 17-4)



MASTER CYLINDER

⚠ WARNING

- * Brake fluid can be hazardous to humans and pets. Brake fluid is harmful or fatal if swallowed, and harmful if it comes in contact with your skin or eyes.
- * Keep brake fluid away from children. Call your doctor immediately if brake fluid is swallowed, and induce vomiting. Flush eyes or skin with water if brake fluid gets in eyes or comes in contact with skin.

⚠ WARNING

- * The use of any fluid except DOT 4 brake fluid from a sealed container can damage the brake system and lead to an accident.
- * Use only DOT 4 brake fluid from a sealed container. Never use or mix different types of brake fluid.

CAUTION

- * Spilled brake fluid can damage painted surfaces and plastic parts.
- * Be careful not to spill any fluid when filling the brake fluid reservoir. Wipe spilled fluid up immediately.

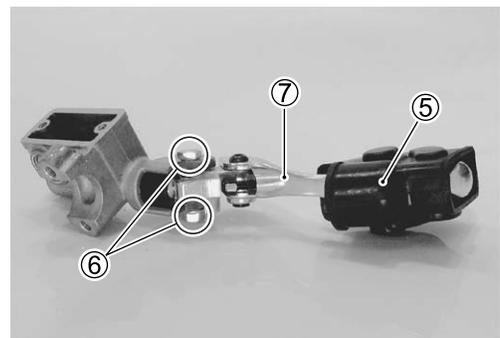
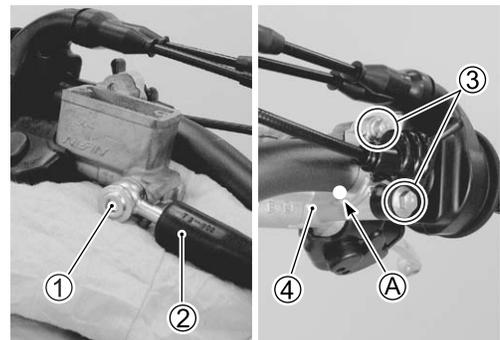
FRONT MASTER CYLINDER REMOVAL AND DISASSEMBLY

- Drain brake fluid. (☞ 17-5)
- Place a rag under the brake hose union bolt ① to catch spilled brake fluid.
- Disconnect the brake hose ② by removing the union bolt ①.
- Remove the master cylinder ④ by removing the master cylinder holder bolts ③.

NOTE:

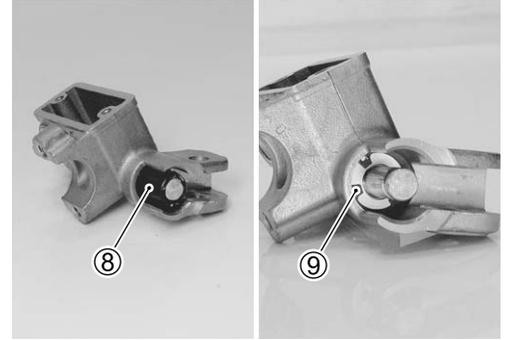
Mark the paint mark Ⓐ to the matching surface of master cylinder holder and handlebars.

- Remove the boot ⑤.
- Remove the brake lever ⑦ by removing the brake lever pivot bolt and nut ⑥.

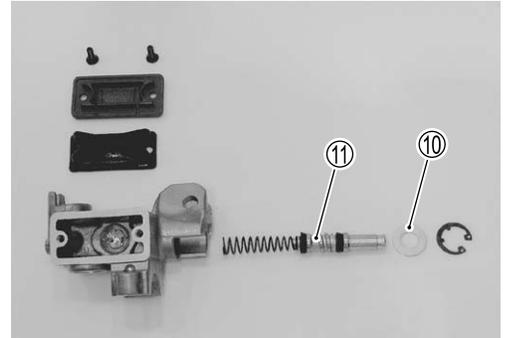


- Remove the dust boot ⑧ and snap ring ⑨.

 **09900-06108: Snap ring remover (Close type)**

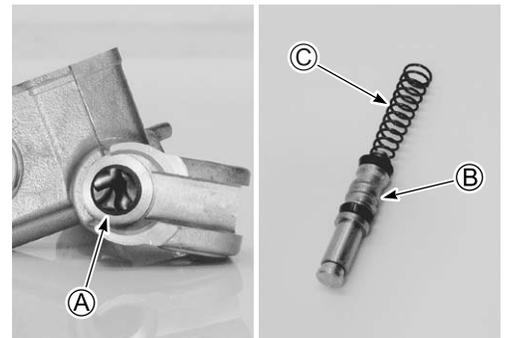


- Remove the washer ⑩ and piston/cup set ⑪.



MASTER CYLINDER INSPECTION

- Inspect the cylinder bore (A) and piston (B) for scuffing, wear and damage.
- Inspect the piston (B) and spring (C) for damage.
- If necessary, replace the defective parts with a new one.



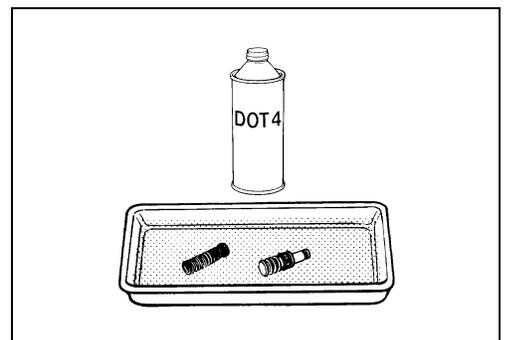
MASTER CYLINDER CLEANING

- Flush the master cylinder ports with pressurized air.
- Wash the master cylinder bore and piston with fresh brake fluid.

 **Specification and classification: DOT 4**

NOTE:

Do not use gasoline or other cleaning solvents to wash the master cylinder parts.



FRONT MASTER CYLINDER REASSEMBLY AND INSTALLATION

Reassemble and install the master cylinder in the reverse order of removal and disassembly. Pay attention to the following points:

- Install the brake lever. (☞ 17-19)

NOTE:

When remounting the master cylinder onto the handlebar, align the master cylinder holder's mating surface **A** with the matching mark **B** on the handlebar and tighten the lower bolt **1** first.

- Tighten the master cylinder holder bolts (**1**, **2**) to the specified torque.

Master cylinder holder bolt :

(Lower **1**): 12 N·m (1.2 kgf-m, 8.5 lbf-ft)

(Upper **2**): 10 N·m (1.0 kgf-m, 7.0 lbf-ft)

NOTE:

Fasten the bolt of master cylinder holder bolt lower side **C**, due to hot starter lever **3** provided.

- Ⓐ Clearance
- ④ Master cylinder
- ⑤ Master cylinder holder

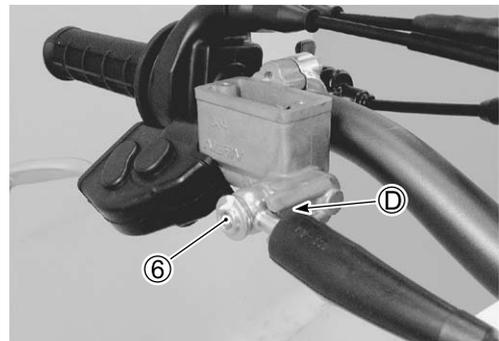
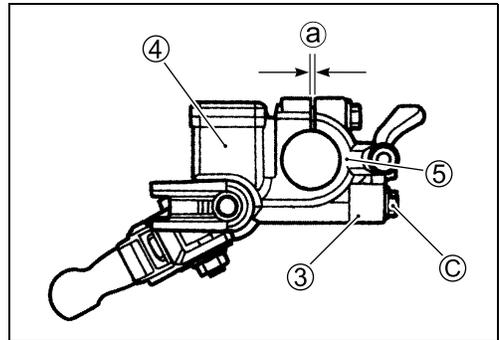
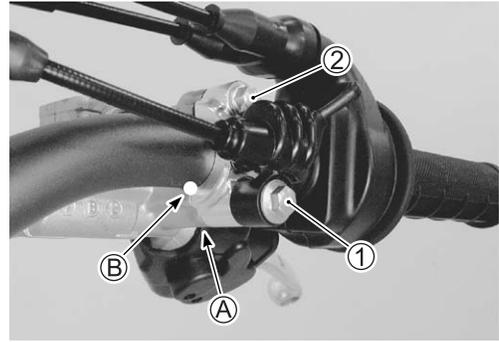
- Set the brake hose end between the hose stopper **D**, then tighten the brake hose union bolt **6** to the specified torque.

CAUTION

Replace the seal washers with new ones.

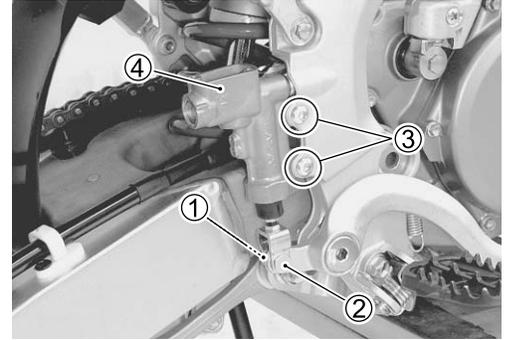
Brake hose union bolt: 23 N·m (2.3 kgf-m, 16.5 lbf-ft)

- Refill brake fluid and bleed air from the brake system. (☞ 17-4)

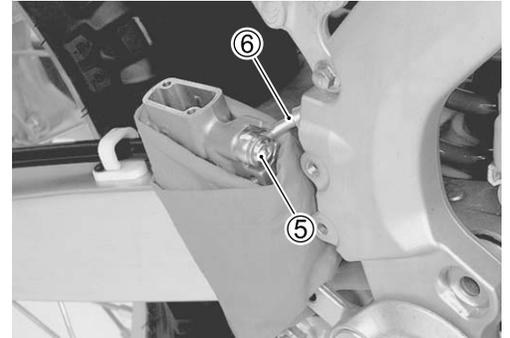


REAR MASTER CYLINDER REMOVAL AND DISASSEMBLY

- Drain brake fluid. (☞ 17-5)
- Remove the cotter pin ① and then master cylinder rod pin ② and washer. (☞ 17-18)
- Remove the master cylinder ④ by removing the bolts ③.

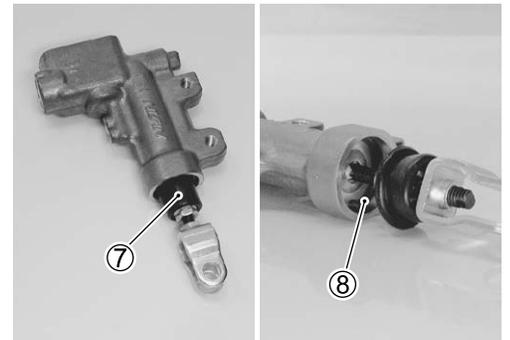


- Place a rag under the brake hose union bolt ⑤ to catch spilled brake fluid.
- Disconnect the brake hose ⑥ by removing the union bolt ⑤.
- Remove the master cylinder.

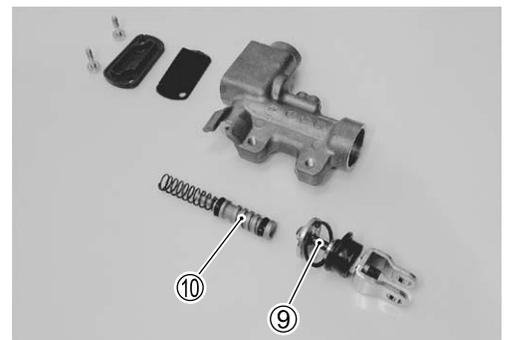


- Remove the dust boot ⑦ and snap ring ⑧.

TOOL 09900-06108: Snap ring remover (Close type)

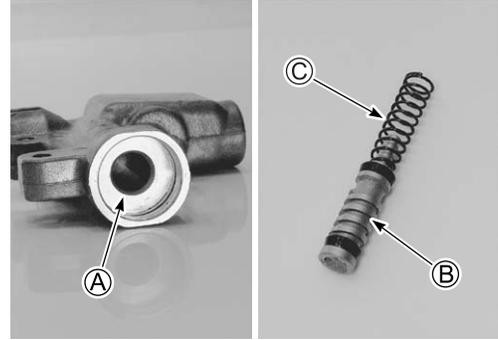


- Remove the push rod ⑨.
- Remove the piston/cup set ⑩.



MASTER CYLINDER INSPECTION

- Inspect the cylinder bore (A) and piston (B) for scuffing, wear and damage.
- Inspect the piston (B) and spring (C) for damage.



MASTER CYLINDER CLEANING (☞ 17-15)

REAR MASTER CYLINDER REASSEMBLY AND INSTALLATION

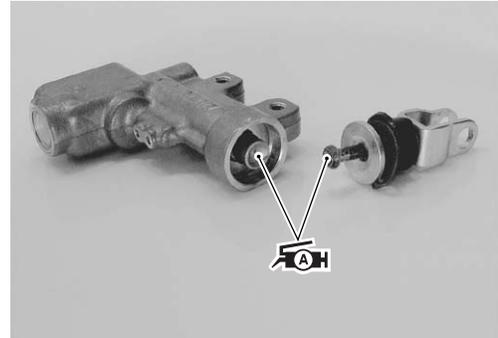
Reassemble and install the master cylinder in the reverse order of removal and disassembly. Pay attention to the following points:

- Apply grease to the contact point between piston and push rod.

 99000-25010: SUZUKI SUPER GREASE "A"

or equivalent

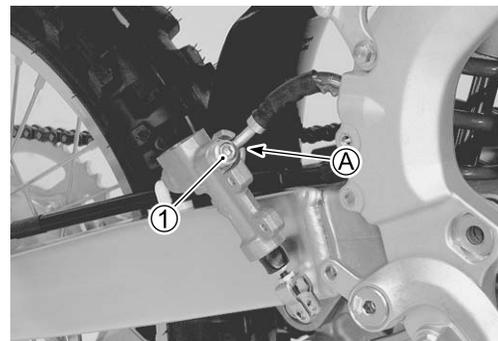
- Set the brake hose end between the hose stoppers (A), then tighten the brake hose union bolt (1) to the specified torque.



CAUTION

Replace the seal washers with new ones.

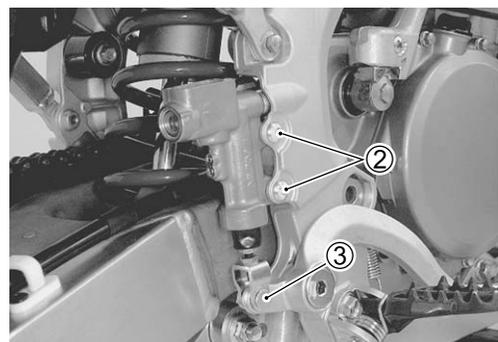
 Brake hose union bolt: 23 N·m (2.3 kgf-m, 16.5 lbf-ft)



- Tighten the master cylinder mounting bolts (2) to the specified torque.

CAUTION

- * Improper brake hose routing can damage the brake hose.
- * Ensure the brake hose has enough clearance to the rear suspension spring.



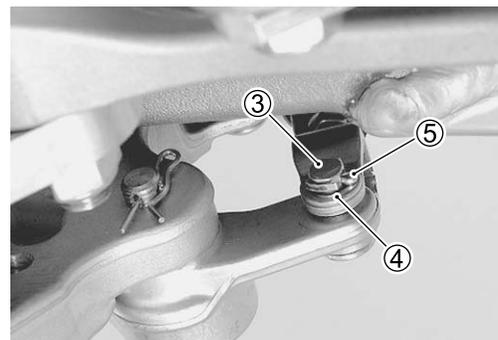
 Master cylinder mounting bolt: 10 N·m (1.0 kgf-m, 7.0 lbf-ft)

- Install the master cylinder rod pin (3), washer (4) and new cotter pin (5).

CAUTION

Replace the cotter pin (5) with a new one.

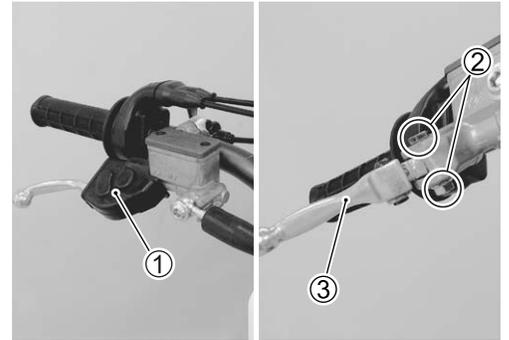
- Refill brake fluid and bleed air from the brake system. (☞ 17-4)



BRAKE LEVER

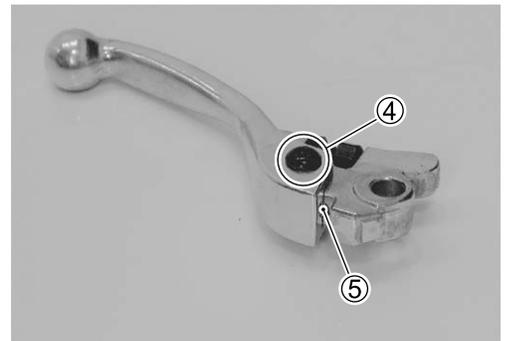
REMOVAL

- Remove the boot ①.
- Remove the brake lever ③ by removing its bolt and nut ②.



- Remove the brake lever adjuster return spring ⑤ by removing its bolt ④ with the special tool.

 **09930-11950: Torx wrench (T25H)**



INSTALLATION

Install the brake lever in the reverse order of removal. Pay attention to the following points:

- Apply grease to the brake lever adjuster return spring, pivot bolt and contact point between piston and brake lever.

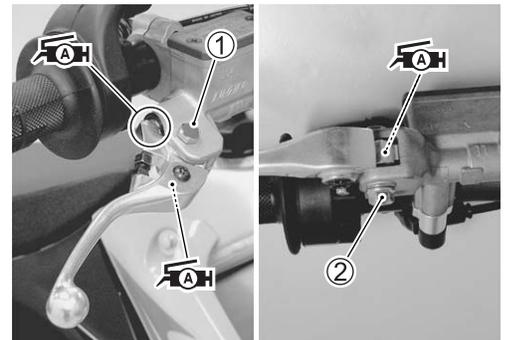
 **99000-25010: SUZUKI SUPER GREASE "A"**
or equivalent

- Tighten the brake lever pivot bolt ① and lock-nut ② to the specified torque.

 **Brake lever pivot bolt: 6 N·m (0.6 kgf·m, 4.5 lbf·ft)**

Brake lever pivot bolt lock-nut:

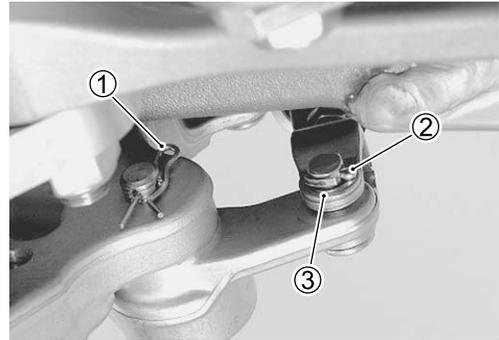
6 N·m (0.6 kgf·m, 4.5 lbf·ft)



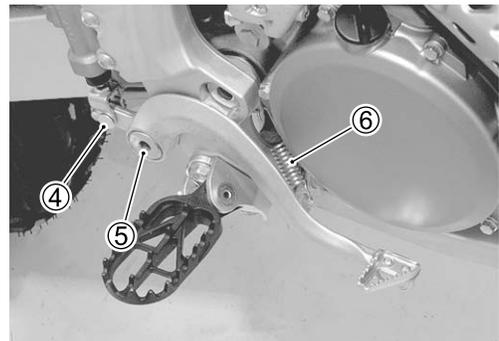
BRAKE PEDAL

REMOVAL

- Remove the clip ①.
- Remove the cotter pin ② and washer ③.



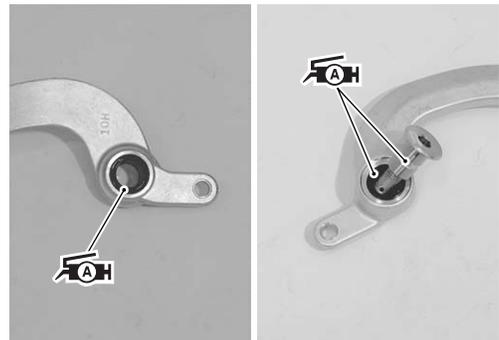
- Remove the master cylinder rod pin ④.
- Remove the brake pedal pivot bolt ⑤ and return spring ⑥.



INSTALLATION

- Apply grease to the oil seals and brake pedal pivot bolt.

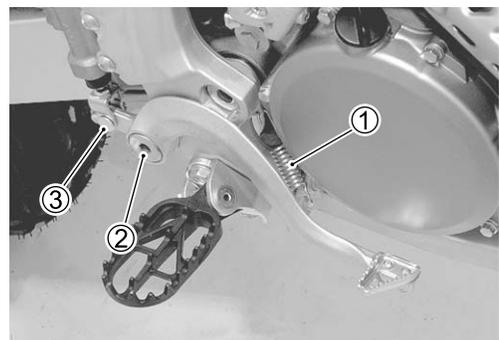
 99000-25010: SUZUKI SUPER GREASE "A"
or equivalent



- Install the return spring ① properly. (☞ 20-29)
- Tighten the brake pedal pivot bolt ② to the specified torque.

 **Brake pedal pivot bolt: 29 N·m (2.9 kgf-m, 21.0 lbf-ft)**

- Install the clip.
- Install the master cylinder rod pin ③, washer and new cotter pin.
- Adjust the brake pedal height. (☞ 2-35)



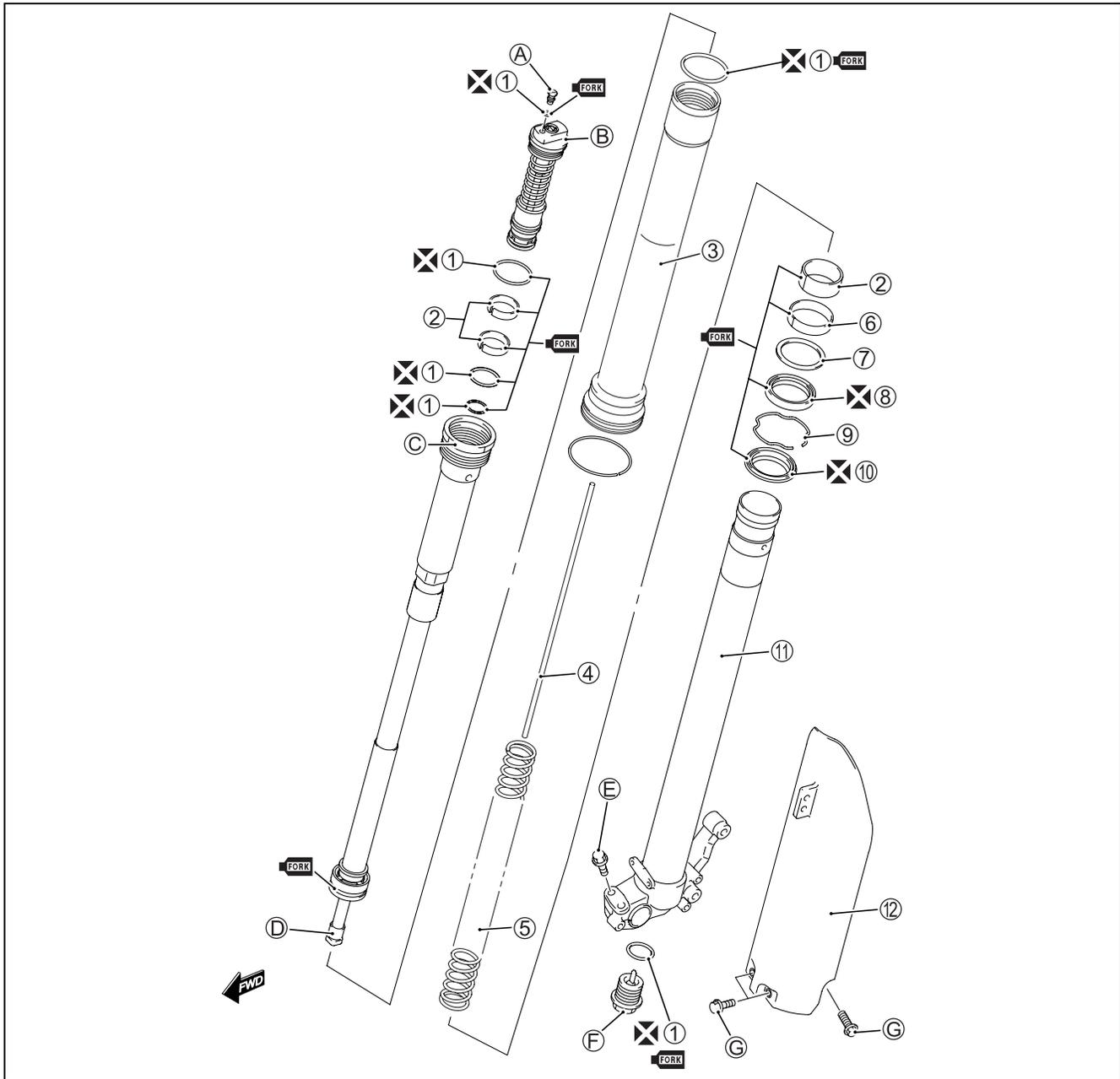
FRONT FORK AND STEERING

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CONSTRUCTION

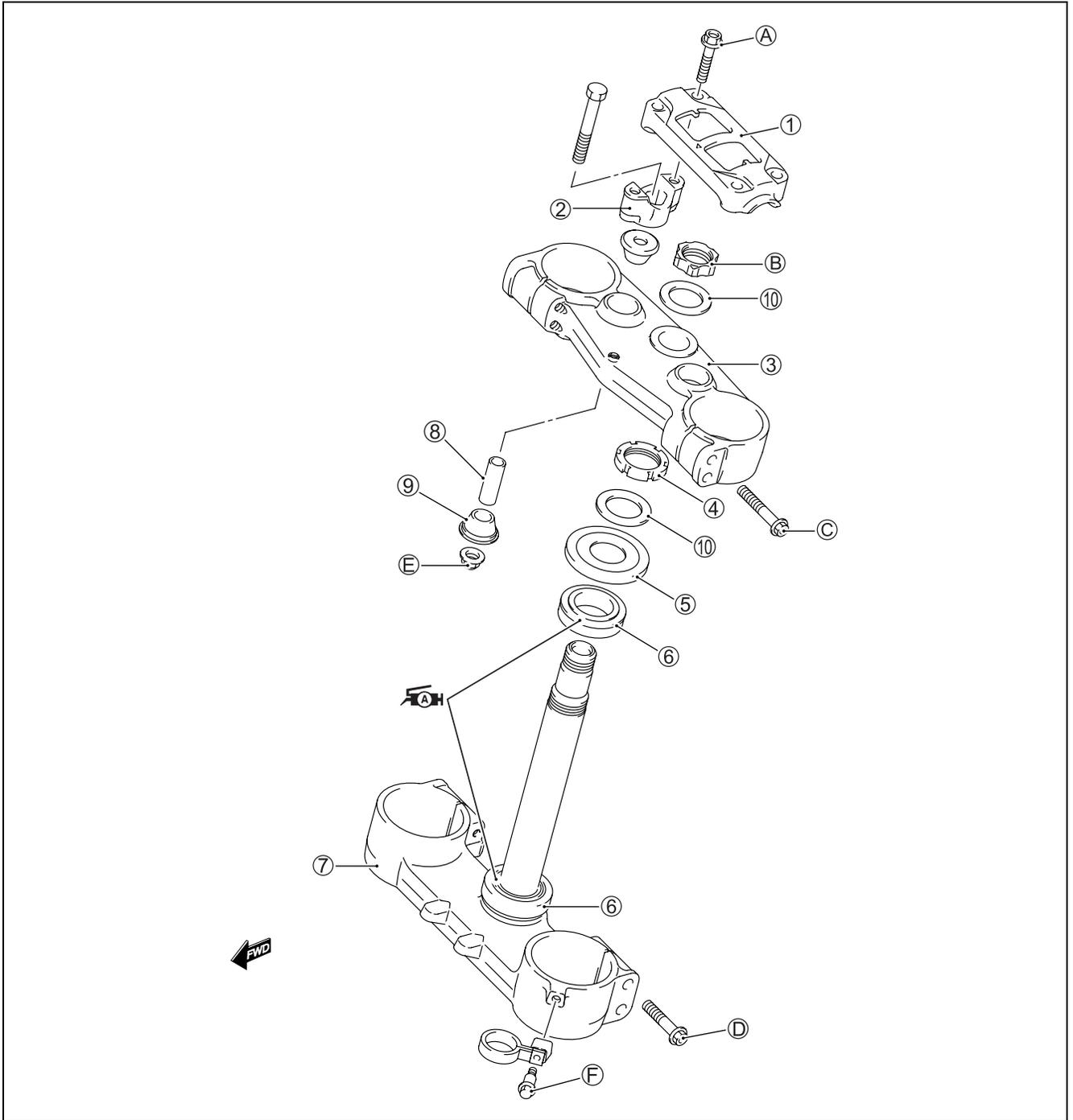
FRONT FORK



① O-ring	⑪ Inner tube
② Slide bushing	⑫ Fork protector
③ Outer tube	A Air bleeder valve
④ Push rod	B Compression damper unit
⑤ Fork spring	C Fork cap bolt
⑥ Guide busing	D Lock-nut/Center bolt
⑦ Seal retainer	E Front axle holder bolt
⑧ Oil seal	F Center bolt
⑨ Stopper ring	G Fork protector bolt
⑩ Dust seal	

ITEM	N·m	kgf·m	lbf·ft
A	1.3	0.13	1.0
B	30	3.0	21.5
C	34	3.4	24.5
D	22	2.2	16.0
E	18	1.8	13.0
F	69	6.9	50.0
G	4.9	0.49	3.5

STEERING

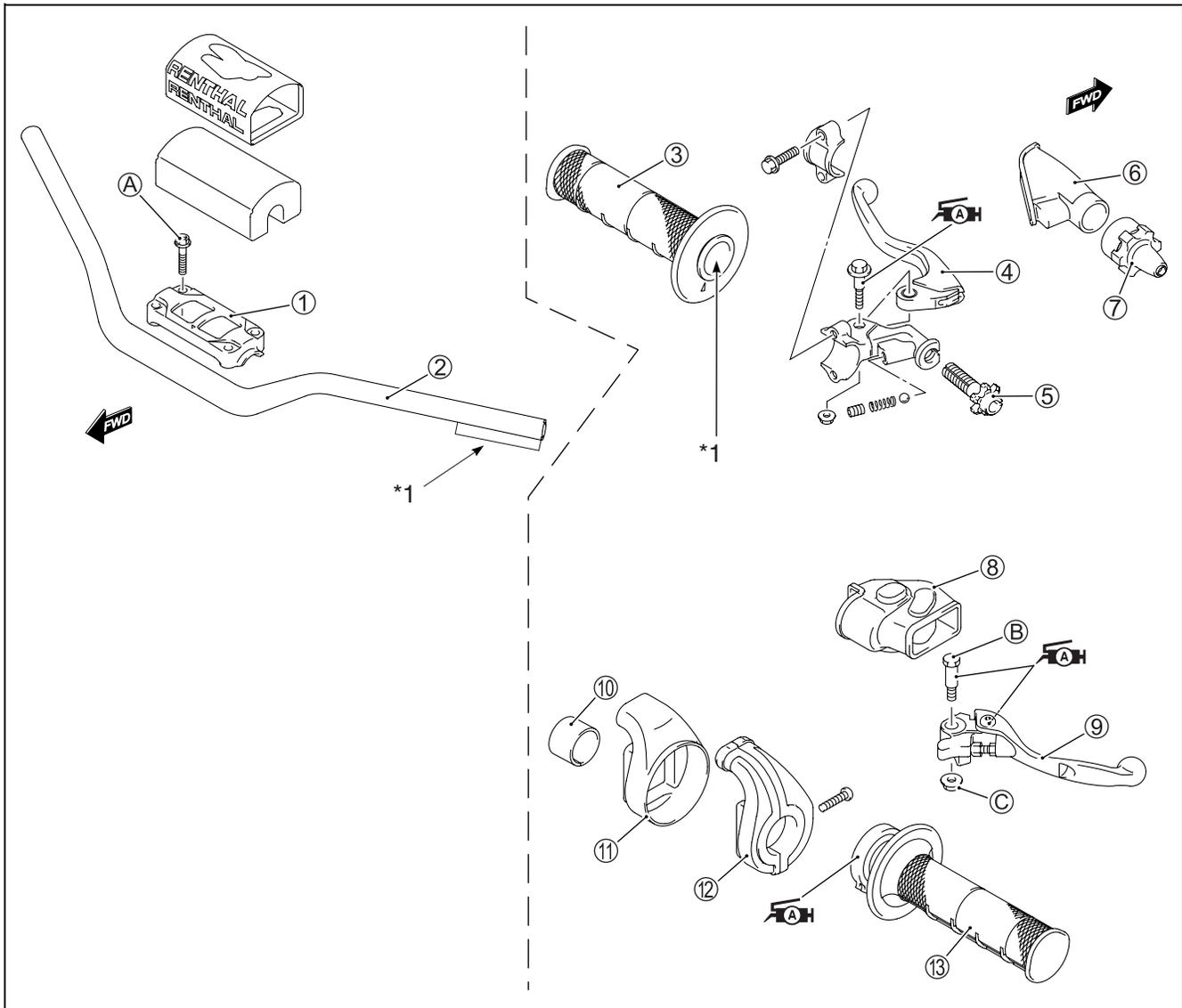


①	Handlebar upper holder	⑨	Damper bushing
②	Handlebar lower holder	⑩	Washer
③	Steering stem upper bracket	Ⓐ	Handlebar clamp bolt
④	Steering stem nut	Ⓑ	Steering stem head nut
⑤	Dust seal	Ⓒ	Front fork upper clamp bolt
⑥	Bearing	Ⓓ	Front fork lower clamp bolt
⑦	Steering stem lower bracket	Ⓔ	Handlebar holder set nut
⑧	Spacer	Ⓕ	Brake hose guide bolt



ITEM	N·m	kgf·m	lbf·ft
Ⓐ	25	2.5	18.0
Ⓑ	100	10.0	72.5
Ⓒ	23	2.3	16.5
Ⓓ	23	2.3	16.5
Ⓔ	44	4.4	32.0
Ⓕ	3	0.3	2.0

HANDLEBAR CONTROLS



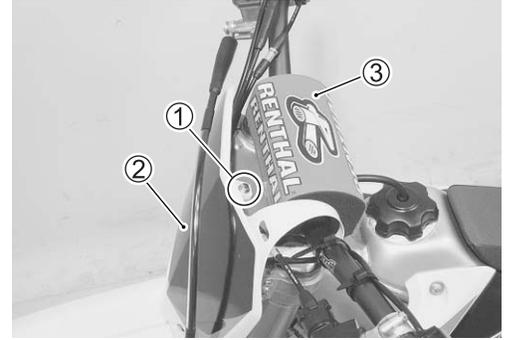
①	Handlebar upper holder	⑩	Cooler
②	Handlebars	⑪	Throttle case cover
③	Left handle grip	⑫	Throttle case
④	Clutch lever	⑬	Throttle grip
⑤	Clutch cable adjuster bolt	Ⓐ	Handlebar clamp bolt
⑥	Clutch lever cover	Ⓑ	Brake lever pivot bolt
⑦	Clutch adjuster cover	Ⓒ	Brake lever pivot bolt lock-nut
⑧	Brake lever cover	*1	Apply handle grip bond
⑨	Front brake lever		



ITEM	N-m	kgf-m	lbf-ft
Ⓐ	25	2.5	18.0
Ⓑ	6	0.6	4.5
Ⓒ	6	0.6	4.5

REMOVAL

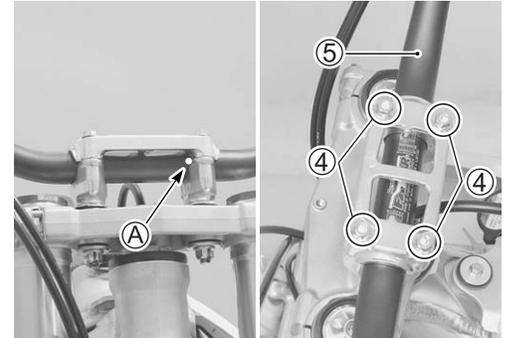
- Place the motorcycle on a block to lift front wheel off the ground.
- Remove the front wheel. (☞ 16-3)
- Remove the front number plate ② by removing its bolt ①.
- Remove the handlebar pad ③.



