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**SUZUKI**

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**TL 1000S**

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**SERVICE MANUAL**

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SUZUKI MOTOR CORPORATION PRINTED IN JAPAN MARCH, '97 (TK)

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(英)

This manual contains an introductory description on the SUZUKI TL1000S 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 to use 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 and passenger.

**IMPORTANT**

All street-legal Suzuki motorcycles with engine displacement of 50 cc or greater are subject to Environmental Protection agency emission regulations. These regulations set specific standards for exhaust emission output levels as well as particular servicing requirements. This manual includes specific information required to properly inspect and service TL1000S in accordance with all EPA regulations. It is strongly recommended that the chapter on Emission Control, Periodic Servicing and Carburetion be thoroughly reviewed before any type of service work is performed.

Further information concerning the EPA emission reduction program and Download All 688 pages at <https://www.irepairmanual.com/downloads/1998-2001-suzuki-tl1000s-motorcycle-service-repair-workshop-manual/> program can be found in the U.S. SUZUKI EMISSION CONTROL PROGRAM MANUAL/SERVICE BULLETIN.

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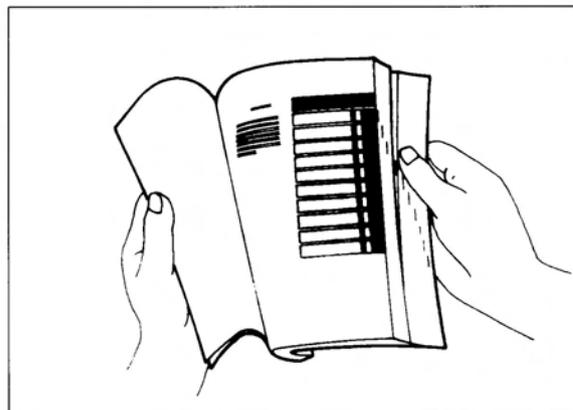
**SUZUKI MOTOR CORPORATION**

Motorcycle Service Department

# 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 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 wheel

① Brake disc  
 ② Dust seal  
 ③ Bearing  
 ④ Spacer  
 ⑤ Spacer nut  
 ⑥ Front wheel

A Front axle  
 B Brake disc bolt (Front)

ITEM	N·m	kg-m	lb-ft
A	100	10.0	72.5
B	23	2.3	16.5

## SYMBOL

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

SYMBOL	DEFINITION	SYMBOL	DEFINITION
	Torque control required. Data beside it indicates specified torque.		Measure in voltage range.
	Apply oil. Use engine oil unless otherwise specified.		Measure in resistance range.
	Apply SUZUKI SUPER GREASE "A". 99000-25030		Measure in current range.
	Apply SUZUKI MOLY PASTE. 99000-25140		Measure in diode test range.
	Apply SUZUKI BOND "1207B". 99104-31140		Measure in continuity test range.
	Apply THREAD LOCK SUPER "1303". 99000-32030		Use special tool.
	Apply THREAD LOCK "1342". 99000-32050		Use engine coolant.
	Apply THREAD LOCK SUPER "1360". 99000-32130		Use fork oil. 99000-99044-L01
	Apply or use brake fluid.		

## ABBREVIATIONS MAY BE USED IN THIS MANUAL

### A

ACL : Air Cleaner, Air Cleaner Box  
ATDC : After Top Dead Center  
ATM Pressure: Atmospheric Pressure  
Atmospheric Pressure  
Sensor (APS)  
API : American Petroleum  
Institute  
AC : Alternating Current  
ABDC : After Bottom Dead Center  
A/F : Air Fuel Mixture

### B

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

### C

CKT : Circuit  
CKP Sensor : Crankshaft Position Sensor  
(CKPS)  
CMP Sensor : Camshaft Position Sensor  
(CMPS)  
CO : Carbon Monoxide  
CLP Switch : Clutch Lever Position Switch  
(Clutch Switch)  
CPU : Central Processing Unit

### D

DC : Direct Current  
DMC : Dealer Mode Coupler  
DOHC : Double Over Head Camshaft  
DRL : Daytime Running Light

### E

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

### F

FI : Fuel Injection, Fuel Injector  
FP : Fuel Pump  
FP Relay : Fuel Pump Relay  
FPR : Fuel Pressure Regulator

### G

GEN : Generator  
GND : Ground  
GP Switch : Gear Position Switch

### H

HC : Hydrocarbons

### I

IAC Valve  
Actuator : Intake Air Control Valve  
Actuator  
IAT Sensor : Intake Air Temperature  
Sensor (IATS)  
IAP Sensor : Intake Air Pressure  
Sensor (IAPS)  
IG : Ignition

### L

LCD : Liquid Crystal Display  
LED : Light Emitting Diode  
(Malfunction Indicator  
Lamp)  
LH : Left Hand

### M

MAL-Code : Malfunction Code  
(Diagnostic Code)  
Max : Maximum  
Min : Minimum  
MIL : Malfunction Indicator Lamp  
(LED)

### N

NOx : Nitrogen Oxides

### O

OHC : Over Head Camshaft  
OPS : Oil Pressure Switch

### P

PCV : Positive Crankcase  
Ventilation (Crankcase  
Breather)

### R

RH : Right Hand  
ROM : Read Only Memory

### S

SAE : Society of Automotive  
Engineers

### T

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

### V

VCSV : Vacuum Control Solenoid  
Valve  
VD : Vacuum Damper  
VTV : Vacuum Transmitting Valve

## SAE-TO-FORMER SUZUKI TERM (ONLY FOR U.S.A.)

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	
<b>A</b>		
Air Cleaner	ACL	Air Cleaner, Air Cleaner Box
<b>B</b>		
Barometric Pressure	BARO	Barometric Pressure, Atmospheric Pressure
Battery Positive Voltage	B+	Battery Voltage, +B
<b>C</b>		
Camshaft Position Sensor	CMP Sensor	Camshaft Position Sensor (CMPS)
Crankshaft Position Sensor	CKP Sensor	Crankshaft Position Sensor (CKPS), Crank Angle
<b>D</b>		
Data Link Connector	DLC	Dealer Mode Coupler
Diagnostic Test Mode	DTM	_____
Diagnostic Trouble Code	DTC	Diagnostic Code, Malfunction Code
<b>E</b>		
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)
Evaporative Emission	EVAP	Evaporative Emission
Evaporative Emission Canister	EVAP Canister	_____ (Canister)
Purge Valve	Purge Valve	Purge Valve (SP Valve)
<b>F</b>		
Fan Control	FC	_____
Fuel Level Sensor	_____	Fuel Level Sensor, Fuel Level Gauge
Fuel Pump	FP	Fuel Pump (FP)
<b>G</b>		
Generator	GEN	Generator
Ground	GND	Ground (GND, GRD)

SAE TERMS		FORMER SUZUKI TERM
FULL TERM	ABBREVIATION	
<b>I</b>		
Idle Speed Control	ISC	_____
Ignition Control	IC	Electronic Spark Advance (ESA)
Ignition Control Module	ICM	_____
Intake Air Temperature	IAT	Intake Air Temperature (IAT), Air Temperature
<b>M</b>		
Malfunction Indicator Lamp	MIL	LED Lamp Malfunction Indicator Lamp (MIL)
Manifold Absolute Pressure	MAP	Intake Air Pressure, Intake Vacuum
Mass Air Flow	MAF	Air Flow
<b>O</b>		
On-Board Diagnostic	ODB	Self-Diagnosis Function Diagnostic
Open Loop	OL	_____
<b>P</b>		
Programmable Read Only Memory	PROM	_____
Pulsed Secondary Air Injection	PAIR	Pulse Air Control (PAIR)
<b>R</b>		
Random Access Memory	RAM	_____
Read Only Memory	ROM	ROM
<b>S</b>		
Secondary Air Injection	AIR	_____
<b>T</b>		
Throttle Body	TB	Throttle Body (TB)
Throttle Body Fuel Injection	TBI	Throttle Body Fuel Injection (TBI)
Throttle Position Sensor	TP Sensor	TP Sensor (TPS)
<b>V</b>		
Voltage Regulator	VR	Voltage Regulator
Volume Air Flow	VAF	Air Flow

