SUZUKI OUTBOARD MOTOR

DF9.9
DF15

FOUR STROKE

SERVICE MANUAL

For 2003 model~

99500-93E10-01E

FOREWORD

This manual contains an introductory description on SUZUKI Outboard motor DF9.9/15 and procedures for the inspection, service and overhaul of its main components.
General knowledge information is not included.

Please read the GENERAL INFORMATION section to familiarize yourself with basic information concerning this motor. Read and refer to the other sections in this manual for information regarding proper inspection and service procedures.

This manual will help you better understand this outboard motor so that you may provide your customers with optimum and quick service.

- *This manual has been prepared using the latest information available at the time of publication.*
  If a modification has been made since then, differences may exist between the content of this manual and the actual outboard motor.
- *Illustrations in this manual are used to show the basic principles of operation and work procedures and may not represent the actual outboard motor in exact detail.*
- *This manual is intended for use by technicians who already possess the basic knowledge and skills to service SUZUKI outboard motors.*
  Persons without such knowledge and skills should not attempt to service an outboard engine by relying on this manual only.
  Instead, please contact your nearby authorized SUZUKI outboard motor dealer.

⚠ WARNING

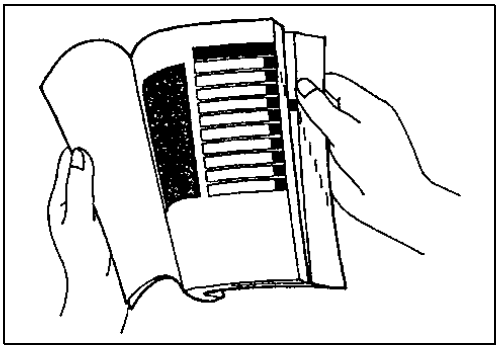
NOTE:
This manual is compiled based on 2003 (K3) model.

GROUP INDEX

HOW TO USE THIS MANUAL

TO LOCATE WHAT YOU ARE LOOKING FOR:

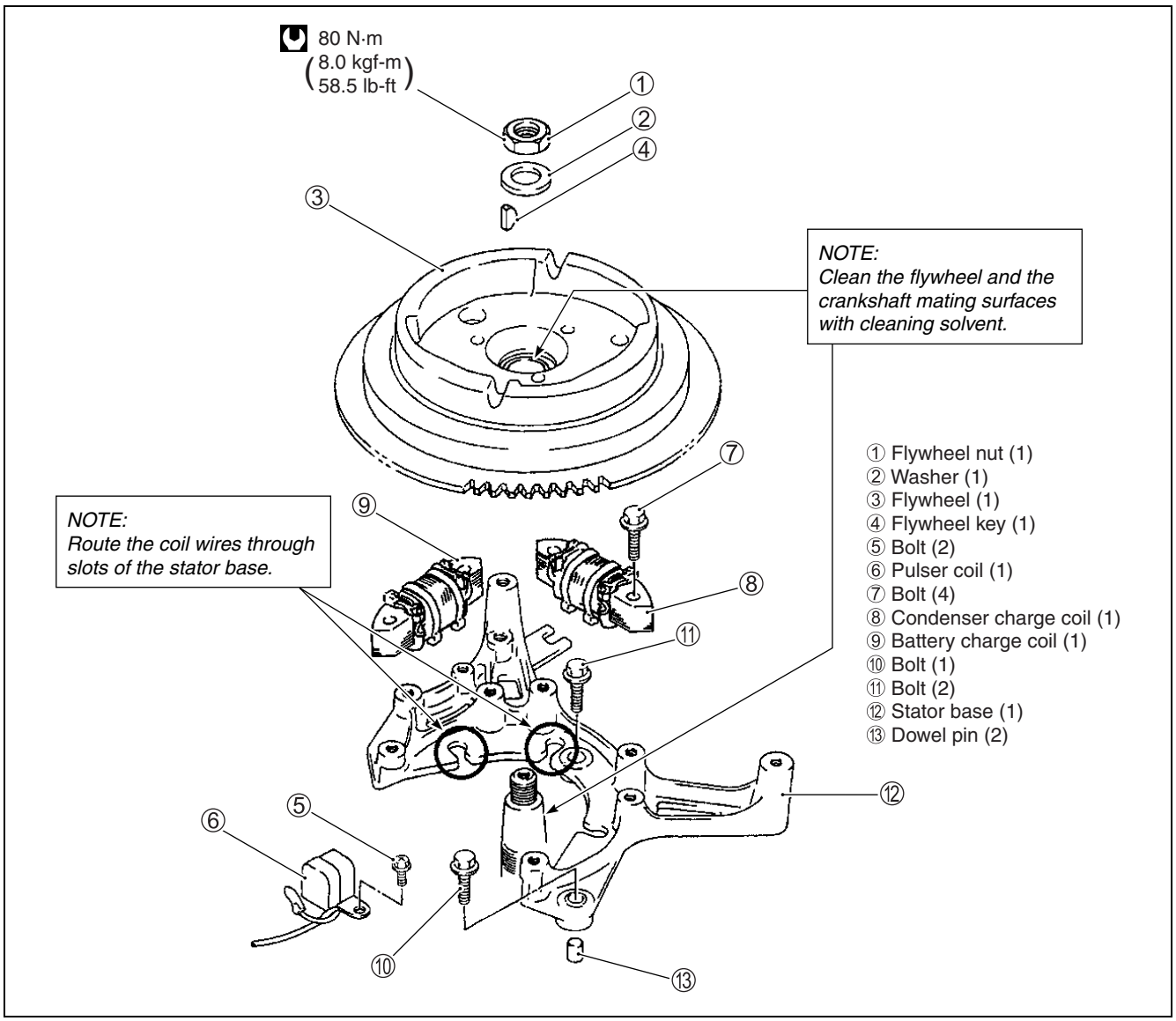
1. The text of this manual is divided into sections.
2. The section titles are listed on the previous page in a GROUP INDEX. Select the section needed for reference.
3. Holding the manual as shown at the right will allow you to find the first page of the section easily.
4. The first page of each section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



COMPONENT PARTS AND IMPORTANT ITEM ILLUSTRATIONS

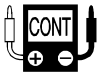
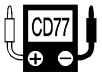
Under the name of each system or unit, an exploded view is provided with work instructions and other service information such as the tightening torque, lubrication and locking agent points.

Example:



SYMBOL

Listed in the table below are the symbols indicating instructions and other important information necessary for proper servicing. Please note the definition for each symbol. You will find these symbols used throughout this manual. Refer back to this table if you are not sure of any symbol(s) meanings.

SYMBOL	DEFINITION	SYMBOL	DEFINITION
	Torque control required. Data beside it indicates specified torque.		Apply the THREAD LOCK “1342”.
	Apply the oil. Use the engine oil unless otherwise specified.		Apply the THREAD LOCK SUPER “1333B”.
	Apply the SUZUKI OUTBOARD MOTOR GEAR OIL.		Measure in resistance range.
	Apply the SUZUKI SUPER GREASE “A”.		Measure in continuity test range.
	Apply the SUZUKI WATER RESISTANT GREASE.		Use peak voltmeter “Stevens CD-77”.
	Apply the SUZUKI BOND “1207B”.		Use special tool.
	Apply the SUZUKI SILICONE SEAL.		

GENERAL INFORMATION

1

CONTENTS

WARNING/CAUTION/NOTE

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

⚠ WARNING

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

CAUTION

Indicates a potential hazard that could result in motor 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 outboard motor. In addition to the WARNING and CAUTION stated, you must also use good judgement and observe basic mechanical safety principles.