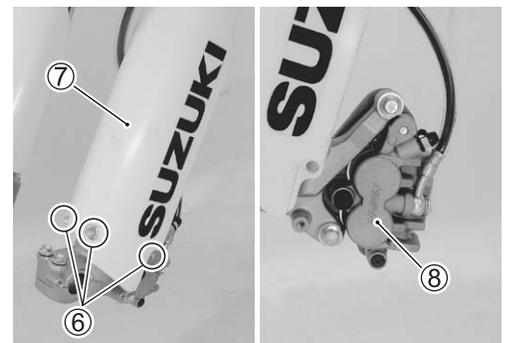
- Remove the handlebars ⑤ by removing the handlebar clamp bolts ④.

NOTE:

Mark the paint mark **A** to the matching surface of handlebar holder and handlebars before removing.

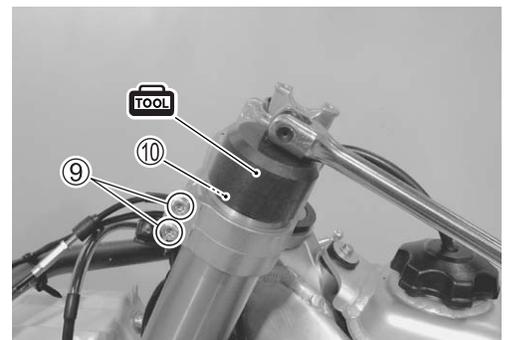


- Remove the fork protector ⑦ by removing the mounting bolts ⑥.
- Remove the brake caliper ⑧. (☞ 17-8)



- Loosen the front fork upper clamp bolts ⑨.
- Loosen the front fork cap bolt ⑩ 1 – 2 turns to facilitate later disassembly with the special tool.

 **09941-53630: Front fork cap socket wrench (50 mm)**



- Hold the fork body and loosen the front fork lower clamp bolts ⑪.
- Remove the front fork.



DISASSEMBLY

- Set rebound and compression damper settings to the minimum settings (softest) before disassembling. Record the setting before turning the adjuster.
- Thoroughly clean the fork before disassembly.

CAUTION

- * **Scratches or other damage on the inner tube or on the oil seal lip will cause oil leakage.**
- * **Avoid scratching or damaging the inner tube or the oil seal. Use a mild detergent or car wash soap and sponge out dirt with plenty of water.**

- Clamp the outer tube ② with a vise. Protect the outer tube with a rag when using a vise.
- Loosen and remove the fork cap bolt ① (sub-tank) from the outer tube with the special tool and slowly slide down the outer tube.

 09941-53630: Front fork cap socket wrench (50 mm)

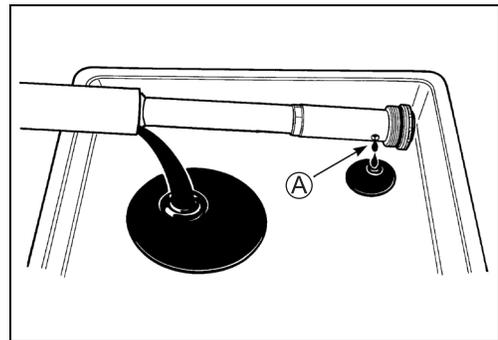
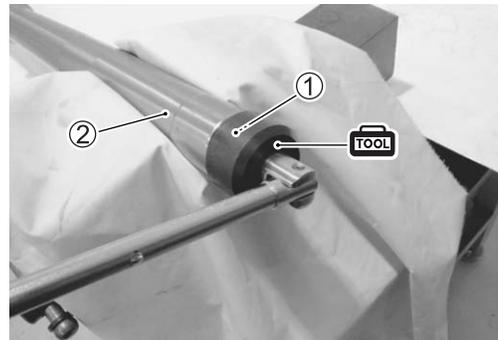
⚠ WARNING

- * **Clamping the outer tube too tight can damage it which will affect riding stability.**
- * **Be careful not to clamp the outer tube too tight.**

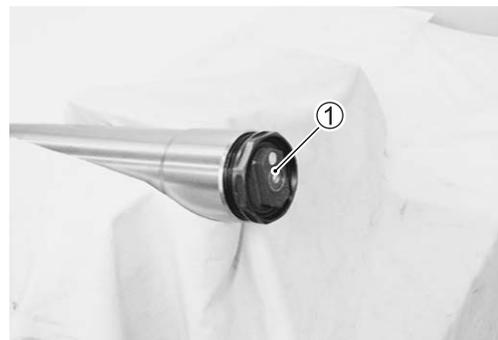
- Place a drain pan under the front fork and drain fork oil.

NOTE:

Face the oil hole Ⓐ on the sub-tank downward.



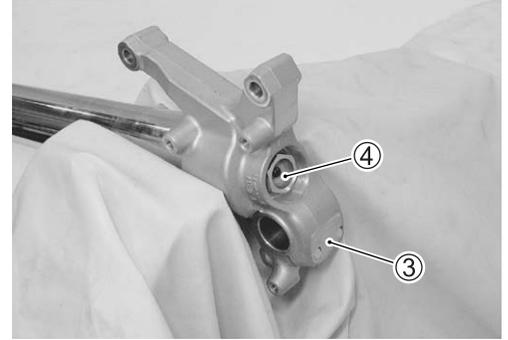
- Raise the outer tube and temporarily install the fork cap bolt ① (sub-tank) to the outer tube.



- Clamp the axle holder ③ with a vise. Protect the axle holder ③ with a rag when using a vise.
- Loosen the center bolt ④ completely with a 21 mm socket wrench.

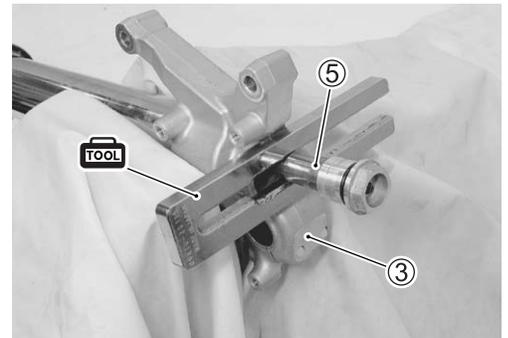
⚠ WARNING

- * Clamping the axle holder ③ too tight can damage it which will affect riding stability.
- * Be careful not to clamp the axle holder ③ too tight.

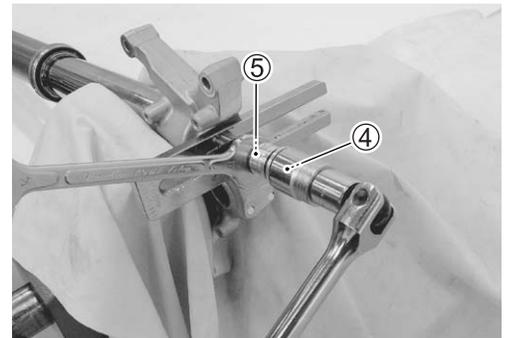


- Compress the outer tube by hands and install the piston holder (special tool) between the axle holder ③ bottom and lock-nut ⑤.

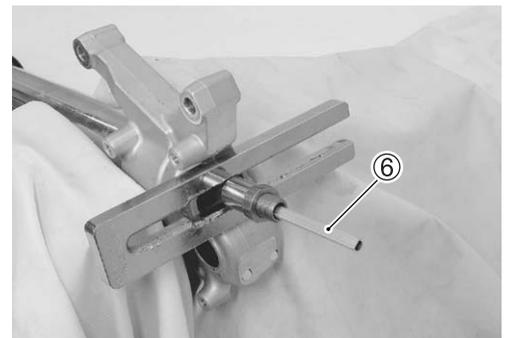
TOOL 09910-20115: Piston holder



- Hold the lock-nut ⑤ with a wrench and remove the center bolt ④.



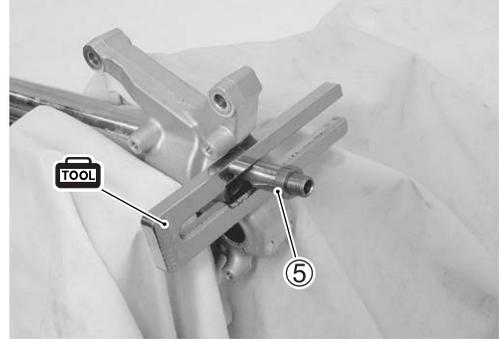
- Remove the push rod ⑥.



- With the outer tube compressed by hands, remove the special tool.

CAUTION

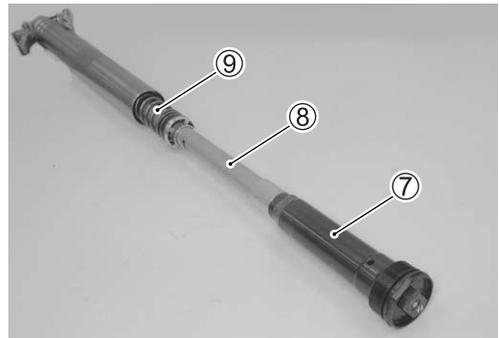
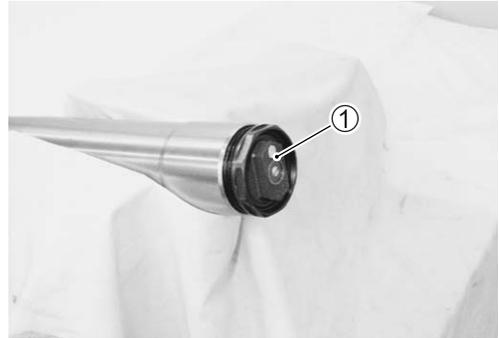
Do not remove the lock-nut ⑤. If removed, the inner rod may slip into the damper rod, possibly causing the threaded section to damage the oil seal.



- Loosen the fork cap bolt ① (sub-tank) and remove the sub-tank ⑦ along with the damper rod assembly ⑧.
- Remove the fork spring ⑨.

CAUTION

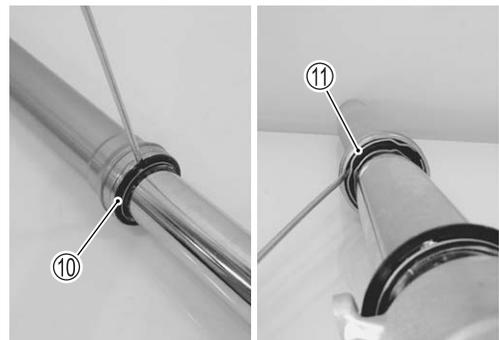
*** Do not attempt to disassemble the damper rod assembly ⑧.
* The damper rod assembly ⑧ is available only as an assembly.**



- Remove the dust seal ⑩.
- Remove the stopper ring ⑪.

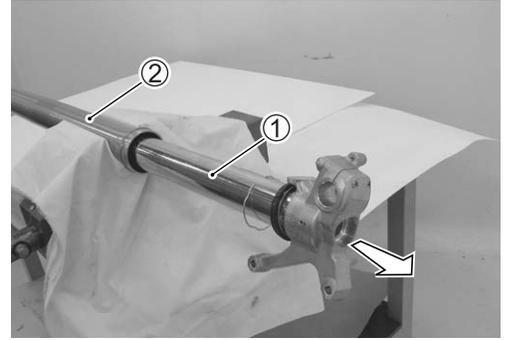
CAUTION

*** Scratches on the inner tube could cause oil leaks.
* Avoid scratching when removing.**



INNER TUBE

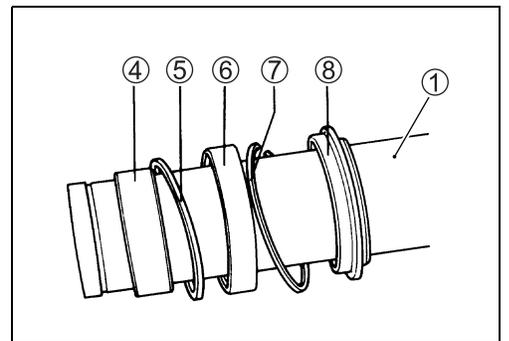
- Separate the inner tube ① out of the outer tube ②.



- Remove the slide bushing ③ from the inner tube ①.



- Remove the following parts from the inner tube ①.
 - Guide bushing ④
 - Seal retainer ⑤
 - Oil seal ⑥
 - Stopper ring ⑦
 - Dust seal ⑧

**DAMPER ROD AND COMPRESSION DAMPER UNIT**

- Clamp the bottom (flat part) of the sub-tank with a vise.

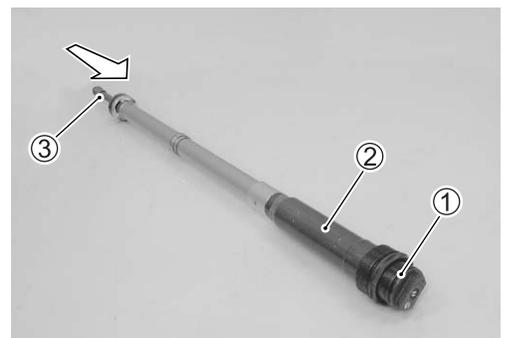
CAUTION

Do not clamp the sub-tank too tight.

- Loosen the compression damper unit ①.
- Remove the compression damper unit ① from the sub-tank ②.

**NOTE:**

Slowly compress the inner rod ③ until it stops so that the compression damper unit can be removed easily.



- Drain the fork oil from the damper rod assembly by moving the inner rod several strokes.



INSPECTION

CENTER BOLT

- Inspect the adjuster rod of the center bolt for damage. If it is damaged, replace it with a new one.



COMPRESSION DAMPER UNIT

- Inspect the compression damper unit for damage. If it is damaged, replace it with a new one.

CAUTION

- * **Disassembling the compression damper unit can lead to trouble.**
- * **Do not attempt to disassemble the compression damper unit.**



INNER TUBE AND OUTER TUBE

- Inspect the inner tube for scratches. If it has scratches, replace it with a new one.
- Inspect the outer tube for dent. If it is dented all the way to the inner side, replace it with a new one.



- Measure the inner tube runout using the V blocks and dial gauge.



Inner tube runout

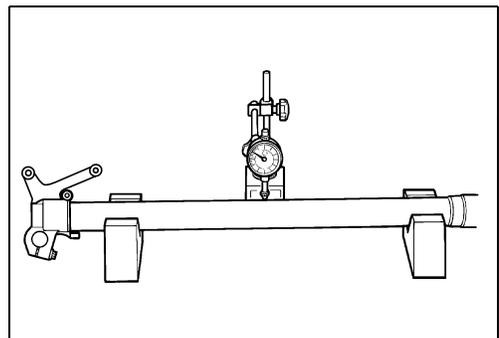
Service Limit: 0.4 mm (0.02 in)



09900-20607: Dial gauge

09900-20701: Dial gauge chuck

09900-21304: V blocks



DAMPER ROD ASSEMBLY

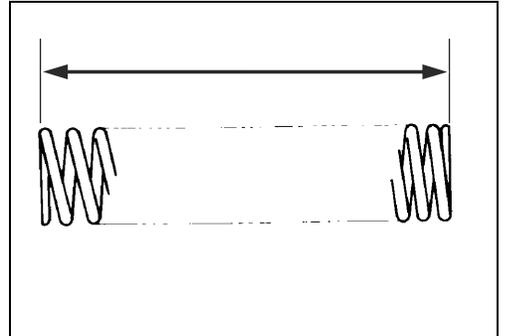
- Inspect the damper rod assembly for scratches or bending. If it has scratches or is bent, replace it with a new one.



FORK SPRING

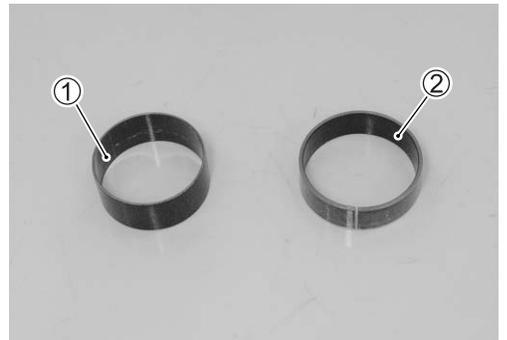
- Measure the free length of front fork spring.
- If it is shorter than service limit, replace it with a new one.

DATA Service Limit: 485 mm (19.09 in)



SLIDE BUSHING AND GUIDE BUSHING

- Inspect the teflon coating metals (slide bushing ① and guide bushing ②) for wear or damage. If they are worn or damaged, replace them with new ones.
- Inspect the teflon coating metals surface. If they are not clean, clean them with a nylon brush and fork oil.



REASSEMBLY

CAUTION

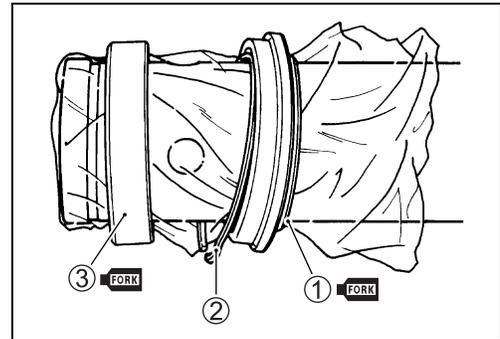
- * Clean all fork parts before reassembling.
- * Replace the O-rings, oil seal and dust seal with new ones.
- * Apply specified front fork oil when installing the O-rings, slide bushing, guide bushing, damper unit and sliding parts.

INNER TUBE

- Apply fork oil to the oil seal lip and the dust seal.
- Cover the inner tube with a plastic film.
- Install the following parts to the inner tube:
New dust seal ①
Stopper ring ②
New oil seal ③

CAUTION

- * Scratches on the oil seal lip can cause oil leaks.
- * When installing the seals, place a plastic film over the bushing attachment groove and edges of the inner tube to avoid damaging the seals' lip.



NOTE:

The side of the oil seal that has a mark should face the dust seal.

- Remove the plastic film and then install the seal retainer ④, guide bushing ⑤ and slide bushing ⑥.
- Clean the parts and keep them free from dust.

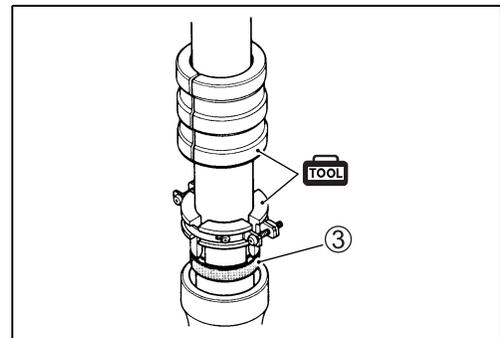
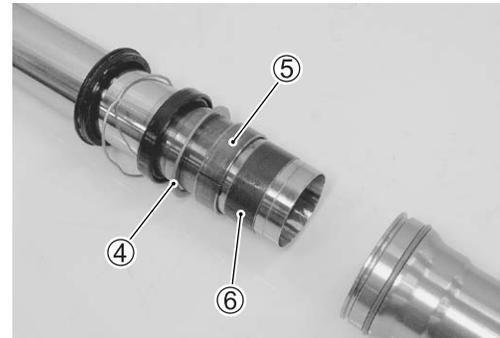
NOTE:

Inspect the bushings for burrs. If there is a burr, remove it with a knife, taking care not to peel off the teflon coating. If the bushings have a large crack or excessive play after installing them, replace them with new ones.

- Insert the inner tube into the outer tube.
- Install a new oil seal ③ with the special tool until the stopper ring groove of the outer tube can be seen.

09940-52861: Front fork oil seal installer set

- Attach the stopper ring securely to the stopper ring groove of the outer tube.



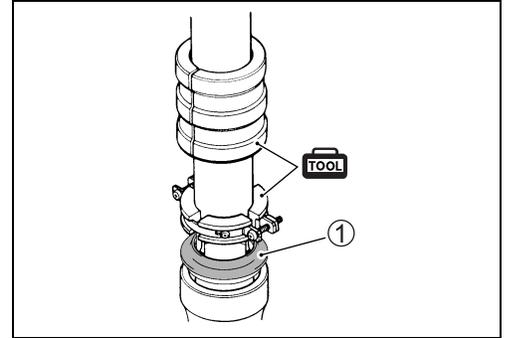
- Attach the dust seal ①.

NOTE:

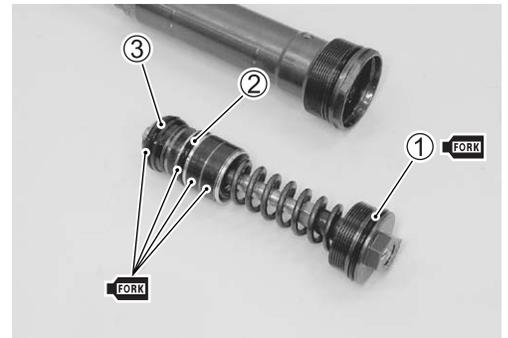
After attaching the dust seal, make sure that there are no cracks around the circumference of the seal. Cracks could allow water, mud and the like to enter and cause an oil leak.

CAUTION

- * Use of grease as a substitute fork oil when installing the oil seal can result in an oil leak. Applying grease to the dust seal and oil seal can cause dirt to accumulate and damage the dust seal lip and oil seal lip.
- * Use only a thin coat of fork oil on the oil seal.

**DAMPER ROD AND COMPRESSION DAMPER UNIT**

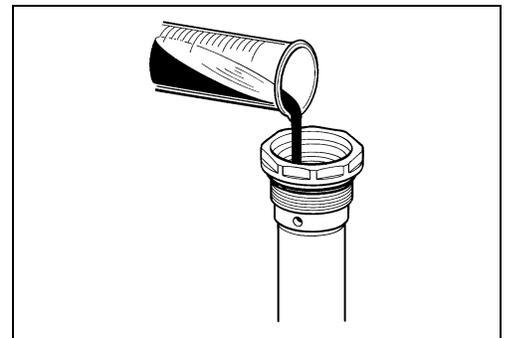
- Clean each threaded part before installing.
- Replace the O-rings (①, ②, ③) with new ones.
- Apply fork oil to the O-rings and bushings on the compression damper unit.



- With the damper rod in fully extended position, pour the specified amount of fork oil.

DATA Fork oil quantity (Inside the damper rod):
193 ml (6.5/6.8 US/Imp oz)

FORK 99000-99001-SS5: SUZUKI FORK OIL SS-05
or equivalent



- Apply fork oil to the O-ring ④.

CAUTION

Replace the O-ring ④ with a new one.

- With the damper rod held immovable in fully extended position, gently install the compression damper unit ⑤ to the sub-tank ⑥.



- Clamp the bottom (flat part) of the sub-tank with a vise.

CAUTION

Do not clamp the sub-tank too tight.

- Tighten the compression damper unit ⑤ to the specified torque.

🔧 Compression damper unit: 30 N·m (3.0 kgf-m, 21.5 lbf-ft)

- With the damper rod held in vertical position, slowly move the inner rod several strokes.

Ⓐ 100 mm (3.9 in)

- Tighten the lock-nut ⑦ by hand completely.

- With the damper rod held in vertical position, compress the damper rod fully to discharge an excess of oil.

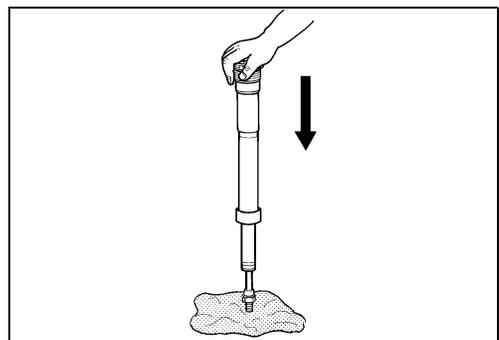
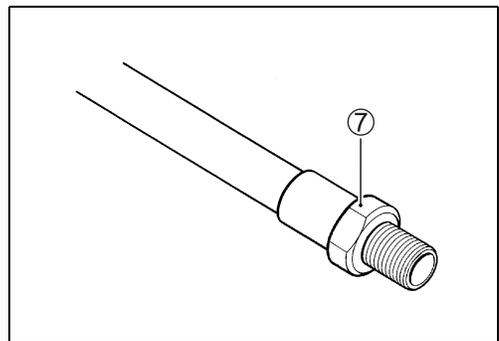
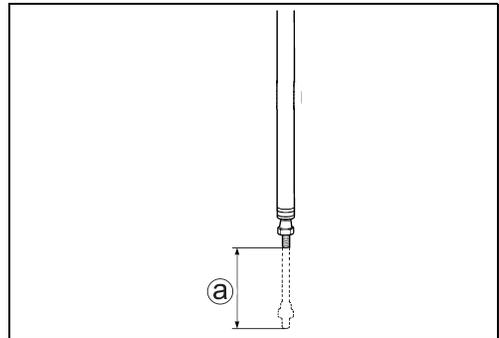
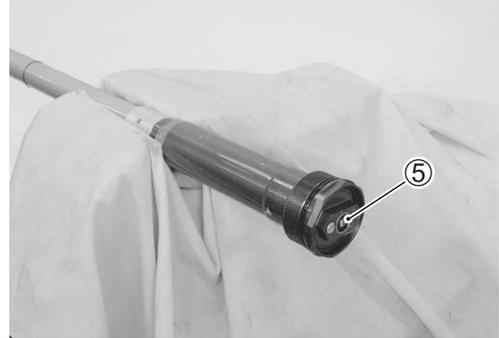
CAUTION

Protect the inner rod end with a rag when compressing the damper rod.

NOTE:

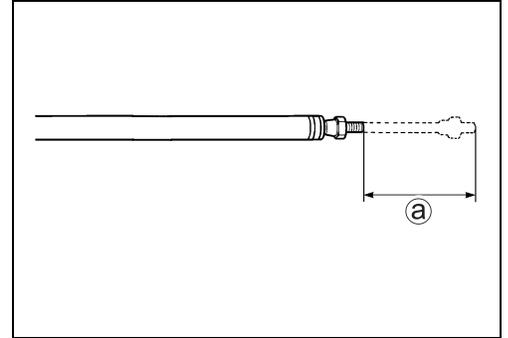
Set the compression damper setting to the softest.

- Force out the remaining oil (discharged oil) using compressed air completely.



- With the damper rod in horizontal position, move the inner rod by hand to inspect it if operating smoothly.
- If the inner rod is not extend, repeat the “DAMPER ROD AND COMPRESSION DAMPER UNIT” procedures (Pour the specified amount fork oil and discharge an excess of oil). (☞ 18-13, -14)

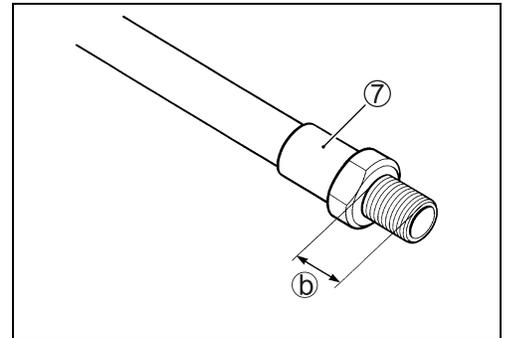
Ⓐ 100 mm (3.9 in)



- Make sure approx. 10 mm (0.39 in) of inner rod thread is exposed on the end.

Ⓑ Approx. 10 mm (0.39 in)

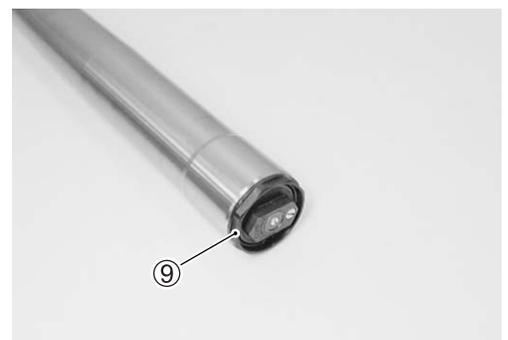
⑦ Lock-nut



- Completely wipe off the fork oil from the spring and damper rod assembly.
- Apply fork oil to the bushing ⑧.
- Insert the spring and damper rod assembly into the fork.



- Temporarily tighten the fork cap bolt ⑨ (sub-tank).



- Clamp the axle holder ⑩ with a vise. Protect the axle holder ⑩ with a rag when using a vise.

⚠ WARNING

- * **Clamping the axle holder ⑩ too tight can damage it which will affect riding stability.**
- * **Be careful not to clamp the axle holder ⑩ too tight.**

- Compress the outer tube by hands and install the piston holder (special tool) between the axle holder ⑩ bottom and lock-nut ⑦.

TOOL 09910-20115: Piston holder

- Insert the push rod ⑪ into the inner rod.
- Replace the O-ring with a new one.
- Apply fork oil to the O-ring.
- Insert the  shaped projection ① of center bolt ⑫ into the push rod ②.

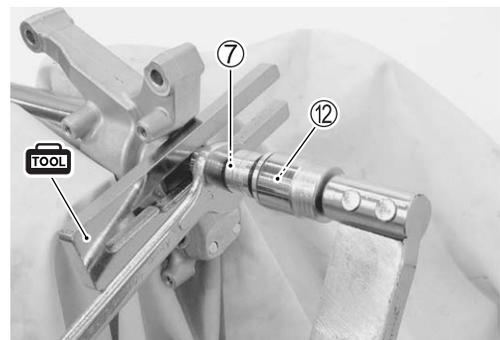
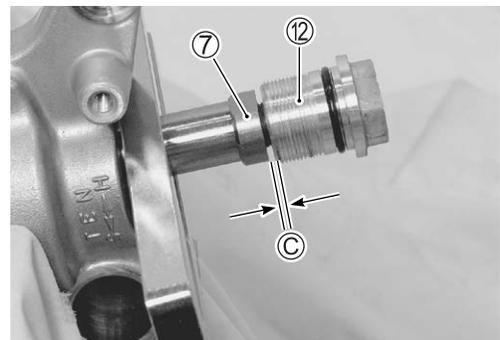
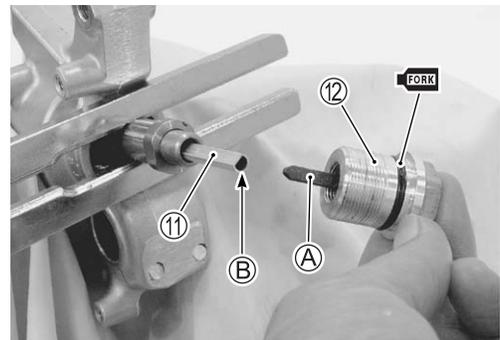
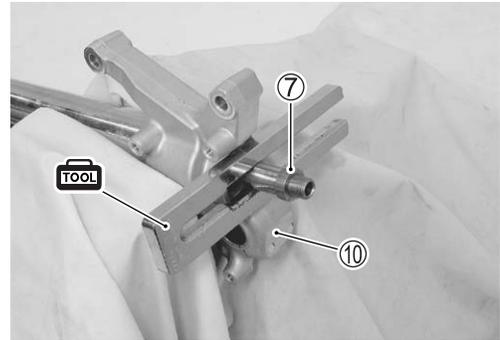
- Slowly tighten the center bolt ⑫ until resistance is felt and check the clearance between the lock-nut ⑦ and center bolt ⑫ to provide 1 mm (0.04 in) and more.

© 1 mm (0.04 in) and more

- Turn the lock-nut ⑦ counterclockwise until it contacts with the center bolt ⑫.
- With the lock-nut ⑦ held immovable using a wrench, tighten the lock-nut/center bolt to the specified torque.

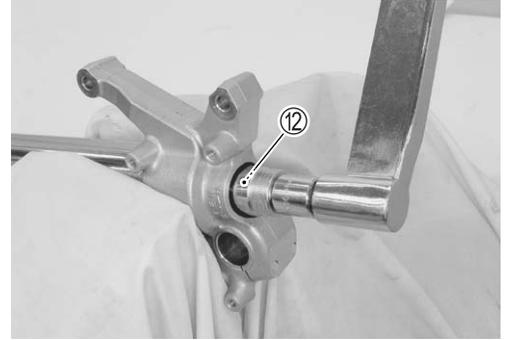
🔧 Lock-nut/center bolt: 22 N·m (2.2 kgf·m, 16.0 lbf·ft)

- With the outer tube compressed by hands, remove the special tool.



- Tighten the center bolt ⑫ to the specified torque.

U Center bolt: 69 N·m (6.9 kgf·m, 50.0 lbf·ft)



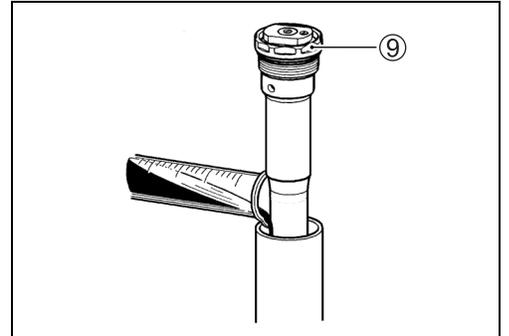
- Loosen and remove the fork cap bolt ⑨ (sub-tank) from the outer tube with the special tool and slowly slide down the outer tube.

TOOL 09941-53630: Front fork cap socket wrench (50 mm)

- Pour the specified amount of fork oil into the outer tube.

DATA Oil quantity (When standard fork spring is used):
375 ml (12.68/13.20 US/lmp oz)

FORK 99000-99001-SS5: SUZUKI FORK OIL SS-05
or equivalent



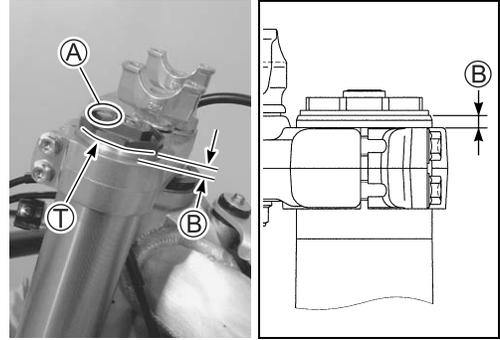
- Raise the outer tube and temporarily tighten the fork cap bolt ⑨ (sub-tank) with the special tool.

TOOL 09941-53630: Front fork cap socket wrench (50 mm)



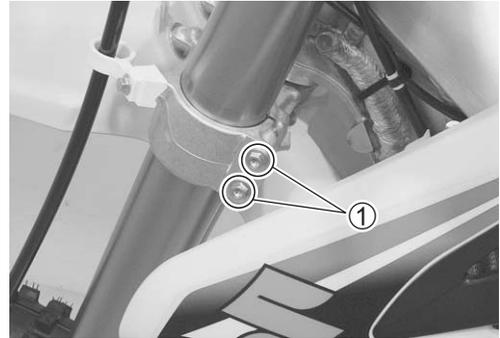
INSTALLATION

- Install the front fork with the upper surface ① of the outer tube positioned 1.0 mm (0.04 in) ② from the upper surface of the upper bracket.
- Check that the air valve ③ is positioned at the front.



- Tighten the fork lower clamp bolts ① to the specified torque.

