FOREWORD

This manual contains an introductory description on the SUZUKI AN650/A 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.

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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 wheel



SYMBOL

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

SYMBOL	DEFINITION	SYMBOL	DEFINITION
	Torque control required. Data beside it indicates specified torque.	LLC	Use engine coolant.
OIL	Apply oil. Use engine oil unless other- wise specified.	FORK	Use fork oil. 99000-99044-10G
M/O	Apply molybdenum oil solution. (Mixture of engine oil and SUZUKI MOLY PASTE in a ratio of 1 : 1)	BF	Apply or use brake fluid.
	Apply SUZUKI SUPER GREASE "A". 99000-25030		Measure in voltage range.
	Apply SUZUKI MOLY PASTE. 99000-25140		Measure in current range.
1207B	Apply SUZUKI BOND "1207B" 99104-31140 (USA)	Ω 	Measure in resistance range.
1215	Apply SUZUKI BOND "1215". 99000-31110 (Except USA)		Measure in diode test range.
1216B	Apply SUZUKI BOND "1216B". 99000-31230	(●)))	Measure in continuity test range.
1303	Apply THREAD LOCK SUPER "1303". 99000-32030	TOOL	Use special tool.
1342	Apply THREAD LOCK "1342". 99000-32050	DATA	Indication of service data.
1360	Apply THREAD LOCK SUPER "1360". 99000-32130		

ABBREVIATIONS USED IN THIS MANUAL

Α

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

В

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

С

CKP Sensor	: Crankshaft Position Sensor (CKPS)
СКТ	: Circuit
CLP Switch	: Clutch Lever Position Switch
	(Clutch Switch)
CMP Sensor	: Camshaft Position Sensor
	(CMPS)
CO	: Carbon Monoxide
CPU	: Central Processing Unit
CVT Control	
Unit	: Continuously Variable
	Transmission Control Unit
	(TCU)

D

DC	: Direct Current
DMC	: Dealer Mode Coupler
DOHC	: Double Over Head Camshaft
DRL	: Daytime Running Light
DTC	: Diagnostic Trouble Code
	Malfunction Code

Ε

	ECM	: Engine Control Module Engine Control Unit (ECU) (El Control Unit)
	ECT Sensor	: Engine Coolant Temperature Sensor (ECTS), Water Temp. Sensor (WTS)
	EVAP	: Evaporative Emission
	EVAP Canister	r: Evaporative Emission
		Canister (Canister)
F	=	
•	FI	: Fuel Injection, Fuel Injector
	FP	: Fuel Pump
	FPR	: Fuel Pressure Regulator
	FP Relay	: Fuel Pump Relay
	FTPC Valve	: Fuel Tank Pressure Control Valve
		(TPC valve)
(G	
	GEN	: Generator
	GND	: Ground
	GP Switch	: Gear Position Switch
ŀ	4	
-	- HC	: Hvdrocarbons
	HO2S	: Heated Oxygen Sensor
I		
	IAC Valve	: Idle Air Control Valve
	IAF Sensor	: Intake Air Temperature Sensor
		(IATS)
	IG	: Ignition
I		
•		· Liquid Crystal Display
	LED	: Light Emitting Diode
		(Malfunction Indicator Lamp)
	LH	: Left Hand

Μ

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

Ν

NOx	: Nitrogen Oxides

0

OHC	: Over Head Camshaft
OLS	: Oil Level Switch
OPS	: Oil Pressure Switch

Ρ

PCV	: Positive Crankcase
	Ventilation (Crankcase Breather)

R

RH	: Right Hand
ROM	: Read Only Memory

S

SAE : Societ	of Automotive Engineers
--------------	-------------------------

Т

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

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			
FULL TERM	ABBREVIATION	FORMER SUZUKI TERM	
A			
Air Cleaner	ACL	Air Cleaner, Air Cleaner Box	
В			
Barometric Pressure	BARO	Barometric Pressure, Atmospheric Pressure (APS, AP Sensor)	
Battery Positive Voltage	B+	Battery Voltage, +B	
C			
Camshaft Position Sensor	CMP Sensor	Camshaft Position Sensor (CMPS)	
Crankshaft Position Sensor	CKP Sensor	Crankshaft Position Sensor (CKPS), Crank Angle	
D			
Data Link Connector	DLC	Dealer Mode 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) Fl Control Unit, Engine Control Unit (ECU)	
Engine Coolant Level	ECL	Coolant Level	
Engine Coolant Temperature ECT		Coolant Temperature, Engine Coolant Tem- perature Water Temperature	
Engine Speed	RPM	Engine Speed (RPM)	
Evaporative Emission	EVAP	Evaporative Emission	
Evaporative Emission Canister	EVAP Canister	(Canister)	
Exhaust Control System	EXCS	EXC System (EXCS)	
Exhaust Control Valve	EXCV	EXC Valve (EXCV)	
Exhaust Control Valve Actuator	EXCVA	EXCV Actuator (EXCVA)	
Purge Valve	Purge Valve	Purge Valve (SP Valve)	
F			
Fan Control	FC		
Fuel Level Sensor		Fuel Level Sensor, Fuel Level Gauge	
Fuel Pump	FP	Fuel Pump (FP)	

SAE TERM				
FULL TERM	ABBREVIATION			
G				
Generator	GEN	Generator		
Ground	GND	Ground (GND, GRD)		
I				
Idle Air Control Valve	IAC Valve	IAC Valve (IACV)		
Idle Speed Control	ISC			
Ignition Control	IC	Electronic Spark Advance (ESA)		
Ignition Control Module	ICM			
Intake Air Temperature	IAT	Intake Air Temperature (IAT), Air Tempera- ture		
М				
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		
0				
On-Board Diagnostic	OBD	Self-Diagnosis Function Diagnostic		
Open Loop	OL			
Ρ				
Programmable Read Only Memory	PROM			
Pulsed Secondary Air Injection	PAIR	Pulse Air Control (PAIR)		
R				
Random Access Memory	RAM			
Read Only Memory	ROM	ROM		
S				
Secondary Air Injection	AIR			
Secondary Throttle Control Sys- tem	STCS	STC System (STCS)		
Secondary Throttle Valve	STV	ST Valve (STV)		
Secondary Throttle Valve Actuator	STVA	STV Actuator (STVA)		
т				
Tank Pressure Control Valve	TPC Valve	TPC Valve (TPCV)		
Throttle Body	ТВ	Throttle Body (TB)		
Throttle Body Fuel Injection	ТВІ	Throttle Body Fuel Injection (TBI)		
Throttle Position Sensor	TP Sensor	TP Sensor (TPS)		
Transmission Control Module	ТСМ	CVT Control Unit (TCU)		

SAE TERM		
FULL TERM	ABBREVIATION	FORMER SOZORI TERM
V		
Voltage Regulator	VR	Voltage Regulator
Volume Air Flow	VAF	Air Flow

WIRE COLOR

В	: Black	G	: Green		P : Pink
BI	: Blue	Gr	: Grav		R : Red
Br	: Brown	Lbl	: Light blue		V : Violet
Dg	: Dark green	Lg	: Light green		W : White
Dgr	: Dark gray	Õ	: Orange		Y : Yellow
U	0,		U		
B/BI	: Black with Blue tracer			B/Br	: Black with Brown tracer
B/G	: Black with Green trace	er		B/O	: Black with Orange tracer
B/R	: Black with Red tracer			B/W	: Black with White tracer
B/Y	: Black with Yellow trace	er		BI/B	: Blue with Black tracer
BI/G	: Blue with Green tracer			BI/R	: Blue with Red tracer
BI/W	: Blue with White tracer			BI/Y	: Blue with Yellow tracer
Br/B	: Brown with Black trace	er		Br/W	: Brown with White tracer
G/B	: Green with Black trace	er		G/BI	: Green with Blue tracer
G/R	: Green with Red tracer			G/W	: Green with White tracer
G/Y	: Green with Yellow trac	er		Gr/B	: Gray with Black tracer
Gr/R	: Gray with Red tracer			Gr/W	: Gray with White tracer
Gr/Y	: Gray with Yellow trace	r		Lg/B	: Light green with Black tra
Lg/Y	: Light green with Yellow	v trace	er	O/B	: Orange with Black tracer
O/BI	: Orange with Blue trace	er		O/G	: Orange with Green trace
O/R	: Orange with Red trace	r		O/W	: Orange with White tracer
O/Y	: Orange with Yellow tra	cer		P/B	: Pink with Black tracer
P/W	: Pink with White tracer			R/B	: Red with Black tracer
R/BI	: Red with Blue tracer			R/G	: Red with Green tracer
R/W	: Red with White tracer			R/Y	: Red with Yellow tracer
W/B	: White with Black trace	r		W/BI	: White with Blue tracer
W/G	: White with Green trace	ər		W/R	: White with Red tracer
W/Y	: White with Yellow trac	er		Y/B	: Yellow with Black tracer
Y/BI	: Yellow with Blue trace	r		Y/G	: Yellow with Green tracer
Y/R	: Yellow with Red tracer			Y/W	: Yellow with White tracer

	Y : Yellow
B/Br	: Black with Brown tracer
B/O	: Black with Orange tracer
B/W	: Black with White tracer
BI/B	: Blue with Black tracer
BI/R	: Blue with Red tracer
BI/Y	: Blue with Yellow tracer
Br/W	: Brown with White tracer
G/BI	: Green with Blue tracer
G/W	: Green with White tracer
Gr/B	: Gray with Black tracer
Gr/W	: Gray with White tracer
Lg/B	: Light green with Black tracer
O/B	: Orange with Black tracer
O/G	: Orange with Green tracer
O/W	: Orange with White tracer
P/B	: Pink with Black tracer
R/B	: Red with Black tracer
R/G	: Red with Green tracer
R/Y	: Red with Yellow tracer
W/BI	: White with Blue tracer
W/R	: White with Red tracer
Y/B	: Yellow with Black tracer
Y/G	: Yellow with Green tracer

GENERAL INFORMATION

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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.

A 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 WARN-INGS 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

A 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 wellventilated 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 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 AN650K3 ('03-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 frame down tube. The engine serial number 2 is located on the left 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 87 pump octane ($\frac{R+M}{2}$) or 91 octane or higher rated by the research method.

Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.

FUEL (FOR OTHER COUNTRIES)

Gasoline used should be graded 91 octane (Research Method) or higher. Unleaded gasoline is recommended.

ENGINE OIL AND TRANSMISSION OIL (FOR USA)

SUZUKI recommends the use of SUZUKI PERFORMANCE 4 MOTOR OIL or an oil which is rated SF or SG under the API (American Pertoleum Institute) service classification. The recommended viscosity is SAE 10W-40. If an SAE 10W-40 oil is not available, select and alternative according to the following chart.

ENGINE OIL AND TRANSMISSION OIL (FOR OTHER COUNTRIES)

Use a premium quality 4-stroke motor oil to ensure longer service life of your motorcycle. Use only oils which are rated SF or SG under the API service classification. 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.



FINAL GEAR OIL

Use hypoid gear oil that meets the API service classification GL-5 and is rated SAE #90. Use a hypoid gear oil with a rating of SAE #80 if the motorcycle is operated where the ambient temperature is below 0 $^{\circ}$ C (32 $^{\circ}$ F).

BRAKE FLUID

Specification and classification: DOT 4

A 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 #10 or an equivalent fork oil.

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 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): 1 300 ml (1.4/1.1 US/Imp qt)

For engine coolant mixture information, refer to cooling system section, page 8-3.

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 4 000 r/min
- Up to 1 600 km (1 000 miles): Below 6 000 r/min
- Over 1 600 km (1 000 miles): Below 8 500 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 8 500 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 left to right (as viewed by the rider on the seat).



INFORMATION LABELS

1	Warning safety label
2	Engine starting label
3	Screen warning label
4	Tire pressure label
(5)	Fuel information label
6	Front box loading capacity label
\bigcirc	Trunk box loading capacity label
8	ID label
9	Noise label
10	Manual notice label
1	Safety plate
12	Information label
(13)	Oil information label
(14)	EVAP canister hose routing label





(4)

VIEW A





Stick the label behind the fuel lid.







SPECIFICATIONS DIMENSIONS AND DRY MASS

Overall length	2 260	mm (89.0 in)
Overall width	810	mm (31.9 in)
Overall height	1 430	mm (56.3 in)
Wheelbase	1 595	mm (62.8 in)
Ground clearance	125	mm (4.9 in)
Seat height	750	mm (29.5 in)
Dry mass	238	kg (394 lbs)

ENGINE

Туре	Four-stroke, Liquid-cooled, DOHC
Number of cylinders	2
Bore	75.5 mm (2.972 in)
Stroke	. 71.3 mm (2.807 in)
Piston displacement	638 cm³ (38.9 cu. in)
Compression ratio	. 11.2 : 1
Fuel system	Fuel injection system
Air cleaner	Non-woven fabric element
Starter system	Electric starter
Lubrication system	Wet sump

DRIVE TRAIN

Clutch	Wet multi-plate automatic, centrifugal type
Gearshift pattern	Automatic & Manual shift
Automatic transmission ratio	Variable change (1.800 – 0.465)
Final reduction ratio	1.580 (32/31 × 31/32 × 34/31 × 49/34)
Drive system	Gear drive

CHASSIS

Front suspension	Telescopic, coil spring, oil damped
Rear suspension	Swingarm type, coil spring, oil damped
Steering angle	41° (right & left)
Caster	26°
Trail	102 mm (4.0 in)
Turning radius	2.7 m (8.9 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	120/70 R15M/C 56H, tubeless
Rear tire size	160/60 R14M/C 65H, tubeless
Front fork stroke	105 mm (4.1 in)
Rear wheel travel	100 mm (3.9 in)

ELECTRICAL

Ignition type	Electronic ignition (ECM, Transistorized)
Ignition timing	10° B. T. D. C at 1 200 r/min
Spark plug	.NGK: CR8E or DENSO: U24ESR-N
Battery	12 V 43.2 kC (12 Ah)/10 HR
Generator	Three-phase A.C. Generator
Main fuse	40 A
CVT fuse	40 A
Fuse	15/15/15/15/10/10/10 A
Headlight	12 V 60/55 W + 55 W (H4 + H7) E-02, 19
	12 V 60/55W × 2 (H4)E-03, 24, 28, 33
Position light	12 V 5 W × 2 E-02, 19
Turn signal light	12 V 21 W
License light	12 V 5 W
Brake light/Taillight	12 V 21/5 W × 2
Speedometer light	12 V 1.4 W × 2
Power mode indicator light	12 V 1.4 W
Drive indicator light	12 V 1.4 W
High beam indicator light	12 V 1.4 W
Turn signal indicator light	12 V 1.4 W
Brake-lock indicator light	12 V 1.4 W
Fuel injector indicator light	12 V 1.4 W
Engine coolant temperature indicator light	12 V 1.4 W
Oil pressure indicator light	12 V 1.4 W
Gear position indicator light	12 V 1.4 W × 5

CAPACITIES

Fuel tank, including reserve1	5.0 L (4.0/3.3 US/Imp gal)
Engine oil, oil change2	600 ml (2.7/2.3 US/Imp qt)
with filter change2	900 ml (3.1/2.6 US/Imp qt)
overhaul3	400 ml (3.6/3.0 US/Imp qt)
Transmission oil, oil change	360 ml (12.2/12.7 US/Imp oz)
overhaul	400 ml (13.5/14.1 US/Imp oz)
Final gear oil, oil change	300 ml (10.1/10.6 US/Imp oz)
overhaul	430 ml (14.5/15.1 US/Imp oz)
Engine coolant, including reserve1	300 ml (1.4/1.1 US/Imp qt)
Front fork oil (each leg)	482 ml (16.3/17.0 US/Imp oz)

These specifications are subject to change without notice.

COUNTRY AND AREA CODES

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

CODE	COUNTRY or AREA
E-02	U. K.
E-03	U. S. A. (Except for California)
E-19	EU
E-24	Australia
E-28	Canada
E-33	California (U. S. A.)

PERIODIC MAINTENANCE

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2

PERIODIC MAINTENANCE SCHEDULE

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

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.

NOTE:

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

PERIODIC MAINTENANCE CHART

Interval	km	1 000	6 000	12 000	18 000	24 000					
	miles	600	4 000	7 500	11 000	14 500					
Item	months	1	6	12	18	24					
Air cleaner		<u> </u>		I	R						
Exhaust pipe bolts and muffler bolts	S	Т			Т						
Tappet clearance		—	_	_	_						
Spark plugs		_	I	R	I	R					
Firel have		_	I	I	I						
Fuei nose			Repla	ce every 4	years.						
Engine oil		R	R	R	R	R					
Engine oil filter		R	—	_	R	_					
Transmission oil		R	I	R	I	R					
Final gear oil		R	—	R	—	R					
CVT filter		—	—	I	—	I					
Idle speed				I	I	I					
Throttle cable play		I			I	-					
Throttle valve synchronization		I E-33 only	—	—	Ι						
Evaporative emission control system	n	_	_	I	I — I						
E-33 (California) model only		Replace vapor hose every 4 years.									
PAIR (air supply) system											
Engine coolant		Replace every 2 years.									
Radiator hose		—	I	I	I	I					
Brakes		I	I	I	I						
Proko hoso		_	I	I	I	I					
Blake Hose			Repla	ce every 4	years.						
Braka fluid		_	I	I	I	-					
			Repla	ce every 2	years.						
Tires		—	I	I	I						
Steering		I	—	I	—	I					
Front forks		—	—	I	—						
Rear suspension					—						
Chassis bolts and nuts		Т	Т	Т	Т	Т					

NOTE:

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

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).

- Open the front box 1.
- \bullet Remove the air cleaner box lid 2.
- \bullet Remove the air cleaner element lid 3.

• Remove the air cleaner element ④.

• Inspect the air cleaner element and O-ring for damage. If any defects are found, the air cleaner element and O-ring must be replaced.









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

CAUTION

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

- Install the O-ring (5) properly.
- 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 plug.









SPARK PLUG

Inspect every 6 000 km (4 000 miles, 6 months) and replace every 12 000 km (7 500 miles, 12 months).

SPARK PLUG REMOVAL

- Remove the lower leg shield. (239-10)
- Remove the bolt.
- Move the radiator ① forward.

NOTE:

Be careful not to damage the radiator fins.

A WARNING

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

• Remove the ignition coil/plug caps 2.







HEAT RANGE

• Check to see the heat range of the plug.

• Remove the spark plugs with the spark plug wrench.

	Standard	Cold type	Hot type
NGK	CR8E	CR9E	CR7E
DENSO	U24ESR-N	U27ESR-N	U22ESR-N

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

ELECTRODES CONDITION

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



• 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 INSTALLATION

CAUTION

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

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

I Spark plug: 11 N⋅m (1.1 kgf-m, 8.0 lb-ft)

TAPPET CLEARANCE

Inspect every 24 000 km (14 500 miles, 24 months).

- Remove the front box. (19-18)
- Remove the foot board. (19-18)
- Remove the radiator. (238-6)
- Remove the spark plugs. (12-6)
- Remove the cylinder head cover 1.



0.7 – 0.8 mm (0.028 – 0.031 in)



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 removed for servicing.

DATA Tappet clearance (when cold):

Standard: IN. : 0.10 – 0.20 mm (0.004 – 0.008 in) EX.: 0.20 – 0.30 mm (0.008 – 0.012 in)

NOTE:

- * The clearance specification is for COLD state.
- * To turn the crankshaft for clearance checking, be sure to use a wrench, and rotate in the normal running direction. All spark plugs should be removed.
- Remove the valve timing inspection cap 2.

• Turn the crankshaft to bring the "Top" line on the starter clutch to the index mark and also to align the notches (A) on the both ends of each camshaft with "1" mark (B) on the exhaust sprocket to the positions as shown.







- In this condition, read the tappet clearance at the valves (In and Ex of No.2).
- If the clearance is out of specification, adjust the clearance as shown below.

09900-20803: Thickness gauge

- Turn the crankshaft 360 degrees (one rotation) to bring the "TOP" line on the starter clutch to the index mark of valve timing inspection hole and also to bring notches (A) to the position as shown.
- Read the clearance at the remaining valves (In and Ex of No.1) and adjust the clearance if necessary as shown below.







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. (23-12)
- 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, a total of 25 sizes of tappet shim are available ranging from 1.20 to 2.20 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 2-11 and 2-12) 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. (2373-72)

- 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.





		Page
*	Cylinder head cover	.3-74
*	Spark plug and plug cap	.2-6
*	Valve timing inspection plug	.2-8

TAPPET SHIM SELECTION TABLE [INTAKE] TAPPET SHIM NO. (12892-05C00-XXX) TAPPET SHIM SET (12800-05820)

																			e				
220	2.20	2.10	2.15																m siz				
215	2.15	2.05	2.10		2.20												<u>"</u>		nt sh				
210	2.10	2.00	2.05		2.20												COLE		prese				
205	2.05	1.95	2.00		2.15	2.20											NE IS		n with				
200	2.00	1.90	1.95		2.10	2.15	2.20										ENGIN		olumr			Ę	
195	1.95	1.85	1.90		2.05	2.10	2.15	2.20		_						Ë	nce. "I	size.	tical c			20 u	1 70 n
190	1.90	1.80	1.85	ED	2.00	2.05	2.10	2.15	2.20							CHAI	cleara	shim	in ver	mn.	L	<u>.</u> Е	2
185	1.85	1.75	1.80	EQUIR	1.95	2.00	2.05	2.10	2.15	2.20		_				THIS	ppet c	esent	rance	ıl colu			m size
180	1.80	1.70	1.75	AENT P	1.90	1.95	2.00	2.05	2.10	2.15	2.20					USE	ure ta	ure pi	n clea	izonta	Ĺ	л Сос t	et ciea ent shi
175	1.75	1.65	1.70	JUSTA	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20		_		W TO	Meas	Meas	Match	in hor		Topoor	Prese
170	1.70	1.60	1.65	/NO AL	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20			£	<u> </u>	=	Ë				
165	1.65	1.55	1.60	RANCE	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20									
160	1.60	1.50	1.55	O CLEA	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20								
155	1.55	1.45	1.50	ECIFIE	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20							
150	1.50	1.40	1.45	SPI	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20						
145	1.45	1.35	1.40		1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20					
140	1.40	1.30	1.35		1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20		_		
135	1.35	1.25	1.30		1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20		_	
130	1.30	1.20	1.25		1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20		_
125	1.25	\square	1.20		1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20	
120	1.20	\square	\square		1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20
UFFIX NO.	RESENT IM SIZE (mm)																						
S	mersource Fr Tappet (cLEARANCE SH (mm)	0.00-0.04	0.05-0.09	0.10-0.20	0.21-0.25	0.26-0.30	0.31-0.35	0.36-0.40	0.41-0.45	0.46-0.50	0.51-0.55	0.56-0.60	0.61-0.65	0.66-0.70	0.71-0.75	0.76-0.80	0.81-0.85	0.86-0.90	0.91-0.95	0.96-1.00	1.01-1.05	1.06-1.10	1.11-1.15

(INTAKE SIDE)

Shim size to be used 1.80 mm

TAPPET SHIM SELECTION TABLE [EXHAUST] TAPPET SHIM NO. (12892-05C00-XXX) TAPPET SHIM SET (12800-05820)

220	2.20	2.05	2.10	2.15			I													nim size					
215	2.15	2.00	2.05	2.10		2.20												'n	-	ent sr					
210	2.10	1.95	2.00	2.05		2.20		1										COL		ı pres					
205	2.05	1.90	1.95	2.00		2.15	2.20												3	n with					
200	2.00	1.85	1.90	1.95		2.10	2.15	2.20										ËNGI	-	colum			шШ	шШ	шШ
195	1.95	1.80	1.85	1.90		2.05	2.10	2.15	2.20								,RT:	ance.	I SIZE.	rtical			0.33	1.70	1.80
190	1.90	1.75	1.80	1.85	ED	2.00	2.05	2.10	2.15	2.20							CHA	clear	it shirr			ЦП	e is	e	used
185	1.85	1.70	1.75	1.80	EQUIR	1.95	2.00	2.05	2.10	2.15	2.20						THIS	appet	resen	urance	al cult	XAMF	arance	iim siz	to be
180	1.80	1.65	1.70	1.75	JENT P	1.90	1.95	2.00	2.05	2.10	2.15	2.20					ISU C	sure t	sure p	th cles		Ш	et cle	ent sh	i size
175	1.75	1.60	1.65	1.70	JUSTI	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20				OW TO	Mea	Mea	. Matc			Tapp	Pres	Shirr
170	1.70	1.55	1.60	1.65	E/NO AE	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20			Ĭ	_::	= 3	Ξ					
165	1.65	1.50	1.55	1.60	RANCE	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20										
160	1.60	1.45	1.50	1.55	O CLEA	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20		-							
155	1.55	1.40	1.45	1.50	ECIFIEI	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20								
150	1.50	1.35	1.40	1.45	SPI	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20		_					
145	1.45	1.30	1.35	1.40		1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20						
140	1.40	1.25	1.30	1.35		1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20					
135	1.35	1.20	1.25	1.30		1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20				
130	1.30	$\left/ \right.$	1.20	1.25		1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20			
125	1.25			1.20		1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20		
120	1.20			/		1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.20	
SUFFIX NO.	PRESENT SHIM SIZE (mm)																								
AL AQUINED	Intersorted TAPPET CLEARANCE (mm)	0.05-0.09	0.10-0.14	0.15-0.19	0.20-0.30	0.31-0.35	0.36-0.40	0.41-0.45	0.46-0.50	0.51-0.55	0.56-0.60	0.61-0.65	0.66-0.70	0.71-0.75	0.76-0.80	0.81-0.85	0.86-0.90	0.91-0.95	0.96-1.00	1.01-1.05	1.06-1.10	1.11-1.15	1.16-1.20	1.21-1.25	

(EXHAUST SIDE)

FUEL HOSE

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

Inspect the fuel feed hose A 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 with the center stand.
- Remove the maintenance lid. (2-9-13)
- 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 2.6 L (2.7/2.3 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 kgf-m, 16.5 lb-ft)







- Start the engine and allow it to run for three minutes at idling speed.
- Turn off the engine and wait about three minutes, then check the oil level through the inspection window (A). 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.

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.

DATA Engine oil capacity

 Oil change:
 2.6 L (2.7/2.3 US/Imp qt)

 Filter change:
 2.9 L (3.1/2.6 US/Imp qt)

 Overhaul engine:
 3.4 L (3.6/3.0 US/Imp qt)

CAUTION

ONLY USE A GENUINE SUZUKI MOTORCYCLE OIL FILTER. Other manufacturer's oil filters may differ in thread specifications (thread diameter and pitch), filtering performance and durability which may lead to engine damage or oil leaks. Also, do not use a genuine Suzuki automobile oil filter on this motorcycle.






TRANSMISSION OIL

Replace initially at 1 000 km (600 miles, 1 month) and every 12 000 km (7 500 miles, 12 months) thereafter. Inspect every 6 000 km (4 000 miles, 6 months) thereafter.

TRANSMISSION OIL REPLACEMENT

- Keep the motorcycle upright with the center stand.
- Place an oil pan below the mission case.
- Remove the oil drain plug (1) and filler plug (2).
- Tighten the drain plug ① to the specified torque, and pour fresh oil through the oil filler.
- Remove the oil level plug ③ and inspect the oil level. If the level is below the level hole, add oil until oil flows from the level hole.

P Oil viscosity and classification

: SAE 10W-40 with API SF or SG

- Tighten the oil level plug ③ and filler plug ② to the specified torque.
- Transmission oil drain plug: 21 N·m (2.1 kgf-m, 15.0 lb-ft) Transmission oil filler plug: 23 N·m (2.3 kgf-m, 16.5 lb-ft) Transmission oil level plug: 21 N·m (2.1 kgf-m, 15.0 lb-ft)

NECESSARY AMOUNT OF TRANSMISSION OIL Oil change: 360 ml (12.2/12.7 US/Imp oz) Overhaul: 400 ml (13.5/14.1 US/Imp oz)

FINAL GEAR OIL

Replace initially at 1 000 km (600 miles, 1 month) and every 12 000 km (7 500 miles, 12 months) thereafter.

FINAL GEAR OIL REPLACEMENT

- Keep the motorcycle upright with the center stand.
- Remove the final gear case cover ①.
- Place an oil pan below the final gear case.









- Remove the oil drain plug 2 and oil level plug 3.
- Tighten the oil drain plug ② to the specified torque, and pour fresh oil through the oil level hole until the oil over flows from the oil level hole.

Drain plug: 33 N·m (3.3 kgf-m, 24.0 lb-ft)

• Tighten the oil level plug (3) to the specified torque.

Oil level plug: 33 N⋅m (3.3 kgf-m, 24.0 lb-ft)

Oil viscosity and classification : Hypoid gear oil SAE #90 API grade GL-5

NECESSARY AMOUNT OF FINAL GEAR OIL Oil change: 300 ml (10.1/10.6 US/Imp oz) Overhaul: 430 ml (14.5/15.1 US/Imp oz)





CVT FILTER

Inspect every 12 000 km (7 500 miles, 12 months).

- Remove the leg side cover. (29-12)
- Remove the CVT filter lid 1.

☆: hooked part

• Remove the CVT filter cover 2.









• Inspect the CVT filter for damage and dirt. If any defects are found, the CVT filter must be replaced.



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.

- Remove the maintenance lid. (29-13)
- Start the engine and set its idle speed to the specified range by turning the throttle stop screw (A).

Engine idle speed: 1 200 ± 100 r/min

THROTTLE CABLE PLAY

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

Adjust the throttle cable play A with the following three steps.

MINOR ADJUSTMENT

First step:

• Loosen the locknut ③ of the throttle returning cable ① and turn in the adjuster ④ fully into the threads.

Second step:

- Loosen the locknut (5) of the throttle pulling cable (2).
- Turn the adjuster (6) in or out until the throttle cable play (A) should be 2.0 4.0 mm (0.08 0.16 in) at the throttle grip.
- Tighten the locknut (5) while holding the adjuster (6).

Third step:

- While holding the throttle grip at the fully closed position, slowly turn out the adjuster ④ of the throttle returning cable ① to feel resistance.
- Tighten the locknut 3 while holding the adjuster 4.

Throttle cable play (A): 2.0 – 4.0 mm (0.08 – 0.16 in)

A WARNING

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

NOTE:

Major adjustment can be made by the throttle body side adjuster.







MAJOR ADJUSTMENT

- Remove the front box. (19-18)
- Loosen the locknut 1 of the throttle returning cable 2.
- Turn the returning cable adjuster ③ to obtain proper cable play.
- Loosen the locknut ④ of the throttle pulling cable ⑤.
- Turn the pulling cable adjuster (6) in or out until the throttle cable play (A) should be 2.0 4.0 mm (0.08 0.16 in) at the throttle grip.
- Tighten the locknut ④ securely while holding the adjuster ⑥.

Throttle cable play (A): 2.0 – 4.0 mm (0.08 – 0.16 in)

- While holding the throttle grip at the fully closed position, slowly turn the returning cable adjuster ③ to obtain a slack ⑧ of 1.0 mm (0.04 in).
- Tighten the locknut ① securely.

A WARNING

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

THROTTLE VALVE SYNCHRONIZATION

Inspect initially at 1 000 km (600 miles, 1 month) (E-33 only) and every 12 000 km (7 500 miles, 12 months).

Inspect the throttle valve synchronization periodically. (237-7-24)

PAIR (AIR SUPPLY) SYSTEM

Inspect every 12 000 km (7 500 miles, 12 months).

Inspect the PAIR (air supply) system periodically. (12-6)

EVAPORATIVE EMISSION CONTROL SYSTEM

Inspect every 12 000 km (7 500 miles, 12 months). Replace vapor hose every 4 years.

Inspect the EVAP system periodically. (137-12-9)





COOLING SYSTEM

Inspect every 6 000 km (4 000 miles, 6 months). Replace engine coolant every 2 years.

ENGINE COOLANT LEVEL CHECK

- Keep the motorcycle upright with the center stand.
- - A Full line B Lower line
- If the level is below the lower line, add engine coolant to the full line from the engine coolant reserve tank filler. To remove the filler cap, remove the maintenance lid. (1) - 9-13)





ENGINE COOLANT CHANGE

- Remove the lower leg shield. (2-9-10)
- Remove the radiator cap ①.
- Drain engine coolant by removing the drain bolt (A).

A WARNING

- * Do not open the radiator cap when the engine is hot, as you may be injured by escaping hot liquid or vapor.
- * Engine coolant may be harmful if swallowed or if it comes in contact with skin or eyes. If engine coolant gets into the eyes or in contact with the skin, flush thoroughly with plenty of water. If swallowed, induce vomiting and call physician immediately!





- Remove the front box. (79-18)
- Remove the foot board. (239-18)
- Drain engine coolant by disconnecting the radiator hose 2.
- Flush the radiator with fresh water if necessary.
- Tighten the water drain bolt (A) to the specified torque.

Water drain bolt (A): 6 N⋅m (0.6 kgf-m, 4.3 lb-ft)

- Pour the specified engine coolant up to the radiator inlet.
- Bleed the air from the engine coolant circuit as following procedure.

NOTE:

For engine coolant information, refer to page 8-3.

AIR BLEEDING THE ENGINE COOLANT CIRCUIT

- Add engine coolant up to the radiator inlet.
- Support the motorcycle upright with the center stand.
- Slowly swing the motorcycle, right and left, to bleed the air trapped.
- Add engine coolant up to the radiator inlet.
- Start the engine and bleed air from the radiator inlet completely.
- Add engine coolant up to the radiator inlet.
- Repeat the above procedure until bleed no air from the radiator inlet.
- Close the radiator cap ① securely.
- After warming up and cooling down the engine several times, add the engine coolant up to the full level of the reserve tank.

CAUTION

Repeat the above procedure several times and make sure that the radiator is filled with engine coolant up to the reserve tank full level.

Engine coolant capacity Reverse tank side: 250 ml (0.3/0.2 US/Imp qt) Engine side: 1 050 ml (1.1/0.9 US/Imp qt)







RADIATOR HOSES

Check to see the radiator hoses for crack, damage or engine coolant leakage.

If any defects are found, replace the radiator hoses with new ones.





BRAKE

(BRAKE)

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

(BRAKE HOSE AND BRAKE FLUID)

Inspect every 6 000 km (4 000 miles, 6 months). Replace hoses every 4 years. Replace fluid every 2 years.

BRAKE FLUID LEVEL CHECK

- Keep the motorcycle upright and place the handlebars straight.
- Check the brake fluid level by observing the lower limit lines on the front and rear brake fluid reservoirs.
- When the level is below the lower limit line, replenish with brake fluid that meets the following specification.

B Specification and Classification: DOT 4





A WARNING

The brake system of this motorcycle is filled with a glycol-based brake fluid. Do not use or mix different types of fluid such as silicone-based or petroleum-based. Do not use any brake fluid taken from old, used or unsealed containers. Never re-use brake fluid left over from the last servicing or stored for a long period.

WARNING

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

BRAKE PADS

The extent of brake pad wear can be checked by observing the grooved limit \triangle on the pad. When the wear exceeds the grooved limit, replace the pads with new ones. ($\Box = 9-64, 9-74$)



CAUTION

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



AIR BLEEDING THE BRAKE FLUID CIRCUIT

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

- Fill up the master cylinder reservoir to the "UPPER" line. Place the reservoir cap to prevent entry of dirt.
- Attach a pipe to the air bleeder valve, and insert the free end of the pipe into a receptacle.

Air bleeder valve: 7.5 N·m (0.75 kgf-m, 5.5 lb-ft)

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

NOTE:

Replenish the brake fluid in the reservoir as necessary while bleeding the brake system. Make sure that there is always some fluid visible in the reservoir.

• Close the bleeder valve, and disconnect the pipe. Fill the reservoir with brake fluid to the "UPPER" line.

CAUTION

Handle brake fluid with care: the fluid reacts chemically with paint, plastics, rubber materials and so on.







· The procedure to bleed the rear brake is indentical to that of the front.



TIRE

Inspect every 6 000 km (4 000 miles, 6 months).

TIRE TREAD CONDITION

Operating the motorcycle with excessively worn tires will decrease riding stability and consequently invite a dangerous situation. It is highly recommended to replace a tire when the remaining depth of tire tread reaches the following specification.



09900-20805: Tire depth gauge

DATA Tire tread depth Service Limit (FRONT): 1.6 mm (0.06 in)

(REAR): 2.0 mm (0.08 in)



TIRE PRESSURE

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

COLD INFLATION	SOLO RINDING			DUAL RIDING		
TIRE PRESSURE	kPa	kgf/cm ²	psi	kPa	kgf/cm ²	psi
FRONT	225	2.25	33	225	2.25	33
REAR	250	2.50	36	280	2.80	41



CAUTION

The standard tire fitted on this motorcycle is 120/70 R15M/C 56H for front and 160/60 R14M/C 65H for rear. The use of tires other than those specified may cause instability. It is highly recommended to use a SUZUKI Genuine Tire.

TIRE TYPE BRIDGESTONE (Front: TH01F Rear: TH01R)

STEERING

Inspect initially at 1 000 km (600 miles, 1 month) and every 12 000 km (7 500 miles, 12 months) thereafter.

Steering should be adjusted properly for smooth turning of handlebars and safe running. Overtight steering prevents smooth turning of the handlebars and too loose steering will cause poor stability. Check that there is no play in the steering stem while grasping the lower fork tubes by supporting the machine so that the front wheel is off the ground, with the wheel straight ahead, and pull forward. If play is found, perform steering bearing adjustment as described in page 9-46 of this manual.



FRONT FORK

Inspect every 12 000 km (7 500 miles, 12 months).

Inspect the front forks for oil leakage, scoring or scratches on the outer surface of the inner tubes. Replace any defective parts, if necessary. (1379-32)



REAR SUSPENSION

Inspect every 12 000 km (7 500 miles, 12 months).

Inspect the rear shock absorbers for oil leakage and mounting rubbers for wear and damage. Replace any defective parts, if necessary. ($\square P-57$)

EXHAUST PIPE BOLT AND MUFFLER MOUNTING BOLT

Tighten initially at 1 000 km (600 miles, 1 month) and every 12 000 km (7 500 miles, 12 months) thereafter.

- Tighten the exhaust pipe bolts, muffler mounting bolts and nut to the specified torque.
- Muffler mounting bolt /nut A: 23 N·m (2.3 kgf-m, 16.5 lb-ft) Exhaust pipe bolt B: 23 N·m (2.3 kgf-m, 16.5 lb-ft)







CHASSIS BOLT AND NUT

Tighten initially at 1 000 km (600 miles, 1 month) and every 6 000 km (4 000 miles, 6 months) thereafter.

Check that all chassis bolts and nuts are tightened to their specified torque. (Refer to page 2-28 for the locations of the following nuts and bolts on the motorcycle.)

ITEM		N∙m	kgf-m	lb-ft
① Steering stem head nut		65	6.5	47.0
2 Front fork upper clamp bolt		23	2.3	16.5
③ Front fork lower clamp bolt		23	2.3	16.5
④ Front axle		65	6.5	47.0
5 Front axle pinch bolt		23	2.3	16.5
6 Handlebar clamp bolt		23	2.3	16.5
⑦ Front brake master cylinder mounting bolt		10	1.0	7.0
8 Front brake caliper mounting bolt		26	2.6	19.0
9 Brake hose union bolt		23	2.3	16.5
1 Air bleeder valve		7.5	0.75	5.5
1 Brake disc bolt (Front & Rear)		23	2.3	16.5
⑦ Rear brake caliper mounting bolt		26	2.6	19.0
(3) Rear brake master cylinder mounting bolt		10	1.0	7.0
Image: Front footrest bracket mounting bolt	(M8)	26	2.6	19.0
	(M6)	11	1.1	8.0
(5) Swingarm pivot nut		100	10.0	72.5
(6) Rear shock absorber mounting nut (Upper & Lower)		29	2.9	21.0
⑦ Rear axle nut		100	10.0	72.5







COMPRESSION PRESSURE CHECK

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

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

COMPRESSION PRESSURE SPECIFICATION

Standard	Limit	Difference
1 500 – 1 900 kPa	1 200 kPa	200 kPa
(15 – 19 kgf/cm²)	(12 kgf/cm²)	(2 kgf/cm²)
(213 – 270 psi)	171 psi	28 psi)

Low compression pressure can indicate any of the following conditions:

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

Overhaul the engine in the following cases:

- * Compression pressure in one of the cylinders is less than 1 200 kPa (12 kgf/cm², 171 psi).
- * Difference in compression pressure between two cylinders is more than 200 kPa (2 kgf/cm², 28 psi).
- * All compression pressure are below 1 500 kPa (15 kgf/cm², 213 psi) even when they measure more than 1 200 kPa (12 kgf/cm², 171 psi).

COMPRESSION TEST PROCEDURE

NOTE:

- * Before testing the engine for compression pressure, make sure that the cylinder head bolts are tightened to the specified torque values and valves are properly adjusted.
- * Have the engine warmed up by idling before testing.
- * Be sure that the battery used is in fully-charged condition.

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

- Support the motorcycle with the center stand.
- Move the radiator. (2-2-6)
- Remove all the spark plugs. (2-6)
- Fit the compression gauge in one of the plug holes, while taking care of the tight connection.
- Keep the throttle grip in full-open position.
- While cranking the engine a few seconds with the starter, and record the maximum gauge reading as the compression of that cylinder.
- Repeat this procedure with an other cylinder.

09915-64512: Compression gauge 09915-63311: Compression gauge attachment 09915-74521: Gauge hose





OIL PRESSURE CHECK

Check periodically the oil pressure in the engine to judge roughly the condition of the moving parts.

OIL PRESSURE SPECIFICATION

Above 350 kPa (3.5 kgf/cm², 50 psi) Below 550 kPa (5.5 kgf/cm², 78 psi) at 3 000 r/min., Oil temp. at 60°C (140°F)

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

LOW OIL PRESSURE

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

HIGH OIL PRESSURE

- * Used of high viscosity engine oil
- * Clogged oil passage way
- * Combination of the above items

OIL PRESSURE TEST PROCEDURE

Start the engine and check if the oil pressure indicator light is turned on. If it keeps on lighting, check the oil pressure indicator light circuit. If it is in good condition, check the oil pressure in the following manner.

- Remove the main oil gallery plug ①.
- Install the oil pressure gauge with attachment in the position shown in the figure.
- Warm up the engine as follows: Summer 10 min. at 2 000 r/min. Winter 20 min. at 2 000 r/min.
- After warming up, increase the engine speed to 3 000 r/min. (with the engine tachometer), and read the oil pressure gauge.

09915-74521: Gauge hose09915-74532: Oil pressure gauge attachment09915-74511: Oil pressure gauge

Oil gallery plug [M8]: 10 N⋅m (1.0 kgf-m, 7.3 lb-ft)





AUTOMATIC CLUTCH INSPECTION

This motorcycle is equipped with an automatic clutch and variable ratio belt drive transmission. The engagement of the clutch is governed by engine RPMs and centrifugal mechanism located in the clutch.

To insure proper performance and longer lifetime of the clutch assembly it is essential that the clutch engages smoothly and gradually. The following inspections must be performed:

1. INITIAL ENGAGEMENT INSPECTION

- Warm up the engine to normal operating temperature.
- Start the engine.
- Seated on the motorcycle with the motorcycle on level ground, increase the engine RPMs slowly and note the RPM at which the motorcycle begins to move forward.

09900-26006: Tachometer

Engagement r/min: 1 500 – 2 100 r/min

2. CLUTCH "LOCK-UP" INSPECTION

Perform this inspection to determine if the clutch is engaging fully and not slipping.

- Start the engine.
- Apply the front and rear brakes as firm as possible.
- Briefly open the throttle fully and note the maximum engine RPMs sustained during the test cycle.

CAUTION

Do not apply full power for more than 3 seconds or damage to the clutch or engine may occur.

Lock-up r/min: 3 200 – 3 800 r/min







BRAKE-LOCK INSPECTION

Inspect that the rear wheel is locked up when pulling the brake-lock lever 4 to 6 notches and moving the motorcycle forward to make sure that the brake-lock acts enough.

Adjust the brake-lock, if necessary. (199-85)





ENGINE

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ENGINE COMPONENTS REMOVABLE WITH THE ENGINE IN PLACE

Engine components which can be removed while the engine is installed on the chassis are listed below. For the installing and removing procedures, refer to respective paragraphs describing each component.

ITEM	REMOVAL	INSPECTION	INSTALLATION		
CENTER OF ENGINE					
Muffler	[3-7	—	[3-11		
Cylinder head cover	[3-12	∑₹3-22	[3-74		
Camshaft	[3-12	∑₹3-23	[3-72		
Starter motor	∑₹3-12	[]10-13	∑₹3-75		
Cam chain tensioner adjuster	∑₹3-13	∑₹3-25	[3-71		
Cylinder head	∑₹3-13	∑₹3-26	[3-71		
Cylinder	∑₹3-13	∑₹3-34	⊆₹3-70		
Oil level switch	∑₹3-12	[]10-29	∑₹3-75		
Piston	∑₹3-14	∑₹3-36	⊆₹3-70		
Oil filter/Oil cooler	∑₹3-17	—	∑₹3-63		
Cam position sensor	∑₹3-22	⊆₹6-27	∑₹3-23		
Engine coolant temperature switch	∑₹8-12	∑₹8-13	E7 8-13		
RIGHT OF ENGINE					
Starter clutch	∑₹3-16	∑₹3-43	∑₹3-64		
Starter torque limiter	∑₹3-16	∑₹3-44	[3-64		
Thermostat	∑₹3-34	£3-14	∑₹3-35		
LEFT SIDE OF ENGINE					
Oil sump filter	[3-15	∑₹3-44	⊆₹3-67		
Generator	∑₹3-15	لا⊊710-9	⊆₹3-67		
CKP sensor	[3-15	[6-28			
Clutch	[3-16	∑₹3-40	∑₹3-66		
Oil pressure switch	∑₹3-56	∷₹10-36	∑₹3-56		

ENGINE REMOVAL AND REMOUNTING ENGINE REMOVAL

- Drain the engine oil and transmission oil. (2-10, 2-13)
- Drain the engine coolant. (2-2-20)

NOTE:

If the engine is stained, clean with steam cleaner before removal.

• Cover the parts, (A) and (B), to prevent water from entering the CVT unit.

EXTERNAL PARTS

- Remove the following parts: (9-6)
- Lower leg shield. Front leg shield cover. Leg shield. Front box. Maintenance lid. Lower frame cover. Center frame cover. Pilion rider handle. Trunk box cover. Frame cover. Foot board. Trunk box. Rear fender. Leg side cover.
- Remove the final gear case cover. (1-10-48)
- Disconnect the battery terminals. (CF10-3)

CAUTION

Remove the battery terminals from the \bigcirc side first.



• Disconnect the joint hose ① and breather hose ②.

• Remove the air cleaner box 3.



- Remove the IAP sensor lead wire coupler ①, IAT sensor ②, and PAIR solenoid valve lead wire coupler ③.
- Disconnect the vacuum hose ④.

- Loosen the throttle body clamp screws.
- Remove the PAIR solenoid valve (5).
- Remove the air chamber 6.



- Disconnect the throttle cables $\widehat{\mathcal{O}}$.
- Disconnect the injector couplers (8).
- Disconnect the TP sensor coupler 9 and IAC valve coupler 10.
- Loosen the throttle body clamp screws.
- Disconnect the fuel delivery hose.
- Remove the throttle body ass'y.









 $(\mathbf{8})$



• Disconnect the PAIR hose (1) and crankcase breather hose (2).

- Disconnect the engine coolant breather hose 3 and radiator hose 4.
- Disconnect the radiator inlet hose.

• Disconnect the cooling fan switch coupler (5).

• Remove the radiator.



• Disconnect the engine ground lead wire.

• Disconnect the center stand switch lead wire coupler ①, CVT pulley position sensor lead wire coupler ②, CVT motor lead wire coupler ③, CVT scondary pulley revolution sensor lead wire coupler ④ and HO2 sensor lead wire coupler ⑤.

- Disconnect the starter motor lead wire.
- Disconnect the ECT sensor coupler 6.

Disconnect the side-stand switch lead wire coupler 7, oil pressure switch lead wire coupler 8, oil level switch lead wire 9, CKP sensor coupler 10 and trunk light seat switch lead coupler 11.

- Disconnect the CMP sensor coupler 1.
- Remove the ignition coil/spark plug cap.



- Disconnect the generator coupler ①.
- Disconnect the HO2 sensor coupler 2.

• Remove the muffler.



- Remove the brake-lock cable clamp.
- Remove the rear brake hose clamp.
- Remove the rear brake caliper bolts and remove the rear brake caliper ③.
- Remove the both sides of the rear shock absorber lower bolts ④.



- Remove the clamps.
- Move the fuel feed hose not to interfere with the work.

- Support the engine using an engine jack.
- Remove the engine mounting bolts and nuts.

• Remove the foot board bracket.

• Remove the engine from the frame.





• Remove the CVT assembly. (

• Remove the swingarm. (

• Remove the final gear case assembly. (13^{-4-3})

CAUTION

Be careful not to allow the engine main body to fall down.

• Remove the center stand.









ENGINE REMOUNTING

- Reinstall the engine assembly following the procedure below: Assembling of center stand (1711-26) Installation of final gear case (174-7) Installation of rear wheel (179-9-56) Installation of CVT unit (179-5-4) Installation of rear brake caliper (179-81)
- Pass through the engine mounting bolts from the right side of the frame.
- Tighten the engine mounting nuts 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 new one.



MUFFLER



After mounting the engine, connect the wiring, cables and hoses securely. (11-14, 11-18)

- Supply a specified amount of engine oil and transmission oil.
 (<u>2-13</u>)
- Supply a specified amount of cooling water. (2-29)

Adjust or inspect the following items:

- Play of throttle cable (2-18, 2-19)
- Idling rpm (2-18)
- Check the leakage of oil, cooling water, etc.

ENGINE DISASSEMBLY

STARTER MOTOR

- \bullet Remove the starter motor (1).
- Disconnect the water bypass hose ②.

OIL PRESSURE SWITCH

• Remove the oil pressure switch.



• Remove the oil level switch ③.

CYLINDER HEAD COVER

- Remove the cylinder head cover 4.

NOTE:

Do not remove the dowel pin at the back side of the cylinder head cover since it is embedded.











CAMSHAFT

 Remove the valve timing inspection cap and bring the piston to the top dead center by turning the crankshaft. (2-3-2-8)

NOTE:

Take note of the tappet clearance. (2-3-2-9)

• Push the cam chain tension adjuster rod and insert the special tool.

09918-53810: Chain tensioner lock tool

• Remove the two camshaft journal holders ① by removing the bolts.

CAUTION

Be sure to loosen the camshaft journal holder bolts evenly by shifting the wrench diagonally.

• Remove the camshafts 2.

CYLINDER HEAD AND CYLINER

- Remove the cylinder head side bolt 1.
- Remove the cam chain tension adjuster bolts 2.

- Loosen the cylinder head bolts ③.
- Remove the cylinder head bolts diagonally.
- Remove the cylinder head assembly.











- Remove the cylinder head gasket ①, dowel pins ② and cam chain guide ③.
- Remove the cylinder ④.

• Remove the cylinder base gasket 5 and dowel pins 6.

PISTON

- Place a clean rag over the cylinder base so as not to drop the piston pin circlip into the crankcase.
- Remove the piston pin circlip.
- Remove the piston by driving out the piston pin. *NOTE:*
- * Scribe the piston number on the head of the piston.

OIL HOSE

• Remove the oil hose 0 and oil return hose 8.

GENERATOR COVER

• Remove the generator cover (9).











• Remove the oil sump filter 1.

GENERATOR

• Remove the generator rotor nut with the special tool.

1001 09930-40113: Rotor holder

• Remove the generator rotor 2 with the special tools.

09930-40113: Rotor holder 09930-30450: Rotor remover

- Remove the generator stator ③, CKP sensor ④ and lead wire grommet ⑤.
- Remove the key.





CLUTCH

• Remove the clutch cover ①.

- Remove the clutch housing nut and washer.
- Remove the clutch assembly.

09930-40113: Rotor holder

• Remove the clutch shaft ③.

STARTER CLUTCH

 \bullet Remove the driveshaft oil seal retainer (4).

• Remove the starter clutch cover (5).

- Remove the starter torque limiter shaft 6, starter torque limiter 7 and washer.
- Remove the starter idle gear shaft (8) and starter idle gear (9).


• Remove the starter clutch bolt with the special tool.

09920-34830: Starter clutch rotor holder

CAM CHAINRemove the cam chain tensioner ① and cam chain ②.

• Remove the cam chain sprocket ③.

WATER PUMP

• Remove the water pump assembly.

OIL FILTER

• Remove the oil filter ④ with the special tool.

09915-40610: Oil filter wrench



OIL COOLER

• Untighten the union bolt and remove the oil cooler.

• Untighten the crankcase tightening bolts diagonally.

SEPARATION OF CRANKCASE





• Separate the crankcase into 2 parts, right and left, with the crankcase separating tool.

09920-13120: Crankcase/crankshft separator

NOTE:

* Pay attention when separating the crankcase so that it is kept horizontal with the mating surface.



DRIVESHAFT

• Remove the driveshaft assembly 1 and idle shaft 2.

- Remove the idle gear ③.
- Remove the circlip 4 and counter drive gear 5.

• Remove the counter drive gear shaft 6.

- **BALANCER SHAFT**
- Remove the upper balancer shaft $\widehat{\mathcal{O}}$.

• Remove the circlip (8), lower balancer shaft (9), oil pump gear (1) and oil pump drive chain.



8

OIL PUMP

• Remove the pin (1), washer (2) and oil pump assembly (3).

• Remove the oil sump filter ④.

OIL PRESSURE REGULATOR

• Remove the oil pressure regulator (5).

PISTON COOLING NOZZLE

• Remove the piston cooling nozzle.

• Remove the O-ring.



• Remove the oil separator.

CRANKSHAFT • Remove the crankshaft assembly ①.

PRIMARY DRIVEN GEAR

• Remove the primary drive gear 2.

RETURN OIL PUMP

• Remove the circlip ③ and return oil pump gear ④.

• Remove the pin (5) and return oil pump assembly (6).



ENGINE COMPONENT INSPECTION AND SERVICE

CAUTION

Identify the position of each removed part. Organize the parts in their respective groups (i.e., intake, exhaust, No.1 or No.2) so that they can be installed in their original locations.

CYLINDER HEAD COVER

• Remove the PAIR reed valve cover ①, cam position sensor ② and breather cover ③.









INSPECTION

- Inspect the reed valve for the carbon deposit.
- If the carbon deposit is found in the reed valve, replace the reed valve with a new one.

REASSEMBLY

• Apply THREAD LOCK "1342" to the thread and install the PAIR reed valve cover.

€1342 99000-32050: THREAD LOCK "1342"

- Check for stain and clogging in the breather and clean as required.
- Assemble a new gasket and breather cover and tighten the part (A) together with the clamp.

Tightning torque: 10 N⋅m (1.0 kgf-m, 7.0 lb-ft)

CAM POSITION SENSOR

- Apply SUZUKI SUPER GREASE "A" to the O-ring and install it.
- Install the CMP sensor.

Cam position sensor bolt: 10 N·m (1.0 kgf-m, 7.0 lb-ft)

✓ 99000-25030: SUZUKI SUPER GREASE "A" (USA) 99000-25010: SUZUKI SUPER GREASE "A" (Others)





CAMSHAFT

• Exhaust camshaft and intake camshaft are distinguished by the punched mark.

Exhaust camshaft: Punched mark "B" Intake camshaft: Punched mark "A"



CAM FACE

- Check the sliding surface for extraordinary scratches or wear.
- Measure the cam height \oplus with a micrometer.
- If the service limit has been exceeded, replace the camshaft.

DATA Cam height Θ :

Service Limit: (IN.): 35.1 mm (1.378 in) (EX.): 33.7 mm (1.339 in)

CAMSHAFT RUNOUT

- Measure the runout using the dial gauge.
- Replace the camshaft if the runout exceeds the limit.

09900-20606: Dial gauge (1/100 mm)
 09900-20701: Magnetic stand
 09900-21304: V-block set (100 mm)

Camshaft runout: Service Limit (IN & EX): 0.10 mm (0.004 in)





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:

Camshaft journal oil clearance: Standard: (IN & EX): 0.032 – 0.066 mm (0.0013 – 0.0026 in) Service Limit: (IN & EX): 0.150 mm (0.0059 in)

09900-22301: Plastigauge 09900-22302: Plastigauge

• Tighten the camshaft journal holder bolts evenly and diagonally to the specified torque.

Camshaft journal holder bolt: 10 N·m (1.0 kgf-m, 7.4 lb-ft) NOTE:

Do not rotate the camshaft with the plastigauge in place.

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

- 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.













CAM CHAIN TENSION ADJUSTER

INSPECTION

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

CAM CHAIN TENSIONER INSPECTION

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





CAM CHAIN GUIDE

INSPECTION

- Check the contacting surfaces of the cam chain guides.
- If they are worn or damaged, replace them with the new ones.



CYLINDER HEAD

VALVE AND VALVE SPRING DIASSEMBLY

• Remove the tappets and shims by fingers or magnetic hand.

CAUTION

Identify the position of each removed part.

- Using special tools, compress the valve spring and remove the two cotter halves ① from valve stem.
- 69916-14510: Valve lifter 09916-14521: Valve lifter attachment (24 mm) 09916-84511: Tweezers

CAUTION

Be careful not to damage the tappet sliding surface with the special tool.

- Remove the valve spring retainer (2) and valve spring (3).
- Pull out the valve ④ from the other side.







• Remove the oil seal (5).

CAUTION

Do not reuse the removed oil seal.

• Remove the spring seat 6.

CYLINDER HEAD DISTORTION

- Decarbonize the combustion chambers.
- 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.
- Cylinder head distortion: Service Limit: 0.10 mm (0.004 in)





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.

09900-20606: Dial gauge (1/100 mm) 09900-20701: Magnetic stand

Valve stem deflection (IN & EX): Service Limit: 0.35 mm (0.014 in)

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.

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09900-20205: Micrometer (0 – 25 mm)
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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)

NOTE:

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

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.

09900-20606: Dial gauge (1/100 mm) 09900-20701: Magnetic stand 09900-21304: V-block set (100 mm)

Valve stem runout: Service Limit: 0.05 mm (0.002 in)

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.
- Valve head radial runout: Service Limit: 0.03 mm (0.001 in)









VALVE FACE WEAR

 Visually inspect each valve face for wear. Replace any valve with an abnormally worn face. The thickness of the valve face decreases as the face wears. Measure the valve face ①. If it is out of specification, replace the valve with a new one.

Valve head thickness T: Service Limit: 0.5 mm (0.02 in)

VALVE SPRING

The force of the coil spring keeps the valve seat tight. Weakened spring result in reduced engine power output, and often account for the chattering noise coming from the valve mechanism.

- 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.

09900-20102: Vernier calipers

- Valve spring free length (IN & EX): Service limit: 40.6 mm (1.60 in)
- Valve spring tension (IN & EX): Standard: 136 – 156 N, 13.6 – 15.6 kgf/33.4 mm (30.0 – 33.4 lbs/1.31 in)





VALVE GUIDE SERVICING

• Using the valve guide remover, drive the valve guide out toward the intake or exhaust camshaft side.

09916-53310: Valve guide remover/installer

NOTE:

- * Discard the removed valve guide subassemblies.
- * Only oversized valve guides are available as replacement parts. (Part No. 11115-33D71)
- Refinish the valve guide holes in cylinder head with the reamer and handle.

09916-34561: Valve guide reamer 09916-34542: Reamer handle

CAUTION

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

- Apply engine oil to the valve guide hole.
- Drive the valve guide into the hole using the special tool.

09916-43210: Valve guide installer/remover

NOTE:

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

09916-43210: Valve guide remover/installer 09916-44930: Valve guide installer attachment

CAUTION

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

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

09916-33310: Valve guide reamer 09916-34542: Valve guide reamer handle

NOTE:

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.

09916-10911: Valve rapper set

 If the seat width

 measured exceeds the standard value, or seat width is not uniform reface the seat using the seat cutter.

DATA Valve seat width $\widehat{\mathbb{W}}$:

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

If the valve seat is out of specification, recut the seat.





60

Exhaust

VALVE SEAT SERVICING

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

	INTAKE	EXHAUST
15°		N-121
30°	N-126	
45°	N-122	N-122
60°	N-111	N-111

© 09916-21111: Valve seat cutter set 09916-20630: Valve seat cutter (N-126) 09916-20640: Solid pilot (N-100-4.5)

NOTE:

The valve seat cutters (N-121), (N-122) and (N-111) are included in the valve seat cutter set (09916-21111).



CAUTION

The valve seat contact area must be inspected after each cut.

• When installing the solid pilot ①, rotate it slightly.

3

INITIAL SEAT CUT

• Install the 45° cutter (1), attachment (2) and T-handle (3).

- Using the 45° cutter, descale and clean up the seat. Rotate the cutter one or two turns.
- Measure the valve seat width W after every cut.

• If the valve seat is pitted or burned, use the 45° cutter to condition the seat some more.

NOTE:

Cut only the minimum amount necessary from the seat to prevent the possibility of the valve stem becoming too close to the camshaft.





TOP NARROWING CUT

• If the contact area \mathbb{W} is too high on the valve, or if it is too wide, use the 15° (for the exhaust side) and the 30° (for the intake side) to lower and narrow the contact area.





BOTTOM NARROWING CUT

 If the contact area (W) is too wide or too low, use the 60° cutter to narrow and raise the contact area.



FINAL SEAT CUT

 If the contact area (W) is too low or too narrow, use the 45° cutter to raise and widen the contact area.



Too low or too narrow

NOTE:

After cutting the 15°, 30° and 60° angles, it is possible that the valve seat (45°) is too narrow. If so, recut the valve seat to the correct width.

• After the desired seat position and width is achieved, use the 45° cutter very lightly to clean up any burrs caused by the previous cutting operations.

CAUTION

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.

NOTE:

After servicing the value seats, be sure to check the tappet clearance after the cylinder head has been reinstalled. ($\square 2-9$)

- 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.

A WARNING

Always use extreme caution when handling gasoline.





VALVE AND VALVE SPRING REASSEMBLY

- Apply molybdenum oil solution to each oil seal, and press-fit them into position with the valve guide installer.
- 09916-43210: Valve guide remover/installer
- MOLYBDENUM OIL SOLUTION

CAUTION

Do not reuse the removed oil seals.

• Insert the valves, with their stems coated with molybdenum oil solution all around and along the full stem length without any break.

CAUTION

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

MOLYBDENUM OIL SOLUTION

- Install the valve springs with the small-pitch portion facing cylinder head.
- (A): Small-pitch portion
- B: Large-pitch portion

• Put on the valve spring retainer, and using the valve lifter, press down the springs, fit the cotter halves to the stem end, and release the lifter to allow the cotter ① to wedge in between retainer and stem. Be sure that the rounded lip A of the cotter fits snugly into the groove B in the stem end.

09916-14510: Valve lifter 09916-14521: Valve lifter attachment 09916-84511: Tweezers

CAUTION

Be sure to restore each spring and valve to their original positions.

• Install the tappet shims and the tappets to their original position.









NOTE:

- * Apply engine oil to the shim and tappet before fitting them.
- * When seating the tappet shim, be sure the figure printed surface faces the tappet. ($\Box = 2-9$)



• Coat the O-ring with grease and install the intake pipe together with the O-ring.

✓ 99000-25030: SUZUKI SUPER GREASE "A" (USA) 99000-25010: SUZUKI SUPER GREASE "A" (Others)





CYLINDER

- Disconnect the water pipe and remove the O-ring.



• Remove the thermostat 2.





CYLINDER DISTORTION

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

09900-20803: Thickness gauge

Cylinder distortion: Service Limit: 0.10 mm (0.004 in)



CYLINDER BORE

- Check the cylinder bore for stepped wear or scars.
- Measure the 6 positions as shown in the right figure with a cylinder gauge.



Cylinder bore:

Standard: 75.500 – 75.515 mm (2.9724 – 2.9730 in) Service Limit: 75.585 mm (2.9758 in)

- Fit the O-ring ① to the water pipe and install the water pipe to the cylinder.
- Coat the water pipe bolt with screw lock agent and tighten the water pipe with the bolt.

€1342 99000-32050: THREAD LOCK "1342"

CAUTION

Use new O-rings.

- Install the thermostat to the cylinder.
- Tighten the thermostat case bolt.

NOTE:

Position the thermostat jiggle valve as shown in the photo.









PISTON AND PISTON RING

PISTON DIAMETER

- Using a micrometer, measure the piston outside diameter at 15 mm (0.6 in) from the piston skirt end.
- If the measurement is less than the limit, replace the piston.

PATA Piston diameter:

Standard: 75.450 – 75.465 mm (2.9704 – 2.9710 in) Service Limit: 75.380 mm (2.9677 in) at 15 mm (0.6 in) from the skirt end





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

PISTON TO CYLINDER CLEARANCE

- Subtract the piston diameter from the cylinder bore diameter.
- If the piston to cylinder clearance exceeds the service limit, replace the cylinder and the piston.
- **PATA** Piston to cylinder clearance:

Standard: 0.045 – 0.055 mm (0.00177 – 0.00216 in) Service Limit: 0.120 mm (0.0047 in)

PISTON PINS AND PIN BORE

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

09900-20602: Dial gauge (1/1000 mm) 09900-22401: Small bore gauge (10 – 18 mm)

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Piston pin bore I.D.:
Service Limit: 16.030 mm (0.6311 in)
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- 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.

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09900-20205: Micrometer (0 – 25 mm)
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Piston pin O.D.: Service Limit: 15.980 mm (0.6291 in)





PISTON RING TO GROOVE CLEARANCE

- Measure the side clearances of the 1st and 2nd piston rings using the thickness gauge.
- If any of the clearances exceed the limit, replace both the piston and piston rings.
- 09900-20803: Thickness gauge 09900-20205: Micrometer (0 – 25 mm)



Piston ring to groove clearance: Service Limit (1st): 0.18 mm (0.0071 in) (2nd): 0.15 mm (0.0059 in)

PATA Piston ring groove width:

Standard (1st): 1.01 – 1.03 mm (0.0398 – 0.0406 in) (2nd): 1.01 – 1.03 mm (0.0398 – 0.0406 in) (Oil): 2.01 – 2.03 mm (0.0791 – 0.0799 in)

Piston ring thickness:

Standard (1st): 0.970 – 0.990 mm (0.03819 – 0.03898 in) (2nd): 0.970 – 0.990 mm (0.03819 – 0.03898 in)

PISTON RING FREE END GAP AND PISTON RING END GAP

- Measure the piston ring free end gap using 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.