GENERAL PRECAUTIONS

⚠ WARNING

- **Proper service and repair procedures are important for the safety of the service mechanic and the safety and reliability of the outboard motor.**
- **To avoid eye injury, always wear protective goggles when filing metals, working on a grinder, or doing other work, which could cause flying material particles.**
- **When 2 or more persons work together, pay attention to the safety of each other.**
- **When it is necessary to run the outboard motor indoors, make sure that exhaust gas is vented outdoors.**
- **When testing an outboard motor in the water and on a boat, ensure that the necessary safety equipment is on board. Such equipment includes: flotation aids for each person, fire extinguisher, distress signals, anchor, paddles, bilge pump, first-aid kit, emergency starter rope, etc.**
- **When working with toxic or flammable materials, make sure that the area you work in is well-ventilated and that you follow all of the material manufacturer's instructions.**
- **Never use gasoline as a cleaning solvent.**
- **To avoid getting burned, do not touch the engine, engine oil or exhaust system during or shortly after engine operation.**
- **Oil can be hazardous. Children and pets may be harmed from contact with oil. Keep new and used oil away from children and pets. To minimize your exposure to oil, wear a long sleeve shirt and moisture-proof gloves (such as dishwashing gloves) when changing oil. If oil contacts your skin, wash thoroughly with soap and water. Launder any clothing or rags if wet with oil. Recycle or properly dispose of used oil.**
- **After servicing fuel, oil/engine cooling system and exhaust system, check all lines and fittings related to the system for leaks.**
- **Carefully adhere to the battery handling instructions laid out by the battery supplier.**

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 assembly are clean and also lubricated when specified.**
*** When use of a certain type of lubricant, bond or sealant is specified, be sure to use the specified type.**
*** When removing the battery, disconnect the negative cable first and then the positive cable. When reconnecting the battery, connect the positive cable first and then the negative cable.**
*** When performing service to electrical parts, if the service procedures do not require using battery power, disconnect the negative cable at the battery.**
*** Tighten cylinder head and case bolts and nuts, beginning with larger diameter and ending with smaller diameter. Always tighten from inside to outside diagonally to the specified tightening torque.**
*** Whenever you remove oil seals, gaskets, packing, O-rings, locking washers, locking nuts, cotter pins, circlips and certain other parts as specified, always replace them with new. 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 torque values when specified.**
Remove grease or oil from screw/bolt threads unless a lubricant is specified.
*** After assembly, check parts for tightness and operation.**

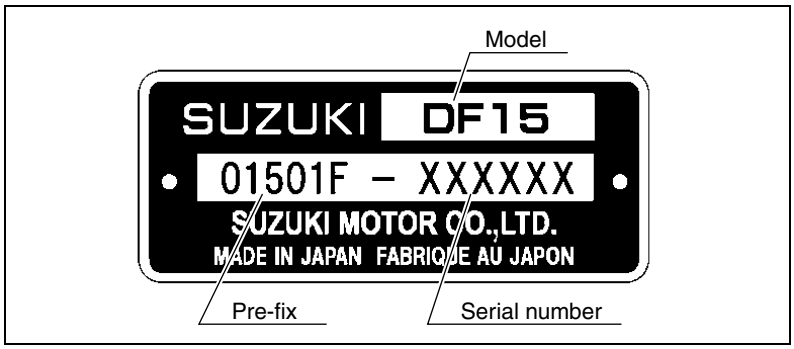
*** To protect the environment, do not unlawfully dispose of used motor oil, other fluids and batteries.**
*** To protect the Earth's natural resources, properly dispose of used motor parts.**

IDENTIFICATION NUMBER LOCATION

MODEL, PRE-FIX, SERIAL NUMBER

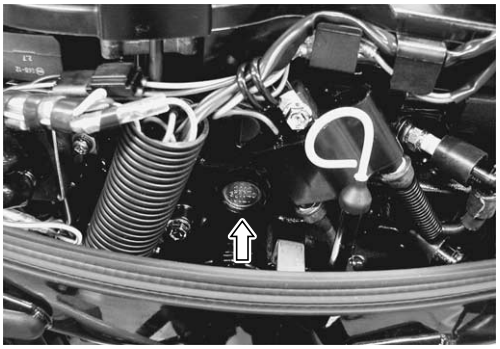
The MODEL, PRE-FIX and SERIAL NUMBER of the motor are stamped on a plate attached to the clamp bracket.

Example



ENGINE SERIAL NUMBER

A second engine serial number plate is pressed into a boss on the cylinder block.



FUEL AND OIL

GASOLINE RECOMMENDATION

Suzuki highly recommends that you use alcohol-free unleaded gasoline with a minimum pump octane rating of 87 (R+M /2 method) or 91 (Research method). However, blends of unleaded gasoline and alcohol with equivalent octane content may be used.

Allowable maximum blend of a single additive (not combination):

5% Methanol, 10% Ethanol, 15% MTBE

CAUTION

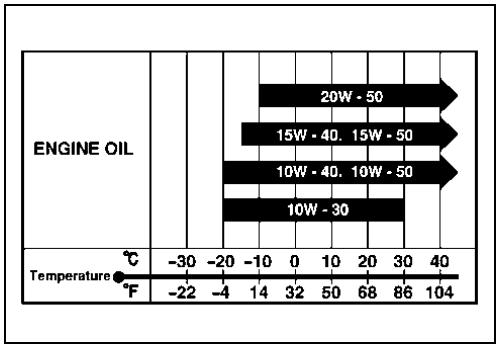
If leaded gasoline is used, engine damage may result. Use only unleaded gasoline.

ENGINE OIL

Use only oils that are rated SE, SF, SG, SH or SJ under the API (American Petroleum Institute) classification system.

The viscosity rating should be SAE 10W-40.

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



ENGINE BREAK-IN

The first 10 hours are critically important to ensure correct running of either a brand new motor or a motor that has been reconditioned or rebuilt. How the motor is operated during this time will have direct bearing on its life span and long-term durability.

Break-in period: 10 hours

WARM-UP RECOMMENDATION

Allow sufficient idling time (more than 5 minutes) for the engine to warm up after cold engine starting.

THROTTLE RECOMMENDATION

NOTE:
Avoid maintaining a constant engine speed for an extended period at any time during the engine break-in by varying the throttle position occasionally.

1. FIRST 2 HOURS
   For first 15 minutes, operate the engine in-gear at idling speed.
   During the remaining 1 hour and 45 minutes, operate the engine in-gear at less than 1/2 (half) throttle (3 000 r/min).

NOTE:
The throttle may be briefly opened beyond the recommended setting to plane the boat, but must be reduced to the recommended setting immediately after planing.

2. NEXT 1 HOUR
   Operate the engine in-gear at less than 3/4 (three-quarter) throttle (4 000 r/min).

3. LAST 7 HOURS
   Operate the engine in-gear at desired engine speed.
   However, do not operate continuously at full throttle for more than 5 minutes.

PROPELLERS

An outboard motor is designed to develop its rated power within a specified engine speed range. The maximum rated power delivered by the DF9.9/15 models are shown below.

Recommended full throttle speed range	**DF9.9**	**4 500 – 5 500 r/min**
	DF15	**5 400 – 6 000 r/min**

If the standard propeller fails to meet the above requirement, use another pitch propeller to hold the engine speed within the range specified above.

Propeller selection chart

Blade × Diam. (in) × Pitch (in)
3 × 9¼ × 7
3 × 9¼ × 8
3 × 9¼ × 9
3 × 9¼ × 10
3 × 9¼ × 11

CAUTION

Installing a propeller with pitch either too high or too low will cause incorrect maximum engine speed, which may result in severe damage to the motor.

SPECIFICATIONS

Item		Unit	Date					
			DF9.9/9.9A	DF9.9E/9.9AE	DF9.9R/9.9AR	DF15/15A	DF15E/15AE	DF15R/15AR
DIMENSIONS & WEIGHT								
Overall length (front to back)		mm (in)	1 005 (39.6)					
Overall width (side to side)		mm (in)	320 (12.6)					
Overall heigth	S	mm (in)	1 095 (43.1)					
	L	mm (in)	1 220 (48.0)					
Weight	S	kg (lbs)	44.0 (97.0)	47.5 (104.7)	46.5 (102.5)	44.0 (97.0)	47.5 (104.7)	46.5 (102.5)
	L	kg (lbs)	45.0 (99.2)	48.5 (106.9)	47.5 (104.7)	45.0 (99.2)	48.5 (106.9)	47.5 (104.7)
Transom height [Trim position: 3]	S	mm (in. type)	427 (15)					
	L	mm (in. type)	554 (20)					
PERFORMANCE								
Maximum output		kW (PS)	7.3 (9.9)			11.0 (15)		
Recommended operating range		r/min	4 500 – 5 500			5 400 – 6 000		
Idle speed		r/min	1 100 ± 50					
In-gear idle speed		r/min	Approx. 1 000					
POWER HEAD								
Engine type			4-stroke SOHC					
Number of cylinders			2					
Bore		mm (in)	58.0 (2.28)					
Stroke		mm (in)	57.0 (2.24)					
Total displacement		cm^3 (cu. in)	302 (18.4)					
Compression ratio			9.0					
Spark plug		NGK	DCPR6E					
Intake system			Carburetor					
Exhaust system			Through prop exhaust					
Cooling system			Water cooled					
Lubrication system			Wet sump by trochoid pump					
Starting system			Manual	Electric		Manual	Electric	
Choke system			Manual		Electric	Manual		Electric
Throttle control			Twist grip		Remote control	Twist grip		Remote control
Ignition system			SUZUKI PEI (Digital CDI)					