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## 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**

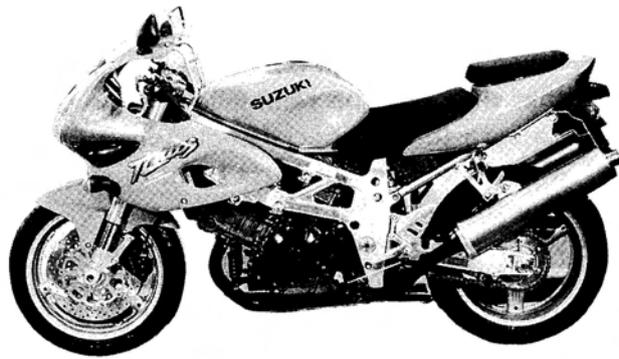
- \* If parts replacement is necessary, replace the parts with Suzuki Genuine Parts or their equivalent.
- \* When removing parts that are to be reused, keep them arranged in an orderly manner so that they may be reinstalled in the proper order and orientation.
- \* Be sure to use special tools when 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 not require use of battery power, disconnect the negative cable the battery.
- \* When tightening the cylinder head and case bolts and nuts, tighten the larger sizes first. Always tighten the bolts and nuts from the inside working out, in a crisscross manner.
- \* 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 TL1000SV ('97-MODEL)



RIGHT SIDE

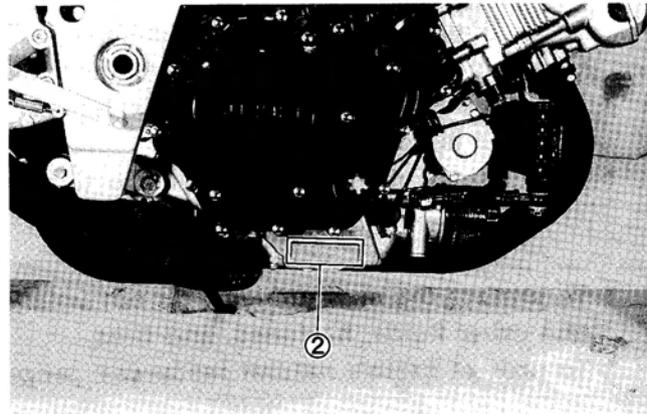
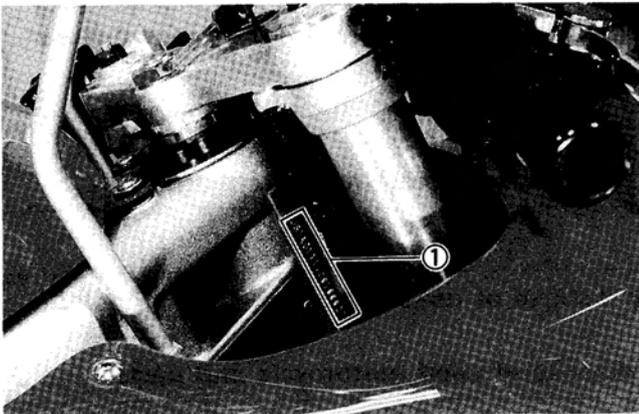


LEFT SIDE

\*Difference between photographs and actual motorcycles depends 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 right side of the crankcase. These numbers are required especially for registering the machine and ordering spare parts.



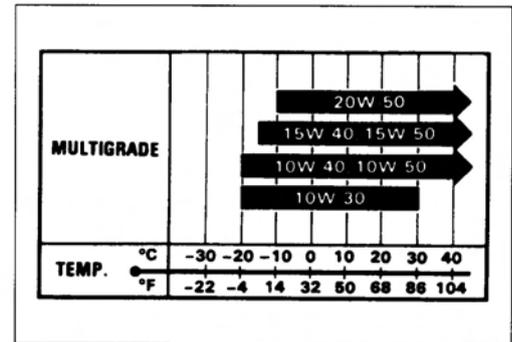
### FUEL, OIL AND ENGINE COOLANT RECOMMENDATION

#### FUEL

1. Use only unleaded gasoline of at least 87 pump octane ( $\frac{R+M}{2}$ ) method or 91 octane or higher rated by the research method.
2. Suzuki recommends that customers use alcohol free, unleaded gasoline whenever possible.
3. Use of blended gasoline containing MTBE (Methyl Tertiary Butyl Ether) is permitted.
4. Use of blended gasoline/alcohol fuel is permitted, provided that the fuel contains not more than 10% ethanol. Gasoline/alcohol fuel may contain up to 5% methanol if appropriate cosolvents and corrosion inhibitors are present in it.
5. If the performance of the vehicle is unsatisfactory while using blended gasoline/alcohol fuel, you should switch to alcohol-free unleaded gasoline.
6. Failure to follow these guideline could possibly void applicable warranty coverage. Check with your fuel supplier to make sure that the fuel you intend to use meets the requirements listed above.

## ENGINE OIL

SUZUKI recommends the use of SUZUKI PERFORMANCE 4 MOTOR OIL or an oil which is rated SF or SG under the API (American Petroleum Institute) service classification. The recommended viscosity is SAE 10W/40. If an SAE 10W/40 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 fork oil L01.

## ENGINE COOLANT

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

## 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 perform as a corrosion and rust inhabit 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.

## LIQUID AMOUNT OF WATER/ENGINE COOLANT

Solution capacity (total): 2 200 ml (2.3/1.9 US/Imp qt)

For engine coolant mixture information, refer to cooling system section, page 5-3.

### ⚠ 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 PROCEDURES

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

- Keep to these break-in engine speed limits:

**Initial 800 km ( 500 miles): Below 5 000 r/min**

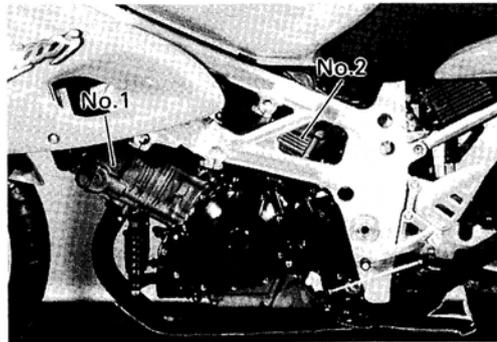
**Up to 1 600 km (1 000 miles): Below 7 500 r/min**

**Over 1 600 km (1 000 miles): Below 10 500 r/min**

- Upon reaching an odometer reading of 1 600 km (1 000 miles) you can subject the motorcycle to full throttle operation. However, do not exceed 10 500 r/min at any time.