09900-20102: Vernier calipers

PATA Piston ring free end gap:

Service Limit (1st): 9.3 mm (0.36 in) (2nd): 6.9 mm (0.27 in)



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

(2nd): 0.50 mm (0.020 in)







CLUTCH



DISASSEMBLY

- Remove the circlip ① with the special tools.
- **109920-33530: Clutch spring compressor 09924-84510: Bearing installer set**



• Remove the clutch hub ① and spacer.



- Remove the spring seat and concaved washer.
- Remove the outer plate, driven plate No.1, clutch plate concaved washer, drive plate and driven plate No.2.

• Remove the clutch spring bolts ②, springs ③ and clutch inner plate ④.

• Remove the rollers.

CLUTCH DRIVE PLATES/CLUTCH DRIVEN PLATES NO.2 INSPECTION

NOTE:

Wipe off engine oil from the clutch drive plates with a clean rag.

- Measure the thickness of drive plates with a vernier calipers.
- If each drive plate thickness is less than the limit, replace it with a new one.

Drive plate thickness:

Service Limit: 2.62 mm (0.095 in) Driven plate No.2 thickness: Service Limit: 2.27 mm (0.0894 in)

09900-20102: Vernier calipers









- Measure the claw width of drive plates with a vernier calipers.
- Replace the drive plates found to have worn down to the limit.

Drive plate claw width:

Service Limit: 13.05 mm (0.5138 in)

09900-20102: Vernier calipers



CLUTCH DRIVEN PLATE NO.2 INSPECTION

- Check for discoloration due to burning.
- Measure the distortion of the plate on the level block with a thickness gauge.
- If the service limit has been exceeded, replace with new one.

DATA Distortion of driven plate:

Service Limit: 0.1 mm (0.004 in)

1000 09900-20803: Thickness gauge

CLUTCH SPRING FREE HEIGHT

- Measure the free length of the clutch spring with vernier calipers.
- If the length is below the service limit, replace the spring.
- Clutch spring free length: Service Limit: 13.2 mm (0.5197 in)

09900-20102: Vernier calipers

CLUTCH PLATE CONCAVED WASHER INSPECTION

- Measure the clutch plate concaved washer height (A) when applying the weight 9.8 N (1 kgf, 2.2 lb) as shown.
- If clutch plate concaved washer height is less than the limit, replace it with the new one.
- Clutch plate concaved washer height: Service Limit: 3.1 mm (0.12 in)
- 09900-20102: Vernier calipers

ROLLER

• Check that there is no abnormal wear or damage on the roller, if any defects are found, replace the rollers as a set.









REASSEMBLY

NOTE:

Reassemble the clutch in the reverse order of removal and disassembly. Pay attention to the following points:

- Install the rollers.
- Tighten the clutch spring bolts to the specified torque.

Clutch spring bolt: 5.5 N·m (0.55 kgf-m, 4.0 lb-ft)

• Install the spacer ① and clutch sleeve hub.







- Install the driven plate No.1, driven plate No.2, drive plate, clutch plate concaved washer outer plate, concaved washer and spring seat.
- Install the circlip with the special tools.
- 09920-33530: Clutch spring compressor 09924-84510: Bearing installer set



STARTER CLUTCH



INSPECTION

- Install the starter driven gear onto the starter clutch.
- Turn the starter driven gear by hand.
- Inspect the starter clutch for a smooth movement.
- Inspect that the gear turns one direction only.



• If they are found to be damaged, replace them with new ones.





STARTER TORQUE LIMITER

INSPECTION

- Measure the torque when slipping by means of the special tool and torque wrench.
- If the measurement result is out of standard value, replace the starter torque limiter with a new one.

Slip torque

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standard: 22 - 41 N·m (2.2 - 4.1 kgf-m, 16 - 29.5 lb-ft)
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09930-73170: Starter torque limiter holder 09930-73120: Starter torque limiter socket

OIL PUMP

INSPECTION

- Rotate the oil pump by hand and check that it moves smoothly.
- If it does not move smoothly, replace the oil pump assembly.

CAUTION

- * Do not attempt to disassemble the oil pump assembly.
- * The oil pump is available only as an assembly.







OIL PRESSURE REGULATOR/OIL SUMP FILTER

- Inspect the operation of the oil pressure regulator by pushing on the piston with a proper bar.
- If the piston dose not operate, replace the oil pressure regulator with a new one.
- Check the oil sump filter for clogging and damage.
- If any fault is detected, clean or replace with new one.





CRANK BALANCER

DISASSEMBLY

• Remove the circlip ①, washer ②, spring ③ and scissors gear 4.

REASSEMBLY

- · Carry out the assembly procedure in the reverse order of disassembly while observing the following instructions.
- · Assemble the scissors gear with its punch mark side the outside.
- When assembling, align the balancer driven gear hole $\ensuremath{\mathbb{A}}$ with the scissors gear hole B.
- Install the springs (5).

DRIVESHAFT DISASSEMBLY

· Remove the driveshaft nut.

• Install the washer 6 and circlip 7.

• Remove the washer (8), spring stopper (9), dumper cam spring 1, cam dog 1, final driven gear 2, and driveshaft oil seal 3.









R





INSPECTION

- Check the disassembled components for any damage.
- Damaged cam dog
- · Abnormal wear or damage of gear and spline





ASSEMBLING

NOTE:

Reassemble the components in the reverse order to disassembly taking care particularly about the following items:

• Coat the spline area of the cam dog 2 with grease.

✓ 99000-25030: SUZUKI SUPER GREASE "A" (USA) 99000-25010: SUZUKI SUPER GREASE "A" (Others)

- Install the bushing ①, final drive gear ②, cam dog ③, dumper spring ④, spring stopper ⑤, washer ⑥ and nut ⑦ to the drive-shaft.
- Fix the driveshaft assembly to the vise and tighten the nut.

Driveshaft nut: 105 N·m (10.5 kgf-m, 76.0 lb-ft)





CONROD/CRANKSHAFT

CONROD SMALL END I.D.

- Using a small bore gauge, measure the inside diameter of the conrod small end.
- 09900-20602: Dial gauge (1/1000 mm, 1 mm) 09900-22401: Small bore gauge (10 – 18 mm)

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

• If the inside diameter of the conrod small end exceeds the limit, replace the conrod.

CONROD BIG END SIDE CLEARANCE

- Inspect the conrod side clearance by using a thickness gauge.
- If the clearance exceeds the limit, remove the conrod and inspect the conrod big end width and the crank pin width.
- If the width exceed the limit, replace conrod or crankshaft.

Conrod big end side clearance: Service Limit: 0.30 mm (0.012 in)

09900-20803: Thickness gauge

- Conrod big end width: Standard: 19.95 – 20.00 mm (0.7854 – 0.7874 in)
- 09900-20205: Micrometer (0 25 mm)
- Crank pin width: Standard: 20.10 – 20.15 mm (0.7913 – 0.7933 in)

09900-20205: Micrometer (0 – 25 mm)
 09900-20605: Dial caliper (10 – 34 mm)
 09900-20803: Thickness gauge

CONROD-CRANK PIN BEARING INSPECTION

• Inspect the bearing surfaces for any sign of fusion, pitting, burn, or flaws. If any, replace them with a specified set of bearings.









CONROD-CRANK PIN BEARING SELECTION

• Place the plastigauge axially along the crank pin, avoiding the oil hole, as shown.

09900-22301: Plastigauge

• Tighten the conrod cap bolts to the specified torque, in two stages. (3-50)



CAUTION

- * Apply engine oil to the bearing cap bolt.
- * Never rotate the crankshaft or conrod when a piece of plastigauge is installed.



- Remove the bearing caps and measure the width of the compressed plastigauge using the envelope scale. This measurement should be taken at the widest part of the compressed plastigauge.
- Conrod big end oil clearance: Standard: 0.032 – 0.056 mm (0.0013 – 0.0022 in) Service Limit: 0.080 mm (0.0031 in)
- If the oil clearance exceeds the service limit, select the specified bearings from the bearing selection table.
- Check the corresponding conrod I.D. code number ("1" or "2") (A).





• Check the corresponding crank pin O.D. code number ("1", "2" or "3") ^(B).

DATA Bearing selection table

		Crank pin O.D. B		
	Code	1	2	3
Conrod	1	Green	Black	Brown
I.D. (À	2	Black	Brown	Yellow



DATA Conrod I.D.

Code A	I.D. specification	
1	48.000 – 48.008 mm (1.8898 – 1.8901 in)	
2	48.008 – 48.016 mm (1.8901 – 1.8904 in)	

Crank pin O.D.

Code B	O.D. specification
1	44.992 – 45.000 mm (1.7713 – 1.7717 in)
2	44.984 – 44.992 mm (1.7710 – 1.7713 in)
3	44.976 – 47.984 mm (1.7707 – 1.7710 in)

09900-20202: Micrometer (25 – 50 mm)

DATA Bearing thickness

Color	Thickness
Green	1.480 – 1.484 mm (0.0583 – 0.0584 in)
Black	1.484 – 1.488 mm (0.0584 – 0.0586 in)
Brown	1.488 – 1.492 mm (0.0586 – 0.0587 in)
Yellow	1.492 – 1.496 mm (0.0587 – 0.0589 in)



CAUTION

The bearing must be replaced as a set.

BEARING ASSEMBLY

• When fitting the bearing to the bearing cap and conrod, be sure to fix the stopper part (A) first, and press in the other end.



• Apply molybdenum oil solution to the crank pin and bearing surface.

MOLYBDNUM OIL SOLUTION



- When fitting the conrods on the crankshaft, make sure that I.D. (A) of the conrods face each cylinder intake valve sides.
- Apply engine oil to the bearing cap bolts.
- Tighten the bearing cap bolts as following two steps.
- Conrod bearing cap bolt
 - (Initial) : 21 N·m (2.1 kgf-m, 15 lb-ft)

(Final) : After tightening the bolts to the above torque, tighten them 1/4 of a turn (90°).

• Check the conrod movement for smooth turning.

CRANKCASE-CRANKSHAFT BEARING INSPECTION

 Inspect the crankshaft journal bearings for any damage. If any, replace them with a specified set of bearings.





- Inspect the crankshaft journal for any damage.
- Measure the crankshaft journal O.D. with the special tool.
- Crankshaft journal O.D.

Standard: 47.985 - 48.000 mm (1.8892 - 1.8898 in)

09900-20202: Micrometer (25 – 50 mm)



CRANKCASE-CRANKSHAFT BEARING SELECTION

Select the specified bearings from the crankcase bore I.D. code. The crankcase bore I.D. code A "A", "B" or "C", is stamped on the inside of each crankcase half.

I.D. code $\ensuremath{\widehat{A}}$	Color	Thickness
A	Green	1.988 – 1.991 mm (0.0783 – 0.0784 in)
В	Black	1.991 – 1.994 mm (0.0784 – 0.085 in)
С	Brown	1.994 – 1.997 mm (0.085 – 0.0786 in)



CRANKSHAFT JOURNAL BEARING REPLACEMENT

• Use the special tool to replace the crankshaft journal bearings. The replacement procedure is as follows.

09913-60230: Journal bearing remover/installer

• Set the special tool as shown to remove the crankshaft journal bearings.

NOTE:

Remove the crankshaft journal bearings in only one direction, from inside to outside of each crankcase half.

• Gradually press out the bearing with the special tool by using the hand-press.

CAUTION

The removed bearings must be replaced with new ones.

NOTE:

Using the hand-press is recommended to remove the crankshaft journal bearings. However, the crankshaft journal bearings can be removed by using with the following special tools.

09913-60230: ① Jornal bearing remover/installer
 09924-84510: ② Bearing installer set
 09924-74570: ③ Final drive gear bearing
 remover/installer





• Set the specified crankshaft journal bearings to the special tool.

09913-60241: Jornal bearing installer holder

CAUTION

- * Before setting the bearing, apply enough engine oil to the special tool and bearings.
- * When setting the bearing, align the bearing side with the engraved line (A) and also the bearing edge with the mating surface of the special tool.





- Tighten the special tool bolt to the specified torque.
- Special tool bolt: 23 N·m (2.3 kgf-m, 16.5 lb-ft)



CAUTION

Before installing the bearings, lightly shave off the sharp edge part of the crankcase chamfer by using an oilstone and wash the crankcase bore with enough engine oil.


• Set the bearings installed in the special tool to the crankcase half as shown.

CAUTION

- * Be sure the bearing protruded side A faces the crankcase bore.
- * Align the special tool mating surface with the line mark $\ensuremath{\mathbb{B}}$ on the crankcase.
- Apply enough engine oil to the special tool and the bearings and then set the special tool carefully.
- Gradually press in the bearing into the main journal bore by using the hand-press until the special tool ① or ② stops the special tool ③.

 ① 09913-60210: Journal bearing remover/installer (Left crankcase)
② 09913-60230: Journal bearing remover/installer (Right crankcase)

③ 09913-60241: Journal bearing installer holder











CAUTION

Since the journal bearing press-fitting position is different between the right and left crankcases, use the correct installer respectively.

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NOTE:

Using the hand-press is recommended to install the crankshaft journal bearings. However, the crankshaft journal bearings can be installed by using the following special tools.

CAUTION

Match the hole center of the special tool correctly.

09924-84510: Bearing installer

CRANKSHAFT THRUST CLEARANCE

- Face the oil groove (A) of the crankshaft shim (1) toward the crank web.
- Install the crankshaft to the crankcase. (23-3-62)
- Install the starter clutch. (13-3-64)
- Measure the gap between the thrust washer and crankcase.

Crankshaft thrust clearance Standard: 0.10 – 0.15 mm (0.004 – 0.006 in)

- If the thrust clearance is out of the standard range, replace the shim so that the standard value is obtained.
- To replace the shim, remove the thrust shim and measure the thickness. Select shims from the table below so that the standard value can be obtained.
- Inspect the crankshaft thrust clearance again.

	Unit: mm (in)
Part number	Thrust shim thickness
09160-48005	2.025 – 2.050 (0.0797 – 0.0807)
09160-48006	2.050 – 2.075 (0.0807 – 0.0817)
09160-48007	2.075 – 2.100 (0.0817 – 0.0827)
09160-48008	2.100 – 2.125 (0.0827 – 0.0837)
09160-48009	2.125 – 2.150 (0.0837 – 0.0846)
09160-48010	2.150 – 2.175 (0.0846 – 0.0856)









OIL JET

• Check the oil jets for clogging.

NOTE:

Before fitting, coat the O-ring with engine oil. Use a new O-ring. Note the carved mark not to mistake the size.

NOTE: The crankcase side of the oil jet is identified by letter 8.

NOTE: The cylinder head side of the oil jet is identified by letter 14.

PISTON COOLING NOZZLE

• Check the piston cooling nozzle for clogging or deformation.

NOTE:

Before installing, coat the O-ring with engine oil. Use a new O-ring.











CRANKCASE

OIL PRESSURE SWITCH

• Remove the oil pressure switch.



• When installing the switch, apply SUZUKI BOND "1207B".

 Oil pressure switch: 13 N·m (1.3 kgf-m, 10.0 lb-ft)
12078 99104-31140: SUZUKI BOND "1207B" (USA) 99000-31140: SUZUKI BOND "1207B" (Others)



- Remove the right crankcase cover ①.
- Remove the primary shaft cap 2.
- Install the right crankcase cover 1 and primary shaft cap 2.

■ Right crankcase cover bolt: 11 N·m (1.1 kgf-m, 8 lb-ft) Primary shaft cap bolt: 11 N·m (1.1 kgf-m, 8 lb-ft)

BEARING DISASSEMBLY

• Remove the bearings with the special tool.

09921-20240: Bearing remover set	1
09941-54911: Bearing outer race remover	2







BEARING INSPECTION

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

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



BEARING REASSEMBLY

• Install the bearing into the crankcase with the special tool.

09913-70210: Bearing installer set

OIL SEAL DISASSEMBLY

• Remove the oil seal with the special tools.

① 09913-70210: Bearing remover set
② 09913-85210: Bearing remover

1001 09913-50121: Oil seal remover



OIL SEAL REASSEMBLY

• Apply grease to the oil seal lip.

₩ 99000-25030: SUZUKI SUPER GREASE "A" (USA) 99000-25010: SUZUKI SUPER GREASE "A" (Others)

• Install the oil seal with the special tool.

09913-70210: Bearing installer set

CAUTION

Use a new Oil seal.

BUSHING INSTALLATION

- Replace the bushing with a new one if necessary.
- Assemble the engine mount bushing as shown in the illustration.





ENGINE REASSEMBLY

- Reassemble the engine in the reverse order of disassembly.
- The following steps require special attention or precautionary measures should be taken.

NOTE:

Apply engine oil to each running and sliding part before reassembling.

RETURN OIL PUMP

- Install the return oil pump and insert the pin 1 into the shaft.
- Install the pin aligning to the groove of the return oil pump gear and fit a circlip.

PRIMARY DRIVEN GEAR/ CRANKSHAFT

• Install the primary driven gear 2 and crankshaft assembly 3.







• Install the crankcase oil separator.









OIL SUMP FILTER

• Install the oil sump filter by aligning the projection of the oil sump filter to the concave of the crankcase.

PISTON COOLING NOZZLE

• Coat the O-ring with a small amount of grease and install the piston cooling nozzle ①.

OIL PUMP/ OIL PRESSURE REGULATOR

• Install the oil pump (2), washer (3) and pin (4).

• Coat the O-ring with grease and install the oil pressure regulator (5) to the crankcase.

CAUTION

Use a new O-ring.

CRANK BALANCER SHAFT

- Install the upper crank balancer shaft ①.
- Install the lower crank balancer ②, oil pump drive gear ③ and oil pump drive chain ④.
- Engage the drive chain to the oil pump gear and install the oil pump gear by aligning the groove and pin.
- Install the circlip (5).







Align the punched marks in line.

DRIVESHAFT

• Install the counter drive gear shaft (6) from the outside, install the counter drive gear (7) and fit the circlip.

CAUTION

Check that the circlip is positively fitted.

• Install the idle gear (8), idle shaft (9) and driveshaft assembly (10).





CRANKCASE

- Install the dowel pins.
- Coat each gear and bearing with engine oil, before mating the crankcase halves.

• Coat the O-ring ① with grease and fit the O-ring to the crankcase.

₩ 99000-25030: SUZUKI SUPER GREASE "A"

• Install the spacer 2.

CAUTION

Use a new O-ring.

- Clean the mating surfaces of the left and right crankcase halves.
- Apply SUZUKI BOND to the mating surface of the right crankcase.

■12078 99104-31140: SUZUKI BOND "1207B" (USA) ■1215 99000-31110: SUZUKI BOND "1215" (Others) CAUTION

- * Coat the sealing agent quickly in uniform thickness without interruption.
- * Be careful when coating the sealing agent not to allow it to enter the oil hole, bearing, etc.
- Assemble the crankcases with in few minutes and tighten the crankcase bolts diagonally and uniformly.

Right crankcase bolt (M6): 11 N·m (1.1 kgf-m, 8 lb-ft)

Left crankcase bolt (M8): 26 N⋅m (2.6 kgf-m, 19 lb-ft)

NOTE:

After tightening the crankcase bolts, check that the crankshaft rotates smoothly.











OIL COOLER

- Coat the O-ring with engine oil and install the oil cooler.
- Install the washer ① and tighten the union bolt ② to the specified torque.

Oil cooler union bolt: 70 N·m (7.0 kgf-m, 50.5 lb-ft)

NOTE: Use a new O-ring.

WATER PUMP

• Install the water pump assembly.



• Install the cam chain sprocket.

NOTE:

Align the punched mark on the crankshaft and that of the cam chain sprocket.

- Install the washer ③.
- Coat the cam chain tensioner bolt with thread lock and tighten it.

€1342 99000-32050: THREAD LOCK "1342"

• Install the cam chain (4).









STARTER CLUTCH

• Install the washer 1.

- Coat the internal surface of the starter clutch gear and crankshaft with engine oil.
- Install the starter clutch assembly to the crankshaft.

NOTE:

Align the engraved line A of the starter clutch and punched mark B of the crankshaft.

- Install the starter clutch bolt together with the washer 2.
- Using the special tool, tighten the bolt to the specified torque.
- 09920-34830: Starter clutch rotor holder

Starter clutch bolt: 55 N·m (5.5 kgf-m, 40.0 lb-ft)

- Install the starter torque limiter shaft 3 and washer 4.
- Install the starter torque limiter (5), starter idle gear shaft (6) and starter idle gear.

CAUTION

Coat each shaft bearing with a sufficient amount of molybdenum oil.





• Install the new gasket ① and dowel pin.

• Coat the starter clutch cover bearings with molybdenum oil.

• Install the starter clutch cover.

NOTE: Tighten the starter clutch cover bolt (A) together with the clamp.







- Coat the O-ring of the driveshaft oil seal retainer with grease and install it.
- Install the driveshaft oil seal retainer to the crankcase.

Driveshaft oil seal retainer bolt:

22 N·m (2.2 kgf-m, 16.0 lb-ft)

NOTE:

Use a new O-ring.

CLUTCH

- Install the clutch shaft to the clutch assembly.
- Coat the part (A) of the clutch shaft with SUZUKI MOLY PASTE.

₩ 99000-25140: SUZUKI MOLY PASTE

- Install the clutch assembly, washer ① and clutch housing nut ② to the left crankcase.
- Using the special tool, tighten the clutch housing nut to the specified torque.
- 09930-40113: Rotor holder
- Clutch housing nut: 70 N·m (7.0 kgf-m, 5 lb-ft)
- Install the new gasket ③ and dowel pins.

• Install the clutch cover.











GENERATOR

- Wipe off the oily from the tapered part of the crankshaft.
- Install the key.

- Install the stator coil 1 and CKP sensor 2.
- Fit the grommet firmly.

• Using the special tool, tighten the generator rotor nut to the specified torque.

09930-40113: Rotor holder

Generator rotor bolt: 160 N·m (16.0 kgf-m, 115.5 lb-ft)

• Install the oil sump filter.

NOTE:

Set the projection of the oil sump filter to concave of the crankcase.

• Install the new gasket.









- 3-68 ENGINE
- Install the generator cover.

NOTE:

Tighten the generator cover bolt (A) together with the clamp.

• Fit the gasket washers ③ and union bolts to the oil hose ① and oil return hose ②.

NOTE: Use a new gasket washer.

• Connect the oil hose and oil return hose to the crankcase.

Oil hose union bolt: 20 N·m (2.0 kgf-m, 14.5 lb-ft) Oil return hose union bolt: 28 N·m (2.8 kgf-m, 20.0 lb-ft)







PISTON RING

- Install the piston rings in the order of the oil ring, second ring and top ring.
- Install the spacer 1 of the oil ring first and then the side rail 2.



INCORRECT

CAUTION

- * When installing the spacer, be careful so that the both edges are not overlapped.
- * When installing the piston ring, be careful not to damage the piston.
- * Do not expand the piston ring excessively since it is apt to be broken down.
- Be careful not to mistake the second ring ③ and the top ring ④, the sectional form is different.



- After installing all the piston rings, check that each ring rotates smoothly.
- To prevent poor compression or oil leaking up to the cylinder inside, position each ring end gap as shown in the right figure.
 A Second ring / side rail (lower side)
 - (B) Side rail (upper side)
 - © Top ring / spacer









PISTON

 Coat the piston pin and conrod small end with molybdenum oil.

MOLYBDENUM OIL SOLUTION

• Face the indent mark on the piston head to the exhaust side of the cylinder, install the pistons ①.



 \bullet Place a clean cloth under the piston and fit the circlip 2.

CAUTION

Use a new circlip.

CYLINDER

- Coat the conrod big end with oil.
- Install the dowel pins 1 and new cylinder base gasket 2.

CAUTION

Use a new gasket.

• Coat the cylinder inside surface and piston rings with engine oil and install the cylinder.

CAUTION

Keep the cam chain pulled out not to be caught between the sprocket and crankshaft.





CYLINDER HEAD

• Install the dowel pins ①, cylinder head gasket ② and cam chain guide ③ to the cylinder.

CAUTION

Use a new gasket.

- Coat the thread of the cylinder head bolts with engine oil.
- Tighten the cylinder head bolts ① and ② in ascending order of the numbers as illustrated.
- Tighten the bolts to the specified torque in 2 steps; lightly first and then firmly.

Cylinder head bolt (M10) ①, ② Initial tightening:25 N⋅m (2.5 kgf-m, 18.0 lb-ft) Final tightening: 53 N⋅m (5.3 kgf-m, 38.5 lb-ft)

NOTE: Bolt ①: 150 mm Bolt ②: 155 mm

• Tighten the cylinder head bolts ③.

Cylinder head bolt (M8) ③: 25 N·m (2.5 kgf-m, 18.0 lb-ft)

- Unlock the ratchet of the cam chain tension adjuster and push and compress the adjuster rod.
- Insert the special tool into the gap between the tension adjuster body and ratchet.
- Install the cam chain tention adjuster bolts ④ and copper washers ⑤.

09918-53810: Tensioner locking tool

Cam chain tensioner adjust bolt:

10 N·m (1.0 kgf-m, 7.3 lb-ft)

NOTE:

Use a new copper washer.

- Coat the both sides of the gasket washer 6 with engine oil.
- Tighten the cylinder head side bolt.

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

Face the metal side of the gasket washer outward. Pass the cylinder head side bolt through the cam chain.









CAMSHAFT

• Turn the crankshaft clockwise and bring the piston to the top dead center. (2-8)

· Before installing the camshafts to the cylinder head, coat the journals, cam surfaces and camshaft journal holders with molybdenum oil.

MOLYBDENUM OIL

NOTE:

Before installing the camshafts, check that the tappet is properly installed.

• The exhaust camshaft and intake camshaft are distinguished by the punched mark. Exhaust camshaft: "B" Intake camshaft: "A"

• Match the arrow marked (\rightarrow) on the exhaust cam sprocket "1" to the cylinder head gasket surface.

• Match the arrow marked on the intake cam sprocket "3" to the 15 roller pins counted from the exhaust cam sprocket "2".

NOTE:

Do not move the crankshaft until the camshaft journal holders and cam chain tension adjuster are fixed.



Punched mark









POSITION OF CAMSHAFTS AND SPROCKETS



Install the dowel pins.

- Install the camshaft holders and cam chain guide.
- Arrange the camshaft holder by hand so that it is positioned at 1-2 mm from the cylinder head mating surface.
- Tighten the camshaft holder bolts in ascending order of numbers as shown in the illustration.
- Cam shaft holder bolt ①: 10 N·m (1.0 kgf-m, 0.7 lb-ft) Cam shaft holder bolt ②: 10 N·m (1.0 kgf-m, 0.7 lb-ft)

NOTE:

Install the camshaft holder to the correct positions according to the identification marks.

Intake camshaft: IN Exhaust camshaft: EX

• Unlock the cam chain tension adjuster.



CYLINDER HEAD COVER

- Assemble the new gasket to the cylinder head cover.
- Coat the semicircular part of the gasket with sealing agent.

99000-31230: SUZUKI BOND "1216B"

NOTE:

Do not remove the dowel pin at the backside of the cylinder head cover since it is embedded.

- Install the cylinder head cover.
- Coat the both sides of the gasket washers ③ with engine oil and tighten the head cover bolts.

Cylinder head cover bolt

Light tightening: 10 N·m (1.0 kgf-m, 7.0 lb-ft) Final tightening: 14 N·m (1.4 kgf-m, 10.0 lb-ft)





OIL LEVEL SWITCH

• Install the oil level switch.

Oil level switch bolt: 10 N·m (1.0 kgf-m, 7.0 lb-ft)

STARTER MOTOR

- Install the starter motor 1.
- Install the water bypass hose 2.

Starter motor bolt: 6 N·m (0.6 kgf-m, 4.5 lb-ft)





DRIVE TRAIN

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DRIVE TRAIN CONSTRUCTION



REMOVAL AND DISASSEMBLY

- Remove the right/left side leg shield cover. (279-12)
- Drain the final gear oil. (2-15)
- Remove the rear wheel. (59-48)
- Remove the swingarm. (39-59)
- Remove the speedometer sensor ① and harness guide ②.
- Remove the final gear case.

• Remove the bearing from the engine.

• Remove the dowel pins.

• Remove the final gear case bolts in a crisscross pattern.











- Remove the gascket 3 and dowel pins.
- Remove the following gears.
- A Final drive gear
- B No.1 gear
- $\ensuremath{\mathbb{C}}$ No.2 gear
- D No.3 gear
- $\ensuremath{\mathbb{E}}$ Final driven gear
- Remove the final drive gear hub ④.



Inspect the gears for wear and damage. If any defects are found, replace the gear with a new one.

OIL SEALS Inspect the oil seals for wear and damage. If any defects are found, replace the seal with a new one.













• Remove the oil seal with the special tool.

09913-50121: Oil seal remover

CAUTION

Replace the removed oil seal with a new one.



- Install the new oil seal to the final gear case.
- Apply SUZUKI SUPER GREASE "A" to the oil seals.

₩ 99000-25030: SUZUKI SUPER GREASE "A"

NOTE:

Direction of the oil seal is shown in the illustration at page 4-2.

BEARINGS

Inspect the inner race play of the bearing by hand while it is in the final gear case.

Rotate the inner race by hand to inspect for abnormal noise and smooth rotation.

If there is anything unusual, replace the bearing with a new one.

• Remove the bearing with the special tool.

09921-20240: Bearing remover set

- To facilitate setting the special tool, knock down the plate ① that is at the No.2 gear bearing.
- Remove the bearing with the special tool.

CAUTION

Replace the removed plate 1 with a new one.







• Remove the final driven gear bearing by using the appropriate bar.

• Remove the final drive gear bearing with the special tools.

09941-64511: Bearing remover 09930-30104: Sliding shaft

• Install the bearings to the final gear case with the special tool.

109913-70210: Bearing installer set

CAUTION

Replace the removed bearing with a new one.

• Install the plate ② into the final gear case cover at the No.2 gear, and then install the bearing.

CAUTION

Install the plate 2 with the convexity A showed up.

FINAL DRIVEN GEAR HUB

Inspect the final driven gear hub for wear and damage. If any defects are found, replace the final driven gear hub with a new one.











REASSEMBLY AND REMOUNTING

- Install the gears and final driven gear hub onto the final gear case cover.
- Install the dowel pins ① and the new gasket.
- Apply SUZUKI SUPER GREASE "A" to spline of the final drive gear.

₩ 99000-25030: SUZUKI SUPER GREASE "A"

- Assemble the final gear case.
- Tighten the final gear case bolts to the specified torque.

Final gear case bolt: 10 N⋅m (1.0 kgf-m, 7.0 lb-ft)

- Apply SUZUKI SUPER GREASE "A" to the bearing.
- Install the bearing to the drive shaft.

₩ 99000-25030: SUZUKI SUPER GREASE "A"

- Install the final gear case assembly.
- Tighten the rear shock absorber mounting bolt.

Rear shock absorber mounting bolt: 29 N·m (2.9 kgf-m, 21.0 lb-ft)

- Install the speedometer sensor 2 and harness guide 3.
- Tighten the speedometer sensor bolt to the specified torque.

Speedometer sensor bolt: 10 N·m (1.0 kgf-m, 7.0 lb-ft)

NOTE:

Apply grease to the O-ring of speedometer sensor before installing the sensor to the final gear case.











• Clamp the breather hose ④ and speedometer sensor harness ⑤.



- Install the swingarm. (19-61)
- Install the exhaust muffler. (2-3-11)
- Install the rear wheel. (79-56)
- Install the right/left side leg shield covers.
- Pour the final gear oil. (2-16)

CVT

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CVT ASSEMBLY REMOVAL AND INSTALLATION

CVT ASSEMBLY REMOVAL

• Remove the engine assembly.

ENGINE REMOVAL 73-3

• Remove the bracket 1.

• Remove the bolts, 2 and 3.

• Install the special tool as shown.





• Remove the CVT mounting bolts.

• Remove the CVT assembly.



CVT ASSEMBLY INSTALLATION

- Remove the valve timing inspection cap 1.

- Install the special tool to the engine assembly as shown.
- Apply SUZUKI MOLY PASTE to the primary driven gear shaft and clutch shaft.

09920-31050: CVT guide

₩99000-25140: SUZUKI MOLY PASTE

• Engage the spline and install the CVT assembly by turning the crankshaft slowly.

• Tighten the CVT mounting bolt to the specified torque.

• Install the bracket 2.

CVT mounting bolt: 50 N·m (5.0 kgf-m, 36.0 lb-ft)

Install the valve timing inspection cap ③.
ENGINE INSTALLATION □ 3-10










CVT DISASSEMBLY AND REASSEMBLY



CVT DISASSEMBLY

CVT CASING/COVER

• Remove the pulley position sensor 1.

• Remove the secondary pulley revolution sensor ②.

• Remove the CVT motor.

• Remove the CVT filter cover.

• Remove the CVT filter



• Remove the secondary pulley shaft nut by holding the shaft with the special tools.

09920-31020: Extension handle 09920-31030: CVT secondary pulley shaft holder

• Remove the secondary shaft adaptor with a bearing puller.

- Remove the primary pulley shaft bolt by holding the primary pulley shaft with the special tools.
- **09920-31010: CVT primary pulley shaft holder 09920-31020: Extension handle**
- Screw in the special tool and remove the primary pulley shaft adaptor.
- 09920-31040: CVT primary pulley shaft adaptor remover









• Separate the CVT assembly by using 6 mm screws.

NOTE:

When separating the CVT assembly, position the right side facing downward.





• After separating the CVT assembly, remove the CVT casing with the special tool.

CAUTION

The crankcase separator plate is parallel with the end face of the CVT crankcase.

CAUTION

When servicing the inside of the CVT assembly, make sure to wear clean protective gloves.







• Remove the dowel pins.

SECONDARY PULLEY ASSEMBLY

 \bullet Remove the washer 1 on the secondary pulley shaft.

• Turn the primary slide pulley idle gear clockwise and open the primary pulley fully.

• Remove the primary slide pulley idle gear (2) and (3).

• Place a piece of clean rag on the primary pulley faces to prevent them from scratches.

• Remove the secondary pulley assembly.

CAUTION

Use caution not to cause scratches on the pulley surfaces dne to their contact.











CVT BELT

• Place a piece of clean rag on the CVT cover mating face to prevent the CVT belt from scratches.

• Remove the CVT belt.

• Mark the direction mark on the CVT belt.

PRIMARY PULLEY

 \bullet Remove the primary pulley stopper bolt A.

NOTE:

In the case of replacing the CVT belt only, removing of the primary pulley is not necessary. (CVT BELT INSTALLATION 5-20)

• Remove the primary pulley assembly.











• Remove the shim 1 and O-ring 2.







CVT INSPECTION PRIMARY PULLEY INSPECTION

- Check that the primary pulley faces are free from any greasy substance.
- Inspect the primary pulley faces for any abnormal conditions such as scratches or stepped wear.

CAUTION

If the surface is found greasy, make sure to degrease it thoroughly.

- If any damages are found, replace the primary pulley assembly with a new one.
- Replace the O-ring with a new one.

SECONDARY PULLEY INSPECTION

- Inspect the secondary pulley faces for any abnormal conditions such as scratches or stepped wear.
- If any damages are found, replace the primary pulley assembly with a new one.
- Check that the secondary pulley faces are free from any greasy substance.

CAUTION

If the surface is found greasy, make sure to degrease it thoroughly.

- Rotate the bearing outer race by finger to inspect for abnor-
- mal play, noise and smooth rotation.Inspect the secondary pulley fan for cracks or damage.
- Replace the bearing or secondary pulley fan if there is anything unusual.



1

SECONDARY PULLEY DISASSEMBLY

 \bullet Remove the secondary pulley fan (1).

• Remove the snap ring ②.

09900-06107: Snap ring pliers

• Remove the bearing with a bearing puller.

CVT MOTOR

• When replacing the CVT motor gear, align the hole (A) with the hole of motor shaft to install the pin.







SECONDARY PULLEY REASSEMBLY

• Fit the special tool and install a new bearing by a hydraulic press.

09913-75810: Bearing installer

CAUTION

Replace the removed bearing with a new one.

• Install the snap ring.

09900-06107: Snap ring pliers

• Apply THREAD LOCK "1342" to the secondary pulley fan bolts and tighten them.

€1342 99000-32050: THREAD LOCK "1342"

CVT BELT INSPECTION

- Check that the drive belt is free from any greasy substance.
- Inspect the CVT belt for cracks or uneven wear.
- If any damages are found, replace the CVT belt with a new one.

CAUTION

- * If the CVT belt is found greasy, replace it with a new one.
- * Do not spray a cleaning solvent directly on the CVT belt.









CVT CASING/COVER INSPECTION

• Replace the oil seal ① with a new one.

CAUTION

Replace the oil seal every time the CVT assembly is separated.

- Rotate the bearing by finger to inspect for abnormal play, noise and smooth rotation.
- Replace the bearing if there is anything unusual.





- Replace the O-ring with a new one.
- Apply SUZUKI SUPER GREASE "A" to the new O-ring and install it.

✓ 99000-25030: SUZUKI SUPER GREASE "A" (USA) 99000-25010: SUZUKI SUPER GREASE "A" (Others)

• Thoroughly clean the case free from dirt and sealant.

CVT CASING/COVER DISASSEMBLY

• Remove the bearing retainer ①.







• Remove the bearing with the special tool.

09921-20240: Bearing remover set

• Remove the bearing together with the oil seal by using the special tool.

09913-70210: Bearing installer set

CVT CASING/COVER REASSEMBLY

• Install the bearing with the special tool.

09913-70210: Bearing installer set

• Install the bearing retainer ①.

- Install the oil seal and bearing with the special tool.
- 09913-70210: Bearing installer set











PRIMARY SLIDE PULLEY IDLE GEAR INSPECTION

- Inspect the pulley gears for wear or damage.
- Rotate the bearing by finger to inspect for abnormal play, noise and smooth rotation.
- If any wear or damage is found, replace the idle gear assembly with a new one.



CVT PRIMARY PULLEY SHIMS ADJUSTMENT

If any of the primary pulley, CVT casing or CVT cover has been replaced, install the shim whose thickness has been adjusted in the shim adjustment procedure.

CVT COVER DEPTH MEASUREMENT

- Fix the CVT cover securely with its mating face positioned horizontally.
- With the straightedge placed on the cover mating face, measure the depth D to the face (A) of the cover which the primary pulley assembly contacts using the vernier calipers.
- Measure the depth D at three points and note the measured value D₁, D₂ and D₃.



PRIMARY PULLEY HEIGHT MEASUREMENT

• Install the primary pulley assembly onto the CVT casing.





• Install the primary pulley shaft adaptor with the special tool.

09913-60910: Bearing puller or 09913-61110: Bearing puller or 09913-61510: Bearing puller



• Tighten the primary pulley shaft bolt to the specified torque with the special tools.

Primary pulley shaft bolt: 64 N·m (6.4 kgf-m, 46.5 lb-ft)

09920-31010: CVT primary pulley shaft holder 09920-31020: Extension handle

- Fix the CVT casing securely with its mating face positioned horizontally.
- With the straightedge placed on the casing mating face, measure the height H to the face (B) of the primary pulley assembly using the vernier calipers.
- Measure the height H at three points and note the measured value H₁, H₂ and H₃.

09900-20102: Vernier calipers









SHIM SELECTION

- Get the average depth Da by averaging $D_1,\,D_2$ and $D_3.$
- Get the average height Ha by averaging H_1 , H_2 and H_3 .
- Obtain the valve X by subtracting Da from Ha.
- Using the chart below, select the appropriate shim with reference to the value X.

SHIM SELECTION TABLE

SHIM THICKNESS	VALUE X
0.12 mm (0.005 in)	3.12 – 3.31 mm (0.123 – 0.130 in)
0.32 mm (0.013 in)	3.32 – 3.51 mm (0.131 – 0.138 in)
0.52 mm (0.020 in)	3.52 – 3.71 mm (0.139 – 0.146 in)
0.72 mm (0.028 in)	3.72 – 3.91 mm (0.147 – 0.154 in)
0.92 mm (0.036 in)	3.92 – 4.11 mm (0.155 – 0.162 in)
1.12 mm (0.044 in)	4.12 – 4.31 mm (0.163 – 0.170 in)
1.32 mm (0.052 in)	4.32 – 4.51 mm (0.171 – 0.178 in)

NOTE:

Г

The shims are available as a set (21746-10G00).

EXAMPLE:

$\frac{\text{CVT cover depth D}}{\text{D}_2} = 125.35 \text{ mm} (4.935 \text{ in})$ $D_2 = 125.15 \text{ mm} (4.927 \text{ in})$	
D3=125.25 mm (4.931 in)Average depthDa=(125.35 + 125.15 + 125.25) \div 3=125.25 mm (4.931 in)	
<u>Primary pulley height H</u> H ₁ = 121.45 mm (4.781 in) H ₂ = 121.60 mm (4.787 in)	
Average height $H_3 = 121.45 \text{ mm} (4.781 \text{ in})$ Average height $H_a = (121.45 + 121.60 + 121.45) \div 3$ $= 121.50 \text{ mm} (4.783 \text{ in})$	
<u>Value</u> X = Da – Ha = 125.25 mm (4.931 in) – 121.50 mm (4.783 in) = 3.75 mm (0.148 in)	
* Slelect the 0.72 mm (0.028 in) shim.	

CVT REASSEMBLY PRIMARY PULLEY ASSEMBLY

CAUTION

Wear clean protective gloves.

• Degrease the inside of the CVT cover and CVT casing completely with a cleaning solvent by using a clean rag.

• Install the O-ring 1 and shim 2.

CAUTION

If any of the primary pulley, CVT casing or CVT cover has been replaced, install the shim whose thickness has been adjusted in the shim adjustment procedure.

• Turn the slide pulley gear and close the primary pulley.

• Align the cutaway (B) of the screw shaft with the protrusion (A).

Degrease the primary pulley faces completely.











NOTE:

Primary pulley cover has the protrusion \mathbb{A} and \mathbb{C} .

• Turn the primary pulley cover 180 degrees along the groove on the screw shaft and align the cutaway (B) with (D) or (E) position of the primary pulley cover.

• With the cutaway (B) aligned with the stopper bolt hole (F) of the CVT cover, position the primary pulley assembly onto the CVT cover.

- Make sure that the screw shaft is in proper position by checking the location of cutaway (B) when viewed from the stopper bolt hole (F).
- Tighten the stopper bolt to the specified torque.

Primary pulley stopper bolt: 36 N·m (3.6 kgf-m, 26.0 lb-ft)

CVT BELT INSTALLATION

- Install the primary slide pulley idle gear temporarily.
- Turn the idle gear clockwise and open the primary pulley fully.











• Place a piece of clean rag on the CVT casing mating face to prevent the CVT belt from scratches.

• Install the CVT belt so that the direction mark on the CVT belt points in the normal turning direction.

CAUTION

Never touch the side walls of the CVT belt.

• Place a piece of clean rag on the primary pulley faces to prevent them from scratches.

SECONDARY PULLEY ASSEMBLY

- Install the secondary pulley assembly.
- Remove the rags.

CAUTION

- * Degrease the secondary pulley faces completely.
- * Use caution not to cause scratches on the pulley surfaces due to their contact.
- Check that the secondary pulley is located inwardly relative to the primary pulley.











• Check that the CVT belt is in parallel with the CVT cover mating face.

- Install the primary slide pulley idle gear 1 and 2.

• Turn the idle gear until the primary pulley faces just touch the CVT belt.

• Check the CVT belt movement for smooth rotation by turning the both pulleys.

• Install the secondary pulley washer ③.











CVT CASING/COVER

- Wipe the CVT casing/cover mating surface with a cleaning solvent.
- Fit the dowel pins.

• Apply a small quantity of SUZUKI SUPER GREASE to the grease groove (A) of the primary pulley shaft.

✓ 99000-25030: SUZUKI SUPER GREASE "A" (USA) 99000-25010: SUZUKI SUPER GREASE "A" (Others)

CAUTION

Do not apply grease under the groove A.

• Cover the secondary pulley shaft with a vinyl film to prevent oil seal damage.

• Apply a small quantity of engine oil to the main lip (B) of the oil seal.

PIENGINE OIL

• Apply SUZUKI BOND "1215" to the mating surface of the CVT casing.

■1215 99000-31110: SUZUKI BOND "1215"

NOTE:

- * Make surfaces free from moisture, oil, dust and other foreign materials.
- * Spread on surfaces thinly to form an even layer, and assemble the CVT casing and cover within few minutes.











• Tighten the CVT cover bolts diagonally to the specified torque.

CVT cover bolt: 22 N·m (2.2 kgf-m, 16.0 lb-ft)

NOTE: Fit the clamp to the bolt \mathbb{A} .

- Apply SUZUKI SUPER GREASE "A" to the primary pulley shaft adaptor.
- ✓ 99000-25030: SUZUKI SUPER GREASE "A" (USA) 99000-25010: SUZUKI SUPER GREASE "A" (Others)
- Install the primary pulley shaft adaptor with the special tool.

09913-60910: Bearing puller or 09913-61110: Bearing puller or 09913-61510: Bearing puller

• Apply THREAD LOCK SUPER "1360" to the primary pulley shaft bolt.

€ 99000-32130: THREAD LOCK SUPER "1360"

• Tighten the primary pulley shaft bolt to the specified torque with the special tools.

Primary pulley shaft bolt: 64 N⋅m (6.4 kgf-m, 46.5 lb-ft)

09920-31010: CVT primary pulley shaft holder 09920-31020: Extension handle











- Apply a small quantity of engine oil to the secondary pulley bearing.
- Apply grease to the secondary pulley shaft adaptor.

Pengine OIL

✓ 99000-25030: SUZUKI SUPER GREASE "A" (USA) 99000-25010: SUZUKI SUPER GREASE "A" (Others)

• Install the special tool onto the secondary pulley shaft.

09910-32850: Crankshaft installer attachment

• Press in the secondary pulley shaft adaptor with the special tool.

09910-32812: Crankshaft installer

• Apply THREAD LOCK SUPER "1360" to the secondary pulley shaft nut.

1360 99000-32130: THREAD LOCK SUPER "1360"

• Tighten the secondary pulley shaft nut to the specified torque with the special tools.

Secondary pulley shaft nut:

226 N·m (22.6 kgf-m, 163.5 lb-ft)

09920-31020: Extension handle 09920-31030: CVT secondary pulley shaft holder











• Clean the CVT filter by using compressed air.

• Install the CVT filter.

- Install the CVT filter cover.
- Fit the clamp to the bolts A.

• Install the CVT motor.

NOTE: Pay attention to the direction of the CVT motor.

• Install the secondary pulley revolution sensor.



• Install the pulley position sensor ① with the sensor pushed toward the primary pulley shaft side.



CVT BELT BRAKE-IN PROCEDURES

• It is necessary to allow the CVT belt to "BRAKE-IN" before subjecting the CVT to maximum stresses.

Brake -in engine speed

Initial 800 km (500 miles): Below 4 000 rpm.

NOTE:

When the CVT belt is new, the engine rpm may jump briefly under hard acceleration due to the smoothness of the belt.



FI SYSTEM/ CVT SYSTEM

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PRECAUTIONS IN SERVICING

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

ELECTRICAL PARTS

CONNECTOR/COUPLER

replace.

- When connecting a connector, be sure to push it in until a click is felt.
- With a lock type coupler, be sure to release the lock when disconnecting, and push it in fully till the lock works when connecting it.
- When disconnecting the coupler, be sure to hold the coupler body and do not pull the lead wires.
- Inspect each terminal on the connector/coupler for looseness or bending.
- Inspect each terminal for corrosion and contamination. The terminals must be clean and free of any foreign material which could impede proper terminal contact.

 Inspect each lead wire circuit for poor connection by shaking it by hand lightly. If any abnormal condition is found, repair or







• When taking measurements at electrical connectors using a tester probe, be sure to insert the probe from the wire harness side (backside) of the connector/coupler.



• When connecting meter probe from the terminal side of the coupler (connection from harness side not being possible), use extra care not to force and cause the male terminal to bend or the female terminal to open.

Connect the probe as shown to avoid opening of female terminal.

Never push in the probe where male terminal is supposed to fit.

• Check the male connector for bend and female connector for excessive opening. Also check the coupler for locking (looseness), corrosion, dust, etc.

FUSE

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









ECM/ CVT CONTROL UNIT/ 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/CVT control unit. The static electricity from your body may damage this part. When disconnecting and connecting the ECM/CVT control unit couplers, make sure to turn OFF the ignition switch, or electronic parts may get damaged.

 Battery connection in reverse polarity is strictly prohibited. Such a wrong connection will damage the components of the FI system/CVT control unit instantly when reverse power is applied.

• Removing any battery terminal of a running engine is strictly prohibited.

The moment such removal is made, damaging counter electromotive force will be applied to the ECM/CVT control unit which may result in serious damage.

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

- Never connect any tester (voltmeter, ohmmeter, or whatever) to the ECM/CVT control unit when its coupler is disconnected. Otherwise, damage to ECM/CVT control unit may result.
- Never connect an ohmmeter to the ECM/CVT control unit with its coupler connected. If attempted, damage to ECM/CVT control unit or sensors may result.
- Be sure to use a specified voltmeter/ohmmeter. Otherwise, accurate measurements may not be obtained and personal injury may result.









INCORRECT

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 circuit 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
- Disconnect the negative cable from the battery.
- 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.



• 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.

• 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.





Continuity check

• Measure resistance across coupler B (between A and C in the figure).

If no continuity is indicated (infinity or over limit), the circuit is open between terminals A and C.

• Disconnect the coupler (B) and measure resistance between couplers (A) and (B).

If no continuity is indicated, the circuit is open between couplers (A) and (B). If continuity is indicated, there is an open circuit between couplers (B) and (C) or an abnormality in coupler (B) or coupler (C).





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 B and B.

Voltage Between:

- ${\rm (C)}$ 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 \triangle and \triangle .

Voltage Between:





SHORT CIRCUIT CHECK (WIRE HARNESS TO GROUND)

- Disconnect the negative cable from the battery.
- 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).
- Disconnect the connector/coupler included in circuit (coupler (B)) and measure resistance between terminal (A) and body ground.

If continuity is indicated, the circuit is shorted to the ground between terminals (A) and (B).



USING TESTERS

- Use the Suzuki multi-circuit tester (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 ⊕ and ⊖ probes may cause the inside of the tester to burnout.
- If the voltage and current are not known, make measurements using the highest range.
- When measuring the resistance with the multi-circuit tester, ∞ 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.

09900-25008: Multi-circuit tester

NOTE:

- * When connecting the multi-circuit tester, use a fine needle pointed probe or install fine copper wires (O.D is below 0.5 mm) to the back side of the lead wire coupler and connect the probes of tester to them.
- * Use a fine copper wire, the outer diameter being below 0.5 mm, to prevent the rubber of the water proof coupler from damage.



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 the 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
ATMOSPHERIC PRESSURE SENSOR	When atmospheric pressure is low, the sensor sends the
SIGNAL	signal to the ECM and reduce the injection time (volume).
ENGINE COOLANT TEMPERATURE SEN-	When engine coolant temperature is low, injection time (vol-
SOR SIGNAL	ume) is increased.
INTAKE AIR TEMPERATURE SENSOR	When intake air temperature is low, injection time (volume)
SIGNAL	is increased.
HEATED OXYGEN SENSOR SIGNAL	Air/fuel ratio is compensated to the theoretical ratio from
(E-02, 19)	density of oxygen in exhaust gasses. The compensation
	occurs in such a way that more fuel is supplied if detected
	air/fuel ratio is lean and less fuel is supplied if it is rich.
BATTERY VOLTAGE SIGNAL	ECM operates on the battery voltage and at the same time,
	it monitors the voltage signal for compensation of the fuel
	injection time (volume). A longer injection time is needed to
	adjust injection volume in the case of low voltage.
ENGINE RPM SIGNAL	At high speed, the injection time (volume) is increased.
STARTING SIGNAL	When starting engine, additional fuel is injected during
	cranking engine.
ACCELERATION SIGNAL/	During acceleration, the fuel injection time (volume) is
DECELERATION SIGNAL	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	When the motorcycle tips over, the tip over sensor sends a
(FUEL SHUT-OFF)	signal to the ECM. Then, this signal cuts OFF current sup-
	plied to the fuel pump, fuel injectors and ignition coils.
OVER-REV. LIMITER SIGNAL	The fuel injectors stop operation when engine rpm reaches
	rev. limit rpm.

FI SYSTEM PARTS LOCATION




FI SYSTEM WIRING DIAGRAM



CVT SYSTEM TECHNICAL FEATURES

The CVT reduction ratio is controlled in relation to Actual CVT ratio and Target CVT ratio.

The reduction ratio as detected by the CVT pulley position sensor is compensated for more accurate valve as Actual CVT ratio by comparing with the signals from the crankshaft position sensor and CVT secondary pully revolution sensor.

Target CVT ratio is calculated on the basis of the target engine speed as determined by the speed sensor and the throttle position sensor.



CVT SYSTEM PARTS LOCATION





The CVT control unit adjusts the CVT reduction ratio by making the pulley wider or narrower. The slide pulley movement is controlled by the CVT motor revolution.

The secondary pulley squeezes the CVT belt with the spring force and the width of pulley adjusts itself in accordance with that of the primary pulley.



SELF-DIAGNOSIS FUNCTION

The self-diagnosis function is incorporated in the ECM. The function has two modes, "User mode" and "Dealer mode". The user can only be notified by the LCD (DISPLAY) panel and FI light. To check the function of the individual FI system devices, the dealer mode is prepared. In this check, the special tool is necessary to read the code of the malfunction items.

USER MODE

MALFUNCTION	LCD (DISPLAY) INDICATION	FI LIGHT INDICATION	INDICATION # MODE
"NO"	Odometer		
"YES"	Odometer and "FI" letters	FI light turns ON.	Each 2 sec. Odometer or "FI" is indicated.
Engine can start	*1		
Engine can not start	"FI" letters	FI light turns ON	"FI" is indicated
	*2	and blinks.	continuously.

*1

When one of the signals is not received by ECM, the fail-safe circuit works and injection is not stopped. In this case, "FI" and odometer are indicated in the LCD panel and motorcycle can run.

*2

The injection signal is stopped, when the crankshaft position sensor signal, tip over sensor signal, #1/#2 ignition signals, #1/#2 injector signals, fuel pump relay signal or ignition switch signal is not sent to ECM. In this case, "FI" is indicated in the LCD panel. Motorcycle does not run.

"CHEC": The LCD panel indicates "CHEC" when no communication signal from the ECM is received for 3 seconds.

For Example

: The ignition switch is turned ON, and the engine stop switch is turned OFF. In this case, the speedometer does not receive any signal from the ECM, and the panel indicates "CHEC".

If CHEC is indicated, the LCD does not indicate the trouble code. It is necessary to check the wiring harness between ECM and speedometer couplers.

The possible cause of this indication is as follows;

Engine stop switch is in OFF position. Ignition fuse is burnt.

DEALER MODE

The defective function is memorized in the computer. Use the special tool's coupler to connect to the dealer mode coupler. The memorized malfunction code is displayed on LCD (DISPLAY) panel. Malfunction means that the ECM does not receive signal from the devices. These affected devices are indicated in the code form.

09930-82720: Mode select switch





CAUTION

Before checking the malfunction code, do not disconnect the ECM lead wire couplers. If the couplers from the ECM are disconnected, the malfunction code memory is erased and the malfunction code can not be checked.

MALFUNCTION	LCD (DISPLAY) INDICATION	FI LIGHT INDICATION	INDICATION MODE
"NO"	C00		
"YES"	C** code is indicated from small numeral to large one.	FI light turns OFF.	For each 2 sec., code is indicated.

CODE	MALFUNCTION PART	REMARKS
C00	None	No defective part
C11	Camshaft position sensor (CMPS)	
C12	Crankshaft position sensor (CKPS)	Pick-up coil signal, signal generator
C13	Intake air pressure sensor (IAPS)	
C14	Throttle position sensor (TPS)	
C15	Engine coolant temp. sensor (ECTS)	
C16	Speed sensor	Speed sensor signal for FI system
C21	Intake air temperature sensor (IATS)	
C22	Atmospheric pressure sensor (APS)	
C23	Tip over sensor (TOS)	
C24	Ignition signal #1 (IG coil #1)	For #1 cylinder
C25	Ignition signal #2 (IG coil #2)	For #2 cylinder
C32	Fuel injector signal #1	For #1 cylinder
C33	Fuel injector signal #2	For #2 cylinder
C40	Idle air control valve (IAC valve)	
C41	Fuel pump control system (FP control system)	Fuel pump, Fuel pump relay
C42	Ignition switch signal (IG switch signal)	Anti-theft
C44	Heated oxygen sensor (HO2S)	E-02, 19
C50	CVT serial communication	
C51	CVT motor	
C52	CVT pulley position sensor	
C53	CVT speed sensor	Speed sensor signal for CVT system
C54	CVT secondary pulley revolution sensor	
C55	CVT engine revolution signal	
C56	CVT throttle position signal	
C58	CVT reduction ratio disagreement	

In the LCD (DISPLAY) panel, the malfunction code is indicated from small code to large code.

TPS ADJUSTMENT

- 1. Warm up the engine and adjust the engine idle speed to 1 200 \pm 100 rpm. (2-18)
- 2. Stop the engine.
- 3. Connect the special tool (Mode select switch) and select the dealer mode.
- 4. If the throttle position sensor adjustment is necessary, loosen the screw and turn the throttle position sensor and bring the line to middle.
- 5. Then, tighten the screw to fix the throttle position sensor.

= C 00 = C 00 = C 00

 $\leftarrow \text{Incorrect}$

← Correct position

← Incorrect





FAIL-SAFE FUNCTION

FI system/CVT 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
Camshaft position sensor	When camshaft position signal has	"NO"	"YES"
	failed during running, the ECM determines cylinder as # before occurrence of such a failure.	Motorcycle can ru stops, engine	n, but once engine can not start.
Crankshaft position sensor	The motorcycle stops.	"NO"	"NO"
Intake air pressure sensor	Intake air pressure is fixed to 760 mmHg.	"YES"	"YES"
Throttle position sensor	The throttle opening is fixed to full open position. Ignition timing is also fixed.	"YES"	"YES"
Engine coolant temp. sensor	Engine coolant temperature value is fixed to 80 °C.	"YES"	"YES"
Intake air temperature sensor	Intake air temperature value is fixed to 40 °C.	"YES"	"YES"
Atmospheric pressure sensor	Atmospheric pressure is fixed to 760 mmHg.	"YES"	"YES"
Ignition signal #1 (IG coil #1)	#1 Ignition-off	"YES"	"YES"
		#2 cylinde	er can run.
Ignition signal #2 (IG coil #2)	#2 Ignition-off	"YES"	"YES"
		#1 cylinde	er can run.
Injection signal #1	#1 Fuel-cut	"YES"	"YES"
		#2 cylinde	er can run.
Injection signal #2	#2 Fuel-cut	"YES"	"YES"
		#1 cylinde	er can run.
HO2 sensor (E-02, 19)	Feedback compensation is inhibited. (Air/fuel ratio is fixed to normal.)	"YES"	"YES"
CVT motor	Current supply to motor is inter- rupted.	"YES"	"YES"
CVT pulley position sensor	Automatic mode: Shifting to manual	"YES"	"YES"
CVT speed sensor	mode is inhibited. Reduction ratio is	"YES"	"YES"
CVT secondary pulley revolution sensor	fixed to an equivalent to 2nd range. Manual mode: During running on	"YES"	"YES"
CVT engine revolution signal	2nd or higher range, the reduction ratio is fixed to an equivalent to 2nd range. If running on 1st range, it is fixed to 1st range. All shifting is inhibited.	"YES"	"YES"
CVT throttle position signal	Throttle position signal is fixed to 30% open.	"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/ CVT SYSTEM TROUBLESHOOTING CUSTOMER COMPLAINT ANALYSIS

Record details of the problem (failure, complaint) and how it occurred as described by the customer. For this purpose, use of such an inspection form will facilitate collecting information to the point required for proper analysis and diagnosis.

EXAMPLE: CUSTOMER PROBLEM INSPECTION FORM

User name:	Model:	VIN:	CVT No.:
Date of issue:	Date Reg.	Date of problem:	Mileage:

Shift mode	□ Automatic (Normal·Power) □ Manual (1st·2nd·3rd·4th·5th)	
Malfunction indicator		
lamp condition (LED)		
Malfunction display/code	User mode: 🗆 No display 🛛 Malfunction display ()	
(LCD)	Dealer mode: No code Malfunction code ()	

PROBLEM SYMPTOMS		
Difficult Starting	Poor Driveability	
🗆 No cranking	Hesitation on acceleration	
No initial combustion	□ Back fire/□ After fire	
No combustion	□ Lack of power	
Poor starting at	Surging	
(🗆 cold 🛛 warm 🗌 always)	Abnormal knocking	
□ Other	□ CVT will not shift	
	Engine rpm jumps briefly	
	□ Other	
Poor Idling	Engine Stall when	
Poor fast Idle	Immediately after start	
Abnormal idling speed	\Box Throttle valve is opened	
(High 🛛 Low) (r/min)	\Box Throttle valve is closed	
Unstable	\Box Load is applied	
□ Hunting (r/min. to r/min)	□ Other	
□ Other		
□ OTHERS:		

MOTORCYCLE/ENVIRONMENTAL CONDITION WHEN PROBLEM OCCURS		
	Environmental condition	
Weather	🗆 Fair 🔲 Cloudy 📋 Rain 🔲 Snow 📋 Always 📋 Other	
Temperature	🗆 Hot 🗆 Warm 🗀 Cool 🗆 Cold (🛛 °F/ 🛛 °C) 🗀 Always	
Frequency	🗆 Always 🔲 Sometimes (times/ day, month) 🗆 Only once	
	Under certain condition	
Road	🗆 Urban 🔲 Suburb 🔲 Highway 🗌 Mountainous (🗌 Uphill 🔲 Downhill)	
	🗆 Tarmacadam 🔲 Gravel 🗌 Other	
Motorcycle condition		
Engine condition	🗆 Cold 🔲 Warming up phase 🗌 Warmed up 📄 Always 🗌 Other at starting	
	\Box Immediately after start \Box Racing without load \Box Engine speed (r/min)	
Motorcycle con-	During driving: 🗌 Constant speed 🔲 Accelerating 🗌 Decelerating	
dition	\Box Right hand corner \Box Left hand corner \Box When shifting (Gear position)	
	□ At stop □ Motorcycle speed when problem occurs (km/h, Mile/h)	
	□ Other	

NOTE:

The above form is a standard sample. It should be modified according to conditions characteristic of each market.

SELF-DIAGNOSTIC PROCEDURES

- Don't disconnect couplers from ECM/CVT control unit, battery cable from battery, ECM ground wire harness from engine or main fuse before confirming malfunction code (self-diagnostic trouble code) stored in memory. Such disconnection will erase memorized information in ECM memory.
- Malfunction code stored in ECM memory can be checked by the special tool.
- Before checking malfunction code, read SELF-DIAGNOSIS FUNCTION "USER MODE and DEALER MODE" (CF6-18) carefully to have good understanding as to what functions are available and how to use it.
- Be sure to read "PRECAUTIONS for Electrical Circuit Service" (5.7.6-2) before inspection and observe what is written there.
- · Lift the seat.
- Connect the special tool to the dealer mode coupler (A) at the wiring harness, and start the engine or crank the engine for more than 4 seconds.
- Turn the special tool's switch ON and check the malfunction code to determine the malfunction part.

09930-82720: Mode select switch







SELF-DIAGNOSIS RESET PROCEDURE

- After repairing the trouble, turn OFF the ignition switch and turn ON again.
- If the malfunction code indicates (C00), the malfunction is cleared.
- Disconnect the special tool from the dealer mode coupler.



MALFUNCTION CODE AND DEFECTIVE CONDITION

MALFUNCTION		DETECTED FAILURE CONDITION
CODE	DETECTEDITEM	CHECK FOR
C00	NO FAULT	
	Camshaft position	The signal does not reach ECM for more than 2 sec. after
	sensor	receiving the starter signal.
C11		The camshaft position sensor wiring and mechanical parts.
		(Camshaft position sensor, intake cam pin, wiring/coupler con-
		nection)
	Crankshaft position	The signal does not reach ECM for more than 2 sec. after
C12	sensor	receiving the starter signal.
012		The crankshaft position sensor wiring and mechanical parts.
		(Crankshaft position sensor, wiring/coupler connection)
	Intake air pressure	The sensor should produce following voltage.
C13	sensor	(0.50 V \leq sensor voltage < 4.85 V)
010		Without the above range, C13 is indicated.
		Intake air pressure sensor, wiring/coupler connection.
	Throttle position	The sensor should produce following voltage.
C14	sensor	$(0.20 \text{ V} \leq \text{sensor voltage} < 4.80 \text{ V})$
011		Without the above range, C14 is indicated.
		Throttle position sensor, wiring/coupler connection.
	Engine coolant	The sensor voltage should be the following.
C15	temperature sensor	$(0.15 \text{ V} \leq \text{sensor voltage} < 4.85 \text{ V})$
		Without the above range, C15 is indicated.
		Engine coolant temperature sensor, wiring/coupler connection.
	Speed sensor	The speed sensor signal is not input for more than 3 sec. during
C16		vehicle deceleration.
		Speed sensor, wiring/coupler connection.
	Intake air temperature	The sensor voltage should be the following.
C21	sensor	$(0.15 \text{ V} \leq \text{sensor voltage} < 4.85 \text{ V})$
		Without the above range, C21 is indicated.
		Intake air temperature sensor, wiring/coupler connection.
	Atmospheric pressure	The sensor voltage should be the following.
C22	sensor	$(0.50 \text{ V} \leq \text{sensor voltage} < 4.85 \text{ V})$
		Atm. pressure sensor, wiring/coupler connection.
	Tip over sensor	The sensor voltage should be the following for more than 2 sec.
<u></u>		alter ignition switch turns ON. (0.20 V \leq concerveltage ≤ 4.80 V)
623		$(0.20 \text{ V} \ge \text{Sellsof Vollage} < 4.80 \text{ V})$
	Ignition gignal	Crenkehoft position concer (nick up coil) signal is produced but
	Ingrituori Signal	signal from ignition coil is interrupted continuous by 4 times or
C24 or C25		more in this case the code C24 or C25 is indicated
024 01 023		Ignition coil wiring/coupler connection power supply from the
		hattery
		Suitory.