Item	Unit	Date					
		DF9.9/9.9A	DF9.9E/9.9AE	DF9.9R/9.9AR	DF15/15A	DF15E/15AE	DF15R/15AR

FUEL & OIL

Fuel		Suzuki highly recommends that you use alcohol-free unleaded gasoline with a minimum pump octane rating of 87 (R+M /2 method) or 91 (Research method). However, blends of unleaded gasoline and alcohol with equivalent octane content may be used.
Engine oil		API classification SE, SF, SG, SH, SJ Viscosity rating SAE 10W-40
Engine oil amounts	L (US/Imp. qt)	1.0 (1.1/0.9): Oil change only 1.1 (1.2/1.0): Oil filter change
Gear oil		SUZUKI Outboard Motor Gear Oil (SAE #90 hypoid gear oil)
Gearcase oil amounts	ml (US/Imp. qt)	170 (5.7/6.0)

BRACKET

Trim angle	Degrees	4 – 20
Number of trim position		5
Maximum tilt angle	Degrees	74

LOWER UNIT

Reversing system	Gear
Transmission	Forward-Neutral-Reverse
Reduction system	Bevel gear
Gear ratio	12 : 23 (1.917)
Drive line impact protection	Spline drive rubber hub
Propeller	Blade × Diam. (in) × Pitch (in)
	3 × 9¼ × 7 3 × 9¼ × 8 3 × 9¼ × 9 3 × 9¼ × 10 3 × 9¼ × 11

These specifications are subject to change without notice.

SERVICE DATA

Item	Unit	Date			
		DF9.9 (E)/9.9R	DF9.9A (E)/9.9AR	DF15 (E)/15R	DF15A (E)/15AR

POWERHEAD

Recommended operation range	r/min	4 500 – 5 500		5 400 – 6 000
Idle speed	r/min	1 100 ± 50 (in-gear: approx. 1 000)		
Cylinder compression* (with decompression system)	kPa (kg/cm², psi)	Approx. 400 (4.0, 57) with recoil starting		
Oil pressure* [Oil temp. at 60 °C (140 °F)]	kPa (kg/cm², psi)	Min. 200 (2.0, 28) Max. 500 (5.0, 71) at 3 000 r/min		
Engine oil		API classification SE, SF, SG, SH, SJ Viscosity rating SAE 10W-40		
Engine oil amount	L (US/lpm. qt))	1.0 (1.1/0.9): Oil change only 1.1 (1.2/1.0): Oil filter change		
Thermostat operating temperature	°C (°F)	58 – 62 (136 – 144)		

* Figures shown are guidelines only, not absolute service limit.

CYLINDER HEAD/CAMSHAFT

Cylinder head distortion		Limit	mm (in)	0.05 (0.002)	
Cam height	IN	STD	mm (in)	22.259 – 22.319 (0.8763 – 0.8787)	23.471 – 23.531 (0.9241 – 0.9264)
		Limit	mm (in)	22.100 (0.8701)	23.320 (0.9181)
	EX	STD	mm (in)	22.257 – 22.317 (0.8763 – 0.8786)	23.471 – 23.531 (0.9241 – 0.9264)
		Limit	mm (in)	22.100 (0.8701)	23.230 (0.9181)
Camshaft journal oil clearance		STD	mm (in)	0.020 – 0.062 (0.0008 – 0.0024)	
		Limit	mm (in)	0.100 (0.0039)	
Camshaft holder inside diameter	Upper	STD	mm (in)	25.000 – 25.021 (0.9843 – 0.9851)	
	Lower	STD	mm (in)	23.000 – 23.021 (0.9055 – 0.9063)	
Camshaft journal outside diameter	Upper	STD	mm (in)	24.959 – 24.980 (0.9826 – 0.9835)	
	Lower	STD	mm (in)	22.959 – 22.980 (0.9039 – 0.9047)	
Rocker arm shaft to rocker arm clearance		STD	mm (in)	0.016 – 0.045 (0.0006 – 0.0018)	
		Limit	mm (in)	0.060 (0.0024)	
Rocker arm inside diameter		STD	mm (in)	13.000 – 13.018 (0.5118 – 0.5125)	
Rocker arm shaft outside diameter		STD	mm (in)	12.973 – 12.984 (0.5107 – 0.5112)	

Item			Unit	Date			
				DF9.9 (E)/9.9R	DF9.9A (E)/9.9AR	DF15 (E)/15R	DF15A (E)/15AR

VALVE/VALVE GUIDE

Valve diameter	IN	STD	mm (in)	26 (1.0)
	EX	STD	mm (in)	22 (0.9)
Valve clearance (when cold)	IN	STD	mm (in)	0.08 – 0.12 (0.003 – 0.005)
	EX	STD	mm (in)	0.13 – 0.17 (0.005 – 0.007)
Valve guide to valve stem clearance	IN	STD	mm (in)	0.010 – 0.037 (0.0004 – 0.0015)
		Limit	mm (in)	0.070 (0.0028)
	EX	STD	mm (in)	0.035 – 0.062 (0.0014 – 0.0024)
		Limit	mm (in)	0.090 (0.0035)
Valve guide inside diameter	IN	STD	mm (in)	5.500 – 5.512 (0.2165 – 0.2170)
	EX	STD	mm (in)	5.500 – 5.512 (0.2165 – 0.2170)
Valve guide outside diameter	IN	STD	mm (in)	5.475 – 5.490 (0.2156 – 0.2161)
	EX	STD	mm (in)	5.450 – 5.465 (0.2146 – 0.2152)
Valve stem end length	IN	Limit	mm (in)	2.2 (0.09)
	EX	Limit	mm (in)	2.2 (0.09)
Valve stem deflection	IN	Limit	mm (in)	0.16 (0.006)
	EX	Limit	mm (in)	0.16 (0.006)
Valve stem runout	IN	Limit	mm (in)	0.05 (0.02)
	EX	Limit	mm (in)	0.05 (0.02)
Valve head radial runout	IN	Limit	mm (in)	0.03 (0.001)
	EX	Limit	mm (in)	0.03 (0.001)
Valve head thickness	IN	Limit	mm (in)	0.5 (0.02)
	EX	Limit	mm (in)	0.5 (0.02)
Valve seat width	IN	STD	mm (in)	0.9 – 1.1 (0.035 – 0.043)
	EX	STD	mm (in)	0.9 – 1.1 (0.035 – 0.043)
Valve spring free length		STD	mm (in)	32.52 (1.280)
		Limit	mm (in)	32.40 (1.276)
Valve spring tension		STD	N (kg, lbs)	90 (9.0, 19.8) for 28.5 mm (1.12 in)
		Limit	N (kg, lbs)	76 (7.6, 16.8) for 28.5 mm (1.12 in)

Item			Unit	Date			
				DF9.9 (E)/9.9R	DF9.9A (E)/9.9AR	DF15 (E)/15R	DF15A (E)/15AR

CYLINDER/PISTON/PISTON RING

Cylinder distortion		Limit	mm (in)	0.05 (0.002)
Piston to cylinder clearance		STD	mm (in)	0.0276 – 0.0425 (0.0011 – 0.0017)
		Limit	mm (in)	0.100 (0.0039)
Cylinder bore		STD	mm (in)	58.000 – 58.015 (2.2835 – 2.2841)
Cylinder measuring position			mm (in)	50 (2.0) from cylinder top surface
Piston skirt diameter		STD	mm (in)	57.965 – 57.980 (2.2821 – 2.2827)
Piston measuring position			mm (in)	15 (0.6) from piston skirt end
Wear on cylinder bore		Limit	mm (in)	0.055 (0.0022)
Piston ring end gap	1st	STD	mm (in)	0.10 – 0.25 (0.004 – 0.010)
		Limit	mm (in)	0.50 (0.020)
	2nd	STD	mm (in)	0.10 – 0.25 (0.004 – 0.010)
		Limit	mm (in)	0.50 (0.020)
Piston ring free end gap	1st	STD	mm (in)	Approx. 5.8 (0.23)
		Limit	mm (in)	4.6 (0.18)
	2nd	STD	mm (in)	Approx. 7.4 (0.29)
		Limit	mm (in)	5.9 (0.23)
Piston ring to groove clearance	1st	STD	mm (in)	0.02 – 0.06 (0.001 – 0.002)
		Limit	mm (in)	0.10 (0.004)
	2nd	STD	mm (in)	0.02 – 0.06 (0.001 – 0.002)
		Limit	mm (in)	0.10 (0.004)
Piston ring to groove width	1st		mm (in)	1.21 – 1.23 (0.0476 – 0.0484)
	2nd		mm (in)	1.21 – 1.23 (0.0476 – 0.0484)
	Oil		mm (in)	2.51 – 2.53 (0.0988 – 0.0996)
Piston ring thickness	1st	STD	mm (in)	1.17 – 1.19 (0.0461 – 0.469)
	2nd	STD	mm (in)	1.17 – 1.19 (0.0461 – 0.469)
Piston pin oil clearance		STD	mm (in)	0.002 – 0.013 (0.0001 – 0.0005)
		Limit	mm (in)	0.040 (0.0016)
Piston pin outside diameter		STD	mm (in)	13.995 – 14.000 (0.5510 – 0.5512)
		Limit	mm (in)	13.980 (0.5504)
Piston pin hole diameter		STD	mm (in)	14.002 – 14.008 (0.5513 – 0.5515)
		Limit	mm (in)	14.030 (0.5524)