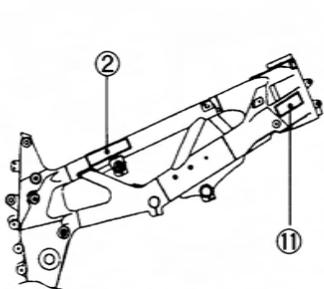
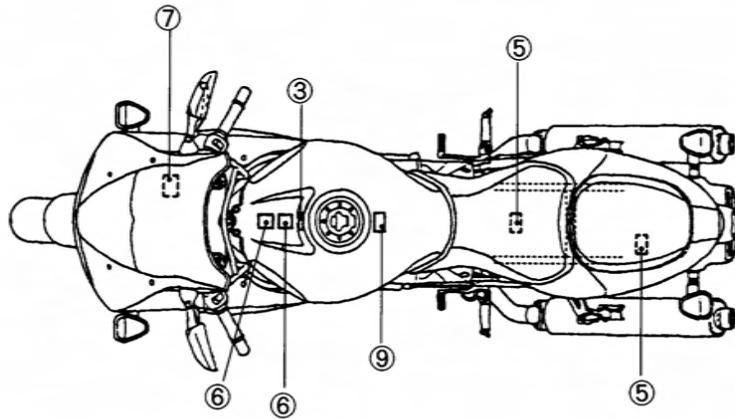
## CYLINDER IDENTIFICATION

The two cylinders of this engine are identified as No.1 and No.2 cylinder, as counted from front to rear (as viewed by the rider on the seat).

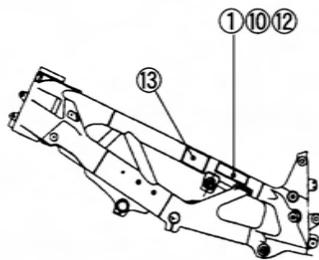


# INFORMATION LABELS

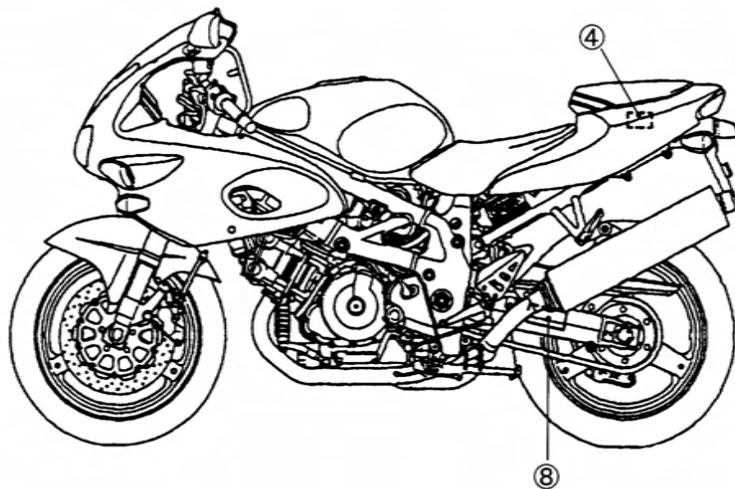
①	Noise label (For E-03,24,33,34)
②	Information label (For E-03,28,33)
③	Fuel caution label (For E-02,24)
④	Manual notice label (For E-03,33)
⑤	Frame caution labe
⑥	Screen warning label
⑦	Steering warning label (For E-03,33,34)
⑧	Tire pressure label
⑨	Warning safety labe
⑩	ICES Canada label (For E-28)
⑪	ID label (Except for E-03,28,33)
⑫	ID label (For E-39)
⑬	Safety label (For E-03,28,33)



Frame (left)



Frame (right)



## SPECIFICATIONS

### DIMENSIONS AND DRY MASS

Overall length .....	2 045 mm (80.5 in) .....	E-02,03,04,25,28,33,34,37
	2 065 mm (81.3 in) .....	E-18,22,24
	2 085 mm (82.1 in) .....	E-39
Overall width .....	715 mm (28.1 in)	
Overall height .....	1 175 mm (46.3 in)	
Wheelbase .....	1 415 mm (55.7 in)	
Ground clearance .....	140 mm (5.5 in)	
Seat height .....	835 mm (32.9 in)	
Dry mass .....	187 kg (412 lbs)	

### ENGINE

Type .....	Four-stroke, Liquid-cooled, DOHC, TSCC, 90-degree V-twin
Number of cylinders .....	2
Bore .....	98.0 mm (3.858 in)
Stroke .....	66.0 mm (2.598 in)
Piston displacement .....	996 cm <sup>3</sup> (60.8 cu. in)
Compression ratio .....	11.3 : 1
Fuel system .....	Fuel injection
Air cleaner .....	Non-woven fabric element
Starter system .....	Electric starter
Lubrication system .....	Wet sump

### TRANSMISSION

Clutch .....	Wet multi-plate type
Transmission .....	6-speed constant mesh
Gearshift pattern .....	1-down, 5-up
Primary reduction ratio .....	1.838 (57/31)
Final reduction ratio .....	2.235 (38/17)
Gear ratios, Low .....	2.666 (32/12)
2nd .....	1.933 (29/15)
3rd .....	1.500 (27/18)
4th .....	1.227 (27/22)
5th .....	1.086 (25/23)
Top .....	1.000 (24/24)
Drive chain .....	RK50 GSVZ1, 104 links

**CHASSIS**

Front suspension .....	Inverted telescopic, coil spring, oil damped, spring pre-load fully adjustable, compression damping force fully adjustable, rebound damping force fully adjustable.
Rear suspension .....	Swingarm, coil spring, rotary damper, spring pre-road fully adjustable, compression damping force fully adjustable, rebound damping force fully adjustable.
Steering angle .....	30° (right & left)
Caster .....	23° 42'
Trail .....	94.5 mm (3.7 in)
Turning radius .....	3.1 m (10.2 ft)
Front brake .....	Disc brake, twin
Rear brake .....	Disc brake
Front tire size .....	120/70 ZR17, (58W)
Rear tire size .....	190/50 ZR17, (73W)
Front fork stroke .....	120 mm (4.7 in)
Rear wheel travel .....	128 mm (5.0 in)

**ELECTRICAL**

Ignition type .....	Electronic ignition (Transistorized)
Ignition timing .....	3° B.T.D.C. at 1 200 r/min
Spark plug .....	NGK: CR8EK or ND: U24ETR ..... E-03,28,33 NGK: CR8E or ND: U24ESR-N ..... Others
Battery .....	12V 36.0 kC (10 Ah)/10HR
Generator .....	Three-phase A.C. Generator
Fuse .....	30/15/15/15/10/10A
Headlight .....	12V 60/55W × 2 ..... E-02,03,24,28,33 12V 55W + 12V 55W ..... Others
Position light .....	12V 5W ..... Except for E-03,24,28,33
Turn signal light .....	12V 21W
License light .....	12V 5W
Brake light/Taillight .....	12V 21/5W × 2
Speedometer/Tachometer light .....	12V 0.84W × 3
Neutral indicator light .....	12V 1.7W
High beam indicator light .....	12V 1.7W
Turn signal indicator light .....	12V 3W
Fuel indicator light .....	12V 1.7W
Engine coolant temp. indicator light .....	LED

**CAPACITIES**

Fuel tank .....	17 L (4.5/3.7 US/Imp gal)
Engine oil, oil change .....	3 100 ml (3.3/2.7 US/Imp qt)
with filter change .....	3 300 ml (3.5/2.9 US/Imp qt)
overhaul .....	3 600 ml (3.8/3.2 US/Imp qt)
Engine coolant, including reserve .....	2 200 ml (2.3/1.9 US/Imp qt)
Front fork oil (each leg) .....	488 ml (16.5/17.2 US/Imp oz)

These specifications are subject to change without notice.

## COUNTRY OR AREA

The series of symbols on the left stand for the countries or area on the right.