	Fuel injector	Crankshaft position sensor (pick-up coil) signal is produced but
		fuel injector signal is interrupted continuous by 4 times or more.
C32 or C33		In this case, the code C32 or C33 is indicated.
		Injector, wiring/coupler connection, power supply to the injector.
0.40	Intake air control (IAC)	No IAC valve voltage is supplied after starting the engine.
C40	valve	IAC valve, wiring/coupler connection.
	Fuel pump relay	No voltage is applied to fuel pump although fuel pump relay is
		turned ON, or voltage is applied to fuel pump although fuel
C41		pump relay is turned OFF.
		Fuel pump relay, connecting lead, power source to fuel pump
		relay.
C 10	Ignition switch	Ignition switch signal is not input in the ECM.
042		Ignition switch, lead wire/coupler.
	Heated oxygen sensor	During O2 feedback control, O2 sensor voltage is higher or
	(HO2S) [E-02, 19]	lower than the specification.
C14		No signal is detected during engine operation or no electrical
044		power is supplied from battery.
		HO2S lead wire/coupler connection.
		Battery voltage supply to the HO2S.
	CVT serial	No signal is supplied from CVT control unit to ECM for more
C50	communication	than 5 sec. after starting the engine.
		Wiring/coupler connection.
	CVT motor	The CVT motor operating voltage is not supplied from CVT
C51		control unit
		CVT motor, wiring/coupler connection.
	CVT pulley position	The sensor should produce following voltage.
C52	sensor	$(0.06 \leq \text{sensor voltage} \leq 5.04)$
		Without the above range, C52 is indicated.
		CVI pulley position sensor, wiring/coupler connection.
0.50	CVT speed sensor	The CVT speed sensor signal is not input to CVT control unit
C53		for more than 3 sec. during vehicle rurning.
		Speed sensor, wiring/coupler connection.
	CVT secondary pulley	The CVT secondary pulley revolution signal is not input to CVT
C54	revolution sensor	control unit at speed of 20 km or nigner.
		CVT secondary pulley revolution sensor, wiring/coupler con-
	OV/T an air a manual ation	nection.
055	CVI engine revolution	The CVT engine revolution signal is not input to CVT control
055	signal	
	O(T + b)	Wiring/coupler connection.
050	cvir inrollie position	The CVT infollie position signal does not reach for more than 5
000	Signal	
	CV/T reduction ratio	The CVT pulley position signal discretes with actual revalution
C 5 9	disagreement	ratio for more than 4 sec
008	usayreement	
1		FFS, GVT beit, GVT primary pulley/secondary pulley.

"C11" CMP SENSOR CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
No CMP sensor signal for more than 2 seconds after receiving the starter signal.	 Metal particles or foreign material being attached on the CMP sensor and rotor tip. CMP sensor circuit open or short. CMP sensor malfunction. ECM malfunction

INSPECTION

• Remove the maintenace lid. (- 9-13)



and inspect it again.









"C12" CKP SENSOR CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
No CKP sensor signal for more than 2 seconds after receiving the starter signal.	 Metal particles or foreign material being attached on the CKP sensor and rotor tip. CKP sensor circuit open or short. CKP sensor malfunction. ECM malfunction.

INSPECTION

• Remove the maintenance lid. (239-13)



and inspect it again.









"C13" IAP SENSOR CIRCUIT MALFUNCTION





one, and inspect it again.

Output voltage (Vcc voltage 4.5 – 5.0 V, ambient temp. 20 – 30 °C, 68 – 86 °F)

ALTI	TUDE	ATMOS	PHERIC	OUTPUT
(Refe	rence)	PRES	SURE	VOLTAGE
(ft)	(m)	(mmHg)	kPa	(V)
0	0	760	100	
				3.1 – 3.6
2 000	610	707	94	
2 001	611	707	94	
				2.8 – 3.4
5 000	1 524	634	85	
5 001	1 525	634	85	
				2.6 – 3.1
8 000	2 438	567	76	
8 001	2 439	567	76	
				2.4 – 2.9
10 000	3 048	526	70	

Red

"C14" TP SENSOR CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
Output voltage low or high.	 TP sensor maladjusted.
$(0.20 \text{ V} \leq \text{Sensor voltage} < 4.80 \text{ V})$	 TP sensor circuit open or short.
without the above range.	TP sensor malfunction.
	ECM malfunction.

INSPECTION

• Remove the maintenance lid. (39-13)





"C15" ECT SENSOR CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
Output voltage low or high.	ECT sensor circuit open or short.
(0.15 V \leq Sensor voltage < 4.85 V)	 ECT sensor malfunction.
without the above range.	ECM malfunction.

INSPECTION

• Remove the maintenance lid. (39-13)



ECM coupler







Engine Coolant Temp.	Resistance
20 °C (68 °F)	Approx. 2.45 k Ω
50 °C (112 °F)	Approx. 0.811 kΩ
80 °C (176 °F)	Approx. 0.318 k Ω
110 °C (230 °F)	Approx. 0.142 kΩ

"C16" SPEED SENSOR CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
The speed sensor signal is not input to ECM for more than 3 sec. during vehicle deceleration.	 Speed sensor circuit open or short. Metal particles or foreign material being attached on the speed sensor. Speed sensor malfunction. ECM malfunction.

INSPECTION

• Remove the foot board. (3-9-18) 1 Turn the ignition switch OFF. Check the speed sensor lead wire coupler ① for loose or poor contacts. If OK, then measure the speed sensor input voltage. Insert the copper wires to the lead wire coupler. Turn the ignition switch ON. Measure the speed sensor input voltage at the coupler between \oplus O/R and \bigcirc B/W wire. **DATA** Speed sensor input voltage: More than 7 V (**⊕**O/R – **⊝**B/W) 09900-25008: Multi circuit tester Tester knob indication: Voltage (----) NG Loose or poor contacts on the ECM couplers. Open or short circuit in the O/R wire or B/W wire. OK 2 Remove the speed sensor. Clean away metal particles or foreign material. Next page











Recheck ECM coupler for loose or poor contacts. Replace ECM with a new one and inspect it again.



"C21" IAT SENSOR CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
Output voltage low or high.	 IAT sensor circuit open or short.
$(0.15 \text{ V} \leq \text{Sensor voltage} < 4.85 \text{ V})$	 IAT sensor malfunction.
without the above range.	ECM malfunction.

INSPECTION

• Remove the front box. (2-9-18)









Intake Air Temp.	Resistance
20 °C(68 °F)	Approx. 2.45 k Ω
50 °C (112 °F)	Approx. 0.808 k Ω
80 °C (176 °F)	Approx. 0.322 kΩ
110 °C (230 °F)	Approx. 0.148 kΩ

NOTE:

IAT sensor resistance measurement method is the same way as that of the ECT sensor. Refer to page 8-13 for details.

"C22" AP SENSOR CIRCUIT MALFUNCTION





Output voltage (Vcc voltage 4.5 - 5.0 V, ambient temp. 20 - 30 °C, 68 - 86 °F)

ALTI	TUDE	ATMOS	PHERIC	OUTPUT
(Refe	rence)	PRES	SURE	VOLTAGE
(ft)	(m)	(mmHg)	kPa	(V)
0	0	760	100	
				3.1 – 3.6
2 000	610	707	94	
2 001	611	707	94	
				2.8 - 3.4
5 000	1 524	634	85	
5 001	1 525	634	85	
				2.6 – 3.1
8 000	2 438	567	76	
8 001	2 439	567	76	
				2.4 – 2.9
10 000	3 048	526	70	

"C23" TO SENSOR CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
Output voltage low or high.	TO sensor circuit open or short.
(0.20 V \leq Sensor voltage < 4.80 V	TO sensor malfunction.
without the above range.	ECM malfunction.

INSPECTION

- Remove the front panel. (3-9-8)
- Turn the ignition switch OFF.
 Check the TO sensor coupler for loose or poor contacts. If OK, then measure the TO sensor resistance.
 Disconnect the TO sensor coupler.
 Measure the resistance between Red and B/Br wire terminals.
- **DATA** TO sensor resistance: 19.1 19.7 k Ω (Red B/Br)
- 09900-25008: Multi circuit tester
- **Tester knob indication: Resistance (** Ω **)**

No Replace the TO sensor with a new one.

2 Connect the TO sensor coupler. Insert the copper wires to the lead wire coupler. Turn the ignition switch ON. Measure the voltage at the wire side coupler between

and B/Br wires.

DATA TO sensor voltage: Less than 1.4 V (B – B/Br)

Also, measure the voltage when leaning of the motorcycle. Dismount the TO sensor from its bracket and measure the voltage when it is leaned more than 65°, left and right, from the horizontal level.

DATA TO sensor voltage: More than 3.7 V (B – B/Br)

09900-25008: Multi circuit tester

Tester knob indication: Voltage (----)

No Loose or poor contacts on the ECM coupler. Open or short circuit. Replace the TO sensor with a new one. Yes

Red, B or B/Br wire open or shorted to ground, or poor 48, (48) or (59) 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 new one, and inspect it again.









"C24" or "C25" IGNITION SYSTEM MALFUNCTION *Refer to the IGNITION SYSTEM for details. (CF10-18) "C32" or "C33" FUEL INJECTOR CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
CKP signal is produced but fuel injector signal is	Injector circuit open or short.
interrupted continuous by 4 times or more.	Injector malfunction.
	ECM malfunction.

INSPECTION

• Remove the front box. (3-9-18)











"C40" IAC VALVE CIRCUIT MALFUNCTION

*Refer to the IAC VALVE INSPECTION for details. (\bigcirc 7-20)



"C41" FP RELAY CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
No voltage is applied to fuel pump although fuel	 Fuel pump relay circuit open or short.
pump relay is turned ON, or voltage is applied to	 Fuel pump relay malfunction.
fuel pump although fuel pump relay is turned OFF.	ECM malfunction.

INSPECTION

- Remove the front box. (3-9-18)
- Turn the ignition switch OFF.
 Check the FP relay coupler for loose or poor contacts.
 If OK, then check the insulation and continuity. Refer to page 10-28 for details.



Y/G or O/W wire open or shorted to ground, or poor 9 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 new one, and inspect it again.

"C42" IG SWITCH CIRCUIT MALFUNCTION

* Refer to the IGNITION SWITCH INSPECTION for details.

• Remove the leg shield. (1-35)





ECM couplers



"C44" HO2 SENSOR (HO2S) CIRCUIT MALFUNCTION (E-02, 19)

DETECTED CONDITION	POSSIBLE CAUSE
During O2 feedback control, O2 sensor voltage is	HO2 sensor or its circuit open or short.
higher or lower than the specification.	 Fuel system malfunction.
No signal is detected during engine operation, or no	ECM malfunction.
electrical power is supplied from battery.	

INSPECTION

• Remove the foot board. (39-18)

Yes

 1 Turn the ignition switch OFF.
 Check the HO2 sensor coupler for loose or poor contacts. Insert the copper wires to the HO2 sensor lead wire coupler. Warm up the engine enough. Measure the HO2 sensor output voltage at the coupler (between Black and Gray wires) when idling condition. Also, measure the HO2 sensor output voltage while holding the engine speed at 3 000 r/min.
 Image HO2 sensor output voltage at idle speed: Less than 0.4 V (⊕ B – ⊖ Gr) HO2 sensor output voltage at 3 000 r/min: More than 0.6 V (⊕ B – ⊖ Gr)
 Image 09900-25008: Multi circuit tester
 Image 109900-25008: Multi circuit tester
 Image 109900-25008: Multi circuit tester
 Image 109900-25008: Multi circuit tester

a new one.







"C50" CVT SERIAL COMMUNICATION CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
No signal is supplied from CVT control unit to ECM	"C58" circuit open or short.
for more than 5 sec. after starting the engine.	 CVT control unit malfunction.
	ECM malfunction.

INSPECTION



"C51" CVT MOTOR CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
CVT motor operating voltage is not supplied from	CVT motor circuit open or short.
CVT control unit.	CVT motor malfunction.
	CVT control unit malfunction.

INSPECTION

- Remove the foot board. (39-18)
- Place the motorcycle on the center stand and put the side stand in.











3 Remove the CVT motor.

Apply 12 volts to the terminals of the CVT motor lead wire coupler.

Check the CVT motor movement.

Then, swap the wires supplied 12 volts and check the movement.

Check the CVT motor both way movements.



Replace the ECM with a new one, and inspect it again.





"C52" CVT PULLEY POSITION SENSOR (PPS) CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
PPS voltage low or high.	PPS circuit open or short.
(0.06 V \leq Sensor voltage \leq 5.04 V)	PPS malfunction.
without the above range.	 CVT control unit malfunction.

INSPECTION

- Remove the foot board. (3-9-18)
- Place the motorcycle on the center stand and put the side stand in.















3



Replace the ECM with a new one, and inspect it again.
"C53" CVT SPEED SENSOR CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
The speed sensor signal is not input to CVT control	 Speed sensor circuit open or short.
unit for more than 3 sec. during vehicle running.	Metal particles or foreign material being attached
	on the speed sensor.
	 Speed sensor malfunction.
	CVT control unit malfunction.

INSPECTION

• Remove the foot board. (3-9-18)









 Check the speed sensor output voltage. Insert the copper wires to the lead wire caupler. (White – Black/White) Turn the ignition switch ON. Check that the voltage varies when a screwdriver is brought close to the pick-up face of the speed sensor.
 09900-25008: Multi circuit tester
 Tester knob indication: Voltage (---)

NG Short circuit in the lead wire. Replace the speed sensor with a new one.

Recheck the CVT control unit coupler for loose or poor contacts.

Replace the CVT control unit with a new one and inspect it again.





"C54" CVT SECONDARY PULLEY REVOLUTION SENSOR CIRCUIT MAL-FUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
The CVT secondary pulley revolution signal is not	Sensor circuit open or short.
input to CVT control unit at speed of 20 km or	• Metal particles or foreign material being attached
higher.	on the speed sensor.
	 Revolution sensor malfunction.
	CVT control unit malfunction.

INSPECTION

- Remove the foot board. (39-18)
- Place the motorcycle on the center stand and put the side stand in.



09900-25008: Multi circuit tester

 \square Tester knob indication: Resistance (Ω)

NG Replace the revolution sensor with a new one.

 OK
 2 Remove the revolution sensor lead wire coupler. Start the engine and measure the revolution sensor peak voltage at idle speed.

Revolution sensor peak voltage : More than 5.0 V (at idle speed) (+Yellow – -White)

Repeat the above procedure a few times and measure the highest peak voltage.

09900-25008: Multi circuit tester

Tester knob indication: Voltage (----)

OK Loose or poor contacts on the CVT control unit coupler. CVT control unit malfunction.

↓ NG Next page







3 Remove the CVT assembly. (5-2)
 Remove the CVT secondary pulley revolution sensor ②.
 Clean away metal particles or foreign material.

It "C54" code is indicated, replace the CVT control unit.





"C55" CVT ENGINE REVOLUTION SIGNAL CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
The CVT engine revolution signal is not input to	Lead wire open or short.
CVT control unit from ECM at speed of 20 km or	ECM malfunction.
higher.	 CVT control unit malfunction.

INSPECTION

- Remove the front panel. (239-8)
- Place the motorcycle on the center stand and put the side stand in.



If OK, check the CVT engine revolution signal.

Insert the copper wire to the ③ (Br/W) wire of the CVT control unit coupler.

Start the engine and measure the signal voltage between \oplus Br/W (③) wire and \bigcirc Ground.

NOTE:

Do not need to disconnect any couplers.

CVT engine revolution signal: Approx. 2.5 V

(⊕Br/W – ⊝Ground)

09900-25008: Multi circuit tester



NG Short circuit in the Br/W lead wire. Loose or poor contacts. ECM malfunction.

OK

Loose or poor contacts on the CVT control unit couplers.

CVT control unit malfunction.





"C56" CVT THROTTLE POSITION SIGNAL CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE	
The CVT throttle position signal is not input to CVT	Lead wire open or short.	
control unit from ECM for more than 5 sec. after	ECM malfunction.	
ignition switch turns ON.	CVT control unit malfunction.	

INSPECTION



ECM couplers

"C58" CVT REDUCTION RATIO DISAGREEMENT

DETECTED CONDITION	POSSIBLE CAUSE
The revolution ratio detected by CVT pulley position	PPS is stuck immovable.
sensor (PPS) disagrees with actual revolution ratio	Foreign substance such as water, oil or metal parti-
for more than 4 sec.	cle has entered CVT assembly.

INSPECTION



module) with a new one and inspect it again.

SENSORS

THROTTLE POSITION SENSOR (TPS) SETTING

• After all adjustments are completed, check or adjust the TPS setting condition.

TPS SETTING PROCEDURE (CF6-20)



CMP SENSOR

The signal rotor is installed on the exhaust camshaft, and the camshaft position sensor (Pick-up coil) is installed on the cylinder head cover. (276-27)

CKP SENSOR

The signal rotor is mounted on the generator rotor, and the crankshaft position sensor (Pick-up coil) is installed above the rotor. (26-28)

IAP SENSOR

The intake air pressure sensor is located at the right side of the air chamber. (76-29)





TP SENSOR

• The throttle position sensor is installed on the No.2 throttle body. (236-31)

ECT SENSOR

- The engine coolant temperature sensor is installed on the cylinder head. (2.36-33)
- ECT sensor: 18 N·m (1.8 kgf-m, 13.0 lb-ft)

SPEED SENSOR

• The speed sensor is installed on the final gear case. ($\square F6-34$)

IAT SENSOR

• The intake air temperature sensor is installed on the right side of the air chamber. (236-36)

AP SENSOR

• The atmospheric pressure sensor is located at the right side of the leg shield brace. (2.76-37)











TO SENSOR

• The tip over sensor is located under the combination meter. (

NOTE:

When installing the TO sensor, bring the "UPPER" letter to the top.

HO2 SENSOR (E-02, 19)

The heated oxygen sensor is installed on the exhaust pipe.
 (1) F6-42)

A WARNING

Do not remove the HO2 sensor while it is hot.

CAUTION

Be careful not to expose it to excessive shock. Do not use an impact wrench while removing or installing the HO2 sensor unit.

Be careful not to twist or damage the sensor lead wire.

CAUTION

Do not apply oil or other materials to the sensor air hole.

HO2 SENSOR: 47.5 N·m (4.75 kgf-m, 34.3 lb-ft)

CVT PULLEY POSITION SENSOR

• The CVT pulley position sensor is mounted on the CVT cover. (5.76-47)

CVT SECONDARY PULLEY REVOLUTION SENSOR

 The secondary pulley revolution sensor is located underneath the CVT assembly. (236-51)









FUEL SYSTEM AND THROTTLE BODY

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THROTTLE VALVE SYNCHRONIZATION

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

FUEL SYSTEM FUEL TANK COMPONENTS



FUEL TANK REMOVAL

The fuel tank is located under the seat.

- Remove the following parts. (29-6)
 - * Seat
- * Pillion rider handles
- * Battery cover
- * Lower frame cover
- * Center frame cover* Frame covers
- * Helmet box cover
- * Helmet box
- Loosen the fuel tank inlet hose clamp.
- Disconnect the fuel tank breather hose ①.
- Remove the fuel tank inlet hose ② along with the fuel tank inlet pipe ③.

- Disconnect the fuel pump/fuel level gauge coupler ④.
- Disconnect the fuel feed hose (5).
- Disconnect the fuel cut valve hose 6.

• Remove the fuel tank mounting bolts.









• Remove the fuel tank sideward.

A WARNING

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



FUEL TANK INSTALLATION

Installation is in the reverse order of removal.

TANK PRESSURE CONTROL (TPC) VALVE INSPECTION

Two kinds of the TPC valve are equipped in the fuel tank, they can be distinguished by the color.

Fuel inlet side: ① Gray/Black

Fuel tank side: 2 Orange/Black





Check TPC valve if air can pass through smoothly when blown from the orange color side or gray color side and not from the other side.

Should any abnormal condition be found, replace the valve with a new one.



FUEL PRESSURE INSPECTION

- Remove the front box. (3-9-18)
- Place a rag under the fuel feed hose.
- Disconnect the fuel feed hose at the fuel delivery pipe, and install the special tools between the fuel feed hose and fuel delivery pipe.
- 09940-40211: Fuel pressure gauge adaptor
 09940-40220: Fuel pressure gauge hose attachment
 09915-77330: Oil pressure gauge
 09915-74520: Oil pressure gauge hose

Turn the ignition switch ON and check the fuel pressure.

DATA Fuel pressure: Approx. 300 kPa (3.0 kgf/cm², 43 psi)

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

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

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

- * Fuel pump check valve
- * Pressure regulator

A WARNING

- * Before removing the special tools, turn the ignition switch to OFF position and release the fuel pressure slowly.
- * Gasoline is highly flammable and explosive. Keep heat, spark and flame away.





FUEL PUMP INSPECTION

Turn the ignition switch ON and check that the fuel pump operates for few seconds.

If the fuel pump motor does not make operating sound, replace the fuel pump assembly or inspect the fuel pump relay and tip over sensor.

FUEL DISCHARGE AMOUNT INSPECTION

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

- Remove the front box. (19-18)
- Disconnect the fuel feed hose from the fuel delivery pipe.
- Place the measuring cylinder and insert the fuel feed hose end into the measuring cylinder.
- Disconnect the ECM lead wire coupler.
- With the lead wire's fastener (A) unlocked, pull out the power source lead wire (Yellow with red tracer) ①.
- Apply 12 volts to the fuel pump for 30 seconds and measure the amount of fuel discharged.

If the pump does not discharge the amount specified, it means that the fuel pump is defective or that the fuel filter is clogged.

Fuel discharge amount: More than 900 ml/30 sec. (30.4/31.7 US/Imp oz)/30 sec.





NOTE:

The battery must be in fully charged condition.

FUEL PUMP RELAY INSPECTION

Fuel pump relay is located behind the front panel.

- Remove the front panel.
- Remove the fuel pump relay.

First, check the insulation between ① and ② terminals with pocket tester. Then apply 12 volts to ③ and ④ terminals, ⊕ to ③ and \bigcirc to ④, and check the continuity between ① and ②. If there is no continuity, replace it with a new one.





FUEL PUMP COMPONENTS



FUEL PUMP/FUEL LEVEL GAUGE REMOVAL AND DISASSEMBLY

- Remove the seat and battery cover.
- Disconnect the fuel pump/fuel level gauge coupler ①.
- Disconnect the fuel feed hose 2.

NOTE:

The fuel pump can be removed without removing the fuel tank.



• Remove the fuel pump ring locknut by using the special tool.

09941-51010: Ring locknut wrench

A WARNING

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

• Remove the fuel pump assembly.





• Disconnect the fuel level gauge lead wire coupler.

• Remove the fuel level gauge.

- Disconnect the ground wire.
- Remove the fuel pressure regulator.







111

• Disconnect the fuel pump lead wire coupler and ground wire.

• Remove the fuel pump lower case ①.

- Disconnect the fuel feed hose 2.

• Disconnect the fuel pump lead wire coupler.

• Remove the fuel pump from its holder.







FUEL MESH FILTER INSPECTION AND CLEANING

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

NOTE:

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

FUEL LEVEL GAUGE INSPECTION

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

09900-25008: Multi-circuit tester

Fuel level position	Resistance between terminals
130 mm (F)	11 – 13 Ω
82 mm (½)	Approx. 71.5 Ω
23 mm (E)	130 – 150 Ω

If the resistance measured is out of the specification, replace the gauge with a new one.

Fuel meter inspection (1710-27)





FUEL PUMP/FUEL LEVEL GAUGE REASSEMBLY AND INSTALLATION

Install the fuel pump/fuel level gauge in the reverse order of removal and disassembly, and pay attention to the following points:

- Install the new O-rings to the fuel pump, fuel pressure regulator and fuel feed hose.
- Apply thin coat of the engine oil to the O-rings.

CAUTION

coupler.

Use the new O-rings to prevent fuel leakage.











• Install the fuel pump to its holder and connect the lead wire

• Connect the fuel feed hose securely.

• Install the fuel pressure regulator and ground wire.

• Install the fuel level gauge.

• Connect the fuel pump lead wire coupler, ground wire and fuel level gauge lead wire coupler.

- Install the new seal ring to the fuel tank.
- Install the fuel pump assembly.







- Align the alignment marks A and B in line.



• Using the special tool, tighten the fuel pump ring locknut to the specified torque.

09941-51010: Ring locknut wrench
 Ring locknut: 33 N·m (3.3 kgf-m, 24 lb-ft)



THROTTLE BODY THROTTLE BODY COMPONENTS



THROTTLE BODY REMOVAL

- Remove the front box. (3-9-18)
- Disconnect the PCV hose from the bottom side of the air cleaner box.
- Remove the air cleaner box 1.

- Remove the IAP sensor 2.
- Disconnect the IAT sensor coupler ③.

• Remove the PAIR solenoid valve ④.

• Loosen the respective throttle body clamp screws (air chamber side).











- Disconnect the IAC hose (5).
- Remove the air chamber 6.

Disconnect the various lead wire couplers.
 ⑦ TPS
 ⑧ IAC valve
 ⑨ FI

• Disconnect the fuel feed hose 10.

• Disconnect the throttle cables.

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.

- Loosen the respective throttle body clamp screws (intake pipe side).
- Remove the throttle body assembly.



THROTTLE BODY DISASSEMBLY

- Remove the IAC hose.
- Remove the vacuum hoses.

• Remove the fuel delivery pipe.

• Remove the fuel injectors.

• Remove the IAC valve.

• Remove the TPS.

NOTE:

Prior to disassembly, mark sensor's original position with a paint or scribe for accurate reinstallation.











CAUTION

Never remove the throttle valve.



CAUTION

Avoid removing the throttle lever stopper screw A.



• Remove the throttle cable bracket.

• Remove the synchronizing screws.

NOTE:

Before removing the synchronizing screw, determine the setting by slowly turning it clockwise and count the number of turns required to lightly seat the screw. This counted number is important when reassembling synchronizing screw to original position.









THROTTLE BODY CLEANING AND INSPECTION

A 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.

• Check following items for any damage or clogging.

* O-ring

- * Fuel injector filter
- * Throttle shaft bushing and seal
- * Throttle valve
- * Injector seal* Vacuum hose
- * Synchronizing screw
- * IAC hose

* Fuel injector

IAC VALVE INSPECTION

The IAC valve can be checked without removing it from the throttle body.

- Remove the front box. (2-9-18)
- Disconnect the IAC valve lead wire coupler.
- Check the resistance between the terminals of the IAC valve.

PATA Resistance: Approx. 4 Ω (at 20 – 24 °C/68 – 75 °F)

09900-25008: Multi circuit tester set

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

If the resistance is not within the standard range, replace the IAC valve with a new one.

CAUTION

Do not attempt to disassemble the IAC valve. IAC valve is available only as an assembly.

- Remove the IAC value cover 1.
- Disconnect the IAC valve lead wire coupler.
- Connect the 12 V battery to the IAC valve terminals for more than 3 minutes and check for change of the IAC valve temperature from the cold condition.
- If the IAC valve is not warmed up, replace the IAC valve with a new one.





THROTTLE BODY REASSEMBLY

Reassemble the throttle body in the reverse order of disassembly.

Pay attention to the following points:

• Apply thread lock "1342" to the screws and tighten them.

€1342 99000-32050: THREAD LOCK "1342"

Throttle cable bracket screw:

3.5 N·m (0.35 kgf-m, 2.5 lb-ft)



• Apply a small quantity of grease to the shaft end and seal lip.

✓ 99000-25030: SUZUKI SUPER GREASE "A" (USA) 99000-25010: SUZUKI SUPER GREASE "A" (Others)

• With the TV fully closed, install the TP sensor to the original setting position.

TP sensor mounting screw: 3.5 N⋅m (0.35 kgf-m, 2.5 lb-ft)

• Install the IAC valve.

CAUTION

Replace the O-ring with a new one.

- Apply thin coat of the engine oil to the new O-ring.
- Install the injector seal 1 and O-ring 2 to each fuel injector.
- Apply thin coat of the engine oil to the new O-ring and new seal.
- Install the fuel injectors by pushing them straight to each throttle body.

CAUTION

Replace the injector seal and O-ring with the new ones. Never turn the injector while pushing it.

• Install the fuel delivery pipe assembly to the throttle body assembly.

CAUTION

Never turn the fuel injectors while installing fuel delivery pipe.

- Tighten the fuel delivery pipe mounting screws.
- Fuel delivery pipe mounting screw: 3.5 N⋅m (0.35 kgf-m, 2.5 lb-ft)











• Install the IAC hose connector.

CAUTION

Replace the O-ring with a new one.

• Apply thin coat of the engine oil to the new O-ring.



• Install the synchronizing screw to the original setting by turning the screw in until it lightly seats, and then backing it out the same number of turns counted during disassembly.

CAUTION

Replace the O-ring with a new one.

• Apply thin coat of the engine oil to the new O-ring.

THROTTLE BODY INSTALLATION

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

- Connect the throttle pulling cable and throttle returning cable to the throttle cable drum.
- Adjust the throttle cable play with the cable adjusters. Refer to page 2-19 for details.



THROTTLE BODY CLAMP POSITION



THROTTLE CABLE ADJUSTMENT

NOTE:

Minor adjustment can be made by the throttle grip side adjuster. $(\Box = 2-18)$

TP SENSOR ADJUSTMENT

- After checking or adjusting the throttle valve synchronization, adjust the TP sensor positioning as follows:
- After warming up engine, adjust the idling speed to 1 200 \pm 100 rpm.
- Stop the warmed-up engine and connect the special tool to the dealer mode coupler. (2.3-6-24)

09930-82710: Mode select switch

- Turn the special tool's switch ON.
- If the TP sensor adjustment is necessary, loosen the TP sensor mounting screw.
- Turn the TP sensor and bring the line to middle.
- Tighten the TP sensor mounting screw.

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TP sensor mounting screw: 3.5 N⋅m (0.35 kgf-m, 2.5 lb-ft)
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FUEL INJECTOR REMOVAL

- Remove the front box. (3-9-18)
- Disconnect the injector couplers.
- Remove the fuel delivery pipe assembly. (27-17)
- Remove the fuel injectors No.1 and No.2. (27-17)

FUEL INJECTOR INSPECTION

The fuel injector can be checked without removing it from the throttle body.

Refer to page 6-40 for details.

• Check the 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.

FUEL INJECTOR INSTALLATION

- Apply thin coat of the engine oil to new injector seals and O-rings.
- Install the injector by pushing it straight to the throttle body. Never turn the injector while pushing it. (27-7-21)



THROTTLE VALVE SYNCHRONIZATION

Check and adjust the throttle valve synchronization between two cylinders. To synchronize throttle valves, disconnect the IAP sensor's vacuum hoses from the vacuum nipples on the respective throttle bodies and connect the vacuum balancer gauge hoses to each vacuum nipple.

NOTE:

Before balancing the throttle valves, calibrate each vacuum balancer gauge.

- Remove the front box. (239-18)
- Start up the engine and run it in idling condition for warming up.
- Stop the warmed-up engine.
- Connect a tachometer and start up the engine.
- Bring the engine rpm to 1 200 rpm by the throttle stop screw.
- Check the vacuum of the two cylinders and balance the two throttle valves with the synchronizing screw (A).



NOTE:

- * During balancing the throttle valves, always set the engine rpm at 1 200 rpm, using throttle stop screw.
- * After balancing the two valves, set the idle rpm to 1 200 rpm.

For vacuum balancer gauge (09913-13121)

The vacuum gauge is positioned approx. 30° from the horizontal level, and in this position the two balls should be within one ball dia. If the difference is larger than one ball, turn the synchronizing screw on the throttle body and bring the ball to the same level.

A correctly adjusted throttle valve synchronization has the balls in the No.1 and No.2 at the same level.



COOLING AND LUBRICATION SYSTEM

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COOLING SYSTEM DESCRIPTION

The engine is cooled by the forced circulation of engine coolant, using a high-capacity, centrifugal water pump, through water jackets formed in the cylinder and cylinder head, and through the radiator. The tubeand-fin type radiator is made of aluminum, which is characterized by lightness in weight and good heat dissipation.

A wax-pellet type thermostat is used to regulate the flow of engine coolant through the radiator. As the coolant temperature rises to about 88°C (190°F) the thermostat valve unseats and a normal coolant flow is established. At about 100°C (212°F) the thermostat becomes completely open and, as a result, heat is released to the atmosphere through the radiator core.

COOLING CIRCUIT



OIL COOLER

Oil cooler is setting on the place of oil filter.

The engine oil is cooled by engine coolant, which is circulated through inside core of oil cooler.




ENGINE COOLANT

At the time of manufacture, the cooling system is filled with a 50:50 mixture of distilled water and ethylene glycol anti-freeze. This 50:50 mixture will provide the optimum corrosion protection and excellent heat protection, and will protect the cooling system from freezing at temperatures above $-31^{\circ}C$ ($-24^{\circ}F$).

If the vehicle is to be exposed to temperatures below $-31^{\circ}C$ ($-24^{\circ}F$), this mixing ratio should be increased up to 55% or 60% according to the figure.

CAUTION

- * Use a high quality ethylene glycol base anti-freeze, mixed with distilled water. Do not mix an alcohol base anti-freeze and different brands of anti-freeze.
- * Do not put in more than 60% anti-freeze or less than 50%. (Refer to Right figure.)
- * Do not use a radiator anti-leak additive.

50% Engine coolant including reserve tank capacity

Anti-freeze	650 ml (1.4/1.1 US/Imp. pt)
Water	650 ml (1.4/1.1 US/lmp. pt)

Anti-freeze 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 curve.



A WARNING

- * You can be injured by scalding fluid or steam if you open the radiator cap when the engine is hot. After the engine cools, wrap a thick cloth around cap and carefully remove the cap by turning it a quarter turn to allow pressure to escape and then turn the cap all the way off.
- * The engine must be cool before servicing the cooling system.
- * Coolant is harmful;
 - If it comes in contact with skin or eyes, flush with water.
 - If swallowed accidentally, induce vomiting and call physician immediately.
 - Keep it away from children.

RADIATOR AND HOSES COOLING CIRCUIT INSPECTION

Before removing the radiator and draining the engine coolant, check the following.

Check the cooling system for leaks with a radiator tester ①.

Remove the radiator cap and connect the radiator tester to the filler. Pressurize the cooling system with 120 kPa (1.2 kgf/cm², 17 psi) of pressure, and then check if it holds the pressure for 10 seconds. If the cooling system does not hold the pressure for at least 10 seconds, check the entire cooling system for leaks. If a leak is found, replace the damaged part.



A WARNING

- * Do not open the radiator cap when the engine is hot, as you may be injured by escaping hot liquid or vapor.
- * When removing the radiator cap tester, put a rag on the filler to prevent the engine coolant from spraying out.

CAUTION

Do not exceed the radiator cap release pressure, or the radiator cap and subsequently the radiator, can be damaged.

RADIATOR CAP INSPECTION

Check the radiator cap 2 using a radiator tester 1.

Attach the radiator cap to the radiator tester as shown. Slowly apply pressure to the radiator cap; do not exceed 95 - 125 kPa (0.95 - 1.25 kgf/cm², 13.5 - 17.8 psi). If the radiator cap does not hold the pressure for at least 10 seconds, replace it with a new one.

Radiator cap release pressure: 95 – 125 kPa (0.95 – 1.25 kgf/cm², 13.5 – 17.8 psi)

RADIATOR INSPECTION

Check the radiator for dirt and other foreign materials. If any are found, clean the radiator using compressed air. Also, repair any bent or dented fins using a small screwdriver.







RADIATOR HOSE INSPECTION

• Remove the leg shield and footboard. (\$\cong 9-10, 9-18\$) Any radiator hose found in a cracked condition or flattened must be replaced.

Any leakage from the connecting section should be corrected by proper tightening.



RADIATOR REMOVAL

- Remove the leg shield and footboard. (2-3-9-10, 9-18)
- Drain engine coolant by removing the drain plug.

- Disconnect the fan motor lead wire coupler 1.
- Disconnect the upper and lower radiator hoses.

• Remove the three mounting bolts and radiator assembly.

• Remove the radiator guard.





• Remove the four fixing places and the heat shield.



RADIATOR REMOUNTING

Install the radiator and the radiator hoses in the reverse order of removal.

Pay attention to the following points:

- Connect the fan motor lead wire coupler.
- Tighten the drain plug to the specified torque.

Drain plug: 6 N·m (0.6 kgf-m, 4.3 lb-ft)

- Pour engine coolant. (2-2-21)
- Bleed air from the cooling circuit. (2-21)

RADIATOR RESERVOIR TANK REMOVAL/REMOUNTING

- Remove the reservoir tank mounting bolt.
- Disconnect the siphon hose from the reservoir tank and drain engine coolant.
- Install the reservoir tank in the reverse order of removal.
- Fill the reservoir tank to the upper level line.



COOLING FAN

INSPECTION

- Remove the leg side cover and footboard. (2-9-12, 9-18)
- Disconnect the cooling fan motor lead wire coupler ① and fan switch coupler ②.

Test the cooling fan motor for load current with an ammeter connected as shown in the illustration.



The voltmeter is for making sure that the battery applies 12 volts to the motor. With the motor with electric motor fan running at full speed, the ammeter should be indicating not more than 5 amperes.

If the fan motor does not turn, replace the motor assembly with a new one.

NOTE:

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

Connection: $\oplus \to \mathsf{Fan}$ motor lead wire coupler <code>BLUE</code>

 \bigcirc \rightarrow Fan switch coupler BLACK (fan motor side)



REMOVAL

- Remove the radiator. (238-6)
- Disconnect the cooling fan switch coupler .
- Remove the three mounting bolts and the cooling fan unit.





• Remove the cooling fan.



REMOUNTING

Remount the cooling fan in the reverse order of removal.

Pay attention to the following point:

• Tighten the cooling fan mounting bolts to the specified torque.

Cooling fan mounting bolt: 6.5 N·m (0.65 kgf-m, 4.7 lb-ft)

COOLING FAN THERMO-SWITCH

The cooling fan is secured behind the radiator by three bolts and is automatically controlled by the thermoswitch. The thermo-switch remains open when the temperature of the engine coolant is low, but closes when the temperature reaches approximately 98°C (208°F) setting the cooling fan in motion.



REMOVAL

- Remove the leg shield and footboard. (2-9-10, 9-18)
- Drain engine coolant. (2-2-20)
- Disconnect the cooling fan thermo-switch lead wire coupler ①.
- Remove the cooling fan thermo-switch ②.



INSPECTION

- Check the thermo-switch closing or opening temperatures by testing it at the bench as shown in the figure. Connect the thermo-switch ① to a circuit tester and place it in the oil contained in a pan, which is placed on a stove.
- Heat the oil to raise its temperature slowly and read the column thermometer ② when the switch closes or opens.

🚾 09900-25008: Multi circuit tester set

Tester knob indication: Continuity test (•)))

Cooling fan thermo-switch operating temperature Standard (OFF→ON): Approx. 98°C (208°F) (ON→OFF): Approx. 92°C (198°F)

CAUTION

- * Take special care when handling the cooling fan thermo-switch. Do not subject it to strong blows or allow it to be dropped.
- * Do not contact the cooling fan thermo-switch (1) and the column thermometer (2) with a pan.

INSTALLATION

Install the cooling fan thermo-switch in the reverse order of removal. Pay attention to the following points:

- Apply engine coolant to the O-ring.
- Tighten the cooling fan thermo-switch to the specified torque.

Cooling fan thermo-switch: 17 N·m (1.7 kgf-m, 12.3 lb-ft)

Replace the removed O-ring with a new one.

- Pour engine coolant. (2-2-21)
- Bleed air from the cooling circuit. (2-21)





ENGINE COOLANT TEMPERATURE SENSOR

The following circuit diagram shows the electrical wiring for the thermometer. The major components are temperature sensor in contact with coolant; and temperature indicator (engine coolant temperature meter).



REMOVAL

- Remove the footboard. (39-18)
- Disconnect the engine coolant temperature sensor lead wire coupler ①.
- Remove the engine coolant temperature sensor 2.



INSPECTION

- Check the engine coolant temperature by testing it at the bench as shown in the figure. Connect the temperature sensor ① to a circuit tester and place it in the oil contained in a pan, which is placed on a stove.
- Heat the water to raise its temperature slowly and read the column thermometer ② and the ohmmeter.
- If the temperature sensor ohmic valve does not change in the proportion indicated, replace it with a new one.

DATA Temperature sensor specification

Temperature	Standard resistance
20°C (68°F)	Approx. 2.45 k Ω
50°C (122°F)	Approx. 0.811 kΩ
80°C (176°F)	Approx. 0.318 k Ω
110°C (230°F)	Approx. 0.142 kΩ

If the resistance noted to show infinty or too much different resistance value, replace the temperature sensor with a new one.

CAUTION

* Take special care when handling the temperature sensor. It may cause damage if it gets a sharp impact.

* Do not contact the engine coolant temperature sensor (1) and the column thermometer (2) with a pan.

INSTALATION

• Tighten the engine coolant temperature sensor to the specified torque.

Engine coolant temperature sensor:

18 N·m (1.8 kgf-m, 13.0 lb-ft)

CAUTION

Replace the removed sealing washer with a new one.





THERMOSTAT

REMOVAL

- Remove the leg shield and footboard. (2-3-9-10, 9-18)
- Drain a small amount of engine coolant. (2-2-20)
- Place a rag under the thermostat case.
- Remove the thermostat case.
- Remove the thermostat ①.



INSPECTION

Inspect the thermostat pellet for signs of cracking.

Test the thermostat at the bench for control action, in the following manner.

- Immerse the thermostat ① in the water contained in a beaker, as shown in the illustration. Note that the immersed thermostat is in suspension. Heat the water by placing the beaker on a stove and observe the rising temperature on a thermometer ②.
- Read the thermometer just when opening the thermostat. This reading, which is the temperature level at which the thermostat valve begins to open, should satisfy the standard value.
- Thermostat valve opening temperature Standard: Approx. 88°C (190 °F)

CAUTION

- * Do not contact the thermostat ① and the column thermometer ② with a pan.
- * As the thermostat operating response to water temperature change is gradual, do not raise water temperature too quickly.
- * The thermostat with its valve open even slightly under normal temperature must be replaced.



- Keep on heating the water to raise its temperature.
- Just when the water temperature reaches specified value, the thermostat valve should have lifted by at least 8.0 mm (0.31 in).

Thermostat valve lift Standard: Over 8.0 mm at 100°C (Over 0.31 in at 212°F)

• A thermostat failing to satisfy either of the two requirements (start-to-open temperature and valve lift) must be replaced with a new one.

INSTALLATION

Install the thermostat in the reverse order of removal.

• Apply engine coolant to the rubber seal on the thermostat.







NOTE: The jiggle valve (A) of the thermostat faces upside.

- Install the thermostat case.
- Pour engine coolant. (2-21)
- Bleed air from the cooling circuit. (2-2-21)





WATER PUMP CONSTRUCTION



REMOVAL AND DISASSEMBLY

- Remove the leg shield and footboard. (29-10, 9-18)
- Drain engine coolant. (2-20)
- Hold the chassis by side stand.

A WARNING

- * Do not open the radiator cap when the engine is hot, as you may be injured by escaping hot liquid or vapor.
- * The engine must be cool before servicing the cooling system.
- * 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.
- Disconnect the radiator hose.
- Remove the water pump cover.









- Remove the cable clip.
- Remove the water pump body with impeller .

• Remove the E-ring 1 and impeller 2.

• Remove the mechanical seal using the special tool.

09921-20240: Bearing remover set

NOTE:

If there is no abnormal condition, the mechanical seal removal is not necessary.

CAUTION

The removed mechanical seal must be replaced with a new one.

• Remove the outer bearing using the special tool.

09921-20240: Bearing remover set

NOTE:

If there is no abnormal noise, bearing removal is not necessary.

CAUTION

The removed bearing must be replaced with a new one.

• Remove the circlip 1.



09921-20240: Bearing remover set

NOTE:

If there is no abnormal noise, bearing removal is not necessary.

CAUTION

The removed bearing must be replaced with a new one.



2





- Place a rag over the water pump body.
- Remove the oil seal using a suitable bar.

NOTE:

If there is no abnormal condition, the oil seal removal is not necessary.

CAUTION

The removed oil seal must be replaced with a new one.

- Remove the mechanical seal ring 1 and the rubber seal 2 from the impeller.











INSPECTION

BEARING

- Inspect the play of the outer bearing and inner bearing by hand while it is in the water pump case.
- Rotate the inner race by hand to inspect for abnormal noise and smooth rotation.
- Replace the bearing if there is anything unusual.

MECHANICAL SEAL

- Visually inspect the mechanical seal for damage, with particular attention given to the sealing face.
- Replace the mechanical seal that shows indications of leakage.

OIL SEAL

- Visually inspect the oil seal for damage, with particular attention given to the lip.
- Replace the oil seal that shows indications of leakage.





- Visually inspect the bearing case and mechanical case for damage.
- Replace the water pump body if necessary.





IMPELLER

• Visually inspect the impeller and its shaft for damage.



REASSEMBLY AND INSTALLATION

• Install the new inner bearing using the special tool.

09913-70210: Bearing installer set

• Install the circlip 1.

• Install the new outer bearing using the special tool. 09913-70210: Bearing installer set

• Install the new oil seal using the special tool.

1001 09913-70210: Bearing installer set NOTE: The stamped mark on the oil seal faces outside.

• Apply a small quantity of the SUZUKI SUPER GREASE "A" to the oil seal lip.

→ 99000-25030: SUZUKI SUPER GREASE "A" (USA) 99000-25010: SUZUKI SUPER GREASE "A" (Others)











• Install the new mechanical seal using a suitable size socket wrench.

NOTE:

On the new mechanical seal, the seealer (A) has been applied.



- Install the rubber seal into the impeller.
- After wiping off the oily or greasy matter from the mechanical seal ring, install it into the impeller.

NOTE:

The paint marked side A of the mechanical seal ring faces the impeller.

Make sure the mechanical seal ring is fit into the impeller.

• Apply grease to the impeller shaft.

✓ 99000-25030: SUZUKI SUPER GREASE "A" (USA) 99000-25010: SUZUKI SUPER GREASE "A" (Others)

- Install the impeller shaft to the water pump body.
- Install the E-ring 1 to the impeller shaft.







- Install the new O-rings 1 and 2.
- Apply grease to the O-rings.

✓ 99000-25030: SUZUKI SUPER GREASE "A" (USA) 99000-25010: SUZUKI SUPER GREASE "A" (Others)

- Install the water pump body 1 with impeller 2 to the crankcase.
- Fit the cable clip.

NOTE:

Set the water pump shaft end B to the oil pump shaft B as shown in the figures.

• Install the O-ring to the water pump cover.

CAUTION

Use the new O-rings to prevent engine coolant leakage.

- Apply engine coolant to the O-ring.
- Install the water pump cover.











- Connect the radiator hose.
- Pour engine coolant. (
- Bleed air from the cooling circuit. (2-2-21)
- Install the leg shield and footboard.



LUBRICATION SYSTEM OIL PRESSURE

[____2-31

OIL FILTER

OIL COOLER

OIL PRESSURE REGULATOR

[]3-44

OIL SUMP FILTER

OIL LEVEL SWITCH

[] 10-29

OIL PRESSURE SWITCH

710-36 🕞

OIL PUMP

3-20, 3-60

OIL RETURN PUMP

[_____3-21, 3-59]



ENGINE LUBRICATION SYSTEM CHART

ENGINE LUBRICATION SYSTEM





CHASSIS

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EXTERIOR PARTS CONSTRUCTION















WIND SCREEN

• Remove the screws.

• Remove the wind screen cover ①.

• Remove the wind screen.

• Remove the wind screen brace 2.











HANDLEBAR COVER

• Remove the handlebar rear cover 1.







• Remove the handlebar front cover ②.



Da



- Remove the handlebar cover. (
- Remove the screws.
- Remove the front panel.




REAR VIEW MIRROR

- Remove the handlebar covers. (2-9-8)
- Remove the front panel. (3-9-8)
- Remove the bolts.
- Disconnect the turn signal coupler which is located under the combination meter.

• Remove the screws.

- Insert the screw driver into the hole A.
- Pry the turn signal light out. (1710-32)

• Disconnect the turn signal coupler.











LOWER LEG SHIELD

- Disconnect the fasteners ① by pulling the tab of fastener.
- Remove the screws.
- \bullet Remove the lower leg shield 2.

LEG SHIELD

- Remove the handlebar covers. (2-9-8)
- Remove the front panel. (3-9-8)
- Remove the lower leg shield. (
- Remove the screws.
- Remove the right/left floor mat.
- Remove the screws.

• Detach the insertings of the leg side covers.



• Remove the front leg shield cover ①.

• Remove the screws.

- Disconnect the headlight couplers, ECM couplers and position light couplers (only E02, E19).
- Remove the leg shield.







☆: hooked part

RIGHT LEG SIDE COVER

- Remove the floor mats.
- Remove the screws and fasteners.
- Remove the right leg side cover by detaching the insertings.







LEFT LEG SIDE COVER

- Remove the floor mats.
- Remove the screws and fasteners.
- Remove the left side cover by detaching the insertings.







MAINTENANCE LID

- Remove the screw.
- Detach the inserting (A) of maintenance lid.
- Remove the maintenance lid.

NOTE:

Cover the hatched areas in order to prevent the front box from getting damage.







SEAT

- Lift the seat up.
- Remove the tool set.
- Remove the battery cover ①.
- Remove the battery. (1-3)
- Disconnect the trunk light coupler 2.
- Disconnect the seat damper. (239-14)

• Remove the seat by removing the nuts at the seat hinge.







SEAT DAMPER

- Remove the right frame cover. (2-9-16)
- Remove the clip 1, washer 2 and mounting bolt 3.
- Remove the seat damper ④.



PILLION RIDER HANDLE

- Lift the seat up.
- Remove the lower frame cover ① by removing the fasteners.

• Remove the center frame cover 2.



• Remove the pillion rider handles ③.







TRUNK BOX COVER

- Remove the battery cover 1.
- Remove the starter relay 2 and coupler 3 from the battery cover.
- Remove the battery. (10-3)
- Remove the trunk box cover ④.







FRAME COVER

- Remove the lower frame cover, center frame cover and pillion rider handles ①. (1379-15)
- Remove the trunk box cover. (
- Remove the bolt and the fasteners.





- Remove the fuel tank cap.
- Remove the fuel inlet mounting screws and tray 2.

NOTE:

When applying a tool to the mounting screw, turn the lower part of cushion ③ over.

- Remove the screws.
- Remove the turn signal light socket and combination light socket.

- Remove the frame covers.
- Unclamp the harness in the back of the frame cover.









FOOT BOARD

• Remove the screws on the cooling duct.

• Remove the foot board.











- Remove the following parts. Maintenance lid (279-13) Handlebar covers (29-8) Front panel (29-8) Leg shield (29-9-10) Screws in the box
- Disconnect the power source coupler.



- Pull the brake-lock knob.
- Remove the brake-lock knob 1.

• Remove the inner box 2.

• Remove the ignition switch 3 by using the special tools.

09930-11930: Torx bit JT30H 09930-11940: Bit holder

- Remove the screws.
- Remove the front box.



REAR FENDER

- Remove the lower frame cover 1.

- Remove the fasteners and bolts.
- Remove the rear fender 2.
- Disconnect the license light coupler.







- Remove the following parts. Seat (2,3,9-13)
 Pillion rider handles (2,3,9-15)
 Right/left frame covers (2,3,9-16)
 Rear fender (2,3,9-18)
- \bullet Remove the rear frame brace (1).





• Remove the trunk light seat switch 2.





- Remove the seat lock ③.
- Remove the trunk box screws.

• Remove the muffler bracket ④.

• Remove the seat rail (5).



• Remove the trunk box 6.











LEG SHIELD BRACE

- Remove the wind screen and wind screen brace. (29-7)
- Remove the leg shield. (3-9-10)
- \bullet Remove the front meter panel 1 and the combination meter assembly.



- Remove the electrical parts from the leg shield brace.
- Remove the mounting bolts.

NOTE:

It is possible to remove the leg shield brace without removing the front box.







REMOUNTING

Remounting the exterior parts in the reverse order of removal. Pay attention to the following points:

SEAT RAIL

 Apply THREAD LOCK SUPER "1360" to the seat rail mounting bolts (only M10).

1360 99000-32130: THREAD LOCK SUPER "1360"

• Tighten the seat rail mounting bolts to the specified torque.







Seat rail mounting bolt
 (M8): 23 N·m (2.3 kgf-m, 16.5 lb-ft)
 (M10): 50 N·m (5.0 kgf-m, 36.0 lb-ft)

HANDLEBAR COVER

After installing the handlebar covers, inspect clearances A between the handlebar cover 1 and front panel 2/meter panel 3. If the clearance A is less than 5 mm (0.2 in), adjust the handlebar's position.

- Remove the handlebar covers. (29-8)
- Loosen the handlebar clamp bolts ④.
- Turn the handlebars until the clearances (A) should be more than 5 mm (0.2 in) at all around the handlebar cover.

When turning the handlebars by 0.5 mm (0.02 in) at the punched

mark, the clearances would be varied as follows. \bigcirc 4.7 mm (0.19 in) at front end of handlebar cover

B 7.3 mm (0.29 in) at rear end of handlebar cover

• Tighten the handlebar clamp bolts to the specified torque.

■ Handlebar clamp bolt: 23 N·m (2.3 kgf-m, 16.5 lb-ft)

- Install the handlebar covers.
- Inspect the clearance.

NOTE:

NOTE:

- * First tighten the bolts (5), and then tighten the bolts (6).
- * Because of above adjustment, it is possible that the punched mark on the handlebars is out of alignment with the mating surface of handlebar holder.









FRONT WHEEL CONSTRUCTION

Other and a second	e disc r seal ng tire wheel er alve bolt axle
TEM N.m kaf-m lb-ft	
A 23 2.3 16.5	
B 65 65 470	

REMOVAL

• Remove the right and left brake hose clamp bolts.

• Remove the right and left brake calipers.

NOTE:

- * Cover the front fender, especially hatched area (A), from damage.
- * Do not operate the brake lever while removing the caliper.
- Loosen the axle pinch bolt.
- Loosen the front axle with special tool.

1001 09900-18710: Hexagon socket (12 mm)

· Rise the front wheel off the ground and support the motorcycle with a jack or wooden block.

CAUTION

Make sure that the motorcycle is supported securely.

- Remove the front axle and the front wheel.
- Remove the collar ①.

NOTE:

After removing the front wheel, fit the calipers temporarily to the original positions.







INSPECTION AND DISASSEMBLY

• Remove the discs.

DUST SEAL

Inspect the dust seal's lip for wear or damage. If any damages are found, replace the dust seals with new ones.

• Remove the dust seals by using the special tool.

09913-50121: Oil seal remover

CAUTION

Do not reuse the removed dust seals.



Using a dial gauge, check the front axle for runout and replace it if the runout exceeds the limit.

- 09900-20607: Dial gauge (1/100)
 09900-20701: Magnetic stand
 09900-21304: V-block set (100 mm)
- Axle shaft runout Service Limit: 0.25 mm (0.010 in)

WHEEL

Make sure that the wheel runout checked as shown does not exceed the service limit. An excessive runout is usually due to worn or loosened wheel bearings and can be reduced by replacing the bearings. If bearing replacement fails to reduce the runout, replace the wheel.

(Wheel inspection: 2-9-91)

DATA Wheel runout

Service Limit (Axial and Radial): 2.0 mm (0.08 in)







WHEEL BEARING

Inspect the play of the wheel bearings by finger while they are in the wheel. Rotate the inner race by finger to inspect for abnormal noise and smooth rotation.

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



• Remove the wheel bearings by using the special tool.

CAUTION

Do not reuse the removed bearings.



CHASSIS 9-29

REASSEMBLY AND REMOUNTING

Reassemble and remount the front wheel in the reverse order of removal and disassembly. Pay attention to the following points:



WHEEL BEARING

• Apply grease to the wheel bearings.

FAH 99000-25030: SUZUKI SUPER GREASE "A"



- First install the right wheel bearing, then install the left wheel bearing and spacer by using the special tools.
- 09941-34513: Bearing/Steering race installer set 09913-70210: Bearing installer set

CAUTION

The sealed cover of the bearing must face outside.





BRAKE DISC

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

• Apply THREAD LOCK SUPER "1360" to the disc mounting bolts and tighten them to the specified torque.

Brake disc bolt: 23 N⋅m (2.3 kgf-m, 16.5 lb-ft)

1360 99000-32130: THREAD LOCK SUPER "1360"



DUST SEAL

• Apply SUZUKI SUPER GREASE "A" to the dust seals.

₩ 99000-25030: SUZUKI SUPER GREASE "A"

• Install the dust seals to the wheel.

NOTE:

The spring (A) of dust seal must face to the bearing.

FRONT AXLE

- Install the front wheel and front axle.
- Tighten the front axle to the specified torque with special tool.

09900-18710: Hexagon socket 12 mm

Front axle: 65 N·m (6.5 kgf-m, 47.0 lb-ft)

NOTE:

- * Before tightening the two axle pinch bolt on the left front fork leg, move the front fork up and down 4 or 5 times without applying front brake.
- * Make sure that the arrow on the tire side wall points to the wheel rotation. (9-93)
- Tighten axle pinch bolt on the left front fork leg to the specified torque.

Front axle pinch bolt: 23 N·m (2.3 kgf-m, 16.5 lb-ft)









BRAKE CALIPER

• Tighten the brake caliper mounting bolts to the specified torque.

Front brake caliper mounting bolt:

26 N·m (2.6 kgf-m, 19.0 lb-ft)

NOTE:

- * Push the pistons all the way into the caliper and remount the calipers.
- * After installing the wheel, pump the brake lever several times in order to operate the brake correctly.

FRONT FORK CONSTRUCTION



REMOVAL AND DISASSEMBLY

- Remove the handlebar cover. (29-8)
- Remove the front panel. (39-8)
- Remove the front wheel. (239-26)
- Remove the front fender.







• Loosen the front fork upper clamp bolt ①.

NOTE:

Slightly loosen the front fork cap bolt ② before loosening the lower clamp bolts to facilitate later disassembly.

• Loosen the front fork lower clamp bolts.

NOTE:

Hold the front fork by the hand to prevent sliding out of the steering stem.

• Remove the front fork cap bolt ③ with the special tool.

09940-30230: Socket hexagon (17 mm)

• Remove the spacer (4), washer (5) and spring (6).

- Invert the fork and drain the fork oil out of the fork by stroking.
- Hold the fork inverted for a few minutes to drain oil.



(4)

• Remove the cylinder bolt $\widehat{\mathcal{T}}.$

NOTE:

If the cylinder turns together with the cylinder bolt, temporarily install the fork spring, spacer, washer and cap bolt to prevent the cylinder from turning.

• Remove the cylinder (8) and rebound spring (9).

- Remove the dust seal.
- Remove the oil seal stopper ring.







• Pull the inner tube out of the outer tube.

NOTE:

Be careful not to damage the inner tube.

CAUTION

The slide metal, guide metal, oil seal and dust seal must be replaced with the new ones when reassembling the front fork.

- Remove the following parts.
 - 1 Oil seal
 - 1 Oil seal retainer
 - 12 Guide metal
 - (13) Slide metal
 - (1) Oil lock piece





INSPECTION

INNER AND OUTER TUBES

Inspect the inner tube outer surface and the outer tube inner surface for scratches. If any defects are found, replace them with the new ones.





FORK SPRING

Measure the fork spring free length. If it is shorter than the service limit, replace it with a new one.

Front fork spring free length Service limit: 341 mm (13.42 in)



CYLINDER

Inspect the cylinder and piston ring 1 for damage. If any defects are found, replace them with new ones.



REASSEMBLY AND REMOUNTING

Reassemble and remount the front fork in the reverse order of removal and disassembly. Pay attention to the following points:

METALS AND SEALS

• Hold the inner tube vertically and clean the metal groove and install the guide metal by hand as shown.

CAUTION

- * Use special care to prevent damage to the "Teflon" coated surface of the guide metal when mounting it.
- * When installing the oil seal to inner tube, be careful not to damage the oil seal lip.
- * Replace the removed metals and seals with new ones.
- * Apply fork oil to the Anti-triction metals and lip of the oil seal.
- Apply fork oil to the oil seal lip lightly before installing it.
- Assemble the following parts as shown.
 - ① Oil seal
 - 2 Oil seal retainer
 - ③ Guide metal
 - ④ Slide metal

NOTE:

Stamped mark on the oil seal must face upward.

• Install the spring (5) into the oil lock piece (6) securely.







- Install the oil lock piece into the inner tube.
- Install the inner tube into the outer tube with care not to drop the oil lock piece out.

NOTE:

After installing the inner tube into the outer tube, keep the oil lock piece into the inner tube by compressing the front fork fully.

• Install the guide metal, the retainer and the oil seal into the outer rube with special tool.















A Dust seal

- (B) Oil seal stopper ring
- $\ensuremath{\mathbb{C}}$ Oil seal
- $\ensuremath{\mathbb{D}}$ Oil seal retainer
- $\ensuremath{\mathbb{E}}$ Guide metal

CYLINDER BOLT

- Install the rebound spring to the cylinder.
- Install the cylinder into the front fork.

• Apply THREAD LOCK "1342" to the cylinder bolt and tighten it to the specified torque.

+1342 99000-32050: THREAD LOCK "1342"

Cylinder bolt: 30 N⋅m (3.0 kgf-m, 21.5 lb-ft)

CAUTION

Use a new gasket $\overline{\mathcal{O}}$ to prevent oil leakage.

NOTE:

- * If the cylinder turns together with the cylinder bolt, temporarily install the fork spring, spacer, washer and cap bolt to prevent the cylinder from turning.
- * Check the front fork for smoothness by stroking it after installing the cylinder.

FORK OIL

- Place the front fork vertically without spring.
- Compress the front fork fully.
- Pour the specified front fork oil into the front fork.

FORK 99000-99044-10G: SUZUKI FORK OIL #10

DATA Front fork oil capacity (each leg):

482 ml (16.29/16.97 US/Imp oz)

- Move the inner tube up and down several strokes until no more bubbles come out from the oil.
- Keep the front fork vertically and leave it during 5 6 minutes.

NOTE:

Take extreme attention to pump out air completely.



NOTE:

When adjusting the fork oil level, remove the fork spring and compress the inner tube fully.



Fork oil level: 129 mm (5.08 in)

FORK 99000-99044-10G: SUZUKI FORK OIL #10









FORK SPRING

- Install the fork spring into the front fork.
- Install the washer ① and the spacer ②.

NOTE:

The smaller spring pitch end must face upward.

FRONT FORK CAP BOLT

• Apply fork oil lightly to the O-ring.

CAUTION

Use a new O-ring to prevent oil leakage.

- Tighten the front fork cap bolt temporarily.
- Set the front fork to the front fork lower bracket temporarily by tightening the lower clamp bolts.
- Tighten the front fork cap bolt ① to the specified torque with the special tool.
- Front fork cap bolt: 23 N·m (2.3 kgf-m, 16.5 lb-ft)

09940-30230: Socket hexagon (17 mm)

- Align the top of the inner tube with the upper surface of the steering stem upper bracket.
- Tighten the front fork upper and lower clamp bolts.
- Front fork upper clamp bolt: 23 N⋅m (2.3 kgf-m, 16.5 lb-ft) Front fork lower clamp bolt: 23 N⋅m (2.3 kgf-m, 16.5 lb-ft)









- Install the front fender.
- Install the front wheel and brake calipers. (239-31)

NOTE:

After install the brake calipers, front brake should be efficient by pumping the front brake lever.

STEERING AND HANDLEBARS CONSTRUCTION



REMOVAL

HANDLEBARS

- Remove the handlebar covers. (239-8)
- Remove the right switch box ①.
- Disconnect the brake switch coupler.
- Remove the front brake master cylinder 2.
- Remove the left switch box ③.
- Disconnect the brake switch coupler.
- Remove the rear brake master cylinder ④.

• Remove the handlebars.

STEERING STEM

- Remove the front panel. (39-8)
- Remove the front fork. (19-33)
- Remove the cable/harness guide 1.
- Remove the brake hose clamp 2.

NOTE:

Before removing the handlebars, loosen the steering stem head nut to facilitate later disassembly.

• Remove the steering stem lower cover.











- Remove the brake hose clamp ③.
- Remove the front brake assembly.

CAUTION

Take care not to make air come in the front brake system.

• Remove the steering stem upper bracket.





• Remove the steering stem nut with the special tool.

09940-14911: Steering socket wrench

• Remove the steering stem lower bracket.

NOTE:

When loosing the stem nut, hold the steering stem lower bracket to prevent it from falling.

• Remove the dust cover ④ and bearing ⑤.





INSPECTION AND DISASSEMBLY

Inspect the removed parts for the following abnormalities.

- * Handlebars distriction
- * Race wear and brinelling
- * Bearing wear or damage
- * Abnormal bearing noise
- * Distortion of the steering stem

If any abnormal points are found, replace defective parts with the new ones.

• Remove the steering stem lower bearing and dust seal using a chisel.

CAUTION

The removed bearing inner race and dust seal must be replaced with the new ones.



• Drive out the steering stem upper and lower bearing races using the special tools.

09941-54911: Bearing outer race remover 09941-74911: Steering bearing installer



REASSEMBLY AND REMOUNTING

Reassemble and remount the steering stem in the reverse order of removal and disassembly. Pay attention to the following points:

BEARING RACES

• Press in the upper and lower outer races using the special tool.

09941-34513: Steering outer race installer

BEARINGS

• Press in the lower bearing and dust seal using the special tool.

1001 09941-18011: Steering bearing installer





- Apply grease to the bearings, dust cover and dust seal.
- Install the upper bearing and the dust cover onto the frame.

₩ 99000-25010: SUZUKI SUPER GREASE "A"





- Tighten the steering stem nut to the specified torque with the special tools.
- 09940-14911: Steering stem nut wrench
- Steering stem nut: 45 N⋅m (4.5 kgf-m, 32.5 lb-ft)
- Turn the steering stem about five or six times to the left and right so that the angular ball bearing will be seated properly.
- Loosen the steering stem nut by $\frac{1}{4} \frac{1}{2}$ turn.

NOTE:

This adjustment will vary from motorcycle to motorcycle.

- Install the front fork to the steering stem lower bracket temporarily.
- Install the steering stem upper bracket ①.
- Tighten the steering stem head nut 2.
- Steering stem head nut: 65 N⋅m (6.5 kgf-m, 47.0 lb-ft)
- Remount the front fork. (239-39)

HANDLEBARS

• Install the handlebars with the punch mark (A) on the handlebars aligned with the mating surface (B) of the handlebar clamp.

NOTE:

Make sure that the dent $\mathbb C$ on the handlebar clamp faces forward.








• Tighten the handlebar clamp bolt to the specified torque.

Handlebar clamp bolt: 23 N·m (2.3 kgf-m, 16.5 lb-ft) *NOTE:*

When tightening the handlebar clamp bolts, first tighten the bolts 1 and then tighten the bolts 2.

- Install the left switch box ③ to the handlebars by engaging the stopper ① with the hole ⓒ on the handlebars.
- Install the rear brake master cylinder. (239-84)

- Install the right switch box ④ to the handlebars by engaging the stopper ⊕ with the hole ₲ on the handlebars.
- Install the front brake master cylinder. (239-72)

 Install the handlebar covers and inspect the handlebar cover clearance. (19-24)







STEERING TENSION ADJUSTMENT

Check the steering movement in the following procedure.