Item		Unit	Date			
			DF9.9 (E)/9.9R	DF9.9A (E)/9.9AR	DF15 (E)/15R	DF15A (E)/15AR

CRANKSHAFT/CONROD

Conrod small end inside diameter	STD	mm (in)	14.006 – 14.014 (0.5514 – 0.5517)
	Limit	mm (in)	14.040 (0.5528)
Conrod big end oil clearance	STD	mm (in)	0.025 – 0.043 (0.0010 – 0.0017)
	Limit	mm (in)	0.063 (0.0025)
Conrod big end inside diameter	STD	mm (in)	29.016 – 29.034 (1.1424 – 1.1431)
Crank pin outside diameter	STD	mm (in)	28.982 – 29.000 (1.1410 – 1.1417)
Crank pin outside diameter difference	Limit	mm (in)	0.010 (0.0004)
Conrod big end side clearance	STD	mm (in)	0.10 – 0.20 (0.004 – 0.008)
	Limit	mm (in)	0.60 (0.024)
Conrod big end width	STD	mm (in)	19.95 – 20.00 (0.785 – 0.787)
Crank pin width	STD	mm (in)	20.10 – 20.15 (0.791 – 0.793)
Crankshaft thrust clearance	Limit	mm (in)	0.60 (0.024)
Crankshaft length	STD	mm (in)	126.8 – 126.9 (4.992 – 4.996)
Crankcase length	STD	mm (in)	127.0 – 127.1 (5.000 – 5.004)
Crankshaft bearing oil clearance	STD	mm (in)	0.020 – 0.044 (0.0008 – 0.0017)
	Limit	mm (in)	0.060 (0.0024)
Crankshaft bearing holder inside diameter	STD	mm (in)	35.000 – 35.016 (1.3780 – 0.3986)
Crankshaft journal outside diameter	STD	mm (in)	31.984 – 32.000 (1.2592 – 1.2598)
Crankshaft journal outside diameter difference	Limit	mm (in)	0.010 (0.0004)
Bearing thickness	STD	mm (in)	1.486 – 1.498 (0.0585 – 0.0590)

Item	Unit	Date			
		DF9.9 (E)/9.9R	DF9.9A (E)/9.9AR	DF15 (E)/15R	DF15A (E)/15AR

LOWER UNIT

Gearcase oil amount	ml (US/Imp.oz)	170 (5.7/6.0)
Gear ratio		1.917 (23/12)

Preliminary gear shim & thrust washer

Pinion back up shim	mm (in)	1.0 (0.039)
Forward back up shim	mm (in)	1.0 (0.039)
Reverse back up shim	mm (in)	1.0 (0.039)
Forward thrust washer	mm (in)	1.5 (0.06)
Reverse thrust washer	mm (in)	1.5 (0.06)

Initial selection-shim adjustment may be required.

CARBURETOR

Type	MIKUNI	B22TI-15		B26TI-20	
I.D. mark		93E40	93E21	93E50	93E31
Main jet	#	92.5	86.3	123.8	118.8
Pilot jet	#	60	52.5	47.5	42.5
Pilot screw	Turns open	PRE-SET	PRE-SET	PRE-SET	PRE-SET
Float height	mm	17.6 ± 1	17.6 ± 1	17.6 ± 1	17.6 ± 1

NOTE:
Hold carburetor vertical (bore up) and slowly rotate to an inverted horizontal position until float adjustment tab contacts inlet needle valve. Holding carburetor in this position, measure with vernier caliper from the float to the mating surface of the carburetor body, gasket removed, at 180° from the needle valve.

Item		Unit	Date			
			DF9.9 (E)/9.9R	DF9.9A (E)/9.9AR	DF15 (E)/15R	DF15A (E)/15AR

ELECTRICAL

Ignition timing		Degree at r/min	BTDC 5° at 1 300 BTDC 35° at 3 500	BTDC 5° at 1 300 BTDC 30° at 3 500
Over revolution limiter		r/min	Approx. 6 500	
Condenser charge coil resistance		Ω at 20°	244 – 364 (G – B/R)	
Pulser coil resistance		Ω at 20°	155 – 233 (R/B – B)	
Ignition coil resistance (without spark plug cap)	Primary	Ω at 20°	0.2 – 0.4 (O – B)	
	Secondary	kΩ at 20°	6.4 – 9.6 (H.T. cord – H.T. cord)	
Spark plug cap resistance		kΩ at 20°	8 – 12	
Battery charge coil resistance		Ω at 20°	0.2 – 0.4 (R – Y)	
Battery charge coil output (12V)		Watt	80 (120.....with option coil)	
Standard spark plug	Type	NGK	DCPR6E	
	Gap	mm (in)	0.8 – 0.9 (0.031 – 0.035)	
Fuse amp rating		A	25: Electric start model	
Recommended battery capacity (12V)		Ah (kC)	35 (126) or over: Electric start model	
Chock solenoid coil resistance		Ω at 20 °C	2.8 – 4.2 (O – B): Remote control model	
Starter motor relay coil resistance		Ω at 20 °C	3.5 – 5.1 (Y/G – B): Remote control model	

STARTER MOTOR (only for Electric start model)

Max. continuous time of use		Sec.	30
Motor output		kW	0.6
Brush length	STD	mm (in)	12.5 (0.49)
	Limit	mm (in)	9.0 (0.35)
Commutator undercut	STD	mm (in)	0.5 – 0.8 (0.02 – 0.03)
	Limit	mm (in)	0.2 (0.01)
Commutator outside diameter	STD	mm (in)	30 (1.2)
	Limit	mm (in)	29 (1.1)
Difference between max/min diameter of commutator	STD	mm (in)	0.05 (0.002)
	Limit	mm (in)	0.40 (0.016)
Pinion/ring gear gap		mm (in)	3.0 – 5.0 (0.12 – 0.20)

PEAK VOLTAGE

Requirements for peak voltage measurement

- Remove all spark plugs to eliminate the variables at cranking speed.
- Crank with recoil starter.
- Use a STEVENS peak voltage tester, Model CD-77.

Testing sequence	Tester probe connection		Peak voltage	Tester range	Remarks
	⊕ (Red)	⊖ (Black)			
CDI output	Orange	Black	144 V or over	NEG 500	With ignition coil connected
Condenser charge coil output	Green	Black/Red	144 V or over	POS 500	With CDI unit disconnected
Pluser coil output	Red/Black	Black (Ground)	2.2 V or over	SEN 5	
Battery charge coil output	Red	Yellow	3.5 V or over	POS 50	With rectifier disconnected

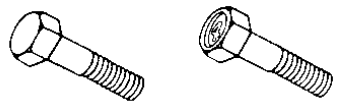
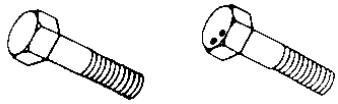
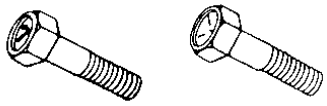
TIGHTENING TORQUE