SYMBOL	COUNTRY or AREA
E-02	U.K.
E-03	U.S.A.
E-04	France
E-18	Switzerland
E-21	Belgium
E-22	Germany
E-24	Australia
E-25	Netherlands
E-28	Canada
E-33	California (U.S.A.)
E-34	Italy
E-37	Brazil
E-39	Austria
E-53	Spain

(E-21 and 53 countries are included in E-34.)

# PERIODIC MAINTENANCE

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## PERIODIC MAINTENANCE SCHEDULE

**IMPORTANT:** The periodic maintenance intervals and service requirements have been established in accordance with EPA regulations. Following these instructions will ensure that the motorcycle will not exceed emission standards and it will also ensure the reliability and performance of the motorcycle.

The chart below lists the recommended intervals for all the required periodic service work necessary to keep the motorcycle operating at peak performance and economy. Mileages are expressed in terms of kilometer, miles and time for your convenience.

**NOTE:**

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

### PERIODIC MAINTENANCE CHART

Item	Interval	km	1 000	6 000	12 000	18 000	24 000
		miles	600	4 000	7 500	11 000	15 000
		months	1	6	12	18	24
Air cleaner element		-	I	I	R	I	
Spark plugs		-	I	R	I	R	
Tappet clearance		-	-	-	-	I	
Fuel hoses		-	I	I	I	I	
		Replace every four years.					
Engine oil		R	R	R	R	R	
Engine oil filter		R	-	-	R	-	
Engine idle speed		I	I	I	I	I	
Throttle cable play		I	I	I	I	I	
Throttle valve synchronization		*I	-	I	-	I	
*Evaporative emission control system (California model only)		-	-	I	-	I	
		Replace vapor hoses every four years.					
Clutch		-	I	I	I	I	
Radiator hose		-	I	I	I	I	
Engine coolant		Replace every two years.					
Drive chain		I	I	I	I	I	
		Clean and lubricate every 1000 km (600 miles).					
Brakes		I	I	I	I	I	
Brake hose		-	I	I	I	I	
		Replace every four years.					
Brake fluid		-	I	I	I	I	
		Replace every two years.					
Tires		-	I	I	I	I	
Steering		I	-	I	-	I	
Front forks		-	-	I	-	I	
Rear suspension		-	-	I	-	I	
Exhaust pipe bolts and muffler bolts		T	-	T	-	T	
Chassis bolts and nuts		T	T	T	T	T	

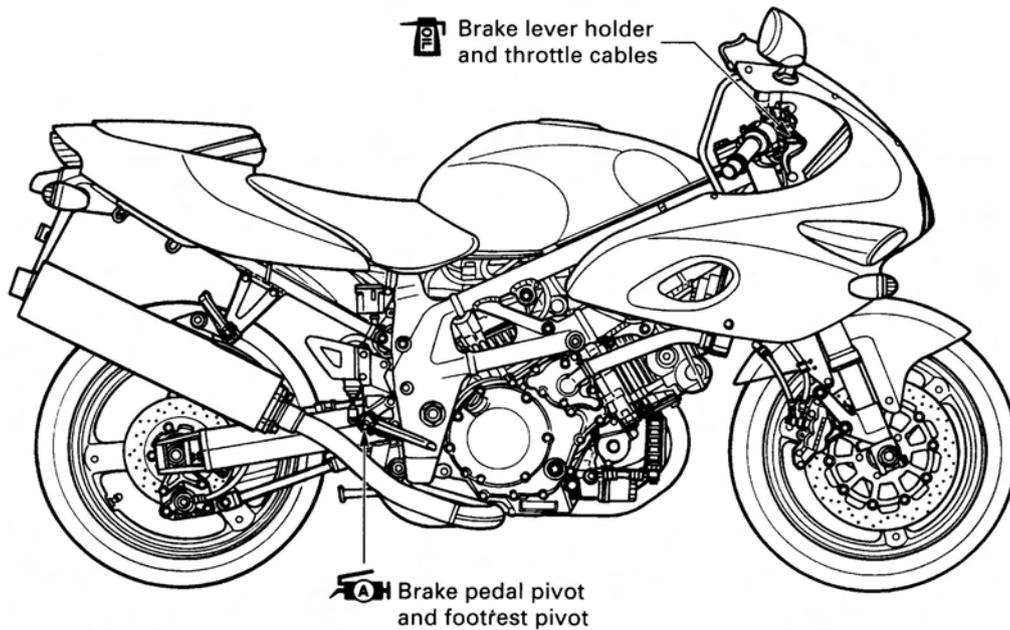
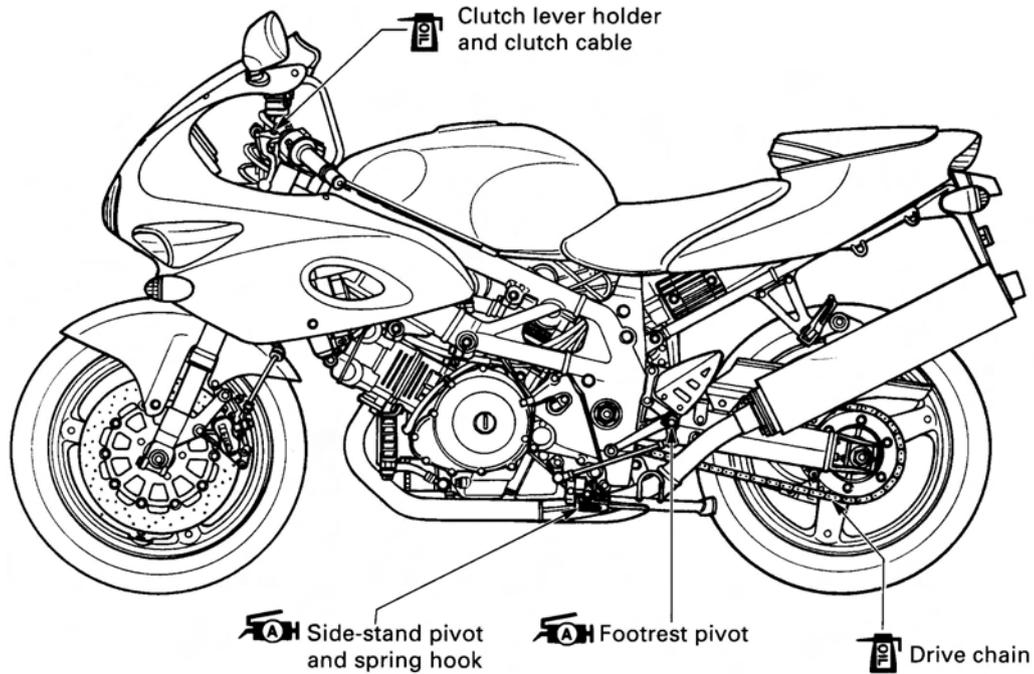
NOTE: I=Inspect and clean, adjust, replace or lubricate as necessary;  
R=Replace; T=Tighten

Asterisk mark (\*) indicates the California model only.

## LUBRICATION POINTS

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

Major lubrication points are indicated below.



### NOTE:

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

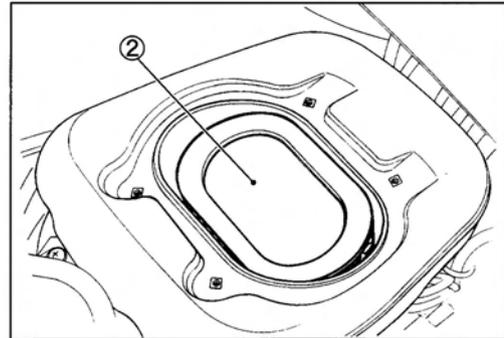
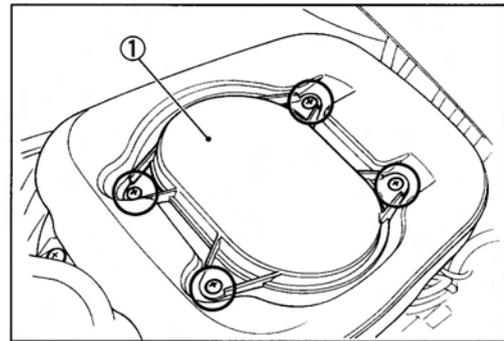
## MAINTENANCE AND TUNE-UP PROCEDURES

This section describes the servicing procedures for each item of the Periodic Maintenance requirements.