- By supporting the motorcycle with a jack, lift the front wheel until it is off the floor by 20 – 30 mm (0.8 – 1.2 in).
- Check to make sure that the cables and wire harnesses are properly routed.
- With the front wheel in the straight ahead state, hitch the spring scale (special tool) on one handlebar grip end as shown in the figure and read the graduation when the handlebar starts moving. Do the same on the other grip end.

DATA Initial force: 200 – 500 grams

09940-92720: Spring scale

- If the initial force read on the scale when the handlebar starts turning is either too heavy or too light, adjust it till it satisfies the specification.
- 1)First, loosen the front fork upper clamp bolts, steering stem head nut and steering stem nut, and then adjust the steering stem nut by loosening or tightening it.
- 2)Tighten the steering stem nut, stem head nut and front fork upper and lower clamp bolts to the specified torque and recheck the initial force with the spring scale according to the previously described procedure.
- 3)If the initial force is found within the specified range, adjustment has been completed.

NOTE:

Hold the front fork legs, move them back and forth and make sure that the steering is not loose.





REAR WHEEL CONSTRUCTION



REMOVAL

- Place the motorcycle on the center stand.
- Remove the final gear case cover ①.

• Disconnect the brake-lock cable 2. (29-85)





- Remove the cotter pin. (For E-03, 28, 33)
- Loosen the rear axle nut.
- Remove the caliper.
- Remove the axle nut and draw out the rear axle.

CAUTION

Do not operate the brake lever while removing the rear wheel.

- Remove the spacer ③.
- Remove the rear wheel.









- Flatten the lock washers (5).
- Remove the bolts and washers (6).

• Remove the rear hub driven joint $\widehat{\mathcal{T}}$.

• Remove the O-ring (8).

CAUTION

Replace the removed O-ring with a new one.

• Remove the brake disc.



INSPECTION AND DISASSEMBLY

TIRE: ((______9-91) WHEEL: ((_____9-27 and 9-91)

REAR AXLE

Using a dial gauge, check the rear axle for runout. If the runout exceeds the limit, replace the rear axle.

Axle shaft runout: Service Limit: 0.25 mm (0.010 in)

© 09900-20607: Dial gauge (1/100 mm) 09900-20701: Magnetic stand 09900-21304: V-block set (100 mm)

REAR HUB DAMPER

Inspect the dampers for wear and damage. Replace the damper if there is anything unusual.

• Remove the dampers with the appropriate bar.









REAR HUB DRIVEN JOINT

Inspect the rear hub driven joint for wear and damage. If any defects are found, replace it with a new one.

DUST SEAL

Inspect the wheel dust seal lip for wear or damage. If any damages are found, replace the dust seal with a new one.

• Remove the dust seal with the special tool.

09913-50121: Oil seal remover

CAUTION

Do not reuse the removed dust seal.





BEARING

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

• Remove the wheel bearings by using the special tool.

09921-20240: Bearing remover set

CAUTION

The removed bearings must be replaced with the new ones.





REASSEMBLY AND REMOUNTING

Reassemble and remount the rear wheel in the reverse order of removal and disassembly. Pay attention to the following points:



BEARING

• Apply grease to the bearings before installing.

₩ 99000-25030: SUZUKI SUPER GREASE "A"



• First install the right wheel bearing, then install the left wheel bearing and spacer using the special tool.

09941-34513: Bearing/Steering race installer set

CAUTION

The sealed cover of the bearing must face outside.



DUST SEAL

• Install the new dust seal using the special tool.

09913-70210: Bearing installer set

 Apply SUZUKI SUPER GREASE "A" to the dust seal lips before assembling rear wheel.

₩ 99000-25030: SUZUKI SUPER GREASE "A"

NOTE:

When installing the dust seals, the stamped mark of dust seal must face the special tool.

REAR HUB DAMPER

• Install the rear hub damper into the rear wheel at a depth of 5.5 mm (0.22 in).

NOTE:

Apply soap water to the hub damper before installing the hub damper in order to facilitate press fit.





BRAKE DISC

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

- Apply THREAD LOCK SUPER "1360" to the disc bolts and tighten them to the specified torque.
- **€**1360 99000-32130: THREAD LOCK SUPER "1360"

Brake disc bolt: 23 N·m (2.3 kgf-m, 16.5 lb-ft)

REAR HUB DRIVEN JOINT

• Apply SUZUKI SUPER GREASE "A" to the O-ring and wheel.

₩ 99000-25030: SUZUKI SUPER GREASE "A"

• Install the O-ring to the rear wheel.

CAUTION

Replace the removed O-ring with a new one.

• Apply SUZUKI SUPER GREASE "A" to the rear hub driven gear joint.

₩ 99000-25030: SUZUKI SUPER GREASE "A"







• Install the rear hub driven gear joint.

- Install the washers ①, lock washers ②.
- Apply THREAD LOCK SUPER "1303" to the bolts and tighten them.

1303 99000-32030: THREAD LOCK SUPER "1303"

- Bend the lock washers securely.
- Install the collar.



REAR AXLE

- Install the left spacer 1 into the final gear case 2.

- Remount the rear wheel, coller, spacer and rear axle.
- Install the washer and rear axle nut.
- Tighten the rear axle nut (3) to the specified torque.

■ Rear axle nut: 100 N·m (10.0 kgf-m, 72.5 lb-ft)

- Install the new cotter pin. (For E-03, 28, 33)
- Install the final gear case cover.





- Install the caliper. (79-81)
- Install the brake-lock cable and brake-lock arm. (
- Adjust the brake-lock. (239-84)

NOTE:

If the caliper pistons come out by operating the rear brake lever while removing the rear caliper, it is impossible to push back the pistons into the caliper because of the brake-lock system. Therefore remove the pads and turn the piston clockwise so that the piston will come in. Refer to REAR BRAKE PAD REPLACE-MENT page 9-74.

REAR SHOCK ABSORBER CONSTRUCTION



REMOVAL

- Place the motorcycle on the center stand.
- Remove the rear shock absorber mounting nut .

- Remove the rear shock absorber mounting bolt 2.
- Remove the rear shock absorber.



INSPECTION

Inspect the shock absorber body and bushing for damage and oil leakage.

If any defects are found, replace the shock absorber with a new one.

CAUTION

Do not attempt to disassemble the rear shock absorber unit. It is unserviceable.



REMOUNTING

• Install the rear shock absorber and tighten the rear shock absorber mounting nut ①/bolt ②.

Rear shock absorber mounting nut:

29 N·m (2.9 kgf-m, 21.0 lb-ft) Rear shock absorber mounting bolt: 29 N·m (2.9 kgf-m, 21.0 lb-ft)





SUSPENSION SETTING

After installing the rear suspension, adjust the spring pre-load as follows.

SPRING PRE-LOAD ADJUSTMENT

The pre-load is adjusted by turning the pre-load adjuster. Set the indicator (a) in the center of absorber lower bracket (1). Position "1" provides the softest spring pre-load. Position "5" provides the stiffest spring pre-load. **STD position: "2**"

Adjust the right and left absorbers to the same settings.



REAR SWINGARM CONSTRUCTION



REMOVAL

- Place the motorcycle on the center stand.
- Remove the exhaust muffler. (23-7)
- Remove the rear wheel. (239-48)
- Remove the rear brake hose guide (1), (2).
- Remove the rear shock absorber bolt ③.





INSPECTION SWINGARM BEARING

- Remove the swingarm bolts.
- Remove the swingarm ④.

• Remove the swingarm pivot bearing.

• Remove the swingarm pivot locknut (5), washer and the swingarm pivot bolt (6).

Inspect the dust seal on the bearing for wear and damage. If any defects are found, replace the bearing with a new one.

If there is anything unusual, replace the bearing with a new one.

Insert the bearing and check smoothness of rotation.





• Remove the swingarm pivot bearing with the special tools.

09921-20240: Bearing remover set

CAUTION

Do not reuse the removed bearings.

• Install the bearing with the special tool.

09913-70210: Bearing installer set

BUSHING

Inspect the bushing for damage. If any defects are found, replace it with a new one.





REMOUNTING

Remount the swingarm in the reverse order of disassembly and removal, and pay attention to the following points:

• Apply SUZUKI SUPER GREASE "A" to the bearing, and then install the bearing.

₩ 99000-25030: SUZUKI SUPER GREASE "A"

- Install the dowel pins 1.
- Install the swingarm.
- Apply THREAD LOCK "1342" to the swingarm bolts.
- Tighten the swingarm bolt.

€1342 99000-32050: THREAD LOCK "1342"





Tighten the swingarm pivot bolt to the specified torque.
Swingarm pivot bolt: 9.5 N·m (0.95 kgf-m, 7.0 lb-ft)



• Tighten the swingarm pivot locknut 2 to the specified torque.

Swingarm pivot locknut: 100 N·m (10.0 kgf-m, 72.5 lb-ft)

- Install the rear wheel. (39-56)
- Install the exhaust muffler. (





FRONT BRAKE CONSTRUCTION



A WARNING

- * This brake system is filled with an ethylene glycol-based DOT 4 brake fluid. Do not use mix different types of fluid such as silicone-based or petroleum-based.
- * Do not use any brake fluid taken from old, used or unsealed containers. Never reuse brake fluid left over from the last servicing or stored for long periods.
- * When storing the brake fluid, seal the container completely and keep away from children.
- * When replenishing brake fluid, take care not to get dust into fluid.
- * When washing brake components, use fresh brake fluid. Never use cleaning solvent.
- * A contaminated brake disc or brake pad reduces braking performance. Discard contaminated pads and clean the disc with high quality brake cleaner or neutral detergent.

CAUTION

Handle brake fluid with care: the fluid reacts chemically with paint, plastics, rubber materials etc. and will damage then severly.

BRAKE PAD REPLACEMENT

• Remove the plug 1.

• Remove the pad mounting pin ②.

- Remove the pads ③.
- Inspect the pad mounting pin for wear. If excessive wear is found, replace the mounting pin with a new one.

- Assemble the new brake pad (4), insulator (5) and shim (6).

CAUTION

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

NOTE:

The pad fitted shim and insulator must be installed at piston side.

• Install the brake pads.











CHASSIS 9-65

- Tighten the pad mounting $\text{pin}\,\overline{()}$ to the specified torque.

Front brake pad mounting pin:

18 N·m (1.8 kgf-m, 13.0 lb-ft)

- Install the brake hose clamp bolt.
- Install the plug \circledast and tighten it to the specified torque.

Pad pin plug: 2.5 N·m (0.25 kgf-m, 1.8 lb-ft)

NOTE:

After replacing the brake pads, pump the brake lever several times in order to operate the brake correctly and then check the brake fluid level.





BRAKE FLUID REPLACEMENT

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

B Specification and Classification: DOT 4



- Connect a clear hose to the caliper air bleeder valve and insert the other end of hose into a receptacle.
- Loosen the air bleeder valve and pump the brake lever until old brake fluid flows out of the bleeder system.
- Close the caliper air bleeder valve and disconnect a clear hose. Fill the reservoir with the new fluid to the upper mark of the reservoir.

Brake air bleeder valve: 7.5 N·m (0.75 kgf-m, 5.5 lb-ft)

CAUTION

- * Never reuse the brake fluid left over from previous servicing and which has been stored for long periods of time.
- * Bleed air from the brake system. (2-24)

CALIPER REMOVAL AND DISASSEMBLY

- Drain the brake fluid. (239-65)
- Disconnect the brake hoses by removing the brake hose union bolts.

CAUTION

Place a rag underneath the union bolt on the brake caliper to catch any spilt brake fluid.

- Remove the brake calipers by removing the caliper mounting bolts.
- Remove the brake pads. (3-9-64)
- Remove the caliper holder ①.
- Remove the pad spring ②.









• Place a rag over the pistons to prevent them from popping out and then force out the pistons using compressed air.

CAUTION

Do not use high pressure air to prevent piston damage.

• Remove the dust seals and piston seals.

CAUTION

Do not reuse the removed dust seals and piston seals to prevent fluid leakage.



BRAKE CALIPER

Inspect the brake caliper cylinder wall for nicks, scratches and other damage. If any damage is found, replace the caliper with a new one.

BRAKE CALIPER PISTON

Inspect the brake caliper piston surface for any scratches and other damage. If any damage is found, replace the caliper piston with a new one.

CALIPER HOLDER

• Inspect the caliper holder for damage. If any damage is found, replace it with a new one.











RUBBER PARTS

Inspect the rubber parts for damage. If any damage is found, replace them with the new ones.





CALIPER REASSEMBLY AND REMOUNTING

Reassemble the caliper in the reverse order of removal and disassembly. Pay attention to the following points:

• Wash the caliper bores and pistons with specified brake fluid. Particularly wash the dust seal groove and piston seal groove.

Specification and Classification: DOT 4

CAUTION

- * Wash the caliper components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them.
- * Do not wipe the brake fluid off after washing the components with a rag.
- * When washing the components, use the specified brake fluid. Never use different types of fluid or cleaning solvent such as gasoline, kerosine or the others.
- * Replace the piston seals and dust seals with the new ones when reassembly.
- * Apply the brake fluid to both seals when installing them.

PISTON SEAL

- Install the piston seal and dust seal as shown in the illustration.
- Install the piston to the caliper.





CALIPER HOLDER

• Apply THREAD LOCK SUPER "1303" to the pin 2.

1303 99000-32030: THREAD LOCK SUPER "1303"

• Tighten the pin ② to the caliper holder ① to the specified torque.

Caliper holder pin: 13 N·m (1.3 kgf-m, 9.5 lb-ft)

• Apply SUZUKI SILICONE GREASE to the brake caliper holder pin 2.

₩ 99000-25100: SUZUKI SILICONE GREASE

• Be sure to check that the boot is fitted on the slide pin.







NOTE:

Before remounting the caliper, push the piston all the way into the caliper.

- Remount the brake caliper to the front fork.
- Tighten each bolt to the specified torque.

Front brake caliper mounting bolt ④:

26 N·m (2.6 kgf-m, 19.0 lb-ft)

Front brake hose union bolt (5):

23 N·m (2.3 kgf-m, 16.5 lb-ft)

CAUTION

- * The seal washers should be replaced with the new ones to prevent fluid leakage.
- * Bleed air from the system after reassembling the caliper. (2-24)
- * Brake fluid, if it leaks, will interfere with safe running and discolor painted surfaces. Check the brake hose and hose joints for cracks and fluid leakage.





BRAKE DISC INSPECTION

Visually check the brake disc for damage or cracks. Measure the thickness with a micrometer. Replace the disc if the thickness is less than the service limit or if damage is found.

Front disc thickness Service Limit: 4.0 mm (0.16 in)

09900-20205: Micrometer (0 – 25 mm)

Measure the runout with a dial gauge. Replace the disc if the runout exceeds the service limit.

- Front disc runout Service Limit: 0.30 mm (0.012 in)
- 09900-20607: Dial gauge (1/100 mm) 09900-20701: Magnetic stand
- * Brake disc removal (39-27)
- * Brake disc installation (39-30)

MASTER CYLINDER REMOVAL AND DISAS-SEMBLY

- Remove the handlebar cover. (2-9-8)
- Drain the brake fluid. (39-65)
- Disconnect the front brake light switch coupler .
- Place a rag underneath the union bolt on the master cylinder to catch any spilt brake fluid. Remove the brake hose union bolt and disconnect the brake hose.
- Remove the master cylinder.

CAUTION

Immediately and completely wipe off any brake fluid contacting any part of the motorcycle. The fluid reacts chemically with paint, plastics and rubber materials, etc. and will damage them severely.

• Remove the brake lever 2 and brake switch 3.









- Pull out the dust boot 4 and remove the snap ring 5.

- Remove the piston and return spring.
 - 6 Piston
 - ⑦ Secondary cup
 - (8) Primary cup
 - (9) Return spring





MASTER CYLINDER INSPECTION

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

Inspect the piston surface for any scratches or other damage. Inspect the primary cup, secondary cup and dust boot for wear or damage.

If any defects are found, replace them with new ones.

MASTER CYLINDER REASSEMBLY AND REMOUNTING

Reassemble the master cylinder in the reverse order of removal and disassembly. Pay attention to the following points:

CAUTION

- * Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them.
- * Do not wipe the components with a rag.
- * Apply brake fluid to the cylinder bore and all the component to be inserted into the bore.

Specification and Classification: DOT 4





- Apply brake fluid to the piston and cups.
- Install the following parts to the master cylinder.
- 1 Dust boot
- 2 Snap ring
- 3 Secondary cup
- ④ Piston
- (5) Primary cup
- 6 Return spring
- When remounting the brake master cylinder onto the handlebars, align the master cylinder holder's mating surface (A) with punch mark (B) on the handlebars and tighten the upper bolt (7) first.

Front brake master cylinder mounting bolt: 10 N·m (1.0 kgf-m, 7.0 lb-ft)

• After touching the brake hose union to the stopper, tighten the brake hose union bolt to the specified torque.

Brake hose union bolt: 23 N⋅m (2.3 kgf-m, 16.5 lb-ft)

- CAUTION
 - * The seal washers should be replaced with the new ones to prevent fluid leakage.
 - * Bleed air from the system after reassembling the master cylinder. (2-2-24)







REAR BRAKE CONSTRUCTION



WARNING

- * This brake system is filled with an ethylene glycol-based DOT 4 brake fluid. Do not use or mix different types of fluid such as silicone-based or petroleum-based.
- * Do not use any brake fluid taken from old, used or unsealed containers. Never reuse brake fluid left over from the last servicing or stored for long periods.
- * When storing the brake fluid, seal the container completely and keep away from children.
- * When replenishing brake fluid, take care not to get dust into fluid.
- * When washing brake components, use fresh brake fluid. Never use cleaning solvent.
- * A contaminated brake disc or brake pad reduces braking performance. Discard contaminated pads and clean the disc with high quality brake cleaner or neutral detergent.

CAUTION

Handle brake fluid with care: the fluid reacts chemically with paint, plastics, rubber materials etc. and will damage them severly.

BRAKE PAD REPLACEMENT

- Remove the brake-lock arm (1) and spring (2).
- Disconnect the brake-lock cable ③. (CF9-85)

• Remove the caliper.

CAUTION

Do not operate the brake lever while dismounting the pads.

- Remove the pad mounting pins ④, and then remove the brake pads.
- Clean up the caliper especially around the pistons.

• Inspect the pad mounting pins for wear. If excessive wear is found, replace the mounting pins with new ones.

- Assemble the new pads (5), insulators (6) and shims (7).

CAUTION

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









- Turn the piston 8 clockwise until it stops.
- Align the groove with line A by turning the piston out.
- Install the pad with the projection [®] fitted in the groove on the piston.

• Install the pad to the caliper with the pad seated at the hatched area C of pad spring.

Tighten the pad mounting pins to the specified torque.
Pad mounting pin: 18 N·m (1.8 kgf-m, 13.0 lb-ft)

- Install the caliper.
- Tighten the caliper mounting bolt to the specified torque.

Caliper mounting bolt: 26 N·m (2.6 kgf-m, 19.0 lb-ft) NOTE:

After replacing the brake pads, pump the brake lever several times to check for proper brake operation and then check the brake fluid level.

- Install the brake-lock cable. (239-86)
- Install the brake-lock arm with the punch mark ${\rm \bar{D}}$ aligned with punch mark ${\rm \bar{E}}$ on the brake-lock shaft.

NOTE:

Make sure that the spring end faces to right side of the vehicle.

• Adjust the brake-lock. (79-84)











BRAKE FLUID REPLACEMENT

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

Specification and Classification: DOT 4

- Connect a clear hose to the caliper air bleeder valve and insert the other end of hose into a receptacle.
- Loosen the air bleeder valve and pump the brake lever until old brake fluid flows out of the bleeder system.
- Close the caliper air bleeder valve and disconnect a clear hose. Fill the reservoir with the new fluid to the upper mark of the reservoir.

Brake air bleeder valve: 7.5 N·m (0.75 kgf-m, 5.5 lb-ft)

CAUTION

- * Never reuse the brake fluid left over from previous servicing and which has been stored for long periods of time.
- * Bleed air from the brake system. (2372-225)

CALIPER REMOVAL AND DISASSEMBLY

- Drain the brake fluid. (
- Disconnect the brake-lock cable. (29-85)
- Disconnect the brake hose.
- Remove the caliper.
- Remove the brake pads. (3-9-74)

CAUTION

Place a rag underneath the union bolt on the brake caliper to catch any spilt brake fluid.









- Remove the pad spring 1 and caliper holder 2.

• Remove the parking brake housing ③.

• Disassemble the parking brake.

CAUTION

Replace the removed O-ring with a new one.

• Turn the piston counterclockwise fully.

• Place a rag over the piston to prevent it from popping out and then force out the piston using compressed air.

CAUTION

Do not use high pressure air to prevent piston damage.







- Remove the dust seals 4 and piston seals 5.

CAUTION

Do not reuse the dust seal and piston seal to prevent fluid leakage.

CALIPER INSPECTION BRAKE CALIPER

Inspect the brake caliper cylinder walls for nicks, scratches and other damage. If any damage is found, replace the caliper with a new one.

CAUTION

Do not attempt to disassemble the brake-lock bolt that is built in the caliper. It is unserviceable.

Inspect the brake fluid leakage from O-ring ① and cup ②. If any abnormal condition found, replace the rear brake caliper.







BRAKE CALIPER PISTON

Inspect the brake caliper pistons surface for any scratches and other damage. Inspect the grooved piston for spring tension by pushing the retainer ①. If any damage is found, replace the caliper piston with a new one.

CAUTION

Do not attempt to disassemble the piston. It is unserviceable.



CALIPER HOLDER

Inspect the brake holder sliding pins for wear and other damage. If any damage is found, replace the sliding pin with a new one.

BOOT

Inspect the boots for damage and wear. If any damage is found, replace boots with new ones.

CALIPER REASSEMBLY AND REMOUNTING

Reassemble and remount the caliper in the reverse order of removal and disassembly. Pay attention to the following points:

CAUTION

- * Wash the caliper components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them.
- * Apply brake fluid to the caliper bore and piston to be inserted into the bore.



Specification and Classification: DOT 4

PISTON SEAL

- Install the piston seals as shown in the right illustration.
- Install the pistons to the caliper.









• Turn the piston clockwise fully.

• Install the pad spring 1.





CALIPER HOLDER

• Apply THREAD LOCK SUPER "1303" to the sliding pins.

4303 99000-32030: THREAD LOCK SUPER "1303"

- Tighten the sliding pins (1), (2) to the specified torque.
- Caliper sliding pin 1: 23 N·m (2.3 kgf-m, 16.5 lb-ft) Caliper sliding pin 2: 13 N·m (1.3 kgf-m, 9.5 lb-ft)
- Apply SUZUKI SILICONE GREASE to the sliding pin.

₩ 99000-25100: SUZUKI SILICONE GREASE

- Install the caliper holder to the caliper.
- Set the boot onto the sliding pin securely.
- Install the brake pad. (239-75)




CALIPER

- Install the caliper.
- Tighten the caliper mounting bolts to the specified torque.

Rear caliper mounting bolt: 26 N·m (2.6 kgf-m, 19.0 lb-ft)

- Connect the brake hose ② to the caliper with the brake hose union pipe seated in the cutaway on the caliper.
- Tighten the brake hose union bolt to the specified torque.

Brake hose union bolt: 23 N·m (2.3 kgf-m, 16.5 lb-ft)

CAUTION

- * The seal washers should be replaced with the new ones to prevent fluid leakage.
- * Bleed air from the system after reassembling the caliper. (2-25)
- * Brake fluid, if it leaks, will interfere with safe running and discolor painted surfaces. Check the brake hose and hose joints for cracks and fluid leakage.

BRAKE-LOCK

- Apply SUZUKI SILICONE GREASE to the brake-lock bolt end (A).
- ₩ 99000-25100: SUZUKI SILICONE GREASE
- Install the new gasket and the brake-lock housing to the caliper.
- Apply THREAD LOCK SUPER "1360" to the brake-lock bolts.

41360 99000-32130: THREAD LOCK SUPER "1360"

• Tighten the brake-lock housing bolts to the specified torque.

Brake-lock housing bolt: 23 N⋅m (2.3 kgf-m, 16.5 lb-ft)

• Apply SUZUKI SILICONE GREASE to the O-ring.

₩ 99000-25100: SUZUKI SILICONE GREASE

• Install the O-ring into the brake-lock housing.

CAUTION

Replace the gasket and O-ring with new ones.









• Apply SUZUKI SILICONE GREASE to the brake-lock shaft.

• Install the brake-lock shaft so that the punch mark (B) can be positioned in (C) when the brake-lock shaft is turned clockwise until it stops.

• Install the brake-lock cable and E-ring.

- Install the brake-lock adjust bolt ① to the brake-lock shaft.
- Turn the brake-lock shaft about 90 degree counterclockwise so that the punch mark D will face upward.

- Install the brake-lock arm ② with the punch mark ⑤ aligned with the punch mark ⑥ on the brake-lock arm ②.
- Hook the spring and connect the brake arm ② with the brake-lock cable.

NOTE:

Make sure that the spring end faces to right side of the vehicle.

• Adjust the brake-lock. (39-85)











BRAKE DISC INSPECTION

Inspect the rear brake disc in the same manner as the front brake disc. (19-9-70)

- Service Limit Rear disc thickness: 5.0 mm (0.20 in) Rear disc runout: 0.30 mm (0.012 in)
- * Brake disc removal (79-49)
- * Brake disc installation (19-54)

MASTER CYLINDER REMOVAL AND DISASSEMBLY

Remove and disassemble the rear master cylinder in the same manner as the front brake master cylinder. ($\Box = 9-70$)

MASTER CYLINDER INSPECTION (29-71)

MASTER CYLINDER REASSEMBLY AND REMOUNTING

Reassemble and remount the master cylinder in the reverse order of removal and disassembly. Pay attention to the following points:

CAUTION

- * Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them.
- * Do not wipe the components with a rag.
- * Apply brake fluid to the cylinder bore and all the component to be inserted into the bore.

Specification and Classification: DOT 4

- Apply brake fluid to the piston/cup set.
- Install the following parts to the master cylinder.
 - ① Dust boot
 - 2 Snap ring
 - 3 Secondary cup
 - ④ Piston
 - ⑤ Primary cup
 - ⑥ Return spring





When remounting the brake master cylinder onto the handle-bars, align the master cylinder holder's mating surface A with the punch mark B on the handlebars and tighten the upper bolt T first.

Master cylinder mounting bolt:

10 N·m (1.0 kgf-m, 7.0 lb-ft)

• After touching the brake hose union pipe to the stopper, tighten the brake hose union bolt to the specified torque.

■ Brake hose union bolt: 23 N·m (2.3 kgf-m, 16.5 lb-ft)

- * The seal washers should be replaced with the new ones to prevent fluid leakage.
- * Bleed air from the system after reassembling the master cylinder. (2-25)

BRAKE-LOCK ADJUSTMENT

Before adjusting the brake-lock, perform to bleed the air from the rear brake system.

• Pull the brake-lock lever by one step (one notch).

NOTE:

- * The brake-lock lever has eight steps (eight notches) when pulling in full.
- * When pulling the brake-lock lever, first the brake-lock switch makes sound, then notch makes a sound. Make a count of notch by sound except the brake-lock switch's sound.
- Loosen the locknut ① and the adjust bolt ②.









- Turn the adjuster bolt ② clockwise until it stops.
- Tighten the locknut ① to the specified torque with the adjust bolt ② held in that position.

Brake-lock adjust locknut: 9.5 N⋅m (0.95 kgf-m, 7.0 lb-ft)

NOTE:

Do not turn the adjust bolt more than the given position, or the adjust bolt may be damaged.

• Inspect the brake-lock. (2-33)

BRAKE-LOCK CABLE REPLACEMENT

- Remove the right side leg shield. (239-12)
- Remove the front box. (3-9-18)
- Loosen the locknut 1.
- Disconnect the brake-lock cable 2.
- Remove the brake hose clamp on the swingarm.

- Remove the locknut ③.
- Remove the brake-lock arm 4 from the caliper.

• Disconnect the brake-lock cable (5) by removing the E-ring (6).











- Install the brake-lock cable. (CABLE ROUTING: 11-18)
- Turn the nut $\widehat{\mathcal{T}}$ until the clearance is 0 mm (0 in).

- Connect the brake-lock cable to the brake-lock lever assembly.
- Fit the nut (8) into the concavity on the brake-lock lever assembly.
- Tighten the locknut (9) securely.
- Be sure to fit the boot 1 on the brake-lock cable.
- Connect the brake-lock cable and install the E-ring $\textcircled{1}{2}.$
- Be sure to the dust boots (3) on the brake-lock cable.

• Install the brake-lock arm (4). (\bigcirc 9-82)

NOTE:

The open end of spring 5 must face to the right side of vehicle.

- Install the brake hose clamp.
- Adjust the brake-lock. (239-84)
- Install the front box and right leg side shield.











BRAKE-LOCK SYSTEM

BRAKE-LOCK OPERATION

The brake-lock arm turns through the brake-lock cable as soon as pulling the brake-lock lever. The turning movement is converted to axial movement by the brake-lock adjuster connected to the body with the thread (A). The axial movement transmits automatically from sleeve piston to adjust-bolt. The adjust-bolt presses brake pad to brake disk through the adjust-nut/caliper piston. In this bout, the adjust-bolt and adjust-nut move together with the relation as shown in the illustration.

When releasing the brake-lock lever, each parts return to home position, the caliper piston will be returned by an elasticity transform of piston seal, the adjust-bolt will be returned by the adjust-bolt spring, the brakelock adjuster will be returned by the return-spring.



AUTOMATIC BRAKE-LOCK ADJUSTER SYSTEM

The automatic brake-lock adjuster system is equipped on the brake-lock. If the brake pad worn, the adjust bolt/nut adjust the position of caliper piston so as to keep the certain clearance between brake pad and brake disk.

OPERATION (Normal condition→Braking)

The hydraulic pressure by brake lever operation acts on the adjust-nut/caliper piston. The adjust-bolt threads and adjust-nut threads have a clearance. The piston stroke when braking is shorter than clearance, thus, the braking operation will finish without automatic brake-lock adjuster system operation.



OPERATION (Brake pads are worn→Braking→Automatic adjuster operate)

If braking when the brake pad being worn, the caliper piston/adjust-nut move [1] untill the clearance depended on abrasion is done away.

The axial movement [2] is converted to rotary movement and acts on the adjust-bolt and adjust-nut. Only the adjust-bolt turns [3] because the caliper piston/adjust-nut is fixed to the brake pad with caliper piston groove and pad boss at (A). Thus, the adjust-bolt keeps original position with rotating as well as the caliper piston/adjust-nut moves outside.

The adjust-bolt stops rotating once the brake pad-to-disc clearance become zero, so the automatic adjuster operation is completed.



OVER-ADJUST PREVENTION MECHANISM

When rapid braking [①], the automatic brake-lock adjuster operation works too fast [②].

The caliper piston/adjust-nut is forced to stop [③] as soon as the brake pad contacts with brake disk, but the adjust-bolt turns by inertia force [④] after that. The adjust-bolt stops after the adjust-bolt/nut clearance becomes zero. On this account, the caliper piston/adjust-nut can not return back [⑤] using the elasticity transform of piston seal when releasing the brake lever. It is the over-adjust condition.



The spring is equipped between the caliper piston and the adjust-nut for preventing the over-adjust, serves damper interm of rapid caliper piston movement.

The spring compress [2] as soon as the caliper piston moves exponentially [1], the adjust-nut moves [3], [4] behind time. Here with, it is possible to make correct clearance of the adjust-bolt/nut because the inertia force with rapid movement does not work the adjust-bolt.



TIRE AND WHEEL TIRE REMOVAL

The most critical factor of a tubeless tire is the seal between the wheel rim and the tire bead. For this reason, it is recommended to use a tire changer that can satisfy this sealing requirement and can make the operation efficient as well as functional.

For operating procedures, refer to the instructions supplied by the tire changer manufacturer.

NOTE:

When removing the tire in the case of repair or inspection, mark the tire with a chalk to indicate the tire position relative to the valve position.

Even though the tire is refitted to the original position after repairing puncture, the tire may have to be balanced again since such a repair can cause imbalance.



INSPECTION WHEEL

Wipe the wheel clean and check for the following:

- * Distortion and crack
- * Any flaws and scratches at the bead seating area.
- * Wheel rim runout (279-27)



TIRE

Tire must be checked for the following points:

- * Nick and rupture on side wall
- * Tire tread depth (2-2-25)
- Tread separation
- * Abnormal, uneven wear on tread
- * Surface damage on bead
- * Localized tread wear due to skidding (Flat spot)
- * Abnormal condition of inner liner





VALVE

- Inspect the valve after the tire is removed from the rim. Replace the valve with a new one if the seal rubber is peeling or has damage.
- Inspect the valve core. If the seal has abnormal deformation, replace the valve with a new one.





VALVE INSTALLATION

• Any dust or rust around the valve hole must be cleaned off. Then install the valve in the rim.

NOTE:

To properly install the valve into the valve hole, apply a special tire lubricant or neutral soapy liquid to the valve.

CAUTION

Be careful not to damage the lip of valve.





TIRE INSTALLATION

- Apply tire lubricant to the tire bead.
- When installing the tire onto the wheel, observe the following points.

CAUTION

- * Do not reuse the valve which has been once removed.
- * Do not use oil, grease or gasoline on the tire bead in place of tire lubricant.



- When installing the tire, the arrow ① on the side wall should point to the direction of wheel rotation.
- Align the chalk mark put on the tire at the time of removal with the valve position.

- For installation procedure of tire onto the wheel, follow the instructions given by the tire changer manufacturer.
- Bounce the tire several times while rotating. This makes the tire bead expand outward to contact the wheel, thereby facili-tating air inflation.
- Inflate the tire.

A WARNING

- * Do not inflate the tire to more than 400 kPa (4.0kgf/ cm²). If inflated beyond this limit, the tire can burst and possibly cause injury. Do not stand directly over the tire while inflating.
- * In the case of preset pressure air inflator, pay special care for the set pressure adjustment.
- In this condition, check the "rim line" cast on the tire side walls. The line must be equidistant from the wheel rim all around. If the distance between the rim line and wheel rim varies, this indicates that the bead is not properly seated. If this is the case, deflate the tire completely and unseat the bead for both sides. Coat the bead with lubricant and fit the tire again.
- When the bead has been fitted properly, adjust the pressure to specification. (2-2-26)
- As necessary, adjust the tire balance.

CAUTION

Do not run with a repaired tire at a high speed.

BALANCER WEIGHT INSTALLATION

• When installing the balancer weights to the wheel, set the two balancer weights on both sides of wheel rim.

CAUTION

Weight difference between the two balancer weights must be less than 10 g.







ELECTRICAL SYSTEM

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10

CAUTIONS IN SERVICING

CONNECTORS

- When disconnecting a connector, be sure to hold the terminals; do not pull the lead wires.
- When connecting a connector, push it in so it is firmly attached.
- Inspect the connector for corrosion, contamination and any breakage in the cover.

COUPLERS

- With a lock-type coupler, be sure to release the lock before disconnecting it. When connecting a coupler, push it in until the lock clicks shut.
- When disconnecting a coupler, be sure to hold the coupler; do not pull the lead wires.
- Inspect each terminal on the coupler for looseness or bends.
- Inspect each terminal for corrosion and contamination.

CLAMPS

- Refer to the "WIRING HARNESS ROUTING" section for proper clamping procedures. (11-14 to 11-17)
- Bend the clamp properly, as shown in the illustration.
- When clamping the wire harness, do not allow it to hang down.
- Do not use wire or any substitutes for the band-type clamp.

FUSES

- When a fuse blows, always investigate the cause, correct the problem, and then replace the fuse.
- Do not use a fuse of a different capacity.
- Do not use any substitutes for the fuse (e.g., wire).









SEMI-CONDUCTOR EQUIPPED PARTS

- Do not drop any part that contains a semi-conductor (e.g., ECM, CVT control unit, regulator/rectifier).
- When inspecting the part, follow the inspection instructions carefully. Neglecting proper procedures may cause this part to be damaged.



BATTERY

- The MF battery used in this motorcycle does not require maintenance (e.g., electrolyte level inspection, distilled water replenishment).
- During normal charging, no hydrogen gas is produced. However, if the battery is overcharged, hydrogen gas may be produced. Therefore, be sure there are no fire or spark sources (e.g., short circuit) nearby when charging the battery.
- Be sure to recharge the battery in a well-ventilated and open area.
- Note that the charging system for the MF battery is different from that of a conventional battery. Do not replace the MF battery with a conventional battery.

CONNECTING THE BATTERY

- When disconnecting terminals from the battery for disassembly or servicing, be sure to disconnect the ⊖ battery lead wire, first.
- When connecting the battery lead wires, be sure to connect the \oplus battery lead wire, first.
- If the terminal is corroded, remove the battery, pour warm water over it and clean it with a wire brush.
- After connecting the battery, apply a light coat of grease to the battery terminals.
- Install the cover over the \oplus battery terminal.

WIRING PROCEDURE

• Properly route the wiring harness according to the "WIRING HARNESS ROUTING" section. (11-14 to 11-17)

USING THE MULTI CIRCUIT TESTER

- Properly use the multi circuit tester ⊕ and ⊖ 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 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 position.

CAUTION

Before using the multi circuit tester, read its instruction manual.







LOCATION OF ELECTRICAL COMPONENTS



- 2 Engine coolant temp. sensor (178-13)
- ③ IAC valve (□ 7-20)
 ④ Injector (□ 76-40)
- 5 Throttle position sensor (2-6-31)
- 6 Intake air temp. sensor (3-6-36)
- ⑦ Intake air pressure sensor (6-29)
- 8 Brake lock switch
- (9) Cooling fan motor relay
- 1 Side-stand relay or Fuel pump relay
- 1 Fuel pump relay or Side-stand relay

- ③ TO sensor (□ F6-39)
 ④ CVT control unit
- (5) ECM (Engine Control Module)
- (C ______12-6)
- 17) Horn
- (18) CVT motor (57) 6-45)
- 2 Center stand switch
- 2 HO2 sensor (6-42)
- 2 CVT secondary pulley revolution sensor (CF6-51)



- 1 Fuel pump/fuel gauge
- 2 Starter relay diode
- 3 Main fuse4 CTV fuse
- (5) Battery
- 6 Trunk light seat switch

- 10 Fuse box
- Turn signal relay
 Regulator/rectifier

- ③ Speedometer sensor
 ④ Ignition coil/plug cap (#1)
 ⑤ Ignition coil/plug cap (#2)
 ⑥ Generator

- 1 Oil pressure switch
- 18 Side-stand switch

- (a) Code status switch (b) Cam position sensor ($[-7]^{-7}6-27$) (c) Fan motor ($[-7]^{-7}8-8$) (c) Cooling fan thermo-switch ($[-7]^{-7}8-16$) (c) CKP sensor ($[-7]^{-7}6-28$)
- 23 Oil level switch

CHARGING SYSTEM



TROUBLESHOOTING





INSPECTION

BATTERY CURRENT LEAKAGE

- Open the seat.
- Remove the tool bag.
- \bullet Remove the battery cover 1 with starter relay.
- Turn the ignition switch to the "OFF" position.
- Disconnect the \bigcirc battery lead wire 2.

Measure the current between \bigcirc battery terminal and the \bigcirc battery lead wire using the multi circuit tester. If the reading exceeds the specified value, leakage is evident.

09900-25008: Multi circuit tester set

Tester knob indication: Current (---, 20 mA)

Battery current (leak): Under 3.0 mA

CAUTION

- * Because the current leak might be large, turn the tester to the high range first to avoid tester damage.
- * Do not turn the ignition switch to the "ON" position when measuring current.

When checking to find the excessive current leakage, remove the couplers and connectors, one by one, checking each part.







REGULATED VOLTAGE

- Open the seat.
- Remove the battery cover. (
- Start the engine, turn the ignition switch to LIGHT (-亞-) (for Italy) and the dimmer switch to HI and run the engine at 5 000 r/min.

Measure the DC voltage between the \oplus and \bigcirc battery terminals using the multi circuit tester. If the voltage is not within the specified value, inspect the generator and regulator/rectifier. (\bigcirc 10-9 and 10-10)

NOTE:

When making this test, be sure that the battery is in fullycharged condition.

09900-25008: Multi circuit tester set

Tester knob indication: Voltage (----)

Regulated voltage: 14.0 – 15.5 V at 5 000 r/min

GENERATOR COIL RESISTANCE

- Remove the left frame cover. (239-16)
- Disconnect the generator coupler.

Measure the resistance between the three lead wires.

If the resistance is not specified value, replace the stator coil with a new one.

Also, check that the generator core is insulated.

09900-25008: Multi circuit tester set

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

Generator coil resistance: $0.1 - 1.0 \Omega$ (Yellow – Yellow) $\infty \Omega$ (Yellow – Ground)







GENERATOR NO-LOAD PERFORMANCE

- Remove the left frame cover. (239-16)
- Disconnect the generator lead wire coupler.
- Start the engine and run it at 5 000 r/min.

Measure the AC voltage between the lead wires of the generator using the multi circuit tester.

If the voltage is under the specified value, replace the AC generator with a new one.

09900-25008: Multi circuit tester set

Tester knob indication: Voltage (~)

Generator no-load performance (when engine is cold): More than 50 V (AC) at 5 000 r/min





REGULATOR/RECTIFIER

- Remove the left frame cover. (2-9-16)
- Disconnect the regulator/rectifier couplers ①.

Measure the voltage between the terminals 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
$\overline{\ }$	 Tester probe 					
🖯 Tester probe		B/R	B/W	B1	B ₂	B₃
	B/R		0.5 – 1.2	0.4 – 0.7	0.4 – 0.7	0.4 - 0.7
	B/W	*		*	*	*
	B1	*	0.4 – 0.7		*	*
	B ₂	*	0.4 - 0.7	*		*
	B₃	*	0.4 – 0.7	*	*	

* More than 1.4 V (tester's battery voltage)

NOTE:

If the tester reads under 1.4 V when the tester probes are not connected, replace the battery of multi circuit tester.





STARTER SYSTEM



TROUBLESHOOTING





Others

Engine does not turn though the starter motor runs. • Faulty starter clutch

STARTER MOTOR REMOVAL AND DISASSEMBLY

- Remove the foot board. (79-18)
- Disconnect the starter motor lead wire ① and remove the starter motor bolts ②.



- \bullet Remove the starter motor A from the crankcase.
- Turn the starter motor B 180° to forward.
- Remove the starter motor.



• Disassembly the starter motor, as shown.



STARTER MOTOR INSPECTION

CARBON BRUSHES

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

If any damages are found, replace the brush assembly with a new one.



COMMUTATOR

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

If abnormal wear is found, replace the armature with a new one. If the commutator surface is discolored, polish it with #400 sandpaper and wipe it using a clean, dry cloth.

If there is no undercut, scrape out the insulator 1 with a saw blade.

ARMATURE COIL INSPECTION

Check for continuity between each segment and between each segment and the armature shaft using the multi circuit tester. If there is no continuity between the segments or there is continuity between the segments and shaft, replace the armature with a new one.

09900-25008: Multi circuit tester set

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





OIL SEAL INSPECTION

Check the oil seal lip for damage or leakage. If any damage is found, replace the housing end.



STARTER MOTOR REASSEMBLY

Reassemble the starter motor in the reverse order of disassembly. Pay attention to the following points:

• Apply SUZUKI SUPER GREASE "A" to the lip of the oil seal.

✓ 99000-25030: SUZUKI SUPER GREASE "A" (USA) 99000-25010: SUZUKI SUPER GREASE "A" (Others)



• Apply a small quantity of THREAD LOCK "1342" to the starter motor housing bolts.

+1342 99000-32050: THREAD LOCK "1342"

- Apply SUZUKI SUPER GREASE "A" to the O-ring.
- ✓ 99000-25030: SUZUKI SUPER GREASE "A" (USA) 99000-25010: SUZUKI SUPER GREASE "A" (Others)





STARTER RELAY INSPECTION

- Open the seat.
- Remove the battery cover. (1-710-8)
- Disconnect the battery \ominus lead wire from the battery.

• Disconnect the battery lead wire ① and starter motor lead wire ②.

- Disconnect the starter realy lead wire coupler $\ensuremath{\mathfrak{I}}$.
- Remove the starter relay with battery cover.

Apply 12 V to A and B lead wires and check for continuity between the positive and negative terminals using the multi circuit tester. If the starter relay clicks and continuity is found, the relay is ok.

- 09900-25008: Multi circuit tester set
- Tester knob indication: Continuity test (•)))

CAUTION

Do not apply a battery voltage to the starter relay for more than five seconds, since the relay coil may overheat and damaged.









Measure the relay coil resistance between the terminals using the multi circuit tester. If the resistance is not within the specified value, replace the starter relay with a new one.

09900-25008: Multi circuit tester set

PATA Starter relay resistance: $3 - 6 \Omega$



SIDE-STAND/IGNITION INTERLOCK SYSTEM PARTS INSPECTION

Check the interlock system for proper operation. If the interlock system does not operate properly, check each component for damage or abnormalities. If any abnormality is found, replace the component with a new one.

SIDE-STAND SWITCH

- Remove the maintenance lid. (139-13)
- Remove the left leg shield cover. (2-9-12)
- Disconnect the side-stand switch coupler and measure the voltage between Green and Black/White lead wires.

09900-25008: Multi circuit tester set

🔛 Tester knob indication: Diode test (+++)

	Green (⊕ Probe)	Black/White (─ Probe)
ON (Side-stand up)	0.4 – 0.6 V	
OFF (Side-stand down)	More than 1.4 V (Tester's battery voltage)	

NOTE:

If the tester reads under 1.4 V when the tester probes are not connected, replace its battery.

SIDE-STAND RELAY

- Remove the leg shield. (39-10)
- Remove the side-stand relay. (1-10-4)

NOTE:

Wire color of the side-stand relay lead wire are G, O/W, B/W and Y/B.



First check the insulation between A and B terminals with the tester. Then apply 12 V to terminals as shown and check the continuity between A and B. If there is no continuity, replace the side-stand relay with a new one.

STARTER RELAY DIODE INSPECTION

- Remove left frame cover. (29-16)
- Remove the diode.

Measure the voltage between the terminals using the multi circuit tester.

			Unit: V
		Probe of test index is a second sec	ter to:
be		A	B
test to:	A		0.3 – 0.6
<u>ح</u> ق	B	*	

* More than 1.4 V (tester's battery voltage)

09900-25008: Multi circuit tester set

Tester knob indication: Diode test (⊣←)

NOTE:

If the tester reads under 1.4 V when the tester probes are not connected, replace the batter of multi circuit tester.







IGNITION SYSTEM



NOTE:

The ignition cut-off circuit is incorporated in this ECM to prevent over-running of engine. If engine rpm reaches 8 000 r/min., this circuit cuts off ignition primary current for all spark plugs.

CAUTION

Under no load, the engine can run over 8 000 r/min, even if the ignition cut-off circuit is effective, and it may cause engine damage. Do not run the engine without load over 8 000 r/min at anytime.

TROUBLESHOOTING





INSPECTION

IGNITION COIL PRIMARY PEAK VOLTAGE

- Remove the lower leg shield. (39-10)
- Remove the radiator mounting bolt.
- Disconnect the two ignition coil/plug caps.
- · Connect the new spark plugs to the each ignition coil/plug cap and ground them on the cylinder head.

NOTE:

Make sure that the each ignition coil/plug cap and spark plug are connected properly.

Measure the ignition coil primary peak voltage using the multi circuit tester in the following procedure.

- Connect the multi circuit tester with the peak volt adaptor as follows.

No.1 ignition coil/plug cap: + Probe: White/Blue lead wire connector Probe: Ground

- No.2 ignition coil/plug cap:

 Probe: Black/Yellow lead wire connector Probe: Ground

NOTE:

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

09900-25008: Multi circuit tester set

CAUTION

Before using the multi circuit tester and peak volt adaptor, be sure to refer to the appropriate instruction manual.

- · Set the side-stand upright position, and then turn the ignition switch to the "ON" position.
- Pull the front or rear brake lever.
- Press the starter button and allow the engine to crank for a few seconds, and then measure the ignition coil primary peak voltage.
- Repeat the above procedure a few times and measure the highest ignition coil primary peak voltage.

Tester knob indication: Voltage (----)

DATA Ignition coil primary peak voltage: More than 80 V

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

If the peak voltage is lower than the specified values, inspect the ignition coil/plug cap. (10-21)









IGNITION COIL/PLUG CAP RESISTANCE

• Remove the radiator mounting bolt. (

• Remove the ignition coil/plug cap and disconnect its coupler. Measure the ignition coil/plug cap resistance in both the primary and secondary windings. If the resistance is not within the standard range, replace the ignition coil/plug cap with a new one.

09900-25008: Multi circuit tester set

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

Ignition coil/plug cap resistance

Primary : $0.8 - 2.5 \Omega$ (Terminal – Terminal) Secondary: $8 - 18 k\Omega$ (Plug cap – Terminal)

• Install the ignition coil/plug cap.







CKP SENSOR PEAK VOLTAGE

- Remove the front panel. (79-8)
- Disconnect the wire harness coupler at the ECM.

Measure the CKP sensor peak voltage in the following procedure.

- Connect the multi circuit tester with the peak volt adaptor as follows.
- \oplus Probe: White lead wire
- \bigcirc Probe: White/Green lead wire

09900-25008: Multi circuit tester set

CAUTION

Before using the multi circuit tester and peak volt adaptor, be sure to refer to the appropriate instruction manual.





- Turn the ignition switch to the "ON" position.
- Pull the front or rear brake.
- Press the starter button and allow the engine to crank for a few seconds, and then measure the CKP sensor peak voltage.
- Repeat the above procedure a few times and measure the highest peak voltage.

Tester knob indication: Voltage (----)

CKP sensor peak voltage: More than 2.0 V

If the peak voltage is lower than the specified values, check the peak voltage at the CKP sensor lead wire coupler.

- Remove the maintenance lid. (19-13)
- Dicsonnect the CKP sensor lead wire coupler and connect the multi circuit tester with the peak volt adaptor.
- \oplus Probe: Blue lead wire
- \bigcirc Probe: Green lead wire

Measure the CKP sensor peak voltage at the CKP sensor lead wire coupler, in the same manner as on the ECM coupler.

Tester knob indication: Voltage (----)

CKP sensor peak voltage: More than 2.0 V

If the peak voltage on the CKP sensor lead wire coupler is ok but on the ECM coupler is out of specification, the wire harness must be replaced. If both peak voltages are out of specification, the generator must be replaced and re-checked.







CKP SENSOR RESISTANCE

Measure the resistance between the lead wires and ground. If the resistance is not specified value, the CKP sensor must be replaced.

09900-25008: Multi circuit tester set

(Ω) Tester knob indication: Resistance (Ω)

CKP sensor resistance: 150 – 300 Ω (Green – Blue) : $\infty \Omega$ (Green – Ground)

• Connect the CKP sensor coupler and install the maintenance lid.


COMBINATION METER PARTS NAMES



REMOVAL AND DISASSEMBLY

- Remove the combination meter. (2-9-22)
- Disassembly the combination meter, as shown.



OPERATING PROCEDURE

INITIAL DISPLAY

When the ignition switch is set to ON, all LCD (Liquid Crystal Display) and engine coolant temp. Indicator, FI indicator and shift indicator lights light up for two seconds.

The tachometer light up for 0.5 second and then it operates 0 \leftrightarrow 10 000 r/min two times.

NOTE:

If the power supply is cut (e.g., when the battery is replaced); Since the clock resets to "AM1:00", it will need to be readjusted.

CHANGE THE DISPLAY MODE

With each press of the SELECT button, the display changes between odometer, tripmeter A and tripmeter B as shown.



WARNING

To aboid riding with only one hand, do not operate the button while riding.

ODOMETER

Displays the total distance travelled.

TRIPMETER

Displays the distance travelled since the tripmeter was last reset.

NOTE:

The tripmeters A and B can be used independently.

Hold down the RESET button over two seconds to reset the tripmeter.

CLOCK

Displays the time (hour and minutes) on a 12-hour clock.

Setting the time (Ignition switch is "ON" position)

Press the "H" button to adjust the hour display. Press the "M" button to adjust the minute display.

OIL CHANGE INDICATOR

The oil change indicator warns the driver of engine oil replacement timing. The indicator comes on at initial 600 mile (1 000 km) and the preset intervals thereafter. The preset interval can be varied in the range between 300 mile (500 km) to 3 600 mile (6 000 km) with a step of 300 mile (500 km). Reset the indicator after changing engine oil to turn off the display.

To reset the oil change indicator:

- 1. Turn off the ignition switch.
- 2. Hold down the "SELECT" and "RESET" buttons together and turn the ignition switch to the ON position. Continue pushing on the "SELECT" and "RESET" buttons for two seconds.
- 3. Oil change counter will be reset to initial and the indicator blinks for three seconds.

To vary the preset interval of oil change indicator:

- 1. Push the SELECT and RESET buttons together for two seconds until INTERVAL display comes on.
- 2. Push the SELECT button to decrease the interval from the maximum of 3 600 mile (6 000 km) to the desired interval with a step of 300 mile (500 km). The minimum possible interval is 300 mile (500 km).
- 3. Push the RESET button to increase the interval from the minimum of 300 mile (500 km) to the desired interval with a step of 300 mile (500 km). The maximum possible interval is 3 600 mile (6 000 km).

4. Push the SELECT and RESET buttons together for more than two seconds.

NOTE:

- * The preset interval can be adjusted after the odometer reading has exceeded 600 mile (1 000 km).
- * Reset the indicator after engine oil replacement has been performed.



INSPECTION

ENGINE COOLANT TEMPERATURE METER AND INDICATOR LIGHT

• Disconnect the engine coolant temperature sensor coupler.

CAUTION

When connecting and disconnecting the engine coolant temp. sensor lead wire coupler, make sure to turn OFF the ignition switch, or electronic parts may get damaged.

- \bullet Connect the variable resistor A between the terminals.
- Turn the ignition switch "ON".
- Check the display of engine coolant temperature meter as shown below. If any abnormality is found, replace the combination meter with a new one.





Engine coolant temperature sensor. (238-13)

Engine coolant temperature	Under 39 °C	40 – 59 °C	60 – 99 °C	100 – 111 °C
Resistance	More than 1.148 kΩ	1.148 – 0.587 kΩ	0.587 – 0.188 kΩ	0.188 – 0.140 kΩ
Engine coolant temperature meter	С Н	C H		C H
Engine coolant temperature indicator light	OFF	OFF	OFF	OFF

Engine coolant temperature	112 – 119 °C	Over 120 °C
Resistance	0.140 – 0.116 kΩ	Less than 0.116 kΩ
Engine coolant temperature meter	C H	C H
Engine coolant temperature indicator light	OFF	- - on

FUEL METER

- Remove the trunk box. (3-9-16)
- Connect each resistor between the Red/Black and Black/ White lead wires at the wire harness.
- Turn the ignition switch "ON" position and wait for approx. 13 seconds.

Check the display of fuel meter as shown below, If any abnormality is found, replace the combination meter with a new one.





Resistance	More than 112 Ω	96 – 112 Ω	82 – 96 Ω	71 – 82 Ω	51 – 62 Ω	Less than 50 Ω
Fuel level meter	Flicker F F Flicker F Flicker		P) - ○N E F	P) - 0N E F	P) - ○N E F	P) - ○N E F

FUEL GAUGE

• Remove the fuel pump. (

Measure the resistance at each fuel level gauge float position. If the resistance is incorrect, replace the fuel level gauge with a new one.

Float position	Resistance
(F) (Full) ⓐ (A)	Approx. 13 Ω
B "E" (Empty)	Approx. 130 Ω

09900-25008: Multi circuit tester set

(Ω) Tester knob indication: Resistance (Ω)





- Remove the fuel gauge from the fuel pump.
- Install the fuel gauge.
- Install the fuel pump. (27-11)



FUEL PUMP RELAY

• Remove the fuel pump relay. (10-4) Same as side-stand relay. (10-17)

OIL PRESSURE INDICATOR

NOTE:

Before inspecting the oil pressure switch, check the engine oil level.

- Remove the leg side cover. (29-12)
- Disconnect the oil pressure switch lead wire from the oil pressure switch.
- Turn the ignition switch "ON" position.

Check if the oil pressure indicator comes on, when grounding the lead wire. If the oil pressure indicator does not come on, check the circuit connection or replace the bulb.





ENGINE OIL LEVEL INDICATOR

- Remove the maintenance lid. (39-13)
- Disconnect the oil level switch lead wire ①.
- Turn the ignition switch to the ON position.

Check if the oil level indicator comes on. If the oil level indicator does not come on, check the combination meter coupler or replace the combination meter.

ENGINE OIL LEVEL SWITCH

• Remove the engine oil level switch. (13-3-12)

Check the continuity between the lead wine and switch body. The relation between the position of the oil level gauge float in the oil level gauge and the continuity as shown below.

Switch position	Continuity
A	ON
B	OFF

• Install the oil level switch. (23-74)







SPEEDOMETER

If the speedometer, odometer or trip meter does not function properly, inspect the speedometer sensor and connection of coupler. If the speedometer sensor and connection are all right, replace the meter with a new one.

SPEEDOMETER SENSOR

- Remove the final gear case cover. (2-15)
- Remove the left frame cover. (239-16)
- Disconnect speedometer sensor coupler 1.
- Remove the speedometer sensor ② by removing its mounting bolt and lead wire set bolts.





Connect 12 V battery, 10 k Ω resistor and the multi circuit tester as shown in the right illustration.

O/R: Orange with Red tracer B/W: Black with White tracer W: White

09900-25008: Multi circuit tester set

Tester knob indication: Voltage (----)

Under above condition, if a suitable screwdriver touching the pick-up surface of the speedometer sensor is moved, the tester reading voltage changes (0 V \rightarrow 12 V or 12 V \rightarrow 0 V). If the tester reading voltage does not change, replace the speedometer sensor with a new one.

NOTE:

The highest voltage reading in this test will be the same as that of battery voltage (12 V).

• Apply SUZUKI SUPER GREASE "A" to the speed sensor Oring before installing it.

✓ 99000-25030: SUZUKI SUPER GREASE "A" (USA) 99000-25010: SUZUKI SUPER GREASE "A" (Others)







LAMP HEADLIGHT



HEADLIGHT BULB REPLACEMENT

- Disconnect the lead wire couplers.
- Remove the headlight socket cover.
- Remove the headlight bulb ① by releasing the bulb spring ②.
- Remove the position light ③.
- Install the bulbs.

HEADLIGHT BEAM ADJUSUMENT

- Remove the front panel. (39-8)
- Adjust the headlight beam, both vertical and horizontal.
- (A) Vertical adjuster (using a screw driver \oplus)
- (B) Horizontal adjuster (using a screw driver \oplus)





BRAKE LIGHT/ TAILLIGHT, TURN SIGNAL LIGHT AND LICENSE LIGHT



BULB REPLACEMENT

Front turn signal light

- Remove the cap 1 and screw 2.
- Insert the suitable screwdriver into the screw hole.
- Remove the front turn signal light as shown.



- Remove the socket ③.
- Remove the bulb 4.
- Install the turn signal light in the reverse order of removal.



Rear turn signal light

- Remove the center frame cover. (3-9-15)
- Remove the socket ①.
- \bullet Remove the bulb 2.
- Install the turn signal light in the reverse order of removal.

Brake light/taillight

- Remove the center frame cover. (2-9-15)
- Remove the socket holder plate 1 and socket 2.
- Remove the bulb ③.
- Install the brake light/taillight in the reverse order of removal.









License light

- Remove the lower frame cover. (2-9-15)
- \bullet Remove the lens (1).
- Remove the bulb 2.
- Install the license light in the reverse order of removal.





RELAYS

TURN SIGNAL RELAY

INSPECTION

Before removing the turn signal relay, check the operation of the turn signal light.

If the turn signal light does not illuminate, inspect the bulb, turn signal switch and circuit connection.

If the bulb, turn signal switch and circuit connection are OK, the turn signal relay may be faulty; therefore, replace the turn signal relay with a new one.

NOTE:

Make sure that the battery is fully charged.

COOLING FAN MOTOR RELAY

• Remove the cooling fan motor relay. (1-7-10-4)

First check the insulation between (A) and (B) terminals with the tester. Then apply 12 V to terminals as shown and check the continuity between (A) and (B). If there is no continuity, replace the side-stand relay with a new one.





FUEL PUMP RELAY

[_____10-28]

SIDE-STAND RELAY

[] **10-16**, 10-17

STARTER RELAY

710-15 🕞

SWITCHES IGNITION SWITCH REMOVAL

INSPECTION

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

IGNITION SWITCH

For E-24

Color Position	R	0	O/B	B/W	O/G	Br
ON	<u> </u>	-0	$ $ \bigcirc	-0	$ $ \bigcirc	-0
OFF						
LOCK						

For Others

Color Position	R	0	O/B	B/W	O/G	Br
ON	\bigcirc	-	$ $ \bigcirc $-$		\bigcirc	-0
OFF						
LOCK						
Р	0-					-0

LIGHTING SWITCH For AN650L

Color Position	O/BI	Gr	O/R	Y/W
OFF				
S	<u> </u>	0		
ON	0	0	0	-0

DIMMER SWITCH

Color Position	W	Y	Y/W
HI		O	0
LO	0		0

PASSING LIGHT SWITCH

Color Position	Y	O/R
•		
PUSH	0	0

TURN SIGNAL SWITCH

Color Position	Lg	Lbl	В
L		0	0
PUSH			
R	0	———————————————————————————————————————	

HAZARD SWITCH

Except for E-24 and AN650L

Color Position	В	Lbl	Lg
OFF			
ON	0		

ENGINE STOP SWITCH

Color Position	O/B	O/W
0FF (💢)		
RUN (\C)	0	O

STARTER BUTTON

Color Position	B/BI	Y/G
•		
PUSH	0	0

HORN BUTTON

Color Position	B/BI	B/W
•		
PUSH	0	O

FRONT BRAKE SWITCH

Color Position	B/R	B/BI
OFF		
ON	0	O

REAR BRAKE SWITCH

Color Position	B/G	B/R
OFF		
ON	0	0

BRAKE LOCK SWITCH

Color Position	Y	O/G
OFF		
ON	0	O

CVT UP/DOWN SWITCH

Color Position	Y/G	Br/W	G
UP	0	0	
FREE			
DOWN		0	O

CVT POWER SWITCH

Color Position	Br/W	R/W
FREE		
PUSH	0	0

$CVT "D" \leftrightarrow "M" SWITCH$

Color Position	Br/W	BI/Y
FREE		
PUSH	0	0

TRUNK LIGHT SWITCH

Color Position	R	B/W
OFF		
ON	0	0
OFF		

TRUNK LIGHT SEAT SWITCH

Color Position	В	B/W
•	0	O
PUSH		

OIL LEVEL SWITCH

[_____10-29

OIL PRESSURE SWITCH

Color Position	G/Y	Ground
ON (engine is stopped)	0	O
OFF (engine is running)		

NOTE:

Before inspecting the oil pressure switch check if engine oil level is enough. (

COOLING FAN THERMO SWITCH

3-16

WIRE COLOR

В	: Black	Lbl	: Light blue
Br	: Brown	Lg	: Light green
G	: Green	0	: Orange
Gr	: Gray	R	: Red
B/BI	: Black with E	Blue tr	acer
B/G	: Black with C	Green	tracer
B/W	: Black with V	Vhite	tracer
B/R	: Black with F	Red tra	acer
BI/Y	: Blue with Yellow tracer		
Br/W	: Brown with White tracer		
G/Y	: Green with Yellow tracer		
O/B	: Orange with Black tracer		
O/BI	: Orange with Blue tracer		
O/G	: Orange with Green tracer		
O/R	: Orange with Red tracer		
O/W	: Orange with White tracer		
R/W	: Red with White tracer		
Y/G	: Yellow with	Greer	n tracer
Y/W	: Yellow with	White	tracer

: Yellow Υ W

: White

BATTERY SPECIFICATIONS

Type designation	FTX14-BS
Capacity	12V, 43.2 kC (12 Ah)/10HR

(a) Anode plates

holes 2.

(e) Stopper

(b) Separator (fiberglass plate) © Cathode plates

d Upper cover breather

INITIAL CHARGING FILLING ELECTROLYTE

(f) Filter (9) Terminal h Safty valve

• Remove the aluminum tape ① which seals the battery filler









• Remove the caps ③ from the electrolyte container.

NOTE:

- * Do not remove or pierce the sealed areas ④ of the electrolyte container.
- * After completely filling the battery with electrolyte, use the caps ③ from the electrolyte container to seal the battery filler holes.
- Insert the nozzles of the electrolyte container (5) into the electrolyte filler holes of the battery. Hold the electrolyte container firmly so that it does not fall. Do not allow any of the electrolyte to spill.

• Make sure the air bubbles ① rise to the top of each electrolyte container and leave the electrolyte container in this position for more than 20 minutes.

NOTE:

If air bubbles do not rise from any one of the filler ports, tap the bottom of the electrolyte container two or three times.

Never remove the electrolyte container from the battery while there is still electrolyte in the container.

- After the electrolyte container is completely empty, remove it from the battery and wait about 20 minutes.
- Insert the caps ② firmly into the filler holes, so that the top of the caps do not protrude above the upper surface of the top cover of the battery.

CAUTION

- * Never use anything except the specified battery.
- * Once install the caps to the battery; do not remove the caps.
- * Do not tap the caps with a hammer when installing them.









For initial charging, use the charger specially designed for MF battery.

CAUTION

- * For charging the battery, make sure to use the charger specially designed for MF battery. Otherwise, the battery may be overcharged resulting in shortned service life.
- * Do not remove the caps on the battery top while charging.
- * Position the battery with the cap facing upward during charging.

SERVICING

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

RECHARGING OPERATION

Measure the battery voltage using the multi circuit tester. If the voltage reading is less than the 12 V (DC), recharge the battery with a battery charger.

CAUTION

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

NOTE:

While recharging, do not remove the caps on the top of the battery.

Recharging time: 1.4 A for 5 to 10 hours or 6 A for 1 hour.

CAUTION

Be careful not to permit the charging current to exceed 6 A at any time.

After recharging, wait at least 30 minutes and then measure the battery voltage using the multi circuit tester. If the battery voltage is less than 12.5 V, recharge the battery again. If the battery voltage is still less than 12.5 V after recharging, replace the battery with a new one.

When a battery is left unused for a long time, its voltage needs to be regularly measured. When the motorcycle is not used for more than one month (especially during the winter season), measure the battery voltage at least once a month.