 **Fork lower clamp bolt: 23 N·m (2.3 kgf-m, 16.5 lbf-ft)**



- Tighten the fork cap bolt ② (sub-tank) to the specified torque with the special tool.

 **09941-53630 : Front fork cap socket wrench (50 mm)**

 **Fork cap bolt: 34 N·m (3.4 kgf-m, 24.5 lbf-ft)**

- Tighten the fork upper clamp bolts ③ to the specified torque.

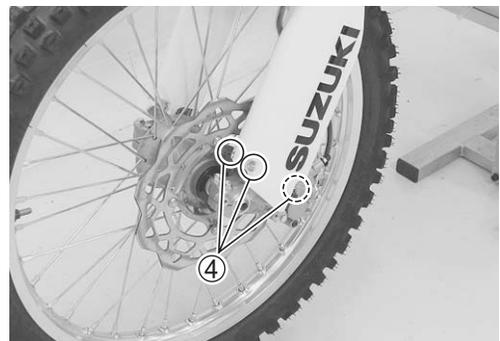
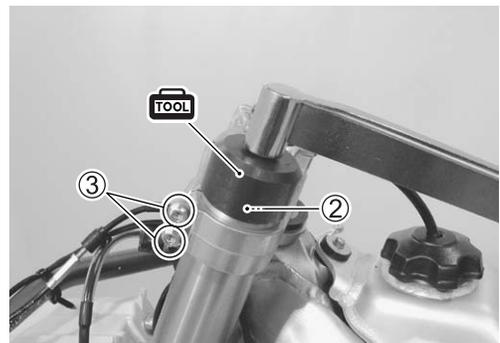
 **Fork upper clamp bolt: 23 N·m (2.3 kgf-m, 16.5 lbf-ft)**

NOTE:

Check that the air valve is positioned at the front.

- Install the handlebars. ( 18-24, -25)
- Install the front wheel. ( 16-6)
- Install the brake caliper. ( 17-10)
- Tighten the fork protector bolts ④ to the specified torque.

 **Fork protector bolt: 4.9 N·m (0.49 kgf-m, 3.5 lbf-ft)**



INSPECTION AFTER INSTALLATION

- Front fork ( 2-36)
- Steering ( 2-37)
- Wiring harness, cable and hose routing ( 20-18, -21, -22, -30, -32)

STEERING

REMOVAL

HANDLEBARS

- Place the motorcycle on a block to lift front wheel off the ground.
- Remove the front number plate and handlebar pad.
(☞ 18-5)
- Remove the clamps ①.
- Remove the engine stop switch ③ by removing its screw ②.
- Remove the clutch lever holder ⑤ removing its bolts ④.

NOTE:

Mark the paint marks ① to the matching surfaces of clutch lever holder and handlebars, left handlebar grip and handlebars.

- Remove the left handlebar grip ⑥.

- Remove the front brake master cylinder holder bolts ⑦.

NOTE:

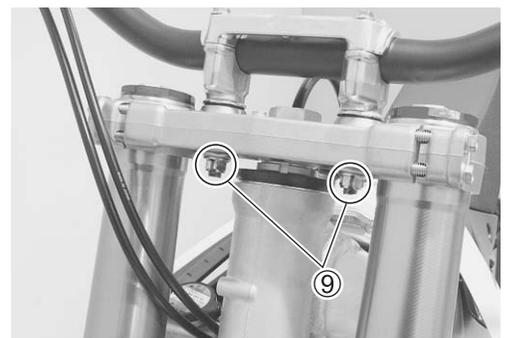
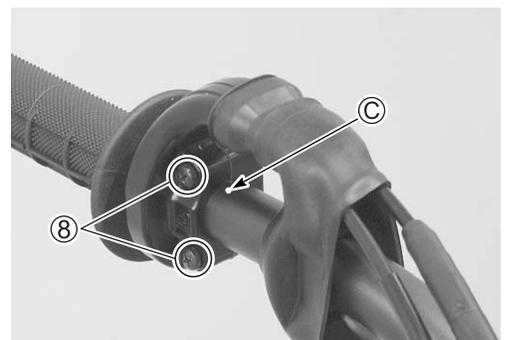
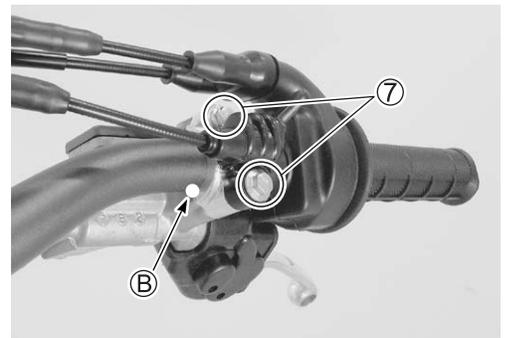
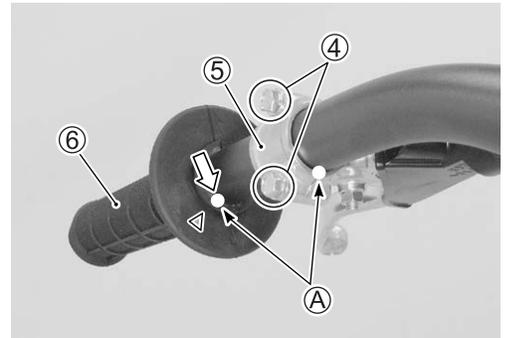
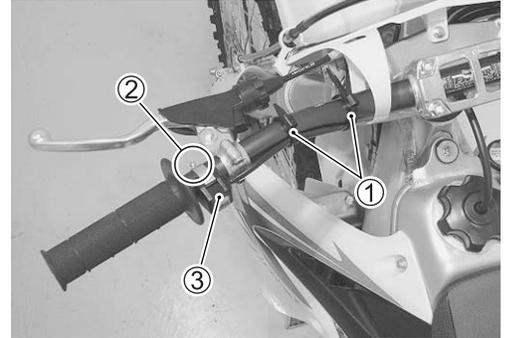
Mark the paint mark ② to the matching surface of master cylinder holder and handlebars before removing.

- Remove the throttle case screws ⑧.

NOTE:

Mark the paint mark ③ to the matching surface of throttle holder and handlebars before removing.

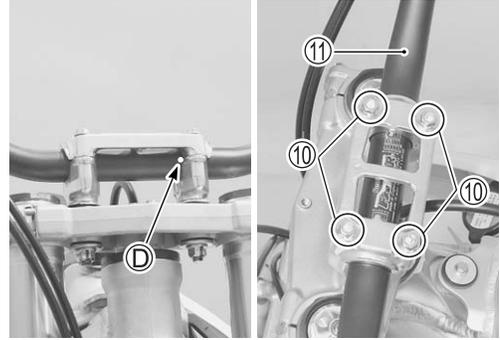
- Slightly loosen the handlebar holder set nuts ⑨.



- Remove the handlebars ⑪ by removing the handlebar clamp bolts ⑩.

NOTE:

Mark the paint mark ㊦ to the matching surface of handlebar holder and handlebars before removing.

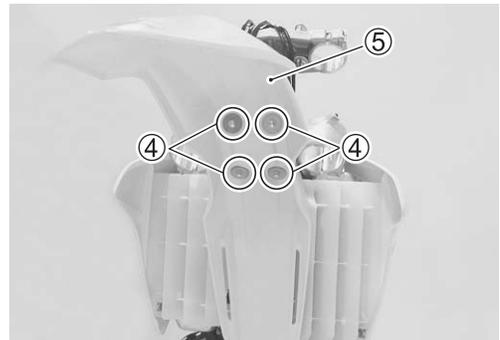


STEERING STEM

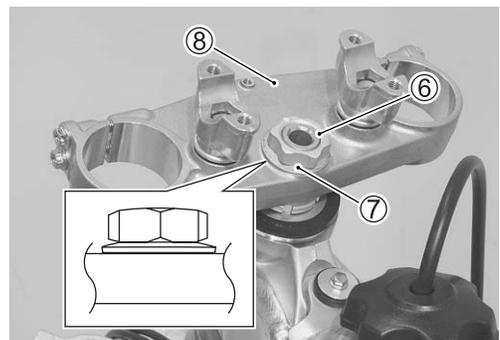
- Remove the front wheel ①. (➡ 16-3)
- Remove the brake hose guide ②.
- Remove the front forks ③. (➡ 18-5)



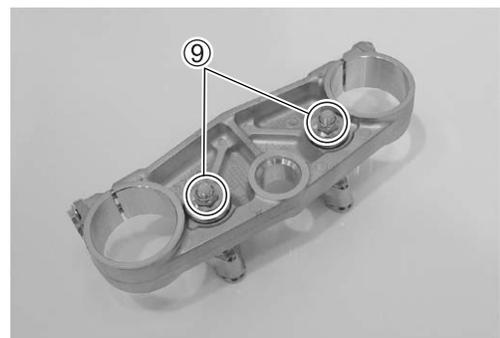
- Remove the front fender ⑤ by removing its bolts ④.



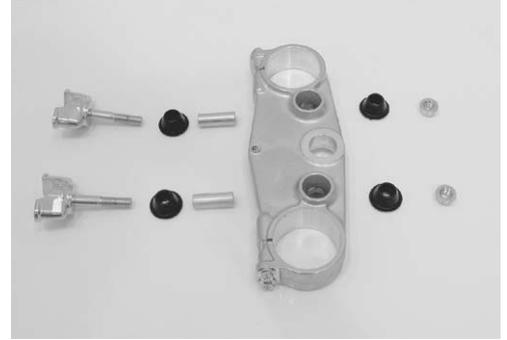
- Remove the steering stem head nut ⑥ and washer ⑦.
- Remove the steering stem upper bracket ⑧.



- Remove the handlebar holder set nuts ⑨.



- Remove the handlebar holders, damper bushings and spacers.



- Remove the steering stem nut ⑩ with the special tools.

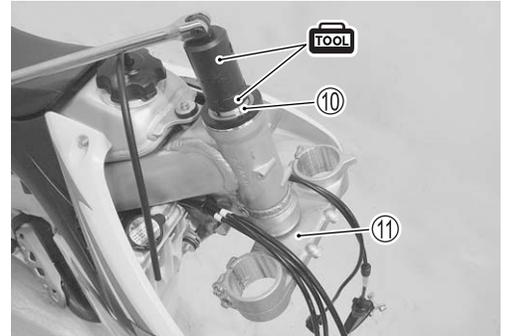
NOTE:

Hold the steering stem lower bracket to prevent it from falling.

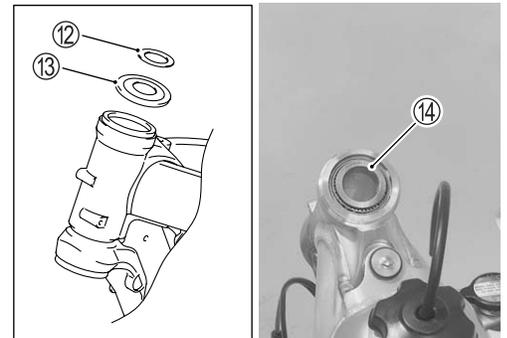
TOOL 09940-14911: Steering stem nut socket wrench

09940-14960: Steering stem nut socket wrench

- Remove the steering stem lower bracket ⑪ and lower bearing.

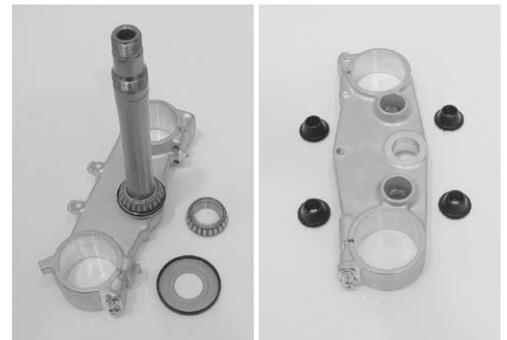


- Remove the washer ⑫, upper dust seal ⑬ and upper bearing ⑭.



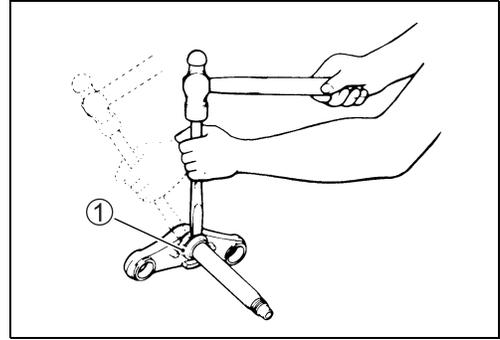
INSPECTION

- Inspect the removed parts for the following abnormalities.
 - Distortion of the steering stem
 - Bearing wear or damage
 - Abnormal bearing noise
 - Race wear or damage
 - Damper bushing wear or damage
- If any abnormal points are found, replace defective parts with new ones.



BEARING REPLACEMENT

- Remove the lower bearing ①.

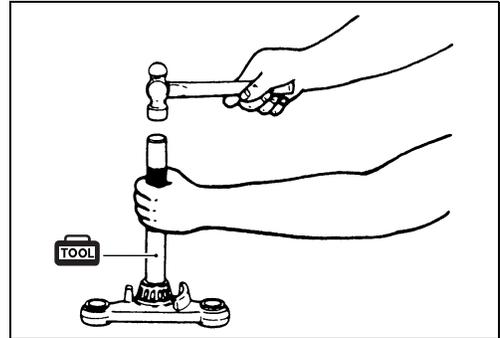


- Fit the lower bearing with the special tool.

TOOL 09925-18011: Bearing installer

NOTE:

Replace the outer race and bearing as a set.

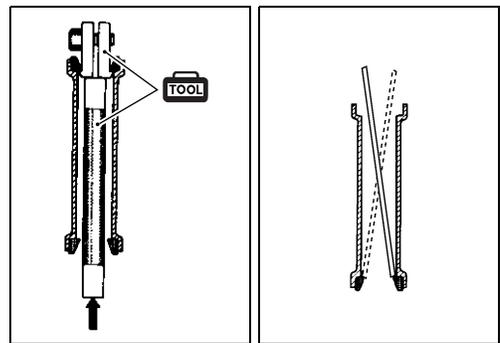


- Remove the upper outer race with the special tools.

TOOL 09941-54911: Bearing outer race remover

09941-74911: Steering race installer

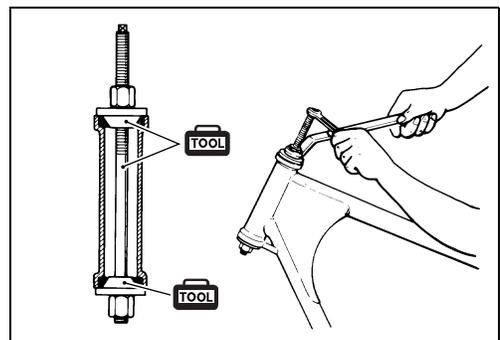
- Drive out the lower outer race using the steel rod.



- Fit the upper and lower outer races with the special tools.

TOOL 09941-34513: Bearing installer

09924-84510: Bearing installer set (ϕ 51.5 Attachment)



INSTALLATION

Install the steering in the reverse order of steering removal.

Pay attention to the following points:

STEERING STEM

- Apply grease to the bearings.

 99000-25010: SUZUKI SUPER GREASE "A"
or equivalent

- Fit the steering stem lower bracket, upper bearing, upper dust seal and washer.
- Tighten the steering stem nut ① with the special tools. [45 N·m (4.5 kgf-m, 32.5 lbf-ft)]

 09940-14911: Steering stem nut socket wrench
09940-14960: Steering stem nut socket wrench

- Move the steering stem right and left several times to seat the bearings.
- Turn back the steering stem nut by 1/4 – 1/2 turn.

 **Steering stem nut: 45 N·m (4.5 kgf-m, 32.5 lbf-ft) then turn back 1/4 – 1/2**

- Install the damper bushings, spacers and handlebar holders.

NOTE:

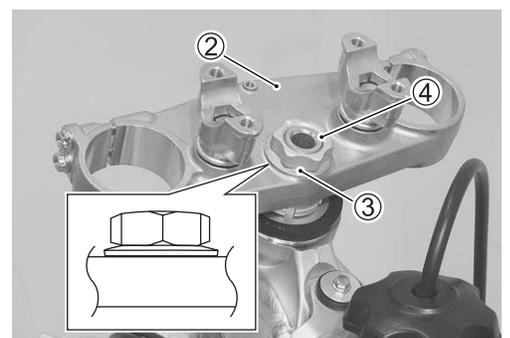
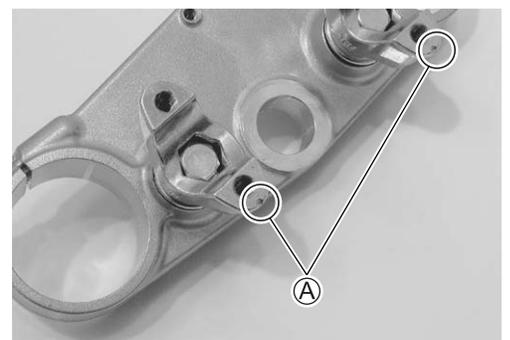
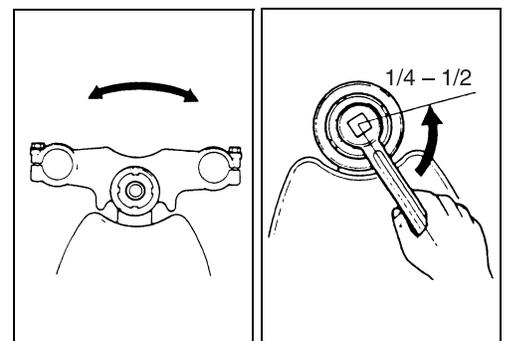
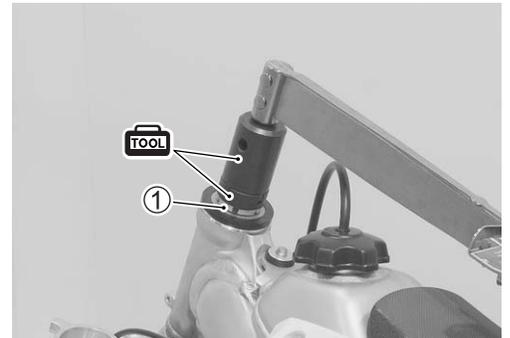
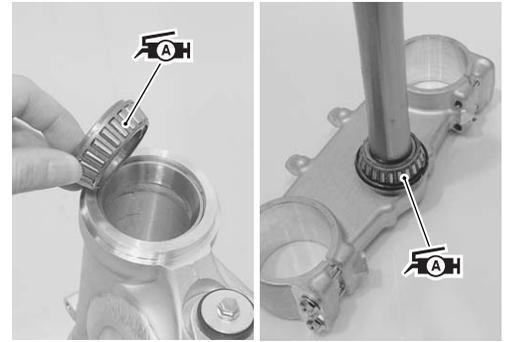
Make sure that the notch mark  on the handlebar holder faces backward.

- Temporarily tighten the handlebar holder set nuts.

- Fit the steering stem upper bracket  and washer .
- Temporarily tighten the steering stem head nut .

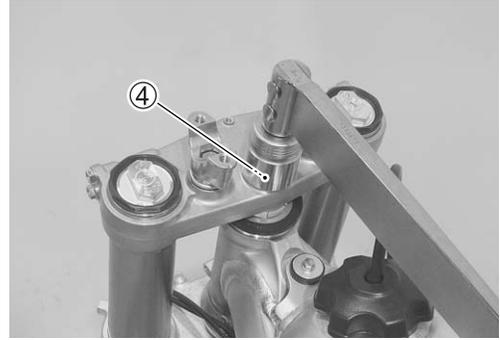
NOTE:

Pay attention to the direction of the washer .



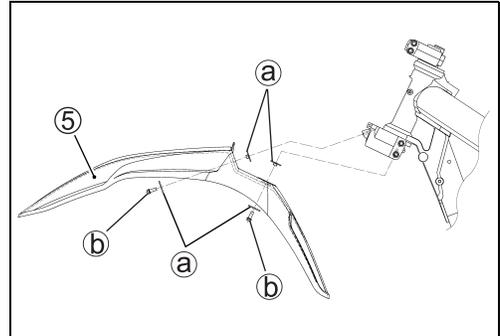
- Temporarily install the front forks to the steering stem, and tighten the lower clamp bolts.
- Tighten the steering stem head nut ④ to the specified torque.

 **Steering stem head nut: 100 N·m (10.0 kgf-m, 72.5 lbf-ft)**

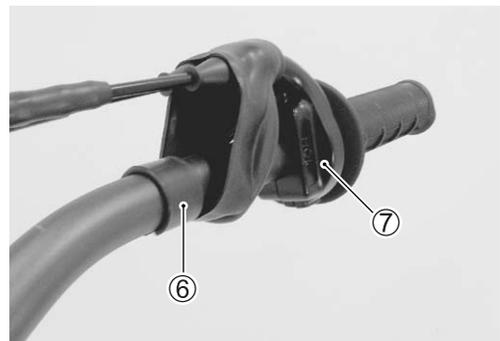


- Install the front fender ⑤ as shown.
- Reinstall the front forks. ( 18-18)
- Install the front wheel. ( 16-6)

- Ⓐ Washer
- Ⓑ Bolt



- Insert the collar ⑥ and throttle assembly ⑦ onto the handlebars.

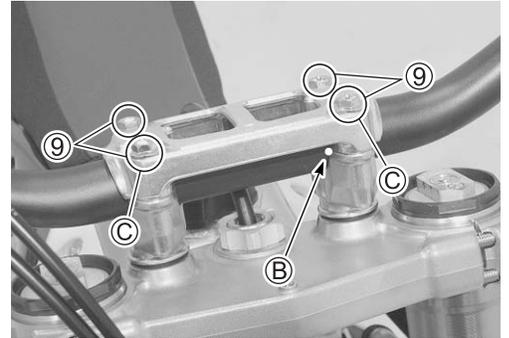
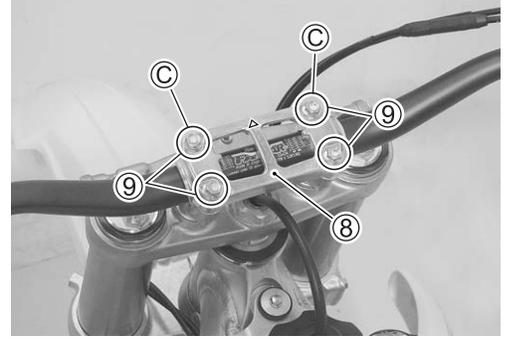


- Set the “△” mark on the handlebar holder ⑧ forward.
- Align the matching mark ⑥ on the handlebars with the matching surface of the handlebar holder ⑧.
- Tighten the handlebar clamp bolts ⑨ to the specified torque.

NOTE:

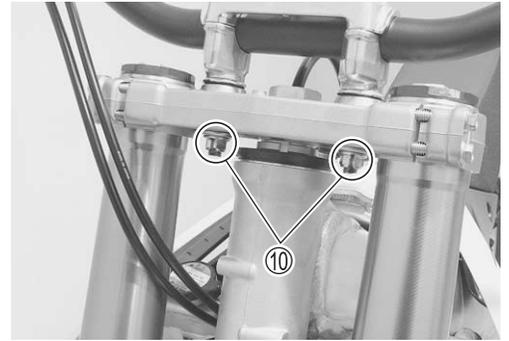
When tightening the handlebar clamp bolts ⑨, first tighten the bolts ③.

 **Handlebar clamp bolt: 25 N·m (2.5 kgf·m, 18.0 lbf·ft)**



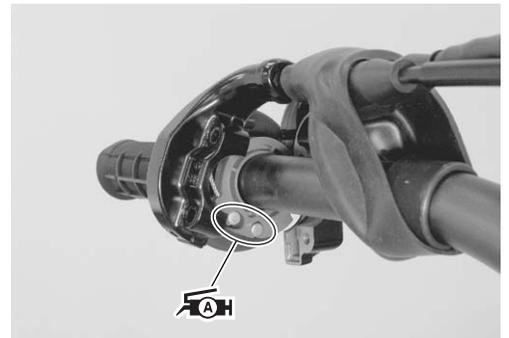
- Tighten the handlebar holder set nuts ⑩ to the specified torque.

 **Handlebar holder set nut: 44 N·m (4.4 kgf·m, 32.0 lbf·ft)**



- Apply grease to the throttle cable and their hole.

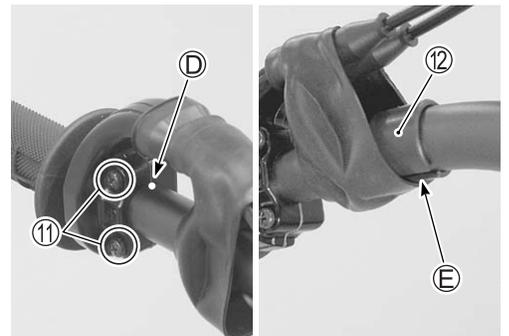
 99000-25010: SUZUKI SUPER GREASE “A”
or equivalent



- Align the matching mark ⑦ on the handlebars with the matching surface of throttle holder.
- Tighten the screws ⑪ securely.

NOTE:

Make sure that the cut-line ⑫ of collar ⑫ to lower side.

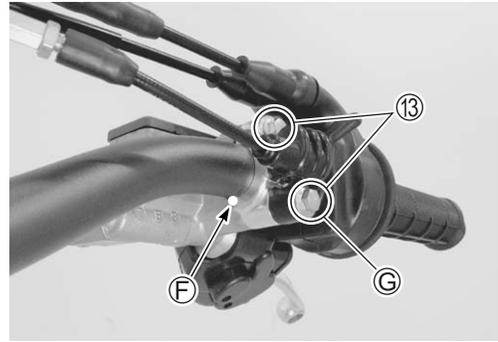


- Align the matching mark ⑥ on the handlebars with the matching surface master cylinder.
- Tighten the master cylinder holder lower bolt ③ first temporarily to provide clearance on the upper side and then tighten both the master cylinder holder bolts ⑬ to the specified torque. (☞ 20-28)

Master cylinder holder bolt :

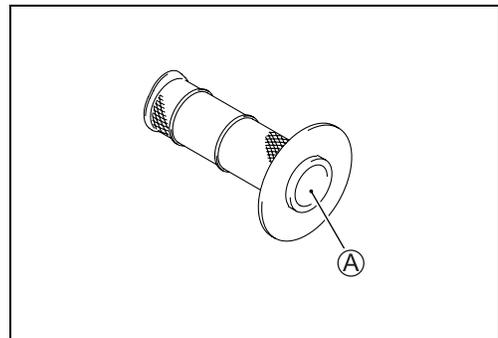
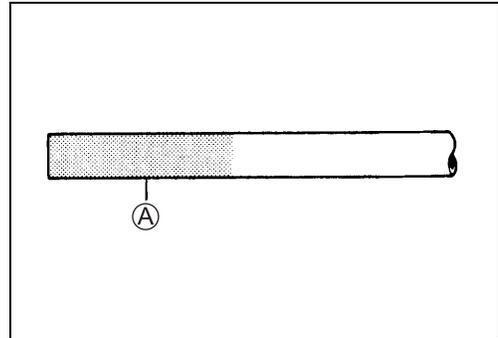
(Lower): 12 N·m (1.2 kgf-m, 8.5 lbf-ft)

(Upper): 10 N·m (1.0 kgf-m, 7.0 lbf-ft)

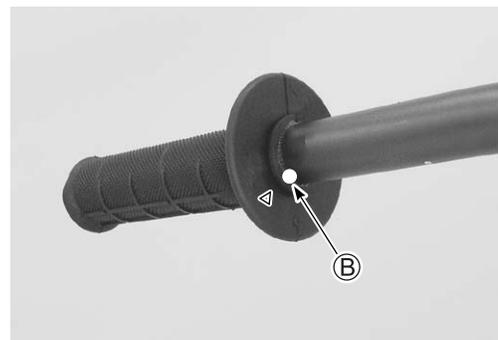


HANDLEBARS

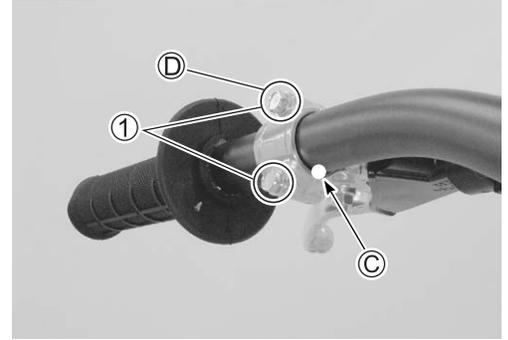
- Apply handle grip bond ① to the left handlebar end and inside of the left grip.



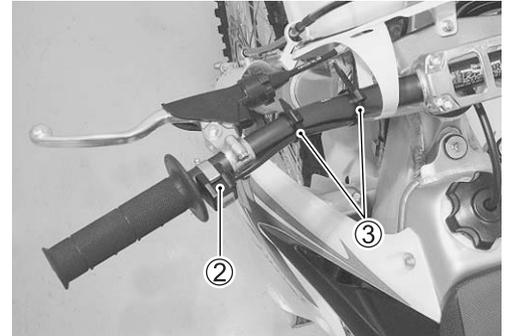
- Align the “△” mark on the left grip with the matching mark ② on the left handlebar end.



- Align the matching mark © on the handlebars with the matching surface clutch lever holder.
- Tighten the upper bolt ① first temporarily to provide clearance on the lower side and then tighten both the bolts ①.



- Install the engine stop switch ② and clamps ③.
- Install the front number plate and handlebar pad.



INSPECTION AFTER INSTALLATION

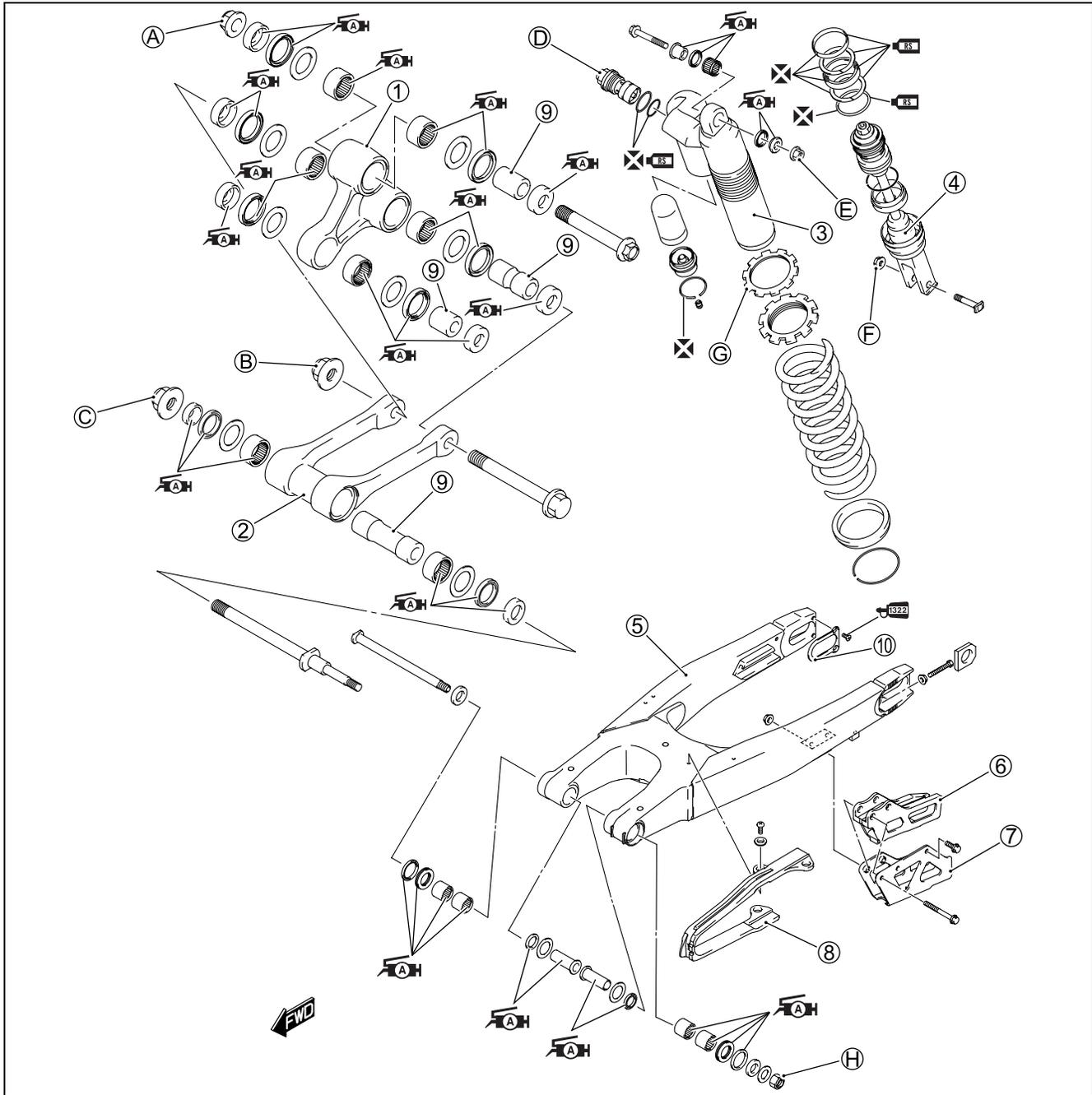
- Front fork (☞ 2-36)
- Steering (☞ 2-37)
- Wiring harness, cable and hose routing (☞ 20-18, -21, -22, -27, -28, -30)
- Handlebars set-up (☞ 20-32)

REAR SUSPENSION

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CONSTRUCTION REAR SUSPENSION

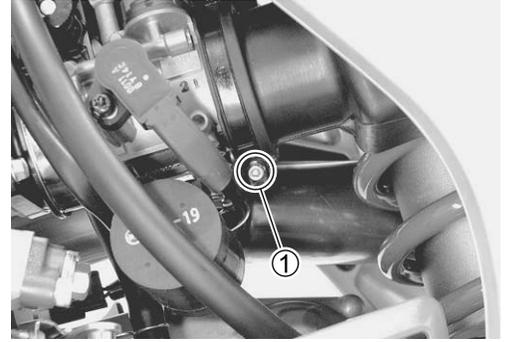


①	Cushion lever	(A)	Cushion lever nut
②	Cushion rod	(B)	Cushion rod nut (rear)
③	Shock absorber body	(C)	Cushion rod nut (front)
④	Damper rod assembly	(D)	Compression adjuster assembly
⑤	Swingarm	(E)	Rear shock absorber mounting nut (upper)
⑥	Chain guide	(F)	Rear shock absorber mounting nut (lower)
⑦	Chain guide plate	(G)	Spring adjuster lock-nut
⑧	Chain buffer	(H)	Swingarm pivot nut
⑨	Spacer		
⑩	Plate		

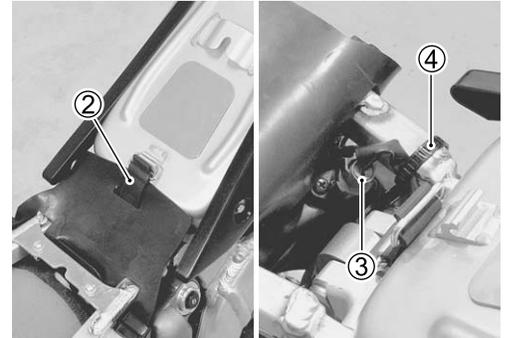
ITEM	N-m	kgf-m	lbf-ft
(A)(B)(C)	80	8.0	58.0
(D)	30	3.0	21.5
(E)(F)	50	5.0	36.0
(G)	44	4.4	32.0
(H)	70	7.0	50.5

REAR SHOCK ABSORBER REMOVAL

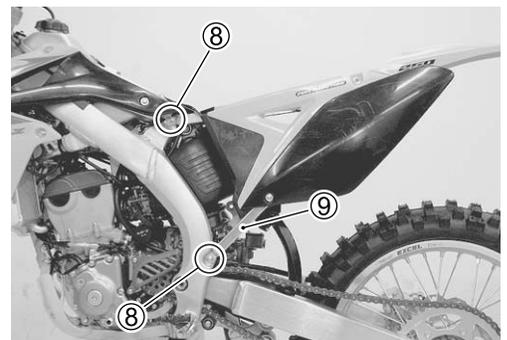
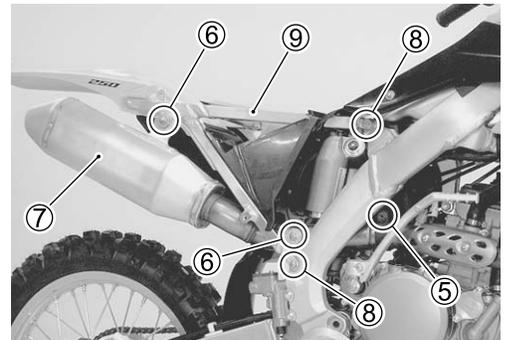
- Place the motorcycle on a block to lift rear wheel off the ground.
- Remove the seat and right frame cover. (➡ 5-2)
- Loosen the air cleaner clamp screw ①.