### AIR CLEANER

**Inspect Every 6 000 km (4 000 miles, 6 months) and Replace Every 18 000 km (11 000 miles, 18 months).**

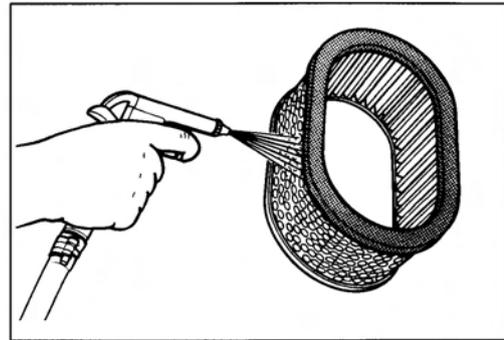
- Remove the front seat. (Refer to page 6-4.)
- Lift and support the fuel tank. (Refer to page 4-49.)
- Remove the air cleaner cover ① by removing the screws.
- Remove the air cleaner element ②.



- Carefully use air hose to blow the dust from the cleaner element.

#### ▲ CAUTION

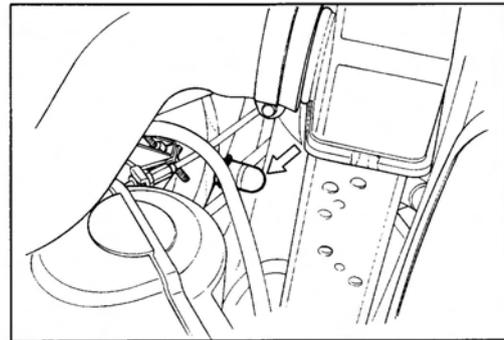
Always use air pressure on the outside of the air cleaner element. If air pressure is used on the inside, dirt will be forced into the pores of the air cleaner element thus restricting air flow through the air cleaner element.



- Reinstall the cleaned or new air cleaner element in the reverse order of removal.

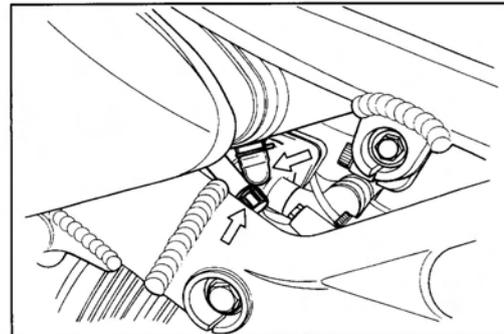
#### ▲ CAUTION

If driving under dusty condition, clean the air cleaner element more frequently. The surest way to accelerate engine wear is to use the engine without the element or to use a ruptured element. Make sure that the air cleaner is in good condition at all times. Life of the engine depends largely on this component!



#### NOTE:

When cleaning the air cleaner element, drain water from the air cleaner by removing the drain plugs.

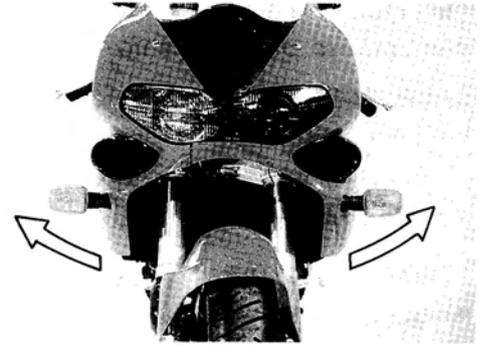
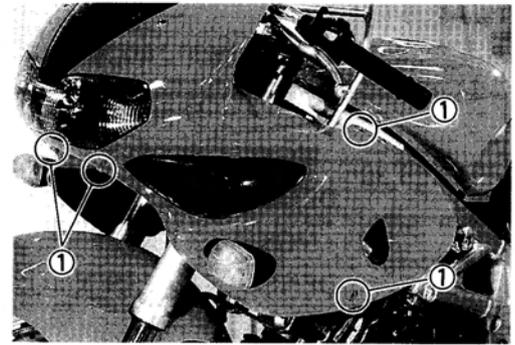


## SPARK PLUG

Inspect Every 6 000 km (4 000 miles, 6 months) and  
Replace Every 12 000 km (7 500 miles, 12 months).

### NO.1 (FRONT) SPARK PLUG REMOVAL

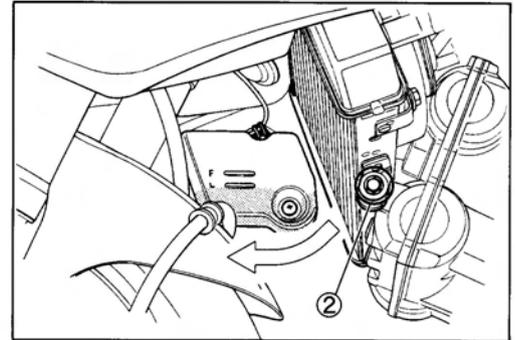
- Remove the fairing bolts ①, left and right.
- Open the lower sides of fairing, left and right.



- Remove the radiator mounting bolt ② (lower side).
- Move the radiator lower side forward.

#### NOTE:

To keep the radiator lower side at the forward position, insert a wooden block or a appropriate block between the radiator and the cylinder head.



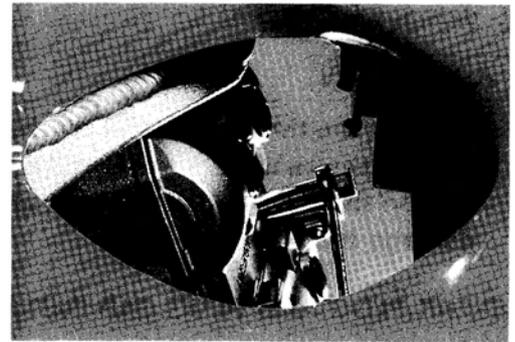
- Remove the spark plug cap.
- Remove the spark plug with a spark plug wrench.

#### NOTE:

Be careful not to damage the radiator fins.

#### **▲WARNING**

The hot radiator and the hot engine can burn you.  
Wait until the radiator and the engine are cool  
enough to touch.



### NO.2 (REAR) SPARK PLUG REMOVAL

- Remove the front seat. (Refer to page 6-4.)
- Lift and support the fuel tank. (Refer to page 4-49.)
- Remove the spark plug cap.
- Remove the spark plug with a spark plug wrench.



## 2-5 PERIODIC MAINTENANCE

### HEAT RANGE

- Check to see the heat range of the plug.

		Standard	Cold type
E-03,28,33	NGK	CR8EK	CR9EK or CR10EK
	DENSO	U24ETR	U27ETR or U31ETR
Others	NGK	CR8E	CR9E or CR10E
	DENSO	U24ESR-N	U27ESR-N or U31ESR-N

#### NOTE:

"R" type spark plug has a resistor located at the center electrode to prevent radio noise.

### CARBON DEPOSIT

- Check to see if there are carbons deposit on the plugs. If carbon is deposited, remove it with a spark plug cleaner machine or carefully using a tool with a pointed end.