SERVICING INFORMATION

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TROUBLESHOOTING FI SYSTEM/ CVT SYSTEM MALFUNCTION CODE AND DEFECTIVE CONDITION

MALFUNCTION		DETECTED FAILURE CONDITION	
CODE		CHECK FOR	
C00	NO FAULT		
	Camshaft position	The signal does not reach ECM for more than 2 sec. after	
	sensor	receiving the starter signal.	
C11		The camshaft position sensor wiring and mechanical parts.	
		(Camshaft position sensor, intake cam pin, wiring/coupler con-	
		nection)	
	Crankshaft position	The signal does not reach ECM for more than 2 sec. after	
C10	sensor	receiving the starter signal.	
012		The crankshaft position sensor wiring and mechanical parts.	
		(Crankshaft position sensor, wiring/coupler connection)	
	Intake air pressure	The sensor should produce following voltage.	
010	sensor	$(0.50 \text{ V} \leq \text{sensor voltage} < 4.85 \text{ V})$	
013		Without the above range, C13 is indicated.	
		Intake air pressure sensor, wiring/coupler connection.	
	Throttle position	The sensor should produce following voltage.	
014	sensor	$(0.20 \text{ V} \leq \text{sensor voltage} < 4.80 \text{ V})$	
014		Without the above range, C14 is indicated.	
		Throttle position sensor, wiring/coupler connection.	
	Engine coolant	The sensor voltage should be the following.	
015	temperature sensor	$(0.15 \text{ V} \leq \text{sensor voltage} < 4.85 \text{ V})$	
015		Without the above range, C15 is indicated.	
		Engine coolant temperature sensor, wiring/coupler connection.	
	Speed sensor	The speed sensor signal is not input for more than 3 sec. during	
C16		vehicle deceleration.	
Speed sensor, wiring/coupler connection.		Speed sensor, wiring/coupler connection.	
	Intake air temperature	The sensor voltage should be the following.	
C01	sensor	$(0.15 \text{ V} \leq \text{sensor voltage} < 4.85 \text{ V})$	
021		Without the above range, C21 is indicated.	
		Intake air temperature sensor, wiring/coupler connection.	
	Atmospheric pressure	The sensor voltage should be the following.	
C22	sensor	$(0.50 \text{ V} \leq \text{sensor voltage} < 4.85 \text{ V})$	
022		Without the above range, C22 is indicated.	
		Atm. pressure sensor, wiring/coupler connection.	
	Tip over sensor	The sensor voltage should be the following for more than 2 sec.	
		after ignition switch turns ON.	
C23		$(0.20 \text{ V} \leq \text{sensor voltage} < 4.80 \text{ V})$	
		Without the above value, C23 is indicated.	
		Tip over sensor, wiring/coupler connection.	
	Ignition signal	Crankshaft position sensor (pick-up coil) signal is produced but	
C24 or C25		signal from ignition coil is interrupted continuous by 4 times of	
		more. In this case, the code C24 or C25 is indicated.	
		Ignition coil, wiring/coupler connection, power supply from the	
		battery.	

	Fuel injector	Crankshaft position sensor (pick-up coil) signal is produced but	
C22 or C22		fuel injector signal is interrupted continuous by 4 times or mo	
C32 OF C33		In this case, the code C32 or C33 is indicated.	
		Injector, wiring/coupler connection, power supply to the injector.	
Intake air control (IAC) No I		No IAC valve voltage is supplied after starting the engine.	
Valve IAC valve, wiring/coupler connection.		IAC valve, wiring/coupler connection.	
	Fuel pump relay	No voltage is applied to fuel pump although fuel pump relay is	
		turned ON, or voltage is applied to fuel pump although fuel	
C41		pump relay is turned OFF.	
		Fuel pump relay, connecting lead, power source to fuel pump	
		relay.	
C12	Ignition switch	Ignition switch signal is not input in the ECM.	
042		Ignition switch, lead wire/coupler.	
	Heated oxygen sensor	During O2 feedback control, O2 sensor voltage is higher or	
	(HO2S) [E-02, 19]	lower than the specification.	
C14		No signal is detected during engine operation or no electrical	
044		power is supplied from battery.	
		HO2S lead wire/coupler connection.	
		Battery voltage supply to the HO2S.	
	CVT serial	No signal is supplied from CVT control unit to ECM for more	
C50	communication	than 5 sec. after starting the engine.	
		Wiring/coupler connection.	
	CVT motor	The CVT motor operating voltage is not supplied from CVT	
C51		control unit.	
		CVT motor, wiring/coupler connection.	
	CVT pulley position	The sensor should produce following voltage.	
C52	sensor	$(0.06 \leq \text{sensor voltage} \leq 5.04)$	
		Without the above range, C52 is indicated.	
		CVT pulley position sensor, wiring/coupler connection.	
	CVT speed sensor	The CVT speed sensor signal is not input to CVT control unit	
C53		for more than 3 sec. during vehicle rurning.	
		Speed sensor, wiring/coupler connection.	
	CVT secondary pulley	The CVT secondary pulley revolution signal is not input to CVT	
C54	revolution sensor	control unit at speed of 20 km or higher.	
		CVT secondary pulley revolution sensor, wiring/coupler con-	
0.55	CVI engine revolution	The CVT engine revolution signal is not input to CVT control	
C55	signal	unit from ECM at speed of 20 km or higher.	
0.50	CVI throttle position	The CVT throttle position signal does not reach for more than 5	
C56	signal	sec. from ECIVI to CVI control unit after ignition switch turns ON.	
	O) (The share in the state	wiring/coupler connection.	
0.50	GVT reduction ratio	The UVT pulley position signal disagrees with actual revolution	
C58	disagreement	ratio for more than 4 sec.	
		PPS, CVT belt, CVT primary pulley/secondary pulley.	

ENGINE

Complaint	Symptom and possible causes	Remedy
Engine will not start	Compression too low	
or is hard to start.	1. Tappet clearance out of adjustment.	Adjust.
	2. Worn valve guides or poor seating of valves.	Repair or replace.
	3. Mistimed valves.	Adjust.
	4. Excessively worn piston rings.	Replace.
	5. Worn-down cylinder bores.	Replace.
	6. Starter motor cranks too slowly.	See electrical section.
	7. Poor seating of spark plugs.	Retighten.
	Plugs not sparking	
	1. Fouled spark plugs.	Clean.
	2. Wet spark plugs.	Clean and dry.
	3. Defective ignition coil or camshaft position sensor.	Replace.
	4. Open or short in high-tension cords.	Replace.
	5. Defective crankshaft position sensor.	Replace.
	6. Defective ECM.	Replace.
	7. Open-circuited wiring connections.	Repair or replace.
	No fuel reaching the intake manifold	
	1 Clogged fuel filter or fuel hose	Clean or replace
	2 Defective fuel numn	Replace
	2. Defective fuel pressure regulator	Ronlaco
	Defective fuel injector	Replace
	5. Defective fuel numn relay	Replace
	6 Defective FCM	Renlace
	7 Open-circuited wiring connections	Check and renair
		Check and repair.
	Incorrect tuel/air mixture	
	1. I hrottie position sensor out of adjustment.	Adjust.
	2. Defective fuel pump.	
	3. Defective fuel pressure regulator.	Replace.
	4. Defective throttle position sensor.	Replace.
	5. Defective crankshaft position sensor.	Replace.
	6. Defective intake air pressure sensor.	Replace.
	7. Detective atmospheric pressure sensor.	Replace.
	8. Defective ECM.	Replace.
	9. Defective engine coolant temp. sensor.	Replace.
	10. Defective intake air temp. sensor.	Replace.
Engine idles poorly.	1. Tappet clearance out of adjustment.	Adjust.
	2. Poor seating of valves.	Replace or repair.
	3. Defective valve guides.	Replace.
	4. Worn down camshaft.	Replace.
	5. Too wide spark plug gaps.	Adjust or replace.
	6. Defective ignition coil.	Replace.
	7. Defective crankshaft position sensor.	Replace.
	8. Defective ECM.	Replace.
	9. Defective throttle position sensor.	Replace.
	10. Defective fuel pump.	Replace.
	11. Imbalanced throttle valve.	Adjust.
	12. Damaged or cracked vacuum hose.	Replace.
	13. Defective IAC valve.	Replace.

Complaint	Symptom and possible causes	Remedy
Engine stalls often	Incorrect fuel/air mixture	
	1. Defective intake air pressure sensor or circuit.	Repair or replace.
	2. Clogged fuel filter.	Clean or replace.
	3. Defective fuel pump.	Replace.
	4. Defective fuel pressure regulator.	Replace.
	5. Damaged or cracked vacuum hose.	Replace.
	6. Defective engine coolant temp. sensor.	Replace.
	7. Defective thermostat.	Replace.
	8. Defective intake air temp. sensor.	Replace.
	Fuel injector improperly operating	
	1. Defective fuel injector.	Replace.
	2. No injection signal from ECM.	Repair or replace.
	3. Open or short circuited wiring connection.	Repair or replace.
	4. Defective battery or low battery voltage.	Replace or recharge.
	Control circuit or sensor improperly operating	
	1. Defective ECM.	Replace.
	2. Defective fuel pressure regulator.	Replace.
	3. Defective throttle position sensor.	Replace.
	4. Defective intake air temp. sensor.	Replace.
	5. Defective camshaft position sensor.	Replace.
	6. Defective crankshaft position sensor.	Replace.
	7. Defective engine coolant temp. sensor.	Replace.
	8. Defective fuel pump relay.	Replace.
	Engine parts improperly operating	
	1. Fouled spark plugs.	Clean.
	2. Defective crankshaft position sensor or ECM.	Replace.
	3. Clogged fuel hose.	Clean.
	4. Tappet clearance out of adjustment.	Adjust.

Complaint	Symptom and possible causes	Remedy
Noisy engine.	Excessive valve chatter	
	1. Too large tappet clearance.	Adjust.
	2. Weakened or broken valve springs.	Replace.
	3. Worn tappet or cam surface.	Replace.
	4. Worn and burnt camshaft journal.	Replace.
	Noise seems to come from piston	
	1. Worn down pistons or cylinders.	Replace.
	2. Combustion chambers fouled with carbon.	Clean.
	3. Worn piston pins or piston pin bore.	Replace.
	4. Worn piston rings or ring grooves.	Replace.
	Noise seems to come from timing chain	
	1. Stretched chain.	Replace.
	2. Worn sprockets.	Replace.
	3. Tension adjuster not working.	Repair or replace.
	Noise seems to come from clutch	
	1. Worn splines of countershaft or hub.	Replace.
	2. Worn teeth of clutch plates.	Replace.
	3. Distorted clutch plates, driven and drive.	Replace.
	4. Worn clutch release bearing.	Replace.
	5. Weakened clutch dampers.	Replace the primary driven
		gear.
	Noise seems to come from crankshaft	
	1. Rattling bearings due to wear.	Replace.
	2. Worn and burnt big-end bearings.	Replace.
	3. Worn and burnt journal bearings.	Replace.
	4. Too large thrust clearance.	Replace thrust bearing.
	Noise seems to come from transmission	
	1. Worn or rubbing gears.	Replace.
	2. Worn splines.	Replace.
	3. Worn or rubbing primary gears.	Replace.
	4. Worn bearings.	Replace.
	Noise seems to come from water pump	
	1. Too much play on pump shaft bearing.	Replace.
	2. Worn or damaged impeller shaft.	Replace.
	3. Worn or damaged mechanical seal.	Replace.
	4. Contact between pump case and impeller.	Replace.
Engine runs poorly in high speed range	1 Weekened velve springs	Benlace
ingii speca range.	2. Worn camshafts.	Replace.
	3. Valve timing out of adjustment.	Adjust.
	4. Too narrow spark plug gaps.	Adjust.
	5. Ignition not advanced sufficiently due to poorly working	Replace ECM.
	6 Defective ignition coil	Benlace
	7. Defective crankshaft position sensor.	Replace.
	8. Defective ECM.	Replace.
	9. Clogged air cleaner element.	Clean.
	10. Clogged fuel hose, resulting in inadequate fuel supply to injector.	Clean and prime.
	11. Defective fuel pump.	Replace.
	12. Defective throttle position sensor.	Replace.

Complaint	Symptom and possible causes	Remedy
Engine runs poorly in	Defective air flow system	
high speed range.	1. Clogged air cleaner element.	Clean or replace.
	2. Defective throttle valve.	Adjust or replace.
	3. Defective IAC valve.	Replace.
	4. Sucking air from throttle body joint.	Repair or replace.
	5. Imbalanced throttle valve synchronization.	Adjust.
	Defective control circuit or sensor	
	1. Low fuel pressure.	Repair or replace.
	2. Defective throttle position sensor.	Replace.
	3. Defective intake air temp. sensor.	Replace.
	4. Defective camshaft position sensor.	Replace.
	5. Defective crankshaft position sensor.	Replace.
	6. Defective gear position switch.	Replace.
	7. Defective intake air pressure sensor.	Replace.
	8. Defective atmospheric pressure sensor.	Replace.
	9. Defective ECM.	Replace.
	10. Throttle position sensor out of adjustment.	Adjust.
	11. Defective fuel tank pressure control valve.	Replace.
Engine lacks power.	Defective engine internal/electrical parts	
	1. Loss of tappet clearance.	Adjust.
	2. Weakened valve springs.	Replace.
	3. Valve timing out of adjustment.	Adjust.
	4. Worn piston rings or cylinders.	Replace.
	5. Poor seating of valves.	Repair.
	6. Fouled spark plug.	Clean or replace.
	7. Incorrect spark plug.	Adjust or replace.
	8. Clogged injector.	Clean.
	9. Throttle position sensor out of adjustment.	Adjust.
	10. Clogged air cleaner element.	Clean.
	11. Imbalanced throttle valve synchronization.	Adjust.
	12. Sucking air from throttle valve or vacuum hose.	Retighten or replace.
	13. Too much engine oil.	Drain out excess oil.
	14. Defective fuel pump or ECM.	Replace.
	15. Detective crankshaft position sensor and ignition coll.	Replace.
	Defective control circuit or sensor	
	1. Low fuel pressure.	Repair or replace.
	2. Defective throttle position sensor.	Replace.
	3. Defective intake air temp. sensor.	Replace.
	4. Defective camshaft position sensor.	Replace.
	5. Defective crankshaft position sensor.	Replace.
	 Delective gear position switch. Defective intoles of processing concerns. 	
	7. Delective intake air pressure sensor.	
	 Detective atmospheric pressure sensor. Detective ECM 	
	J. Deletive ECIVI.	Adjust
	11. Throttle position sonsor out of adjustment	Adjust
	12. Defective fuel tank pressure central value	Roplaco
L	12. Delective ruer tank pressure control valve.	nepiace.

Complaint	Symptom and possible causes	Remedy
Engine overheats.	Defective engine internal parts	
	1. Heavy carbon deposit on piston crowns.	Clean.
	2. Not enough oil in the engine.	Add oil.
	3. Defective oil pump or clogged oil circuit.	Replace or clean.
	4. Sucking air from intake pipes.	Retighten or replace.
	5. Use of incorrect engine oil.	Change.
	6. Defective cooling system.	See radiator section.
	Lean fuel/air mixture	
	1. Short-circuited intake air pressure sensor/lead wire.	Repair or replace.
	2. Short-circuited intake air temp. sensor/lead wire.	Repair or replace.
	3. Sucking air from intake pipe joint.	Repair or replace.
	4. Defective fuel injector.	Replace.
	5. Defective engine coolant temp. sensor.	Replace.
	The other factors	
	1. Ignition timing too advanced due to defective timing	Replace.
	advance system (engine coolant temp. sensor, gear	
	position switch, crankshaft position sensor and ECM.)	
Dirty or heavy	1. Too much engine oil in the engine.	Check with inspection window.
exhaust smoke.		Drain excess oil.
	2. Worn piston rings or cylinders.	Replace.
	3. Worn valve guides.	Replace.
	4. Scored or scuffed cylinder walls.	Replace.
	5. Worn valves stems.	Replace.
	6. Defective stem seal.	Replace.
	7. Worn oil ring side rails.	Replace.
Slipping clutch.	1. Weakened clutch springs.	Replace.
	2. Worn or distorted pressure plate.	Replace.
	3. Distorted clutch plates.	Replace.
Dragging clutch.	1. Some clutch spring weakened while others are not.	Replace.
	2. Distorted pressure plate or clutch plate.	Replace.

CVT

Complaint	Symptom and possible causes	Remedy
CVT is noisy.	1. Worn or burnt bearing.	Replace.
	2. Primary pulley shim maladjusted.	Adjust.
	3. Broken CVT motor gear.	Replace.
	4. Broken or damaged secondary pulley fan.	Replace.
Slipping CVT belt.	1. Worn CVT belt.	Replace.
	2. Worn pulley face.	Replace.
	3. Entrance of foreign substance.	Clean or adjust.
CVT will not shift.	1. Defective handle switches.	Replace.
	2. Defective sensors.	Replace.
	3. CVT motor locking.	Replace.

RADIATOR (COOLING SYSTEM)

Complaint	Symptom and possible causes	Remedy
Engine overheats.	1. Not enough engine coolant.	Add engine coolant.
	2. Radiator core clogged with dirt or scale.	Clean.
	3. Faulty cooling fan.	Repair or replace.
	4. Defective cooling fan thermo-switch.	Replace.
	5. Clogged water passage.	Clean.
	6. Air trapped in the cooling circuit.	Bleed air.
	7. Defective water pump.	Replace.
	8. Use of incorrect engine coolant.	Replace.
	9. Defective thermostat.	Replace.
Engine overcools.	1. Defective cooling fan thermo-switch.	Replace.
	2. Extremely cold weather.	Put on radiator cover.
	3. Defective thermostat.	Replace.

CHASSIS

Complaint	Symptom and possible causes	Remedy
Heavy steering.	1. Overtightened steering stem nut.	Adjust.
	2. Broken bearing in steering stem.	Replace.
	3. Distorted steering stem.	Replace.
	4. Not enough pressure in tires.	Adjust.
Wobbly handlebars.	1. Loss of balance between right and left front forks.	Replace.
	2. Distorted front fork.	Repair or replace.
	3. Distorted front axle or crooked tire.	Replace.
	4. Loose steering stem nut.	Adjust.
	5. Worn or incorrect tire or wrong tire pressure.	Adjust or replace.
	6. Worn bearing/race in steering stem.	Replace.
Wobbly front wheel.	1. Distorted wheel rim.	Replace.
	2. Worn front wheel bearings.	Replace.
	3. Defective or incorrect tire.	Replace.
	4. Loose axle or axle pinch bolt.	Retighten.
	5. Incorrect front fork oil level.	Adjust.
Front suspension too	1. Weakened springs.	Replace.
soft.	2. Not enough fork oil.	Replenish.
	3. Wrong viscous fork oil.	Replace.
Front suspension too	1. Too viscous fork oil.	Replace.
stiff.	2. Too much fork oil.	Drain excess oil.
	3. Bent front axle.	Replace.
Noisy front suspen-	1. Not enough fork oil.	Replenish.
sion.	2. Loose bolts on suspension.	Retighten.
Wobbly rear wheel.	1. Distorted wheel rim.	Replace.
	2. Worn rear wheel bearing or swingarm bearings.	Replace.
	3. Defective or incorrect tire.	Replace.
	4. Loose nuts or bolts on rear suspension and rear swing-	Retighten.
	arm.	
Rear suspension too	1. Weakened spring of shock absorber.	Replace.
soft.	2. Leakage of oil from shock absorber.	Replace.
	3. Improperly set rear spring unit adjuster.	Adjust.
Rear suspension too	1. Bent shock absorber shaft.	Replace.
stiff.	2. Over tightened swingarm pivot bolt.	Retighten.
	3. Worn swingarm and suspension bearings.	Replace.
	4. Improperly set rear suspension adjuster.	Adjust.
Noisy rear suspen-	1. Loose nuts or bolts on rear suspension.	Retighten.
sion.	2. Worn swingarm bearings.	Replace.

BRAKES

Complaint	Symptom and possible causes	Remedy
Insufficient brake	1. Leakage of brake fluid from hydraulic system.	Repair or replace.
power.	2. Worn pads.	Replace.
	3. Oil adhesion on friction surface of pads/shoe.	Clean disc and pads.
	4. Worn disc.	Replace.
	5. Air in hydraulic system.	Bleed air.
	6. Not enough brake fluid in the reservoir.	Replenish.
Brake squeaking.	1. Carbon adhesion on pad surface.	Repair surface with sandpaper.
	2. Tilted pad.	Correct pad fitting or replace.
	3. Damaged wheel bearing.	Replace.
	4. Loose front-wheel axle or rear-wheel axle.	Tighten to specified torque.
	5. Worn pads or disc.	Replace.
	6. Foreign material in brake fluid.	Replace brake fluid.
	Clogged return port of master cylinder.	Disassemble and clean master
		cylinder.
Excessive brake lever	1. Air in hydraulic system.	Bleed air.
stroke.	2. Insufficient brake fluid.	Replenish fluid to specified
		level; bleed air.
	3. Improper quality of brake fluid.	Replace with correct fluid.
Leakage of brake	1. Insufficient tightening of connection joints.	Tighten to specified torque.
fluid.	2. Cracked hose.	Replace.
	3. Worn piston and/or cup.	Replace piston and/or cup.
Brake drags.	1. Rusty part.	Clean and lubricate.
-	2. Insufficient brake lever or brake pedal pivot lubrication.	Lubricate.
	3. Malfunction of brake-lock.	Adjust or replace.

ELECTRICAL

Complaint	Symptom and possible causes	Remedy
No sparking or poor	1. Defective ignition coil/plug cap or camshaft position	Replace.
sparking.	sensor.	
	2. Defective spark plugs.	Replace.
	3. Defective generator.	Replace.
	4. Defective ECM.	Replace.
	5. Defective tip over sensor.	Replace.
	Open-circuited wiring connections.	Check and repair.
Spark plugs soon	1. Mixture too rich.	Consult FI system.
become fouled with	2. Idling speed set too high.	Adjust fast idle or throttle stop
carbon.		screw.
	3. Incorrect gasoline.	Change.
	4. Dirty air cleaner element.	Clean or replace.
	5. Too cold spark plugs.	Replace with hot type plugs.
Spark plugs become	1. Worn piston rings.	Replace.
fouled too soon.	2. Worn piston or cylinders.	Replace.
	3. Excessive clearance of valve stems in valve guides.	Replace.
	4. Worn stem oil seal.	Replace.
Spark plug electrodes	1. Too hot spark plugs.	Replace with cold type plugs.
overheat or burn.	2. Overheated the engine.	Tune up.
	3. Loose spark plugs.	Retighten.
	4. Too lean mixture.	Consult FI system.
Generator does not	1. Open- or short-circuited lead wires, or loose lead con-	Repair or replace or retighten.
charge.	nections.	
	2. Short-circuited, grounded or open generator coils.	Replace.
	3. Short-circuited or panctured regulator/rectifiers.	Replace.
Generator does	1. Lead wires tend to get short- or open-circuited or	Repair or retighten.
charge, but charging	loosely connected at terminals.	
rate is below the	2. Grounded or open-circuited stator coils or generator.	Replace.
specification.	3. Defective regulator/rectifier.	Replace.
	4. Defective cell plates in the battery.	Replace the battery.
Generator over-	1. Internal short-circuit in the battery.	Replace the battery.
charges.	2. Damaged or defective resistor element in the regulator/	Replace.
	rectifier.	
	3. Poorly grounded regulator/rectifier.	Clean and tighten ground con-
Unstable charging.	1. Lead wire insulation frayed due to vibration, resulting in	Repair or replace.
	Intermittent short-circuiting.	Bashara
	2. Internally short-circuited generator.	Replace.
	3. Detective regulator/rectifier.	Replace.
Starter button is not	1. Run down battery.	Repair or replace.
effective.	2. Detective switch contacts.	Replace.
	3. Brusnes not seating properly on starter motor commu-	Repair or replace.
	lalor.	Baplaga
	4. Delective starter relay or starter interlock switch.	
	5. Detective main fuse.	Replace.

BATTERY

Complaint	Symptom and possible causes	Remedy
"Sulfation", acidic	1. Cracked battery case.	Replace the battery.
white powdery sub-	2. Battery has been left in a run-down condition for a long	Replace the battery.
stance or spots on	time.	
surfaces of cell		
plates.		
Battery runs down	1. Trouble in charging system.	Check the generator, regulator/
quickly.		rectifier and circuit connections
		and make necessary adjust-
		ments to obtain specified
		charging operation.
	2. Cell plates have lost much of their active material as a	Replace the battery, and cor-
	result of overcharging.	rect the charging system.
	3. Internal short-circuit in the battery.	Replace the battery.
	4. Too low battery voltage.	Recharge the battery fully.
	5. Too old battery.	Replace the battery.
Battery "sulfation".	1. Incorrect charging rate.	Replace the battery.
	(When not in use battery should be checked at least	
	once a month to avoid sulfation.)	
	2. The battery was left unused in a cold climate for too	Replace the battery if badly
	long.	sulfated.

WIRING HARNESS, CABLE AND HOSE ROUTING WIRING HARNESS ROUTING









CABLE ROUTING






THROTTLE BODY INSTALLATION/HOSE ROUTING

FUEL TANK MOUNTING



FUEL TANK HOSE ROUTING



EVAP CANISTER HOSE ROUTING (Only for E-33)





RADIATOR HOSE ROUTING



FRONT BRAKE HOSE ROUTING



REAR BRAKE HOSE ROUTING



SIDE-STAND SET-UP



CENTER STAND SET-UP







SPECIAL TOOLS

09900-06107 Snap ring pliers	09900-06108 Snap ring pliers	09900-09004 Impact driver set	09900-18710 Hexagon socket 12 mm	09900-20102 Vernier calipers
09900-20202 Micrometer	09900-20204 Micrometer	09900-20205 Micrometer	09900-20508	09900-20602 Dial gauge
(25 – 50 mm)	(75 – 100 mm)	(0 – 25 mm)	Cylinder gauge set	(1/1000 mm, 1 mm)
09900-20605 Dial gauge	09900-20607 Dial gauge (1/100 mm, 10 mm)	09900-20701 Magnetic stand	09900-20803 09900-20806 Thickness gauge	09900-20805 Tire depth gauge
	2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
09900-21304 V-block (100 mm)	09900-22301 09900-22302 Plastigauge	09900-22401 Small bore gauge (10 – 18 mm)	09900-25008 Multi circuit tester set	09910-32812 Crankshaft installer
		Co		
09910-32850 Crankshaft installer attachment	09913-50121 Oil seal remover	09913-60210 09913-60230 Journal bearing remover/installer	09913-60241 Journal bearing holder	09913-60912 or 09913-61110 or 09913-61510 Bearing puller



09916-44930

Attachment

09920-31010

CVT primary

pulley shaft holder

09916-84511

09920-31020

Extension handle

Tweezers

09913-70210

09915-74521

09916-14521

09916-34542

09917-23711

Ring nut wrench

Reamer handle

Valve spring com-

pressor attachment

09916-34561

09918-53810

tool

Chain tensioner lock

(11.3 mm)

Valve guide reamer

09916-43210

Valve guide

09920-13120

ing tool

Crankcase separat-

remover/installer

hose

Oil pressure gauge

Bearing installer set







When ordering a special tool, please confirm whether it is available or not.

TIGHTENING TORQUE ENGINE

ITEM		N∙m	kgf-m	lb-ft
Cylinder head cover bolt	Tighten lightly.	10	1.0	7.3
	Tighten firmly.	14	1.4	10.0
Cylinder head bolt	(M8)	25	2.5	1.8
	(M10) Tighten lightly.	25	2.5	1.8
	Tighten firmly.	53	5.3	38.5
Cam chain tension adjuster bolt		10	1.0	7.3
Clutch spring set bolt		5.5	0.55	4.0
Clutch housing nut		70	7.0	50.5
Generator rotor bolt		160	16.0	115.5
Starter clutch bolt		55	5.5	40.0
Crankcase bolt	(M6)	11	1.1	8.0
	(M8)	26	2.6	19.0
Oil pressure switch		13	1.3	9.5
Engine oil drain plug		23	2.3	16.5
Transmission oil drain plug		21	2.1	15.0
Transmission breather plug		35	3.5	25.5
Transmission oil filler plug		23	2.3	16.5
Transmission oil level plug		21	2.1	15.0
Right crankcase cover bolt		11	1.1	8.0
Primary shaft cap bolt		11	1.1	8.0
Breather cover bolt		10	1.0	7.3
Spark plug		11	1.1	8.0
Cam shaft holder bolt		10	1.0	7.3
Cylinder head side bolt		14	1.4	10.0
Cam position sensor bolt		10	1.0	7.3
Oil level switch bolt		10	1.0	7.3
Oil cooler union bolt		70	7.0	5.0
Engine mount bolt		55	5.5	40.0
Final gear oil drain plug		33	3.3	24.0
Final gear oil level plug		33	3.3	24.0
Exhaust pipe clamp bolt		23	2.3	16.5
Muffler mounting bolt		23	2.3	16.5
Oil hose union bolt (M10)		20	2.0	14.5
Oil return hose union bolt (M14)		28	2.8	20.5
Timing cap		15	1.5	11.0
Drive shaft nut		105	10.5	76.0
Connecting rod bolt	Tighten lightly.	21	2.1	15.0
	Tighten firmly.		90°	
Starter motor mounting bolt		6	0.6	4.5
Starter motor lead wire nut		6	0.6	4.5

CVT

ITEM	N∙m	kgf-m	lb-ft
CVT mounting bolt	50	5.0	36.0
Primary pulley stopper bolt	36	3.6	26.0
CVT cover bolt	22	2.2	16.0
Primary pulley shaft bolt	64	6.4	46.5
Secondary pulley shaft nut	226	22.6	163.5

CHASSIS

ITEM	N∙m	kgf-m	lb-ft
Handlebar clamp bolt	23	2.3	16.5
Steering stem head nut	65	6.5	47.0
Steering stem nut	45	4.5	32.5
Front fork upper clamp bolt	23	2.3	16.5
Front fork lower clamp bolt	23	2.3	16.5
Front fork cap bolt	23	2.3	16.5
Front fork cylinder bolt	30	3.0	21.5
Front axle	65	6.5	47.0
Front axle pinch bolt	23	2.3	16.5
Brake hose union bolt	23	2.3	16.5
Brake disc bolt (Front and Rear)	23	2.3	16.5
Brake air bleeder valve (Front and Rear)	7.5	0.75	5.5
Brake caliper mounting bolt (Front and Rear)	26	2.6	19.0
Brake master cylinder mounting bolt (Front and Rear)	10	1.0	7.0
Front brake caliper holder pin	13	1.3	9.5
Front brake pad mounting pin plug	2.5	0.25	1.8
Brake pad mounting pin (Front and Rear)	18	1.8	13.0
Rear brake caliper holder sliding pin	13	1.3	9.5
	23	2.3	16.5
Brake-lock housing bolt	23	2.3	16.5
Brake-lock adjuster locknut	9.5	0.95	7.0
Brake pipe nut	16	1.6	11.5
Swingarm pivot bolt	9.5	0.95	7.0
Swingarm pivot bolt locknut	100	10.0	72.5
Rear shock absorber mounting nut (Upper)	29	2.9	21.0
Rear shock absorber mounting bolt (Lower)	29	2.9	21.0
Rear axle nut	100	10.0	72.5
Seat rail mounting bolt (M8)	23	2.3	16.5
(M10)	50	5.0	36.0
Side-stand bolt	50	5.0	36.0
Side-stand nut	40	4.0	29.0
Center stand bracket bolt	23	2.3	16.5
Center stand nut	29	2.9	21.0

TIGHTENING TORQUE CHART

For other nuts and bolts not listed in the preceding page, refer to this chart:

Bolt Diameter	Conventi	onal or "4" ma	rked bolt	"7" marked bolt			
(mm) 🛞	N∙m	kgf-m	lb-ft	N∙m	kgf-m	lb-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	

A





Conventional bolt

"4" marked bolt

"7" marked bolt

SERVICE DATA VALVE + GUIDE

Unit: mm (in)

ITEM	STANDARD		LIMIT
Valve diam.	IN.	29.5 (1.16)	_
	EX.	25.0 (0.98)	—
Tappet clearance (when cold)	IN.	0.10 – 0.20 (0.0039 – 0.0079)	—
	EX.	0.20 – 0.30 (0.0079 – 0.0118)	_
Valve guide to valve stem clearance	IN.	0.010 - 0.040 (0.0004 - 0.0016)	_
	EX.	0.030 - 0.060 (0.0012 - 0.0024)	_
Valve guide I.D.	IN. & EX.	4.500 – 4.515 (0.1772 – 0.1778)	—
Valve stem O.D.	IN.	4.475 – 4.490 (0.1762 – 0.1768)	—
	EX.	4.455 – 4.470 (0.1754 – 0.1760)	—
Valve stem deflection	IN. & EX.	—	0.35 (0.014)
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	_	0.5 (0.02)
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. & EX.)	IN. & EX.	—	40.6 (1.60)
Valve spring tension (IN. & EX.)	IN. & EX.	136 – 156 N (13.6 – 15.6 kgf, 30.0 – 34.4 lbs) at length 33.4 mm (1.31 in)	_

CAMSHAFT + CYLINDER HEAD

ITEM STANDARD LIMIT 35.38 - 35.43 35.10 Cam height IN. (1.393 - 1.395)(1.382)33.98 - 34.03 (1.338 - 1.340) 33.70 EX. (1.327)0.032- 0.066 (0.0013 - 0.0026) Camshaft journal oil clearance 0.150 IN. & EX. (0.0059)Camshaft journal holder I.D. 24.012 - 24.025IN. & EX. _ (0.9454 - 0.9459)Camshaft journal O.D. 23.959 - 23.980 IN. & EX. ____ (0.9433 - 0.9441)Camshaft runout 0.10 IN. & EX. (0.004)

ITEM	STANDARD	LIMIT
Cam chain pin (at arrow "3")	15th pin	—
Cylinder head distortion	_	0.10 (0.004)

CYLINDER + PISTON + PISTON RING

ITEM			STANDARD	LIMIT
Compression pressure		(15.	1 500 – 1 900 kPa 0 – 19.0 kgf/cm², 213 – 270 psi)	1 200 kPa (12 kgf/cm², 171 psi)
Compression pressure difference	_		200 kPa (2.0 kgf/cm², 28 psi)	
Piston to cylinder clearance			0.045 - 0.055 (0.0018 - 0.0022)	0.120 (0.0047)
Cylinder bore			75.500 – 75.515 (2.9724 – 2.9730)	75.585 (2.9758)
Piston diam.	Меа	asure	75.450 – 75.465 (2.9705 – 2.9711) at 15 mm (0.6 in) from the skirt end.	75.380 (2.9677)
Cylinder distortion			—	0.10 (0.004)
Piston ring free end gap	1st	R	Approx. 11.6 (0.46)	9.3 (0.37)
	2nd	RN	Approx. 8.6 (0.34)	6.9 (0.27)
Piston ring end gap	1s	t	0.20 – 0.30 (0.008 – 0.012)	0.50 (0.020)
	2n	d	0.20 – 0.30 (0.008 – 0.012)	0.50 (0.020)
Piston ring to groove clearance	1st		_	0.180 (0.007)
	2n	d	_	0.150 (0.006)
Piston ring groove width	1s	t	1.01 – 1.03 (0.040 – 0.041)	_
	2n	d	1.01 – 1.03 (0.040 – 0.041)	_
	Oi	I	2.01 – 2.03 (0.079 – 0.080)	—
Piston ring thickness	1s	t	0.97 – 0.99 (0.038 – 0.039)	—
	2n	d	0.97 – 0.99 (0.038 – 0.039)	_
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 big end side clearance	0.10 - 0.20 (0.004 - 0.008)	0.30 (0.012)
Conrod big end width	19.950 – 20.000 (0.7854 – 0.7874)	
Crank pin width	20.100 – 20.150 (0.7913 – 0.7933)	_
Conrod big end oil clearance	0.032 - 0.056 (0.0013 - 0.0022)	0.080 (0.0031)
Crank pin O.D.	44.976 – 45.000 (1.7707 – 1.7717)	
Crankshaft journal oil clearance	0.018 - 0.045 (0.0007 - 0.0018)	0.080 (0.0031)
Crankshaft journal O.D.	47.985 – 48.000 (1.8892 – 1.8898)	_
Crankshaft thrust bearing thickness	2.025 – 2.175 (0.0797 – 0.0856)	—
Crankshaft thrust clearance	0.10 - 0.15 (0.0039 - 0.0059)	_
Crankshaft runout	—	0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pressure (at 60°C, 140°F)	Above 350 kPa (3.5 kgf/cm²) Below 550 kPa (5.5 kgf/cm²) at 3 000 r/min.	_

CLUTCH

ITEM	STANDARD	LIMIT
Drive plate thickness	2.92 - 3.08 (0.115 - 0.121)	2.62 (0.103)
Drive plate claw width	13.85 – 13.96 (0.545 – 0.550)	13.05 (0.514)
Driven plate No.2 thickness	2.42 - 2.58 (0.095 - 0.102)	2.27 (0.089)
Driven plate No.1 distortion	—	0.10 (0.004)
Clutch spring free length	13.9 (0.547)	13.2 (0.520)
Clutch plate concaved washer height	—	3.1 (0.12)
Clutch engagement	1 500 – 2 100 r/min.	—
Clutch lock-up	3 200 – 3 800 r/min.	—

INJECTOR + FUEL PUMP + FUEL PRESSURE REGULATOR

ITEM	SPECIFICATION	NOTE
Injector resistance	11 – 13 Ω at 20 °C (68 °F)	—
Fuel pump discharge amount	More than 0.9 L (0.95/0.79 US/Imp qt) For 30 sec, at 300 kPa (3.0 kgf/cm², 43 psi)	—
Fuel pressure regulator operating set pressure	Approx. 300 kPa (3.0 kgf/cm², 43 psi)	—

FI/CVT-SENSORS

ITEM		SPECIFICATION	NOTE
CMP sensor resistance		0.9 – 1.7 kΩ	
CMP sensor peak voltage	More th	an 0.5 V (When cranking)	⊕: B/Y, ⊝: Br
CKP sensor resistance		150 – 300 Ω	
CKP sensor peak voltage	More th	an 2.0 V (When cranking)	⊕: BI, ⊝: G
IAP sensor input voltage		4.5 – 5.5 V	
IAP sensor output voltage	Appr	rox. 2.6 V at idle speed	
TP sensor input voltage		4.5 – 5.5 V	
TP sensor resistance	Closed	Approx. 1.1 kΩ	
	Opened	Approx. 4.2 kΩ	
TP sensor output voltage	Closed	Approx. 1.1 V	
	Opened	Approx. 4.3 V	
ECT sensor input voltage		4.5 – 5.5 V	
ECT sensor resistance	Approx	. 2.45 kΩ at 20 °C (68 °F)	
IAT sensor input voltage		4.5 – 5.5 V	
IAT sensor resistance	Approx	. 2.45 kΩ at 20 °C (68 °F)	
AP sensor input voltage		4.5 – 5.5 V	
AP sensor output voltage	Approx. 3.	6 V at 760 mmHg (100 kPa)	
TO sensor resistance		19.1 – 19.7 kΩ	
TO sensor output voltage	Normal	Less than 1.4 V	
	Leaning	Less than 3.7 V	
Injector voltage		Battery voltage	
Ignition coil primary peak voltage	More th	nan 80 V (When cranking)	#1 ⊕: W/Bl, ⊡: Ground #2 ⊕: B/Y, ⊡: Ground
HO2 sensor resistance	4 –	5 Ω at 23 °C (73.4 °F)	
HO2 sensor output voltage	Idle speed	Less than 0.4 V	
	3 000 r/min.	More than 0.6 V	
PAIR solenoid valve resistance	20 -	- 24 Ω at 20 °C (68 °F)	
CVT primary pulley position sensor	Compressed	1.9 – 2.3 kΩ	
	Extended	0.2 – 1.0 kΩ	
CVT primary pulley position sensor	1 st : Idle speed	Approx. 3.3 V	
output voltage	3 rd : 3 000 r/min.	Approx. 1.3 V	
	5 th : 3 000 r/min.	Approx. 0.5 V	
CVT secondary pulley revolution sensor resistance		400 – 600 Ω	
CVT secondary pulley revolution sensor peak voltage	More	e than 5 V at idle speed	⊕: Y, ⊝: W

THROTTLE BODY

ITEM	SPECIFICATION
ID No.	10GO
Bore size	32 mm
Fast idle r/min.	1 300 – 1600 r/min.
Idle r/min.	1 200 ± 100 r/min.
Synchronizing screw opening	1½ turns out
IAC valve resistance	Approx. 4 Ω at 20 – 24 °C (68 – 75 °F)
Throttle cable play	2.0 – 4.0 mm (0.08 – 0.16 in)

THERMOSTAT + RADIATOR + FAN + COOLANT

ITEM	STAN	LIMIT		
Thermostat valve opening temper- ature	Ap	_		
Thermostat valve lift	Over 8.0 n	nm (0.3 in) at 100°C (212 °F)	—	
Engine coolant temperature sensor	20 °C (68 °F)	Approx. 2.45 kΩ	—	
resistance	50 °C (122 °F)	Approx. 0.811 k Ω	—	
	80 °C (176 °F)	Approx. 0.318 kΩ	—	
	110 °C (230 °F)	Approx. 0.142 k Ω	—	
Radiator cap valve opening pres- sure	1.	110 kPa (1.1 kgf/cm²)		
Eclectic fan thermo-switch operat-	ON	93 – 103 °C	—	
ing temperature	OFF	87 – 97 °C	—	
Engine coolant type	Use an anti-freeze/coolant compatible with alumi- num radiator, mixed with distilled water only, at the ratio of 50:50.		_	
Engine coolant including reserve	Reverse tank side	Approx. 250 ml	_	
	Engine side	Approx. 1 050 ml	_	

ELECTRICAL

ITEM		STD/SPEC.	NOTE
Firing order		1.2	
Spark plug	Туре	NGK: CR8E DENSO: U24ESR-N	
	Gap	0.7 – 0.8 (0.028 – 0.031)	
Spark performance	C	over 8.0 mm (0.3) at 1 atm.	
CKP sensor peak voltage		More than 2.0 V	⊕: Bl, ⊝:G
Ignition coil resistance	Primary	0.8 – 2.5 Ω	
	Secondary	8 – 18 kΩ	
Ignition coil primary peak voltage		More than 80 V	#1 ⊕: W/Bl, ⊡: Ground #2 ⊕: B/Y, ⊡: Ground
Generator coil resistance	CKP sensor	150 – 300 Ω	G – Bl
	Charging	0.1 – 1.0 Ω	Y – Y

ITEM	STD/SPEC.			NOTE
Generator no-load voltage (When cold)		Мо	ore than 50 V at 5 000 r/min.	
Generator Max. output		Ap	prox. 500 W at 5 000 r/min.	
Regulated voltage		14	4.0 – 15.5 V at 5 000 r/min.	
Starter relay resistance			3-6Ω	
Battery	Type designation		FTX14-BS	
	Capac	ity	12 V 43.2 kC (12 Ah)/10 HR	
Fuze size	Head-	HI	15 A	
	light	LO	15 A	
	Fuel pu	imp	10 A	
	Ignition		15 A	
	Turn signal		15 A	
	Fan mo	otor	10 A	
	Mair	۱	40 A	
	CVT		40 A	

WATTAGE

Unit: W

ITEM		STD/SPEC.				
		E-02, 19	E-03, 24, 28, 33			
Headlight	HI	60 + 55	60 × 2			
	LO	55	55 × 2			
Parking or position light		5 × 2				
Brake light/Taillight		21/5 × 2	\leftarrow			
Turn signal light		21	\leftarrow			
License light		5	\leftarrow			
Instrument panel light		1.4 × 2	\leftarrow			
Engine coolant temp. indicator light		1.4	\leftarrow			
FI indicator light		1.4	\leftarrow			
Engine oil pressure indicate	or light	1.4	\leftarrow			
Brake-lock indicator light		1.4	\leftarrow			
High beam indicator light		1.4	\leftarrow			
Turn signal indicator light		1.4 × 2	\leftarrow			
Power mode indicator light		1.4	\leftarrow			
Drive indicator light		1.4	\leftarrow			
Gear position indicator ligh	t	1.4 × 5	\leftarrow			
Trunk light		5	\leftarrow			

BRAKE + WHEEL

Unit: mm (in)

ITEM		STANDARD	LIMIT
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)	4.0 (0.16)
	Rear	5.5 ± 0.2 (0.217 ± 0.008)	5.0 (0.20)
Brake disc runout		—	0.30 (0.012)
Master cylinder bore	Front	12.700 – 12.743 (0.5000 – 0.5017)	_
	Rear	12.700 – 12.743 (0.5000 – 0.5017)	—
Master cylinder piston diameter	Front	12.657 – 12.684 (0.4983 – 0.4994)	_
	Rear	12.657 – 12.684 (0.4983 – 0.4994)	—
Brake caliper cylinder bore	Front	25.400 – 25.450 (1.0000 – 1.0020)	_
	Rear	27.000 – 27.050 (1.0630 – 1.0650)	—
Brake caliper piston diameter	Front	25.318 – 25.368 (0.9968 – 0.9987)	_
	Rear	26.918 – 26.968 (1.0598 – 1.0617)	—
Brake fluid type		DOT4	—
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	_	2.0 (0.08)
Wheel axle runout	Front	_	0.25 (0.010)
	Rear	—	0.25 (0.010)
Wheel rim size	Front	15 M/C × MT3.50	_
	Rear	14 M/C × MT4.50	

SUSPENSION

ITEM STANDARD LIMIT Front fork stroke 105 ____ (4.1) Front fork spring free length 341 _ (13.4) Front fork oil type SUZUKI FORK OIL G-10 (#10) ____ or an equivalent fork oil Front fork oil capacity (each leg) 482 ml (16.29/16.97 US/Imp oz) ____ Front fork oil level 129 ____ (5.09) Rear wheel travel 100 ____ (3.9) Rear shock absorber spring 2nd adjuster

TIRE

ITEM			STANDARD	LIMIT
Cold inflation tire pressure	Solo	Front	225 kPa (2.25 kgf/cm², 33 psi)	—
	riding	Rear	250 kPa (2.50 kgf/cm², 36 psi)	—
	Dual	Front	225 kPa (2.25 kgf/cm², 33 psi)	—
	riding	Rear	280 kPa (2.80 kgf/cm², 41 psi)	—
Tire size		Front	120/70R15M/C 56H	—
		Rear	160/60R14M/C 65H	—
Tire type		Front	BRIDGESTONE TH01F	—
		Rear	BRIDGESTONE TH01R	—
Tire tread depth (Recommended depth)		Front	—	1.6 mm (0.06 in)
		Rear	—	2.0 mm (0.08 in)

FUEL + OIL

ITEM		SPECIFICATION	NOTE
Fuel type	Use only unleaded gasoline of at least 87 pump octane $\left(\frac{R+M}{2}\right)$ or 91 octane or higher rated by the research method. Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10 % ethanol, or less than 5 % methanol with appropriate cosolvents and corrosion inhibitor is permissible.		E-03, 28, 33
	Gasoline used higher. An unle	should be graded 91 octane or eaded gasoline is recommended.	The others
Fuel tank capacity	Including reserve	15.0 L (4.0/3.3 US/Imp gal)	
	Fuel meter mark flickering	Approx. 3.0 L (0.79/0.66 US/Imp gal)	
	Fuel meter mark and LCD flickering	Approx. 1.5 L (0.40/0.33 US/Imp gal)	
Engine oil and transmission oil type	SA	E 10W-40, API, SF or SG	
Engine oil capacity	Oil change	2.6 L (2.7/2.3 US/Imp qt)	
	Filter change	2.9 L (3.1/2.6 US/Imp qt)	
	Overhaul	3.4 L (3.6/3.0 US/Imp qt)	
Transmission oil capacity	Oil change	360 ml (12.2/12.7 US/Imp oz)	
	Overhaul	400 ml (13.5/14.1 US/Imp oz)	
Final gear oil type	Hypoid ge	ear oil SAE #90 API grade GL-5	
Final gear oil capacity	Oil change	300 ml (10.1/10.6 US/lmp oz)	
	Overhaul	430 ml (14.5/15.1 US/lmp oz)	

EMISSION CONTROL INFORMATION

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12

EMISSION CONTROL SYSTEMS FUEL INJECTION SYSTEM

AN650 motorcycles are equipped with a fuel injection system for emission level control.

This fuel injection system is precision designed, manufactured and adjusted to comply with the applicable emission limits.



CRANKCASE EMISSION CONTROL SYSTEM

The engine is equipped with a PCV system. Blow-by gas in the engine is constantly drawn into the crankcase, which is returned to the combustion chamber through the PCV (breather) hose, air cleaner and throttle body.



EXHAUST EMISSION CONTROL SYSTEM (PAIR SYSTEM)

The exhaust emission control system is composed of the PAIR system and THREE-WAY CATALYST system (Except for USA). The fresh air is drawn into the exhaust port with the PAIR solenoid valve and PAIR reed valve. The PAIR solenoid valve is operated by the ECM, and the fresh air flow is controlled according to the TPS, ECTS, IATS, IAPS and CKPS.



NOISE EMISSION CONTROL SYSTEM

TAMPERING WITH THE NOISE CONTROL SYSTEM PROHIBITED: Federal law prohibits the following acts or the causing thereof:

- 1. The removal or rendering inoperative by any person, other than for purposes of maintenance, repair or replacement, of any device or element of design incorporated into any new vehicle for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use, or
- 2. The use of the vehicle after such device or element of design has been removed or rendered inoperative by any person.

AMONG THOSE ACTS PRESUMED TO CONSTITUTE TAMPERING ARE THE ACTS LISTED BELOW:

- Removing or puncturing the muffler, baffles, header pipes, screen type spark arrester (if equipped) or any other component which conducts exhaust gases.
- Removing or puncturing the air cleaner case, air cleaner cover, baffles or any other component which conducts intake air.
- Replacing the exhaust system or muffler with a system or muffler not marked with the same model specific code as the code listed on the Motorcycle Noise Emission Control Information label.

EVAPORATIVE EMISSION CONTROL SYSTEM (Only for E-33)



PAIR (AIR SUPPLY) SYSTEM INSPECTION

HOSE

- Remove the front box. (59-18)
- Inspect the hose for wear or damage.
- Inspect that the hose is securely connected.





Remove the air chamber. (27-16)
Remove the PAIR reed valve cover.

PAIR REED VALVE

- Inspect the reed valve for the carbon deposit.
- If the carbon deposit is found in the reed valve, replace the PAIR reed valve with a new one.
- Installation is in the reverse order of removal.



PAIR CONTROL SOLENOID VALVE

- Disconnect the PAIR control solenoid valve lead wire coupler.
- Disconnect the PAIR hose.
- Remove the PAIR control solenoid valve.



- Check that air flows through the air inlet port to the air outlet port.
- If air does not flow out, replace the PAIR control solenoid valve with a new one.



- Connect the 12 V battery to the PAIR control solenoid valve terminals and check the air flow.
- If air does not flow out, the solenoid valve is in normal condition.

• Check the resistance between the terminals of the PAIR control solenoid valve.

PATA Resistance: $20 - 24 \Omega$ (at 20 °C/68 °F)

09900-25008: Multi circuit tester set

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

If the resistance is not within the standard range, replace the PAIR control solenoid valve with a new one.

- Installation is in the reverse order of removal.
- Connect the PAIR control solenoid valve lead wire coupler securely.





PAIR (AIR SUPPLY) SYSTEM HOSE ROUTING



EVAPORATIVE EMISSION CONTROL SYSTEM INSPECTION (Only for E-33)

- Remove the following parts. (9-6)
 - * Seat
 - * Battery cover
 - * Center frame cover
 - * Frame cover
 - * Pillion rider handles
 - * Lower frame cover
 - * Helmet box cover
 - * Helmet box

HOSES

- Inspect the hoses for wear or damage.
- Make sure that the hoses are securely connected.

EVAP CANISTER

- Inspect the canister for damage to the body.
- Install the evaporative emission control device in the reverse order of removal.

EVAP CANISTER HOSE ROUTING (Only for E-33)







AN650K4 ('04-MODEL)

This chapter describes service data, service specifications and servicing procedures which differ from those of the AN650K3 ('03-MODEL).

NOTE:

Please refer to the chapter 1 through 12 for details which are not given in this chapter.

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SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 260 mm (89.0 in)
Overall width	810 mm (31.9 in)
Overall height*	1 435 mm (56.5 in)
Wheelbase	1 595 mm (62.8 in)
Ground clearance*	130 mm (5.1 in)
Seat height	750 mm (29.5 in)
Dry mass	238 kg (524 lbs)
ENGINE	
Туре	4-stroke, liquid-cooled, DOHC
Number of cylinders	2
Bore	75.5 mm (2.972 in)
Stroke	71.3 mm (2.807 in)
	638 cm ³ (38.9 cu. in)
Compression ratio	11.2 : 1 Evel injection
	Fuel Injection
Startar ovetam	
Lubrication system	Wet sump
Idle speed	$1.200 \pm 100 r/min$
DRIVE TRAIN	
Clutch	Wet multi-plate, automatic, centrifugal type
Primary reduction ratio	1.333 (88/66)
Gearshift pattern	Automatic & Manual shift
Automatic transmission ratio	Variable change (1.8 – 0.465)
Final reduction ratio	1.580 (32/31 × 31/32 × 34/31 × 49/34)
Drive system	Gear drive
CHASSIS	
Front suspension	Telescopic, coil spring, oil damped
Rear suspension	Swingarm type, coil spring, oil damped
Front fork stroke*	110 mm (4.3 in)
Rear wheel travel	100 mm (3.9 in)
Caster*	26° 10'
Trail*	106 mm (4.17 in)
Steering angle	41° (right and left)
Turning radius	2.7 m (8.9 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	120/70R15M/C 56H, tubeless
	100/00H 14WI/C 05H, IUDEIESS
ELECTRICAL	
Ignition type	Electronic ignition (Transistorized)
Ignition timing	10° B.T.D.C. at 1 200 r/min
Spark plug	NGK CR8E or DENSO U24ESR-N
Battery	12 V 43.2 kC (12 Ah)/10 HR
Generator	Three-phase A.C. generator
Main fuse	40 A
Fuse	15/15/15/15/10/10/10 AE-02, 19
Hoodlight	12/15/15/15/15/10/10 A E-03, 24, 28, 33
neaulight	$12 \vee 60 + 55/55 + 55 (\Pi 4 + \Pi 7) \dots E - 02, 19$
Position/parking light	$12 \vee 00/55 \times (14 \times 2)$ E-03, 24, 20, 55 12 V 5 W \times 2 E-02 19
Brake light/Taillight	12 V 21/5 W × 2
Lisense nlate light	12 V 5 W
Trunk light	12 V 5 W
Turn signal light	12 V 21 W × 4
Instrument panel light	12 V 1.4 W × 2
Coolant temperature warning light	12 V 1.4 W
Fuel injection warning light	12 V 1.4 W
Oil pressure warning light	12 V 1.4 W
Brake-lock warning light	12 V 1.4 W
High beam indicator light	12 V 1.4 W
Turn signal indicator light	12 V 1.4 W × 2
Power mode indicator light	12 V 1.4 W
Drive indicator light	12 V 1.4 W
Gear position indicator light	12 V 1.4 W × 5
CAPACITIES

CAPACITIES	
Fuel tank, including reserve	15.0 L (4.0/3.3 US/Imp gal)
Engine oil, oil change	2 600 ml (2.7/2.3 US/Imp qt)
with filter change	2 900 ml (3.1/2.6 US/Imp qt)
overhaul	3 400 ml (3.6/3.0 US/Imp qt)
Transmission oil, oil change	360 ml (12.2/12.7US/Imp oz)
overhaul	400 ml (13.5/14.1US/Imp oz)
Final gear oil, oil change	300 ml (10.1/10.6US/Imp oz)
overhaul	430 ml (14.5/15.1US/Imp oz)
Coolant	1.3 L (1.4/1.1 US/Imp qt)

SERVICE DATA

VALVE + GUIDE				
ITEM		STANDARD	LIMIT	
Valve diam.	IN.	29.5 (1.16)		
	EX.	25.0 (0.98)	_	
Tappet clearance (when cold)	IN.	0.10 – 0.20 (0.0039 – 0.0079)	—	
	EX.	0.20 - 0.30 (0.0079 - 0.0118)	_	
Valve guide to valve stem clearance	IN.	0.010 - 0.040 (0.0004 - 0.0016)	—	
	EX.	0.030 - 0.060 (0.0012 - 0.0024)	—	
Valve guide I.D.	IN. & EX.	4.500 – 4.515 (0.1772 – 0.1778)	—	
Valve stem O.D.	IN.	4.475 – 4.490 (0.1762 – 0.1768)	—	
	EX.	4.455 – 4.470 (0.1754 – 0.1760)	_	
Valve stem deflection	IN. & EX.	—	0.35 (0.014)	
Valve stem runout	IN. & EX.		0.05 (0.002)	
Valve head thickness	IN. & EX.	—	0.5 (0.02)	
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. & EX.)	IN. & EX.		40.6 (1.60)	
Valve spring tension (IN. & EX.)	IN. & EX.	136 – 156 N (13.6 – 15.6 kgf, 30.0 – 34.4 lbs) at length 33.4 mm (1.31 in)	_	

Unit: mm (in)

CAMSHAFT + CYLINDER HEAD

ITEM		STANDARD	LIMIT
Cam height	IN.	35.38 – 35.43 (1.393 – 1.395)	35.10 (1.382)
	EX.	33.98 – 34.03 (1.338 – 1.340)	33.70 (1.327)
Camshaft journal oil clearance	IN. & EX.	0.032- 0.066 (0.0013 - 0.0026)	0.150 (0.0059)
Camshaft journal holder I.D.	IN. & EX.	24.012 – 24.025 (0.9454 – 0.9459)	—
Camshaft journal O.D.	IN. & EX.	23.959 – 24.000 (0.9433 – 0.9449)	—
Camshaft runout	IN. & EX.	_	0.10 (0.004)
Cam chain pin (at arrow "3")	15th pin		
Cylinder head distortion		_	0.10 (0.004)

CYLINDER + PISTON + PISTON RING

ITEM			STANDARD	LIMIT
Compression pressure		(15.	1 200 kPa (12 kgf/cm², 171 psi)	
Compression pressure difference			200 kPa (2.0 kgf/cm², 28 psi)	
Piston to cylinder clearance			0.045 - 0.055 (0.0018 - 0.0022)	0.120 (0.0047)
Cylinder bore			75.500 – 75.515 (2.9724 – 2.9730)	75.585 (2.9758)
Piston diam.	Mea	asure	75.380 (2.9677)	
Cylinder distortion		_		0.10 (0.004)
Piston ring free end gap	1st	R	Approx. 11.6 (0.46)	9.3 (0.37)
	2nd	RN	Approx. 8.6 (0.34)	6.9 (0.27)
Piston ring end gap	1s ⁻	t	0.20 – 0.30 (0.008 – 0.012)	0.50 (0.020)
	2n	d	0.20 – 0.30 (0.008 – 0.012)	0.50 (0.020)
Piston ring to groove clearance	1st		_	0.180 (0.007)
	2n	d	_	0.150 (0.006)
Piston ring groove width	1st 2nd		1.01 – 1.03 (0.040 – 0.041)	_
			1.01 – 1.03 (0.040 – 0.041)	_
	Oi	I	2.01 – 2.03 (0.079 – 0.080)	_

ITEM		STANDARD		
Piston ring thickness	1st	0.97 - 0.99 (0.038 - 0.039)	—	
	2nd	0.97 - 0.99 (0.038 - 0.039)	—	
Piston pin bore		16.002 – 16.008 (0.6300 – 0.6302)		
Piston pin O.D.		15.995 – 16.000 (0.6297 – 0.6299)		

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 big end side clearance	0.10 - 0.20 (0.004 - 0.008)	0.30 (0.012)
Conrod big end width	19.950 – 20.000 (0.7854 – 0.7874)	_
Crank pin width	20.100 – 20.150 (0.7913 – 0.7933)	_
Conrod big end oil clearance	0.032 - 0.056 (0.0013 - 0.0022)	0.080 (0.0031)
Crank pin O.D.	44.976 – 45.000 (1.7707 – 1.7717)	_
Crankshaft journal oil clearance	0.018 - 0.045 (0.0007 - 0.0018)	0.080 (0.0031)
Crankshaft journal O.D.	47.985 – 48.000 (1.8892 – 1.8898)	—
Crankshaft thrust bearing thickness	2.025 – 2.175 (0.0797 – 0.0856)	—
Crankshaft thrust clearance	0.10 - 0.15 (0.0039 - 0.0059)	_
Crankshaft runout	—	0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pressure (at 60°C, 140°F)	Above 350 kPa (3.5 kgf/cm²) Below 550 kPa (5.5 kgf/cm²) at 3 000 r/min	

CLUTCH		Unit: mm (in)
ITEM	STANDARD	LIMIT
Drive plate thickness	2.92 - 3.08 (0.115 - 0.121)	2.62 (0.103)
Drive plate claw width	13.85 – 13.96 (0.545 – 0.550)	13.05 (0.514)
Driven plate thickness	2.42 – 2.58 (0.095 – 0.102)	2.27 (0.089)
Driven plate distortion	_	0.10 (0.004)
Clutch spring free length	13.9 (0.547)	13.2 (0.520)
Clutch plate concaved washer height		3.1 (0.12)
Clutch engagement	1 500 – 2 100 r/min	—
Clutch lock-up	3 200 – 3 800 r/min	—

INJECTOR + FUEL PUMP + FUEL PRESSURE REGULATOR

ITEM	SPECIFICATION	NOTE
Injector resistance	11 – 13 Ω at 20 °C (68 °F)	_
Fuel pump discharge amount	More than 0.9 L (0.95/0.79 US/Imp qt) For 30 sec, at 300 kPa (3.0 kgf/cm², 43 psi)	—
Fuel pressure regulator operating set pressure	Approx. 300 kPa (3.0 kgf/cm², 43 psi)	—

FI/CVT-SENSORS

ITEM	SPECIFICATION		NOTE
CMP sensor resistance	0.9 – 1.7 kΩ		
CMP sensor peak voltage	More than 0.5 V (When cranking)		⊕: B/Y, ⊝: Br
CKP sensor resistance		150 – 300 Ω	
CKP sensor peak voltage	More th	an 2.0 V (When cranking)	⊕: Bl, ⊝: G
IAP sensor input voltage		4.5 – 5.5 V	
IAP sensor output voltage	Аррі	rox. 2.6 V at idle speed	
TP sensor input voltage		4.5 – 5.5 V	
TP sensor resistance	Closed	Approx. 1.1 kΩ	
	Opened	Approx. 4.2 kΩ	
TP sensor output voltage	Closed	Approx. 1.1 V	
	Opened	Approx. 4.3 V	
ECT sensor input voltage		4.5 – 5.5 V	
ECT sensor resistance	Approx	. 2.45 kΩ at 20 °C (68 °F)	
IAT sensor input voltage		4.5 – 5.5 V	
IAT sensor resistance	Approx. 2.45 kΩ at 20 °C (68 °F)		
AP sensor input voltage		4.5 – 5.5 V	
AP sensor output voltage	Approx. 3.	6 V at 760 mmHg (100 kPa)	
TO sensor resistance		19.1 – 19.7 kΩ	
TO sensor output voltage	Normal	Less than 1.4 V	
	Leaning	Less than 3.7 V	
Injector voltage		Battery voltage	
Ignition coil primary peak voltage	More than 80 V (When cranking)		#1 ⊕: W/Bl, ⊖: Ground #2 ⊕: B/Y, ⊖: Ground
HO2 sensor resistance	4 –	5 Ω at 23 °C (73.4 °F)	
HO2 sensor output voltage	Idle speed	Less than 0.4 V	
	3 000 r/min	More than 0.6 V	
PAIR solenoid valve resistance	20 -	- 24 Ω at 20 °C (68 °F)	
CVT primary pulley position sensor	Compressed	1.9 – 2.3 kΩ	
	Extended	0.2 – 1.0 kΩ	
CVT primary pulley position sensor	1 st : Idle speed	Approx. 3.3 V	
output voltage	3 rd : 3 000 r/min	Approx. 1.3 V	
	5 th : 3 000 r/min	Approx. 0.5 V	
CVT secondary pulley revolution sensor resistance	400 – 600 Ω		
CVT secondary pulley revolution sensor peak voltage	More than 5V at idle speed		⊕: Y, ⊝: W

THROTTLE BODY

ITEM	SPECIFICATION
ID No.	10GO
Bore size	32 mm
Fast idle r/min	1 300 – 1600 r/min
Idle r/min	1 200 ± 100 r/min
Synchronizing screw opening	1 and 1/2 turns out
IAC valve resistance	Approx. 4 Ω at 20 – 24 °C (68 – 75 °F)
Throttle cable play	2.0 – 4.0 mm (0.08 – 0.16 in)

THERMOSTAT + RADIATOR + FAN + COOLANT

ITEM	STAN	DARD/SPECIFICATION	LIMIT
Thermostat valve opening temper- ature	Approx. 88 °C (190 °F)		_
Thermostat valve lift	Over 8.0 m	nm (0.3 in) at 100°C (212 °F)	—
Engine coolant temperature sensor	20 °C (68 °F)	Approx. 2.45 kΩ	—
resistance	50 °C (122 °F)	Approx. 0.811 k Ω	—
	80 °C (176 °F)	Approx. 0.318 kΩ	—
	110 °C (230 °F)	Approx. 0.142 kΩ	—
Radiator cap valve opening pres- sure	110 kPa (1.1 kgf/cm ²)		—
Eclectic fan thermo-switch operat-	ON	93 – 103 °C	—
ing temperature	OFF	87 – 97 °C	—
Engine coolant type	Use an anti-freeze/coolant compatible with alumi- num radiator, mixed with distilled water only, at the ratio of 50:50.		_
Engine coolant including reserve	Reverse tank side	Approx. 250 ml	_
	Engine side	Approx. 1 050 ml	—

ELECTRICAL

ITEM				
	31D/3FLC.		NOTE	
Firing order	1.2			
Spark plug	Type NGK: CR8E DENSO: U24ESR-N			
	Gap	0.7 - 0.8 (0.028 - 0.031)		
Spark performance	C			
CKP sensor peak voltage		⊕: BI, ⊝:G		
Ignition coil resistance	Primary 0.8 - 2.5 Ω			
	Secondary	8 – 18 kΩ		
Ignition coil primary peak voltage	More than 80 V		#1 ⊕: W/Bl, ⊖: Ground #2 ⊕: B/Y, ⊖: Ground	
Generator coil resistance	CKP sensor 150 – 300 Ω		G – BI	
	Charging	0.1 – 1.0 Ω	Y – Y	

ITEM	STD/SPEC.			NOTE
Generator no-load voltage (When cold)	More than 50 V at 5 000 r/min			
Generator Max. output		Ap	prox. 500 W at 5 000 r/min	
Regulated voltage		14	4.0 – 15.5 V at 5 000 r/min	
Starter relay resistance			3-6Ω	
Battery	Type designa		FTX14-BS	
	Capac	ity	12 V 43.2 kC (12 Ah)/10 HR	
⁻ use size	Head-	LO	15 A E-03, 24, 28, 33 10A E-02, 19	
	ingin	HI	15 A	
	Fuel pump		10 A	
	Ignition		15 A	
	Turn signal		15 A	
	Fan mo	otor	15 A	
	Main	۱	40 A	
	CVT		40 A	
	Powe sourc	er e	10 A	

WATTAGE

Unit: W

		STD/SPEC.			
		E-02, 19	E-03, 24, 28, 33		
Headlight	HI	60 + 55	60 × 2		
	LO	55	55 × 2		
Parking or position light		5 × 2			
Brake light/Taillight		21/5 × 2	←		
Turn signal light		21 × 4	\leftarrow		
License light		5	\leftarrow		
Instrument panel light		1.4 × 2	←		
Engine coolant temp. indic	ator light	1.4	\leftarrow		
FI indicator light		1.4	\leftarrow		
Engine oil pressure indicat	or light	1.4	\leftarrow		
Brake-lock indicator light		1.4	\leftarrow		
High beam indicator light		1.4	\leftarrow		
Turn signal indicator light		1.4 × 2	\leftarrow		
Power mode indicator light		1.4	\leftarrow		
Drive indicator light		1.4	\leftarrow		
Gear position indicator ligh	t	1.4 × 5	\leftarrow		
Trunk light		5	←		

BRAKE + WHEEL

Unit: mm (in)

ITEM		STANDARD	LIMIT
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)	4.0 (0.16)
	Rear	5.5 ± 0.2 (0.217 ± 0.008)	5.0 (0.20)
Brake disc runout		—	0.30 (0.012)
Master cylinder bore	Front	12.700 – 12.743 (0.5000 – 0.5017)	_
	Rear	12.700 – 12.743 (0.5000 – 0.5017)	_
Master cylinder piston diameter	Front	12.657 - 12.684 (0.4983 - 0.4994)	—
	Rear	12.657 – 12.684 (0.4983 – 0.4994)	—
Brake caliper cylinder bore	Front	25.400 – 25.450 (1.0000 – 1.0020)	_
	Rear	27.000 – 27.050 (1.0630 – 1.0650)	—
Brake caliper piston diameter	Front	25.318 – 25.368 (0.9968 – 0.9987)	—
	Rear	26.918 – 26.968 (1.0598 – 1.0617)	_
Brake fluid type		DOT 4	—
Wheel rim runout	Axial	_	2.0 (0.08)
	Radial	_	2.0 (0.08)
Wheel axle runout	Front	_	0.25 (0.010)
	Rear	_	0.25 (0.010)
Wheel rim size	Front	15 M/C × MT3.50	—
	Rear	14 M/C × MT4.50	_

SUSPENSION

		()
ITEM	STANDARD	LIMIT
Front fork stroke	* 110 (4.3)	—
Front fork spring free length	—	341 (13.4)
Front fork oil type	SUZUKI FORK OIL G-10 (#10) or an equivalent fork oil	-
Front fork oil capacity (each leg)	* 458 ml	_
Front fork oil level	* 151 (5.9)	-
Rear wheel travel	100 (3.9)	—
Rear shock absorber spring adjuster	2nd	—

TIRE

ITEM		STANDARD		LIMIT
Cold inflation tire pressure	Solo	Front	225 kPa (2.25 kgf/cm², 33 psi)	—
	riding	Rear	250 kPa (2.50 kgf/cm², 36 psi)	—
	Dual	Front	225 kPa (2.25 kgf/cm², 33 psi)	—
	riding	Rear	280 kPa (2.80 kgf/cm², 41 psi)	—
Tire size		Front	120/70R15M/C 56H	—
		Rear	160/60R14M/C 65H	—
Tire type		Front	BRIDGESTONE TH01F	—
		Rear	BRIDGESTONE TH01R	—
Tire tread depth (Recommended depth)		Front	—	1.6 mm (0.06 in)
		Rear	_	2.0 mm (0.08 in)

FUEL + OIL

ITEM		SPECIFICATION	NOTE
Fuel type	Use only unleaded gasoline of at least 87 pump octane ($R/2 + M/2$) or 91 octane or higher rated by the research method		
	Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.		E-03, 28, 33
	Gasoline used higher. An unle	d should be graded 91 octane or eaded gasoline is recommended.	The others
Fuel tank capacity	Including reserve	15.0 L (4.0/3.3 US/Imp gal)	
	Fuel meter mark flickering	Approx. 3.0 L (0.79/0.66 US/Imp gal)	
	Fuel meter mark and LCD flickering	Approx. 1.5 L (0.40/0.33 US/Imp gal)	
Engine oil and transmission oil type	SAI	E 10W-40, API, SF or SG	
Engine oil capacity	Oil change	2.6 L (2.7/2.3 US/Imp qt)	
	Filter change	2.9 L (3.1/2.6 US/Imp qt)	
	Overhaul	3.4 L (3.6/3.0 US/Imp qt)	
Transmission oil capacity	Oil change	360 ml (12.2/12.7 US/Imp oz)	
	Overhaul	400 ml (13.5/14.1 US/Imp oz)	
Final gear oil type	Hypoid ge	ear oil SAE #90 API grade GL-5	
Final gear oil capacity	Oil change	300 ml (10.1/10.6 US/Imp oz)	
	Overhaul	430 ml (14.5/15.1 US/Imp oz)	

PERIODIC MAINTENANCE CHART

Interval	km	1 000	6 000	12 000	18 000	24 000
	miles	600	4 000	7 500	11 000	15 000
Item	months	2	12	24	36	48
Air cleaner		—	I	I	R	I
Exhaust pipe bolts and muffler bolts	S	Т	_	Т	—	Т
Tappet clearance		—		—	—	
Spark plugs		_	-	R		R
Eucl bose		—	I	I	I	I
			Repla	ce every 4	years.	
Engine oil		R	R	R	R	R
Engine oil filter		R			R	
Transmission oil		R	I	R	I	R
Final gear oil		R		R	—	R
CVT filter		—	_	I	—	Ι
Idle speed		I		I	I	
Throttle cable play		Ι	I	I	I	Ι
Throttle valve synchronization		l (E-33 only)	—	I	—	Ι
Evaporative emission control system		_	_	I		I
E-33 (California) model only		Replace vapor hose every 4 years.				
PAIR (air supply) system		_				I
Engine coolant		Replace every 2 years.				
Radiator hose		—		I	I	
Brakes		I	I	I	I	I
Braka basas		—		I	I	
DIAKE HOSES			Repla	ce every 4	years.	
Brake fluid		_				
Brake Iluid			Repla	ce every 2	years.	
Tires		—	I	I	I	I
Steering		Ι	—	I	—	I
Front forks		_	_		—	
Rear suspension		_	_	I	—	
Chassis bolts and nuts		Т	Т	Т	Т	Т

I = Inspect and adjust, clean, lubricate or replace lubricate as necessary

R = Replace

T = Tighten

CAMCHAIN SPROCKET/STARTER CLUTCH INSTALLATION



THROTTLE CABLE/BRAKE-LOCK CABLE ROUTING



SEAT LOCK CABLE ROUTING



Only for E-33



LEFT LEG SIDE COVER/UNDER COVER INSTALLATION





AN650/AK5 ('05-MODEL)

This chapter describes service data, service specifications, ABS and servicing procedures which differ from those of the AN650K3 ('03-model) and AN650AK4 ('04-model).