Tightening torque – Important fasteners

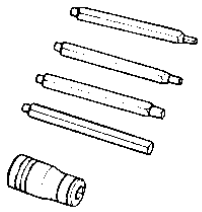
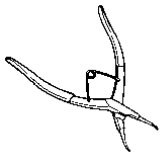
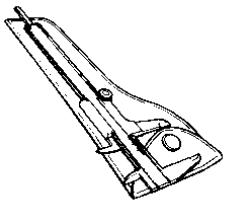
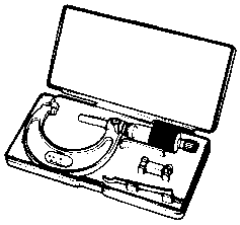
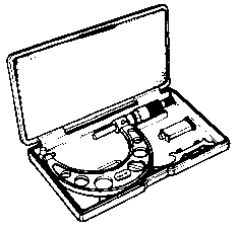
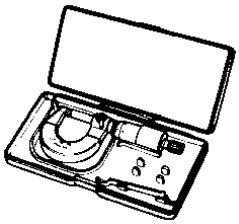
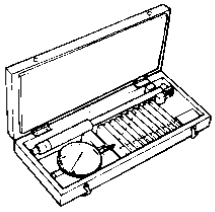
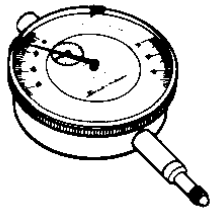
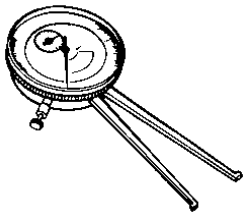
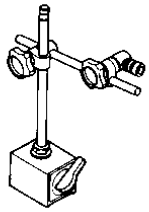
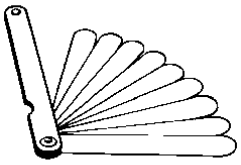
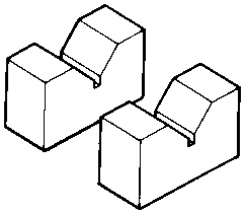
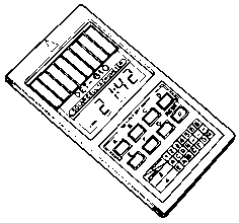
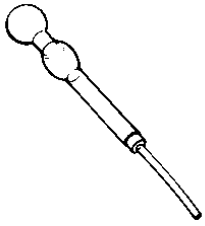
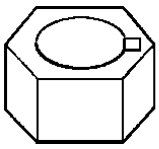
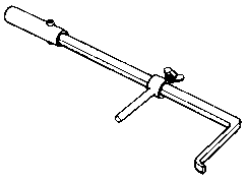
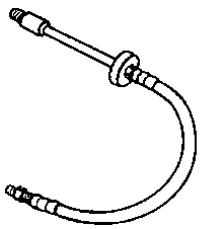
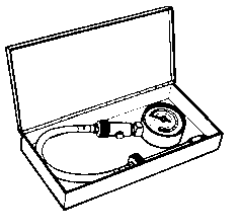
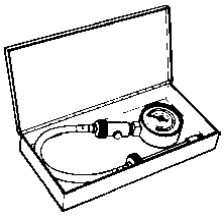
ITEM	THREAD DIAM.	TIGHTENING TORQUE		
		N·m	kgf-m	lb-ft
Cylinder head cover bolt	6 mm	10	1.0	7.0
Cylinder head bolt	8 mm	28	2.8	20.0
Crankcase bolt	6 mm	14	1.4	10.0
	8 mm	25	2.5	18.0
Conrod cap bolt	7 mm	12	1.2	8.5
Oil pump bolt	6 mm	14	1.4	10.0
Oil pump gallery bolt	6 mm	14	1.4	10.0
Intake manifold bolt	8 mm	23	2.3	16.5
Carburetor mounting bolt	6 mm	10	1.0	7.0
Fuel pump bolt	6 mm	10	1.0	7.0
Thermostat cover bolt	6 mm	10	1.0	7.0
Valve adjusting lock nut	5 mm	10	1.0	7.0
Timing pulley nut	26 mm	50	5.0	36.0
Flywheel nut	14 mm	80	8.0	58.5
Spark plug	—	17	1.7	12.5
Power unit mounting bolt and nut	8 mm	23	2.3	16.5
Driveshaft housing bolt	8 mm	23	2.3	16.5
Oil pressure switch	—	13	1.3	9.5
Oil regulator	14 mm	27	2.7	19.5
Camshaft pulley bolt	6 mm	10	1.0	7.0
Engine oil drain plug	12 mm	13	1.3	9.5
Upper mount bolt	8 mm	23	2.3	16.5
Upper mount bracket bolt	8 mm	23	2.3	16.5
Lower mount cover bolt	8 mm	23	2.3	16.5
Lower mount bolt	8 mm	23	2.3	16.5
Clamp bracket shaft nut	22 mm	43	4.3	31.0
Tilt lock arm bolt	10 mm	25	2.5	18.0
Handle pivot bolt	10 mm	6	0.6	4.5
Handle pivot nut	10 mm	23	2.3	16.5
Water pump case bolt	8 mm	8	0.8	6.0
Gearcase bolt	8 mm	23	2.3	16.5
Propeller nut	12 mm	18	1.8	13.0
Propeller shaft bearing housing bolt	6 mm	8	0.8	6.0

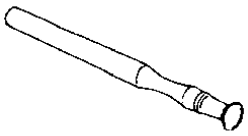
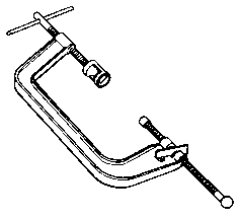
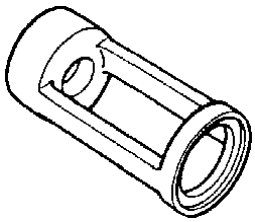
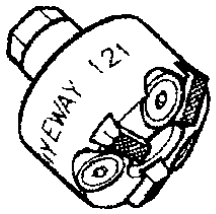
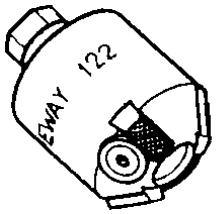
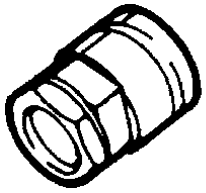
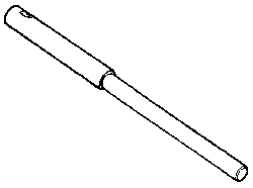
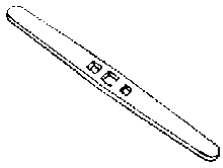
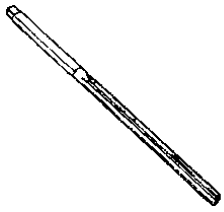
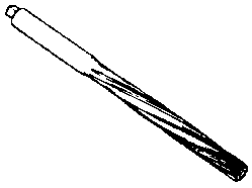
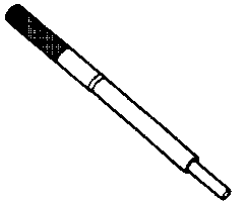
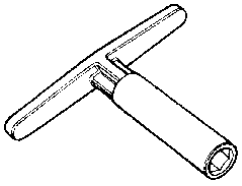
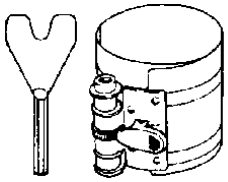
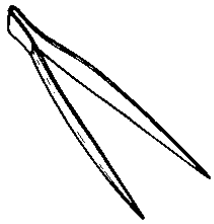
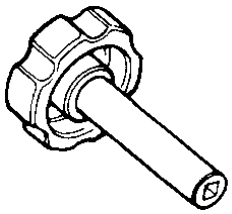
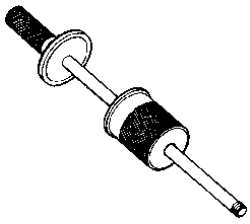
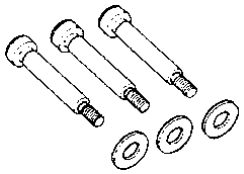
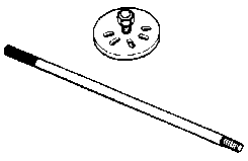
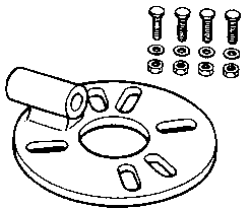
Tightening torque – General bolt

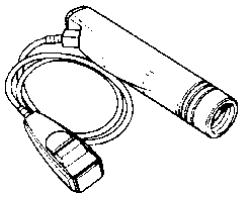
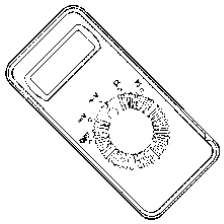
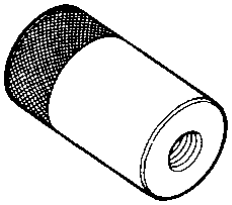
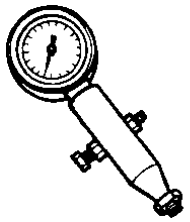
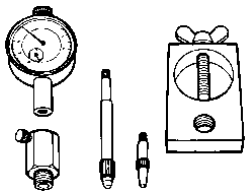
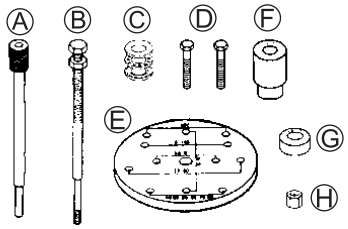
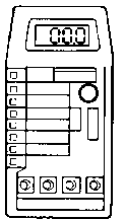
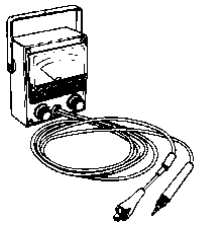
NOTE:
These value are only applicable when torque for a general bolt is not listed in the "Important Fasteners" table.