### SPARK PLUG GAP

- Measure the plug gap with a thickness gauge. If out of specification, adjust it to the following gap.

 09900-20803: Thickness gauge

#### Standard

Spark plug gap **A**: 0.7–0.8 mm (0.028–0.031 in)

**B**: 0.6–0.7 mm (0.024–0.028 in)

### ELECTRODES CONDITION

- Check to see the worn or burnt condition of the electrodes. If it is extremely worn or burnt, replace the plug. And also replace the plug if it has a broken insulator, damaged thread.

#### ▲ CAUTION

Confirm the thread size and reach when replacing the plug. If the reach is too short, carbon will be deposited on the screw portion of the plug hole and engine damage may result.

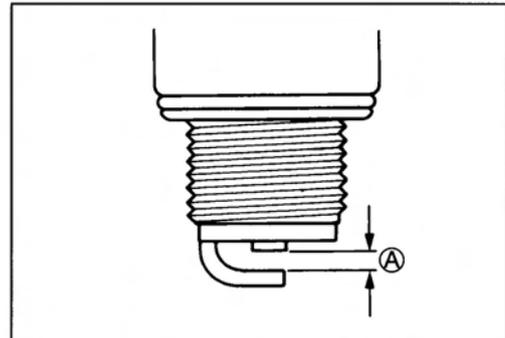
### SPARK PLUG AND PLUG CAP INSTALLATION

#### ▲ CAUTION

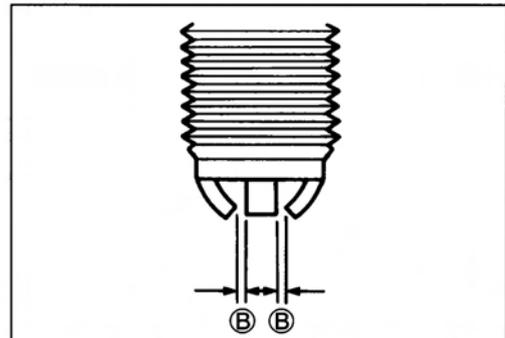
Before using a spark plug wrench, carefully turn the spark plug by finger into the threads of the cylinder head to prevent damage the aluminum threads.

- Install the spark plugs to the cylinder heads by finger tight, and then tighten them to the specified torque.

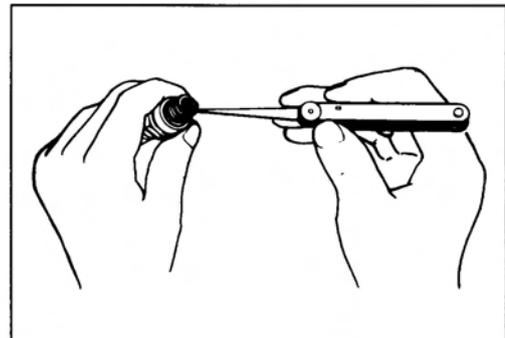
 Spark plug: 11 N·m (1.1 kg·m, 8.0 lb·ft)



(Except for E-03, 28, 33 models)

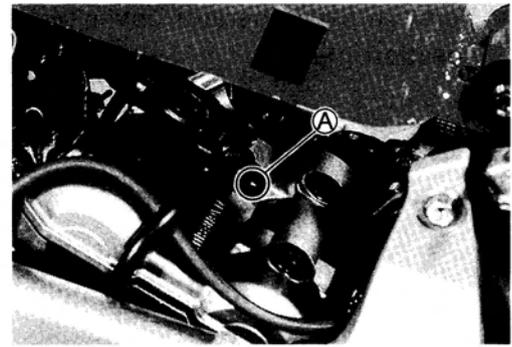


(For E-03, 28, 33 models)



**NOTE:**

When fitting the spark plug caps, front and rear, face the triangle marks on the water-proof covers (A) to each cylinder exhaust side.

**TAPPET CLEARANCE**

**Inspect Every 24 000 km (15 000 miles, 24 months).**

- Remove the front seat. (Refer to page 6-4.)
- Lift and support the fuel tank. (Refer to page 4-49.)
- Remove the spark plugs, front and rear. (Refer to page 2-4.)
- Disconnect the camshaft position sensor coupler from the rear cylinder.
- Remove the cylinder head covers, front and rear.

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

Tappet clearance must be checked and adjusted, 1) at the time of periodic inspection, 2) when the valve mechanism is serviced, and 3) when the camshafts are disturbed by removing them for servicing.

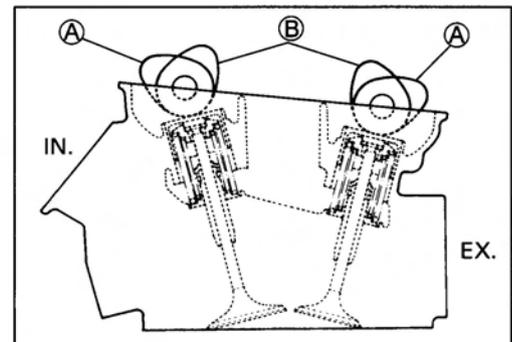
**Tappet clearance (when cold):**

**IN. : 0.10–0.20 mm (0.004–0.008 in)**

**EX. : 0.20–0.30 mm (0.008–0.012 in)**

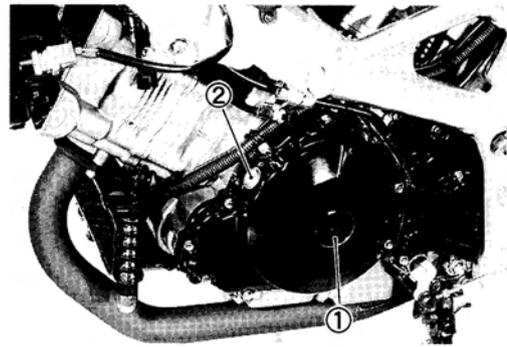
**NOTE:**

- \* The tappet clearance should be taken when each cylinder is at Top Dead Center (TDC) of compression stroke.
- \* The cams (IN & EX) on the front cylinder at position (A) show the front cylinder at TDC of compression stroke.
- \* The cams (IN & EX) on the rear cylinder at position (B) show the rear cylinder at TDC of compression stroke.
- \* The clearance specification is for COLD state.
- \* To turn the crankshaft for clearance checking, be sure to use a 17-mm wrench, and rotate in the normal running direction. All spark plugs should be removed.

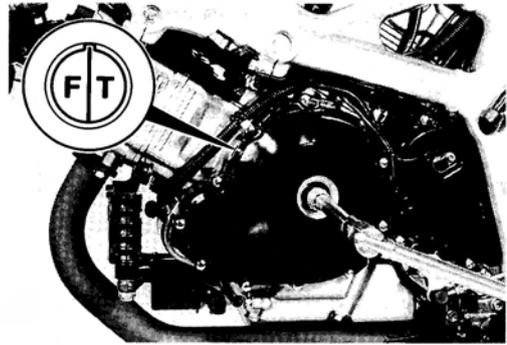


## 2-7 PERIODIC MAINTENANCE

- Remove the generator cover plug ① and the timing inspection plug ②.



- Turn the crankshaft to set the No.1 (Front) cylinder at TDC of compression stroke. (Align the "F|T" line on the generator rotor to the index mark of valve timing inspection hole and also bring the camshafts to the position as shown in page 2-6.)