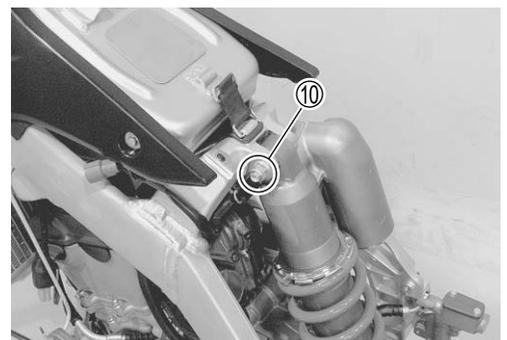
- Remove the rubber band ②.
- Disconnect the IAT sensor coupler ③ and remove the clamp ④.



- Loosen the muffler connector clamp bolt ⑤.
- Remove the muffler ⑦ by removing its bolts ⑥.
- Remove the seat rail ⑨ by removing its bolts ⑧.



- Remove the rear shock absorber upper mounting bolt and nut ⑩.

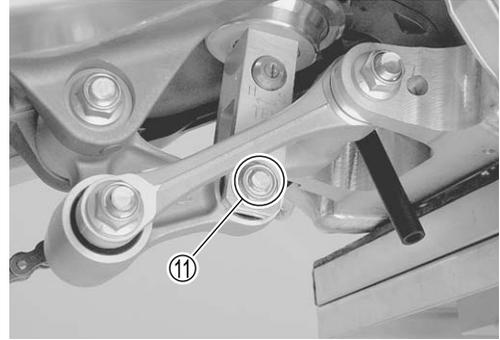


- Remove the rear shock absorber lower mounting bolt and nut ⑪.

NOTE:

If necessary, move the swingarm up or down to facilitate this mounting bolt/nut removal.

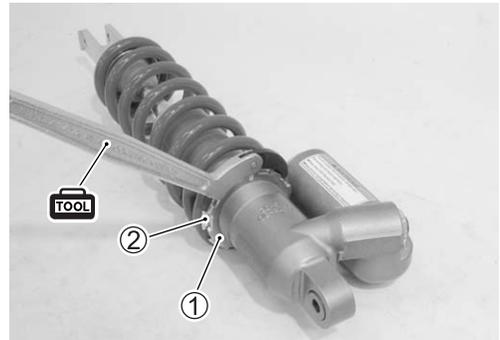
- Remove the rear shock absorber.



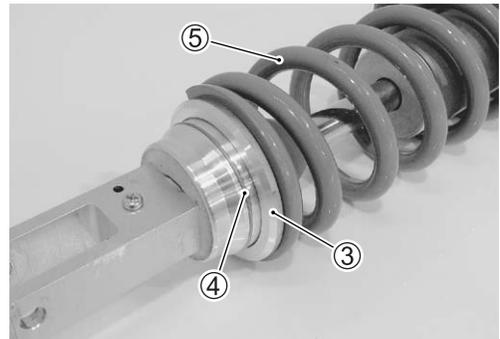
SPRING REPLACEMENT

- Loosen the lock-nut ① with the special tool and turn it fully to the end of the thread.
- Turn the adjuster ② as well as the lock-nut ①.

 **09910-60611: Universal clamp wrench**



- Depress the spring seat ③ and remove the stopper ring ④.
- Remove the spring seat ③ and the spring ⑤ from the rear shock absorber.

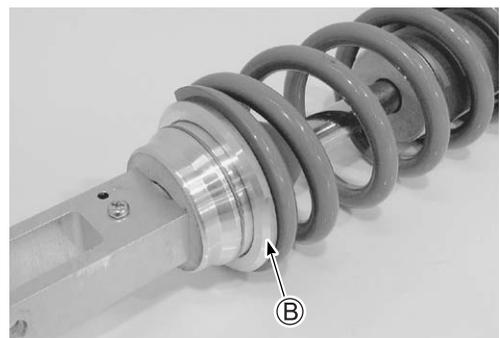
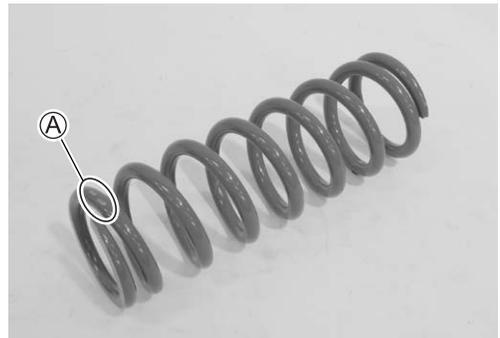


- Install the lock-nut, adjuster, spring, spring seat and stopper ring.

NOTE:

* *Install the spring as its painted side ① (small diameter side) faces bottom.*

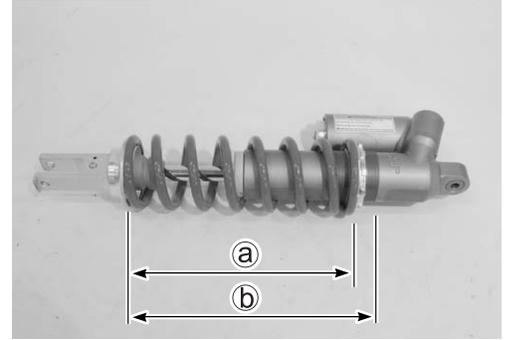
* *When installing the spring seat, insert the tapered end ② of the spring seat to the bottom.*



- Adjust the spring set length and tighten the lock-nut.

DATA Standard spring set length:
 4.2 mm (0.17 in) compressed from the free length
 Spring set length adjustable range:
 248 – 263 mm (9.76 – 10.35 in)
 [at spring free length 265 mm (10.43 in)]
 (a): Hardest spring setting
 (b): Softest spring setting

U Spring adjuster lock-nut: 44 N·m (4.4 kgf-m, 32.0 lbf-ft)



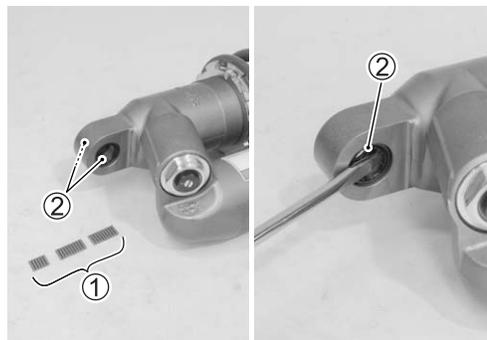
INSPECTION

- Inspect the rear shock absorber for oil leakage.
 - Inspect the damper rod for bends and smooth movement.
 - Inspect the bump rubber for deterioration and damage.
 - Inspect the damper rod hidden by the bump rubber by moving the bump rubber.
 - If necessary, replace the defective parts with a new one.
-
- Inspect the spacers and dust seals for damage.
 - Inspect the bearing for excessive play and smooth movement.
 - If necessary, replace the defective parts with a new one.



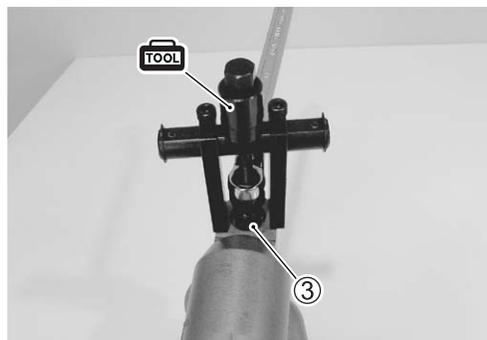
BEARING REPLACEMENT

- Remove the spacers.
- Remove the needle roller bearings ①. (26 pieces of needle roller bearing)
- Remove the dust seals ②.



- Remove the needle roller bearing cage ③ with the special tool.

TOOL 09921-20240: Bearing remover set (Remover 17 mm)



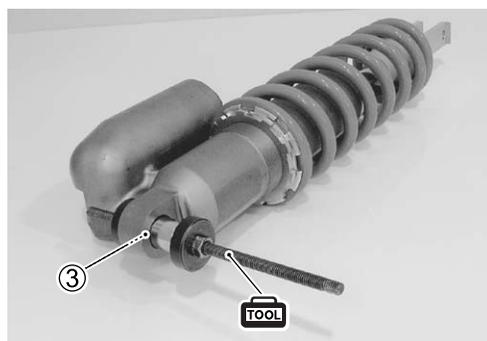
- Press the new needle roller bearing cage with the special tool and a suitable size socket wrench.

NOTE:

When installing the needle roller bearing cage ③, the stamped mark on the bearing must face left side.

Position the needle roller bearing cage by referring to the illustration of page 19-22.

TOOL 09924-84521: Bearing installer set



- Press the new dust seals ④ with the special tool and a suitable size socket wrench.

CAUTION

Replace the dust seal ④ with new ones.

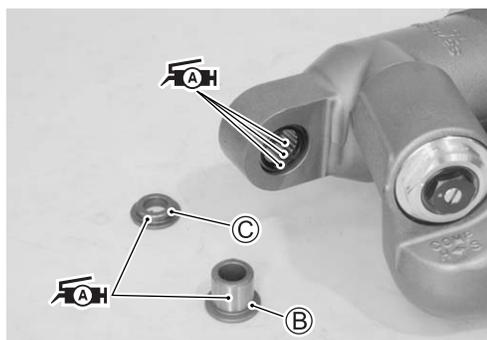
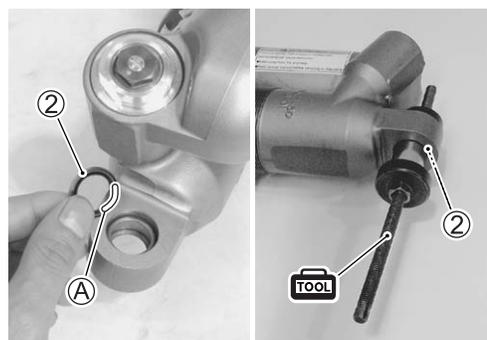
NOTE:

When installing the dust seal ④, the stamped mark (A) on the dust seal ④ must face inside.

TOOL 09924-84521: Bearing installer set

- Apply grease to the needle roller bearings and install them.
- Apply grease to the dust seals and spacers.
- Install the spacers (B) and (C).
 - Ⓑ For right side
 - Ⓒ For left side

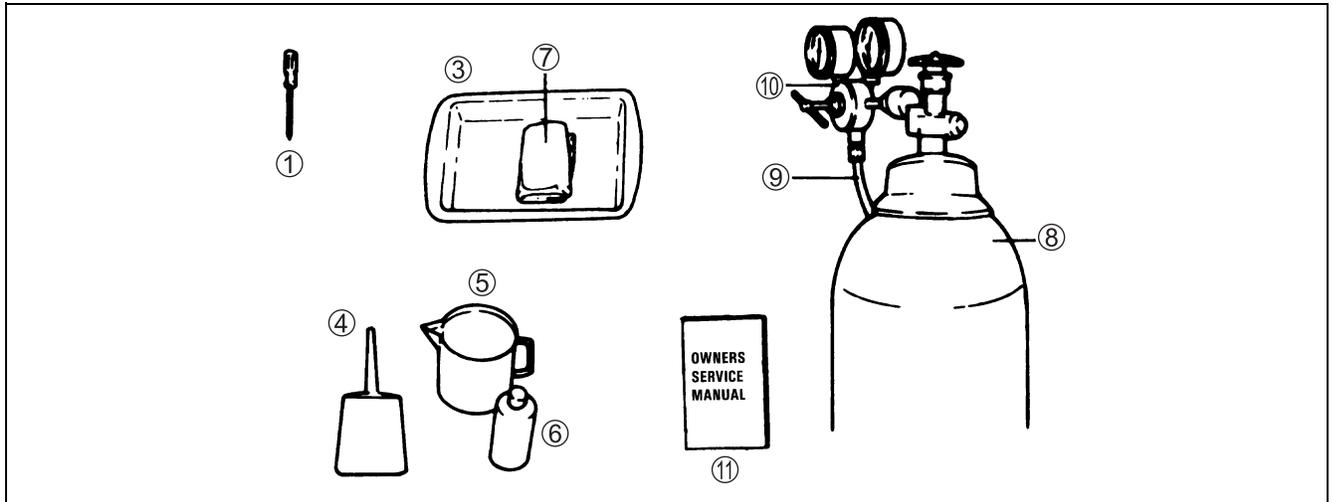
AH 99000-25010: SUZUKI SUPER GREASE "A" or equivalent



OIL REPLACEMENT

TOOLS AND EQUIPMENT

- Following tools and equipment are required to perform oil replacement.



- | | |
|------------------------------|--------------------------|
| ① Screwdriver or small punch | ⑦ Rags |
| ② Vise* | ⑧ Nitrogen tank |
| ③ Drain Pan | ⑨ Filler Hose and Nozzle |
| ④ Oil can | ⑩ Regulator Assembly |
| ⑤ Beaker | ⑪ Owner's Service Manual |
| ⑥ Specified Shock Oil (SS25) | |

* Not shown in the illustration

OIL REPLACEMENT PROCEDURE

- Remove the rear shock absorber unit from the frame (➡ 19-3), clean and dry it.
- Remove the spring from the rear shock absorber unit. (➡ 19-4)

NOTE:

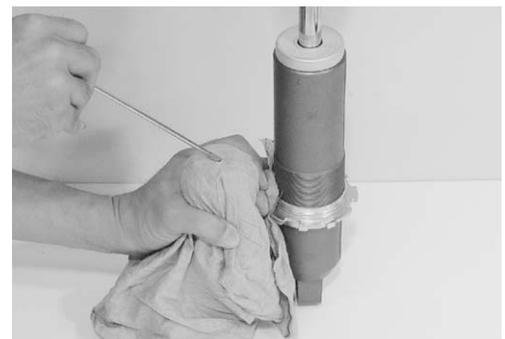
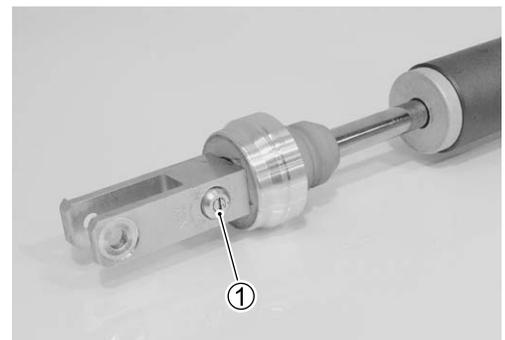
Inspect the rear shock absorber unit for oil leakage.

Turn the rebound damping force adjuster screw ① counterclockwise until it stops so that the rear suspension oil can be poured easily.

- Remove the valve cap. Press the valve with a screwdriver to bleed out nitrogen gas.

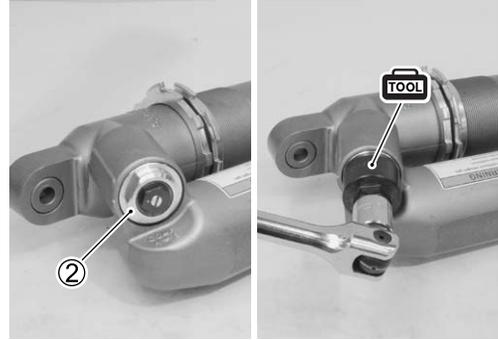
⚠ WARNING

- * Releasing high pressure gas from the rear shock absorber unit can be hazardous.
- * Never perform any servicing until the nitrogen gas pressure has been released from the rear shock absorber unit. When releasing the gas pressure, place a rag over the gas valve and use the tip of a screwdriver etc. to press the valve. Do not use your finger to depress the gas valve, and direct the valve away from your face and body.

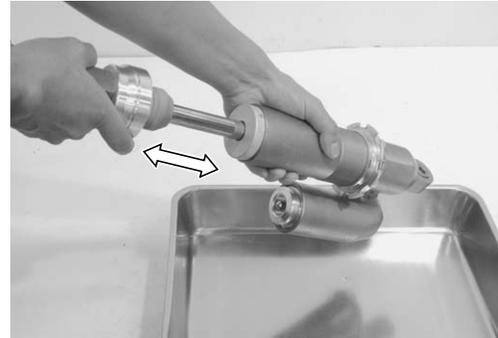


- Remove the compression adjuster assembly ② with the special tool from the rear shock absorber.

TOOL 09941-53660: RCU socket wrench (24 mm)



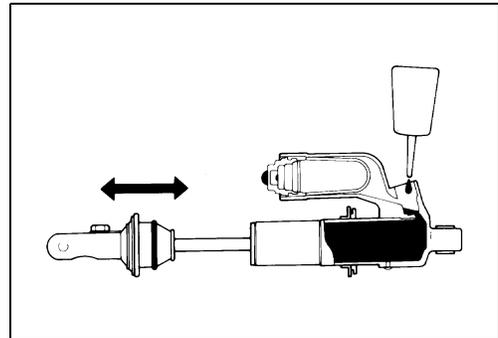
- Place a drain pan under the rear shock absorber unit.
- Move the rod and drain the oil completely.
- Push the valve core again to equalize the bladder to atmospheric pressure.



- Pour the fresh specified rear suspension oil as shown while moving the rod.

NOTE:

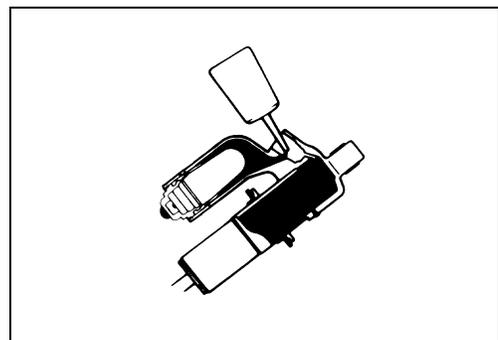
Be sure to extend the rod after filling the oil.



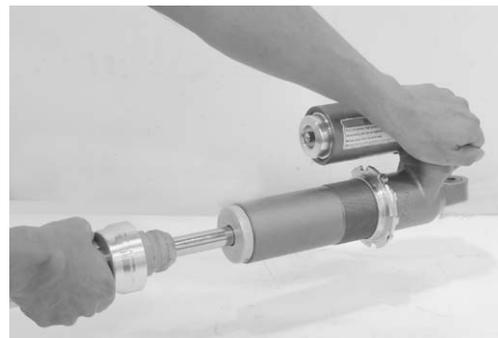
- Tilt the shock absorber unit as shown and pour the fresh rear suspension oil fully into the reservoir.

RS REAR SUSPENSION OIL SS-25 or equivalent

DATA Oil capacity: 383 ml (13.0/13.5 US/Imp oz)



- Cover the compression adjuster hole with the root of your thumb.
- Tilt and shake the rear shock absorber unit to fill the reservoir with the oil.
- Add the oil and repeat the above procedure until the reservoir is filled with the oil completely.



- Replace the O-rings ③ on the compression adjuster assembly with new ones.
- Apply rear suspension oil to the O-rings ③.

RS REAR SUSPENSION OIL SS-25 or equivalent



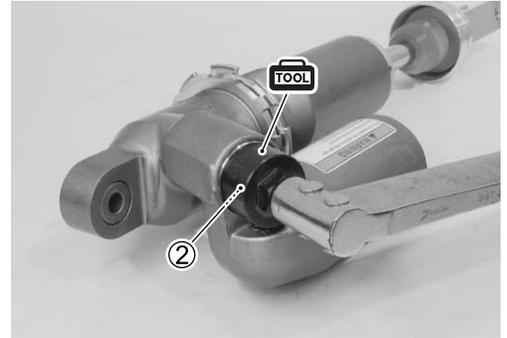
- Reinstall the compression adjuster assembly ②.
- Tighten the compression adjuster assembly ② to the specified torque with the special tool.

TOOL 09941-53660: RCU socket wrench (24 mm)

Compression adjuster assembly:

30 N·m (3.0 kgf·m, 21.5 lbf·ft)

- Fill the rear shock absorber unit with nitrogen gas to 784 kPa (8.0 kgf/cm², 113.8 psi).
- Tighten the gas valve cap.
- Reinstall the spring. (19-4)



⚠ WARNING

- * Use of flammable gas for pressuring the rear shock absorber unit can be hazardous. Flammable gas such as gas welding oxygen can cause a fire hazard.
- * Use nitrogen gas. If nitrogen gas is not available, compressed air free from water can be substituted.

⚠ WARNING

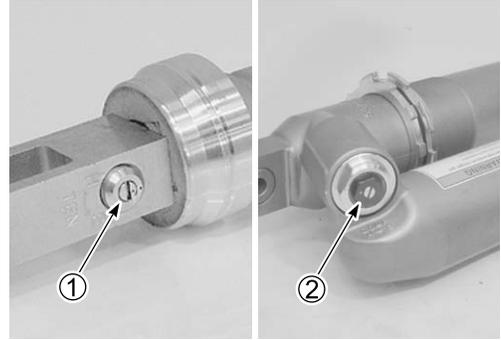
- * Applying too much pressure to the rear shock absorber unit may rupture the rear shock absorber unit.
- * Be sure to fill the rear shock absorber unit to the specified pressure.

CAUTION

- * Riding the motorcycle with abnormal gas pressure can damage the rear shock absorber unit. Low gas pressure can result in oil leakage. Abnormal gas pressure cannot provide normal rear shock absorber unit performance.
- * Be sure to fill the rear shock absorber unit to the specified pressure.

DISASSEMBLY AND INSPECTION

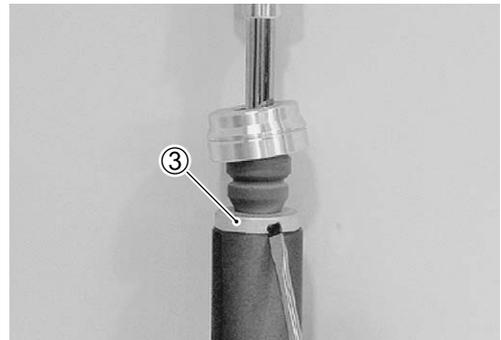
- Clean and dry the rear shock absorber.
- Remove the spring from the rear shock absorber. (☞ 19-4)
- Turn the rebound damping force adjuster ① and compression adjuster ② to the softest position.
- Press the valve with a screwdriver to bleed out nitrogen gas. (☞ 19-7)
- Remove the compression adjuster assembly and drain the oil. (☞ 19-8)



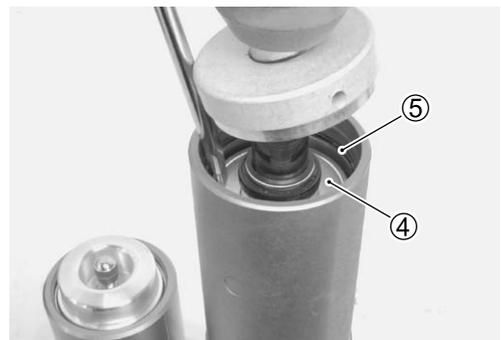
- Vise the rear shock absorber unit in inverted position.
- Depress the bump rubber fully to protect the damper rod.



- Evenly hammer the stopper ③ with a screwdriver or equivalent and remove it from the rear shock absorber body.



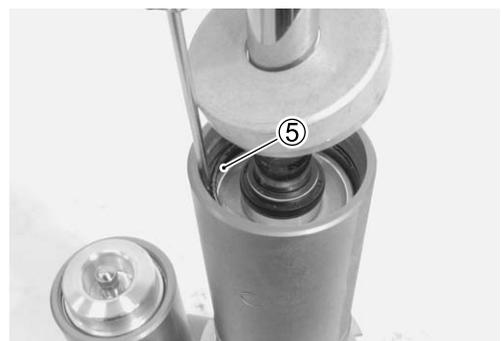
- Depress the seal case ④ with a screwdriver until the circlip ⑤ is fully exposed.



- Remove the circlip ⑤.

NOTE:

Do not scratch the inner surface of the shock absorber body to avoid oil leaks.



- Slowly draw the damper rod assembly ⑥ until the O-ring ⑦ on the seal case ④ is seen.
- Draw out the seal case ④.
- Cut the special tool and set it to the circlip groove ① of shock absorber body.

NOTE:

* Cut the special tool so that the clearance on its cutting surface become 1 mm and less when the special tool is set to the circlip groove ①.

* The tapered side ② of special tool faces shock absorber body side.

TOOL 09943-02810: Rear cushion guard ring

- Extract the damper rod assembly ⑥ from the shock absorber body.
- Remove the special tool.

NOTE:

The special tool is not necessary when reassembling.

① 1 mm and less

- Inspect the oil seal and O-rings.
- Inspect the damper rod for bends and scratches.
- Inspect the inner surface of the body.
- Inspect the piston ring ⑧, back up rings ⑨ and packing ⑩ on the piston.
- Replace the O-rings with new ones.
- Replace the piston ring ⑧, back up rings ⑨ and packing ⑩ by cutting off the old ones and putting new ones onto the piston if necessary.

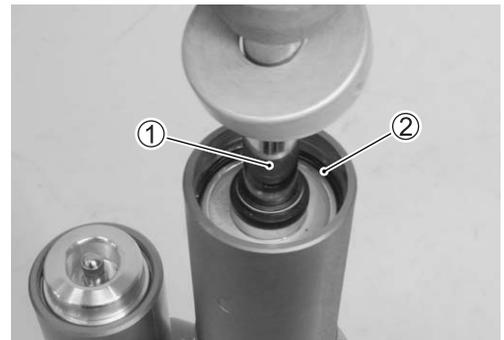
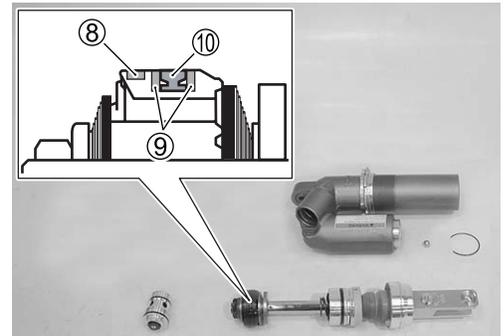
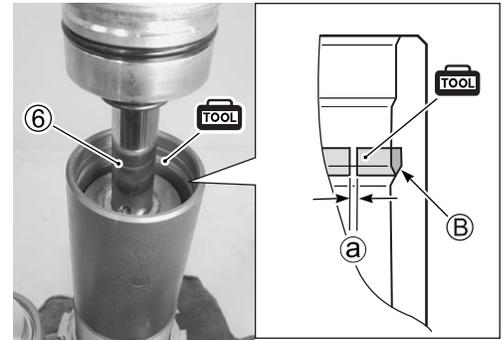
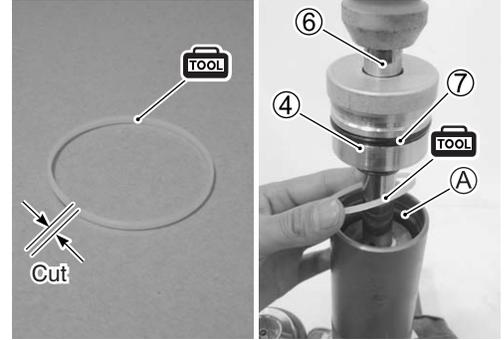
REASSEMBLY

- Apply the rear suspension oil to the O-rings, piston ring, back up rings and packing.
- Insert the damper rod assembly ① and fit a new circlip ②.
- Pull up the damper rod assembly ① until it is stopped by the circlip ②.
- Fit the stopper to the shock absorber body.
- Fill the specified rear suspension oil in the rear shock absorber. (☞ 19-8)

RS REAR SUSPENSION OIL SS-25 or equivalent

DATA Oil capacity: 383 ml (13.0/13.5 US/Imp oz)

- Reinstall the compression adjuster assembly. (☞ 19-9)
- Pressure the rear shock absorber unit with nitrogen gas to 784 kPa (8.0 kgf/cm², 113.8 psi). (☞ 19-9)
- Reassemble the spring and adjust the spring set length. (☞ 19-4, -5)
- Tighten the valve cap.



INSTALLATION

Install the rear shock absorber in the reverse order of removal. Pay attention to the following points:

- Tighten the rear shock absorber lower mounting bolt and nut ① to the specified torque.

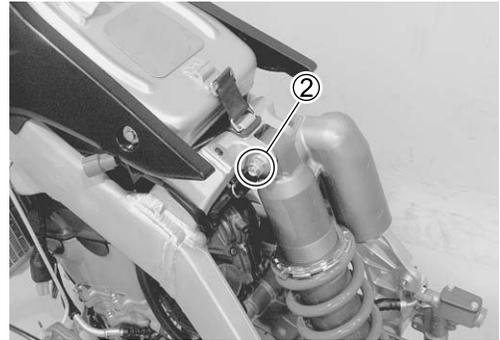
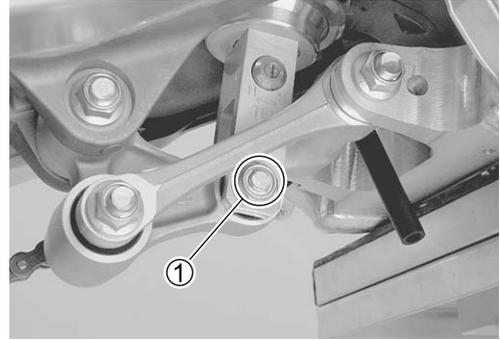
NOTE:

If necessary, move the swingarm up or down to facilitate this mounting bolt/nut tightening.

- 🔩 **Rear shock absorber lower mounting nut:**
50 N·m (5.0 kgf-m, 36.0 lbf-ft)

- Tighten the upper mounting bolt and nut ② to the specified torque.

- 🔩 **Rear shock absorber upper mounting nut:**
50 N·m (5.0 kgf-m, 36.0 lbf-ft)



DISPOSAL

High pressure nitrogen gas is sealed in the rear shock absorber unit. Be sure to release gas before disposing the rear shock absorber unit.

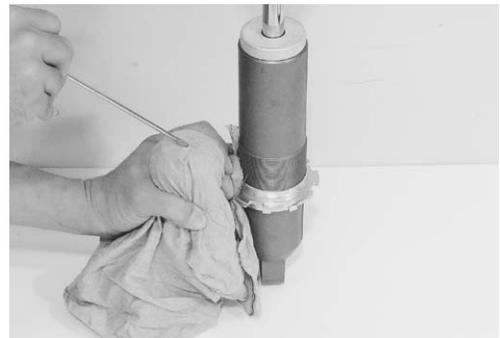
- Remove the valve cap ①.



- Press the valve with a screwdriver.

⚠ WARNING

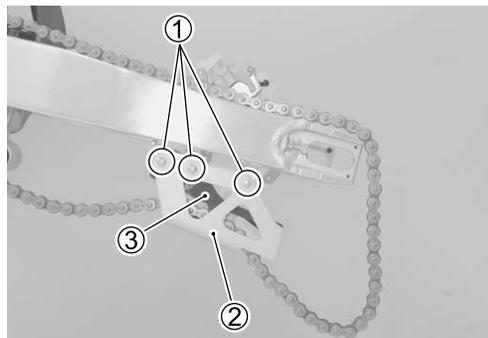
- * Releasing high pressure gas from the rear shock absorber unit can be hazardous.
- * Place a rag over the valve and push the valve with a screwdriver to release nitrogen gas. Do not use your finger to push the valve, and direct the valve away from your face and body.



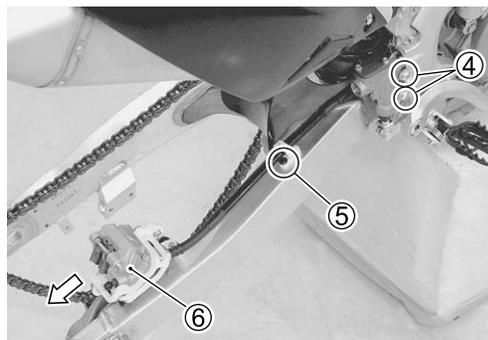
SWINGARM

REMOVAL

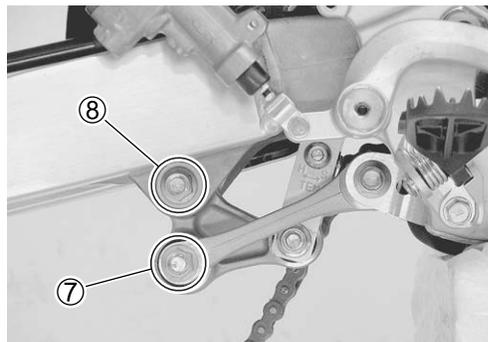
- Place the motorcycle on a block to lift rear wheel off the ground.
- Remove the rear wheel. (➡ 16-7)
- Remove the chain guide bolts and nuts ①.
- Remove the chain guide plate ② and chain guide ③.



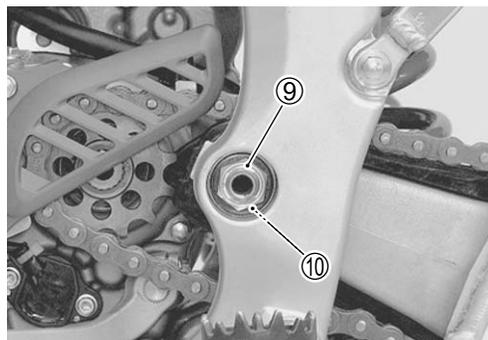
- Remove the rear master cylinder mounting bolts ④ and brake hose guide screw ⑤.
- Remove the rear brake caliper assembly ⑥ from the swing-arm.



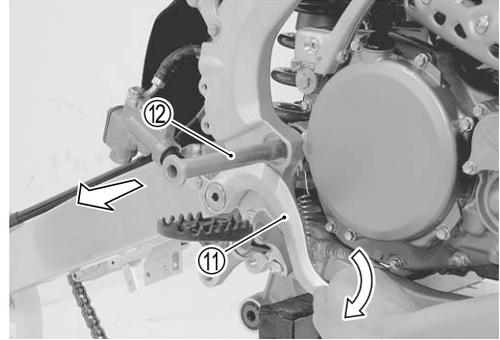
- Remove the cushion rod bolt and nut ⑦.
- Remove the cushion lever bolt and nut ⑧.



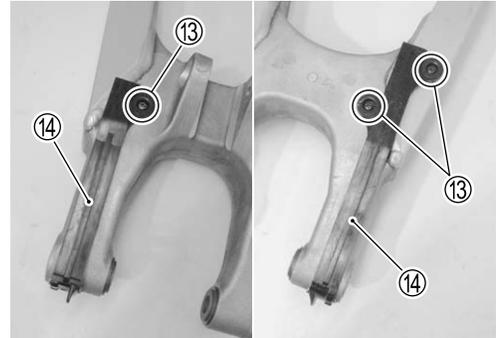
- Remove the swingarm pivot nut ⑨ and washer ⑩.