NOTE:

Any differences between the AN650K3 ('03-model) and AN650K5 ('05-model), AN650AK4 ('04-model) and AN650AK5 ('05-model) in specifications and service data are indicated with an asterisk mark (*).

Please refer to the chapters 1 through 13 for details which are not given in this chapter.

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COUNTRY AND AREA CODES

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

COL	DE	COUNTRY or AREA	EFFECTIVE FRAME NO.
	E-03	U.S.A.	
	E-28	Canada	JS1CP51A52 100001 –
	E-33	California (U.S.A.)	
AN650K5	E-02	U.K.	JS1BU111200100468 –
	E-19	E.U.	JS1BU111100113619 –
	E-24	Australia	JS1BU121300100200 -
	000	JAPAN	* * * * *
	E-02	U.K.	JS1BU132200100080 -
AN650AK5	E-19	E.U.	JS1BU132100105119-
	000	JAPAN	* * * * *

SPECIFICATION (AN650K5)

DIMENSIONS AND DRY MASS

Overall length	2 260 mm (89.0 in)
Overall width	810 mm (31.9 in)
Overall height	1 435 mm (56.5 in)
Wheelbase	1 595 mm (62.8 in)
Ground clearance	130 mm (5.1 in)
Seat height	750 mm (29.5 in)
Dry mass	* 235 kg (518 lbs)

ENGINE

Туре	4-stroke, liquid-cooled, DOHC
Number of cylinders	2
Bore	75.5 mm (2.972 in)
Stroke	71.3 mm (2.807 in)
Displacement	638 cm ³ (38.9 cu. in)
Compression ratio	11.2 : 1
Carburetion	Fuel injection
Air cleaner	Non-woven fabric element
Starter system	Electric
Lubrication system	Wet sump
Idle speed	1 200 ± 100 r/min
•	

DRIVE TRAIN

Clutch	Wet multi-plate, automatic, centrifugal type
Primary reduction ratio	1.333 (88/66)
Gearshift pattern	Automatic & Manual shift
Automatic transmission ratio	Variable change (1.800 - 0.465)
Final reduction ratio	1.580 (32/31 × 31/32 × 34/31 × 49/34)
Drive system	Gear drive

CHASSIS

Front suspension	Telescopic, coil spring, oil damped
Rear suspension	Swingarm type, coil spring, oil damped
Front fork stroke	110 mm (4.3 in)
Rear wheel travel	100 mm (3.9 in)
Caster	26° 10'
Trail	106 mm (4.17 in)
Steering angle	41° (right and left)
Turning radius	2.7 m (8.9 ft)
Front brake	Disc brake, ťwin
Rear brake	Disc brake
Front tire size	120/70R15M/C 56H, tubeless
Rear tire size	160/60R14M/C 65H, tubeless

ELECTRICAL

Ignition type	Electronic ignition (Transistorized)		
Ignition timing	10° B.T.D.C. at 1 200 r/min		
Spark plug	NGK CR8E or DENSO U24ESR-N		
Battery	12 V 43.2 kC (12 Ah)/10 HR		
Generator	Three-phase A.C. generator		
Main fuse	40 A		
CVT fuse	40 A		
Fuse	15/15/15/15/10/10/10 A	E-02, 1	19
	15/15/15/15/15/10/10 A	E-03, 2	24, 28, 33
Headlight	12 V 60 + 55/55 + 55 (H4 + H7)	E-02, 1	19
5	12 V 60/55 W × 2 (H4 × 2)	E-03, 2	24, 28, 33
Position/parking light	12 V 5 W	E-02.	19
Brake light/Taillight	12 V 21/5 W × 2	,	
License plate light	12 V 5 W		
Trunk light	12 V 5 W		
Turn signal light	12 V 21 W		
Instrument panel light	12 V 1.4 W × 2		
Coolant temperature warning light	12 V 1.4 W		
Fuel injection warning light	12 V 1.4 W		
Oil pressure warning light	12 V 1.4 W		
Brake-lock warning light	12 V 1.4 W		
High beam indicator light	12 V 1.4 W		
Turn signal indicator light	12 V 1.4 W × 2		
Power mode indicator light	12 V 1.4 W		
Drive indicator light	12 V 1.4 W		
Gear position indicator light	12 V 1.4 W × 5		
Immobilizer indicator light*	[•] LED	E-02, 1	19
Over drive indicator light*	12 V 1.4 W	E-02, 1	19

CAPACITIES

CAPACITIES	
Fuel tank, including reserve	15.0 L (4.0/3.3 US/Imp gal)
Engine oil, oil change	2 600 ml (2.7/2.3 US/Imp gt)
with filter change	2 900 ml (3.1/2.6 US/Imp qt)
overhaul	3 400 ml (3.6/3.0 US/Imp qt)
Transmission oil, oil change	360 ml (12.2/12.7 US/lmp oz)
overhaul	400 ml (13.5/14.1 US/Imp oz)
Final gear oil, oil change	300 ml (10.1/10.6 US/Imp oz)
overhaul	430 ml (14.5/15.1 US/Imp oz)
Coolant	1.6 L (1.7/1.4 US/Imp qt)
	· · · · · · · · · · · · · · · · · · ·

SPECIFICATION (AN650AK5)

DIMENSIONS AND DRY MASS

Overall length	2 260 mm (89.0 in)
Overall width	810 mm (31.9 in)
Overall height	1 435 mm (56.5 in)
Wheelbase	1 595 mm (62.8 in)
Ground clearance	130 mm (5.1 in)
Seat height	750 mm (29.5 in)
Dry mass*	243 kg (535 lbs)
	.,

ENGINE

Туре	4-stroke, liquid-cooled, DOHC
Number of cylinders	2
Bore	75.5 mm (2.972 in)
Stroke	71.3 mm (2.807 in)
Displacement	638 cm³ (38.9 cu. in)
Compression ratio	11.2 : 1
Carburetion	Fuel injection
Air cleaner	Non-woven fabric element
Starter system	Electric
Lubrication system	Wet sump
Idle speed	1 200 ± 100 r/min
•	

DRIVE TRAIN

Clutch	Wet multi-plate, automatic, centrifugal type
Primary reduction ratio	1.333 (88/66)
Gearshift pattern	Automatic & Manual shift
Automatic transmission ratio	Variable change (1.800 – 0.465)
Final reduction ratio	1.580 (32/31 × 31/32 × 34/31 × 49/34)
Drive system	Gear drive

CHASSIS

Front suspension	Telescopic, coil spring, oil damped
Rear suspension	Swingarm type, coil spring, oil damped
Front fork stroke	110 mm (4.3 in)
Rear wheel travel	100 mm (3.9 in)
Caster	26° 10'
Trail	106 mm (4.17 in)
Steering angle	41° (right and left)
Turning radius	2.7 m (8.9 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	120/70R15M/C 56H, tubeless
Rear tire size	160/60R14M/C 65H, tubeless

ELECTRICAL

Ignition type Ignition timing Spark plug	Electronic ignition (Transistorized) 10° B.T.D.C. at 1 200 r/min NGK CR8E or DENSO U24ESR-N
Battery	12 V 43.2 kC (12 Ah)/10 HR
Generator	Three-phase A.C. generator
Main fuse	40 A
CVT fuse	40 A
Fuse	15/15/15/15/15/10/10/15/15 A
Headlight	12 V 60 + 55/55 + 55 (H4 + H7)
Position/parking light	12 V 5 W × 2
Brake light/Taillight	12 V 21/5 W × 2
License plate light	12 V 5 W
Trunk light	12 V 5 W
Turn signal light	12 V 21 W
Instrument panel light	12 V 1.4 W × 2
Coolant temperature warning light	12 V 1.4 W
Fuel injection warning light	12 V 1.4 W
Oil pressure warning light	12 V 1.4 W
Brake-lock warning light	12 V 1.4 W
High beam indicator light	12 V 1.4 W
Turn signal indicator light	12 V 1.4 W × 2
Power mode indicator light	12 V 1.4 W
Drive indicator light	12 V 1.4 W
Gear position indicator light	12 V 1.4 W × 5
ABS warning light	12 V 1.4 W
Immobilizer indicator light*	LED
Over drive indicator light*	12 V 1.4 W

CAPACITIES

Fuel tank, including reserve	15.0 L (4.0/3.3 US/Imp gal)
Engine oil, oil change	2 600 ml (2.7/2.3 US/lmp qt)
with filter change	2 900 ml (3.1/2.6 US/Imp qt)
overhaul	3 400 ml (3.6/3.0 US/Imp qt)
Transmission oil, oil change	360 ml (12.2/12.7 US/lmp oz
overhaul	400 ml (13.5/14.1 US/Imp oz
Final gear oil, oil change	300 ml (10.1/10.6 US/Imp oz
overhaul	430 ml (14.5/15.1 US/Imp oz
Coolant	1.6 L (1.7/1.4 US/Imp qt)

SERVICE DATA (AN650K5) VALVE + GUIDE

ITEM	STANDARD		LIMIT
Valve diam.	IN.	29.5 (1.16)	—
	EX.	25.0 (0.98)	—
Tappet clearance (when cold)	IN.	0.10 – 0.20 (0.0039 – 0.0079)	_
	EX.	0.20 – 0.30 (0.0079 – 0.0118)	_
Valve guide to valve stem clearance	IN.	0.010 - 0.040 (0.0004 - 0.0016)	_
	EX.	0.030 - 0.060 (0.0012 - 0.0024)	_
Valve guide I.D.	IN. & EX.	4.500 – 4.515 (0.1772 – 0.1778)	—
Valve stem O.D.	IN.	4.475 – 4.490 (0.1762 – 0.1768)	—
	EX.	4.455 – 4.470 (0.1754 – 0.1760)	—
Valve stem deflection	IN. & EX.	_	0.35 (0.014)
Valve stem runout	IN. & EX.	_	0.05 (0.002)
Valve head thickness	IN. & EX.	_	0.5 (0.02)
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. & EX.)	IN. & EX.	—	40.6 (1.60)
Valve spring tension (IN. & EX.)	IN. & EX.	136 – 156 N (13.6 – 15.6 kgf, 30.0 – 34.4 lbs) at length 33.4 mm (1.31 in)	—

CAMSHAFT + CYLINDER HEAD Unit: mm			Unit: mm (in)
ITEM		STANDARD	LIMIT
Cam height	IN.	35.38 – 35.43 (1.393 – 1.395)	35.10 (1.382)
	EX.	33.98 – 34.03 (1.338 – 1.340)	33.70 (1.327)
Camshaft journal oil clearance	IN. & EX.	0.032 – 0.066 (0.0013 – 0.0026)	0.150 (0.0059)
Camshaft journal holder I.D.	IN. & EX.	24.012 – 24.025 (0.9454 – 0.9459)	_
Camshaft journal O.D.	IN. & EX.	23.959 – 23.980 (0.9433 – 0.9441)	_
Camshaft runout	IN. & EX.	—	0.10 (0.004)
Cam chain pin (at arrow "3")		15th pin	—
Cylinder head distortion		—	0.10 (0.004)

CYLINDER + PISTON + PISTON RING

ITEM			STANDARD	LIMIT
Compression pressure	1 500 – 1 900 kPa (15.0 – 19.0 kgf/cm², 213 – 270 psi)			1 200 kPa (12 kgf/cm², 171 psi)
Compression pressure difference			_	200 kPa (2.0 kgf/cm², 28 psi)
Piston to cylinder clearance			0.045 - 0.055 (0.0018 - 0.0022)	0.120 (0.0047)
Cylinder bore			75.500 – 75.515 (2.9724 – 2.9730)	Nicks or scratches
Piston diam.	Меа	asure	* 75.470 – 75.485 (2.9705 – 2.9711) at 15 mm (0.6 in) from the skirt end.	75.380 (2.9677)
Cylinder distortion	—		0.10 (0.004)	
Piston ring free end gap	1st	R	Approx. 11.6 (0.46)	9.3 (0.37)
	2nd	RN	Approx. 8.6 (0.34)	6.9 (0.27)
Piston ring end gap	1st		* 0.06 – 0.18 (0.002 – 0.005)	0.50 (0.020)
	2no	d	* 0.06 – 0.18 (0.002 – 0.005)	0.50 (0.020)
Piston ring to groove clearance	1st 2nd		_	0.180 (0.007)
			_	0.150 (0.006)
Piston ring groove width	1st 2nd		1.01 – 1.03 (0.040 – 0.041)	_
			1.01 – 1.03 (0.040 – 0.041)	_
	Oi		2.01 – 2.03 (0.079 – 0.080)	_

ITEM		LIMIT	
Piston ring thickness	1st	0.97 – 0.99 (0.038 – 0.039)	—
	2nd	0.97 – 0.99 (0.038 – 0.039)	—
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 big end side clearance	0.10 - 0.20 (0.004 - 0.008)	0.30 (0.012)
Conrod big end width	19.950 – 20.000 (0.7854 – 0.7874)	—
Crank pin width	20.100 – 20.150 (0.7913 – 0.7933)	—
Conrod big end oil clearance	0.032 - 0.056 (0.0013 - 0.0022)	0.080 (0.0031)
Crank pin O.D.	44.976 – 45.000 (1.7707 – 1.7717)	—
Crankshaft journal oil clearance	0.018 - 0.045 (0.0007 - 0.0018)	0.080 (0.0031)
Crankshaft journal O.D.	47.985 – 48.000 (1.8892 – 1.8898)	—
Crankshaft thrust bearing thickness	2.025 – 2.175 (0.0797 – 0.0856)	—
Crankshaft thrust clearance	0.10 - 0.15 (0.0039 - 0.0059)	_
Crankshaft runout	—	0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pressure (at 60 °C, 140 °F)	Above 350 kPa (3.5 kgf/cm², 49.8 psi) Below 550 kPa (5.5 kgf/cm², 78.2 psi) at 3 000 r/min	_

CLUTCH		Unit: mm (in)
ITEM	STANDARD	LIMIT
Drive plate thickness	2.92 – 3.08 (0.115 – 0.121)	2.62 (0.103)
Drive plate claw width	13.85 – 13.96 (0.545 – 0.550)	13.05 (0.514)
Driven plate No. 2 thickness	2.42 – 2.58 (0.095 – 0.102)	2.27 (0.089)
Driven plate distortion	—	0.10 (0.004)
Clutch spring free length	13.9 (0.547)	13.2 (0.520)
Clutch plate concaved washer height	3.2 (0.126)	3.1 (0.12)
Clutch engagement	1 500 – 2 100 r/min	—
Clutch lock-up	3 200 – 3 800 r/min	_

INJECTOR + FUEL PUMP + FUEL PRESSURE REGULATOR

ITEM	SPECIFICATION	NOTE
Injector resistance	11 – 13 Ω at 20 °C (68 °F)	—
Fuel pump discharge amount	More than 0.9 L (0.95/0.79 US/Imp qt) For 30 sec. at 300 kPa (3.0 kgf/cm², 43 psi)	—
Fuel pressure regulator operating set pressure	Approx. 300 kPa (3.0 kgf/cm², 43 psi)	—

FI/CVT-SENSORS

ITEM		SPECIFICATION	NOTE	
CMP sensor resistance	0.9 – 1.7 kΩ			
CMP sensor peak voltage	Мс	pre than 0.5 V (When cranking)	⊕: B/Y, ⊝: Br	
CKP sensor resistance		150 – 300 Ω		
CKP sensor peak voltage	Мс	pre than 2.0 V (When cranking)	⊕: Bl, ⊝: G	
IAP sensor input voltage		4.5 – 5.5 V		
IAP sensor output voltage		Approx. 2.6 V at idle speed		
TP sensor input voltage		4.5 – 5.5 V		
TP sensor resistance	Closed	Approx. 1.1 kΩ		
	Opened	Approx. 4.2 kΩ		
TP sensor output voltage	Closed Approx. 1.1 V			
	Opened Approx. 4.3 V			
ECT sensor input voltage	4.5 – 5.5 V			
ECT sensor resistance	Approx. 2.45 kΩ at 20 °C (68 °F)			
IAT sensor input voltage	4.5 – 5.5 V			
IAT sensor resistance	Ap	Approx. 2.45 kΩ at 20 °C (68 °F)		
AP sensor input voltage				
AP sensor output voltage	Appro			
TO sensor resistance				
TO sensor output voltage	Normal 0.4 – 1.4 V		⊕: B, ⊝: B/Br	
	Leaning	3.7 – 4.4 V	⊕: B, ⊝: B/Br	
Injector voltage	Battery voltage			

ITEM		SPECIFICATION	NOTE
Ignition coil primary peak voltage	More than 80 V (When cranking)		#1 ⊕: W/Bl, ⊡: Ground #2 ⊕: B/Y, ⊡: Ground
HO2 sensor resistance	4 – 5	5 Ω at 23 °C (73.4 °F)	
HO2 sensor output voltage	Idle speed	Less than 0.4 V	
	3 000 r/min	More than 0.6 V	
PAIR solenoid valve resistance	20 – 24 Ω at 20 °C (68 °F)		
CVT primary pulley position sensor	Compressed	1.9 – 2.3 kΩ	
	Extended	0.2 – 1.0 kΩ	
CVT primary pulley position sensor	1 st : Idle speed	Approx. 3.3 V	
output voltage	3 rd : 3 000 r/min	Approx. 1.3 V	
	5 th : 3 000 r/min	Approx. 0.5 V	
CVT secondary pulley revolution sensor resistance	400 – 600 Ω		
CVT secondary pulley revolution sensor peak voltage	More than 5 V at idle speed		⊕: Y, ⊝: W

THROTTLE BODY

ITEM	SPECIFICATION		
I.D. No.	10G0		
Bore size	32 mm (1.26 in)		
Fast idle r/min	1 300 – 1 600 r/min		
Idle r/min	1 200 ± 100 r/min		
Synchronizing screw opening	1 and 1/2 turns out		
IAC valve resistance	Approx. 4 Ω at 20 – 24 °C (68 – 75 °F)		
Throttle cable play	2.0 – 4.0 mm (0.08 – 0.16 in)		

THERMOSTAT + RADIATOR + FAN + COOLANT

ITEM	STAN	DARD/SPECIFICATION	LIMIT
Thermostat valve opening temper- ature	Approx. 88 °C (190 °F)		—
Thermostat valve lift	Over 8.0 m	m (0.3 in) at 100 °C (212 °F)	_
Engine coolant temperature sensor	20 °C (68 °F)	Approx. 2.45 k Ω	
resistance	50 °C (122 °F)	Approx. 0.811 kΩ	
	80 °C (176 °F)	Approx. 0.318 kΩ	_
	110 °C (230 °F)	Approx. 0.142 kΩ	_
Radiator cap valve opening pres- sure	110 kPa (1.1 kgf/cm²)		
Eclectic fan thermo-switch operat-	ON	93 – 103 °C (199 – 217 °F)	_
ing temperature	OFF 87 – 97 °C (188 – 206 °F)		_
Engine coolant type	Use an anti-freeze/coolant compatible with alumi- num radiator, mixed with distilled water only, at the ratio of 50:50.		_

ITEM	STANDARD/SPECIFICATION		LIMIT
Engine coolant including reserve	Reverse tank side	Approx. 250 ml (0.264/0.220 US/Imp qt)	—
	Engine side	Approx. 1 350 ml (1.427/1.188 US/Imp qt)	_

ELECTRICAL

NOTE ITEM STD/SPEC. Firing order 1.2 Spark plug NGK: CR8E Type DENSO: U24ESR-N 0.7 - 0.8Gap (0.028 - 0.031)Over 8.0 (0.3) at 1 atm. Spark performance CKP sensor peak voltage More than 2.0 V ⊕: BI, ⊝:G Ignition coil resistance Primary $0.8 - 2.5 \Omega$ Secondary $8 - 18 \text{ k}\Omega$ Ignition coil primary peak voltage #1 ⊕: W/BI, #1 (): W/Di, ⊖: Ground #2 (): B/Y, ⊖: Ground More than 80 V Generator coil resistance CKP sensor $150 - 300 \Omega$ G – BI Y - YCharging 0.1 – 1.0 Ω Generator no-load voltage More than 50 V at 5 000 r/min (When cold) Generator Max. output Approx. 500 W at 5 000 r/min **Regulated voltage** 14.0 - 15.5 V at 5 000 r/min Starter relay resistance $3-6 \Omega$ Type designation Battery FTX14-BS Capacity 12 V 43.2 kC (12 Ah)/10 HR Fuse size 15 A E-03, 24, 28, 33 LO Head-10 A E-02, 19 light HI 15 A Fuel pump 10 A Ignition 15 A Turn signal 15 A Fan motor 15 A Main 40 A CVT 40 A Power 10 A source

WATTAGE

Unit: W

ITEM		STD/SPEC.			
		E-02, 19	E-03, 24, 28, 33		
Headlight	HI	60 + 55	60 × 2		
	LO	55	55 × 2		
Parking or position light		5 × 2			
Brake light/Taillight		21/5 × 2	\leftarrow		
Turn signal light		21 × 4	\leftarrow		
License light		5	\leftarrow		
Instrument panel light		1.4 × 2	\leftarrow		
Engine coolant temp. indicator light		1.4	\leftarrow		
FI indicator light		1.4	\leftarrow		
Engine oil pressure indicator light		1.4	\leftarrow		
Brake-lock indicator light		1.4	\leftarrow		
High beam indicator light		1.4	\leftarrow		
Turn signal indicator light		1.4 × 2	\leftarrow		
Power mode indicator light		1.4	\leftarrow		
Drive indicator light		1.4	\leftarrow		
Gear position indicator ligh	sition indicator light		\leftarrow		
Trunk light		5	\leftarrow		
* Immobilizer indicator light	mmobilizer indicator light				
* Over drive indicator light		1.4	\leftarrow		

BRAKE + WHEEL

ITEM		STANDARD	LIMIT
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)	4.0 (0.16)
	Rear	5.5 ± 0.2 (0.217 ± 0.008)	5.0 (0.20)
Brake disc runout		—	0.30 (0.012)
Master cylinder bore	Front	12.700 – 12.743 (0.5000 – 0.5017)	—
	Rear	12.700 – 12.743 (0.5000 – 0.5017)	
Master cylinder piston diameter	Front	12.657 – 12.684 (0.4983 – 0.4994)	
	Rear	12.657 – 12.684 (0.4983 – 0.4994)	
Brake caliper cylinder bore	Front	25.400 – 25.450 (1.0000 – 1.0020)	
	Rear	27.000 – 27.050 (1.0630 – 1.0650)	
Brake caliper piston diameter	Front	25.318 – 25.368 (0.9968 – 0.9987)	_
	Rear	26.918 – 26.968 (1.0598 – 1.0617)	_
Brake fluid type		DOT 4	_

ITEM		STANDARD	LIMIT
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	_	2.0 (0.08)
Wheel axle runout	Front	_	0.25 (0.010)
	Rear	—	0.25 (0.010)
Wheel rim size	Front	15 M/C × MT3.50	_
	Rear	14 M/C × MT4.50	

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT
Front fork stroke	110 (4.3)	_
Front fork spring free length	—	341 (13.4)
Front fork oil type	SUZUKI FORK OIL G-10 (#10) or an equivalent fork oil	_
Front fork oil capacity (each leg)	458 ml	_
Front fork oil level	151 (5.9)	_
Front fork inner tube diam.	41 (1.61)	_
Rear wheel travel	100 (3.9)	_
Rear shock absorber spring adjuster	2nd	_

TIRE

ITEM			STANDARD	LIMIT
Cold inflation tire pressure Solo	Solo	Front	225 kPa (2.25 kgf/cm², 33 psi)	_
	riding	Rear	250 kPa (2.50 kgf/cm², 36 psi)	
	Dual	Front	225 kPa (2.25 kgf/cm², 33 psi)	—
	riding	Rear	280 kPa (2.80 kgf/cm², 41 psi)	_
Tire size		Front	120/70R15M/C 56H	
		Rear	160/60R14M/C 65H	
Tire type		Front	BRIDGESTONE TH01F	
		Rear	BRIDGESTONE TH01R	
Tire tread depth (Recommended depth)		Front	—	1.6 mm (0.06 in)
		Rear	—	2.0 mm (0.08 in)

FUEL + OIL

ITEM		SPECIFICATION	NOTE
Fuel type	Use only unleaded gasoline of at least 87 pump octane ($R/2 + M/2$) or 91 octane or higher rated by the research method. Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible.		E-03, 28, 33
	Gasoline used higher. An unle	d should be graded 91 octane or eaded gasoline is recommended.	The others
Fuel tank capacity	Including reserve	15.0 L (4.0/3.3 US/Imp gal)	
	Fuel meter mark flickering	Approx. 3.0 L (0.79/0.66 US/Imp gal)	
	Fuel meter mark and LCD flickering	Approx. 1.5 L (0.40/0.33 US/Imp gal)	
Engine oil and transmission oil type	* SAE 10W-40, API, SF/SG or SJ/SH with JASO MA		
Engine oil capacity	Oil change	2.6 L (2.7/2.3 US/Imp qt)	
	Filter change	2.9 L (3.1/2.6 US/Imp qt)	
	Overhaul	3.4 L (3.6/3.0 US/Imp qt)	
Transmission oil capacity	Oil change	360 ml (12.2/12.7 US/Imp oz)	
	Overhaul	400 ml (13.5/14.1 US/Imp oz)	
Final gear oil type	Hypoid ge	ear oil SAE #90 API grade GL-5	
Final gear oil capacity	Oil change	300 ml (10.1/10.6 US/Imp oz)	
	Overhaul	430 ml (14.5/15.1 US/lmp oz)	

SERVICE DATA (AN650AK5) VALVE + GUIDE

VALVE + GUIDE			Unit: mm (in)
ITEM		STANDARD	LIMIT
Valve diam.	IN.	29.5 (1.16)	—
	EX.	25.0 (0.98)	—
Tappet clearance (when cold)	IN.	0.10 – 0.20 (0.0039 – 0.0079)	—
	EX.	0.20 – 0.30 (0.0079 – 0.0118)	—
Valve guide to valve stem clearance	IN.	0.010 - 0.040 (0.0004 - 0.0016)	—
	EX.	0.030 - 0.060 (0.0012 - 0.0024)	—
Valve guide I.D.	IN. & EX.	4.500 – 4.515 (0.1772 – 0.1778)	—
Valve stem O.D.	IN.	4.475 – 4.490 (0.1762 – 0.1768)	—
	EX.	4.455 – 4.470 (0.1754 – 0.1760)	—
Valve stem deflection	IN. & EX.	—	0.35 (0.014)
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
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. & EX.)	IN. & EX.	_	40.6 (1.60)
Valve spring tension (IN. & EX.)	IN. & EX.	136 – 156 N (13.6 – 15.6 kgf, 30.0 – 34.4 lbs) at length 33.4 mm (1.31 in)	_

CAMSHAFT + CYLINDER HEAD

CAMSHAFT + CYLINDER HEAD Unit: mm			
ITEM		STANDARD	
Cam height	IN.	35.38 – 35.43 (1.393 – 1.395)	35.10 (1.382)
	EX.	33.98 – 34.03 (1.338 – 1.340)	33.70 (1.327)
Camshaft journal oil clearance	IN. & EX.	0.032 - 0.066 (0.0013 - 0.0026)	0.150 (0.0059)
Camshaft journal holder I.D.	IN. & EX.	24.012 – 24.025 (0.9454 – 0.9459)	—
Camshaft journal O.D.	IN. & EX.	23.959 – 23.980 (0.9433 – 0.9441)	—
Camshaft runout	IN. & EX.	—	0.10 (0.004)
Cam chain pin (at arrow "3")		15th pin	—
Cylinder head distortion		—	0.10 (0.004)

CYLINDER + PISTON + PISTON RING

ITEM			STANDARD	LIMIT
Compression pressure		(15.	1 500 – 1 900 kPa 0 – 19.0 kgf/cm², 213 – 270 psi)	1 200 kPa (12 kgf/cm², 171 psi)
Compression pressure difference			200 kPa (2.0 kgf/cm², 28 psi)	
Piston to cylinder clearance			0.045 - 0.055 (0.0018 - 0.0022)	0.120 (0.0047)
Cylinder bore			75.500 – 75.515 (2.9724 – 2.9730)	Nicks or scratches
Piston diam.	Меа	asure	75.380 (2.9677)	
Cylinder distortion			0.10 (0.004)	
Piston ring free end gap	1st	R	Approx. 11.6 (0.46)	9.3 (0.37)
	2nd	RN	Approx. 8.6 (0.34)	6.9 (0.27)
Piston ring end gap	1s ⁻	t	* 0.06 – 0.18 (0.002 – 0.005)	0.50 (0.020)
	2no	b	* 0.06 – 0.18 (0.002 – 0.005)	0.50 (0.020)
Piston ring to groove clearance	1s ⁻	t	—	0.180 (0.007)
	2no	þ	—	0.150 (0.006)
Piston ring groove width	1s ⁻	t	1.01 – 1.03 (0.040 – 0.041)	_
	2nd	b	1.01 - 1.03 (0.040 - 0.041)	—
	Oi		2.01 – 2.03 (0.079 – 0.080)	—

ITEM		STANDARD	
Piston ring thickness	1st	0.97 - 0.99 (0.038 - 0.039)	—
	2nd	0.97 - 0.99 (0.038 - 0.039)	—
Piston pin bore		16.002 – 16.008 (0.6300 – 0.6302)	
Piston pin O.D.		15.995 – 16.000 (0.6297 – 0.6299)	

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 big end side clearance	0.10 - 0.20 (0.004 - 0.008)	0.30 (0.012)
Conrod big end width	19.950 – 20.000 (0.7854 – 0.7874)	_
Crank pin width	20.100 – 20.150 (0.7913 – 0.7933)	_
Conrod big end oil clearance	0.032 - 0.056 (0.0013 - 0.0022)	0.080 (0.0031)
Crank pin O.D.	44.976 – 45.000 (1.7707 – 1.7717)	—
Crankshaft journal oil clearance	0.018 - 0.045 (0.0007 - 0.0018)	0.080 (0.0031)
Crankshaft journal O.D.	47.985 – 48.000 (1.8892 – 1.8898)	_
Crankshaft thrust bearing thickness	2.025 – 2.175 (0.0797 – 0.0856)	—
Crankshaft thrust clearance	0.10 - 0.15 (0.0039 - 0.0059)	_
Crankshaft runout	—	0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pressure (at 60 °C, 140 °F)	Above 350 kPa (3.5 kgf/cm², 49.8 psi) Below 550 kPa (5.5 kgf/cm², 78.2 psi) at 3 000 r/min	

CLUTCH		Unit: mm (in)
ITEM	STANDARD	LIMIT
Drive plate thickness	2.92 - 3.08 (0.115 - 0.121)	2.62 (0.103)
Drive plate claw width	13.85 – 13.96 (0.545 – 0.550)	13.05 (0.514)
Driven plate No. 2 thickness	2.42 – 2.58 (0.095 – 0.102)	2.27 (0.089)
Driven plate distortion	_	0.10 (0.004)
Clutch spring free length	13.9 (0.547)	13.2 (0.520)
Clutch plate concaved washer height	3.2 (0.126)	3.1 (0.12)
Clutch engagement	1 500 – 2 100 r/min	—
Clutch lock-up	3 200 – 3 800 r/min	—

INJECTOR + FUEL PUMP + FUEL PRESSURE REGULATOR

ITEM	SPECIFICATION	NOTE
Injector resistance	11 – 13 Ω at 20 °C (68 °F)	
Fuel pump discharge amount	More than 0.9 L (0.95/0.79 US/Imp qt) For 30 sec. at 300 kPa (3.0 kgf/cm², 43 psi)	
Fuel pressure regulator operating set pressure	Approx. 300 kPa (3.0 kgf/cm², 43 psi)	_

FI/CVT-SENSORS

ITEM		NOTE	
CMP sensor resistance	0.9 – 1.7 kΩ		
CMP sensor peak voltage	More than 0.5 V (When cranking)		⊕: B/Y, ⊝: Br
CKP sensor resistance	150 – 300 Ω		
CKP sensor peak voltage	More than 2.0 V (When cranking)		⊕: BI, ⊝: G
IAP sensor input voltage	4.5 – 5.5 V		
IAP sensor output voltage	Approx. 2.6 V at idle speed		
TP sensor input voltage	4.5 – 5.5 V		
TP sensor resistance	Closed	Approx. 1.1 kΩ	
	Opened	Approx. 4.2 kΩ	
TP sensor output voltage	Closed	Approx. 1.1 V	
	Opened	Approx. 4.3 V	
ECT sensor input voltage	4.5 – 5.5 V		
ECT sensor resistance	Approx. 2.45 kΩ at 20 °C (68 °F)		
IAT sensor input voltage	4.5 – 5.5 V		
IAT sensor resistance	Approx. 2.45 kΩ at 20 °C (68 °F)		
AP sensor input voltage	4.5 – 5.5 V		
AP sensor output voltage	Approx. 3.6 V at 100 kPa (760 mmHg)		
TO sensor resistance			
TO sensor output voltage	Normal	0.4 – 1.4 V	⊕: B, ⊝: B/Br
	Leaning	3.7 – 4.4 V	⊕: B, ⊝: B/Br
Injector voltage	Battery voltage		

ITEM		NOTE	
Ignition coil primary peak voltage	More th	#1 ⊕: W/Bl, ⊡: Ground #2 ⊕: B/Y, ⊡: Ground	
HO2 sensor resistance	4 –		
HO2 sensor output voltage	Idle speed	Less than 0.4 V	
	3 000 r/min	More than 0.6 V	
PAIR solenoid valve resistance	20 –		
CVT primary pulley position sensor	Compressed	1.9 – 2.3 kΩ	
	Extended	0.2 – 1.0 kΩ	
CVT primary pulley position sensor output voltage	1 st : Idle speed	Approx. 3.3 V	
	3 rd : 3 000 r/min	Approx. 1.3 V	
	5 th : 3 000 r/min	Approx. 0.5 V	
CVT secondary pulley revolution sensor resistance			
CVT secondary pulley revolution sensor peak voltage	More	⊕: Y, ⊝: W	

THROTTLE BODY

ITEM	SPECIFICATION
I.D. No.	10G0
Bore size	32 mm (1.26 in)
Fast idle r/min	1 300 – 1 600 r/min
Idle r/min	1 200 ± 100 r/min
Synchronizing screw opening	1 and 1/2 turns out
IAC valve resistance	Approx. 4 Ω at 20 – 24 °C (68 – 75 °F)
Throttle cable play	2.0 – 4.0 mm (0.08 – 0.16 in)

THERMOSTAT + RADIATOR + FAN + COOLANT

ITEM	S	LIMIT	
Thermostat valve opening temper- ature		—	
Thermostat valve lift	Over 8.0 mm (0.3 in) at 100 °C (212 °F)		
Engine coolant temperature sensor resistance	20 °C (68 °F)	Approx. 2.45 kΩ	_
	50 °C (122 °F)	Approx. 0.811 kΩ	
	80 °C (176 °F)	Approx. 0.318 kΩ	
	110 °C (230 °F)	Approx. 0.142 kΩ	
Radiator cap valve opening pres- sure			
Eclectic fan thermo-switch operat- ing temperature	ON	93 – 103 °C (199 – 217 °F)	
	OFF	87 – 97 °C (188 – 206 °F)	_
Engine coolant type	Use an anti-freeze/coolant compatible with alumi- num radiator, mixed with distilled water only, at the ratio of 50:50.		_
ITEM	STANDARD/SPECIFICATION		LIMIT
----------------------------------	------------------------	---	-------
Engine coolant including reserve	Reverse tank side	Approx. 250 ml (0.264/0.220 US/Imp qt)	_
	Engine side	Approx. 1 350 ml (1.427/1.188 US/Imp qt)	

ELECTRICAL

Unit: mm (in)

ITEM	STD/SPEC.			NOTE
Firing order			1.2	
Spark plug	Туре		NGK: CR8E DENSO: U24ESR-N	
	Gap		0.7 – 0.8 (0.028 – 0.031)	
Spark performance			Over 8.0 (0.3) at 1 atm.	
CKP sensor peak voltage			More than 2.0 V	⊕: Bl, ⊝:G
Ignition coil resistance	Primar	ſУ	0.8 – 2.5 Ω	
	Second	ary	8 – 18 kΩ	
Ignition coil primary peak voltage			More than 80 V	#1 ⊕: W/Bl, ⊖: Ground #2 ⊕: B/Y, ⊖: Ground
Generator coil resistance	CKP ser	nsor	150 – 300 Ω	G – BI
	Charging		0.1 – 1.0 Ω	Y – Y
Generator no-load voltage (When cold)	More than 50 V at 5 000 r/min			
Generator Max. output	Approx. 500 W at 5 000 r/min			
Regulated voltage	14.0 – 15.5 V at 5 000 r/min		4.0 – 15.5 V at 5 000 r/min	
Starter relay resistance			3-6Ω	
Battery	Type designation		FTX14-BS	
	Capaci	ity	12 V 43.2 kC (12 Ah)/10 HR	
Fuse size	Head-	LO	10 A	000: 15 A
	light	HI	15 A	
	Fuel pu	mp	10 A	
	Ignitio	n	15 A	
	Turn sig	nal	15 A	
Fan m		tor	15 A	
	Main		40 A	
	CVT		40 A	
	Powe source	r e	10 A	
	ABS		15 A × 2	

WATTAGE

```
Unit: W
```

ITEM		STD/SPEC.				
		E-02, 19	E-03, 24, 28, 33			
Headlight	HI	60 + 55	60 × 2			
	LO	55	55 × 2			
Parking or position light		5 × 2				
Brake light/Taillight		21/5 × 2	\leftarrow			
Turn signal light		21 × 4	\leftarrow			
License light		5	\leftarrow			
Instrument panel light		1.4 × 2	\leftarrow			
Engine coolant temp. indic	ator light	1.4	\leftarrow			
FI indicator light		1.4	\leftarrow			
Engine oil pressure indicator light		1.4	\leftarrow			
Brake-lock indicator light		1.4	\leftarrow			
High beam indicator light		1.4	\leftarrow			
Turn signal indicator light		1.4 × 2	\leftarrow			
Power mode indicator light		1.4	\leftarrow			
Drive indicator light		1.4	\leftarrow			
Gear position indicator light		1.4 × 5	\leftarrow			
ABS warning indicator light		1.4				
Trunk light		5	\leftarrow			
* Immobilizer indicator light	t	LED				
* Over drive indicator light		1.4	\leftarrow			

BRAKE + WHEEL

Unit: mm (in)

ITEM		STANDARD	LIMIT
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)	4.0 (0.16)
	Rear	5.5 ± 0.2 (0.217 ± 0.008)	5.0 (0.20)
Brake disc runout		_	0.30 (0.012)
Master cylinder bore	Front	12.700 – 12.743 (0.5000 – 0.5017)	—
	Rear	12.700 – 12.743 (0.5000 – 0.5017)	—
Master cylinder piston diameter	Front	12.657 – 12.684 (0.4983 – 0.4994)	—
	Rear	12.657 – 12.684 (0.4983 – 0.4994)	_
Brake caliper cylinder bore	Front	25.400 – 25.450 (1.0000 – 1.0020)	—
	Rear	27.000 – 27.050 (1.0630 – 1.0650)	—
Brake caliper piston diameter	Front	25.318 – 25.368 (0.9968 – 0.9987)	—
	Rear	26.918 – 26.968 (1.0598 – 1.0617)	_
Brake fluid type		—	

ITEM		STANDARD	LIMIT
Wheel rim runout	Axial	_	2.0 (0.08)
	Radial	_	2.0 (0.08)
Wheel axle runout	Front	_	0.25 (0.010)
	Rear	_	0.25 (0.010)
Wheel rim size	Front	15 M/C × MT3.50	
	Rear	14 M/C × MT4.50	

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT
Front fork stroke	110 (4.3)	—
Front fork spring free length	—	341 (13.4)
Front fork oil type	SUZUKI FORK OIL G-10 (#10) or an equivalent fork oil	—
Front fork oil capacity (each leg)	458 ml	—
Front fork oil level	151 (5.9)	—
Front fork inner tube diam.	41 (1.61)	—
Rear wheel travel	100 (3.9)	—
Rear shock absorber spring adjuster	2nd	—

TIRE

ITEM			LIMIT	
Cold inflation tire pressure	Solo	Front	225 kPa (2.25 kgf/cm², 33 psi)	—
	riding	Rear	250 kPa (2.50 kgf/cm², 36 psi)	—
	Dual	Front	225 kPa (2.25 kgf/cm², 33 psi)	—
	riding	Rear	280 kPa (2.80 kgf/cm², 41 psi)	—
Tire size		Front	120/70R15M/C 56H	—
		Rear	160/60R14M/C 65H	—
Tire type		Front	BRIDGESTONE TH01F	—
		Rear	BRIDGESTONE TH01R	—
Tire tread depth (Recommended depth)		Front	_	1.6 mm (0.06 in)
		Rear	_	2.0 mm (0.08 in)

FUEL + OIL

ITEM		NOTE			
Fuel type	Gasoline used higher. An unle	Gasoline used should be graded 91 octane or higher. An unleaded gasoline is recommended.			
Fuel tank capacity	Including reserve	15.0 L (4.0/3.3 US/Imp gal)			
	Fuel meter mark flickering	Approx. 3.0 L (0.79/0.66 US/Imp gal)			
	Fuel meter mark and LCD flickering	Approx. 1.5 L (0.40/0.33 US/Imp gal)			
Engine oil and transmission oil type	* SAE 10W-40	* SAE 10W-40, API, SF/SG or SH/SJ with JASO MA			
Engine oil capacity	Oil change	2.6 L (2.7/2.3 US/Imp qt)			
	Filter change	2.9 L (3.1/2.6 US/Imp qt)			
	Overhaul	3.4 L (3.6/3.0 US/Imp qt)			
Transmission oil capacity	Oil change	360 ml (12.2/12.7 US/Imp oz)			
	Overhaul	400 ml (13.5/14.1 US/Imp oz)			
Final gear oil type	Hypoid gear oil SAE #90 API grade GL-5				
Final gear oil capacity	Oil change	300 ml (10.1/10.6 US/Imp oz)			
	Overhaul	430 ml (14.5/15.1 US/Imp oz)			

IMMOBILIZER (E-02, 19, 000)

- The immobilizer, an anti-theft system, is installed as a standard equipment.
- The immobilizer verifies that the key ID agrees with ECM ID by means of radio communication through the immobilizer antenna. When the ID agreement is verified, the system makes the engine ready to start.
- This system is same as the AN250/400K5.





OPERATION

When the ignition switch is turned ON with the engine stop switch in ON and the side stand in up position, the immobi-antenna and ECM are powered ON.

The ECM transmits a signal to the transponder through the immobi-antenna in order to make comparison between the key ID and ECM ID.

With the signal received, the transponder transmits the key ID signal to ECM so that ECM can make comparison with its own ID, and if it matches, the engine is made ready to start.



Also, when the ignition switch is turned ON, the indicator light flashes as many as the number of IDs registered in ECM. Thereafter, if the IDs are in agreement, the indicator light turns on for two seconds to notify of completion in successful communication.

If the indicator light flashes fast, it notifies of communication error or disagreement of ID.



NOTE:

If the indicator light flashes fast, turn the ignition switch OFF then ON to make judgment again as there is possible misjudgment due to environmental radio interference.

CAUTION

When the battery performance is lowered in winter (low temperature), the system may make a rejudgment at the time of beginning of the starter motor operation. In this case, the indicator light operation starts immediately after the starter motor operation.



COMBINATION METER



AN650A only
 E-02, 19, 000 only



TERMINAL ALIGNMENT

1	Oil pressure switch (G/Y)	(1)	Turn signal L (B)
2	_	12	Turn signal R (Lg)
3	Speed sensor (O/R)	(13)	Illumination \oplus (O/G)
4	Ignition (O/G)	(14)	ABS (Br) [AN650A]
(5)	Battery (R/BI)	(15)	Brake lock switch (V)
6	Speed sensor signal (W)	(16)	High beam (Y)
\bigcirc	Tachometer signal (Br/W)	17	Immobilizer (E-02, 19, 000)
8	Oil level switch (BI)	(18)	Ambient air temperature sensor (BI)
9	FI (P/W)	(19)	Fuel pump (R/B)
10	Signal ground (B/W)	20	Power ground (B/W)

POWER WIND SCREEN (AN650AK5 E-02, 19, 000)

INSPECTION

- Remove the lower leg shield. (2-9-10)
- Disconnect the wind screen regulator coupler .



Terminal – Terminal	Window screen
R ⊕ – ⊝ G	UP
$G \oplus - \bigcirc R$	DOWN

• Repeat above inspection several times and replace the window screen regulator assembly if necessary.





REMOVAL

- Remove the wind screen. (11-42)
- Remove the leg shield. (79-10)
- Remove the meter front lower panel ①.

NOTE:

Remove the bolts/screws behind the regulator by moving the regulator up or down.

• Remove the meter front upper panel 2.





• Remove the regulator mounting bolts.

• Disconnect the couplers.

- Disconnect the regulator coupler ④.
- Remove the regulator motor mounting bolt and nuts.
- Remove the wind screen regulator assembly.

INSTALLATION

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

- Rout the cables properly. (17-14-40)
- Apply grease to the wires, pulleys and guide rails.



AMBIENT AIR TEMPERATURE SENSOR

INSPECTION

- Turn the ignition switch to OFF.
- Remove the AAT (Ambient Air Temperature) sensor by pushing off the clamp.



- Check the AAT sensor coupler for loose or poor contacts. If OK, measure the AAT sensor resistance.
- **DATA** AAT sensor resistance:

Approx. 2.12 k Ω at 20 °C (68 °F) (Terminal – Terminal)

09900-25008: Multi-circuit tester set

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

Intake Air Temp	Resistance
20 °C (68 °F)	Approx. 2.1 kΩ
25 °C (77 °F)	Approx. 1.7 kΩ
30 °C (86 °F)	Approx. 1.4 kΩ
40 °C (104 °F)	Approx. 0.9 kΩ

NOTE:

AAT sensor resistance measurement method is the same way as that of the ECT sensor. Refer to 8-13 for details.

• If neccesary, replace the AAT sensor with a new one.



FI SYSTEM WIRING DIAGRAM E-02, 19, 000



E-03, 28, 33



ECM COUPLERS K4 MODEL ECM AND CVT CONTROL UNIT COUPLERS



K5 MODEL ECM COUPLERS



ECM		ECM	
TERMINAL	CIRCUIT	TERMINAL	CIRCUIT
NO.		NO.	
1	Ignition coil (IG1)	17	Battery (+B)
2	Fuel injector (#1)	(18)	Center stand switch (CSTD)
3	Fuel injector (#2)	(19)	Side stand switch (SS)
4	Shift up switch (UP)	20	Brake switch (BRK)
5	Pulley position sensor (PPS)	21)	Mode select switch (MS)
6	PTC heater (PTC)	(22)	Test switch (TS)
\overline{O}	Speedometer (SPD)	23	CO and injection pulse width adjust box (COV1)
8	Solenoid valve (SOL)	24)	CO and injection pulse width adjust box (COV2)
9	Fuel pump relay (FP)	25	CO and injection pulse width adjust box (COV3)
10	Ignition coil (IG2)	26	Ground (E03)
(1)	Fan motor relay (FRL)	27)	Ground (E01)
(12)	Power switch (POWER)	28	Starter relay (STA)
(13)	Mode switch (MODE)	29	Writing tool (RXD1)
(14)	Shift down switch (DOWN)	30	Writing tool (TXD1)
(15)	CO and injection pulse width adjust box (COS1)	31)	SDL-KWP (SDL)
(16)	CO and injection pulse width adjust box (COS2)	32	Writing tool (FWE)

ECM		ECM	
TERMINAL	CIRCUIT	TERMINAL	CIRCUIT
NO.		NO.	
33	Battery (BATT)	(49)	TP sensor (VTA)
34)	Writing tool (RST)	(50)	IAT sensor (THA)
35)	Ground (E1)	(51)	ECT sensor (THW)
36	CKP sensor (N-)	(52)	AP sensor (PA)
37)	CMP sensor (G+)	(53)	O2 sensor control selector (EXS)
38	OX heater (OXH)	54)	Ground (E2)
39	Immobilizer (TXCK)	(55)	Tachometer (TACO)
40	Immobilizer (RXCK)	(56)	Meter (TECH)
(41)	Immobilizer LED (LED)	57)	Writing tool (SCK)
42	Injector power voltage (VM)	(58)	IAP sensor (PM)
(43)	CKP sensor (N+)	(59)	TO sensor (DON)
44	CMP sensor (G-)	60	Blank
(45)	O2 sensor (OX)	61)	Battery (VB)
46	Secondary pulley sensor (SPR-)	62	Motor (MO+)
47	Secondary pulley sensor (SPR+)	63	Ground
(48)	Sensor power (VCC)	64	Motor (MO-)

MALFUNCTION CODE

MALFUNCTION		ECM COUPLER TERMINALS TO CHECK	
CODE	DETECTEDITEM	К4	K5
C00	NO FAULT		
C11	Camshaft position	37, 44	
	sensor	([6-27)	\leftarrow
	Crankshaft position	36, 43	
C12	sensor	([6-28)	\leftarrow
010	Intake air pressure	48, 54, 58	
C13	sensor	([6-30)	\leftarrow
C14	Throttle position	48, 49, 54	
014	sensor	([6-32)	\rightarrow
015	Engine coolant	(51), (54)	, ,
015	temperature sensor	([6-33)	\rightarrow
C16	Speed sensor		
C 2 1	Intake air temperature	50, 54	,
021	sensor	()376-36)	\downarrow
C22	Atmospheric pressure	48, 52, 54	<u>/</u>
022	sensor	([6-38)	<u></u>
C23	Tip over sensor	48, 54, 59	<u>/</u>
025		(🗁 6-39)	~
C24 or C25	Ignition signal	4, 5, 4	<u> </u>
024 01 023		([6-40)	× .
C32 or C33	Fuel injector	(4), (5), (42)	(2) (3) (4)
002 01 000		([6-40)	
C40	Intake air control (IAC)		
	valve		
C41	Fuel pump relay	9,42	\leftarrow
		() 6-41)	
C42	Ignition switch		
C44	Heated oxygen sensor	(17), (38), (45), (54)	\leftarrow
	(HO2S) [E-02, 19]	() 76-43)	
C51	CVT motor		
	CVT pulley position	(8), (14), (20)	
C52	sensor	(CVT control unit coupler)	(5), (27), (48)
		(Ľ_3 ³⁶ -48)	
C53	CVT speed sensor		
C54	CVT secondary pulley		
	revolution sensor		
C55	CVI engine revolution	(3) (CVI control unit coupler)	
	signal		(55)
		([6-53)	
C58	GVI reduction ratio		
	usagreement		

ABS TROUBLESHOOTING (AN650AK5) MALFUNCTION CODE TROUBLESHOOTING

"41" Wheel speed sensor signal malfunction (F)

POSSIBLE CAUSE

- · Poor contact on the front wheel speed sensor coupler
- Faulty front wheel speed sensor, etc.
- 1) Inspect the clearance between the front wheel speed sensor and sensor rotor using the thickness gauge.

Wheel speed sensor – sensor rotor clearance:

0.3 – 1.5 mm

09900-20803: Thickness gauge 09900-20806: Thickness gauge

Is the clearance OK?

YES	Go to step 2.
NO	Adjust the clearance.

 Inspect the front wheel speed sensor rotor for damage and check that no foreign objects are caught in the rotor openings.

Is the sensor rotor OK?

YES	Go to step 3.
NO	Clean or replace the sensor rotor.

3) Check that the front wheel speed sensor is mounted steadily. Is the sensor mounted steadily?

YES	Go to malfunction code "42". (14-35)
NO	Tighten the mounting bolts or replace the bracket
NO	if necessary.







"42" Wheel speed sensor circuit open (F)

POSSIBLE CAUSE

- Poor contact on the front wheel speed sensor coupler
- Faulty front wheel speed sensor, etc.
- Turn the ignition switch to OFF.
- Remove the leg shield. (3-9-10)
- Remove the meter front lower panel. (14-26)
- Check the ABS control unit coupler and front wheel speed sensor coupler for looseness. If OK, disconnect the ABS control unit coupler.





1) Measure the resistance between (2) (B/R) and ground at the ABS control unit coupler.

DATA Normal value: ∞

09900-25008: Multi circuit tester set 09900-25009: Needle pointed probe set

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

Is the resistance between 1 and ground OK?

YES	Go to step 3.
NO	Go to step 2.

- Disconnect the front wheel speed sensor coupler.
- 2) Measure the resistance between (A) (B) and ground at the front wheel speed sensor coupler.

Normal value: ∞

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

Is the resistance between (A) and ground OK?

YES	Inspect the wire harness. (Faulty B/R wire)
NO	Faulty front wheel speed sensor

3) Measure the resistance between ③ (W/R) and ground at the ABS control unit coupler.

DATA Normal value: ∞

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

Is the resistance between ③ and ground OK?

YES	Go to step 5.
NO	Go to step 4.





4) Measure the resistance between (B) (W) and ground at the front wheel speed sensor coupler.

Normal value: ∞

\square Tester knob indication: Resistance (Ω)

Is the resistance between (B) and ground OK?

YES	Inspect the wire harness. (Faulty W/R wire)
NO	Faulty front wheel speed sensor

5) Check for continuity between (2) (B/R) on the ABS control unit coupler and (C) (B/R) on the front wheel speed sensor coupler.

Tester knob indication: Continuity (•)))

Is there continuity between 12 and C?

YES	Go to step 6.
NO	Inspect the wire harness. (Faulty B/R wire)

 Check for continuity between ③ (W/R) on the ABS control unit coupler and ① (W/R) on the front wheel speed sensor coupler.

Tester knob indication: Continuity (•)))

Is there continuity between (3) and (D)?

YES	Go to step 7.
NO	Inspect the wire harness. (Faulty W/R wire)

- Connect the front wheel speed sensor coupler.
- 7) Connect three 1.5 V dry cells (A) in series as shown and make sure that their total voltage is more than 4.5 V.
 Measure the current between (+) dry cell terminal and (12) (B/R) on the ABS control unit coupler.

DATA Normal value: 3 – 14 mA

Tester knob indication: Current (---, 20 mA)

Is the current OK?

YES	Replace the ABS control unit/HU.
NO	Faulty front wheel speed sensor.





"44" Wheel speed sensor signal malfunction (R)

POSSIBLE C	AUSE
------------	------

- Poor contact on the rear wheel speed sensor coupler
- Faulty rear wheel speed sensor, etc.
- 1) Inspect the clearance between the rear wheel speed sensor and sensor rotor using the thickness gauge.

Wheel speed sensor – sensor rotor clearance:

0.3 – 1.5 mm

09900-20803: Thickness gauge 09900-20806: Thickness gauge

Is the clearance OK?

YES	Go to step 2.
NO	Adjust the clearance.

 Inspect the rear wheel speed sensor rotor for damage and check that no foreign objects are caught in the rotor openings.

Is the sensor rotor OK?

YES	Go to step 3.
NO	Clean or replace the sensor rotor.





3) Check that the rear wheel speed sensor is mounted steadily. Is the sensor mounted steadily?

YES	Go to malfunction code "45". (14-38)
NO	Tighten the mounting bolts or replace the bracket
	if necessary.



"45" Wheel speed sensor circuit open (R)

POSSIBLE C	AUSE
------------	------

- · Poor contact on the rear wheel speed sensor coupler
- Faulty rear wheel speed sensor, etc.
- Turn the ignition switch to OFF.
- Remove the front box. (2-9-18)
- Remove the trunk box cover. (239-16)
- Check the ABS control unit/HU coupler and rear wheel speed sensor coupler for loose or poor contacts. If OK, then disconnect the ABS control unit/HU coupler



1) Check the resistance between terminal ② (B/Y) on the ABS control unit coupler and ground.

DATA Normal value: $\infty \Omega$ (Infinity)

09900-25008: Multi circuit tester set 09900-25009: Needle pointed probe set

 \square Tester knob indication: Resistance (Ω)

Is the resistance OK?

YES	Go to step 3.
NO	Go to step 2.

2) Check the resistance between A (B) and ground.

DATA Normal value: $\infty \Omega$ (Infinity)

- \mathbf{P} Tester knob indication: Resistance (Ω)
 - Is the resistance OK?

YES	Inspect the wire harness. (Faulty B/Y wire)
NO	Replace the rear wheel speed sensor.

3) Check the resistance between terminal (18) (W/Y) and ground.

Normal value: $\infty \Omega$ (Infinity)

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

Is the resistance OK?

YES	Go to step 5.
NO	Go to step 4.







• Disconnect the rear wheel speed sensor coupler.

4) Check the resistance between B (W) and ground.

Normal value: $\infty \Omega$ (Infinity)

Is the resistance OK?

YES	Inspect the wire harness. (Faulty W/Y wire)
NO	Replace the rear wheel speed sensor.

5) Check the continuity between $\mathbb C$ (B/Y) and terminal $\mathbb Q.$

Normal value: Continuity (•)))

Tester knob indication: Continuity test (•)))

Is the continuity OK?

YES	Go to step 6.
NO	Inspect the wire harness. (Faulty B/Y wire)

6) Check the continuity between \mathbb{D} (W/Y) and terminal B.

Normal value: Continuity (•)))

Tester knob indication: Continuity test (•)))

Is the continuity OK?

YES	Go to step 7.
NO	Inspect the wire harness. (Faulty W/Y wire)

• Connect the rear wheel speed sensor coupler.

- 7) Connect three 1.5 V dry cells A in series as shown and make sure that their total voltage is more than 4.5 V.
 Measure the current between ⊕ dry cell terminal and ② (B/
 - Y) on the ABS control unit coupler.
- Normal value: 3 14 mA
- 09900-25008: Multi-circuit tester set 09900-25009: Needle pointed probe set

Tester knob indication: Current (---, 20 mA)

Is the current OK?

YES	Replace the ABS control unit/HU.
NO	Replace the rear wheel speed sensor.









WIND SCREEN CABLE ROUTING



RADIATOR HOSE ROUTING



EXTERIOR PARTS CONSTRUCTION



1	Meter front upper panel	6	Lower leg shield	(1)	Wind screen regulator
2	Leg shield brace	\bigcirc	Floor mat	2	Meter front lower panel
3	Meter cover	8	Front box	13	Front leg shield cover
4	Front panel	9	Wind screen	(14)	Lower bracket cover
5	Leg shield	10	Wind screen cover		



1	Maintenance lid	(5)	Center frame cover	9	Fuel tank inlet tray
2	Foot board	6	Lower frame cover	1	Fuel tank inlet packing
3	Frame cover	\bigcirc	Rear fender		
4	Leg side cover	8	Floor mat		



CVT CONSTRUCTION



1	Secondary pulley shaft nut	9	CVT belt	17	Secondary pulley fan
2	Secondary pulley shaft adapter	10	Primary pulley assembly	(18)	Bearing
3	O-ring	(1)	Shim	(19)	Snap ring
4	Primary pulley shaft bolt	12	O-ring	20	Primary slide pulley idle gear
(5)	Primary pulley shaft adapter	(13)	Bearing	21)	Secondary pulley revolution sensor
6	CVT casing	(14)	Oil seal	@2	CVT motor
\bigcirc	Bearing	(15)	Washer	23	CVT cover
8	O-ring	(16)	Secondary pulley assembly	24)	CVT filter

• Use new special tool for ④.

09924-51010: Primary pulley shaft bolt holder

Primary pulley shaft bolt: 93 N·m (9.3 kgf-m, 67.5 lb-ft)

NOTE:

Do not reuse the removed primary pulley shaft bolt.