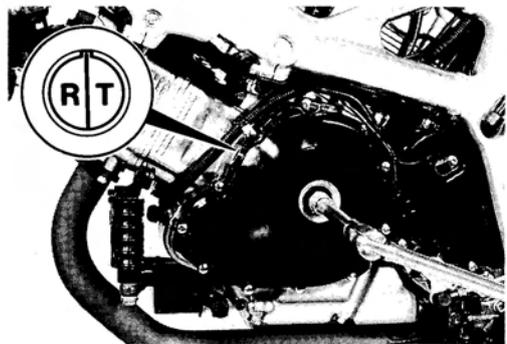


- To inspect the No.1 (Front) cylinder tappet clearance, use a thickness gauge between the tappet and the cam. If the clearance is out of specification, adjust it into the specified range.

**TOOL** 09900-20803: Thickness gauge

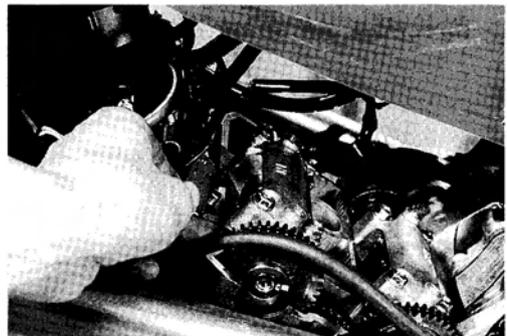


- Turn the crankshaft 270 degrees ( $\frac{3}{4}$  turns) to set the No.2 (Rear) cylinder at TDC of compression stroke. (Align the "R|T" line on the generator rotor to the index mark of valve timing inspection hole and also bring the camshafts to the position as shown in page 2-6.)



- Inspect the No.2 (Rear) cylinder tappet clearance as the same manner of No.1 (Front) cylinder and adjust the clearance if necessary.

**TOOL** 09900-20803: Thickness gauge

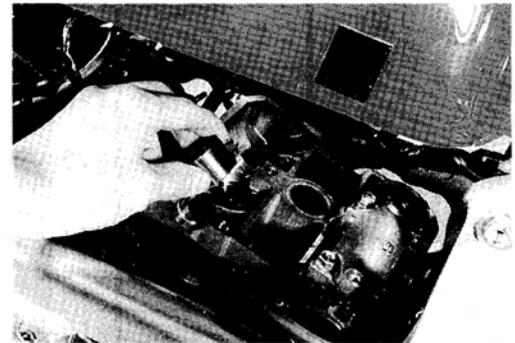


**TAPPET CLEARANCE ADJUSTMENT**

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

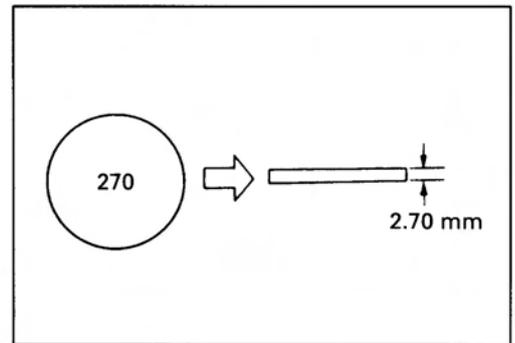
- Remove the intake or exhaust camshafts. (Refer to pages 3A-6 and -7.)
- Remove the tappet and shim by fingers or magnetic hand.
- Check the figures printed on the shim. These figures indicate the thickness of the shim, as illustrated.
- Select a replacement shim that will provide a clearance within the specified range. For the purpose of this adjustment, a total of 25 sizes of tappet shim are available ranging from 2.30 to 3.50 mm in steps of 0.05 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 (Pages 2-9 and -10) for details.



**NOTE:**

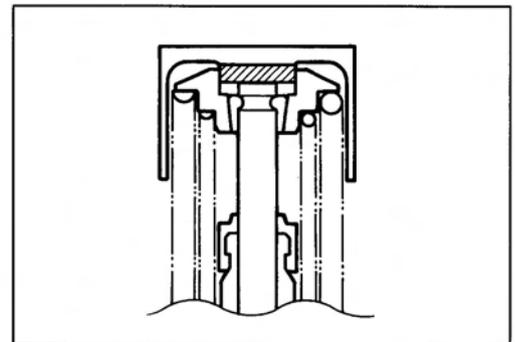
- \* Be sure to apply engine oil to tappet shim top and bottom faces.
- \* When seating the tappet shim, be sure to face figure printed surface to the tappet.



**▲ CAUTION**

**Reinstall the camshafts as the specified manner. (Refer to pages 3-70 through -75.)**

- 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 tappet clearance adjustment, reinstall the following items.

	Page
* Cylinder head cover .....	3-76
* Spark plug and plug cap .....	2-5 and -6
* Valve timing inspection plug .....	3-77
* Generator cover plug .....	3-77

TAPPET SHIM SELECTION TABLE (INTAKE)  
TAPPET SHIM NO. (12892-41C00-XXX)

TAPPET SHIM SET (12800-41810)

MEASURED TAPPET CLEARANCE (mm)	SUFFIX NO.	OPTION				TAPPET SHIM SET (12800-41810)																											
		230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320	325	330	335	340	345	350							
	PRESENT SHIM SIZE (mm)	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50							
0.00-0.04				2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50					
0.05-0.09			2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50						
0.10-0.20		SPECIFIED CLEARANCE NO ADJUSTMENT REQUIRED																															
0.21-0.25		2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50								
0.26-0.30		2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50									
0.31-0.35		2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50										
0.36-0.40		2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50											
0.41-0.45		2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50												
0.46-0.50		2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50													
0.51-0.55		2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50														
0.56-0.60		2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50															
0.61-0.65		2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																
0.66-0.70		2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																	
0.71-0.75		2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																		
0.76-0.80		2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																			
0.81-0.85		3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																				
0.86-0.90		3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																					
0.91-0.95		3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																						
0.96-1.00		3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																							
1.01-1.05		3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																								
1.06-1.10		3.25	3.30	3.35	3.40	3.45	3.50	3.50																									
1.11-1.15		3.30	3.35	3.40	3.45	3.50	3.50																										
1.16-1.20		3.35	3.40	3.45	3.50	3.50																											
1.21-1.25		3.40	3.45	3.50	3.50																												
1.26-1.30		3.45	3.50	3.50																													
1.31-1.35		3.50	3.50																														
1.36-1.40		3.50																															

HOW TO USE THIS CHART:

- I . Measure tappet clearance. "ENGINE IS COLD"
- II . Measure present shim size.
- III . Match clearance in vertical column with present shim size in horizontal column.

EXAMPLE

Tappet clearance is 0.23 mm  
Present shim size 2.70 mm  
Shim size to be used 2.80 mm

TAPPET SHIM SELECTION TABLE [EXHAUST]  
TAPPET SHIM NO. (12892-41C00-XXX)

TAPPET SHIM SET (12800-41810)

(EXHAUST SIDE)

MEASURED TAPPET CLEARANCE (mm)	SUFFIX NO. PRESENT SHIM SIZE (mm)	OPTION				TAPPET SHIM SET (12800-41810)																											
		230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320	325	330	335	340	345	350							
0.00-0.04	2.30	2.35	2.40	2.45	2.50	2.550	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50								
0.05-0.09				2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40							
0.10-0.14			2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45							
0.15-0.19		2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45								
0.20-0.30	SPECIFIED CLEARANCE NO. ADJUSTMENT REQUIRED																																
0.31-0.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50									
0.36-0.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50										
0.41-0.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50											
0.46-0.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50												
0.51-0.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50													
0.56-0.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50														
0.61-0.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50															
0.66-0.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																
0.71-0.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																	
0.76-0.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																		
0.81-0.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																			
0.86-0.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																				
0.91-0.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																					
0.96-1.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																						
1.01-1.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																							
1.06-1.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																								
1.11-1.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																									
1.16-1.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																										
1.21-1.25	3.30	3.35	3.40	3.45	3.50	3.50																											
1.26-1.30	3.35	3.40	3.45	3.50	3.50																												
1.31-1.35	3.40	3.45	3.50	3.50																													
1.36-1.40	3.45	3.50	3.50																														
1.41-1.45	3.50	3.50																															
1.46-1.50	3.50																																

HOW TO USE THIS CHART:

- I . Measure tappet clearance. "ENGINE IS COLD"
- II . Measure present shim size.
- III . Match clearance in vertical column with present shim size in horizontal column.