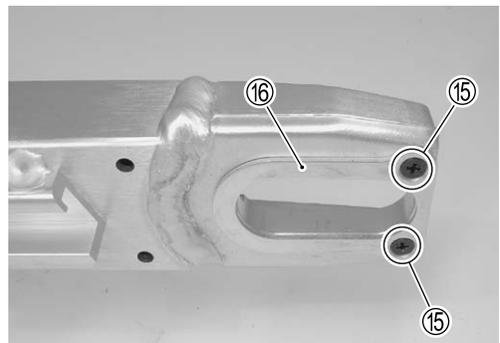
- Down the rear brake pedal ⑪ and remove the pivot shaft ⑫.
- Remove the swingarm.



- Remove the chain buffer (14) by removing its screws (13).

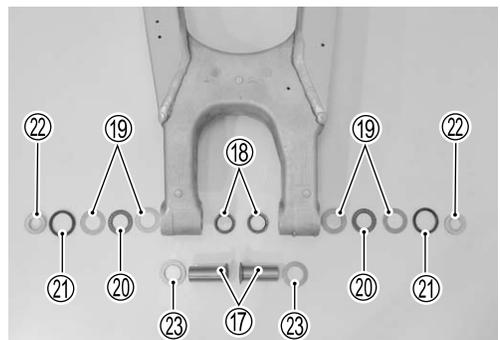


- Remove the plates (16) by removing its screws (15).



- Remove the following parts from the swingarm.

- Spacer ⑰
- Oil seal ⑱
- Washer ⑲
- Thrust bearing ⑳
- Dust seal ㉑
- Spacer ㉒
- Washer ㉓



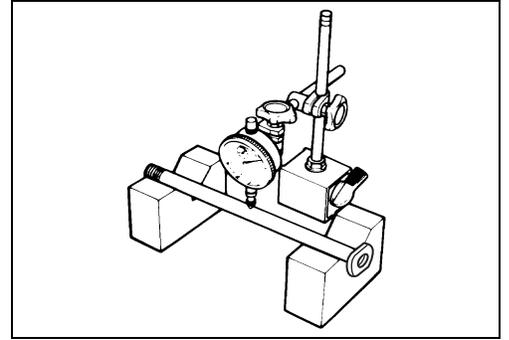
INSPECTION

PIVOT SHAFT

- Measure the pivot shaft runout with the dial gauge and V blocks.
- If any the runout exceeds the limit, replace the pivot shaft with a new one.

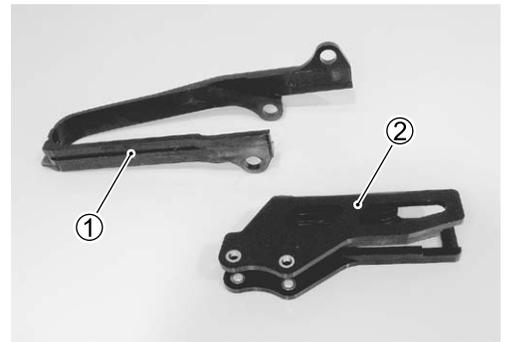
DATA Swingarm pivot shaft runout
Service Limit: 0.3 mm (0.01 in)

TOOL 09900-20607: Dial gauge
09900-20701: Dial gauge chuck
09900-21304: V blocks



CHAIN BUFFER AND CHAIN GUIDE

- Inspect the chain buffer ① and chain guide ② for damage and excessive wear.
- If any defects are found, replace the chain buffer or guide with a new one.



PLATE

- Inspect the plate for damage and excessive bend.
- If any defects are found, replace the plate with a new one.



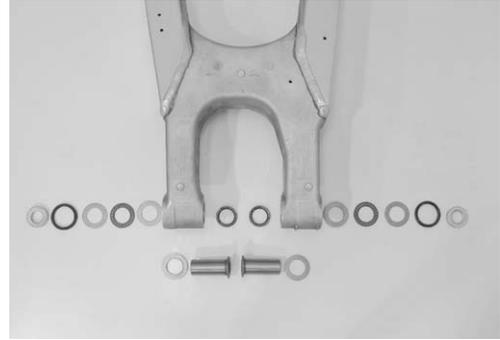
SWINGARM

- Inspect the swingarm for cracks and damage.
- If any defects are found, replace the swingarm with a new one.



BEARING, SPACER, DUST SEAL, OIL SEAL

- Inspect the bearings, spacers, dust seals and oil seals for damage.
- If necessary, replace the defective parts with a new one.



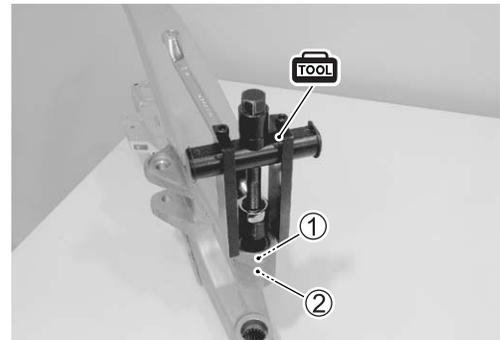
- Insert the spacer into the bearings and inspect them for play and smooth movement.
- If excessive play is noted, replace the bearing with a new one.



BEARING REPLACEMENT

- Remove the bearings ① and ② with the special tool.

 **09921-20240: Bearing remover set (Remover 20 mm)**

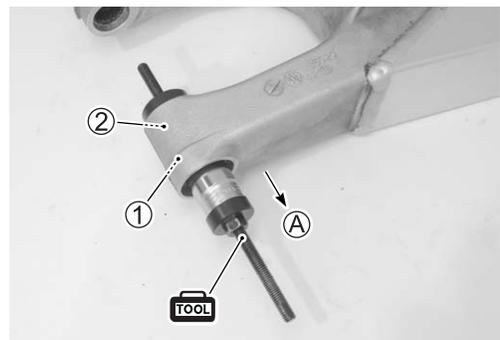


- Press the new bearings ① and ② with the suitable socket wrench and special tool. (☞ 19-23)

NOTE:

When installing the bearings ① and ②, the stamped mark on the bearings must face outside.

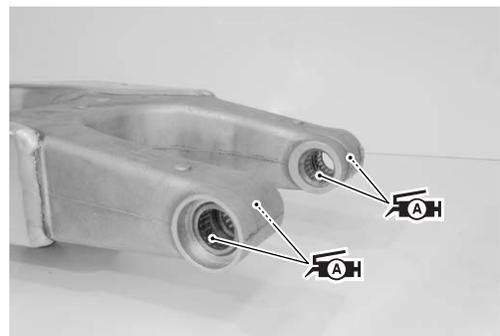
 **09924-84521: Bearing installer set**



Ⓐ Direction of outside

- Apply grease to the bearings.

 **99000-25010: SUZUKI SUPER GREASE "A"**
or equivalent



INSTALLATION

Install the swingarm in the reverse order of removal. Pay attention to the following points:

- Install the following parts into the swingarm.

① Oil seal	⑤ Washer
② Spacer	⑥ Dust seal
③ Washer	⑦ Spacer
④ Thrust bearing	⑧ Washer
- Apply grease to the dust seals, bearings and oil seals.

 **99000-25010: SUZUKI SUPER GREASE “A”**
or equivalent

- Apply a small quantity of THREAD LOCK SUPER to the plate mounting screws ⑨.

 **99000-32110: THREAD LOCK SUPER “1322”**
or equivalent

- Tighten the plate mounting screws ⑨ securely.
- Install the chain buffer.

- Install the swingarm.
- Tighten the swingarm pivot nut ⑩ to the specified torque.

 **Swingarm pivot nut: 70 N·m (7.0 kgf-m, 50.5 lbf-ft)**

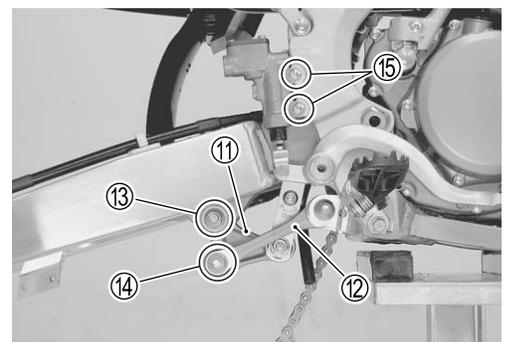
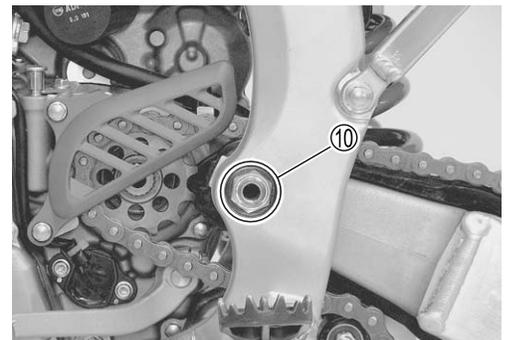
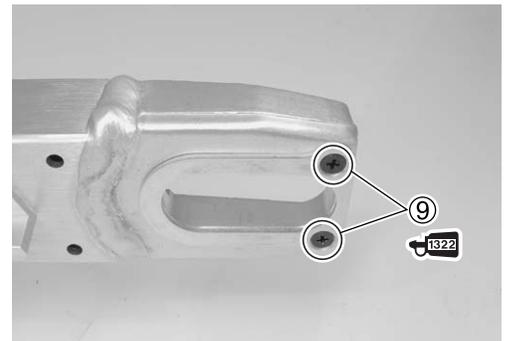
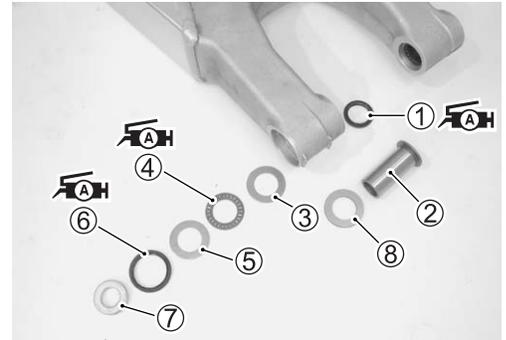
- Install the cushion lever ⑪ and cushion rod ⑫.
- Tighten the cushion lever nut ⑬ and cushion rod nut ⑭ to the specified torque.

 **Cushion lever nut: 80 N·m (8.0 kgf-m, 58.0 lbf-ft)**
Cushion rod nut: 80 N·m (8.0 kgf-m, 58.0 lbf-ft)

- Tighten the master cylinder mounting bolts ⑮ to the specified torque.

 **Rear brake master cylinder mounting bolt:**
10 N·m (1.0 kgf-m, 7.0 lbf-ft)

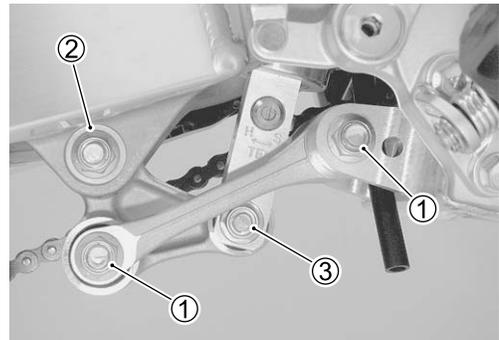
- Install the chain guide.
- Install the rear wheel. ( 16-11)
- Adjust the drive chain slack. ( 2-31)



REAR SUSPENSION LINKAGE

REMOVAL

- Place a block under the chassis tubes.
- Remove the rear cushion rod bolts and nuts ①.
- Remove the cushion lever bolt and nut ②.
- Remove the shock absorber lower bolt and nut ③.



- Remove the collars, dust seals, washers and spacers.

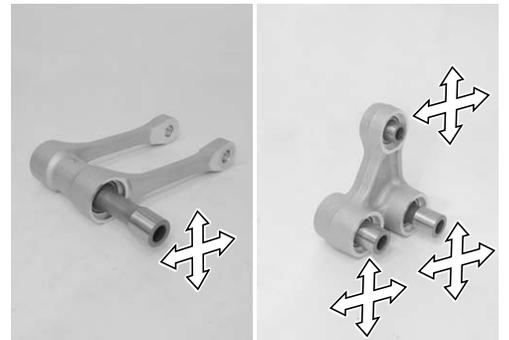


INSPECTION

- Inspect the cushion rod and cushion lever for damage.
- Inspect the collars, dust seals, washers and spacers for damage.
- If necessary, replace the defective parts with a new one.



- Insert the spacers into the bearings and inspect them for excessive play and smooth movement.
- If excessive play is noted, replace the bearing with a new one.



BEARING REPLACEMENT

- Remove the collars, dust seals, washers and spacers.
(☞ 19-18)

- Remove the needle roller bearings.

Cushion rod bearing

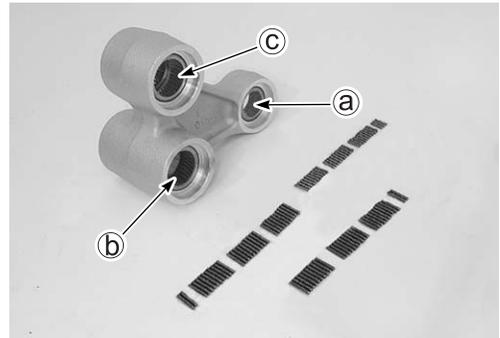
(One side 32 pieces of needle roller bearing)

Cushion lever bearing

Ⓐ (33 pieces of needle roller bearing)

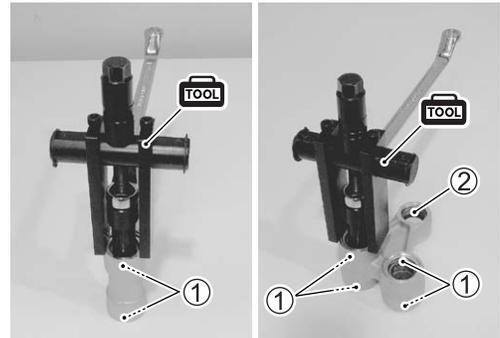
Ⓑ (One side 32 pieces of needle roller bearing)

Ⓒ (One side 32 pieces of needle roller bearing)



- Remove the needle roller bearing cages ① and ② with the special tool.

 **09921-20240: Bearing remover set (Remover 20 mm)**



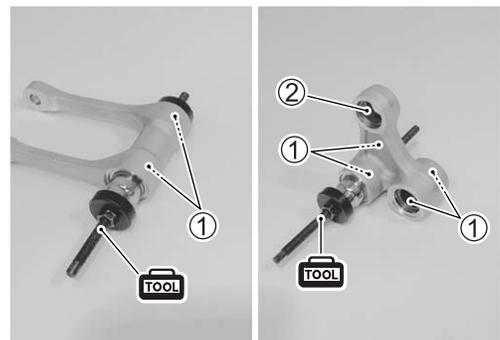
- Press fit the new needle roller bearing cages ① and ② with the special tool and a suitable size socket wrench.

 **09924-84521: Bearing installer set**

NOTE:

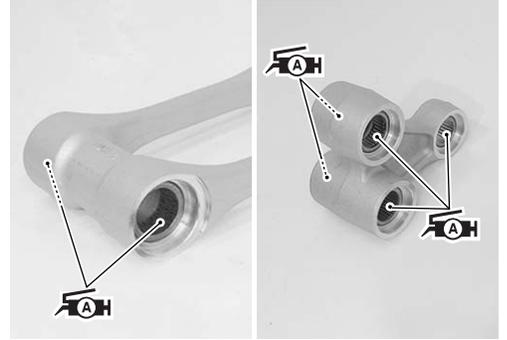
* When installing the needle roller bearing cages ①, the stamped mark on the bearing must face outside. (②: right side)

* Position the needle roller bearing cages by referring to the illustration of page 19-22.



- Apply grease to the needle roller bearings and install them.

 99000-25010: SUZUKI SUPER GREASE "A"
or equivalent

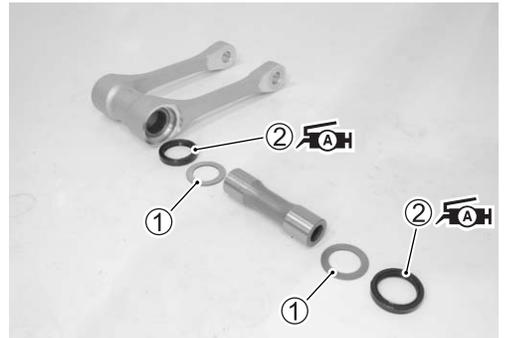
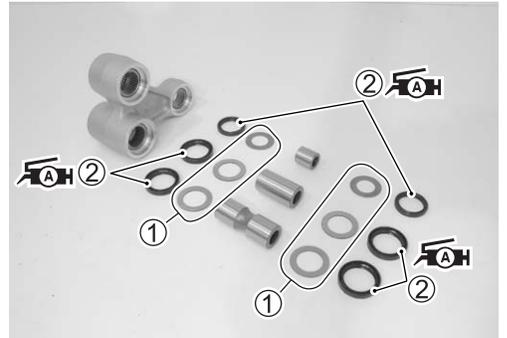


INSTALLATION

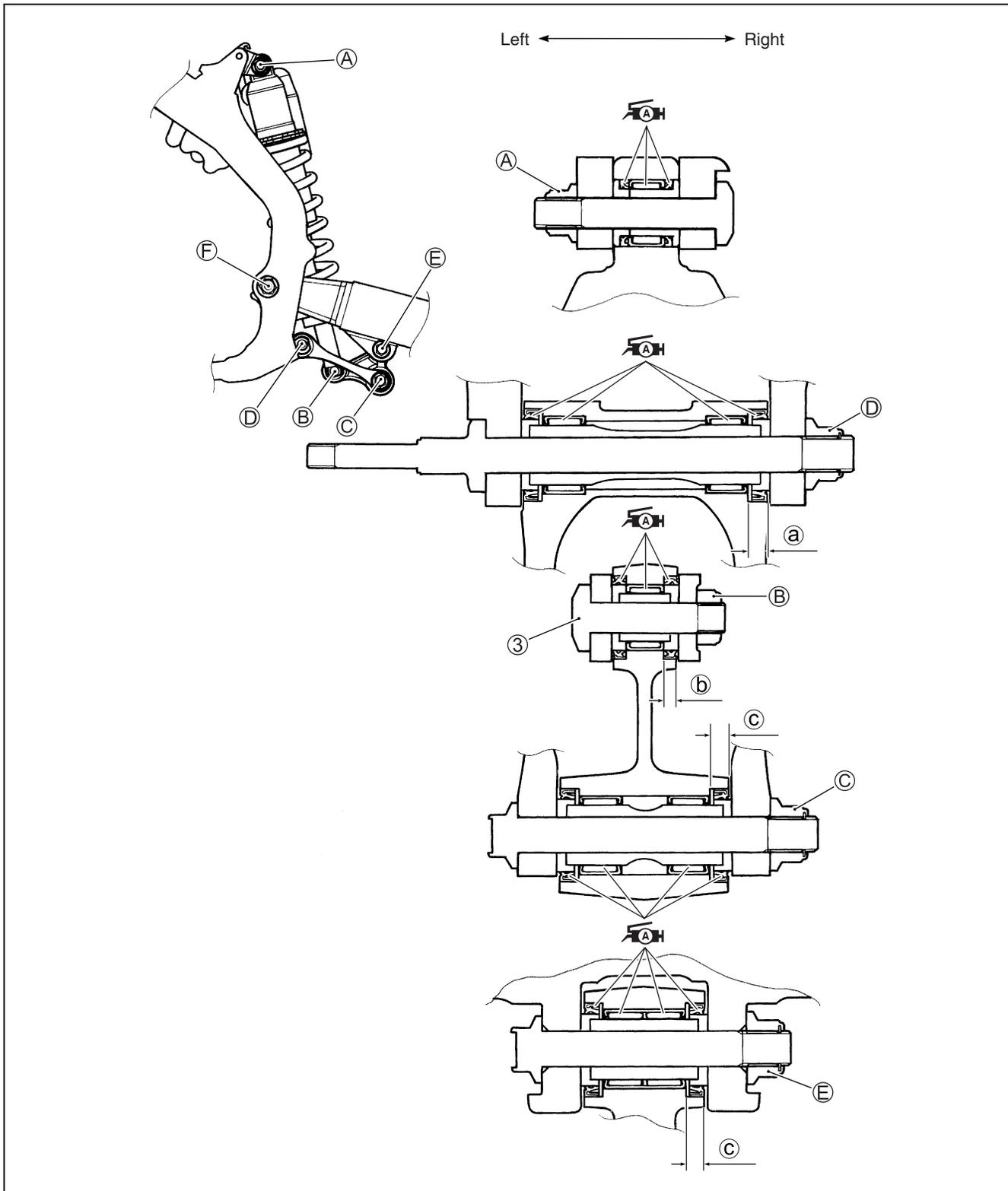
Install the rear suspension linkage in the reverse order of removal. Pay attention to the following points:

- Install the washers ①.
- Position the dust seals ② so that the manufacturer's code indicated side of the seals face outside.
- Apply grease to the dust seals ②.

 99000-25010: SUZUKI SUPER GREASE "A"
or equivalent



- Tighten the cushion lever, cushion rod and swingarm nuts to the specified torque.



③: Rear suspension linkage bolt

 Tightening torque:

A: 50 N·m (5.0 kgf-m, 36.0 lbf-ft)

B: 50 N·m (5.0 kgf-m, 36.0 lbf-ft)

C: 80 N·m (8.0 kgf-m, 58.0 lbf-ft)

D: 80 N·m (8.0 kgf-m, 58.0 lbf-ft)

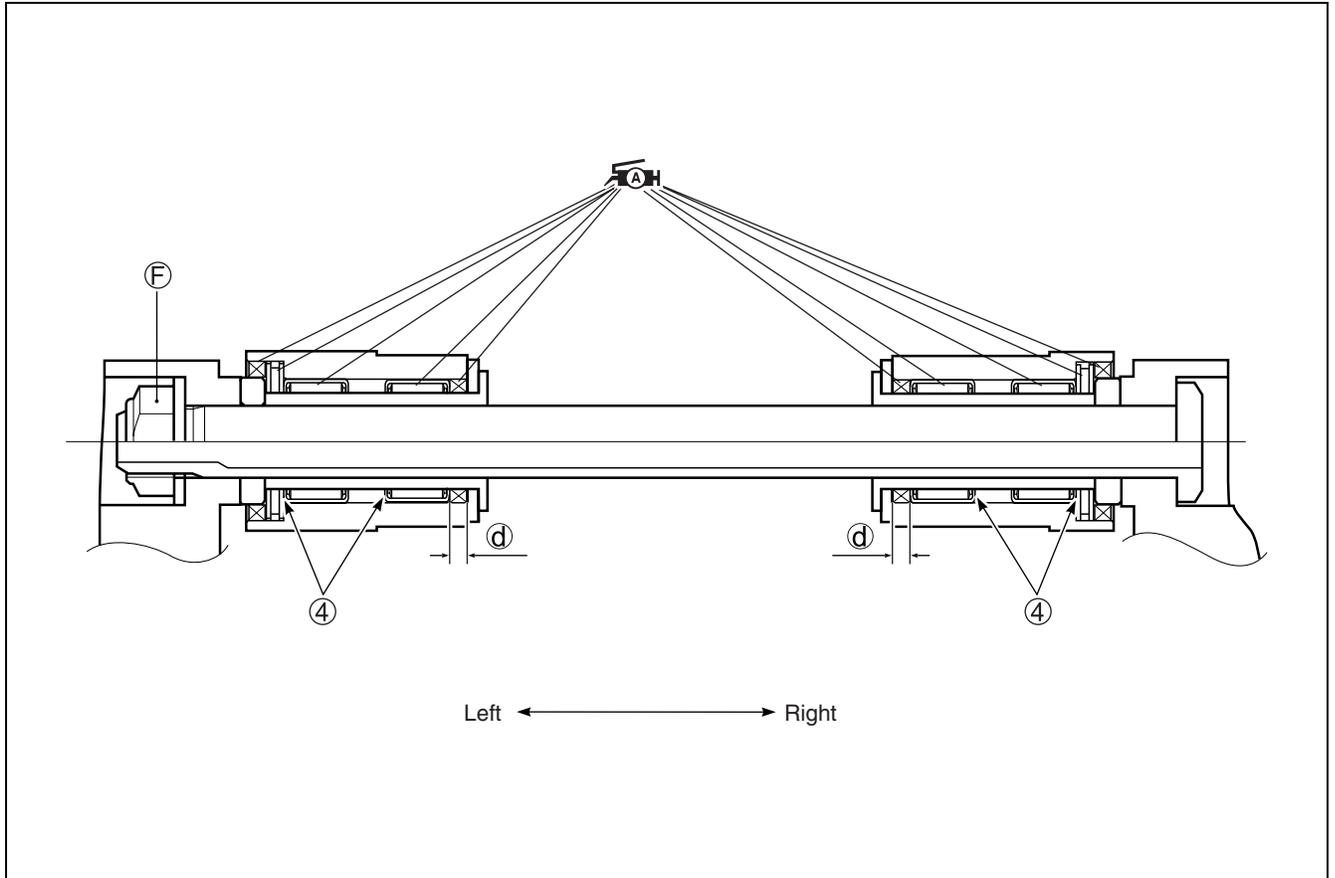
E: 80 N·m (8.0 kgf-m, 58.0 lbf-ft)

F: 70 N·m (7.0 kgf-m, 50.5 lbf-ft)

a: 6.25 mm (0.25 in)

b: 4.5 mm (0.18 in)

c: 6.0 mm (0.24 in)



④: Stamped mark ⓓ: 4.0 mm (0.16 in)

 Tightening torque:

Ⓕ: 70 N·m (7.0 kgf·m, 50.5 lbf·ft)

CAUTION

- * Improperly reassembled rear suspension linkage bolts can interfere with suspension movement and damage the rear suspension linkage.
- * Make sure that the rear shock absorber rebound damping adjuster on the bottom bracket of the rear shock absorber is located to the right side.
- * Insert the rear suspension linkage bolt ③ from the left side. Make sure that the nut Ⓕ is in the recess of the rear shock absorber bottom bracket.

SERVICING INFORMATION

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SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	31 (1.22)	—
	EX.	25 (0.98)	—
Tappet clearance (when cold)	IN.	0.09 – 0.16 (0.004 – 0.006)	—
	EX.	0.17 – 0.24 (0.007 – 0.009)	—
Valve guide to valve stem clearance	IN.	0.010 – 0.037 (0.0004 – 0.0015)	—
	EX.	0.030 – 0.057 (0.0012 – 0.0022)	—
Valve stem deflection	IN. & EX.	—	0.25 (0.010)
Valve guide I.D.	IN. & EX.	4.500 – 4.512 (0.1772 – 0.1176)	—
Valve stem O.D.	IN.	4.475 – 4.490 (0.1762 – 0.1768)	—
	EX.	4.455 – 4.470 (0.1754 – 0.1760)	—
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve seat width	IN. & EX.	0.9 – 1.1 (0.035 – 0.043)	—
Valve head radial runout	IN. & EX.	—	0.03 (0.001)
Valve spring free length	IN.	—	37.1 (1.46)
	EX.	—	37.5 (1.48)
Valve spring tension	IN.	142 – 157 N (14.5 – 16.0 kgf, 31.9 – 35.3 lbs) at length 33.55 mm (1.321 in)	—
	EX.	137 – 157 N (14.0 – 16.0 kgf, 30.8 – 35.3 lbs) at length 33.55 mm (1.321 in)	—

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	34.78 – 34.83 (1.369 – 1.371)	34.48 (1.357)
	EX.	33.94 – 33.99 (1.336 – 1.338)	33.64 (1.324)
Camshaft journal oil clearance	IN. & EX.	0.023 – 0.066 (0.0013 – 0.0026)	0.150 (0.0059)
Camshaft journal holder I.D.	IN. & EX.	22.003 – 22.025 (0.8663 – 0.8671)	—
Camshaft journal O.D.	IN. & EX.	21.959 – 21.980 (0.8645 – 0.8654)	—
Camshaft runout	—		0.10 (0.004)
Cam chain pin	13th pin		—
Cylinder head distortion	—		0.05 (0.002)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD		LIMIT
Compression pressure (Automatic decomp. actuated)	400 – 800 kPa (4.0 – 8.0 kgf/cm ² , 57 – 114 psi)		—
Piston to cylinder clearance	0.030 – 0.040 (0.0012 – 0.0016)		0.120 (0.0047)
Cylinder bore	77.000 – 77.015 (3.0315 – 3.0321)		Nicks or scratches
Piston diam.	76.965 – 76.980 (3.0301 – 3.0307) Measure at 8.0 mm (0.31 in) from the skirt end.		76.880 (3.0268)
Cylinder distortion	—		0.05 (0.002)
Piston ring free end gap	1st	IR Approx. 7.1 (0.28)	5.7 (0.22)
Piston ring end gap	1st	0.15 – 0.25 (0.006 – 0.010)	0.50 (0.020)
Piston ring to groove clearance	1st	—	0.180 (0.0071)
Piston ring groove width	1st	1.01 – 1.03 (0.0398 – 0.0406)	—
	Oil	1.51 – 1.53 (0.0594 – 0.0602)	—
Piston ring thickness	1st	0.97 – 0.99 (0.0382 – 0.0390)	—
Piston pin bore	16.002 – 16.008 (0.6300 – 0.6302)		16.030 (0.6311)
Piston pin O.D.	15.995 – 16.000 (0.6297 – 0.6299)		15.980 (0.6291)

CONROD + CRANKSHAFT

Unit: mm (in)

ITEM	STANDARD	LIMIT
Conrod small end I.D.	16.010 – 16.018 (0.6303 – 0.6306)	16.040 (0.6315)
Conrod deflection	—	3.0 (0.12)
Conrod big end side clearance	0.20 – 0.65 (0.008 – 0.026)	1.0 (0.04)
Conrod big end width	17.75 – 17.80 (0.699 – 0.701)	—
Crank web to web width	55.9 – 56.1 (2.20 – 2.21)	—
Crankshaft runout	—	0.08 (0.003)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pressure (at 50 °C, 122 °F)	25 kPa (0.25 kgf/cm ² , 3.6 psi) at 6 000 r/min	—

CLUTCH

Unit: mm (in)

ITEM	STANDARD	LIMIT
Clutch cable play	2 – 3 (0.08 – 0.16)	—
Drive plate thickness	2.72 – 2.88 (0.107 – 0.113)	2.42 (0.095)
Drive plate claw width	13.85 – 13.96 (0.545 – 0.550)	13.05 (0.514)
Driven plate distortion	—	0.10 (0.004)
Clutch spring free length	50.74 (1.998)	48.2 (1.90)

RADIATOR + ENGINE COOLANT

ITEM	STANDARD/SPECIFICATION	LIMIT
Radiator cap valve opening pressure	95 – 125 kPa (0.95 – 1.25 kgf/cm ² , 14 – 18 psi)	—
Engine coolant type	Use an anti-freeze/coolant compatible with aluminum radiator, mixed with distilled water only, at the ratio of 50:50.	—
Engine coolant capacity	950 ml (1.0/0.8 US/Imp qt)	—

TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM		STANDARD	LIMIT
Primary reduction ratio		3.316 (63/19)	—
Final reduction ratio		3.769 (49/13)	—
Gear ratios	Low	2.153 (28/13)	—
	2nd	1.764 (30/17)	—
	3rd	1.470 (25/17)	—
	4th	1.238 (26/21)	—
	Top	1.090 (24/22)	—
Shift fork to groove clearance	No.1, 2 & 3	0.10 – 0.30 (0.004 – 0.012)	0.50 (0.020)
Shift fork groove width	No.1, 2 & 3	5.00 – 5.10 (0.197 – 0.201)	—
Shift fork thickness	No.1, 2 & 3	4.80 – 4.90 (0.189 – 0.193)	—
Drive chain	Type	DID 520 DMA2	—
	Links	114 links	—
	20-pitch length	—	323.8 (12.75)
Drive chain slack		34 – 45 (1.4 – 1.8)	—
Gearshift lever height		10 – 15 (0.4 – 0.6) (Above the top face of the foot rest)	—

INJECTOR + FUEL PUMP + FUEL PRESSURE REGULATOR

ITEM	SPECIFICATION	NOTE
Injector resistance	10 – 11 Ω at 24 °C (75 °F)	
Fuel pump discharge amount	89 ml (3.0/3.1 US/Imp oz) and more /10 sec.	
Fuel pressure regulator operating set pressure	Approx. 294 kPa (2.94 kgf/cm ² , 41.81 psi)	

FI SENSORS

ITEM	STANDARD/SPECIFICATION	NOTE
CKP sensor resistance	80 – 120 Ω	
CKP sensor peak voltage	2.8 V and more	
Crankshaft rotation signal sensor resistance	0.1 – 0.8 Ω	
Crankshaft rotation signal sensor peak voltage	3.5 V and more	
IAP sensor input voltage	4.5 – 5.5 V	
IAP sensor output voltage	0.23 – 4.10 V at idle speed	
TP sensor input voltage	4.5 – 5.5 V	
TP sensor output voltage	Closed	Approx. 0.6 V
	Opened	Approx. 3.8 V
ECT sensor input voltage	4.5 – 5.5 V	
ECT sensor resistance	Approx. 2.58 k Ω at 20 °C (68 °F)	
IAT sensor input voltage	4.5 – 5.5 V	

ITEM	STANDARD/SPECIFICATION		NOTE
IAT sensor resistance	Approx. 2.58 k Ω at 20 °C (68 °F)		
TO sensor resistance	16.5 – 22.3 k Ω		
TO sensor voltage	Normal	0.4 – 1.4 V	When leaning 65°
	Leaning	3.7 – 4.4 V	
GP switch voltage	0.89 V and more		From 1st to Top
Injector voltage	Battery voltage		

THROTTLE BODY

ITEM	SPECIFICATION
Bore size	44 mm (1.73 in)
I.D. No.	49H0
Idle r/min	2 100 \pm 50 r/min
Throttle cable play	2 – 4 mm (0.08 – 0.16 in)
Hot starter lever clearance	2 – 3 mm (0.08 – 0.12 in)

ELECTRICAL

Unit: mm (in)

ITEM	STANDARD/SPECIFICATION		NOTE
Ignition timing	8° B.T.D.C. at 2 100 r/min.		
Spark plug	Type	NGK: CR8EIA10	
	Gap	0.9 – 1.0 (0.035 – 0.039)	
Spark performance	Over 8 (0.3) at 1 atm.		
CKP sensor resistance	80 – 120 Ω		R – G
Crankshaft rotation signal sensor resistance	0.1 – 0.8 Ω		B/R – R/W
Charge coil resistance	1.0 – 2.5 Ω		Y – Y
CKP sensor peak voltage	2.8 V and more		⊕ R – ⊖ G
Crankshaft rotation signal sensor peak voltage	3.5 V and more		⊕ B/R – ⊖ R/W
Ignition coil resistance	Primary	0.01 – 0.11 Ω at 20 °C (68 °F)	Terminal – Terminal
	Secondary	4.5 – 6.9 k Ω at 20 °C (68 °F)	Plug cap – ⊕ Terminal
Ignition coil primary peak voltage	175 V and more		⊕ Ground – ⊖ W/BI
Magneto no-load voltage (When engine is cold)	95 V (AC) and more at 5 000 r/min		
Regulated voltage	14.0 – 15.0 V at 5 000 r/min		
Engine stop switch resistance	Under 1 Ω		B/Y – B/W

BRAKE + WHEEL

Unit: mm (in)