TYPE OF BOLT	THREAD DIAMETER	TIGHTENING TORQUE		
		N·m	kgf-m	lb-ft
 (Conventional or "4" marked bolt)	5 mm	2 – 4	0.2 – 0.4	1.5 – 3.0
	6 mm	4 – 7	0.4 – 0.7	3.0 – 5.0
	8 mm	10 – 16	1.0 – 1.6	7.0 – 11.5
	10 mm	22 – 35	2.2 – 3.5	16.0 – 25.5
 (Stainless steel bolt)	5 mm	2 – 4	0.2 – 0.4	1.5 – 3.0
	6 mm	6 – 10	0.6 – 1.0	4.5 – 7.0
	8 mm	15 – 20	1.5 – 2.0	11.0 – 14.5
	10 mm	34 – 41	3.4 – 4.1	24.5 – 29.5
 (7 marked or  marked bolt)	5 mm	3 – 6	0.3 – 0.6	2.0 – 4.5
	6 mm	8 – 12	0.8 – 1.2	6.0 – 8.5
	8 mm	18 – 28	1.8 – 2.8	13.0 – 20.0
	10 mm	40 – 60	4.0 – 6.0	29.0 – 43.5

SPECIAL TOOLS

1.  09900-00410 Hexagon wrench set	2.  09900-06108 Snap ring pliers	3.  09900-20101 (150 mm) 09900-20102 (200 mm) Vernier calipers	4.  09900-20202 Micrometer (25 – 50 mm)	5.  09900-20203 Micrometer (50 – 75 mm)
6.  09900-20205 Micrometer (0 – 25 mm)	7.  09900-20508 Cylinder gauge set (40 – 80 mm)	8.  09900-20602 Dial gauge	9.  09900-20605 Dial calipers (10 – 34 mm)	10.  09900-20701 Magnetic stand
11.  09900-20803 Thickness gauge	12.  09900-21304 Steel “V” block set	13.  09900-22301 Plastigauge (0.025 – 0.076 mm)	14.  09900-26006 Engine tachometer	15.  09900-28403 Hydrometer
16.  09911-49310 Crankshaft holder	17.  09913-50121 Oil seal remover	18.  09915-63210 Compression gauge adapter	19.  09915-64512 Compression gauge	20.  09915-77311 Oil pressure gauge

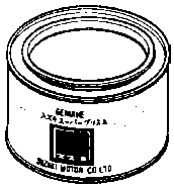
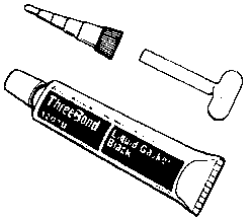
21.  09915-78211 Oil pressure gauge adapter	22.  09916-10911 Valve lapper	23.  09916-14510 Valve lifter	24.  09916-14521 Valve lifter attachment	25.  09916-20610 Valve seat cutter (15°) (N-121)
26.  09916-20620 Valve seat cutter (45°) (N-122)	27.  09916-24440 Handle adapter (N-503-1)	28.  09916-24450 Solid pilot (N-100-5.52)	29.  09916-34542 Valve guide reamer handle	30.  09916-34550 Valve guide reamer (ϕ 5.5 mm)
31.  09916-38210 Valve guide reamer (ϕ 11 mm)	32.  09916-44910 Valve guide remover/installer	33.  09916-54910 Handle (N-505)	34.  09916-77310 Piston ring compressor	35.  09916-84511 Tweezers
36.  09917-14910 Valve adjuster driver	37.  09930-30104 Sliding hammer	38.  09930-39210 Flywheel remover attachment bolt	39.  09930-39411 Flywheel remover	40.  09930-39520 Flywheel holder

41.  **09930-76420** **Timing light**	**42.**  **09930-99320** **Digital tester**	**43.**  **09940-44121** **Air pressure gauge**	**44.**  **09950-59320** **Propeller shaft remover**	**45.**  **09950-69512** **Gearcase oil leakage tester**
46.  **09951-09511** **Gear adjusting gauge**	**47.**  **Pinion bearing installer and remover** **09951-59910 Pinion bearing installer shaft Ⓐ** **09951-49910 Pinion bearing remover shaft Ⓑ** **09951-69910 Bearing Ⓒ** **01500-08403 Bolt Ⓓ** **09951-39914 Pinion bearing plate Ⓔ** **09951-19311 Attachment Ⓕ** **09951-79311 Spacer Ⓖ** **09951-29910 Nut Ⓗ**		**48.**  **99954-53008-820*** **Digital voltmeter**	**49.**  **99954-53873*** **Stevens CD-77** **Peak reading volt-meter**
50.  **99954-53883*** **Gear oil filler**				

NOTE:

** Marked part No. is in U.S. market only.*

MATERIALS REQUIRED

SUZUKI OUTBOARD MOTOR GEAR OIL	SUZUKI SUPER GREASE "A"	WATER RESISTANT GREASE	SUZUKI SILICONE SEAL	SUZUKI BOND "1207B"
				
99000-22540 (400 ml × 24 pcs.)	99000-25030* 99000-25010 (500 g)	99000-25160 (250 g)	99000-31120 (50 g)	99104-33140* 99000-31140 (100 g)

THREAD LOCK "1342"	THREAD LOCK SUPER "1333B"	4-Stroke Motor Oil
		
99000-32050 (50 g)	99000-32020 (50 g)	API: SE, SF, SG, SH, SJ SAE: 10W-40

NOTE:
** Marked part No. is in U.S. market only.*

PERIODIC MAINTENANCE

CONTENTS

PERIODIC MAINTENANCE SCHEDULE

The chart below lists the recommended intervals for all the required periodic service work necessary to keep the motor operating at peak performance and economy.
Maintenance intervals should be judged by number of hours or months, whichever comes first.

NOTE:
More frequent servicing should be performed on outboard motors that are used under severe conditions.

PERIODIC MAINTENANCE CHART

Interval / Item to be serviced	Initial 20 hrs. or 1 month	Every 200 hrs. or 12 months	Every 100 hrs. or 6 months	Every 50 hrs. or 3 months	Refer to page
Spark plug	—	—	I	R	2-7
Breather and fuel line	I	I	I	I	2-14
	Replace every 2 years.				
Engine oil	R	—	R	R	2-3
Gear oil	R	—	R	R	2-5
Lubrication	—	I	I	I	2-6
Anodes and bounding wire	—	I	I	I	2-15
Battery	—	I	I	I	2-17
Bolts and nuts	T	—	T	T	2-18
Engine oil filter	R	—	—	R	2-4
Fuel filter	—	I	I	I	2-14
	Replace every 400 hours or 2 years.				
Valve clearance	I	—	—	I	2-8
Timing belt	—	—	—	I	2-10
	Replace every 4 years.				
Carburetor	I	—	I	I	2-13
Propeller nut and pin	I	—	I	I	2-15
Water pump	—	—	—	I	2-15
Water pump impeller	—	—	—	R	2-15
Idle speed	I	—	—	I	2-13
Ignition timing	—	—	—	I	2-14

I: Inspect and clean, adjust, lubricate or replace, if necessary **T:** Tighten **R:** Replace

MAINTENANCE AND TUNE-UP PROCEDURES

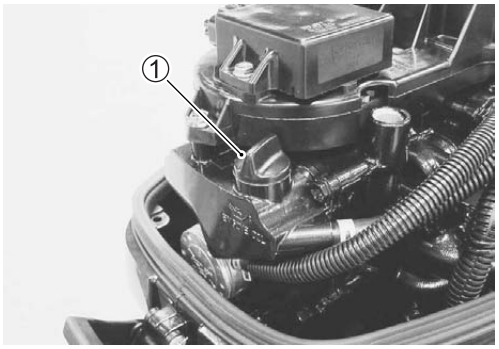
This section describes the servicing procedures for each of the periodic maintenance requirements.