AMBIENT AIR TEMPERATURE SENSOR BRACKET INSTALLATION



SPECIAL TOOLS



TIGHTENING TORQUE CHART

For other nuts and bolts not listed in the preceding page, refer to this chart:

Bolt Diameter (A)	Conventional or	"4" marked bolt	"7" marked bolt		
(mm)	N⋅m	kgf-m	N⋅m	kgf-m	
4	1.5	0.15	2.3	0.23	
5	3	0.3	4.5	0.45	
6	5.5	0.55	10	1.0	
8	13	1.3	23	2.3	
10	29	2.9	50	5.0	
12	45	4.5	85	8.5	
14	65	6.5	135	13.5	
16	105	10.5	210	21.0	
18	160	16.0	240	24.0	

A



"7" marked bolt

Conventional bolt

"4" marked bolt

AN650/K6 ('06-MODEL)

This chapter describes service data, service specifications and servicing procedures which differ from those of the AN650/AK5 ('05-MODEL).

NOTE:

Please refer to the chapter 1 through 14 for details which are not given in this chapter.

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15

SPECIFICATIONS (AN650K6)

DIMENSIONS AND DRY MASS	0.000 mm (00.0 in)
Overall length	2 260 mm (89.0 ln)
Overall beight	810 mm (31.9 m) 1 425 mm (56 5 in)
	1 400 mm (60.0 m)
Ground clearance	130 mm (5.1 in)
Seet height	750 mm (29.5 in)
Dry mass	235 kg (518 lbs)
	200 kg (010 100)
lype	4-stroke, liquid-cooled, DOHC
Number of cylinders	2 75.5 mm (2.072 in)
Stroko	73.3 IIIII (2.972 III) 71.3 mm (2.807 in)
Displacement	638 cm ³ (38.9 cu, in)
Compression ratio	11.2 : 1
Fuel system	Fuel injection
Air cleaner	Non-woven fabric element
Starter system	Electric
Lubrication system	Wet sump
Idle speed	1 200 ± 100 r/min
DRIVE TRAIN	
Clutch	Wet multi-plate, automatic, centrifugal type
Primary reduction ratio	1.333 (88/66)
Gearshift pattern	Automatic & Manual shift
Automatic transmission ratio	Variable change (1.800-0.465)
Secondary reduction ratio	3.934 (39/31 × 43/25 × 40/22)
Final reduction ratio	$1.580(32/31 \times 31/32 \times 34/31 \times 49/34)$
Drive system	Gear drive
CHASSIS	
Front suspension	Telescopic, coil spring, oil damped
Rear suspension	Swingarm type, coil spring, oil damped
Front fork stroke	110 mm (4.3 in)
Rear wheel travel	100 mm (3.9 in)
	$26^{\circ} 10^{\circ}$
Ifdil	100 [[[[]] (4.17 []]) 41° (right and loft)
Turning radius	27 m (8.9 ft)
Front brake	Disc brake.twin
Rear brake	Disc brake
Front tire size	120/70R15M/C 56H, tubeless
Rear tire size	160/60R14M/C 65H, tubeless
ELECTRICAL	
Ianition type	Electronic ignition (Transistorized)
Ignition timing	10° B.T.D.C. at 1 200 r/min
Spark plug	NGK CR8E or DENSO U24ESR-N
Battery	12 V 43.2 kC (12 Ah)/10 HR
Generator	Three-phase A.C. generator
Main fuse	40 A
CVI fuse	
Fuse	15/15/15/15/15/10/10 AE-02, 19 15/15/15/15/15/10/10 AE-03, 24, 28, 33
Headlight	10/10/10/10/10/10/10/10/10/10/10/10/10/1
rioddiight	$12 \vee 60/55 \times 2 (H4 \times 2)$ E-03, 24, 28, 33
Position/Parking light	12 V 5 W × 2
Brake light/Taillight	12 V 21/5 W × 2
Lisense plate light	12 V 5 W
Trunk light	12 V 5 W
Turn signal light	12 V 21 W
Instrument panel light	12 V 1.4 W × 2
Coolant temperature warning light	12 V 1.4 W
Cil prossuro warning light	12 V 1.4 W 12 V 1.4 W
Brake lock warning light	12 V 1.4 W
High beam indicator light	12 V 1 4 W
Turn signal indicator light	12 V 1.4 W × 2
Power mode indicator light	12 V 1.4 W
Drive indicator light	12 V 1.4 W
Gear position indicator light	12 V 1.4 W × 5
Immobilizer indicator light	LEDE-02, 19, 24
Over drive indicator light	12 V 1.4 W

CAPACITIES

15.0 L (4.0/3.3 US/Imp gal)
2 600 ml (2.7/2.3 US/Imp qt)
2 900 ml (3.1/2.6 US/Imp qt)
3 400 ml (3.6/3.0 US/Imp qt)
360 ml (12.2/12.7US/Imp oz)
400 ml (13.5/14.1US/Imp oz)
300 ml (10.1/10.6US/Imp oz)
430 ml (14.5/15.1US/Imp oz)
1.6 L (1.7/1.4 US/Imp qt)

SPECIFICATIONS (AN650AK6)

DIMENSIONS AND DRY MASS	
Overall length	2 260 mm (89.0 in)
Overall width	810 mm (31.9 in)
Overall height	1 435 mm (56.5 in)
Wheelbase	1 595 mm (62.8 in)
Ground clearance	130 mm (5.1 in)
Seat height	750 mm (29.5 in)
Dry mass	243 kg (535 lbs)
Dry mass	243 kg (333 lbs)
ENGINE	
Туре	4-stroke, liquid-cooled, DOHC
Number of cylinders	2
Bore	- 75.5 mm (2.972 in)
Stroke	71.3 mm (2.807 in)
Displacement	638 cm^3 (38.9 cu in)
Compression ratio	
	II.2.I Fuel injection
	Fuel Injection
Air cleaner	Non-woven fabric element
Starter system	Electric
Lubrication system	Wet sump
Idle speed	1 200 ± 100 r/min
	Mat multi plata automatia contrifucal tura
Gearshift pattern	Automatic & Manual Shift
Automatic transmission ratio	Variable change (1.800-0.465)
Secondary reduction ratio	3.934 (39/31 × 43/25 × 40/22)
Final reduction ratio	1.580 (32/31 × 31/32 × 34/31 × 49/34)
Drive system	Gear drive
CHACCIC	
Front evenencion	Tologonia poil opring oil dompod
	Quia segure trace a sil against sil de segure
Rear suspension	Swingarm type, coll spring, oil damped
Front fork stroke	110 mm (4.3 ln)
Rear wheel travel	100 mm (3.9 in)
Caster	26° 10'
Trail	106 mm (4.17 in)
Steering angle	41° (right and left)
Turning radius	2.7 m (8.9 ft)
Front brake	Disc brake,twin
Rear brake	Disc brake
Front tire size	120/70R15M/C 56H, tubeless
Rear tire size	160/60B14M/C 65H, tubeless
ELECTRICAL	
Ignition type	Electronic ignition (Transistorized)
Ignition timing	10° B.T.D.C. at 1 200 r/min
Spark plug	

Ignition timing	10° B.T.D.C. at 1 200 r/min
Spark plug	NGK CR8E or DENSO U24ESR-N
Battery	12 V 43.2 kC (12 Ah)/10 HR
Generator	Three-phase A.C. generator
Main fuse	40 A
CVT fuse	40 A
Fuse	15/15/15/15/15/10/10/15/15 A
Headlight	12 V 60 + 55/55 + 55 (H4 + H7)
Position/Parking light	12 V 5 W × 2
Brake light/Taillight	12 V 21/5 W × 2
Lisense plate light	12 V 5 W
Trunk light	12 V 5 W
Turn signal light	12 V 21 W
Instrument panel light	12 V 1.4 W × 2
Coolant temperature warning light	12 V 1.4 W
Fuel injection warning light	12 V 1.4 W
Oil pressure warning light	12 V 1.4 W
Brake lock warning light	12 V 1.4 W
High beam indicator light	12 V 1.4 W
Turn signal indicator light	12 V 1.4 W × 2
Power mode indicator light	12 V 1.4 W
Drive indicator light	12 V 1.4 W
Gear position indicator light	12 V 1.4 W × 5
ABS indicator light	12 V 1.4 W
Immobilizer indicator light	LEDE-02, 19, 24
Over drive indicator light	12 V 1.4 W

CAPACITIES

tank, including reserve	15.0 L (4.0/3.3 US/Imp gal)
ie oil, oil change	
with filter change	
overhaul	
mission oil, oil change	
overhaul	
gear oil, oil change	
overhaul	
ant	1.6 L (1.7/1.4 US/Imp qt)
overnau mission oil, oil change overhaul gear oil, oil change overhaul	3400 ml (3.5/3.0 US/lmp qt) 360 ml (12.2/12.7US/lmp qt) 400 ml (13.5/14.1US/lmp qt) 300 ml (10.1/10.6US/lmp qt)

SERVICE DATA (AN650K6)

VALVE + GUIDE			Unit: mm (in
ITEM		STANDARD	LIMIT
Valve diam.	IN.	29.5 (1.16)	—
	EX.	25.0 (0.98)	—
Tappet clearance (when cold)	IN.	0.10 – 0.20 (0.0039 – 0.0079)	—
	EX.	0.20 - 0.30 (0.0079 - 0.0118)	—
Valve guide to valve stem clearance	IN.	0.010 - 0.040 (0.0004 - 0.0016)	—
	EX.	0.030 - 0.060 (0.0012 - 0.0024)	—
Valve guide I.D.	IN. & EX.	4.500 – 4.515 (0.1772 – 0.1778)	—
Valve stem O.D.	IN.	4.475 – 4.490 (0.1762 – 0.1768)	—
	EX.	4.455 – 4.470 (0.1754 – 0.1760)	—
Valve stem deflection	IN. & EX.	—	0.35 (0.014)
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
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. & EX.)	IN. & EX.	_	40.6 (1.60)
Valve spring tension (IN. & EX.)	IN. & EX.	136 – 156 N (13.6 – 15.6 kgf, 30.0 – 34.4 lbs) at length 33.4 mm (1.31 in)	_

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM		STANDARD		
11 2101		OTANDAILD		
Cam height	IN.	35.38 – 35.43 (1.393 – 1.395)	35.10 (1.382)	
	EX.	33.98 – 34.03 (1.338 – 1.340)	33.70 (1.327)	
Camshaft journal oil clearance	IN. & EX.	0.032- 0.066 (0.0013 - 0.0026)	0.150 (0.0059)	
Camshaft journal holder I.D.	IN. & EX.	24.012 – 24.025 (0.9454 – 0.9459)	—	
Camshaft journal O.D.	IN. & EX.	23.959 – 23.980 (0.9433 – 0.9441)	—	
Camshaft runout	IN. & EX.	—	0.10 (0.004)	
Cam chain pin (at arrow "3")		15th pin	—	
Cylinder head distortion		_	0.10 (0.004)	
CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure		(15.	1 500 – 1 900 kPa 0 – 19.0 kgf/cm², 213 – 270 psi)	1 200 kPa (12 kgf/cm², 171 psi)
Compression pressure difference	_		200 kPa (2.0 kgf/cm², 28 psi)	
Piston to cylinder clearance			0.045 – 0.055 (0.0018 – 0.0022)	0.120 (0.0047)
Cylinder bore			75.500 – 75.515 (2.9724 – 2.9730)	Nicks or scratches
Piston diam.	Mea	asure	75.470 – 75.485 (2.9705 – 2.9711) at 15 mm (0.6 in) from the skirt end.	75.380 (2.9677)
Cylinder distortion			—	0.10 (0.004)
Piston ring free end gap	1st	R	Approx. 11.6 (0.46)	9.3 (0.37)
	2nd	RN	Approx. 8.6 (0.34)	6.9 (0.27)
Piston ring end gap	1st		0.06 - 0.18 (0.002 - 0.005)	0.50 (0.020)
	2n	d	0.06 – 0.18 (0.002 – 0.005)	0.50 (0.020)
Piston ring to groove clearance	1s ⁻	t	l	0.180 (0.007)
	2n	d	l	0.150 (0.006)
Piston ring groove width	1s ⁻	t	1.01 – 1.03 (0.040 – 0.041)	_
	2n	d	1.01 – 1.03 (0.040 – 0.041)	
	Oi	I	2.01 – 2.03 (0.079 – 0.080)	_
Piston ring thickness	1st		0.97 – 0.99 (0.038 – 0.039)	_
	2n	d	0.97 – 0.99 (0.038 – 0.039)	—
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 16.040 Conrod small end I.D. 16.010 - 16.018 (0.6303 - 0.6306)(0.6315)Conrod big end side clearance 0.10 - 0.200.30 (0.004 - 0.008)(0.012) Conrod big end width 19.950 - 20.000 ____ (0.7854 - 0.7874)20.100 - 20.150 (0.7913 - 0.7933) Crank pin width ___ 0.032 - 0.056 (0.0013 - 0.0022) Conrod big end oil clearance 0.080 (0.0031)

ITEM	STANDARD	LIMIT
Crank pin O.D.	44.976 – 45.000 (1.7707 – 1.7717)	—
Crankshaft journal oil clearance	0.018 – 0.045 (0.0007 – 0.0018)	0.080 (0.0031)
Crankshaft journal O.D.	47.985 – 48.000 (1.8892 – 1.8898)	—
Crankshaft thrust bearing thickness	2.025 – 2.175 (0.0797 – 0.0856)	—
Crankshaft thrust clearance	0.10 - 0.15 (0.0039 - 0.0059)	—
Crankshaft runout	—	0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pressure (at 60 °C, 140 °F)	Above 350 kPa (3.5 kgf/cm², 49.8 psi) Below 550 kPa (5.5 kgf/cm², 78.2 psi) at 3 000 r/min	_

CLUTCH		Unit: mm (in)
ITEM	STANDARD	LIMIT
Drive plate thickness	2.92 – 3.08 (0.115 – 0.121)	2.62 (0.103)
Drive plate claw width	13.85 – 13.96 (0.545 – 0.550)	13.05 (0.514)
Driven plate No. 2 thickness	2.42 – 2.58 (0.095 – 0.102)	2.27 (0.089)
Driven plate distortion		0.10 (0.004)
Clutch spring free length	13.9 (0.547)	13.2 (0.520)
Clutch plate concaved washer height	3.2 (0.126)	3.1 (0.12)
Clutch engagement	1 500 – 2 100 r/min	—
Clutch lock-up	3 200 – 3 800 r/min	—

INJECTOR + FUEL PUMP + FUEL PRESSURE REGULATOR

ITEM	SPECIFICATION	NOTE
Injector resistance	11 – 13 Ω at 20 °C (68 °F)	—
Fuel pump discharge amount	More than 0.9 L (0.95/0.79 US/Imp qt) For 30 sec. at 300 kPa (3.0 kgf/cm², 43 psi)	_
Fuel pressure regulator operating set pressure	Approx. 300 kPa (3.0 kgf/cm², 43 psi)	—

FI/CVT-SENSORS

ITEM		NOTE	
CMP sensor resistance			
CMP sensor peak voltage	Мс	⊕: B/Y, ⊝: Br	
CKP sensor resistance			
CKP sensor peak voltage	Мс	ore than 2.0 V (When cranking)	⊕: Bl, ⊝: G
IAP sensor input voltage		4.5 – 5.5 V	
IAP sensor output voltage		Approx. 2.6 V at idle speed	
TP sensor input voltage		4.5 – 5.5 V	
TP sensor resistance	Closed	Approx. 1.1 kΩ	
	Opened	Approx. 4.2 kΩ	
TP sensor output voltage	Closed	Approx. 1.1 V	
	Opened	Approx. 4.3 V	
ECT sensor input voltage		4.5 – 5.5 V	
ECT sensor resistance	Ap	prox. 2.45 kΩ at 20 °C (68 °F)	
IAT sensor input voltage		4.5 – 5.5 V	
IAT sensor resistance	Ap	prox. 2.45 kΩ at 20 °C (68 °F)	
AP sensor input voltage		4.5 – 5.5 V	
AP sensor output voltage	Appro		
TO sensor resistance	19.1 – 19.7 kΩ		
TO sensor output voltage	Normal	0.4 – 1.4 V	⊕: B, ⊖: B/Br
	Leaning	3.7 – 4.4 V	⊕: B, ⊝: B/Br
Injector voltage		Battery voltage	
Ignition coil primary peak voltage	More than 80 V (When cranking)		#1 ⊕: W/Bl, ⊡: Ground #2 ⊕: B/Y, ⊡: Ground
HO2 sensor resistance		4 – 5 Ω at 23 °C (73.4 °F)	
HO2 sensor output voltage	Idle speed	Less than 0.4 V	
	3 000 r/ min	More than 0.6 V	
PAIR solenoid valve resistance		20 – 24 Ω at 20 °C (68 °F)	
CVT primary pulley position sensor	Com- pressed	1.9 – 2.3 kΩ	
	Extended	0.2 – 1.0 kΩ	
CVT primary pulley position sensor output voltage	1 st : Idle speed	Approx. 3.3 V	
	3 rd : 3 000 r/min	Approx. 1.3 V	
	5 th : 3 000 r/min	Approx. 0.5 V	
CVT secondary pulley revolution sensor resistance		400 – 600 Ω	
CVT secondary pulley revolution sensor peak voltage		⊕: Y, ⊖: W	

THROTTLE BODY

ITEM	SPECIFICATION
I.D. No.	10G0
Bore size	32 mm (1.26 in)
Fast idle r/min	1 300 – 1 600 r/min
Idle r/min	1 200 ± 100 r/min
Synchronizing screw opening	1 and 1/2 turns out
IAC valve resistance	Approx. 4 Ω at 20 – 24 °C (68 – 75 °F)
Throttle cable play	2.0 – 4.0 mm (0.08 – 0.16 in)

THERMOSTAT + RADIATOR + FAN + COOLANT

ITEM	STAN	LIMIT	
Thermostat valve opening temper- ature	Ар	_	
Thermostat valve lift	Over 8.0 m	ım (0.3 in) at 100 °C (212 °F)	_
Engine coolant temperature sensor	20 °C (68 °F)	Approx. 2.45 kΩ	_
resistance	50 °C (122 °F)	Approx. 0.811 kΩ	—
	80 °C (176 °F)	Approx. 0.318 k Ω	—
	110 °C (230 °F)	Approx. 0.142 kΩ	—
Radiator cap valve opening pres- sure	1.	—	
Eclectic fan thermo-switch operat-	ON	93 – 103 °C (199 – 217 °F)	_
ing temperature	OFF	87 – 97 °C (188 – 206 °F)	_
Engine coolant type	Use an anti-freeze/coolant compatible with alumi- num radiator, mixed with distilled water only, at the ratio of 50:50.		_
Engine coolant including reserve	Reverse tank side	Approx. 250 ml (0.264/0.220 US/Imp qt)	_
	Engine side	Approx. 1 350 ml (1.427/1.188 US/Imp qt)	

ELECTRICAL

Unit: mm (in)

ITEM		STD/SPEC.	NOTE	
Firing order		1.2		
Spark plug	Туре	NGK: CR8E DENSO: U24ESR-N		
	Gap	0.7 – 0.8 (0.028 – 0.031)		
Spark performance		Over 8.0 (0.3) at 1 atm.		
CKP sensor peak voltage		More than 2.0 V	⊕: BI, ⊝:G	
Ignition coil resistance	Primary 0.8 – 2.5 Ω			
	Secondary	8 – 18 kΩ		
Ignition coil primary peak voltage	More than 80 V		#1 ⊕: W/Bl, ⊡: Ground #2 ⊕: B/Y, ⊡: Ground	
Generator coil resistance	CKP sensor	150 – 300 Ω	G – Bl	
	Charging	0.1 – 1.0 Ω	Y – Y	

ITEM	STD/SPEC.			NOTE
Generator no-load voltage (When cold)	More than 50 V at 5 000 r/min			
Generator Max. output		Ap	oprox. 500 W at 5 000 r/min	
Regulated voltage		1	4.0 – 15.5 V at 5 000 r/min	
Starter relay resistance			3-6Ω	
Battery	Type designation		FTX14-BS	
	Capacity		12 V 43.2 kC (12 Ah)/10 HR	
Fuse size	Head- light	LO	15 AE-03, 24, 28, 33	
			10 AE-02, 19	
		HI	15 A	
	Fuel pump		10 A	
	Ignition		15 A	
	Turn signal		15 A	
	Fan motor		15 A	
	Main		40 A	
	CVT		40 A	
	Power source		10 A	

WATTAGE

Unit: W

ITEM		STD/SPEC.				
		E-02, 19	E-03, 24, 28, 33			
Headlight	HI	60 + 55	60 × 2			
	LO	55	55 × 2			
Parking or position light		5 × 2				
Brake light/Taillight		21/5 × 2	\leftarrow			
Turn signal light		21 × 4	\leftarrow			
License light		5	\leftarrow			
Instrument panel light		1.4 × 2	\leftarrow			
Engine coolant temp. indicator light		1.4	\leftarrow			
FI indicator light		1.4	\leftarrow			
Engine oil pressure indicat	or light	1.4	\leftarrow			
Brake-lock indicator light		1.4	\leftarrow			
High beam indicator light		1.4	\leftarrow			
Turn signal indicator light		1.4 × 2	\leftarrow			
Power mode indicator light		1.4	\leftarrow			
Drive indicator light		1.4	\leftarrow			
Gear position indicator ligh	t	1.4 × 5	\leftarrow			
Trunk light		5	\leftarrow			
Immobilizer indicator light		LED				
Over drive indicator light		1.4	\leftarrow			

BRAKE + WHEEL

Unit: mm (in)

ITEM		STANDARD	LIMIT
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)	4.0 (0.16)
	Rear	5.5 ± 0.2 (0.217 ± 0.008)	5.0 (0.20)
Brake disc runout		—	0.30 (0.012)
Master cylinder bore	Front	12.700 – 12.743 (0.5000 – 0.5017)	—
	Rear	12.700 – 12.743 (0.5000 – 0.5017)	_
Master cylinder piston diameter	Front	12.657 – 12.684 (0.4983 – 0.4994)	—
	Rear	12.657 – 12.684 (0.4983 – 0.4994)	—
Brake caliper cylinder bore	Front	25.400 – 25.450 (1.0000 – 1.0020)	—
	Rear	27.000 – 27.050 (1.0630 – 1.0650)	—
Brake caliper piston diameter	Front	25.318 – 25.368 (0.9968 – 0.9987)	_
	Rear	26.918 – 26.968 (1.0598 – 1.0617)	—
Brake fluid type		DOT 4	—
Wheel rim runout	Axial	_	2.0 (0.08)
	Radial	_	2.0 (0.08)
Wheel axle runout	Front	_	0.25 (0.010)
	Rear	—	0.25 (0.010)
Wheel rim size	Front	15 M/C × MT3.50	
	Rear	14 M/C × MT4.50	—

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT
Front fork stroke	110 (4.3)	-
Front fork spring free length	—	341 (13.4)
Front fork oil type	SUZUKI FORK OIL G-10 (#10) or an equivalent fork oil	_
Front fork oil capacity (each leg)	458 ml	—
Front fork oil level	151 (5.9)	-
Front fork inner tube diam.	41 (1.61)	
Rear wheel travel	100 (3.9)	_
Rear shock absorber spring adjuster	2nd	_

TIRE

ITEM			STANDARD		
Cold inflation tire pressure Solo	Front	225 kPa (2.25 kgf/cm², 33 psi)			
	riding	Rear	250 kPa (2.50 kgf/cm², 36 psi)	—	
	Dual	Front	225 kPa (2.25 kgf/cm², 33 psi)	—	
	riding	Rear	280 kPa (2.80 kgf/cm², 41 psi)		
Tire size		Front	120/70R15M/C 56H		
		Rear	160/60R14M/C 65H	_	
Tire type		Front	BRIDGESTONE TH01F		
		Rear	BRIDGESTONE TH01R		
Tire tread depth (Recommended depth)		Front	_	1.6 mm (0.06 in)	
		Rear	—	2.0 mm (0.08 in)	

FUEL + OIL

ITEM		SPECIFICATION			
Fuel type	Use only unle octane (R/2 + the research n Gasoline cont Ether), less th methanol with sion inhibitor is	Use only unleaded gasoline of at least 87 pump octane ($R/2 + M/2$) or 91 octane or higher rated by the research method. Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corro- sion inhibitor is permissible.			
	Gasoline used higher. An unle	d should be graded 91 octane or eaded gasoline is recommended.	The others		
Fuel tank capacity	Including reserve	15.0 L (4.0/3.3 US/Imp gal)			
	Fuel meter mark flickering	Approx. 3.0 L (0.79/0.66 US/Imp gal)			
	Fuel meter mark and LCD flickering	Approx. 1.5 L (0.40/0.33 US/Imp gal)			
Engine oil and transmission oil type	SAE 10W-40,	API SF/SG or SH/SJ with JASO MA			
Engine oil capacity	Oil change	2.6 L (2.7/2.3 US/Imp qt)			
	Filter change	2.9 L (3.1/2.6 US/Imp qt)			
	Overhaul	3.4 L (3.6/3.0 US/Imp qt)			
Transmission oil capacity	Oil change	360 ml (12.2/12.7 US/Imp oz)			
	Overhaul	400 ml (13.5/14.1 US/Imp oz)			
Final gear oil type	Hypoid ge				
Final gear oil capacity	Oil change	300 ml (10.1/10.6 US/Imp oz)			
	Overhaul	430 ml (14.5/15.1 US/lmp oz)			

SERVICE DATA (AN650AK6)

VALVE + GUIDE			Unit: mm (in
ITEM		STANDARD	LIMIT
Valve diam.	IN.	29.5 (1.16)	_
	EX.	25.0 (0.98)	—
Tappet clearance (when cold)	IN.	0.10 – 0.20 (0.0039 – 0.0079)	—
	EX.	0.20 - 0.30 (0.0079 - 0.0118)	_
Valve guide to valve stem clearance	IN.	0.010 - 0.040 (0.0004 - 0.0016)	—
	EX.	0.030 - 0.060 (0.0012 - 0.0024)	—
Valve guide I.D.	IN. & EX.	4.500 – 4.515 (0.1772 – 0.1778)	—
Valve stem O.D.	IN.	4.475 – 4.490 (0.1762 – 0.1768)	—
	EX.	4.455 – 4.470 (0.1754 – 0.1760)	—
Valve stem deflection	IN. & EX.	—	0.35 (0.014)
Valve stem runout	IN. & EX.	—	0.05 (0.002)
Valve head thickness	IN. & EX.	—	0.5 (0.02)
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. & EX.)	IN. & EX.		40.6 (1.60)
Valve spring tension (IN. & EX.)	IN. & EX.	136 – 156 N (13.6 – 15.6 kgf, 30.0 – 34.4 lbs) at length 33.4 mm (1.31 in)	_

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM		STANDARD	
11 210		OTANDAILD	
Cam height	IN.	35.38 – 35.43 (1.393 – 1.395)	35.10 (1.382)
	EX.	33.98 – 34.03 (1.338 – 1.340)	33.70 (1.327)
Camshaft journal oil clearance	IN. & EX.	0.032- 0.066 (0.0013 - 0.0026)	0.150 (0.0059)
Camshaft journal holder I.D.	IN. & EX.	24.012 – 24.025 (0.9454 – 0.9459)	—
Camshaft journal O.D.	IN. & EX.	23.959 – 23.980 (0.9433 – 0.9441)	—
Camshaft runout	IN. & EX.	—	0.10 (0.004)
Cam chain pin (at arrow "3")	15th pin		—
Cylinder head distortion		_	0.10 (0.004)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM			LIMIT	
Compression pressure		(15.	1 200 kPa (12 kgf/cm², 171 psi)	
Compression pressure difference			—	200 kPa (2.0 kgf/cm², 28 psi)
Piston to cylinder clearance			0.045 – 0.055 (0.0018 – 0.0022)	0.120 (0.0047)
Cylinder bore			75.500 – 75.515 (2.9724 – 2.9730)	Nicks or scratches
Piston diam.	Mea	asure	75.470 – 75.485 (2.9705 – 2.9711) at 15 mm (0.6 in) from the skirt end.	75.380 (2.9677)
Cylinder distortion			_	0.10 (0.004)
Piston ring free end gap	1st	R	Approx. 11.6 (0.46)	9.3 (0.37)
	2nd	RN	Approx. 8.6 (0.34)	6.9 (0.27)
Piston ring end gap	1st		0.06 - 0.18 (0.002 - 0.005)	0.50 (0.020)
	2n	d	0.06 - 0.18 (0.002 - 0.005)	0.50 (0.020)
Piston ring to groove clearance	1st		—	0.180 (0.007)
	2n	d	—	0.150 (0.006)
Piston ring groove width	1st		1.01 – 1.03 (0.040 – 0.041)	_
	2n	d	1.01 - 1.03 (0.040 - 0.041)	
	Oil		2.01 – 2.03 (0.079 – 0.080)	—
Piston ring thickness	1st		0.97 - 0.99 (0.038 - 0.039)	_
	2n	d	0.97 - 0.99 (0.038 - 0.039)	_
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 16.040 Conrod small end I.D. 16.010 - 16.018 (0.6303 - 0.6306)(0.6315)Conrod big end side clearance 0.10 - 0.200.30 (0.004 - 0.008)(0.012) Conrod big end width 19.950 - 20.000 ____ (0.7854 - 0.7874)20.100 - 20.150 (0.7913 - 0.7933) Crank pin width ___ 0.032 - 0.056 (0.0013 - 0.0022) Conrod big end oil clearance 0.080 (0.0031)

ITEM	STANDARD	LIMIT
Crank pin O.D.	44.976 – 45.000 (1.7707 – 1.7717)	—
Crankshaft journal oil clearance	0.018 – 0.045 (0.0007 – 0.0018)	0.080 (0.0031)
Crankshaft journal O.D.	47.985 – 48.000 (1.8892 – 1.8898)	—
Crankshaft thrust bearing thickness	2.025 – 2.175 (0.0797 – 0.0856)	—
Crankshaft thrust clearance	0.10 - 0.15 (0.0039 - 0.0059)	—
Crankshaft runout	—	0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pressure (at 60 °C, 140 °F)	Above 350 kPa (3.5 kgf/cm², 49.8 psi) Below 550 kPa (5.5 kgf/cm², 78.2 psi) at 3 000 r/min	_

CLUTCH		Unit: mm (in)
ITEM	STANDARD	LIMIT
Drive plate thickness	2.92 - 3.08 (0.115 - 0.121)	2.62 (0.103)
Drive plate claw width	13.85 – 13.96 (0.545 – 0.550)	13.05 (0.514)
Driven plate No. 2 thickness	2.42 - 2.58 (0.095 - 0.102)	2.27 (0.089)
Driven plate distortion	—	0.10 (0.004)
Clutch spring free length	13.9 (0.547)	13.2 (0.520)
Clutch plate concaved washer height	3.2 (0.126)	3.1 (0.12)
Clutch engagement	1 500 – 2 100 r/min	—
Clutch lock-up	3 200 – 3 800 r/min	—

INJECTOR + FUEL PUMP + FUEL PRESSURE REGULATOR

ITEM	SPECIFICATION	NOTE
Injector resistance	11 – 13 Ω at 20 °C (68 °F)	—
Fuel pump discharge amount	More than 0.9 L (0.95/0.79 US/Imp qt) For 30 sec. at 300 kPa (3.0 kgf/cm², 43 psi)	—
Fuel pressure regulator operating set pressure	Approx. 300 kPa (3.0 kgf/cm², 43 psi)	_

FI/CVT-SENSORS

ITEM		NOTE		
CMP sensor resistance				
CMP sensor peak voltage	More th	⊕: B/Y, ⊝: Br		
CKP sensor resistance		150 – 300 Ω		
CKP sensor peak voltage	More th	an 2.0 V (When cranking)	⊕: BI, ⊝: G	
IAP sensor input voltage		4.5 – 5.5 V		
IAP sensor output voltage	Appr	ox. 2.6 V at idle speed		
TP sensor input voltage		4.5 – 5.5 V		
TP sensor resistance	Closed	Approx. 1.1 kΩ		
	Opened	Approx. 4.2 kΩ		
TP sensor output voltage	Closed	Approx. 1.1 V		
	Opened	Approx. 4.3 V		
ECT sensor input voltage		4.5 – 5.5 V		
ECT sensor resistance	Approx	. 2.45 kΩ at 20 °C (68 °F)		
IAT sensor input voltage		4.5 – 5.5 V		
IAT sensor resistance	Approx	Approx. 2.45 kΩ at 20 °C (68 °F)		
AP sensor input voltage		4.5 – 5.5 V		
AP sensor output voltage	Approx. 3.	6 V at 100 kPa (760 mmHg)		
TO sensor resistance		19.1 – 19.7 kΩ		
TO sensor output voltage	Normal	0.4 – 1.4 V	⊕: B, ⊝: B/Br	
	Leaning	3.7 – 4.4 V	⊕: B, ⊝: B/Br	
Injector voltage		Battery voltage		
Ignition coil primary peak voltage	More th	#1 ⊕: W/Bl, ⊖: Ground #2 ⊕: B/Y, ⊖: Ground		
HO2 sensor resistance	4 –	5 Ω at 23 °C (73.4 °F)		
HO2 sensor output voltage	Idle speed	Less than 0.4 V		
	3 000 r/min	More than 0.6 V		
PAIR solenoid valve resistance	20 –	· 24 Ω at 20 °C (68 °F)		
CVT primary pulley position sensor	Compressed	1.9 – 2.3 kΩ		
	Extended	0.2 – 1.0 kΩ		
CVT primary pulley position sensor	1 st : Idle speed	Approx. 3.3 V		
output voltage	3 rd : 3 000 r/min	Approx. 1.3 V		
	5 th : 3 000 r/min	Approx. 0.5 V		
CVT secondary pulley revolution sensor resistance	400 – 600 Ω			
CVT secondary pulley revolution sensor peak voltage	More than 5 V at idle speed \oplus : Y, \ominus : W			

THROTTLE BODY

ITEM	SPECIFICATION
I.D. No.	10G0
Bore size	32 mm (1.26 in)
Fast idle r/min	1 300 – 1 600 r/min
Idle r/min	1 200 ± 100 r/min
Synchronizing screw opening	1 and 1/2 turns out
IAC valve resistance	Approx. 4 Ω at 20 – 24 °C (68 – 75 °F)
Throttle cable play	2.0 – 4.0 mm (0.08 – 0.16 in)

THERMOSTAT + RADIATOR + FAN + COOLANT

ITEM	S	LIMIT	
Thermostat valve opening temper- ature	Approx. 88 °C (190 °F)		_
Thermostat valve lift	Over	8.0 mm (0.3 in) at 100 °C (212 °F)	—
Engine coolant temperature sensor resistance	20 °C (68 °F)	Approx. 2.45 kΩ	
	50 °C (122 °F)	Approx. 0.811 kΩ	
	80 °C (176 °F)	Approx. 0.318 kΩ	_
	110 °C (230 °F) Approx. 0.142 kΩ		
Radiator cap valve opening pres- sure	110 kPa (1.1 kgf/cm ²)		
Eclectic fan thermo-switch operat-	ON	93 – 103 °C (199 – 217 °F)	
ing temperature	OFF	87 – 97 °C (188 – 206 °F)	
Engine coolant type	Use an anti-freeze/coolant compatible with alumi- num radiator, mixed with distilled water only, at the ratio of 50:50.		_
Engine coolant including reserve	Reverse tank sideApprox. 250 ml (0.264/0.220 US/Imp qt)		_
	Engine side	Approx. 1 350 ml (1.427/1.188 US/Imp gt)	

ELECTRICAL

Unit: mm (in)

ITEM	STD/SPEC.		NOTE	
Firing order		1.2		
Spark plug	Туре	NGK: CR8E DENSO: U24ESR-N		
	Gap	0.7 – 0.8 (0.028 – 0.031)		
Spark performance		Over 8.0 (0.3) at 1 atm.		
CKP sensor peak voltage	More than 2.0 V		⊕: Bl, ⊝:G	
Ignition coil resistance	Primary	0.8-2.5 Ω		
	Secondary	8 – 18 kΩ		
Ignition coil primary peak voltage	More than 80 V		#1 ⊕: W/Bl, ⊡: Ground #2 ⊕: B/Y, ⊡: Ground	

ITEM	STD/SPEC.			NOTE
Generator coil resistance	CKP sen	sor	150 – 300 Ω	G – Bl
	Chargir	ng	0.1 – 1.0 Ω	Y – Y
Generator no-load voltage (When cold)		Мо	ore than 50 V at 5 000 r/min	
Generator Max. output		Ap	pprox. 500 W at 5 000 r/min	
Regulated voltage		14	4.0 – 15.5 V at 5 000 r/min	
Starter relay resistance			3-6Ω	
Battery	Type designation		FTX14-BS	
	Capacity		12 V 43.2 kC (12 Ah)/10 HR	
Fuse size	Head-	LO	15 A	
	light	HI	15 A	
	Fuel pump		10 A	
	Ignition		15 A	
	Turn signal		15 A	
	Fan motor		15 A	
	Main		40 A	
			40 A	
	Power source		10 A	
	ABS		15 A × 2	

WATTAGE

Unit: W

ITEM		STD/SPEC.				
		E-02, 19	E-03, 24, 28, 33			
Headlight	HI	60 + 55	60 × 2			
	LO	55	55 × 2			
Parking or position light		5 × 2				
Brake light/Taillight		21/5 × 2	\leftarrow			
Turn signal light		21 × 4	\leftarrow			
License light		5	\leftarrow			
Instrument panel light		1.4 × 2	\leftarrow			
Engine coolant temp. indica	ator light	1.4	\leftarrow			
FI indicator light		1.4	\leftarrow			
Engine oil pressure indicator light		1.4	\leftarrow			
Brake-lock indicator light		1.4	\leftarrow			
High beam indicator light		1.4	\leftarrow			
Turn signal indicator light		1.4 × 2	\leftarrow			
Power mode indicator light		1.4	\leftarrow			
Drive indicator light		1.4	\leftarrow			
Gear position indicator light		1.4 × 5	\leftarrow			
ABS warning indicator light		1.4				
Trunk light		5	\leftarrow			
Immobilizer indicator light		LED				
Over drive indicator light		1.4	\leftarrow			

BRAKE + WHEEL

Unit: mm (in)

ITEM		STANDARD	LIMIT
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)	4.0 (0.16)
	Rear	5.5 ± 0.2 (0.217 ± 0.008)	5.0 (0.20)
Brake disc runout		_	0.30 (0.012)
Master cylinder bore	Front	12.700 – 12.743 (0.5000 – 0.5017)	—
	Rear	12.700 – 12.743 (0.5000 – 0.5017)	—
Master cylinder piston diameter	Front	12.657 – 12.684 (0.4983 – 0.4994)	_
	Rear	12.657 – 12.684 (0.4983 – 0.4994)	—
Brake caliper cylinder bore	Front	25.400 – 25.450 (1.0000 – 1.0020)	—
	Rear	27.000 – 27.050 (1.0630 – 1.0650)	—
Brake caliper piston diameter	Front	25.318 – 25.368 (0.9968 – 0.9987)	_
	Rear	26.918 – 26.968 (1.0598 – 1.0617)	_
Brake fluid type		DOT 4	—
Wheel rim runout	Axial	_	2.0 (0.08)
	Radial	_	2.0 (0.08)
Wheel axle runout	Front		0.25 (0.010)
	Rear	_	0.25 (0.010)
Wheel rim size	Front	15 M/C × MT3.50	—
	Rear	14 M/C × MT4.50	—

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT			
Front fork stroke	110 (4.3)	—			
Front fork spring free length	—	341 (13.4)			
Front fork oil type	SUZUKI FORK OIL G-10 (#10) or an equivalent fork oil	-			
Front fork oil capacity (each leg)	458 ml	—			
Front fork oil level	151 (5.9)	—			
Front fork inner tube diam.	41 (1.61)				
Rear wheel travel	100 (3.9)	—			
Rear shock absorber spring adjuster	2nd	_			

TIRE

ITEM			LIMIT	
Cold inflation tire pressure	Solo	Front	225 kPa (2.25 kgf/cm², 33 psi)	
	riding	Rear	250 kPa (2.50 kgf/cm², 36 psi)	
	Dual	Front	225 kPa (2.25 kgf/cm², 33 psi)	_
	riding	Rear	280 kPa (2.80 kgf/cm², 41 psi)	—
Tire size		Front	120/70R15M/C 56H	
		Rear	160/60R14M/C 65H	
Tire type		Front	BRIDGESTONE TH01F	
		Rear	BRIDGESTONE TH01R	—
Tire tread depth (Recommended depth)		Front	—	1.6 mm (0.06 in)
		Rear	—	2.0 mm (0.08 in)

FUEL + OIL

ITEM		NOTE	
Fuel type	Gasoline used higher. An unle		
Fuel tank capacity	Including reserve	15.0 L (4.0/3.3 US/Imp gal)	
	Fuel meter mark flickering	Approx. 3.0 L (0.79/0.66 US/Imp gal)	
	Fuel meter mark and LCD flickering	Approx. 1.5 L (0.40/0.33 US/Imp gal)	
Engine oil and transmission oil type	SAE 10W-40,	API SF/SG or SH/SJ with JASO MA	
Engine oil capacity	Oil change	2.6 L (2.7/2.3 US/Imp qt)	
	Filter change	2.9 L (3.1/2.6 US/Imp qt)	
	Overhaul	3.4 L (3.6/3.0 US/Imp qt)	
Transmission oil capacity	Oil change	360 ml (12.2/12.7 US/Imp oz)	
	Overhaul	400 ml (13.5/14.1 US/Imp oz)	
Final gear oil type	Hypoid gear oil SAE #90 API grade GL-5		
Final gear oil capacity	Oil change	300 ml (10.1/10.6 US/Imp oz)	
	Overhaul	430 ml (14.5/15.1 US/Imp oz)	

SEAT LOCK CABLE ROUTING

AN650





FUEL HOSE ROUTING (For E-33/K5, K6)



VACCUM HOSE ROUTING (For E-33/K5, K6)



1	Tank pressure control valve (Black/Gray)	\bigcirc	Surge hose (Red stripe & White marking)
2	Tank pressure control valve (Brack/Orange)	8	Map sensor
3	Surge hose (Red stripe)	9	3 way connector
4	Canister	10	Purge hose
(5)	Fuel tank	(1)	Union
6	Fuel-vapor separator/Fuel shut-off valve		

AN650/AK7 ('07-MODEL)

This manual describes service data, service specifications, FI and servicing procedures which differ from those of the AN650/AK6 ('06-model).

NOTE:

- Any differences between the AN650/AK6 ('06-model) and AN650/AK7 ('07-model) in specifications and service data are indicated with an asterisk mark (*).
- Please refer to the AN650K5 ('05-model) service manual and AN650/AK6 ('06-model) service information for details which are not given in this manual.

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AN650/AK7 ('07-MODEL)

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COUNTRY AND AREA CODES

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

MODEL	CODE	COUNTRY or AREA	EFFECTIVE FRAME NO.
	E-02	U.K.	JS1BU111200100524 -
	E-03	U.S.A. (Except for california)	JS1BU111200 100001 –
	E-19	E.U.	JS1BU111100114140 -
ANOSO	E-24	Australia	JS1BU121300100404 –
	E-28	Canada	JS1BU111200 100001 –
	E-33	California (U.S.A.)	JS1BU111200 100001 –
	E-02	U.K.	JS1BU132200100227 -
	E-03	U.S.A. (Except for california)	JS1CP51B 72100001 –
AN650A	E-19	E.U.	JS1BU132100117025 –
	E-24	Australia	JS1BU142300100012 -
	E-28	Canada	JS1CP51B 72100001 –
	E-33	California (U.S.A.)	JS1CP51B 72100001 –
	E-51	Korea	JS1BU132470100001 –

SPECIFICATIONS (AN650K7)

DIMENSIONS AND DR	Y MASS
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Overall length	2 260 mm
Overall width	810 mm
Overall height	1 435 mm
Wheelbase	1 595 mm
Ground clearance	130 mm
Seat height	750 mm
Dry mass	235 kg

ENGINE

Туре
Number of cylinders
Bore
Stroke
Displacement
Compression ratio
Fuel system
Air cleaner
Starter system
Lubrication system
Idle speed

DRIVE TRAIN

Clutch	Wet
Primary reduction ratio	1.33
Gearshift pattern	Auto
Automatic transmission ratio	Varia
Secondary reduction ratio	3.934
Final reduction ratio	1.58
Drive system	Gear

CHASSIS

Front suspension
Rear suspension
Front fork stroke
Rear wheel travel
Caster
Trail
Steering angle
Turning radius
Front brake
Rear brake
Front tire size
Rear tire size

ELECTRICAL

gnition type	
gnition timing	
Spark plug	
Battery	
Senerator	
Main fuse	
CVT fuse	
-use	

Headlight Position/Parking light

Brake light/Taillight	12 V 21/5 V
License plate light	12 V 5 W
Trunk light	12 V 5 W
Turn signal light	12 V 21 W
Instrument panel light	12 V 1.4 W
Coolant temperature warning light	12 V 1.4 W
Fuel injection warning light	12 V 1.4 W
Oil pressure warning light	12 V 1.4 W
Brake lock warning light	12 V 1.4 W
High beam indicator light	12 V 1.4 W
Turn signal indicator light	12 V 1.4 W
Power mode indicator light	12 V 1.4 W
Drive indicator light	12 V 1.4 W
Gear position indicator light	12 V 1.4 W
Immobilizer indicator light	LED E
Over drive indicator light	12 V 1.4 W

4-stroke, liquid-cooled, DOHC 2 75.5 mm (2.972 in) 71.3 mm (2.807 in) 638 cm³ (38.9 cu. in) 11.2:1 Fuel injection Non-woven fabric element Electric Wet sump

(89.0 in) (31.9 in) (56.5 in) (62.8 in) (5.1 in) (29.5 in) (518 lbs)

1 200 ± 100 r/min

multi-plate, automatic, centrifugal type 3 (88/66) matic & Manual shift able change (1.800-0.465) 4 (39/31 × 43/25 × 40/22) 0 (32/31 × 31/32 × 34/31 × 49/34) drive

Telescopic, coil spring, oil damped Swingarm type, coil spring, oil damped 110 mm (4.3 in) 100 mm (3.9 in) 26° 10' 106 mm (4.17 in) 41° (right and left) 2.7 m (8.9 ft) Disc brake,twin Disc brake 120/70R15M/C 56H, tubeless 160/60R14M/C 65H, tubeless

Electronic ignition (Transistorized) 10° B.T.D.C. at 1 200 r/min NGK CR8E or DENSO U24ESR-N 12 V 43.2 kC (12 Ah)/10 HR Three-phase A.C. generator 40 A 40 A 15/15/15/15/10/10/10 AE-02, 19 15/15/15/15/15/10/10 A E-03, 24, 28, 33 12 V 60 + 55/55 + 55 (H4 + H7).....E-02, 19 12 V 60/55 × 2 (H4 × 2)E-03, 24, 28, 33 12 V 5 W × 2..... E-02, 19 W × 2 × 2 × 2 × 5 -02, 19, 24

CAPACITIES

Fuel tank, including reserve	15.0 L (4.0/3.3 US/Imp gal)
Engine oil, oil change	2 600 ml (2.7/2.3 US/Imp qt)
with filter change	2 900 ml (3.1/2.6 US/Imp qt)
overhaul	3 400 ml (3.6/3.0 US/Imp qt)
Transmission oil, oil change	360 ml (12.2/12.7US/Imp oz)
overhaul	400 ml (13.5/14.1US/Imp oz)
Final gear oil, oil change	300 ml (10.1/10.6US/Imp oz)
overhaul	430 ml (14.5/15.1US/Imp oz)
Coolant	1.6 L (1.7/1.4 US/Imp qt)

SPECIFICATIONS (AN650AK7)

DIMENSIONS AND DRY MASS	
-------------------------	--

Overall length	2 260 mm (89.0 in)
Overall width	810 mm (31.9 in)
Overall height	1 435 mm (56.5 in)
Wheelbase	1 595 mm (62.8 in)
Ground clearance	130 mm (5.1 in)
Seat height	750 mm (29.5 in)
Dry mass	243 kg (535 lbs)

ENGINE

Туре
Number of cylinders
Bore
Stroke
Displacement
Compression ratio
Fuel system
Air cleaner
Starter system
Lubrication system
Idle speed

DRIVE TRAIN

Clutch	We
Primary reduction ratio	1.3
Gearshift pattern	Aut
Automatic transmission ratio	Var
Secondary reduction ratio	3.93
Final reduction ratio	1.58
Drive system	Gea

CHASSIS

Front suspension	
Rear suspension	
Front fork stroke	
Rear wheel travel	
Caster	
Frail	
Steering angle	
Turning radius	
Front brake	
Rear brake	
Front tire size	
Rear tire size	

ELECTRICAL

	12 V 60/55 × 2 (H4 × 2)E-
Position/Parking light	12 V 5 W × 2 E-02, 19, 51
Brake light/Taillight	12 V 21/5 W × 2
License plate light	12 V 5 W
Trunk light	12 V 5 W
Turn signal light	12 V 21 W
Instrument panel light	12 V 1.4 W × 2
Coolant temperature warning light	12 V 1.4 W
Fuel injection warning light	12 V 1.4 W
Oil pressure warning light	12 V 1.4 W
Brake lock warning light	12 V 1.4 W
High beam indicator light	12 V 1.4 W
Turn signal indicator light	12 V 1.4 W × 2
Power mode indicator light	12 V 1.4 W
Drive indicator light	12 V 1.4 W
Gear position indicator light	12 V 1.4 W × 5
ABS indicator light	12 V 1.4 W
Immobilizer indicator light	LED E-02, 19, 24, 51
Over drive indicator light	12 V 1.4 W

4-stroke, liquid-cooled, DOHC 2 75.5 mm (2.972 in) 71.3 mm (2.807 in) 638 cm³ (38.9 cu. in) 11.2 : 1 Fuel injection Non-woven fabric element Electric

Wet sump 1 200 ± 100 r/min

Wet multi-plate, automatic, centrifugal type 1.333 (88/66) Automatic & Manual shift Variable change (1.800-0.465) 3.934 (39/31 \times 43/25 \times 40/22) 1.580 (32/31 \times 31/32 \times 34/31 \times 49/34) Gear drive

Telescopic, coil spring, oil damped Swingarm type, coil spring, oil damped 110 mm (4.3 in) 100 mm (3.9 in) 26° 10' 106 mm (4.17 in) 41° (right and left) 2.7 m (8.9 ft) Disc brake,twin Disc brake,twin 20/70R15M/C 56H, tubeless 160/60R14M/C 65H, tubeless

Electronic ignition (Transistorized) 10° B.T.D.C. at 1 200 r/min NGK CR8E or DENSO U24ESR-N 12 V 43.2 kC (12 Ah)/10 HR Three-phase A.C. generator 40 A 40 A 15/15/15/15/15/15/10/10/15/15 A 12 V 60 + 55/55 + 55 (H4 + H7).....E-02, 19, 51 12 V 60/55 \times 2 (H4 \times 2).....E-03, 24, 28, 33 12 V 5 W \times 2.....E-02, 19, 51 12 V 21/5 W \times 2 12 V 21/5 W \times 2 12 V 5 W 12 V 21 W 12 V 1.4 W

CAPACITIES

Fuel tank, including reserve	15.0 L (4.0/3.3 US/Imp gal)
Engine oil, oil change	2 600 ml (2.7/2.3 US/Imp qt)
with filter change	2 900 ml (3.1/2.6 US/Imp qt)
overhaul	3 400 ml (3.6/3.0 US/Imp qt)
Transmission oil, oil change	360 ml (12.2/12.7US/Imp oz)
overhaul	400 ml (13.5/14.1US/Imp oz)
Final gear oil, oil change	300 ml (10.1/10.6US/Imp oz)
overhaul	430 ml (14.5/15.1US/Imp oz)
Coolant	1.6 L (1.7/1.4 US/Imp qt)

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. (Refer to the SDS operation manual for further details.)

09904-41010: SDS set tool 99565-01010-010: CD-ROM Ver.10

NOTE:

- * Before taking the sample of data, check and clear the Past DTC. (Refer to the SDS operation manual for further details.)
- * 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 of manifold absolute pressure operation at the time of cold starting



SUZUKI DIAGNOSIS SYSTEM		
Help F2 Numerical F4	Category Sele	ist Range Print F3 Non SI Return Exit
	Compariso	n Data selection Valuet Cursor scroll Cursor scroll Cursor pos 67/76 25.11 s from sampling start
Item	Range G	raph
Engine speed	3000	
Manifeld shoelds areas up 1	0	
59.6 kPa		Check the manifold absolute pressure. XX kPa
	Ē	
	0.3	
Engine coolant / oil temperature	120.0	
101.1 °C		
		Check the engine coolant temperature.
	20.2	

Data of intake negative pressure during idling (100 °C)

Data of manifold absolute pressure operation at the time of hot starting

SUZUKI DIAGNOSIS SYSTI	EM		<u>_ [6] ×</u>
File View Tool Help	Г. Г.		
Help F2 Numerical	F4 Category Sel	ect Range Print F3 Non SI Return Exit	
			Data selection Value1 Grant condi
	Comparis	on	
			Cursor pos 67/107 25.10 s from sampling start
ltem	Bange (Graph	
Engine speed	3000	Check the engine r/min.	
1235 rpm			
	0		
Manifold absolute pressure 1	146.3	Check the manifold absolute pressure	
75.2 kPa	-		
	0.3		
Engine coolant / oil temperature	120.0		
101.1 °C		R III	
		Check the engine coolant temperature.	
	01		
-			

Example of trouble

Three data; value 1 (current data 1), value 2 (past data 2) and value 3 (past 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 value of engine coolant temperature is found to be lower than the data saved previously, the possible cause may probably lie in a sensor circuit open or ground circuit opened or influence of internal resistance value changes, etc.



FI SYSTEM WIRING DIAGRAM



ECM/PCM TERMINAL



ECM TERMINAL	CIRCUIT	
NO.	K6	K7
1	Ignition coil (IG2)	\leftarrow
2	Fuel injector (#1)	\leftarrow
3	Fuel injector (#2)	\leftarrow
4	Shift up switch (UP)	\leftarrow
5	Pulley position sensor (PPS)	\leftarrow
6	PTVC heater (PTC)	EVAP system purge control solenoid valve (E-33 only)
\overline{O}	Speed sensor (SPD)	<i>←</i>
8	PAIR control solenoid valve (PAIR)	<i>←</i>
9	Fuel pump relay (FP)	<i>←</i>
10	Ignition coil (IG1)	<i>←</i>
(1)	Cooling fan relay (FRL)	\leftarrow
(12)	Power switch (POWER)	\leftarrow
13	Mode switch (MODE)	\leftarrow
(14)	Shift down switch (DOWN)	\leftarrow
(15)	—	—
(16)	—	—
17	Battery (+B)	\leftarrow
(18)	Center stand switch (CSTD)	\leftarrow
(19)	Side-stand switch (SS)	\leftarrow
20	Brake switch (BRK)	\leftarrow
21)	—	—
22	—	—
23	—	—
24)	—	—
25	—	—
26	Ground (E03)	\leftarrow
27	Ground (E01)	\leftarrow
28	Starter relay (STA)	\leftarrow
29	—	TO sensor (DON)
30	—	IAP sensor (PM)
31		



ECM TERMINAL	CIRCUIT		
NO.	K6	К7	
32		—	
33	Battery (BATT)	\leftarrow	
34)		—	
35	Ground (E1)	\leftarrow	
36	CKP sensor (N-)	\leftarrow	
37	CMP sensor (G+)	\leftarrow	
38	HO2 sensor heater (OXH)	\leftarrow	
39	Immobilizer (TXCK) (For E-02, 19, 24)	\leftarrow	
(40)	Immobilizer (RXCK) (For E-02, 19, 24)	\leftarrow	
(A)	Immobilizer LED (Meter) (For E-02, 19, 24)	,	
(4))	Anti-thief switch (AT) (For E-03, 28, 33)	\rightarrow	
(42)	Injector power voltage (VM)	\leftarrow	
(43)	CKP sensor (N+)	\leftarrow	
44	CMP sensor (G-)	\leftarrow	
(45)	HO2 sensor (OX)	\leftarrow	
(46)	Secondary pulley revolution sensor (SPR-)	\leftarrow	
(47)	Secondary pulley revolution sensor (SPR+)	\leftarrow	
(48)	Sensor power (Vcc)	\leftarrow	
(49)	TP sensor (VTA)	\leftarrow	
50	IAT sensor (THA)	\leftarrow	
(51)	ECT sensor (THW)	\leftarrow	
(52)	AP sensor (PA)	\leftarrow	
(53)	_	ISC valve 1A (IS1A)	
(54)	Ground (E2)	\leftarrow	
(55)	Tachometer (TACO)	\leftarrow	
(56)	Meter communication (ETCH)	\leftarrow	
(57)	_	—	
(58)	IAP sensor (PM)	ISC valve 2B (IS2B)	
(59)	TO sensor (DON)	ISC valve 2A (IS2A)	
60	IG switch (AT)	ISC valve 1B (IS1B)	
61)	Battery (VB)	→	
62	CVT motor (MO+)	→	
63	Ground	→	
64	CVT motor (MO-)	\leftarrow	

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
HO2 sensor	Feedback compensation is inhibited. (Air/fuel ratio is fixed to normal.)	"YES"	"YES"
PAIR control solenoid valve	ECM stops controlling PAIR control solenoid valve. HO2 sensor feedback compensation is inhibited. Power for HO2 sensor is shut off.	"YES"	"YES"
ISC valve	When motor disconnection or lock occurs, power from ECM is shut off.	"YES"	"YES"
EVAP system purge control solenoid valve (For E-33)	ECM stops controlling EVAP sys- tem purge control solenoid valve.	"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.

MALFUNCTION CODE AND DEFECTIVE CONDITION

DTC No.	DETECTED ITEM	DETECTED FAILURE CONDITION	CHECK FOR
C00	NO FAULT		
C40 (P0505)	ISC valve	Although current is flowing though the ISC valve motor, the current detection is not possible.	ISC valve circuit open or shorted to ground
C40 (P0506)		Idle speed is lower than the desired idle speed.	Air passage clogged ISC valve is fixed ISC valve pre-set position is incorrect
C40 (P0507)		Idle speed is higher than the desired idle speed.	ISC valve is fixed ISC valve pre-set position is incorrect
C41 (P2505)	ECM/PCM power input signal	No voltage is applied to the ECM, although the ignition switch is turned ON.	Lead wire/coupler connection of ECM terminal to fuel fuse, fuel fuse, battery voltage to ECM (BATT) shorted to ground or open
C44	HO2 sensor	HO2 sensor output voltage is not input to ECM during engine operation and running condition.	HO2 sensor circuit open
P0130		(Sensor voltage < 1.0 V) In other than the above value, C44 (P0130) is indicated.	
C44		The Heater can not operate so that heater operation voltage is not supply	HO2 sensor lead wire/coupler connection
P0135		to the oxygen heater circuit, C44 (P0135) is indicated.	Battery voltage supply to the HO2 sensor
C49	PAIR control	PAIR control solenoid valve voltage is	PAIR control solenoid valve, lead
P1656	solenoid valve	not input to ECM.	wire/coupler
C62	EVAP system purge con-	EVAP system purge control solenoid valve voltage is not input to ECM.	EVAP system purge control solenoid valve, lead wire/coupler
P0443	trol solenoid valve (For E-33)		

"C40" (P0505 or P0506 and P0507) ISC VALVE CIRCUIT MALFUNCTION

	DETECTED CONDITION	POSSIBLE CAUSE
C40	Although current is flowing though the	 ISC valve circuit open or shorted to ground
(P0505)	ISC valve motor, the current detection is	 Power source circuit open
	not possible.	
C40	Idle speed is lower than the desired idle	Air passage clogged
(P0506)	speed.	 ISC valve is fixed
		 ISC valve pre-set position is incorrect
C40	Idle speed is higher than the desired	 ISC valve is fixed
(P0507)	idle speed.	 ISC valve pre-set position is incorrect



CAUTION

* Be careful not to disconnect the ISC valve coupler at least 5 seconds after ignition switch is turned OFF.

If the ECM coupler or ISC valve coupler is disconnected within 5 seconds after ignition switch is turned OFF, there is a possibility of an unusual valve position being written in ECM and causing an error of ISC valve operation.

* 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.

INSPECTION

Step 1

- 1) Turn the ignition switch OFF.
- 2) Remove the maintenance lid. (CFAN650K3 9-13)
- 3) Check the ISC valve coupler ① for loose or poor contacts. If OK, then check the ISC valve lead wire continuity.


- 4) Remove the front panel. (CF AN650K3 9-8)
- 5) Disconnect the ISC valve coupler and ECM couplers.
- 6) Check the continuity between terminals (A) (B/Lg) and (B), terminals (B) (P/W) and (D), terminals (C) (G) and (D), terminals (D) (W/B) and (D).



1



09900-25008: Multi-circuit tester set 09900-25009: Needle pointed probe set

ISC valve lead wire continuity: Continuity (•)))

Tester knob indication: Continuity test (•)))

Is the continuity OK?

YES	Go to Step 2.
NO	Y, B/Lg, P/W, G or W/B wire open.

7) After repairing the trouble, clear the DTC using SDS tool. (Refer to the SDS operation manual for further details.)

Step 2

- 1) Remove the front box. (CFAN650K3 9-18)
- 2) Measure the resistance between terminals (Å) and (B), terminals (C) and (D).

ISC valve resistance: Approx. 80 Ω at 25 °C (77 °F) (Terminal A – Terminal B) (Terminal C – Terminal D)

Is the resistance OK?

YES	If wire is OK, intermittent trouble or faulty ECM.
NO	Replace the ISC valve with a new one.



ACTIVE CONTROL INSPECTION (ISC RPM CONTROL) Check 1

- 1) Place the motorcycle on the center stand.
- 2) Pull the parking brake lever and make sure that the rear wheel is locked.
- 3) Set up the SDS tool. (Refer to the SDS operation manual for further details.)
- 4) Check that the engine is running.
- 5) Click the "Engine and Transmission" ①.
- 6) Click the "ISC rpm control" 2.





- 7) Check that the "Spec" ③ is idle speed 1 200 ± 100 rpm.
- 8) Check that the "Desired idle speed" ④ is within the specified idle rpm.

	Number of samples 434	166.28 s from sampling start	F
ISC r	pm control	1000	
Spec	1	3	

Item	Value	Unit
Engine speed	1202	rpm
Throttle position	27.9	•
Desired idle speed	4) ⊥ 1205	rpm
□ ISC valve position	70	step
Manifold absolute pressure 1	69.4	kPa
Engine coolant / oil temperature	79.2	°C
EVAP purge valve	Off	
🗆 Intake air temperature	23.3	°C
Barometric pressure	102.0	kPa
	~	

Check 2

- 1) Click the button ① and decrease the "Spec" ② to 1 050 rpm slowly.
- 2) Check that the "Desired idle speed" ③ is nearly equal to the "Spec" ②. At the same time, check that the number of steps ④ in the ISC valve position decreases.

NOTE:

It takes a few seconds for "Desired idle speed" to catch up with the changed value of "Spec".

- 3) Click the button (5) and increase the "Spec" (2) slowly.
- 4) Check that the "Desired idle speed" ③ is nearly equal to the "Spec" ②. Also, check that the number of steps ④ in the ISC valve position increases.



Item	Value	Unit
Engine speed	1030	rpm
Throttle position	27.9	•
Desired idle speed 3-	1054	rpm
□ ISC valve position ④	• 54	step
□ Manifold absolute pressure 1	61.5	kPa
Engine coolant / oil temperature	85.5	°C
EVAP purge valve	Off	
🗆 Intake air temperature	25.8	°C
Barometric pressure	102.0	kPa
DATE - LI LI LI	~	

Check 3

- 1) Click the button ① and increase the "Spec" ② to 1 400 rpm slowly.
- Check that the "Desired idle speed" ③ is nearly equal to the "Spec" ②. Also, check that the number of steps ④ in the ISC valve position increases.



Item	Value	Unit
Engine speed	1 402	rpm
Throttle position	27.9	•
Desired idle speed 3-	<u> </u>	rpm
□ ISC valve position (4)-	→ 84	step
□ Manifold absolute pressure 1	79.1	kPa
Engine coolant / oil temperature	94.2	°C
EVAP purge valve	Off	
Intake air temperature	41.5	°C
Barometric pressure	102.0	kPa
	<u> </u>	

Check 4

1) Increase the "Spec" 1 to 1 500 rpm.

- 2) Check that the "Desired idle speed" ② is approx. 1 500 rpm.
- 3) Check that the "Engine speed" ③ is close to 1 500 rpm.

NOTE:

Be careful not to increase the "Spec" to more than 1 600 rpm, or the "Engine speed" may reach the upper limit.



Item	Value	Unit
Engine speed 3) ⊥ → 1509	rpm
□ Throttle position	27.9	°
Desired idle speed) 1518	rpm
□ ISC valve position	106	step
Manifold absolute pressure 1	79.1	kPa
Engine coolant / oil temperature	88.6	°C
EVAP purge valve	Off	
🗆 Intake air temperature	29.0	°C
Barometric pressure	102.0	kPa
	~	

If the ISC valve does not function properly, inspect the ISC valve (Page 29) or replace if necessary.

"C41" (P2505) ECM/PCM POWER INPUT CIRCUIT MALFUNCTION

	DETECTED CONDITION		POSSIBLE CAUSE
C41	No voltage is applied to the ECM,	•	Lead wire/coupler connection of ECM terminal to
(P2505)	although the ignition switch is turned		fuel fuse
	ON.	•	Fuel fuse
		•	Battery voltage to ECM (BATT) shorted to ground
			or 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.

INSPECTION

Step 1 (When indicating C41:)

- 1) Turn the ignition switch OFF.
- 2) Remove the front panel. (Cr AN650K3 9-8)
- Check the ECM couplers ① for loose or poor contacts.
 If OK, then measure the ECM input voltage.
- 4) Disconnect the ECM couplers.
- 5) Measure the voltage between terminal 33 and ground.

ECM input voltage: Battery voltage

- 09900-25008: Multi-circuit tester set 09900-25009: Needle pointed probe set
- Tester knob indication: Voltage (----)





Is the voltage OK?

	Fuel pump related circuit malfunction.
	R/BI wire open or shorted or poor terminal 33 connection.
	Battery voltage to ECM (BATT) shorted to
	ground or open.
YES	• 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 in the R/BI wire.

"C44" (P0130/P0135) HO2 SENSOR (HO2S) CIRCUIT MALFUNCTION

DETECTED CONDITION		POSSIBLE CAUSE
C44	HO2 sensor output voltage is not input	HO2 sensor circuit open
(P0130)	to ECM during engine operation and	
	running condition.	
	(Sensor voltage < 1.0 V)	
	In other than the above value, C44	
	(P0130) is indicated.	
C44	The heater can not operate so that	HO2 sensor lead wire/coupler connection
(P0135)	heater operation voltage is not supplied	 Battery voltage supply to the HO2 sensor.
	to the oxygen heater circuit.	



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.