ITEM	STANDARD		LIMIT
Brake lever adjuster length	11 – 15 (0.4 – 0.6)		—
Rear brake pedal height	0 – 10 (0 – 0.4) (Below the top face of the foot rest)		—
Brake disc thickness	Front	2.8 – 3.2 (0.11 – 0.13)	2.5 (0.10)
	Rear	3.85 – 4.15 (0.152 – 0.163)	3.5 (0.14)
Brake disc distortion	Front & Rear	—	0.3 (0.012)
Master cylinder bore	Front	11.000 – 11.043 (0.4331 – 0.4348)	—
	Rear	11.000 – 11.043 (0.4331 – 0.4348)	—
Master cylinder piston diam.	Front	10.957 – 10.984 (0.4314 – 0.4324)	—
	Rear	10.957 – 10.984 (0.4314 – 0.4324)	—
Brake caliper cylinder bore	Front	27.000 – 27.050 (1.0630 – 1.0650)	—
	Rear	25.400 – 25.450 (1.0000 – 1.0020)	—
Brake caliper piston diam.	Front	26.900 – 26.950 (1.0591 – 1.0610)	—
	Rear	25.335 – 25.368 (0.9974 – 0.9987)	—
Brake fluid type	DOT 4		—
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel rim size	Front	1.60 × 21	—
	Rear	1.85 × 19	—
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)

TIRE

ITEM	STD/SPEC.		LIMIT
Cold inflation tire pressure	Front & Rear	70 – 110 kPa (0.7 – 1.1 kgf/cm ² , 10 – 16 psi)	—
Tire size	Front	80/100-21 51M	—
	Rear	100/90-19 57M	—
Tire type	Front	D742FA	—
	Rear	D756	—
Tire tread depth (Recommend depth)	Front & Rear	—	4.0 mm (0.16 in)

SUSPENSION

Unit: mm (in)

ITEM		STANDARD	LIMIT	NOTE
Front fork stroke		310 (12.2)	—	
Front fork inner tube O.D.		47 (18.5)	—	
Front fork spring free length		495 (19.49)	485 (19.09)	
Front fork damping force adjuster	Rebound	MAX – 10 clicks turn back	—	
	Compression	MAX – 9 clicks turn back	—	
Front fork air pressure		0 kPa (0 kgf/cm ² , 0 psi)	—	
Front fork spring rate		4.7 N/mm (0.47 kgf/mm)	—	
Rear shock absorber gas pressure		784 kPa (8.0 kgf/cm ² , 113.8psi)	—	
Rear shock absorber spring set length		4.2 (0.17)	—	4.2 mm (0.17 in) compressed from spring free length
Rear shock absorber spring rate		57 N/mm (5.7 kgf/mm)	—	
Rear shock absorber damping force adjuster	Rebound	MAX – 14 clicks turn back	—	
	Compression (High speed)	MAX – 2 turn back	—	
	Compression (Low speed)	MAX – 12 clicks turn back	—	
Rear wheel travel		310 (12.2)	—	
Swingarm pivot shaft runout		—	0.3 (0.01)	

FUEL + OIL

ITEM	SPECIFICATION		NOTE
Fuel type	Use only unleaded gasoline of at least 90 pump octane (R/2 + M/2 method).		E-03, 28
	Use only unleaded gasoline of at least 95 octane. (Research method)		The others
Fuel tank capacity	6.5 L (1.7/1.4 US/Imp gal)		
Engine oil type	SAE 10W-40, API SG/SH/SJ/SL with JASO MA/MA1/MA2		E-03
	MOTUL 300V 10W-40 (Recommendation oil) or SAE 10W-40, API SG/SH/SJ/SL with JASO MA/MA1/MA2		The others
Engine oil capacity	Change	850 ml (0.9/0.7 US/Imp qt)	
	Filter change	900 ml (1.0/0.8 US/Imp qt)	
	Overhaul	1 000 ml (1.1/0.9 US/Imp qt)	
Air cleaner element oil type	MOTUL AIR FILTER OIL or equivalent filter oil		
Front fork oil type	SUZUKI FORK OIL SS-05 or an equivalent fork oil		
Front fork oil capacity (each leg)	375 ml (12.68/13.20 US/Imp oz)		Outer tube oil quantity
	193 ml (6.52/6.80 US/Imp oz)		Damper rod oil quantity
Rear shock absorber oil type	REAR SUSPENSION OIL SS-25 or an equivalent suspension oil		
Rear shock absorber oil capacity	383 ml (12.95 /13.49 US/Imp oz)		

TIGHTENING TORQUE

ENGINE

PART		N·m	kgf-m	lbf-ft
Cylinder head cover bolt		14	1.4	10.0
Spark plug		11	1.1	8.0
Ignition coil retainer bolt		11	1.1	8.0
Cylinder head bolt	(Initial)	25	2.5	18.0
	(Final)	51	5.1	37.0
Cylinder head base nut		10	1.0	7.0
Cylinder base bolt		12	1.2	8.5
Camshaft journal holder bolt		10	1.0	7.0
Primary drive gear nut		90	9.0	65.0
Magneto rotor nut		80	8.0	58.0
Clutch sleeve hub nut		90	9.0	65.0
Clutch spring set bolt		10	1.0	7.0
Gearshift arm stopper bolt		23	2.3	16.5
Gearshift cam driven gear pin		24	2.4	17.5
Gearshift cam stopper bolt		10	1.0	7.0
Pawl lifter screw		8.5	0.85	6.0
Kick starter guide bolt		10	1.0	7.0
Cam chain tension adjuster mounting bolt		10	1.0	7.0
Cam chain tension adjuster cap bolt		23	2.3	16.5
Cam chain tensioner bolt		10	1.0	7.0
Cam chain guide retainer mounting bolt		10	1.0	7.0
Right crankcase cover bolt		11	1.1	8.0
Bearing retainer screw		8.5	0.85	6.0
Reed valve guide bolt		4.5	0.45	3.0
Engine oil drain plug		21	2.1	15.0
Engine oil drain No.2 plug		12	1.2	8.5
Engine oil check bolt		11	1.1	8.0
Engine oil strainer cap		21	2.1	15.0
Oil filter cap bolt		11	1.1	8.0
Oil gallery plug		10	1.0	7.0
Oil pump No.1 bolt		5.5	0.55	4.0
Oil pump No.2 bolt		11	1.1	8.0
Oil strainer No.2 bolt		5.5	0.55	4.0
Crankcase bolt		11	1.1	8.0
Clutch cover bolt		11	1.1	8.0
TDC plug		14	1.4	10.0
Magneto cover bolt		11	1.1	8.0
Magneto stator bolt		5.5	0.55	4.0
Crankshaft hole plug		11	1.1	8.0
Regulator/rectifier mounting bolt		8.5	0.85	6.0
Condenser bracket bolt		10	1.0	7.0

PART	N·m	kgf-m	lbf-ft
Engine mounting bolt (upper)	45	4.5	32.5
Engine mounting nut (lower)	66	6.6	47.5
Engine mounting nut (front)	66	6.6	47.5
Engine mounting bracket nut (upper)	40	4.0	29.0
Engine mounting bracket nut (front)	40	4.0	29.0
Engine sprocket cover bolt	11	1.1	8.0
Kick starter lever bolt	29	2.9	21.0
Kick starter lever screw	10	1.0	7.0
Intake pipe bolt	10	1.0	7.0
Exhaust pipe nut	18	1.8	13.0
Muffler connector clamp bolt	18	1.8	13.0
Muffler mounting bolt (front & rear)	23	2.3	16.5
Exhaust pipe cover bolt	11	1.1	8.0

FI SYSTEM AND INTAKE AIR SYSTEM

ITEM	N·m	kgf-m	lbf-ft
CKP sensor bolt	5.5	0.55	4.0
IAT sensor mounting screw	1.3	0.13	0.95
GP switch mounting bolt	6.5	0.65	4.7
Fuel delivery pipe mounting screw	3.5	0.35	2.5
Fuel pipe mounting screw	3.5	0.35	2.5
Fuel pump mounting bolt	10	1.0	7.0
TP sensor mounting screw	3.5	0.35	2.5
ECT sensor	12	1.2	8.5
TO sensor bracket bolt	8.5	0.85	6.0

COOLING SYSTEM

ITEM	N·m	kgf-m	lbf-ft
Water pump impeller	8	0.8	6.0
Water pump case bolt	11	1.1	8.0
Engine coolant drain bolt	11	1.1	8.0
Radiator air bleeder bolt	6	0.6	4.5
Water hose clamp screw	1.5	0.15	1.0

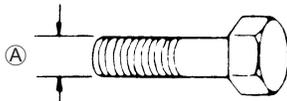
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PART	N·m	kgf-m	lbf-ft
Handlebar clamp bolt	25	2.5	18.0
Handlebar holder set nut	44	4.4	32.0
Front fork upper clamp bolt (right and left)	23	2.3	16.5
Front fork lower clamp bolt (right and left)	23	2.3	16.5
Steering stem head nut	100	10.0	72.5
Front fork cap bolt	34	3.4	24.5
Lock-nut/center bolt	22	2.2	16.0
Front fork center bolt	69	6.9	50.0
Fork cylinder compression damper unit	30	3.0	21.5
Fork air bleeder valve	1.3	0.13	1.0
Fork protector bolt	4.9	0.49	3.5
Front brake master cylinder holder bolt (upper)	10	1.0	7.0
Front brake master cylinder holder bolt (lower)	12	1.2	8.5
Rear brake master cylinder mounting bolt	10	1.0	7.0
Rear brake master cylinder rod lock-nut	6	0.6	4.5
Brake lever pivot bolt	6	0.6	4.5
Brake lever pivot bolt lock-nut	6	0.6	4.5
Brake pedal pivot bolt	29	2.9	21.0
Brake hose union bolt (front and rear)	23	2.3	16.5
Front brake hose guide bolt	3	0.3	2.0
Front brake caliper mounting bolt	26	2.6	19.0
Brake pad mounting pin (front and rear)	18	1.8	13.0
Front brake caliper axle bolt (caliper)	25	2.5	18.0
Front brake caliper axle bolt (bracket)	28	2.8	20.0
Rear brake caliper axle bolt (caliper)	27	2.7	19.5
Rear brake caliper axle bolt (bracket)	13	1.3	9.5
Brake air bleeder valve (front and rear)	6	0.6	4.5
Disc plate bolt (front)	11	1.1	8.0
Disc plate bolt (rear)	26	2.6	19.0
Front axle nut	35	3.5	25.5
Front axle holder bolt	18	1.8	13.0
Rear axle nut	90	9.0	65.0
Rear sprocket nut	30	3.0	21.5
Chain roller bolt/nut	23	2.3	16.5
Spoke nipple	6	0.6	4.5
Front wheel rim lock	13	1.3	9.5
Rear wheel rim lock	17	1.7	12.5
Swingarm pivot nut (engine mounting)	70	7.0	50.5
Rear shock absorber mounting nut (upper and lower)	50	5.0	36.0
Compression adjuster assembly	30	3.0	21.5
Cushion lever nut	80	8.0	58.0
Cushion rod nut (front and rear)	80	8.0	58.0
Spring adjuster lock-nut	44	4.4	32.0

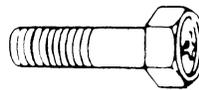
PART	N·m	kgf-m	lbf-ft
Seat rail bolt and nut (upper and lower)	23	2.3	16.5
Footrest bolt	35	3.5	25.5
Cable adjuster lock-nut (throttle, clutch and hot starter)	2.2	0.22	1.60
Clutch cable bracket bolt	6	0.6	4.5
Radiator cover upper bolt	6	0.6	4.5
Radiator cover bolt	10	1.0	7.0

For other bolts and nuts not listed in the table, refer to this chart.

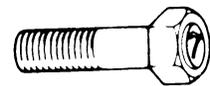
Bolt Diameter (mm)	Conventional or "4" marked bolt			"7" marked or crown headed bolt		
	N·m	kgf-m	lbf-ft	N·m	kgf-m	lbf-ft
4	1.5	0.15	1.0	2.3	0.23	1.5
5	3	0.3	2.0	4.5	0.45	3.0
6	5.5	0.55	4.0	10	1.0	7.0
8	13	1.3	9.5	23	2.3	16.5
10	29	2.9	21.0	50	5.0	36.0
12	45	4.5	32.5	85	8.5	61.5
14	65	6.5	47.0	135	13.5	97.5
16	105	10.5	76.0	210	21.0	152.0
18	160	16.0	115.5	240	24.0	173.5



Conventional bolt

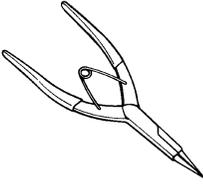
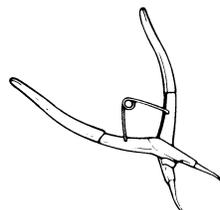
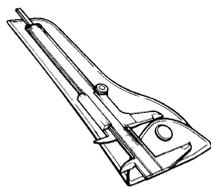
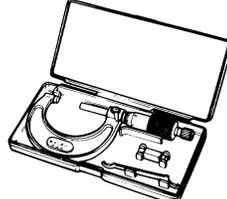
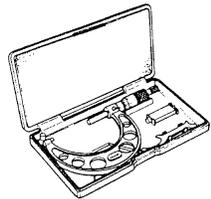
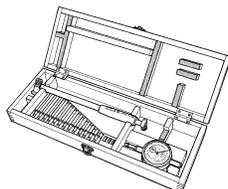
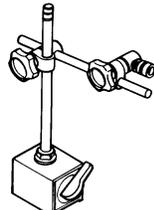
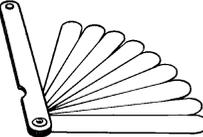
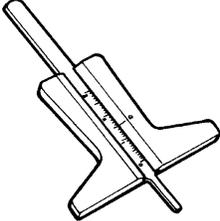
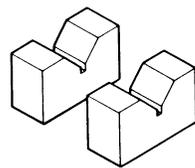
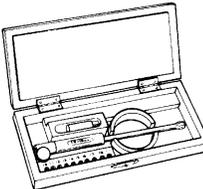
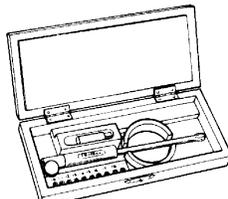
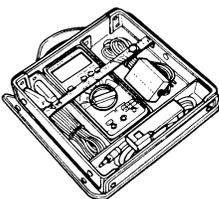
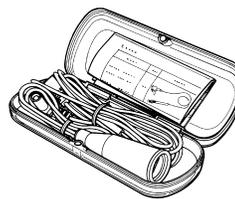
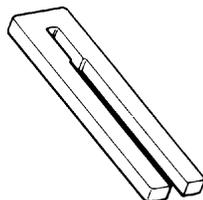
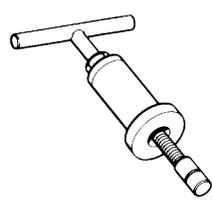
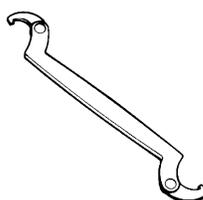
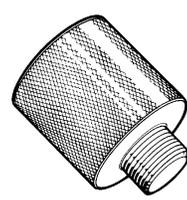


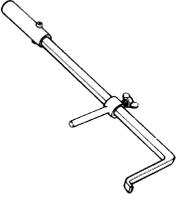
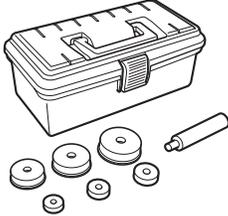
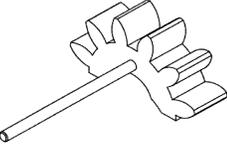
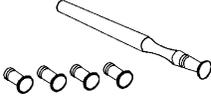
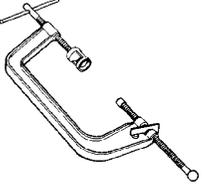
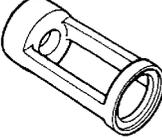
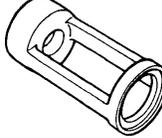
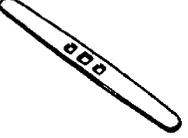
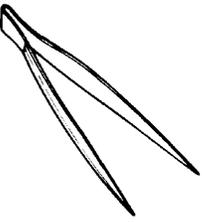
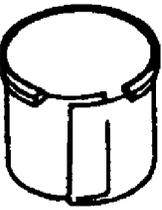
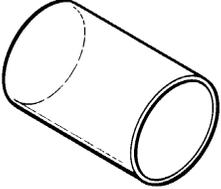
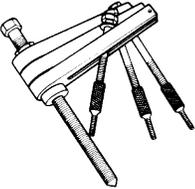
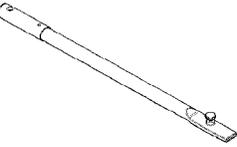
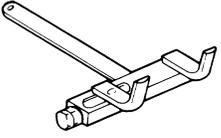
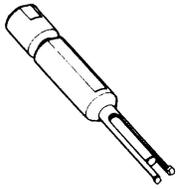
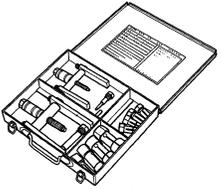
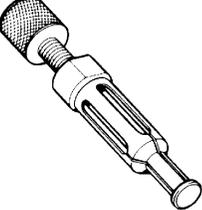
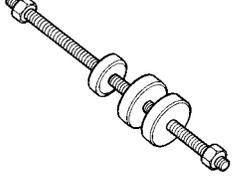
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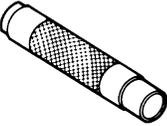
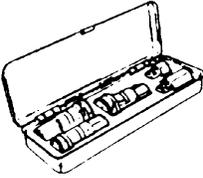
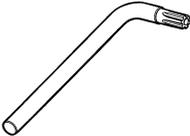
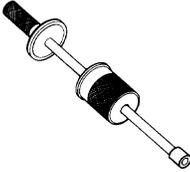
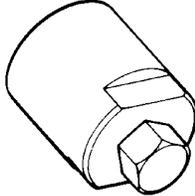
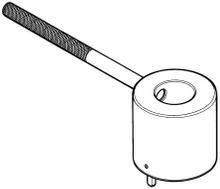
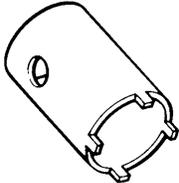
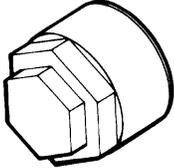
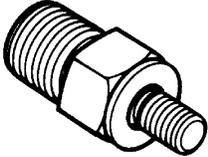
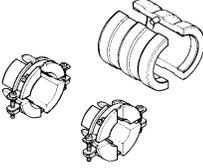
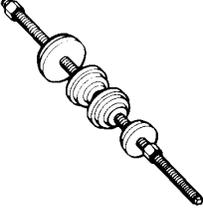
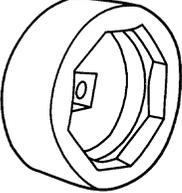
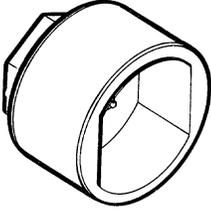
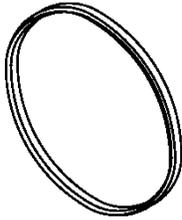


"7" marked bolt

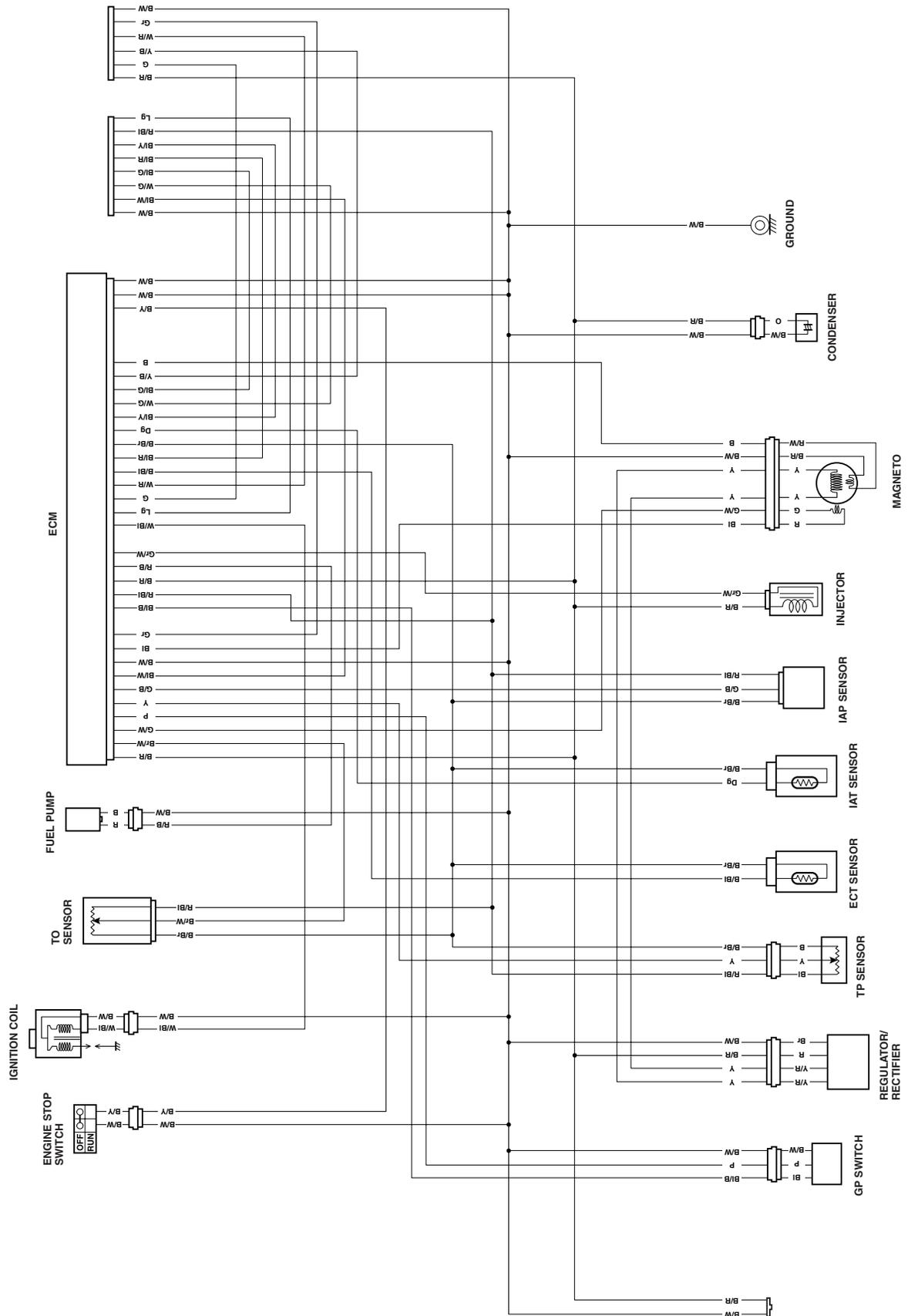
SPECIAL TOOLS

 <p>09900-06107 Snap ring remover (Open type)</p>	 <p>09900-06108 Snap ring remover (Close type)</p>	 <p>09900-20101 Vernier calipers (150 mm)</p>	 <p>09900-20202 Micrometer (25 – 50 mm)</p>	 <p>09900-20204 Micrometer (75 – 100 mm)</p>
 <p>09900-20205 Micrometer (0 – 25 mm)</p>	 <p>09900-20530 Cylinder gauge set</p>	 <p>09900-20602 Dial gauge</p>	 <p>09900-20607 Dial gauge</p>	 <p>09900-20701 Dial gauge chuck</p>
 <p>09900-20803 Thickness gauge</p>	 <p>09900-20805 Tire depth gauge</p>	 <p>09900-21304 V blocks</p>	 <p>09900-22301 Plastigauge (0.025 – 0.076 mm)</p>	 <p>09900-22302 Plastigauge (0.051 – 0.152 mm)</p>
 <p>09900-22401 Small bore gauge (10 – 18 mm)</p>	 <p>09900-22403 Small bore gauge (18 – 35 mm)</p>	 <p>09900-25008 Multi circuit tester set</p>	 <p>09900-25009 Needle-pointed probe set</p>	 <p>09904-41010 SDS set</p>
 <p>09910-20115 Piston holder</p>	 <p>09910-32812 Crankshaft installer</p>	 <p>09910-60611 Universal clamp wrench</p>	 <p>09911-11310 Crankshaft installer attachment C</p>	 <p>09913-10750 Compression gauge adaptor</p>

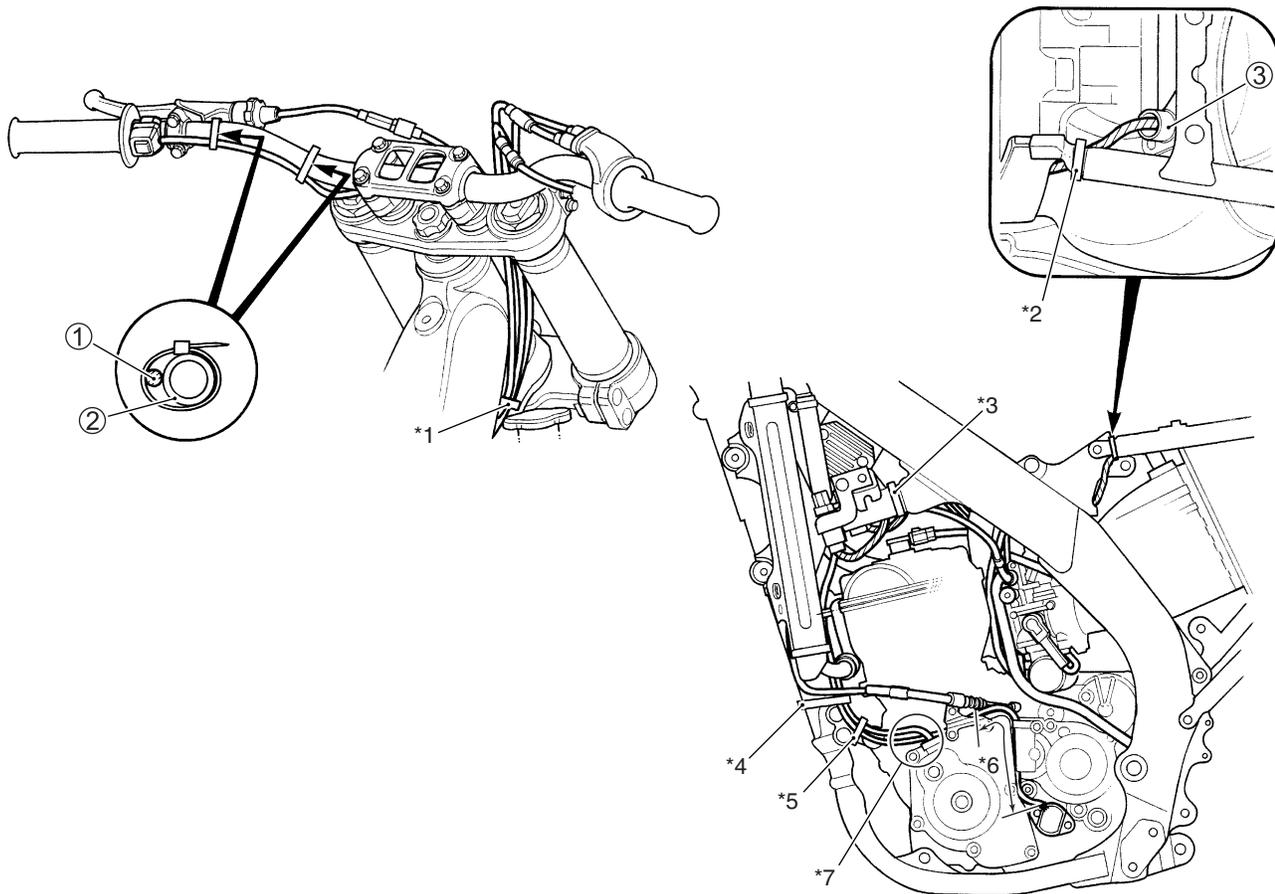
 <p>09913-50121 Oil seal remover</p>	 <p>09913-70210 Bearing installer set (10 – 75 φ)</p>	 <p>09914-61010 Gear holder</p>	 <p>09915-64512 Compression gauge</p>	 <p>09915-74511 Oil pressure gauge (600 kPa)</p>
 <p>09916-10911 Valve lapper set</p>	 <p>09916-14510 Valve lifter</p>	 <p>09916-14522 Valve lifter attach- ment</p>	 <p>09916-14530 Valve lifter attach- ment</p>	 <p>09916-34542 Reamer handle</p>
 <p>09916-33210 Valve guide reamer (4.5 mm)</p>	 <p>09916-33320 Valve guide reamer (9.8 mm)</p>	 <p>09916-43211 Valve guide installer & remover</p>	 <p>09916-44920 Valve guide installer attachment</p>	 <p>09916-84511 Tweezer</p>
 <p>09919-28610 Sleeve protector</p>	 <p>09919-28620 Sleeve protector</p>	 <p>09920-13120 Crankshaft remover</p>	 <p>09920-31020 Extension handle</p>	 <p>09920-53740 Clutch sleeve hub holder</p>
 <p>09921-20200 Bearing remover (10 mm)</p>	 <p>09921-20240 Bearing remover set</p>	 <p>09923-74511 Bearing remover</p>	 <p>09924-84510 Bearing installer set</p>	 <p>09924-84521 Bearing installer set</p>

 <p>09925-18011 Bearing installer</p>	 <p>09930-10121 Spark plug wrench set</p>	 <p>09930-11950 Torx wrench (T25H)</p>	 <p>09930-30104 Rotor remover slide shaft</p>	 <p>09930-35020 Rotor remover</p>
 <p>09930-44560 Rotor holder</p>	 <p>09940-14911 Steering stem nut socket wrench</p>	 <p>09940-14960 Steering stem nut socket wrench</p>	 <p>09940-34581 Front fork assembling attachment (F)</p>	 <p>09940-40211 Fuel pressure gauge adapter</p>
 <p>09940-52861 Front fork oil seal installer set</p>	 <p>09941-34513 Bearing installer</p>	 <p>09941-53630 Front fork cap socket wrench (50 mm)</p>	 <p>09941-53660 RCU socket wrench (24 mm)</p>	 <p>09941-54911 Bearing outer race remover</p>
 <p>09941-74911 Steering race installer</p>	 <p>09943-02810 Rear cushion guard ring</p>	 <p>99565-01010-021 CD-ROM Ver.21</p>		

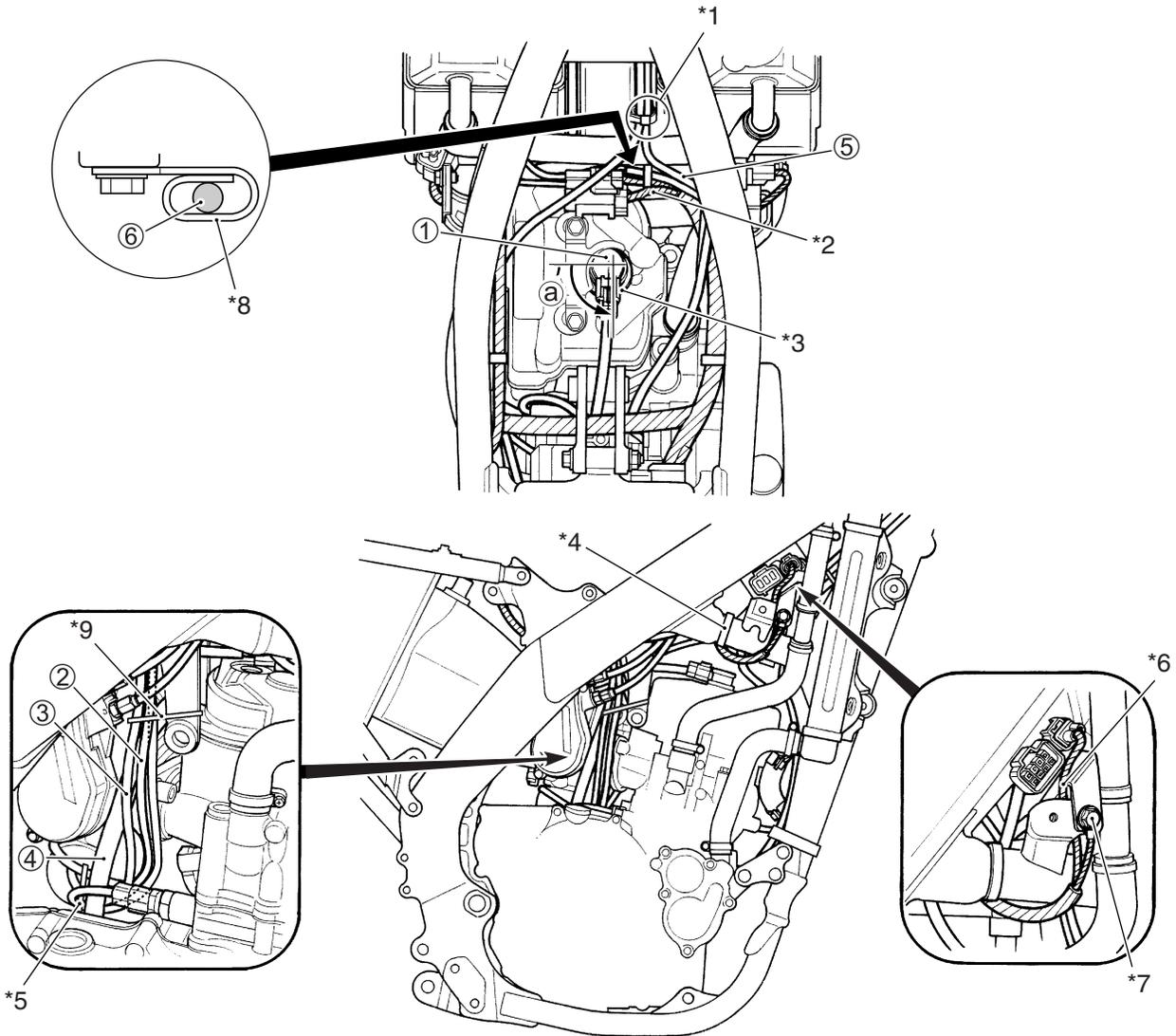
WIRING DIAGRAM



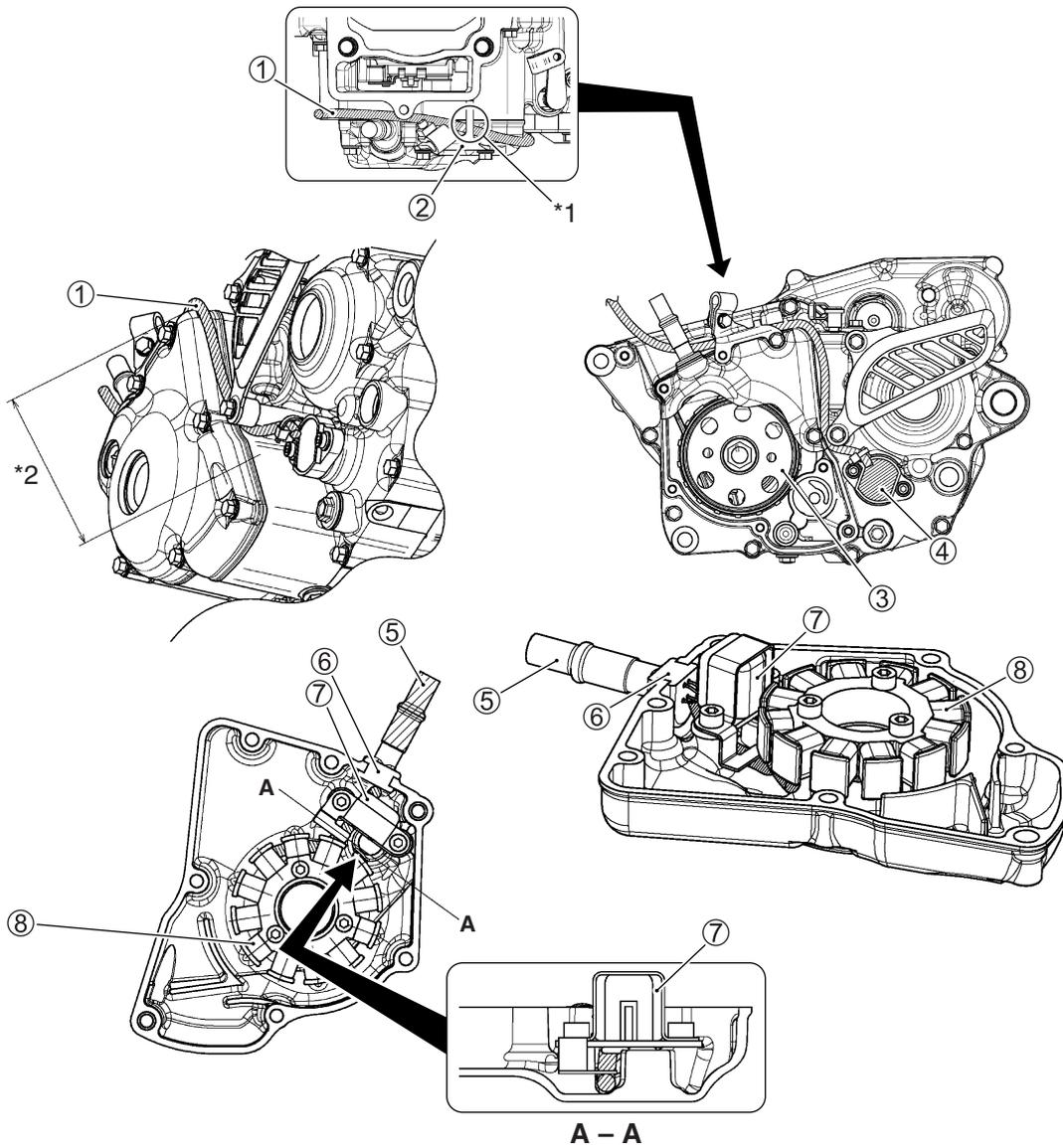
WIRING HARNESS ROUTING



①	Engine stop switch lead wire	*3	Clamp the wiring harness and fuel pump lead wire at the gray taping. Set the tip of the clamp inside.
②	Handlebars	*4	Bind the magneto lead wire and GP switch lead wire with the clamp. Set the lock part of clamp outside and tip of clamp backward.
③	IAT sensor	*5	Bind the magneto lead wire, GP switch lead wire and overflow hose with the clamp. Pass the overflow hose inside of left engine mounting lower bracket. Set the tip of the clamp inside.
*1	Bind the engine stop switch lead wire and hot starter cable with the clamp.	*6	Do not slack the GP switch lead wire at this position.
*2	Clamp the IAT sensor lead wire at the gray taping. Do not clamp IAT sensor lead wire at the square part of pipe of seat rail. Set the tip of the clamp downward.	*7	Pass the GP switch lead wire inside of magneto lead wire.