ENGINE OIL

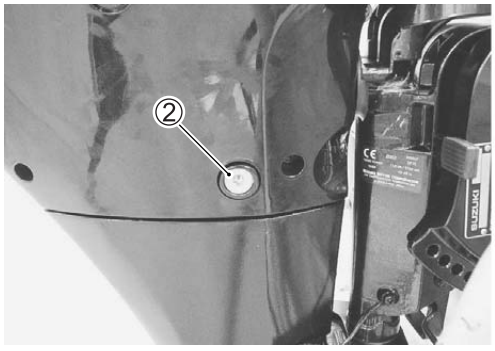
Change initially after 20 hours (1 month) and every 100 hours (6 months) thereafter.

NOTE:
Engine oil should be changed while the engine is warm.

1. Place the outboard motor upright on a level surface.
2. Remove the motor cover.
3. Remove the oil filler cap ①.



4. Place an oil pan, then drain oil by removing the oil drain plug ② and the gasket.



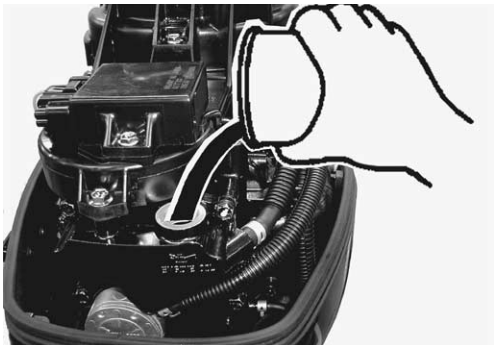
5. Install the gasket and the oil drain plug.
   Tighten the engine oil drain plug.

Engine oil drain plug: 13 N·m (1.3 kgf-m, 9.5 lb-ft)

CAUTION

Do not re-use the gasket once removed. Always use a new gasket.

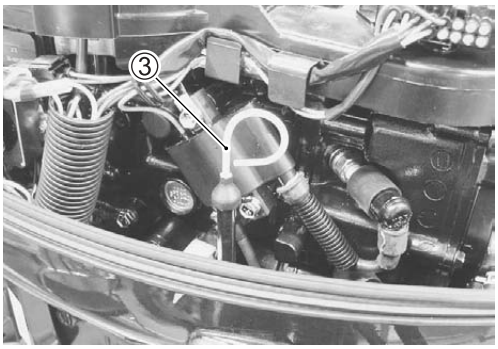
6. Pour the recommended engine oil, then install the oil filler cap.



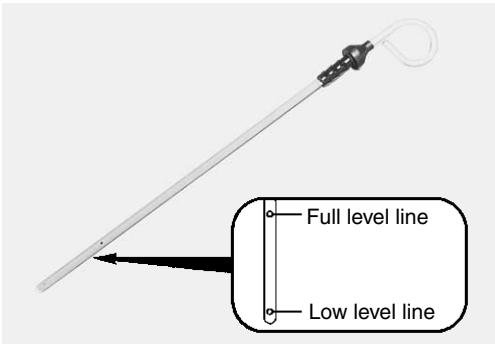
Necessary amount of engine oil:
Oil change only: 1.0 L (1.1/0.9 US/Imp. qt)
Oil filter change: 1.1 L (1.2/1.0 US/Imp. qt)

Recommended oil:
*** 4 stroke motor oil**
*** API classification SE, SF, SG, SH, SJ**
*** Viscosity rating SAE 10W-40**

7. Start the engine and allow it to run for several minutes at the idle speed.
   Turn off the engine and wait for approx. two minutes.
8. Remove the oil level dipstick ③ and wipe it clean.
9. Insert the dipstick fully into the dipstick hole, then pull it out.



10. Oil level should be between the full level hole (Max.) and the low level hole (Min.)
    If the level is low, add the recommended oil to the full level hole.



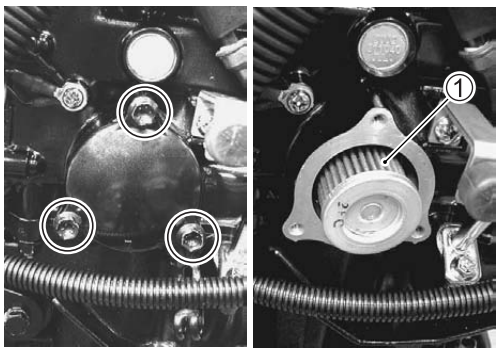
ENGINE OIL FILTER

Replace initially after 20 hours (1 month) and every 200 hours (12 months) thereafter.

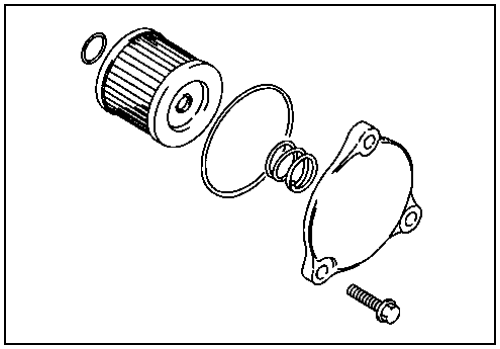
NOTE:
When replacing the engine oil filter, change the engine oil at the same time. (For oil change, see pages 2-3 and 2-4.)

Necessary amount of engine oil:
Oil filter change: 1.1 L (1.2/1.0 US/Imp. qt)

1. Remove the motor cover.
2. Remove the side covers.
3. Remove the three bolts securing the oil filter cap.
4. Remove the oil filter ①.



5. Assembly is reverse order of disassembly.



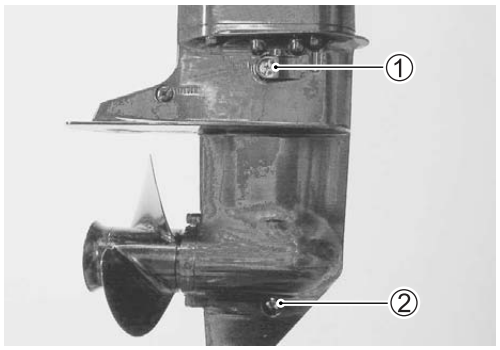
CAUTION

Do not re-use the O-rings removed. Always use a new O-ring.

GEAR OIL

Change initially after 20 hours (1 month) and every 100 hours (6 months) thereafter.

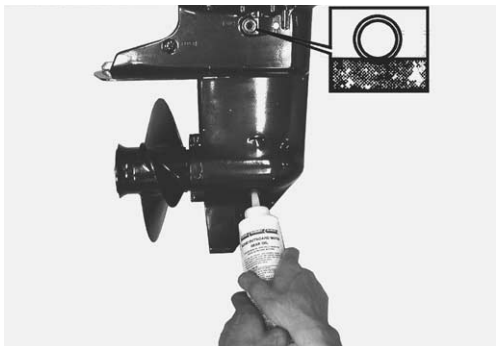
1. Place the outboard motor upright on a level surface.
2. Place a container under the lower unit.
3. Remove the gear oil drain plug ② before the gear oil level plug ① and drain the gear oil.



4. Fill with the recommended gear oil through the oil drain hole until the oil just starts to flow out from the oil level hole.

   Gear oil amount: 170 ml (5.7/6.0 US/Imp. oz)

   Recommended oil:
   SUZUKI OUTBOARD MOTOR GEAR OIL or
   SAE #90 HYPOID GEAR OIL



5. Install the oil level plug before removing the oil filler tube from the drain hole.
6. Install the oil drain plug.

CAUTION

Do not re-use the gasket once removed. Always use a new gasket.