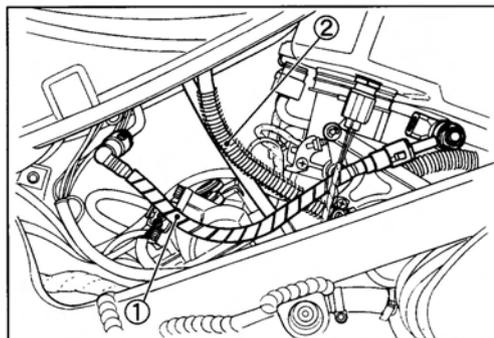
EXAMPLE

Tappet clearance is 0.38 mm  
Present shim size 2.90 mm  
Shim size to be used 3.05 mm

## FUEL HOSE

**Inspect Every 6 000 km (4 000 miles, 6 months).  
Replace Every 4 years.**

Inspect the fuel feed hose ① and the fuel return hose ② for damage and fuel leakage. If any defects are found, the fuel hoses must be replaced.



## ENGINE OIL AND OIL FILTER

### (ENGINE OIL)

**Replace Initially at 1 000 km (600 miles, 1 month) and  
Every 6 000 km (4 000 miles, 6 months) thereafter.**

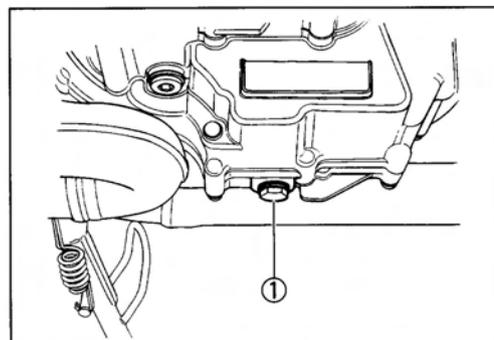
### (OIL FILTER)

**Replace Initially at 1 000 km (600 miles, 1 month) and  
Every 18 000 km (11 000 miles, 18 months) thereafter.**

Oil should be changed while the engine is warm. Oil filter replacement at the above intervals, should be done together with the engine oil change.

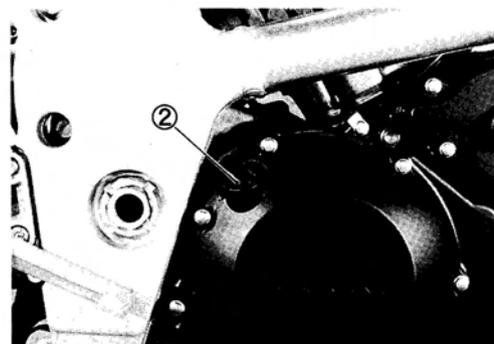
### ENGINE OIL REPLACEMENT

- Keep the motorcycle upright.
- Place an oil pan below the engine, and drain oil by removing the drain plug ① and filler cap ②.

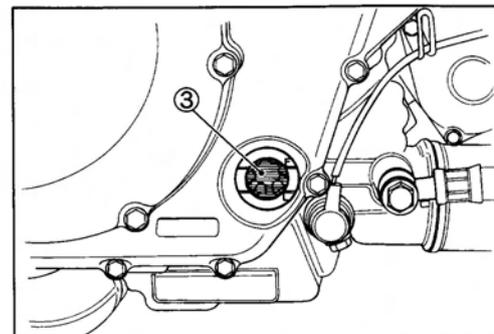


- Tighten the drain plug ① to the specified torque, and pour fresh oil through the oil filler. The engine will hold about 3.1 L (3.3/2.7 US/Imp qt) of oil. Use an API classification of SF or SG oil with SAE 10W/40 viscosity.

 **Oil drain plug: 23 N·m (2.3 kg-m, 16.5 lb-ft)**

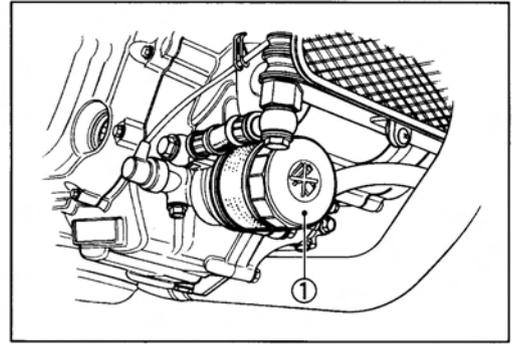


- Start up the engine and allow it to run for several minutes at idling speed.
- Turn off the engine and wait about one minute, then check the oil level through the inspection window ③. If the level is below mark "L", add oil to "F" level. If the level is above mark "F", drain oil to "F" level.



**OIL FILTER REPLACEMENT**

- Drain engine oil in the same manner of engine oil replacement procedure.
- Remove the oil filter ① by using the oil filter wrench. (Special tool)
- Apply engine oil lightly to the gasket of the new filter before installation.
- Install the new filter turning it by hand until you feel that the filter gasket contacts the mounting surface. Then tighten it 2 turns using the oil filter wrench. (Special tool)



**TOOL** 09915-40610: Oil filter wrench

**NOTE:**

To properly tighten the filter, use the special tool. Never tighten the filter by hand.

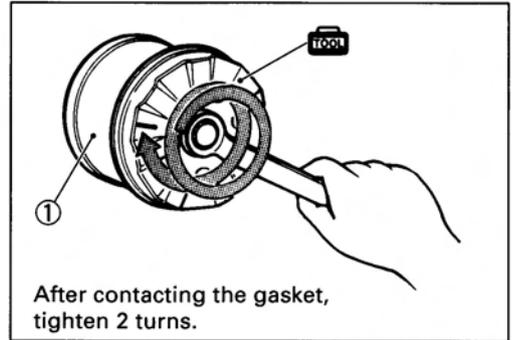
- Pour fresh engine oil and check the oil level in the same manner of engine oil replacement procedure.

**NECESSARY AMOUNT OF ENGINE OIL**

Oil change: 3.1 L (3.3/2.7 US/Imp qt)

Filter change: 3.3 L (3.5/2.9 US/Imp qt)

Overhaul engine: 3.6 L (3.8/3.2 US/Imp qt)



After contacting the gasket, tighten 2 turns.

**CAUTION**

Use **SUZUKI MOTORCYCLE GENUINE OIL FILTER only**, since the other make's genuine filters and after-market parts may differ in thread specifications (thread diameter and pitch), filtering performance and durability, which could cause engine damage or oil leaks. Suzuki automobile genuine oil filter is also not usable for the motorcycles.

**ENGINE IDLE SPEED**

Inspect Initially at 1 000 km (600 miles, 1 month) and Every 6 000 km (4 000 miles, 6 months) thereafter.

**NOTE:**

Make this adjustment when the engine is hot.

- Start up the engine and set its idle speed to the specified range by turning the throttle stop screw ①.

**Engine idle speed:**

1 200 ± 50 r/min ..... For E-18 model

1 200 ± 100 r/min ..... For the other models