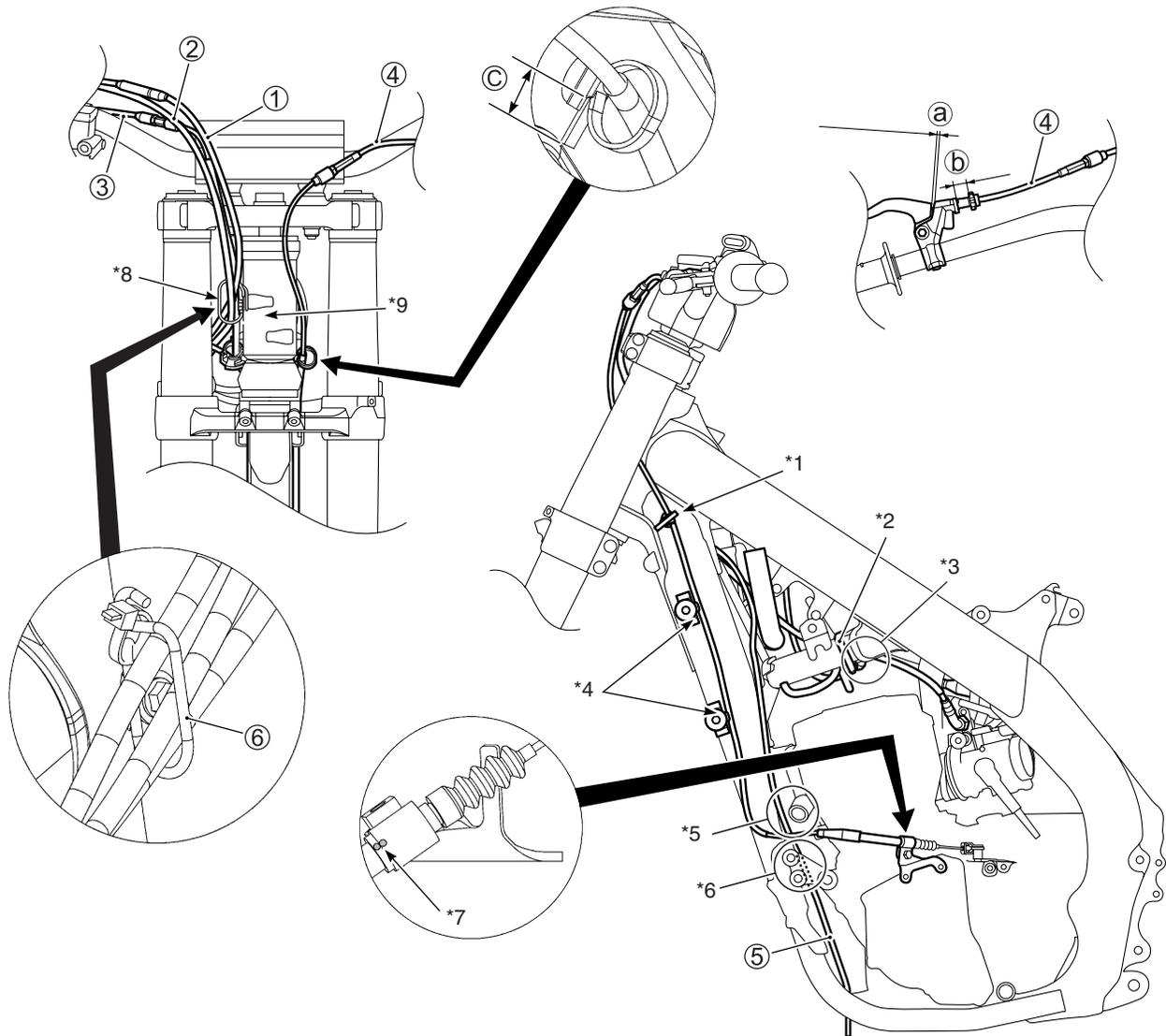


①	Ignition coil/plug cap	*2	Bind the regulator/rectifier lead wire and magneto lead wire with the clamp. Set the tip of the clamp inside.
②	TP sensor lead wire	*3	The coupler of ignition coil/plug cap faces backward.
③	Condenser lead wire	*4	Clamp the wiring harness at the gray taping. Set the tip of the clamp inside.
④	Breather hose	*5	Bind the ECT sensor lead wire, condenser lead wire and TP sensor lead wire with the clamp. Set the tip of clamp downward.
⑤	Engine stop switch lead wire	*6	Pass the service coupler lead wire inside of the bracket.
⑥	GP switch lead wire	*7	Tighten coupler bracket bolt together with earth branch wire of harness. Caulk the end of earth terminal. (Bend flat part of earth terminal toward vehicle.)
@	90° – 110°	*8	Bend the clamp twice.
*1	Place engine stop switch lead wire on hot starter cable and bind them together with the clamp. Set the tip of the clamp left side.	*9	Bind the ECT sensor lead wires, condenser lead wire and TP sensor lead wire with the clamp. Set the tip of clamp backward inside.

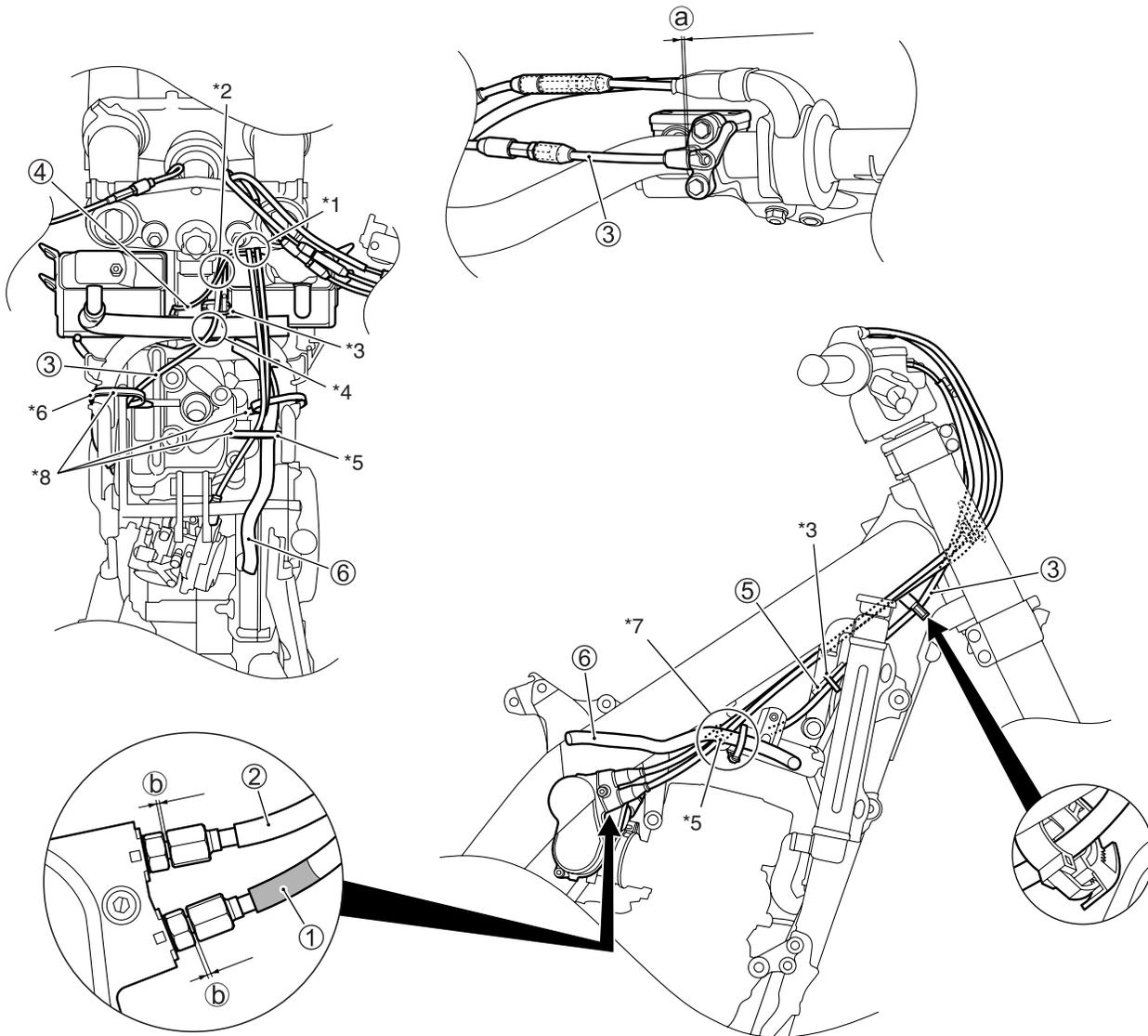


① GP switch lead wire	⑤ Magnet lead wire	*1	Pass the GP switch lead wire under the clutch cable bracket.
② Clutch cable bracket	⑥ Grommet	*2	Do not slack the lead wire at this position.
③ Magneto rotor	⑦ CKP sensor		
④ GP switch	⑧ Stator		

CABLE ROUTING

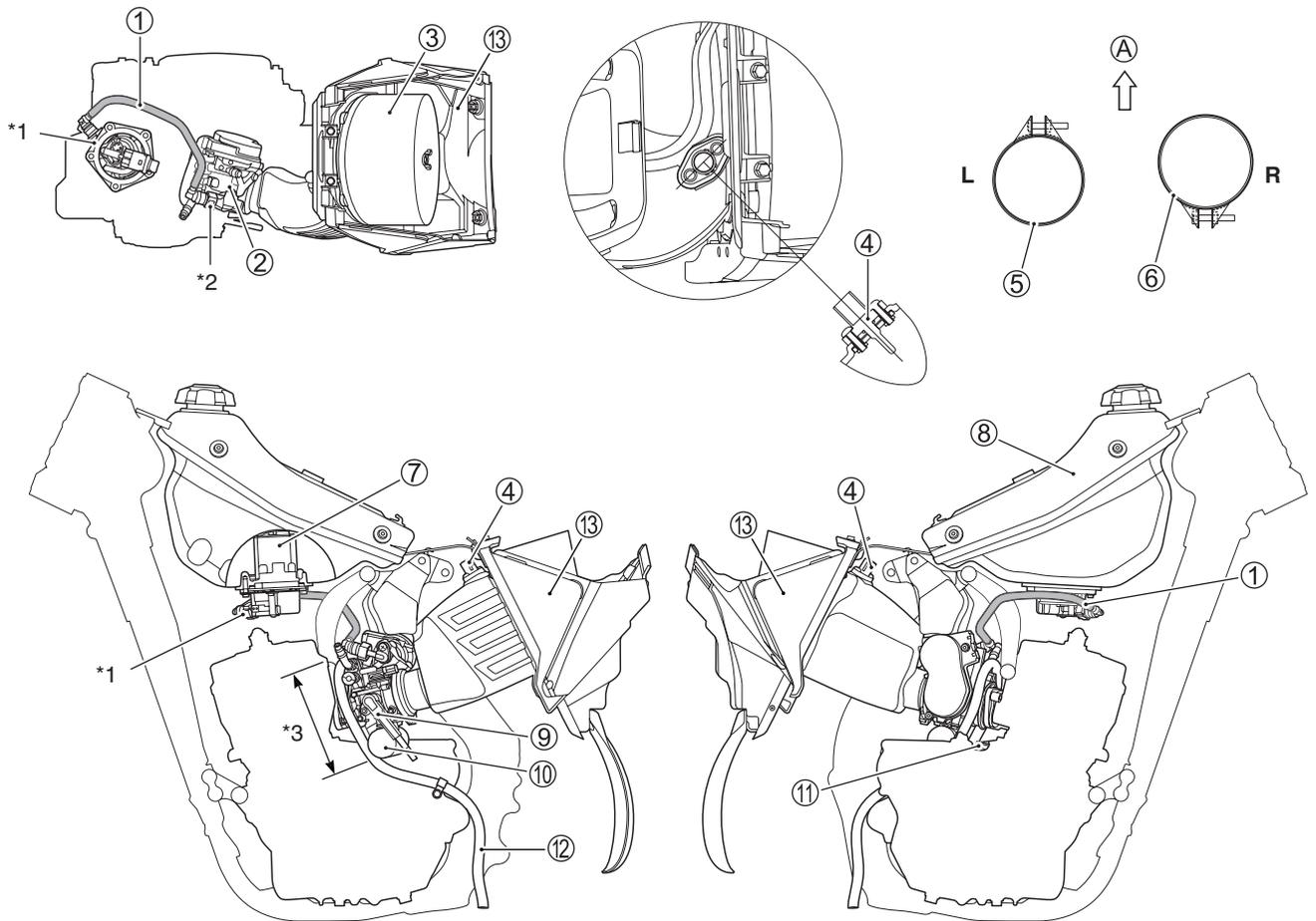


①	Throttle cable (Pulling cable)	*2	Bind the hot starter cable and wiring harness with the clamp.
②	Throttle cable (Returning cable)	*3	Pass the hot starter cable inside of frame bridge.
③	Hot starter cable	*4	Pass the clutch cable between radiator bracket and frame.
④	Clutch cable	*5	Pass the overflow hose and wiring harness between radiator hose and frame.
⑤	Radiator overflow hose	*6	Pass the overflow hose between engine mounting lower bracket.
⑥	Cable guide	*7	Align the matching marks on the clutch cable bracket and on the clutch cable.
a	2 – 3 mm (0.08 – 0.12 in)	*8	Pass the throttle cable, hot starter cable and engine stop switch lead wire inside of the cable guide.
b	14 – 16 mm (0.55 – 0.63 in)	*9	The cable guide must be positioned in parallel with the frame head with its open end facing upward.
*1	Bind the clutch cable (White protector position) with the clamp.		



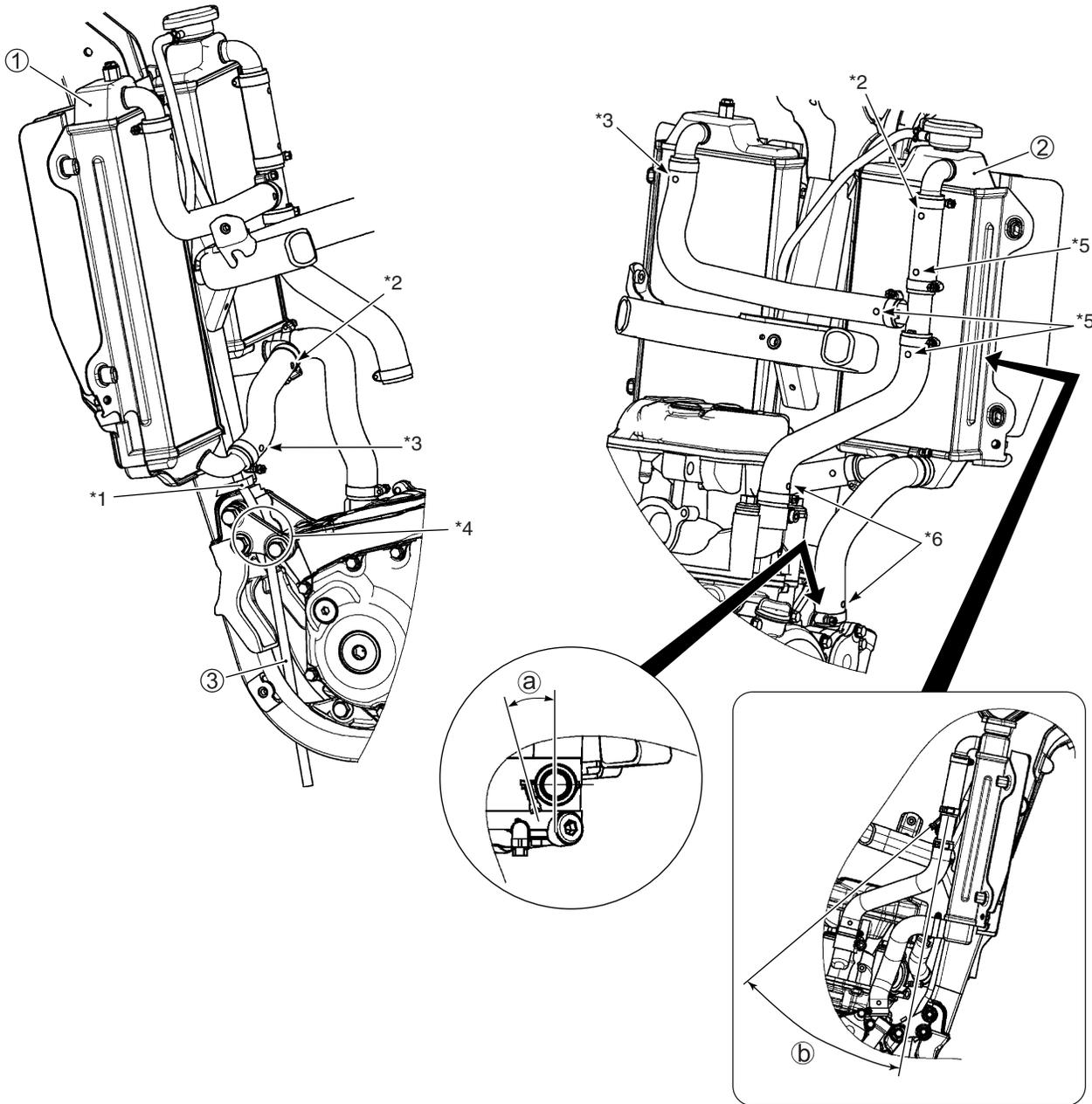
①	Throttle cable (Pulling cable)	*1	Pass the throttle cables over the radiator and radiator overflow hose.
②	Throttle cable (Returning cable)	*2	Pass the hot starter cable between the radiator and frame. Pass the hot starter cable under the radiator overflow hose.
③	Hot starter cable	*3	Bind the hot starter cable and engine stop switch lead wire with the clamp.
④	Radiator overflow hose	*4	Pass the hot starter cable over the radiator hose.
⑤	Engine stop switch lead wire	*5	Bind the throttle cables and wiring harness with the clamp.
⑥	Wiring harness	*6	Bind the hot starter cable and wiring harness with the clamp.
Ⓐ	2 – 3 mm (0.08 – 0.12 in)	*7	Pass the throttle cables inside of the frame bridge.
Ⓑ	0 – 1.5 mm (0 – 0.06 in)	*8	Face the tip of clamp inside.

FUEL HOSE ROUTING



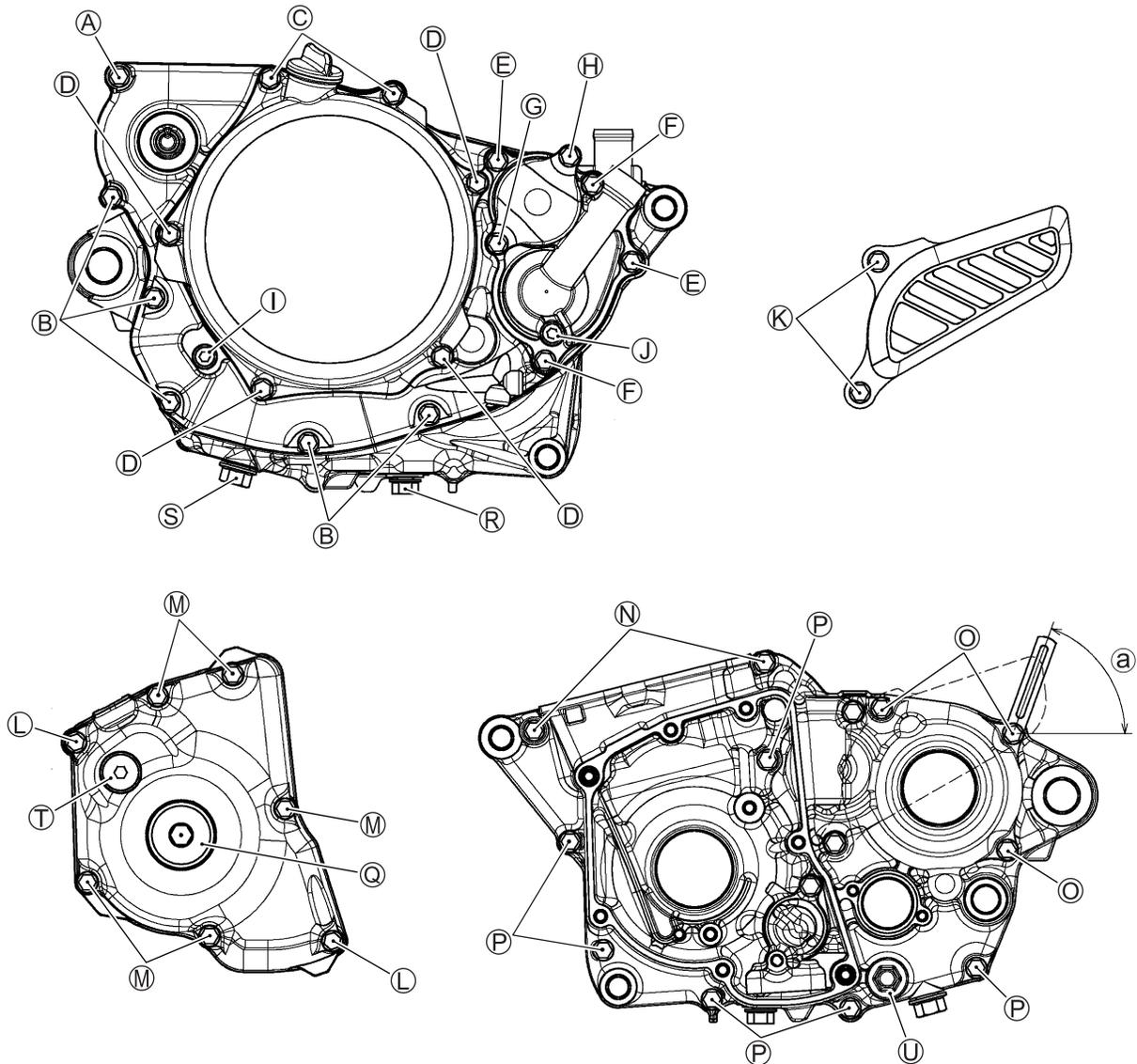
① Fuel hose	⑩ Condenser
② Throttle body	⑪ ECT sensor
③ Air cleaner	⑫ Breather hose
④ IAT sensor	⑬ Air cleaner box
⑤ Intake pipe clamp	Ⓐ Upward
⑥ Air cleaner outlet pipe clamp	*1 Gray button
⑦ Fuel pump	*2 Yellow button
⑧ Fuel tank	*3 Do not slack the breather hose at this position.
⑨ TP sensor	

RADIATOR HOSE ROUTING



① Radiator LH	*2 Face the white mark to the backward.
② Radiator RH	*3 Face the yellow mark to the backward.
③ Radiator overflow hose	*4 Pass the radiator overflow hose between engine mounting lower bracket.
Ⓐ $15 \pm 10^\circ$	*5 Face the blue mark to the backward.
Ⓑ $39 \pm 5^\circ$	*6 Face the pink mark to the right side.
*1 Bind the radiator overflow hose.	

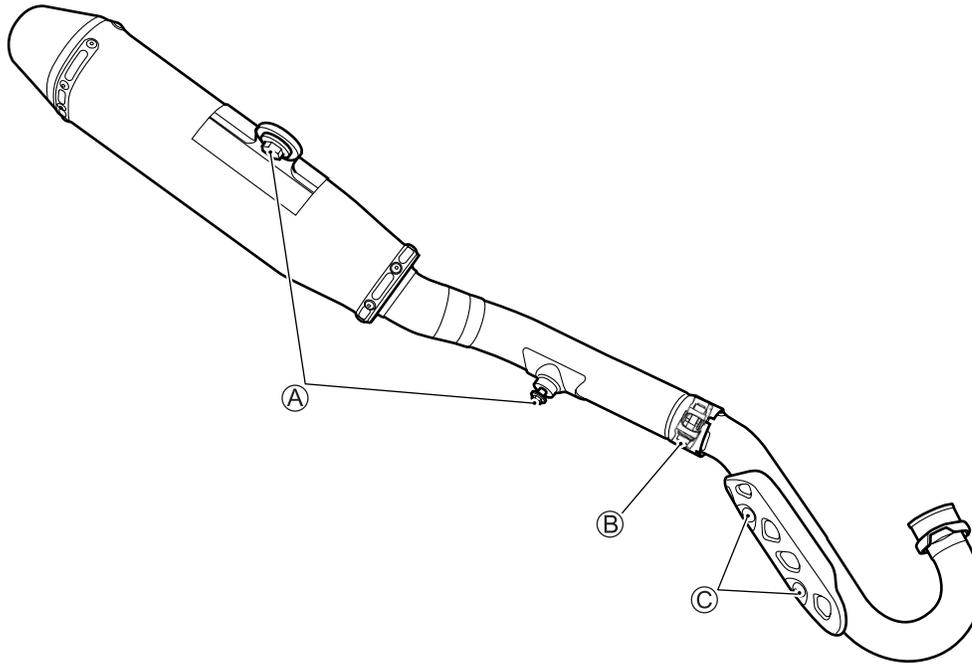
CRANKCASE AND COVER INSTALLATION



(A)	Right crankcase cover bolt L: 30 mm (1.2 in)	(I)	Oil check bolt L: 10 mm (0.4 in)	(Q)	Crankshaft hole plug
(B)	Right crankcase cover bolt L: 25 mm (1.0 in)	(J)	Engine coolant drain bolt L: 10 mm (0.4 in)	(R)	Engine oil drain No. 2 plug
(C)	Clutch cover bolt L: 60 mm (2.4 in)	(K)	Engine sprocket cover bolt L: 30 mm (1.2 in)	(S)	Engine oil drain plug
(D)	Clutch cover bolt L: 25 mm (1.0 in)	(L)	Magneto cover bolt L: 35 mm (1.4 in)	(T)	TDC plug
(E)	Water pump case bolt L: 60 mm (2.4 in)	(M)	Magneto cover bolt L: 30 mm (1.2 in)	(U)	Engine oil strainer cap
(F)	Water pump case bolt L: 35 mm (1.4 in)	(N)	Crankcase bolt L: 40 mm (1.6 in)	(a)	70 ± 10°
(G)	Oil filter cap bolt L: 35 mm (1.4 in)	(O)	Crankcase bolt L: 70 mm (2.8 in)		
(H)	Oil filter cap bolt L: 16 mm (0.6 in)	(P)	Crankcase bolt L: 50 mm (2.0 in)		

ITEM	N-m	kgf-m	lbf-ft
(A – Q)	11	1.1	8.0
(R)	12	1.2	8.5
(S, U)	21	2.1	15.0
(T)	14	1.4	10.0

EXHAUST PIPE AND MUFFLER INSTALLATION

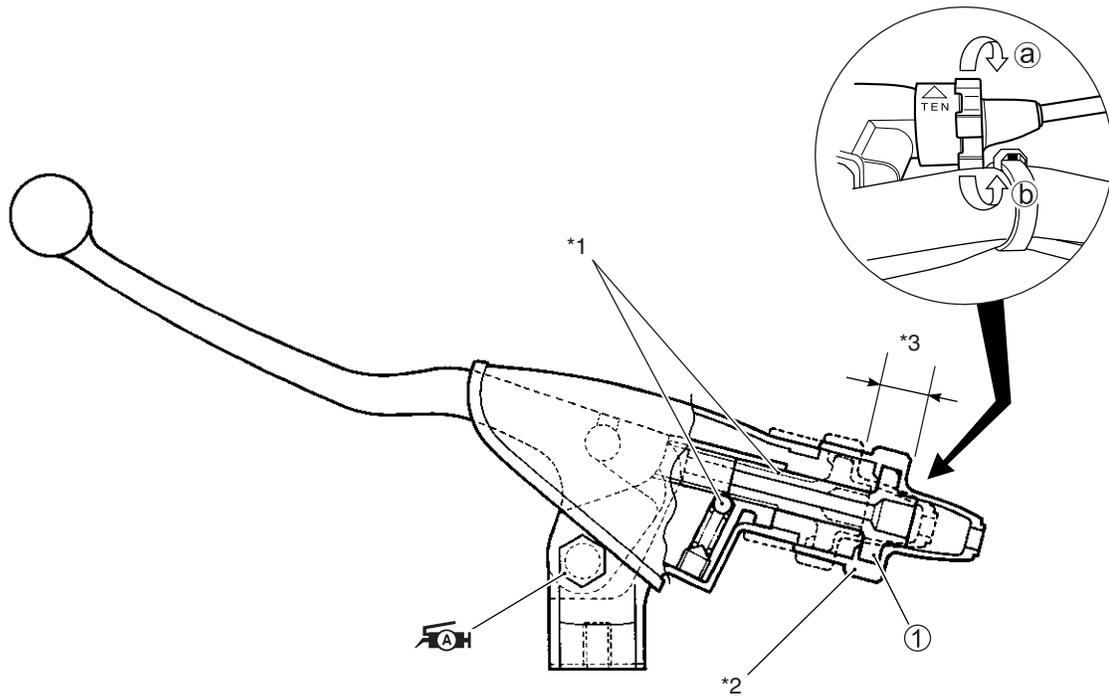


(A)	Muffler mounting bolt
(B)	Muffler connector clamp bolt
(C)	Exhaust pipe cover bolt



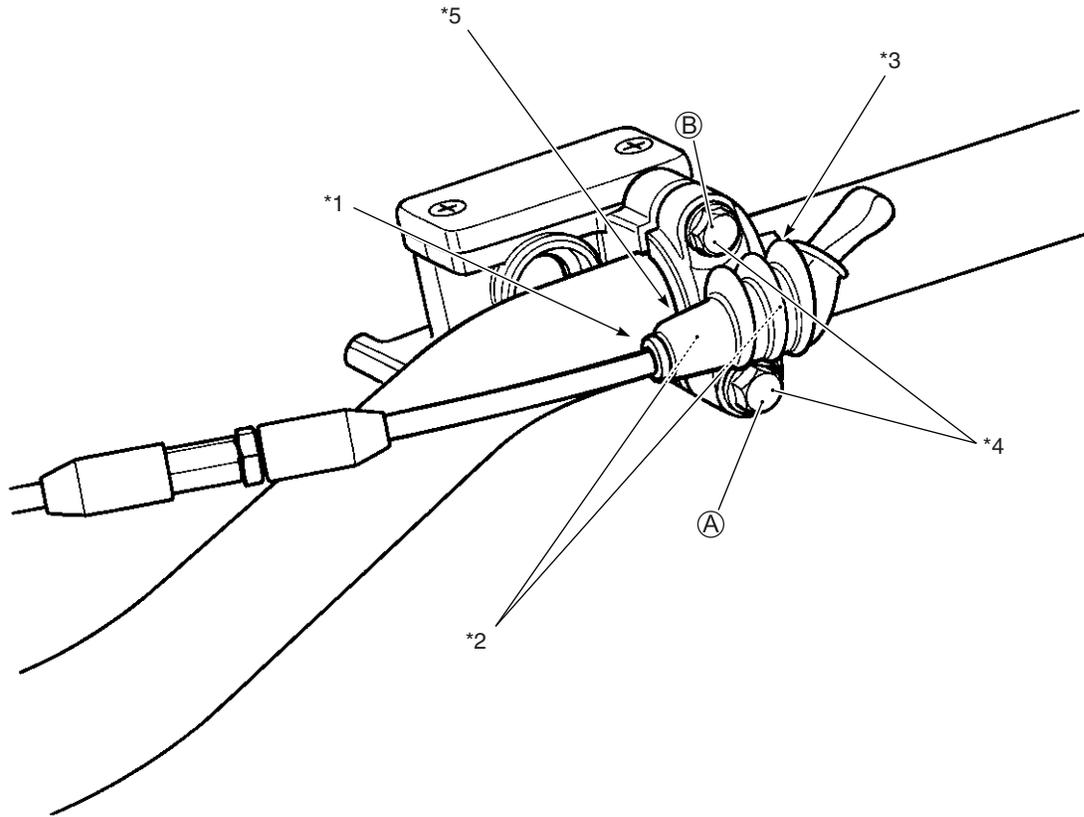
ITEM	N·m	kgf-m	lbf-ft
(A)	23	2.3	16.5
(B)	18	1.8	13.0
(C)	11	1.1	8.0

CLUTCH CABLE ADJUSTER



①	Clutch cable adjuster	*1	When the movement is felt heavier, clean this and apply grease.
Ⓐ	Turn to tighten the clutch cable tension.	*2	Do not apply grease to the rubber covers. Fit the cover positively.
Ⓑ	Turn to loosen the clutch cable tension.	*3	Adjustable range.