INSPECTION

Step 1 (When indicating C44/P0130:)

- 1) Turn the ignition switch OFF.
- 2) Remove the footboard. (CF AN650K3 9-18)
- 3) Check the HO2 sensor coupler ① for loose or poor contacts. If OK, then check the HO2 sensor lead wire continuity.
- 4) Disconnect the HO2 sensor coupler.
- 5) Check the continuity between B/G wire (A) and ground.
- Also, check the continuity between B/G wire (A) and B/Br wire (B). If the sound is not heard from the tester, the circuit condition is OK.



Tester knob indication: Continuity test (•)))





- 7) Remove the front panel. (CFAN650K3 9-8)
- 8) Disconnect the ECM coupler.
- 9) Check the continuity between B/G wire (A) and terminal (45).
- 10)Also, check the continuity between B/Br wire B and terminal G.
- HO2S lead wire continuity: Continuity (•)))
- 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. (When indicating C44/P0130:)	
NO	B/G wire shorted to ground, or B/G or B/Br wire	
	open.	

11)After repairing the trouble, clear the DTC using SDS tool. (Refer to the SDS operation manual for further details.)

Step 2 (When indicating C44/P0130:)

- 1) Connect the ECM couplers and HO2 sensor coupler.
- 2) Warm up the engine enough.
- 3) Measure the HO2 sensor output voltage between B/G wire and B/Br wire, when idling condition.

HO2 sensor output voltage at idle speed: $0 - 1.0 V (\oplus B/G - \bigcirc B/Br)$

- 4) If OK, then remove the lower leg shield (AN650K3 9-10) and pinch the PAIR hose ① with proper hose clamp.
- 5) Measure the HO2 sensor output voltage while holding the engine speed at 5 000 r/min.

HO2 sensor output voltage at 5 000 r/min:

0 – 1.0 V (⊕ B/G – ⊝ B/Br)

- 09900-25008: Multi-circuit tester set 09900-25009: Needle pointed probe set
- Tester knob indication: Voltage (----)







Is the voltage OK?

 B/G wire or B/Br wire open or shorted to
ground, or poor 45 or 54 connection.
• If wire and connection are OK, intermittent trou-
ble 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.
Replace the HO2 sensor with a new one.

 After repairing the trouble, clear the DTC using SDS tool. (Refer to the SDS operation manual for further details.)

Step 1 (When indicating C44/P0135:)

- 1) Turn the ignition switch OFF.
- 2) Remove the footboard. (Cr AN650K3 9-18)
- 3) Check the HO2 sensor coupler ① for loose or poor contacts. If OK, then measure the HO2 sensor resistance.
- 4) Disconnect the HO2 sensor coupler and measure the resistance between terminals.

HO2 heater resistance: Approx. 13 Ω at 20 °C (68 °F) (B – B)

NOTE:

* Temperature of the sensor affects resistance value largely.

* Make sure that the sensor heater is at atmospheric temperature.

09900-25008: Multi-circuit tester set

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

Is the voltage OK?

YES	Go to Step 2.
NO	Replace the HO2 sensor with a new one.







Step 2 (When indicating C44/P0135:)

- 1) Connect the HO2 sensor coupler.
- 2) Insert the needle pointed probe to the HO2 sensor coupler.
- 3) Turn the ignition switch ON and measure the heater voltage between B (O/W) wire and ground.
- 4) If the tester voltage indicates the battery voltage, it is good condition.

Heater voltage: Battery voltage

(\oplus B – \bigcirc Ground)

NOTE:

Battery voltage can be detected only before starting the engine.

09900-25008: Multi-circuit tester set 09900-25009: Needle pointed probe set

Tester knob indication: Voltage (----)

Is the voltage OK?

	 O/W or B wire open or shorted to ground, or poor ³/₈ connection.
YES	Recheck each terminal and wire harness for
	open circuit and poor connection.
	• If wire and connection are OK, intermittent trou-
	ble or faulty ECM.
	• Replace the ECM with a known good one, and
	inspect it again.
	Open or short circuit in the Y/W wire or O/W
NO	wire.
NO	Loose or poor contacts on the ECM coupler
	(Terminal 33) or HO2 sensor coupler.





"C49" (P1656) PAIR CONTROL SOLENOID VALVE CIRCUIT MALFUNCTION

DETECTED CONDITION	POSSIBLE CAUSE
PAIR control solenoid valve voltage is not input to	PAIR control solenoid valve circuit open or short
ECM.	 PAIR control solenoid valve malfunction
	ECM malfunction



INSPECTION

Step 1

- 1) Turn the ignition switch OFF.
- 2) Remove the lower leg shield. (CFAN650K3 9-10)
- 3) Check the PAIR control solenoid valve coupler ① for loose or poor contacts.

If OK, then measure the PAIR control solenoid valve resistance.

4) Remove the PAIR control solenoid valve coupler.

5) Measure the resistance between terminals (valve side).

PAIR control solenoid valve resistance: 20 – 24 Ω at 20 °C (68 °F) (Terminal – Terminal)

09900-25008: Multi-circuit tester set

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

Is the resistance OK?

YES	Go to Step 2.
NO	Replace the PAIR control solenoid valve with a
NO	new one.





Step 2

1) Turn the ignition switch ON.

2) Measure the voltage between O/W wire and ground.

PAIA PAIR control solenoid valve voltage: Battery voltage $(\oplus O/W - \bigcirc Ground)$

09900-25008: Multi-circuit tester set

Tester knob indication: Voltage (----)

inspect it again.

Is the voltage OK?

YES

NO

25008: Multi-circuit tester set knob indication: Voltage ()	
age OK?	2
 G/BI wire open or shorted to ground, or poor (8) connection failure. 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 	ECM coupler (Harness side)

3) After repairing the trouble, clear the DTC using SDS tool. (Refer to the SDS operation manual for further details.)

Open or short circuit in the O/W wire.

ACTIVE CONTROL INSPECTION

- 1) Set up the SDS tool. (Refer to the SDS operation manual for further details.)
- 2) Turn the ignition switch ON.
- 3) Click "PAIR Sol operating control" ①.



4) Click each button 2.

At this time, if an operation sound is heard from the PAIR control solenoid valve, the function is normal.

Engine speed	0	rpm	
🗆 Throttle position	27.9	•	
🗆 Manifold absolute pressure 1	101.3	kPa	- 5
🗆 Engine coolant / oil temperature	13.3	°C	
🗆 Intake air temperature	18.3	°C	
Barometric pressure	102.0	+Pa	
PAIR control solenoid valve	(On)	
Battery voltage	0.0	V	
🗆 02 sensor Bank1-Sensor1	0.0	V	
Desired idle speed	1506	rpm	
🗆 ISC valve position	201	step	



"C62" (P0443) EVAP SYSTEM PURGE CONTROL SOLENOID VALVE CIRCUIT MALFUNCTION (E-33 ONLY)

DETECTED CONDITION	POSSIBLE CAUSE
EVAP system purge control solenoid valve voltage is	EVAP system purge control solenoid valve circuit
not input to ECM.	open or short
	 EVAP system purge control solenoid valve
	malfunction
	ECM malfunction



INSPECTION

Step 1

- 1) Turn the ignition switch OFF.
- 2) Remove the maintenance lid. (CFAN650K3 9-13)
- Check the EVAP system purge control solenoid valve coupler
 for loose or poor contacts.

If OK, then measure the EVAP system purge control solenoid valve resistance.

- 4) Remove the footboard. (CFAN650K3 9-18)
- 5) Remove the EVAP system purge control solenoid valve. (CFP Page 37)
- 6) Measure the resistance between the terminals.

EVAP system purge control solenoid valve resistance: Approx. 32 Ω at 20 °C (68 °F)

09900-25008: Multi-circuit tester set

Tester knob indication: Resistance (Ω)

Is the resistance OK?

YES	Go to Step 2.
NO	Replace the EVAP system purge control solenoid
NO.	valve with a new one.





Step 2

1) Turn the ignition switch ON.

2) Measure the voltage between O/W wire and ground.

EVAP system purge control solenoid valve voltage: Battery voltage (\oplus O/W – \bigcirc Ground)

09900-25008: Multi-circuit tester set

Tester knob indication: Voltage (----)

ls

s the vol	tage OK?
YES	 Dbr wire open or shorted to ground, or poor 6 connection failure. 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	Open or short circuit in the O/W wire.





3) After repairing the trouble, clear the DTC using SDS tool. (Refer to the SDS operation manual for further details.)

ACTIVE CONTROL INSPECTION

- 1) Set up the SDS tool. (Refer to the SDS operation manual for further details.)
- 2) Turn the ignition switch ON.
- 3) Click "EVAP purge valve operating control" ①.



2

4) Click each button 2.

Г

At this time, if an operation sound is heard from the EVAP system purge control solenoid valve, the function is normal.

Engine speed	0	rpm	
Throttle position	27.9	•	EVAP purge valve
Manifold absolute pressure 1	101.3	kPa	
Engine coolant / oil temperature	10.0	°°	Spe/2 Off
EVAP purge valve	(On		
🗆 Intake air temperature	193	8	On
□ Barometric pressure	102.6	kPa	
PAIR control solenoid valve	Off		
Battery voltage	0.0	V	
🗆 02 sensor Bank1–Sensor1	0.0	V	
Desired idle sneed	1506	rom	

ISC VALVE REMOVAL

- Remove the front box. (CFAN650K3 9-18)
- Disconnect the ISC valve coupler ①.

CAUTION

Be careful not to disconnect the ISC valve coupler at least 5 seconds after ignition switch is turned OFF. If the ECM coupler or ISC valve coupler is disconnected within 5 seconds after ignition switch is turned OFF, there is a possibility of an unusual valve position being written in ECM and causing an error of ISC valve operation.



• Remove the ISC valve 2.

ISC VALVE INSPECTION

• Inspect the ISC valve for carbon deposition or damage.

• Clean or replace the ISC valve if necessary.

NOTE:

The ISC valve can be checked without removing it. (Page 16)



ISC VALVE INSTALLATION

Install the ISC valve in the reverse order of removal.

CAUTION

When removing or replacing, the ISC valve must be set to the PRE-SET position. (Page 32)

ISC VALVE PRE-SET

When removing or replacing the ISC valve, set the ISC valve in the following procedures:

- 1) Turn the ignition switch ON.
- 2) Set up the SDS tool. (Refer to the SDS operation manual for further details.)
- 3) Click "Active control".
- 4) Click "ISC learned value reset" ①.

5) Click "Reset" button 2 to clear the ISC learned value.





	27.9 101.3 13.3	° kPa °C
SUZUKI DIAGN	OSIS SYSTEM	X
ISC le	arned value reset has been perfor	med successfully.
	<u> </u>	
	ок 1506	rpm
	<u>ок</u> 1506 201	rpm step
	<u>ок</u> 1506 201 Normal	rpm step

6) Close the SDS tool.

7) Turn the ignition switch OFF.

NOTE:

The ISC valve opening initialization is automatically started after the ignition switch is turned OFF.

THROTTLE VALVE SYNCHRONIZATION

Check and adjust the throttle valve synchronization between two cylinders.

Step 1

- Remove the front box. (CFAN650K3 9-18)
- Disconnect the respective vacuum hoses ① from vacuum nipples.
- Disconnect the IAP sensor coupler 2.

• Connect the respective vacuum tester hoses to the nipples on the throttle body.

Step 2

- Set up the SDS tool. (Refer to the SDS operation manual for further details.)
- Start the engine.
- Click "Data monitor".
- Warm up the engine (Water temp. more than 80 °C (176 °F).

Item	Value	Unit
Vehicle speed	0.0	km/h
Engine speed	1209	rpm
Throttle position	27.9	•
Desired idle speed	1205	rpm
□ ISC valve position	74	step
Manifold absolute pressure 1	03.0	KT a
Engine coolant / oil temperature	(94.2	°C)
EVAP purge valve	Ú#	
🗆 Intake air temperature	49.7	°C
Barometric pressure	102.0	kPa
PAIR control solenoid valve	On	







- Click "Active control".
- Click "ISC air volume control" ①.
- Click "ON" (2) to fix the ISC air volume of two cylinders.

NOTE:

When making this synchronization, be sure that the water temperature is within 80 - 100 °C (176 - 212 °F).

- A Engine speed: Approx. 1 200 rpm
- B ISC valve position: Approx. 75 step



Item	Value	Unit
Vehicle speed	0.0	km/h
Engine speed	1209	rpm
Throttle position	27.9	•
Desired idle speed	(A) → 1205	rpm
□ ISC valve position	(B) → 74	step
Manifold absolute pressure 1	63.5	kPa
Engine coolant / oil temperature	94.2	°C
🗆 EVAP purge valve	Off	
Intake air temperature	49.7	°C



 Check for the synchronization of vacuum of #1 and #2 cylinders.

• Equalize the vacuum of the cylinders by turning each air screw (3) and keep it running at idling speed.

NOTE:

Always set the engine rpm at idle rpm.

• If the adjustment is not yet correct, remove each air screw and clean them with a spray-type carburetor cleaner and blow dry with a compressed air. Also, clean the air screw passageways.

NOTE:

- * Slowly turn the air screw clockwise and count the number of turns until the screw is lightly seated.
- * Make a note of how many turns were made so the screw can be reset correctly after cleaning.
- Repeat the procedures of Step 2.
- Disconnect the vacuum tester and install the removed parts.
- After completing the throttle valve synchronization, clear the DTC and reset the ISC learned value using SDS tool.
 (Transport Page 32)





HO2 SENSOR INSPECTION

(C Page 23)

HO2 SENSOR REMOVAL AND INSTALLATION

- Remove the footboard. (Cr AN650K3 9-18)
- Disconnect the HO2 sensor coupler (1).
- Remove the clamps 2.
- Remove the HO2 sensor ③.

WARNING

Do not remove the HO2 sensor while it is hot.

CAUTION

- * Be careful not to expose it to excessive shock.
- * Do not use an impact wrench while removing or installing the HO2 sensor.
- * Be careful not to twist or damage the sensor lead wire.

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

CAUTION

Do not apply oil or other materials to the sensor air hole.

• Tighten the HO2 sensor to the specified torque.

■ HO2 sensor: 47.5 N·m (4.75 kgf-m, 34.3 lb-ft)

• Rout the HO2 sensor lead wire properly. (Cr Page 39)





NOISE EMISSION CONTROL SYSTEM

TAMPERING WITH THE NOISE CONTROL SYSTEM PROHIBITED: Local law or federal law prohibits the following acts or the causing thereof:

- 1. The removal or rendering inoperative by any person, other than for purposes of maintenance, repair or replacement, of any device or element of design incorporated into any new vehicle for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use, or
- 2. The use of the vehicle after such device or element of design has been removed or rendered inoperative by any person.

AMONG THOSE ACTS PRESUMED TO CONSTITUTE TAMPERING ARE THE ACTS LISTED BELOW:

- Removing or puncturing the muffler, baffles, header pipes, screen type spark arrester (if equipped) or any
 other component which conducts exhaust gases.
- Removing or puncturing the air cleaner case, air cleaner cover, baffles or any other component which conducts intake air.
- Replacing the exhaust system or muffler with a system or muffler not marked with the same model specific code as the code listed on the Motorcycle Noise Emission Control Information label.

EVAPORATIVE EMISSION CONTROL SYSTEM (Only for E-33)

1	Fuel shut-off valve
2	Surge hose
3	TPC valve
4	EVAP canister
(5)	Vacuum hose
6	IAP sensor
\bigcirc	Purge hose
0	EVAP system purge
0	control solenoid valve
9	Throttle body assembly
A	FUEL
₿	HC VAPOR
\bigcirc	FRESH AIR
D	VACUUM



EVAPORATIVE EMISSION CONTROL SYSTEM INSPECTION (Only for E-33)

• Remove the footboard. (Cr AN650K3 9-18)

HOSES

Inspect the hoses for wear and damage. Make sure that the hoses are securely connected.

EVAP CANISTER

Inspect the canister body for damage.

EVAP SYSTEM PURGE CONTROL SOLENOID VALVE

REMOVAL

- Disconnect the EVAP system purge control solenoid valve lead wire coupler ① and hoses ②.
- Remove the clamps ③.
- Remove the EVAP system purge control solenoid valve ④.

NOTE:

EVAP system purge control solenoid valve can be checked without removing it. (Page 29)

INSPECTION

- Check that no air flows through both of the air inlet and outlet ports.
- If air flows out, replace the EVAP system purge control solenoid valve with a new one.
- Connect 12 V battery to the terminals of the EVAP system purge control solenoid valve and check the air flow.
- If air flows out, the solenoid valve is in normal condition.







· Check the resistance between the terminals of the EVAP system purge control solenoid valve.

EVAP system purge control solenoid valve resistance: Approx. 32 Ω at 20 °C (68 °F)



09900-25008: Multi-circuit tester set

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

• If the resistance is not within the standard range, replace the EVAP system purge control solenoid valve with a new one.

INSTALLATION

Installation is in the reverse order of removal.

· Connect the EVAP system purge control solenoid valve lead wire coupler and PAIR hoses securely. (Page 40)



WIRING HARNESS AND HOSE ROUTING WIRING HARNESS ROUTING





THROTTLE BODY INSTALLATION AND HOSE ROUTING

SPECIAL TOOLS



NOTE:

When order the special tool, please confirm whether it is available or not.

TIGHTENING TORQUE CHART

For other nuts and bolts not listed in the preceding page, refer to this chart:

Bolt Diameter	Conventi	onal or "4" ma	rked bolt	"7" marked bolt		
(mm)	N∙m	kgf-m	lb-ft	N∙m	kgf-m	lb-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

"4" marked bolt

"7" marked bolt

SERVICE DATA (AN650K7) VALVE + GUIDE

Unit: mm (in)

ITEM		STANDARD	LIMIT
Valve diam.	IN.	29.5 (1.16)	_
	EX.	25.0 (0.98)	_
Tappet clearance (when cold)	IN.	0.10 – 0.20 (0.0039 – 0.0079)	_
	EX.	0.20 – 0.30 (0.0079 – 0.0118)	
Valve guide to valve stem clearance	IN.	0.010 - 0.040 (0.0004 - 0.0016)	_
	EX.	0.030 - 0.060 (0.0012 - 0.0024)	_
Valve guide I.D.	IN. & EX.	4.500 – 4.515 (0.1772 – 0.1778)	—
Valve stem O.D.	IN.	4.475 – 4.490 (0.1762 – 0.1768)	—
	EX.	4.455 – 4.470 (0.1754 – 0.1760)	—
Valve stem deflection	IN. & EX.		0.35 (0.014)
Valve stem runout	IN. & EX.		0.05 (0.002)
Valve head thickness	IN. & EX.		0.5 (0.02)
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. & EX.)	IN. & EX.	—	40.6 (1.60)
Valve spring tension (IN. & EX.)	IN. & EX.	136 – 156 N (13.6 – 15.6 kgf, 30.0 – 34.4 lbs) at length 33.4 mm (1.31 in)	—

CAMSHAFT + CYLINDER HEAD

CAMSHAFT + CYLINDER HEAD Ur			
ITEM		STANDARD	
Cam height	IN.	35.38 – 35.43 (1.393 – 1.395)	35.10 (1.382)
	EX.	33.98 – 34.03 (1.338 – 1.340)	33.70 (1.327)
Camshaft journal oil clearance	IN. & EX.	0.032- 0.066 (0.0013 - 0.0026)	0.150 (0.0059)
Camshaft journal holder I.D.	IN. & EX.	24.012 – 24.025 (0.9454 – 0.9459)	
Camshaft journal O.D.	IN. & EX.	23.959 – 23.980 (0.9433 – 0.9441)	
Camshaft runout	IN. & EX.	_	0.10 (0.004)
Cam chain pin (at arrow "3")		15th pin	
Cylinder head distortion		—	0.10 (0.004)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

IIEM			SIANDARD		
Compression pressure		(15.	1 500 – 1 900 kPa 0 – 19.0 kgf/cm², 213 – 270 psi)	1 200 kPa (12 kgf/cm², 171 psi)	
Compression pressure difference			200 kPa (2.0 kgf/cm², 28 psi)		
Piston to cylinder clearance			0.045 - 0.055 (0.0018 - 0.0022)	0.120 (0.0047)	
Cylinder bore			75.500 – 75.515 (2.9724 – 2.9730)	Nicks or scratches	
Piston diam.	Меа	asure	75.380 (2.9677)		
Cylinder distortion			0.10 (0.004)		
Piston ring free end gap	1st	R	Approx. 11.6 (0.46)	9.3 (0.37)	
	2nd	RN	Approx. 8.6 (0.34)	6.9 (0.27)	
Piston ring end gap	1s ⁻	t	0.06 - 0.18 (0.002 - 0.005)	0.50 (0.020)	
	2no	d	0.06 - 0.18 (0.002 - 0.005)	0.50 (0.020)	
Piston ring to groove clearance	1s ⁻	t	—	0.180 (0.007)	
	2no	d	—	0.150 (0.006)	
Piston ring groove width	1st		1.01 – 1.03 (0.040 – 0.041)	_	
	2nd	d	1.01 – 1.03 (0.040 – 0.041)	_	
	Oi		2.01 – 2.03 (0.079 – 0.080)	_	

ITEM	STANDARD		LIMIT
Piston ring thickness	1st	0.97 - 0.99 (0.038 - 0.039)	_
	2nd	0.97 - 0.99 (0.038 - 0.039)	—
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 big end side clearance	0.10 - 0.20 (0.004 - 0.008)	0.30 (0.012)
Conrod big end width	19.950 – 20.000 (0.7854 – 0.7874)	_
Crank pin width	20.100 – 20.150 (0.7913 – 0.7933)	—
Conrod big end oil clearance	0.032 - 0.056 (0.0013 - 0.0022)	0.080 (0.0031)
Crank pin O.D.	44.976 – 45.000 (1.7707 – 1.7717)	—
Crankshaft journal oil clearance	0.018 - 0.045 (0.0007 - 0.0018)	0.080 (0.0031)
Crankshaft journal O.D.	47.985 – 48.000 (1.8892 – 1.8898)	—
Crankshaft thrust bearing thickness	2.025 – 2.175 (0.0797 – 0.0856)	—
Crankshaft thrust clearance	0.10 - 0.15 (0.0039 - 0.0059)	_
Crankshaft runout		0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pressure (at 60 °C, 140 °F)	Above 350 kPa (3.5 kgf/cm², 49.8 psi) Below 550 kPa (5.5 kgf/cm², 78.2 psi) at 3 000 r/min	_

CLUTCH		Unit: mm (in)
ITEM	STANDARD	LIMIT
Drive plate thickness	2.92 - 3.08 (0.115 - 0.121)	2.62 (0.103)
Drive plate claw width	13.85 – 13.96 (0.545 – 0.550)	13.05 (0.514)
Driven plate No. 2 thickness	2.42 - 2.58 (0.095 - 0.102)	2.27 (0.089)
Driven plate distortion	—	0.10 (0.004)
Clutch spring free length	13.9 (0.547)	13.2 (0.520)
Clutch plate concaved washer height	3.2 (0.126)	3.1 (0.12)
Clutch engagement	1 500 – 2 100 r/min	
Clutch lock-up	3 200 – 3 800 r/min	_

INJECTOR + FUEL PUMP + FUEL PRESSURE REGULATOR

ITEM	SPECIFICATION	NOTE
Injector resistance	11 – 13 Ω at 20 °C (68 °F)	
Fuel pump discharge amount	More than 0.9 L (0.95/0.79 US/Imp qt) For 30 sec. at 300 kPa (3.0 kgf/cm², 43 psi)	_
Fuel pressure regulator operating set pressure	Approx. 300 kPa (3.0 kgf/cm², 43 psi)	_

FI/CVT-SENSORS

ITEM		NOTE		
CMP sensor resistance				
CMP sensor peak voltage	Мс	ore than 0.5 V (When cranking)	⊕: B/Y, ⊝: Br	
CKP sensor resistance		150 – 300 Ω		
CKP sensor peak voltage	Мс	ore than 2.0 V (When cranking)	⊕: Bl, ⊝: G	
IAP sensor input voltage		4.5 – 5.5 V		
IAP sensor output voltage				
TP sensor input voltage				
TP sensor output voltage	Closed	Approx. 1.1 V		
	Opened	Approx. 4.3 V		
ECT sensor input voltage		4.5 – 5.5 V		
ECT sensor resistance	Ар			
IAT sensor input voltage				
IAT sensor resistance	Ар			
AP sensor input voltage				
AP sensor output voltage	Appro	Approx. 3.6 V at 100 kPa (760 mmHg)		
Injector voltage		Battery voltage		

ITEM		NOTE		
TO sensor resistance				
TO sensor output voltage	Normal	0.4 – 1.4 V	⊕: Gr/R ⊝: B/Br	
	Leaning	3.7 – 4.4 V	⊕: Gr/R ⊝: B/Br	
Ignition coil primary peak voltage	More th	#1 ⊕: W/BI ⊕: Ground #2 ⊕: B/Y ⊕: Ground		
* HO2 sensor heater resistance	Appro	Approx. 13 Ω at 20 °C (68 °F)		
* HO2 sensor output voltage	Idle speed	0 – 1.0 V		
	5 000 r/min	0 – 1.0 V		
PAIR solenoid valve resistance	20 -	- 24 Ω at 20 °C (68 °F)		
CVT primary pulley position sensor	Compressed	1.9 – 2.3 kΩ		
	Extended	0.2 – 1.0 kΩ		
CVT primary pulley position sensor	1 st : Idle speed	Approx. 3.3 V		
output voltage	3 rd : 3 000 r/min	Approx. 1.3 V		
	5 th : 3 000 r/min	Approx. 0.5 V		
CVT secondary pulley revolution sensor resistance				
CVT secondary pulley revolution sensor peak voltage	More	⊕: Y, ⊝: W		
* EVAP system purge control solenoid valve resistance	Appro	x. 32 Ω at 20 °C (68 °F)	E-33 only	

THROTTLE BODY

ITEM	SPECIFICATION
I.D. No.	* 10G3 (E-33), 10G2 (Others)
Bore size	32 mm (1.26 in)
Fast idle r/min	* 1 200 – 1 600 r/min
Idle r/min	1 200 ± 100 r/min
* ISC valve resistance	Approx. 80 Ω at 25 °C (77 °F)
Throttle cable play	2.0 – 4.0 mm (0.08 – 0.16 in)

THERMOSTAT + RADIATOR + FAN + COOLANT

ITEM	STAN	LIMIT		
Thermostat valve opening temper- ature	Ap	—		
Thermostat valve lift	Over 8.0 m	Over 8.0 mm (0.3 in) at 100 °C (212 °F)		
Engine coolant temperature sensor resistance	20 °C (68 °F)	Approx. 2.45 k Ω	—	
	50 °C (122 °F)	Approx. 0.811 k Ω	—	
	80 °C (176 °F)	Approx. 0.318 k Ω	—	
	110 °C (230 °F)	Approx. 0.142 kΩ	—	
Radiator cap valve opening pres- sure	110 kPa (1.1 kgf/cm ²)		—	
Eclectic fan thermo-switch operat- ing temperature	ON	93 – 103 °C (199 – 217 °F)	—	
	OFF	87 – 97 °C (188 – 206 °F)		

ITEM	STAN	LIMIT	
Engine coolant type	Use an anti-free num radiator, mi ratio of 50:50.	_	
Engine coolant including reserve	Reverse tank side	Approx. 250 ml (0.264/0.220 US/Imp qt)	
	Engine side	Approx. 1 350 ml (1.427/1.188 US/Imp qt)	_

ELECTRICAL

Unit: mm (in)

ITEM			STD/SPEC.	NOTE
Firing order			1.2	
Spark plug	Туре)	NGK: CR8E DENSO: U24ESR-N	
	Gap		0.7 – 0.8 (0.028 – 0.031)	
Spark performance			Over 8.0 (0.3) at 1 atm.	
CKP sensor peak voltage			More than 2.0 V	⊕: Bl, ⊝:G
Ignition coil resistance	Prima	ry	0.8 – 2.5 Ω	
	Second	ary	8 – 18 kΩ	
Ignition coil primary peak voltage			More than 80 V	#1 ⊕: W/BI ⊖: Ground #2 ⊕: B/Y ⊖: Ground
Generator coil resistance	CKP ser	nsor	150 – 300 Ω	G – BI
	Chargi	ng	0.1 – 1.0 Ω	Y – Y
Generator no-load voltage (When cold)		More than 50 V at 5 000 r/min		
Generator Max. output	Approx. 500 W at 5 000 r/min			
Regulated voltage	14.0 – 15.5 V at 5 000 r/min			
Starter relay resistance	3-6Ω			
Battery	Type designa	e tion	FTX14-BS	
	Capac	ity	12 V 43.2 kC (12 Ah)/10 HR	
Fuse size	Head- light	LO	15 AE-03, 24, 28, 33 10 AE-02, 19	
	ingine	HI	15 A	
	Fuel pu	mp	10 A	
	Ignitio	n	15 A	
	Turn signal		15 A	
	Fan motor Main		15 A	
			40 A	
	CVT		40 A	
	Powe sourc	er e	10 A	

WATTAGE

```
Unit: W
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ITEM		STD/SPEC.			
		E-02, 19	E-03, 24, 28, 33		
Headlight	HI	60 + 55	60 × 2		
	LO	55	55 × 2		
Parking or position light		5 × 2			
Brake light/Taillight		21/5 × 2	\leftarrow		
Turn signal light		21 × 4	\leftarrow		
License light		5	\leftarrow		
Instrument panel light		1.4 × 2	\leftarrow		
Engine coolant temp. indicator light		1.4	\leftarrow		
FI indicator light		1.4	\leftarrow		
Engine oil pressure indicator light		1.4	\leftarrow		
Parking brake indicator light		1.4	\leftarrow		
High beam indicator light		1.4	\leftarrow		
Turn signal indicator light		1.4 × 2	\leftarrow		
Power mode indicator light		1.4	\leftarrow		
Drive indicator light		1.4	\leftarrow		
Gear position indicator ligh	t	1.4 × 5	\leftarrow		
Trunk light		5	\leftarrow		
Immobilizer indicator light		LED	\leftarrow (E-24 only)		
Over drive indicator light		1.4	\leftarrow		

BRAKE + WHEEL

Unit: mm (in)

ITEM		STANDARD	LIMIT
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)	4.0 (0.16)
	Rear	5.5 ± 0.2 (0.217 ± 0.008)	5.0 (0.20)
Brake disc runout		_	0.30 (0.012)
Master cylinder bore	Front	12.700 – 12.743 (0.5000 – 0.5017)	
	Rear	12.700 – 12.743 (0.5000 – 0.5017)	
Master cylinder piston diameter	Front	12.657 – 12.684 (0.4983 – 0.4994)	_
	Rear	12.657 – 12.684 (0.4983 – 0.4994)	_
Brake caliper cylinder bore	Front	25.400 – 25.450 (1.0000 – 1.0020)	
	Rear	27.000 – 27.050 (1.0630 – 1.0650)	_
Brake caliper piston diameter	Front	25.318 – 25.368 (0.9968 – 0.9987)	
	Rear	26.918 – 26.968 (1.0598 – 1.0617)	_
Brake fluid type		_	

ITEM		LIMIT	
Wheel rim runout	Axial	_	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Wheel rim size	Front	15 M/C × MT3.50	
	Rear	14 M/C × MT4.50	

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT
Front fork stroke	110 (4.3)	—
Front fork spring free length	—	341 (13.4)
Front fork oil type	SUZUKI FORK OIL G-10 (#10) or an equivalent fork oil	—
Front fork oil capacity (each leg)	458 ml	—
Front fork oil level	151 (5.9)	—
Front fork inner tube diam.	41 (1.61)	
Rear wheel travel	100 (3.9)	—
Rear shock absorber spring adjuster	2nd	—

TIRE

ITEM			STANDARD	LIMIT
Cold inflation tire pressure Solo riding	Solo	Front	225 kPa (2.25 kgf/cm², 33 psi)	—
	riding	Rear	250 kPa (2.50 kgf/cm², 36 psi)	—
	Dual	Front	225 kPa (2.25 kgf/cm², 33 psi)	—
riding	riding	Rear	280 kPa (2.80 kgf/cm², 41 psi)	—
Tire size		Front	120/70R15M/C 56H	—
		Rear	160/60R14M/C 65H	—
Tire type		Front	BRIDGESTONE TH01F	—
		Rear	BRIDGESTONE TH01R	—
Tire tread depth (Recommended depth)		Front	—	1.6 mm (0.06 in)
		Rear	—	2.0 mm (0.08 in)

FUEL + OIL

ITEM		SPECIFICATION	NOTE
Fuel type	Use only unleaded gasoline of at least 87 pump octane ($R/2 + M/2$) or 91 octane or higher rated by the research method. Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corro- sion inhibitor is permissible.		E-03, 28, 33
	higher. An unle	eaded gasoline is recommended.	The others
Fuel tank capacity	Including reserve	15.0 L (4.0/3.3 US/Imp gal)	
	Fuel meter mark flickering	Approx. 3.0 L (0.79/0.66 US/Imp gal)	
	Fuel meter mark and LCD flickering	Approx. 1.5 L (0.40/0.33 US/Imp gal)	
Engine oil and transmission oil type	SAE 10W-40,	API, SF/SG or SJ/SH with JASO MA	
Engine oil capacity	Oil change	2.6 L (2.7/2.3 US/Imp qt)	
	Filter change	2.9 L (3.1/2.6 US/Imp qt)	
	Overhaul	3.4 L (3.6/3.0 US/Imp qt)	
Transmission oil capacity	Oil change	360 ml (12.2/12.7 US/Imp oz)	
	Overhaul	400 ml (13.5/14.1 US/Imp oz)	
Final gear oil type	Hypoid gear oil SAE #90 API grade GL-5		
Final gear oil capacity	Oil change	300 ml (10.1/10.6 US/Imp oz)	
	Overhaul	430 ml (14.5/15.1 US/Imp oz)	

SERVICE DATA (AN650AK7) VALVE + GUIDE

Unit: mm (in)

ITEM		STANDARD	LIMIT
Valve diam.	IN.	29.5 (1.16)	_
	EX.	25.0 (0.98)	_
Tappet clearance (when cold)	IN.	0.10 – 0.20 (0.0039 – 0.0079)	_
	EX.	0.20 – 0.30 (0.0079 – 0.0118)	_
Valve guide to valve stem clearance	IN.	0.010 - 0.040 (0.0004 - 0.0016)	_
	EX.	0.030 - 0.060 (0.0012 - 0.0024)	_
Valve guide I.D.	IN. & EX.	4.500 – 4.515 (0.1772 – 0.1778)	_
Valve stem O.D.	IN.	4.475 – 4.490 (0.1762 – 0.1768)	
	EX.	4.455 – 4.470 (0.1754 – 0.1760)	_
Valve stem deflection	IN. & EX.	_	0.35 (0.014)
Valve stem runout	IN. & EX.	_	0.05 (0.002)
Valve head thickness	IN. & EX.	_	0.5 (0.02)
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. & EX.)	IN. & EX.	—	40.6 (1.60)
Valve spring tension (IN. & EX.)	IN. & EX.	136 – 156 N (13.6 – 15.6 kgf, 30.0 – 34.4 lbs) at length 33.4 mm (1.31 in)	_

CAMSHAFT + CYLINDER	Unit: mm (in)		
ITEM	STANDARD		LIMIT
Cam height	IN.	35.38 – 35.43 (1.393 – 1.395)	35.10 (1.382)
	EX.	33.98 – 34.03 (1.338 – 1.340)	33.70 (1.327)
Camshaft journal oil clearance	IN. & EX.	0.032- 0.066 (0.0013 - 0.0026)	0.150 (0.0059)
Camshaft journal holder I.D.	IN. & EX.	24.012 – 24.025 (0.9454 – 0.9459)	_
Camshaft journal O.D.	IN. & EX.	23.959 – 23.980 (0.9433 – 0.9441)	—
Camshaft runout	IN. & EX.	—	0.10 (0.004)
Cam chain pin (at arrow "3")		—	
Cylinder head distortion		_	0.10 (0.004)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM			LIMIT				
Compression pressure	1 500 – 1 900 kPa (15.0 – 19.0 kgf/cm², 213 – 270 psi)			1 200 kPa (12 kgf/cm², 171 psi)			
Compression pressure difference	—			200 kPa (2.0 kgf/cm², 28 psi)			
Piston to cylinder clearance	0.045 - 0.055 (0.0018 - 0.0022)			0.120 (0.0047)			
Cylinder bore	75.500 – 75.515 (2.9724 – 2.9730)			Nicks or scratches			
Piston diam.	75.470 – 75.485 (2.9705 – 2.9711) Measure at 15 mm (0.6 in) from the skirt end.			75.380 (2.9677)			
Cylinder distortion	—			0.10 (0.004)			
Piston ring free end gap	1st	R	Approx. 11.6 (0.46)	9.3 (0.37)			
	2nd	RN	Approx. 8.6 (0.34)	6.9 (0.27)			
Piston ring end gap	1st		0.06 - 0.18 (0.002 - 0.005)	0.50 (0.020)			
	2nd		0.06 - 0.18 (0.002 - 0.005)	0.50 (0.020)			
Piston ring to groove clearance	1s	t	—	0.180 (0.007)			
	2nd		—	0.150 (0.006)			
Piston ring groove width	ton ring groove width 1st		1.01 – 1.03 (0.040 – 0.041)	—			
	2nd		1.01 - 1.03 (0.040 - 0.041)	_			
	Oil		2.01 – 2.03 (0.079 – 0.080)	_			
ITEM		LIMIT					
-----------------------	--------------------------------------	--------------------------------	--------------------				
Piston ring thickness	1st	0.97 - 0.99 (0.038 - 0.039)					
	2nd	0.97 - 0.99 (0.038 - 0.039)					
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 big end side clearance	0.10 - 0.20 (0.004 - 0.008)	0.30 (0.012)
Conrod big end width	19.950 – 20.000 (0.7854 – 0.7874)	—
Crank pin width	20.100 – 20.150 (0.7913 – 0.7933)	—
Conrod big end oil clearance	0.032 - 0.056 (0.0013 - 0.0022)	0.080 (0.0031)
Crank pin O.D.	44.976 – 45.000 (1.7707 – 1.7717)	—
Crankshaft journal oil clearance	0.018 - 0.045 (0.0007 - 0.0018)	0.080 (0.0031)
Crankshaft journal O.D.	47.985 – 48.000 (1.8892 – 1.8898)	—
Crankshaft thrust bearing thickness	2.025 – 2.175 (0.0797 – 0.0856)	—
Crankshaft thrust clearance	0.10 - 0.15 (0.0039 - 0.0059)	—
Crankshaft runout	_	0.05 (0.002)

OIL PUMP

ITEM	STANDARD	LIMIT
Oil pressure (at 60 °C, 140 °F)	Above 350 kPa (3.5 kgf/cm², 49.8 psi) Below 550 kPa (5.5 kgf/cm², 78.2 psi) at 3 000 r/min	_

CLUTCH		Unit: mm (in)
ITEM	STANDARD	LIMIT
Drive plate thickness	2.92 - 3.08 (0.115 - 0.121)	2.62 (0.103)
Drive plate claw width	13.85 – 13.96 (0.545 – 0.550)	13.05 (0.514)
Driven plate No. 2 thickness	2.42 - 2.58 (0.095 - 0.102)	2.27 (0.089)
Driven plate distortion	—	0.10 (0.004)
Clutch spring free length	13.9 (0.547)	13.2 (0.520)
Clutch plate concaved washer height	3.2 (0.126)	3.1 (0.12)
Clutch engagement	1 500 – 2 100 r/min	—
Clutch lock-up	3 200 – 3 800 r/min	—

INJECTOR + FUEL PUMP + FUEL PRESSURE REGULATOR

ITEM	SPECIFICATION	NOTE
Injector resistance	11 – 13 Ω at 20 °C (68 °F)	—
Fuel pump discharge amount	More than 0.9 L (0.95/0.79 US/Imp qt) For 30 sec. at 300 kPa (3.0 kgf/cm², 43 psi)	—
Fuel pressure regulator operating set pressure	Approx. 300 kPa (3.0 kgf/cm², 43 psi)	—

FI/CVT-SENSORS

ITEM	SPECIFICATION		NOTE
CMP sensor resistance			
CMP sensor peak voltage	Мс	ore than 0.5 V (When cranking)	⊕: B/Y, ⊝: Br
CKP sensor resistance		150 – 300 Ω	
CKP sensor peak voltage	Мс	ore than 2.0 V (When cranking)	⊕: Bl, ⊝: G
IAP sensor input voltage		4.5 – 5.5 V	
IAP sensor output voltage	Approx. 2.6 V at idle speed		
TP sensor input voltage	4.5 – 5.5 V		
TP sensor output voltage	Closed	Approx. 1.1 V	
	Opened	Approx. 4.3 V	
ECT sensor input voltage	4.5 – 5.5 V		
ECT sensor resistance	Approx. 2.45 kΩ at 20 °C (68 °F)		
IAT sensor input voltage	4.5 – 5.5 V		
IAT sensor resistance	Approx. 2.45 kΩ at 20 °C (68 °F)		
AP sensor input voltage	4.5 – 5.5 V		
AP sensor output voltage	Appro	ox. 3.6 V at 100 kPa (760 mmHg)	
Injector voltage		Battery voltage	

ITEM		NOTE	
TO sensor resistance			
TO sensor output voltage	Normal	0.4 – 1.4 V	⊕: Gr/R ⊝: B/Br
	Leaning	3.7 – 4.4 V	⊕: Gr/R ⊝: B/Br
Ignition coil primary peak voltage	More than 80 V (When cranking)		#1 ⊕: W/BI ⊕: Ground #2 ⊕: B/Y ⊕: Ground
* HO2 sensor heater resistance	Approx. 13 Ω at 20 °C (68 °F)		
* HO2 sensor output voltage	Idle speed	0 – 1.0 V	
	5 000 r/min	0 – 1.0 V	
PAIR solenoid valve resistance	20 – 24 Ω at 20 °C (68 °F)		
CVT primary pulley position sensor	Compressed	1.9 – 2.3 kΩ	
	Extended	0.2 – 1.0 kΩ	
CVT primary pulley position sensor	1 st : Idle speed	Approx. 3.3 V	
output voltage	3 rd : 3 000 r/min	Approx. 1.3 V	
	5 [≞] : 3 000 r/min	Approx. 0.5 V	
CVT secondary pulley revolution sensor resistance			
CVT secondary pulley revolution sensor peak voltage	More than 5 V at idle speed		⊕: Y, ⊝: W
* EVAP system purge control solenoid valve resistance	Appro	E-33 only	

THROTTLE BODY

ITEM	SPECIFICATION			
I.D. No.	* 10G3 (E-33), 10G2 (Others)			
Bore size	32 mm (1.26 in)			
Fast idle r/min	* 1 200 – 1 600 r/min			
Idle r/min	1 200 ± 100 r/min			
* ISC valve resistance	Approx. 80 Ω at 25 °C (77 °F)			
Throttle cable play	2.0 – 4.0 mm (0.08 – 0.16 in)			

THERMOSTAT + RADIATOR + FAN + COOLANT

ITEM	STANDARD/SPECIFICATION		LIMIT
Thermostat valve opening temper- ature	Approx. 88 °C (190 °F)		—
Thermostat valve lift	Over 8.0 mm (0.3 in) at 100 °C (212 °F)		—
Engine coolant temperature sensor	20 °C (68 °F)	Approx. 2.45 kΩ	—
resistance	50 °C (122 °F)	Approx. 0.811 k Ω	—
	80 °C (176 °F)	Approx. 0.318 k Ω	—
	110 °C (230 °F)	Approx. 0.142 kΩ	—
Radiator cap valve opening pres- sure	110 kPa (1.1 kgf/cm²)		—
Eclectic fan thermo-switch operat-	ON	93 – 103 °C (199 – 217 °F)	—
ing temperature	OFF	87 – 97 °C (188 – 206 °F)	_

ITEM	STAN	LIMIT	
Engine coolant type	Use an anti-freeze/coolant compatible with alumi- num radiator, mixed with distilled water only, at the ratio of 50:50.		_
Engine coolant including reserve	Reverse tank side	Approx. 250 ml (0.264/0.220 US/Imp qt)	_
	Engine side	Approx. 1 350 ml (1.427/1.188 US/Imp qt)	_

ELECTRICAL

Unit: mm (in)

ITEM		NOTE	
Firing order		1.2	
Spark plug	Туре	NGK: CR8E DENSO: U24ESR-N	
	Gap	0.7 – 0.8 (0.028 – 0.031)	
Spark performance		Over 8.0 (0.3) at 1 atm.	
CKP sensor peak voltage		More than 2.0 V	⊕: Bl, ⊝:G
Ignition coil resistance	Primary	0.8-2.5 Ω	
	Secondary	8 – 18 kΩ	
Ignition coil primary peak voltage	More than 80 V		#1 ⊕: W/BI ⊡: Ground #2 ⊕: B/Y ⊡: Ground
Generator coil resistance	CKP sensor 150 – 300 Ω		G – BI
	Charging	0.1 – 1.0 Ω	Y – Y
Generator no-load voltage (When cold)	More than 50 V at 5 000 r/min		
Generator Max. output	Approx. 500 W at 5 000 r/min		
Regulated voltage	14.0 – 15.5 V at 5 000 r/min		
Starter relay resistance	3 – 6 Ω		
Battery	Type designation FTX14-BS		
	Capacity	12 V 43.2 kC (12 Ah)/10 HR	
Fuse size	Head- LO	15 A	
	light HI	15 A	
	Fuel pump	10 A	
	Ignition	15 A	
	Turn signal	15 A	
	Fan motor	15 A	
	Main	40 A	
	CVT	40 A	
	Power source	10 A	
	ABS	15 A × 2	
	Wind screen	20 A	
	Mirror	3 A	

	070			
	STD/SPEC.			
	E-02, 19, 51	E-03, 24, 28, 33		
HI	60 + 55	60 × 2		
LO	55	55 × 2		
	5 × 2			
	21/5 × 2	\leftarrow		
	21 × 4	\leftarrow		
	5	<i>←</i>		
	1.4 × 2	<i>←</i>		
ator light	1.4	<i>←</i>		
	1.4	<i>←</i>		
or light	1.4	<i>←</i>		
nt	1.4	<i>←</i>		
	1.4	<i>←</i>		
	1.4 × 2	<i>←</i>		
	1.4	<i>←</i>		
	1.4	<i>←</i>		
t	1.4 × 5	<i>←</i>		
t	1.4	<i>←</i>		
	5	<i>←</i>		
	LED	\leftarrow (E-24 only)		
	1.4	\leftarrow		
	HI LO ator light or light nt it it it it it it	E-02, 19, 51 HI $60 + 55$ LO 55 21/5 × 2 $21/5 × 2$ 21/5 × 2 $21/5 × 2$ 1.4 × 2 $1.4 × 2$ ator light 1.4 0r light 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 × 2 1.4 1.4 × 5 1.4 1.4 × 5 1.4 1.4 × 5 1.4 1.4 × 5 1.4 1.4 × 5 1.4 1.4 1.4 1.4 1.4		

BRAKE + WHEEL

Unit: mm (in)

ITEM		STANDARD	LIMIT
Brake disc thickness	Front	4.5 ± 0.2 (0.177 ± 0.008)	4.0 (0.16)
	Rear	5.5 ± 0.2 (0.217 ± 0.008)	5.0 (0.20)
Brake disc runout		—	0.30 (0.012)
Master cylinder bore	Front	12.700 – 12.743 (0.5000 – 0.5017)	—
	Rear	12.700 – 12.743 (0.5000 – 0.5017)	—
Master cylinder piston diameter	Front	12.657 – 12.684 (0.4983 – 0.4994)	—
	Rear	12.657 – 12.684 (0.4983 – 0.4994)	_
Brake caliper cylinder bore	Front	25.400 – 25.450 (1.0000 – 1.0020)	
	Rear	27.000 – 27.050 (1.0630 – 1.0650)	-
Brake caliper piston diameter	Front	25.318 – 25.368 (0.9968 – 0.9987)	_
	Rear	26.918 – 26.968 (1.0598 – 1.0617)	_
Brake fluid type		DOT 4	

ITEM	STANDARD		LIMIT
Wheel rim runout	Axial	—	2.0 (0.08)
	Radial	—	2.0 (0.08)
Wheel axle runout	Front	—	0.25 (0.010)
	Rear	—	0.25 (0.010)
Wheel rim size	Front	15 M/C × MT3.50	
	Rear	14 M/C × MT4.50	

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT
Front fork stroke	110 (4.3)	-
Front fork spring free length	_	341 (13.4)
Front fork oil type	SUZUKI FORK OIL G-10 (#10) or an equivalent fork oil	—
Front fork oil capacity (each leg)	458 ml	—
Front fork oil level	151 (5.9)	-
Front fork inner tube diam.	41 (1.61)	
Rear wheel travel	100 (3.9)	_
Rear shock absorber spring adjuster	2nd	—

TIRE

ITEM		STANDARD		LIMIT
Cold inflation tire pressure Solo	Front	225 kPa (2.25 kgf/cm², 33 psi)		
	riding	Rear	250 kPa (2.50 kgf/cm², 36 psi)	
	Dual	Front	225 kPa (2.25 kgf/cm², 33 psi)	—
	riding	Rear	280 kPa (2.80 kgf/cm², 41 psi)	—
Tire size		Front	120/70R15M/C 56H	
		Rear	160/60R14M/C 65H	
Tire type		Front	BRIDGESTONE TH01F	
		Rear	BRIDGESTONE TH01R	
Tire tread depth (Recommended depth)		Front	—	1.6 mm (0.06 in)
		Rear	—	2.0 mm (0.08 in)

FUEL + OIL

ITEM		SPECIFICATION	NOTE
Fuel type	Gasoline used should be graded 91 octane or higher. An unleaded gasoline is recommended.		
Fuel tank capacity	Including reserve	15.0 L (4.0/3.3 US/Imp gal)	
	Fuel meter mark flickering	Approx. 3.0 L (0.79/0.66 US/Imp gal)	
	Fuel meter mark and LCD flickering	Approx. 1.5 L (0.40/0.33 US/Imp gal)	
Engine oil and transmission oil type	SAE 10W-40,	API, SF/SG or SJ/SH with JASO MA	
Engine oil capacity	Oil change	2.6 L (2.7/2.3 US/Imp qt)	
	Filter change	2.9 L (3.1/2.6 US/Imp qt)	
	Overhaul	3.4 L (3.6/3.0 US/Imp qt)	
Transmission oil capacity	Oil change	360 ml (12.2/12.7 US/Imp oz)	
	Overhaul	400 ml (13.5/14.1 US/Imp oz)	
Final gear oil type	Hypoid gear oil SAE #90 API grade GL-5		
Final gear oil capacity	Oil change	300 ml (10.1/10.6 US/Imp oz)	
	Overhaul	430 ml (14.5/15.1 US/Imp oz)	

AN650/AK8 ('08-MODEL)

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NOTE:

The specifications and service data are the same as the K7-MODEL.

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WIRING HARNESS ROUTING



AN650/AK8 ('08-MODEL) 17-3





WIRING HARNESS ROUTING (For ABS model) Pass meter lead to backside of brace. Left front turn signal Left mirror Clamp 6 O C Screen relay Wiring harness 0 0 0

6

AN650/A K9 ('09-MODEL)

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NOTE:

- Differences between K9-MODEL and K8-MODEL specifications are indicated with an asterisk mark (*).
- Different tables between K9-MODEL and K8-MODEL in service data are attached.

SPECIFICATIONS AN650K9

DIMENSIONS AND CURB MASS

Overall length	2 260 mm (89.0 in)
Overall width	810 mm (31.9 in)
Overall height	1 435 mm (56.5 in)
Wheelbase	1 595 mm (62.8 in)
Ground clearance	130 mm (5.1 in) ′
Seat height	750 mm (29.5 in)
* Curb mass	269 kg (592 lbs)E-02, 03, 19, 24, 28, 51
	270 kg (594 lbs)E-33

ENGINE

Туре	4-stroke, liquid-cooled, DOHC
Number of cylinders	2
Bore	75.5 mm (2.972 in)
Stroke	71.3 mm (2.807 in)
Displacement	638 cm ³ (38.9 cu. in)
Compression ratio	11.2 : 1
Fuel system	Fuel injection
Air cleaner	Non-woven fabric element
Starter system	Electric
Lubrication system	Wet sump
Idle speed	1 200 ± 100 r/min

DRIVE TRAIN

Clutch	Wet multi-plate, automatic, centrifugal type
Transmission	SECVT
Gearshift pattern	Automatic & Manual shift
Primary reduction ratio	1.333 (88/66)
Automatic transmission ratio	1.800 - 0.465 (Variable)
Secondary reduction ratio	3.934 (39/31 × 43/25 × 40/22)
Final reduction ratio	1.580 (32/31 × 31/32 × 34/31 × 49/34)
Drive system	Gear drive

CHASSIS

Front suspension	Telescopic, coil spring, oil damped
Rear suspension	Swingarm type, coil spring, oil damped
Front fork stroke	110 mm (4.3 in)
Rear wheel travel	100 mm (3.9 in)
Caster	26° 10'
Trail	106 mm (4.17 in)
Steering angle	41° (right & left)
Turning radius	2.7 m (8.9 ft)
Front brake	Disc brake, twin
Rear brake	Disk brake
Front tire	120/70ZR15M/C 56H, tubeless
Rear tire	160/60ZR14M/C 65H, tubeless
	,

ELECTRICAL

Ignition type Ignition timing	Electronic ignition (Transistorized) 10° B.T.D.C. at 1 200 r/min
Spark plug	
Concrator	Three phase A C generator
Main fuse	
C\/T fuse	40 A
Fuse	$15/15/15/15/15/10/10 \Delta$ E-03 24 33
Headlight	$12 \vee 60/55 \otimes (H4) \times 2 = F-03 24 33$
Brake light/Taillight	12 V 21/5 W × 2
Turn signal light	12 V 21 W
License plate light	12 V 5 W
Trunk light	12 V 5 W
Instrument panel light	12 × 1.4 W × 2
Turn signal indicator light	12 V 1.4 W × 2
Coolant temperature indicator light	12 V 1.4 W
Fuel injection indicator light	12 V 1.4 W
Oil pressure indicator light	12 V 1.4 W
High beam indicator light	12 V 1.4 W
Power mode indicator light	12 V 1.4 W
Cear position indicator light	12 V 1.4 W 12 V 1.4 W x 5
Over drive indicator light	12 V 1.4 W ^ 5
Brake lock indicator light	12 V 1.4 W
	12 0 1.4 00
CAPACITIES	
Fuel tank	15.0 L (4.0/3.3 US/Imp.gal)
Engine oil oil change	2.600 ml (2.7/2.3 US/lmp at)
with filter change	2 900 ml (3.1/2.6 US/Imp at)
overhaul	3400 ml (3.6/3.0 US/Imp at)
Transmission oil. oil change	360 ml (12.2/12.7 US/lmp oz)
overhaul	400 ml (13.5/14.1 US/lmp oz)
Final gear oil, oil change	300 ml (10.1/10.6 US/Imp oz)
overhaul	430 ml (14.5/15.1 US/Imp oz)
Coolant	1.6 L (1.7/1.4 US/Imp qt)

AN650AK9

DIME	NSIO	NS AND	CURB	MASS	
~					

Overall length	 	
Overall widťh	 	
Overall height	 	
Wheelbase	 	
Ground clearance	 	
Seat height	 	
* Curb mass		

ENGINE

Number of cylinders
Bore
Stroke
Displacement
Compression ratio
Fuel system
Air cleaner
Starter system
Lubrication system
Idle speed

2 260 mm (89.0 in) 810 mm (31.9 in) 1 435 mm (56.5 in) 1 595 mm (62.8 in) 130 mm (5.1 in) 755 mm (29.7 in) 277 kg (609 lbs)......E-02, 03, 19, 24, 28, 51 278 kg (612 lbs).....E-33

4-stroke, liquid-cooled, DOHC

4-stroke, inquid-cooled, 200 2 75.5 mm (2.972 in) 71.3 mm (2.807 in) 638 cm³ (38.9 cu. in) 11.2 : 1 Fuel injection Non-woven fabric element Electric Wet sump 1 200 ± 100 r/min

DRIVE TRAIN Clutch

Clutch	Wet multi-plate, automatic, centrifugal type
Transmission	SECVT
Gearshift pattern	Automatic & Manual shift
Primary reduction ratio	1.333 (88/66)
Automatic transmission ratio	1.800 - 0.465 (Variable)
Secondary reduction ratio	3.934 (39/31 × 43/25 × 40/22)
Final reduction ratio	1.580 (32/31 × 31/32 × 34/31 × 49/34)
Drive system	Gear drive
,	

CHASSIS

Front suspension	Telescopic, coil spring, oil damped
Rear suspension	Swingarm type, coil spring, oil damped
Front fork stroke	110 mm (4.3 in)
Rear wheel travel	100 mm (3.9 in)
Caster	26° 10'
Trail	106 mm (4.17 in)
Steering angle	41° (right & left)
Turning radius	2.7 m (8.9 ft)
Front brake	Disc brake, twin
Rear brake	Disk brake
Front tire	120/70ZR15M/C 56H, tubeless
Rear tire	160/60ZR14M/C 65H, tubeless

ELECTRICAL

Ignition type	Electronic ignition (Transistorized) 10° B.T.D.C. at 1 200 r/min NGK CR8E or DENSOI U24ESR-N 12 V 43.2 kC (12 Ah)/10 HR Three-phase A.C. generator 40 A 20/10/10/15/15/15/15/15/15/3 A
Brake lock indicator light	12 V 1.4 W 12 V 1.4 W
ABS indicator light	12 V 1.4 W
CAPACITIES	
Fuel tank Engine oil, oil change with filter change	15.0 L (4.0/3.3 US/Imp gal) 2 600 ml (2.7/2.3 US/Imp qt) 2 900 ml (3.1/2.6 US/Imp qt) 2 400 ml (3.6/2 0 US/Imp qt)
Transmission oil, oil change Final gear oil, oil change	360 ml (12.2/12.7 US/imp oz) 400 ml (13.5/14.1 US/imp oz) 300 ml (10.1/10.6 US/imp oz)
overhaul	430 ml (14.5/15.1 US/Imp oz) 1.6 L (1.7/1.4 US/Imp qt)

REAR BRAKE CONSTRUCTION



- * This brake system is filled with an ethylene glycol-based DOT 4 brake fluid. Do not use of mix different types of fluid such as silicone-based or petroleum-based.
- * Do not use any brake fluid taken from old, used or unsealed containers. Never reuse brake fluid left over from the last servicing or stored for long periods.
- * When storing the brake fluid, seal the container completely and keep away from children.
- * When replenishing brake fluid, take care not to get dust into fluid.
- * When washing brake components, use fresh brake fluid. Never use cleaning solvent.
- * A contaminated brake disc or brake pad reduces braking performance. Discard contaminated pads and clean the disc with high quality brake cleaner or neutral detergent.

CAUTION

Handle brake fluid with care: the fluid reacts chemically with paint, plastics, rubber materials etc. and will damage them severely.

BRAKE PAD INSPECTION

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

BRAKE PAD REPLACEMENT

- Loosen the pad mounting pins 1.

• Remove the brake lock cable guide 2.

- Remove the lock-nut ③, brake lock arm ④ and return spring ⑤.
- Remove the E-ring 6 and disconnect the brake lock cable 7.









• Remove the caliper (8).

CAUTION

Do not operate the brake lever while the caliper is removed.

- Remove the brake pads (9) by removing the pad mounting pins ①.
- Clean up the caliper especially around the pistons.

• Assemble the new pads, insulators 0 and shims 1.

CAUTION

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

- With the piston (rear side) (2) pushed back into the caliper, force the other piston (front side) (3) also into the caliper by turning it clockwise.
- Align one of the groove with the punch mark (A) by turning the piston (front side) (3) counterclockwise.
- Install the pad with the projection (B) fitted in the groove on the piston.
- Temporarily tighten the pad mounting pins.
- Install the caliper to the swingarm.
- Tighten the caliper mounting bolts to the specified torque.

Caliper mounting bolt: 25 N·m (2.5 kgf-m, 18.0 lbf-ft)











• Tighten the pad mounting pins to the specified torque.

Pad mounting pin: 18 N·m (1.8 kgf-m, 13.0 lbf-ft) NOTE:

After replacing the brake pads, pump the brake lever several times to check for proper brake operation.

• Install the brake lock cable ⑦ and E-ring ⑥.

• Hook the brake lock cable and return spring to the brake lock arm ④.

NOTE:

Make sure that the spring ends face to right side of the vehicle.

- Install the brake lock arm ④ to the caliper with aligning the punch marks © and D.
- Adjust the brake lock. (Page 16)

CALIPER REMOVAL

- Disconnect the brake lock cable from the caliper.
 (Page 10)
- Disconnect the brake hose 1.

CAUTION

Place a rag underneath the union bolt on the brake caliper to catch any spilt brake fluid.

- Loosen the pad mounting pins. (Page 10)
- Remove the caliper. (Page 11)
- Remove the brake pads. (Cr Page 11)

Refer to AN650/A/AZK8 service manual for the caliper disassembly and assembly.









CALIPER INSTALLATION

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

CALIPER

• Tighten the caliper mounting bolts to the specified torque.

Rear caliper mounting bolt: 25 N·m (2.5 kgf-m, 18.0 lbf-ft)

- Connect the brake hose to the caliper with the brake hose union seated to the stopper (A).
- Tighten the brake hose union bolt to the specified torque.

Brake hose union bolt: 23 N·m (2.3 kgf-m, 16.5 lbf-ft)

CAUTION

- * The seal washers should be replaced with the new ones to prevent fluid leakage.
- * Bleed air from the system after reassembling the caliper. (AN650/A/AZK8 2-24)
- * Brake fluid, if it leaks, will interfere with safe running and discolor painted surfaces. Check the brake hose and hose joints for cracks and fluid leakage.

BRAKE LOCK

- Apply SUZUKI SILICONE GREASE to the brake lock bolt end.
- ₩ 99000-25100: SUZUKI SILICONE GREASE

or equivalent

- Install new gasket ① and the brake lock housing ② to the caliper.
- Apply THREAD LOCK SUPER "1360" to the brake lock bolts.

ᠳ<u>1360</u> 99000-32130: THREAD LOCK SUPER "1360"

or equivalent

Tighten the brake lock housing bolts to the specified torque.

■ Brake lock housing bolt: 23 N·m (2.3 kgf-m, 16.5 lbf-ft)

• Apply SUZUKI SILICONE GREASE to the O-ring.

₩ 99000-25100: SUZUKI SILICONE GREASE

or equivalent

• Install the O-ring into the brake lock housing.

CAUTION

Replace the gasket and O-ring with new ones.







• Apply SUZUKI SILICONE GREASE to the brake lock shaft.

₩ 99000-25100: SUZUKI SILICONE GREASE

or equivalent

• Install the brake lock shaft so that the punch mark (A) can be positioned in (B) when the brake lock shaft is turned clockwise until it stops.

- Install the brake lock cable and E-ring. (
- Install the brake lock adjust bolt 2 to the brake lock shaft.
- Turn the brake lock shaft about 90 $^\circ$ counterclockwise so that the punch mark ${\rm (}{\rm C}{\rm)}$ will face upward.

• Hook the brake lock cable and return spring to the brake lock arm ③.

NOTE:

Make sure that the spring ends face to right side of the vehicle.

- Install the brake lock arm $\$ ③ to the caliper with aligning the punch marks ${\rm D}$ and ${\rm E}.$
- Adjust the brake lock. (









BRAKE LOCK ADJUSTMENT

Before adjusting the brake lock, perform to bleed the air from the rear brake system.

• Pull the brake lock lever ① by one step (one notch).

NOTE:

- * The brake lock lever has eight steps (eight notches) when pulling in full.
- * When pulling the brake lock lever, first the brake lock switch makes sound, then notch makes a sound. Make a count of notch by sound except the brake lock switch's sound.
- Loosen the lock-nut (2) and adjuster bolt (3).







- Turn the adjuster bolt ③ clockwise until it stops.
- Tighten the lock-nut ② to the specified torque with the adjuster bolt ③ held in that position.

Brake lock adjust lock-nut: 9.5 N·m (0.95 kgf-m, 7.0 lbf-ft)

NOTE:

Do not turn the adjust bolt more than the given position, or the adjust bolt may be damaged.

• Inspect the brake lock. (CFAN650/A/AZK8 2-33)

WIRING HARNESS, CABLE AND HOSE ROUTING WIRING HARNESS ROUTING









REAR WHEEL SPEED SENSOR INSTALLATION (AN650A)









AN650A



REAR BRAKE HOSE ROUTING (AN650A)





WIRING HARNESS PROTECTOR CONSTRUCTION

GRIP HEATER CONSTRUCTION (AN650A E-02, 19, 24)



SERVICE DATA ELECTRICAL (AN650A)

ITEM			STANDARD	NOTE
Fuse size	Head-	LO	15 A E-03, 24, 28, 33 10 A E-02, 19, 51	
	iigin	HI	15 A	
	Fuel pump		10 A	
	Ignition		15 A E-03, 24, 28, 33 10 A E-02, 19, 51	
	Turn signal		15 A	
	Fan motor		15 A	
	Main		40 A	
	CVT		40 A	
	Power source		15 A E-02, 19, 28 10 A E-03, 24, 33, 51	
	ABS		15 A × 2	
	Wind	screen	20 A	
	Mirror		3 A	
	Seat	heater	15 A E-02, 19, 28	

TIRE

ITEM		STANDARD		LIMIT
Cold inflation tire pressure	Solo riding	Front	225 kPa (2.25 kgf/cm², 33 psi)	
		Rear	* 280 kPa (2.80 kgf/cm², 41 psi)	
	Dual rideng	Front	225 kPa (2.25 kgf/cm², 33 psi)	
		Rear	280 kPa (2.80 kgf/cm², 41 psi)	
Tire size		Front	120/70R15M/C 56H	
		Rear	160/60R14M/C 65H	
Tire type		Front	BRIDGESTONE TH01F	
		Rear	* BRIDGESTONE TH01R M	
Tire tread depth (Recommended depth)		Front		
		Rear		

WIRING DIAGRAM AN650K3 ('03-MODEL)



AN650K4 ('04-MODEL)


AN650K5 ('05-MODEL)

HI : HIGH BEAM INDICATOR LIGHT OI : OIL PRESSURE INDICATOR LIGHT FI : FI PILOT BRK: BRAKE-LOCK INDICATOR LIGHT TR : TURN SIGNAL INDICATOR LIGHT (R) T. :TURN SIGNAL INDICATOR LIGHT (L) WT : ENGINE COOLANT TEMP. INDICATOR LIGHT

D : DRIVE MODE INDICATOR PM : POWER MODE INDICATOR OD : OVER DRIVE INDICATOR LIGHT



AN650K6 ('06-MODEL)



AN650/AK6 ('06-MODEL)



WIRING DIAGRAM AN650K7 (E-03, 28, 33)



AN650/AK7 (E-03, 28, 33)