HOT STARTER LEVER INSTALLATION

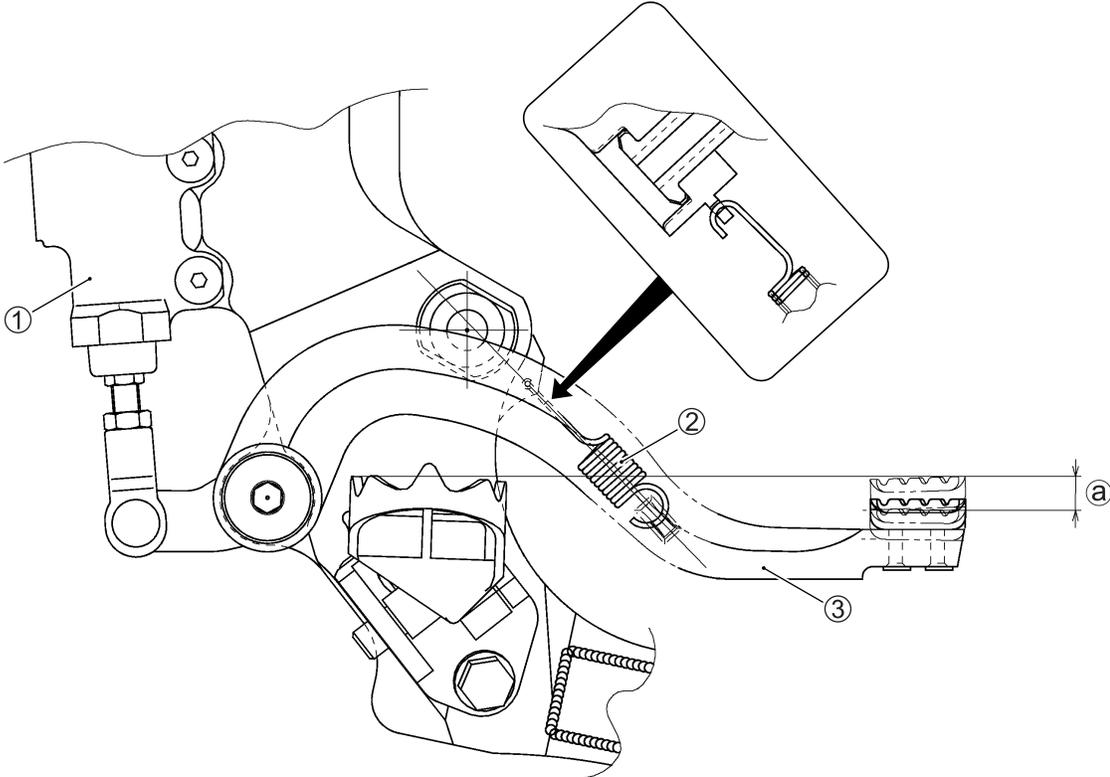


*1	Pass the hot starter cable into the lever cover.	*4	Tighten the lower bolt first temporarily to provide clearance on the upper side and then tighten both the bolts to the specified torque.
*2	Connect the hot starter cable to the master cylinder holder and hot starter lever.	*5	Install the cover of hot starter lever firmly. Be careful not to damage the lever cover when installing.
*3	Pass the hot starter lever into the lever cover.		



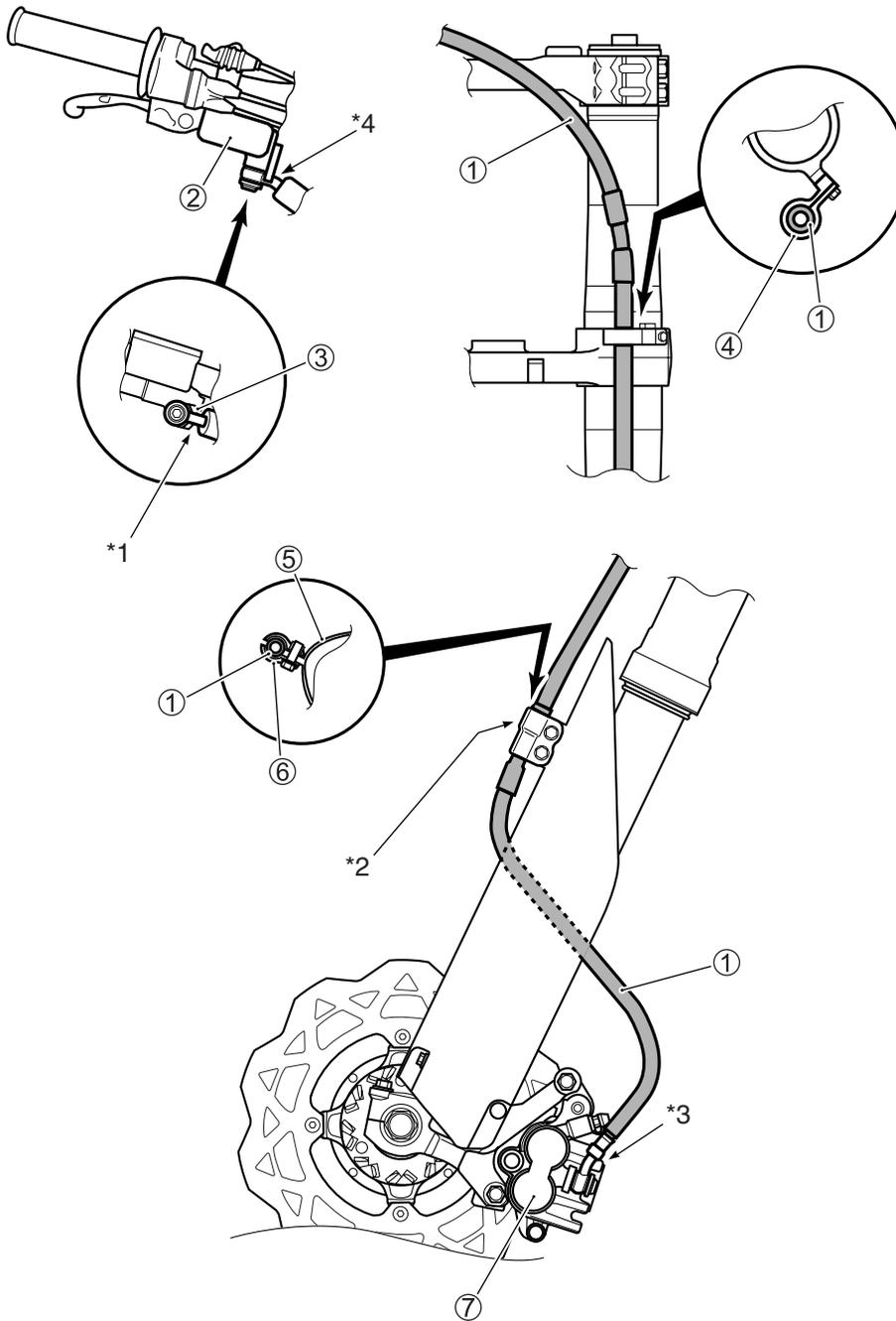
ITEM	N-m	kgf-m	lbf-ft
(A)	12	1.2	8.5
(B)	10	1.0	7.0

BRAKE PEDAL SET-UP



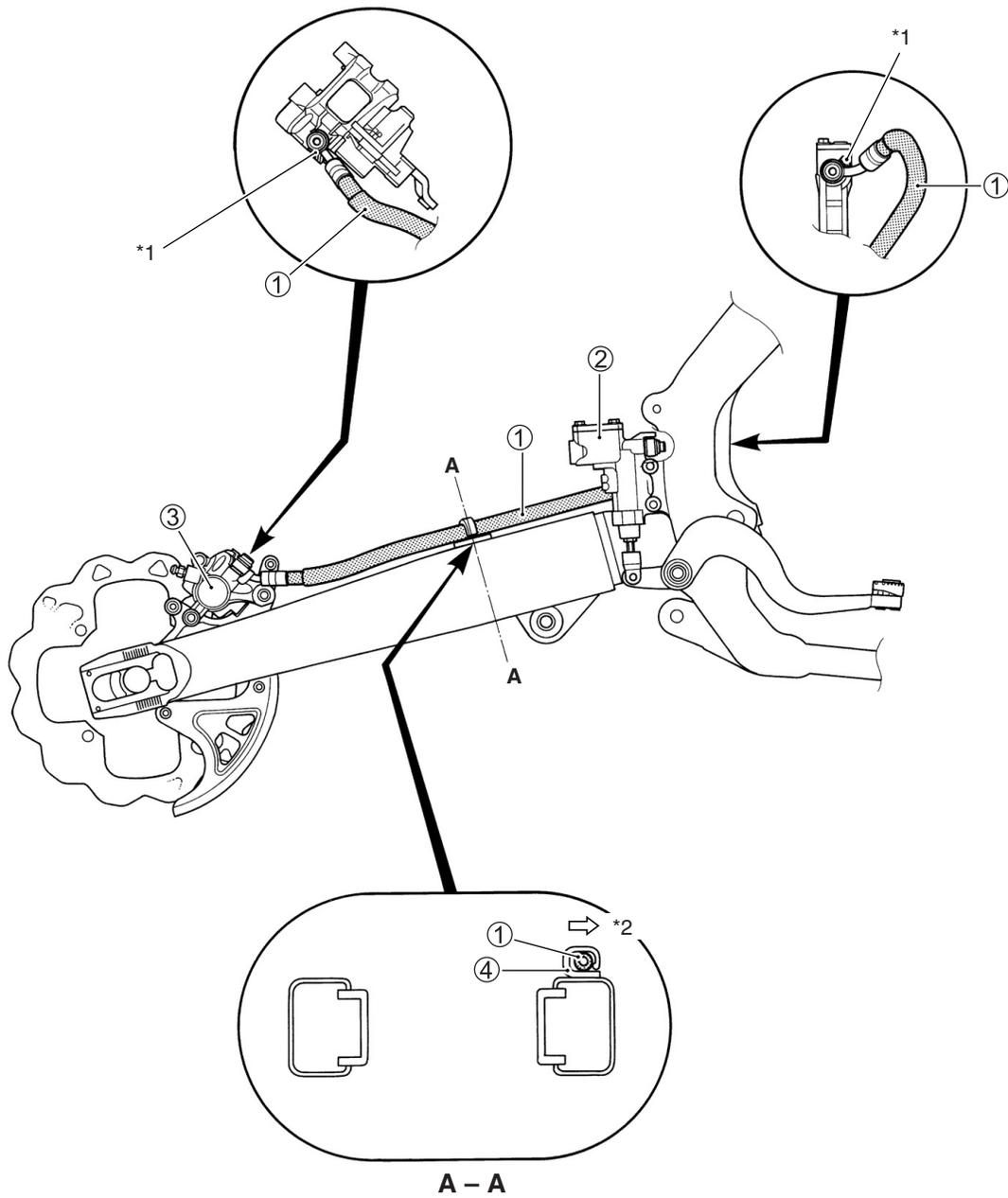
①	Rear master cylinder	③	Brake pedal
②	Return spring	Ⓐ	0 – 10 (0 – 0.4 in)

FRONT BRAKE HOSE ROUTING



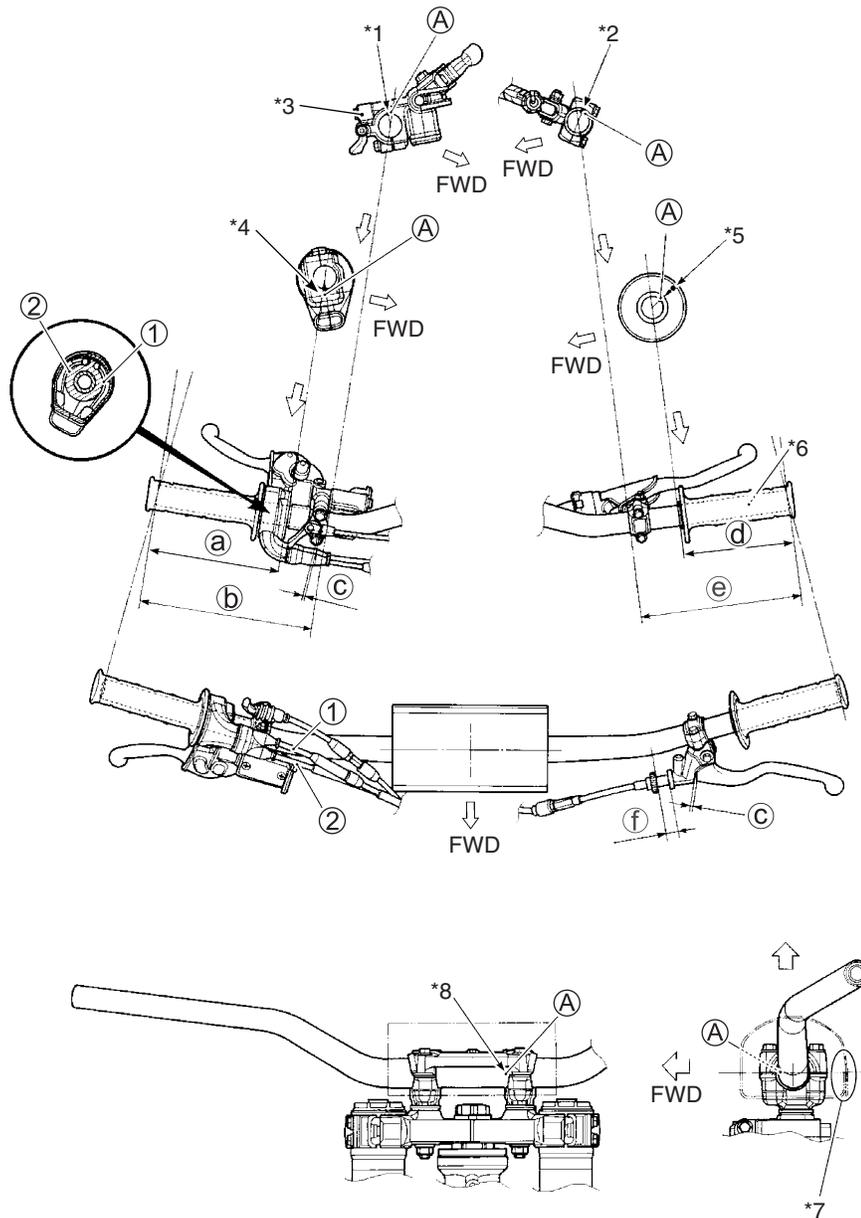
① Front brake hose	⑦ Front brake caliper
② Front brake master cylinder	*1 Set the brake hose end between the hose stopper, then tighten the brake hose union bolt.
③ Stopper	*2 Clamp the upper difference portion in brake hose diameter.
④ Hose guide	*3 After contacting the brake hose union to the stopper, tighten the union bolt.
⑤ Front fork protector	*4 Face the black marking of brake hose to the master cylinder side.
⑥ Clamp	

REAR BRAKE HOSE ROUTING



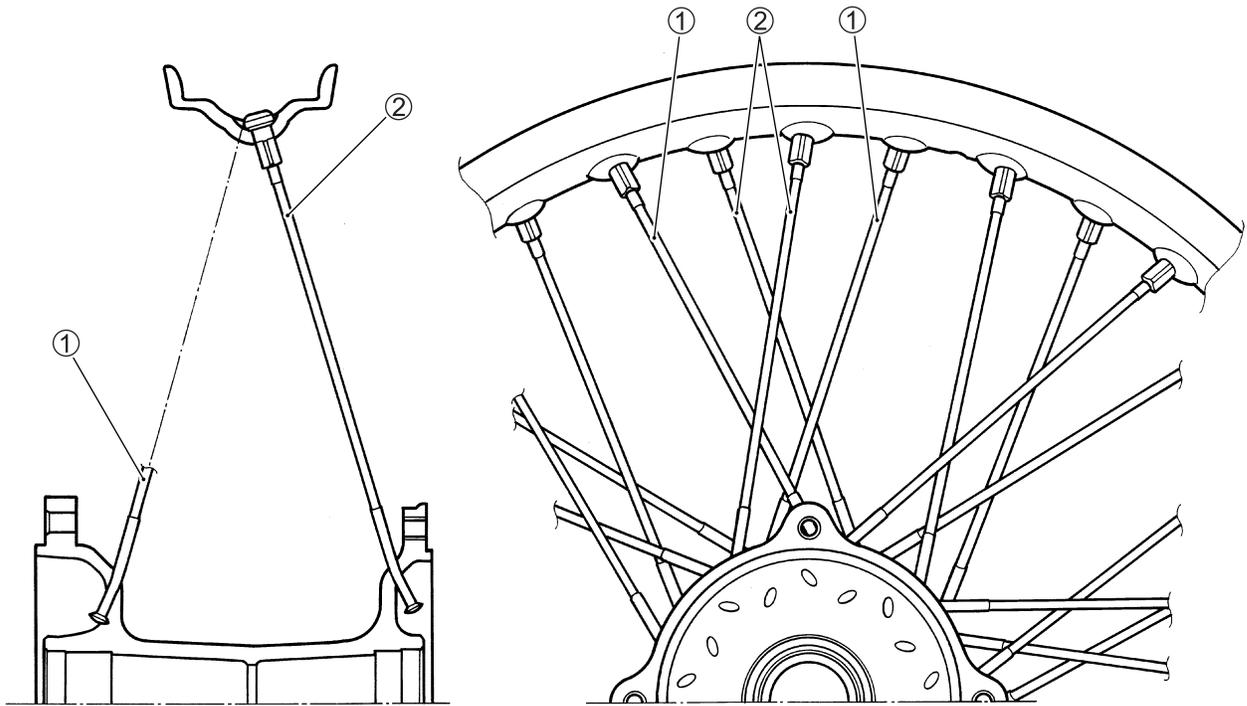
①	Rear brake hose	④	Hose guide
②	Rear brake master cylinder	*1	Set the brake hose end between the hose stopper, then tighten the brake hose union bolt.
③	Rear brake caliper	*2	Outside.

HANDLEBAR SET-UP



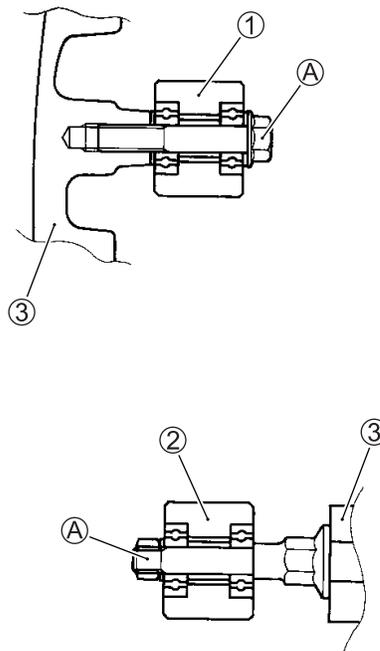
①	Throttle cable (Pulling cable)	Ⓓ	121 mm (4.76 in)	*4	Align the matching surface of throttle case with marking.
②	Throttle cable (Returning cable)	Ⓔ	175 mm (6.89 in)	*5	Align the “△” mark on the left handlebar grip with marking.
Ⓐ	Marking	Ⓕ	14 – 16 mm (0.55 – 0.63 in)	*6	Apply adhesive to the handlebars and inner of left handlebar grip.
Ⓐ	145 mm (5.71 in)	*1	Align the matching surface of master cylinder with marking.	*7	Set the velcro of handlebar pad to backward.
Ⓑ	190 mm (7.48 in)	*2	Align the matching surface of clutch lever holder with marking.	*8	Align the matching surface of handlebar holder with marking.
Ⓒ	2 – 3 mm (0.08 – 0.12 in)	*3	Tighten the lever side bolt first.		

REAR WHEEL SPOKES INSTALLATION



① Spoke (Inner) L: 206.5 mm (8.13 in)	② Spoke (Outer) L: 204.5 mm (8.05 in)
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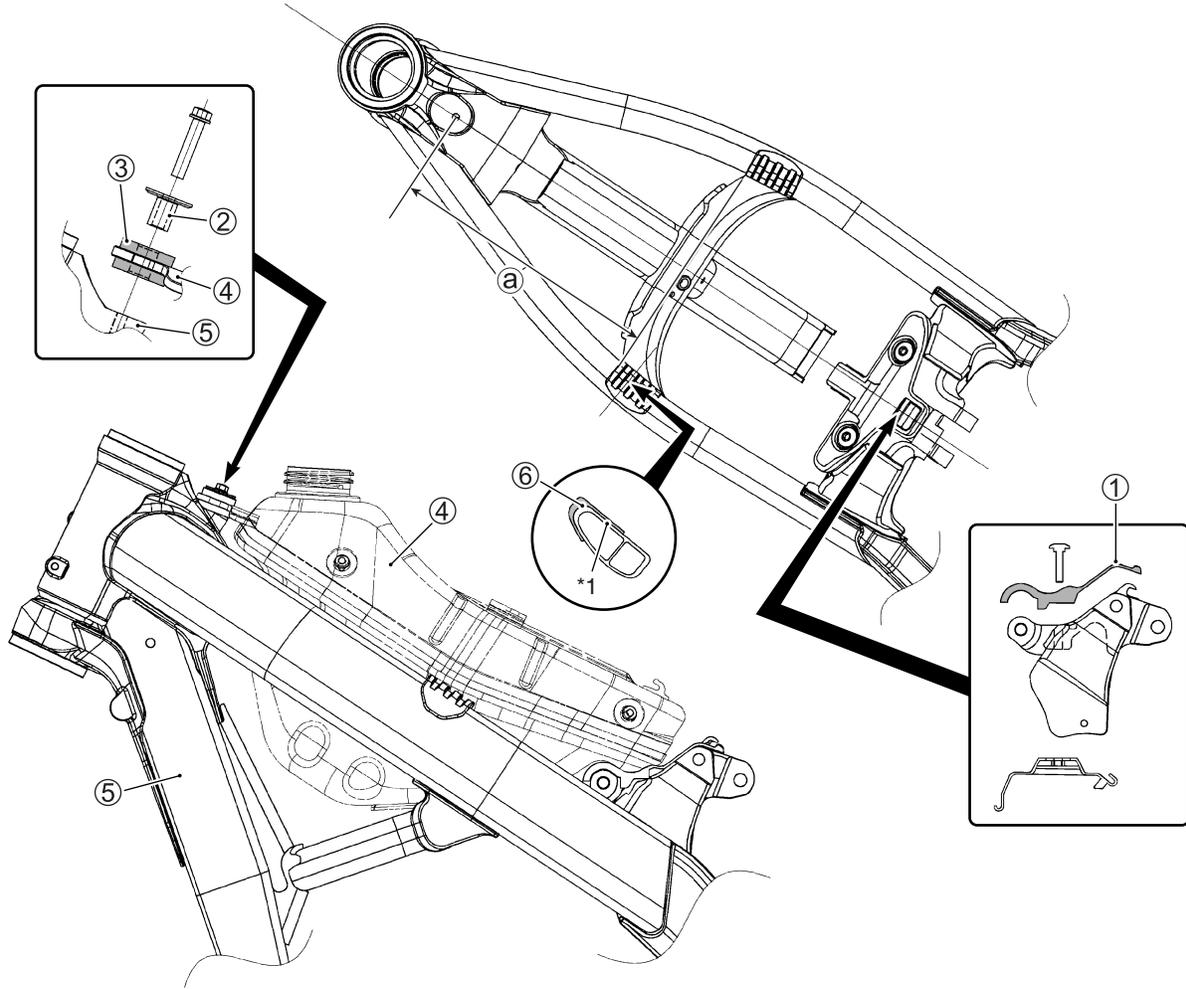
CHAIN ROLLER INSTALLATION



① Chain roller (Upper)	③ Frame
② Chain roller (Lower)	Ⓐ Chain roller bolt/nut

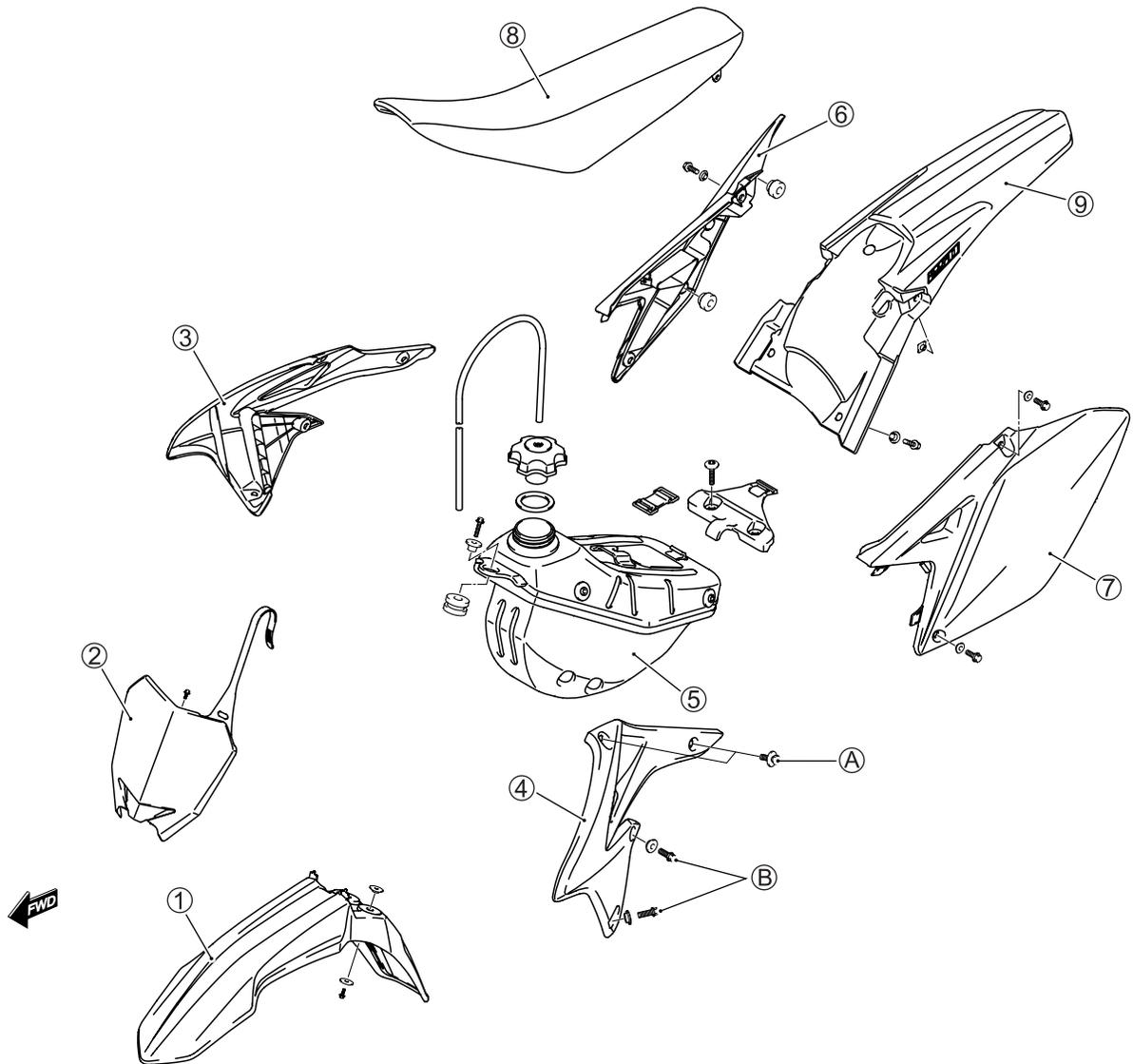
ITEM	N-m	kgf-m	lbf-ft
Ⓐ	23	2.3	16.5

FUEL TANK CUSHION INSTALLATION



① Fuel tank rear cushion	⑤ Frame
② Spacer	⑥ Fuel tank side cushion
③ Fuel tank front cushion	Ⓐ 213 mm (8.39 in)
④ Fuel tank	*1 Clean an adhesive surface before adhering the cushion.

EXTERIOR PARTS

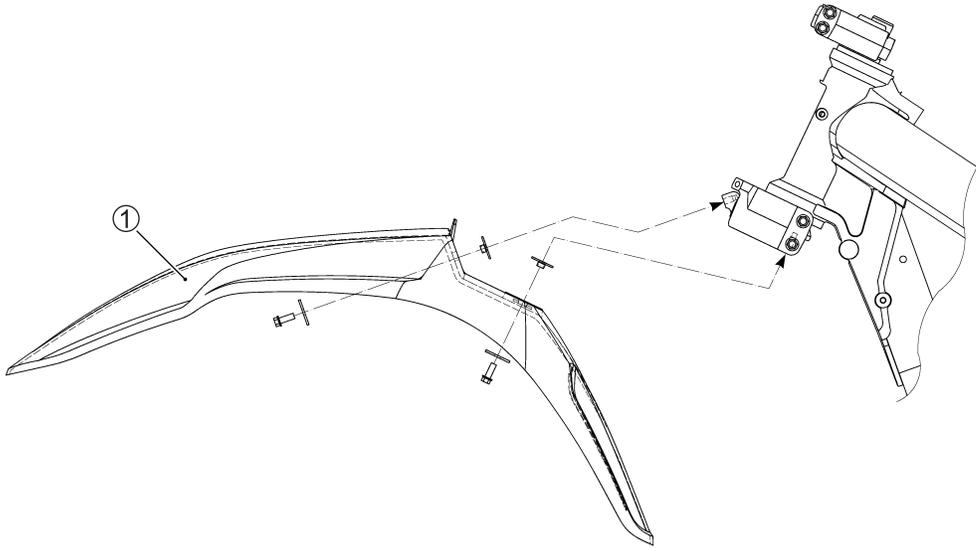


①	Front fender	⑤	Fuel tank	⑨	Rear fender
②	Front number plate	⑥	Right frame cover	A	Radiator cover upper bolt
③	Right radiator cover	⑦	Left frame cover	B	Radiator cover bolt
④	Left radiator cover	⑧	Seat		



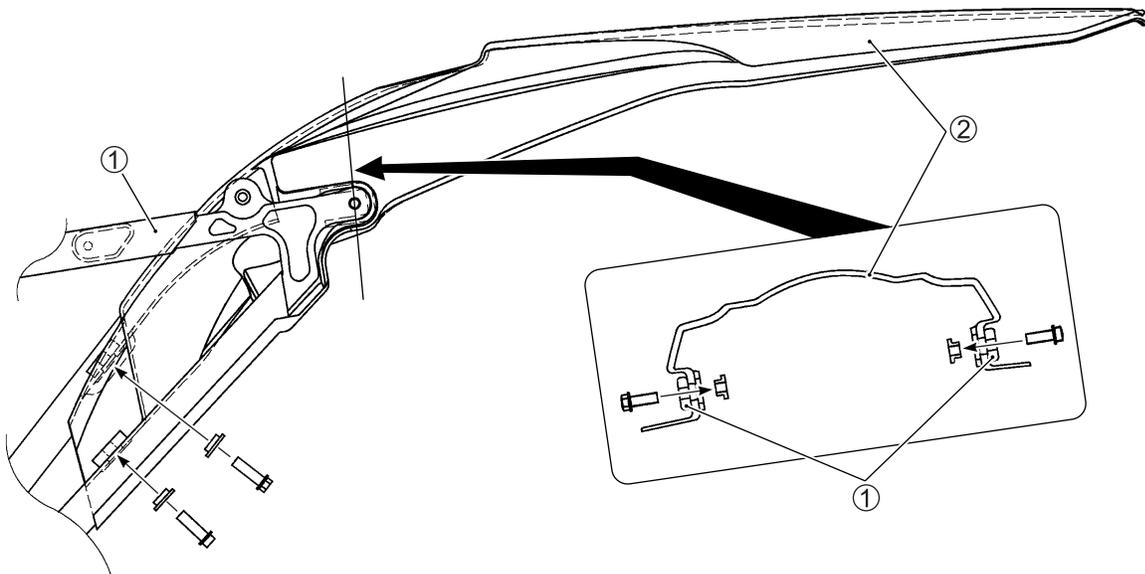
ITEM	N·m	kgf·m	lbf·ft
A	6	0.6	4.5
B	10	1.0	7.0

FRONT FENDER INSTALLATION



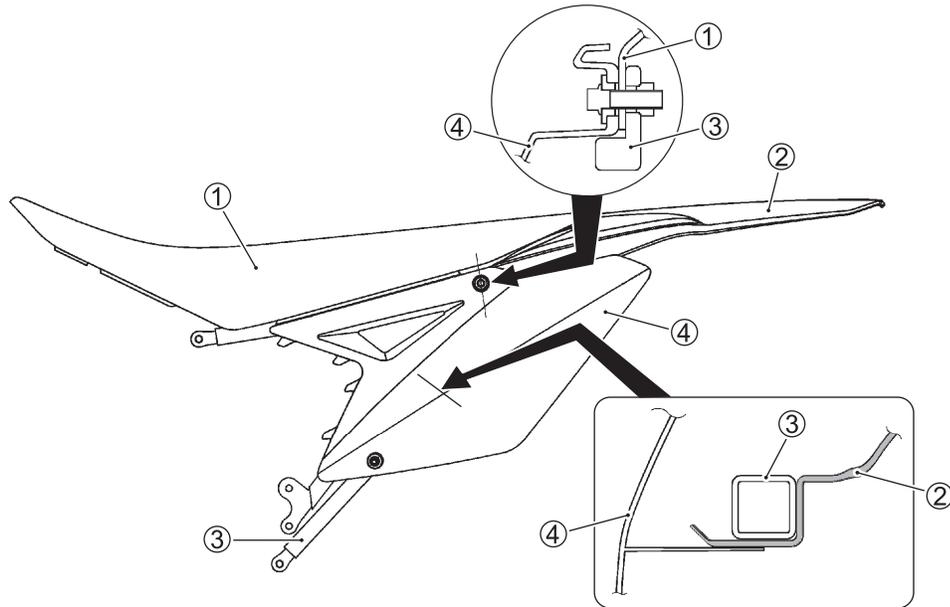
① Front fender

REAR FENDER INSTALLATION



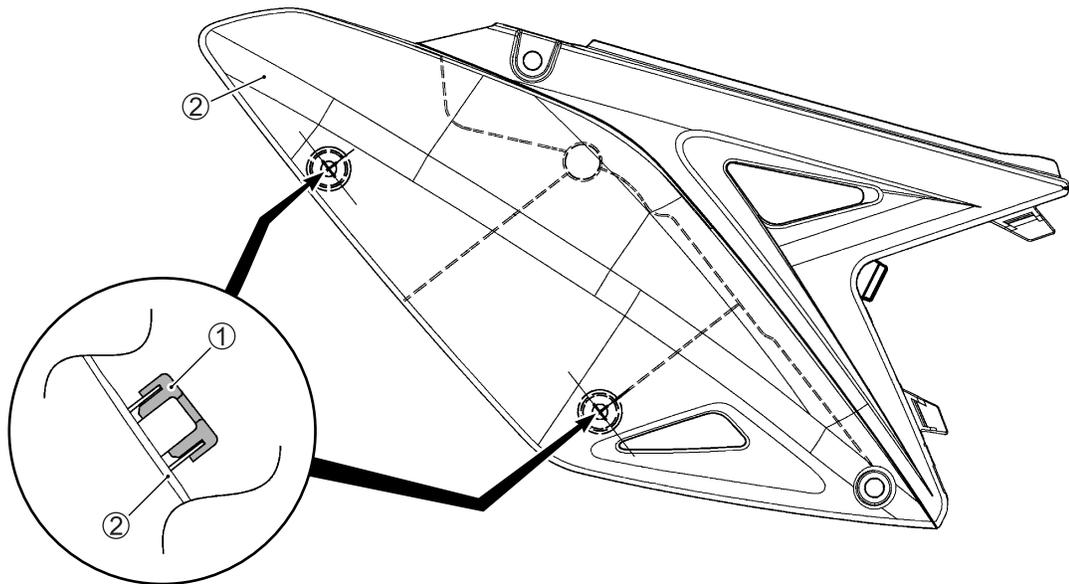
① Seat rail ② Rear fender

FRAME COVER INSTALLATION



① Seat	③ Seat rail
② Rear fender	④ Frame cover

FRAME COVER CUSHION INSTALLATION



① Cushion
② Frame cover

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