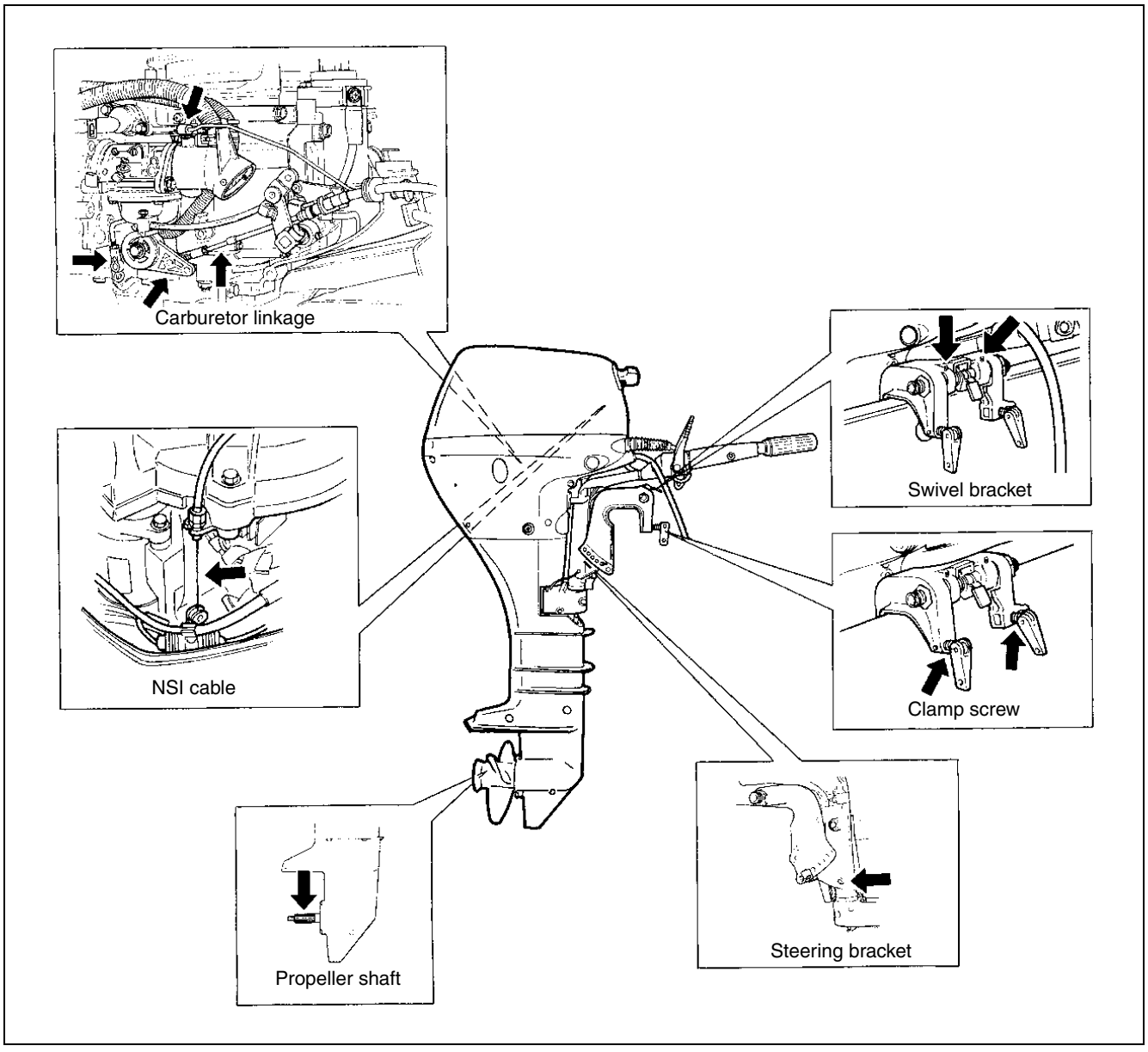
NOTE:
To avoid insufficient injection of the gear oil, check the gear oil level 10 minutes after doing the procedure in the step 6. If the oil level is low, slowly inject the gear oil up to the correct level.

LUBRICATION

Inspect every 50 hours (3 months).

Apply the water resistant grease to the following points.

W/R G's **99000-25160: SUZUKI WATER RESESTANT GREASE**



SPARK PLUG

*** Inspect every 100 hours (6 months).**
*** Replace every 200 hours (12 months).**

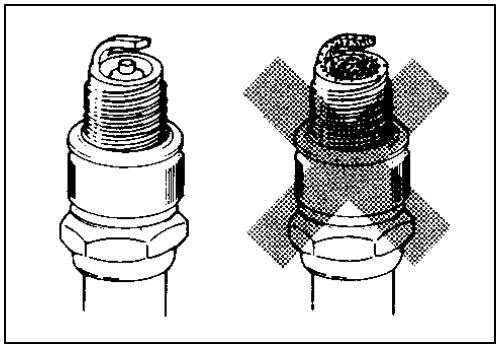
Standard spark plug: NGK DCPR6E

CAUTION

Only resistor (R) type spark plugs must be used with this engine. Using a non-resistor spark plug will cause ignition system malfunctions.

CARBON DEPOSIT

Inspect for a carbon deposit on the spark plug bases.
If carbon is present, remove carbon with a spark plug cleaning machine or by carefully using a pointed tool.

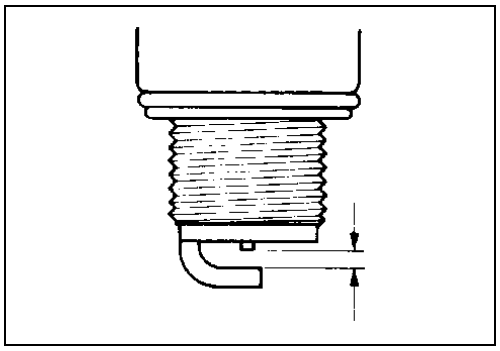


SPARK PLUG GAP

Measure for the spark plug gap using the thickness gauge.
Adjust to within the specified range if the gap is out of the specification.

Spark plug gap: 0.8 – 0.9 mm (0.031 – 0.035 in)

09900-20803: Thickness gauge



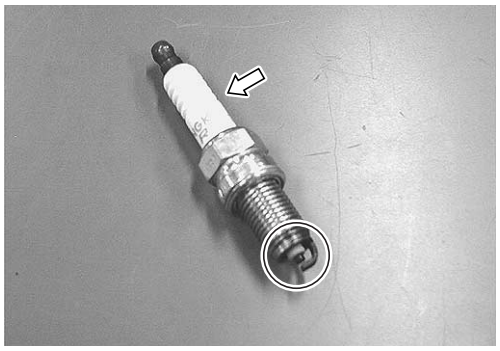
CONDITION OF ELECTRODE/INSULATOR

Check the electrode and insulator condition.
If the electrode is extremely worn or burnt, replace the spark plug.
If the spark plug has a broken insulator, damaged threads, etc., replace the spark plug.

CAUTION

Confirm the thread size and reach when replacing the plug. If the reach is too short, carbon will be deposited on the threaded portion of the plug hole resulting in possible engine damage.

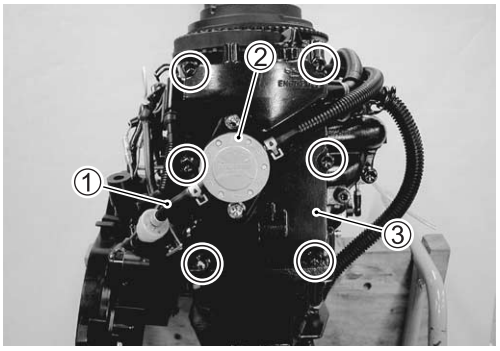
Spark plug: 17 N·m (1.7 kgf-m, 12.5 lb-ft)



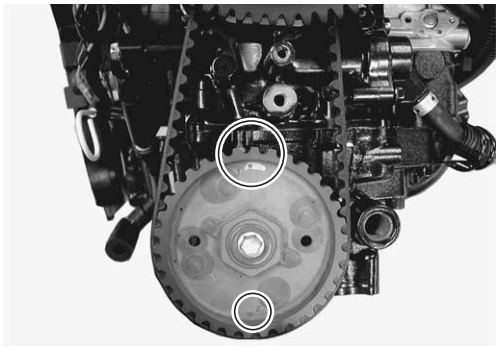
VALVE CLEARANCE

Inspect initially after 20 hours (1 month) and every 200 hours (12 months) thereafter.

1. Remove the following parts:
   * Motor cover
   * Side covers
   * Recoil starter
   * Spark plugs
2. Disconnect the fuel hoses ① from the fuel pump ②.
3. Remove the six bolts and the cylinder head cover ③.



4. Rotate the flywheel clockwise to bring each piston to the Top Dead Center (TDC) on a compression stroke. Align each PUNCH mark on the cam pulley with the INDEX mark on the cylinder head block.



PUNCH mark	TDC cylinder number
1	No. 1 cylinder
2	No. 2 cylinder

CAUTION

Rotate the crankshaft in the normal running direction only (clockwise) to prevent water pump impeller damage.

NOTE:

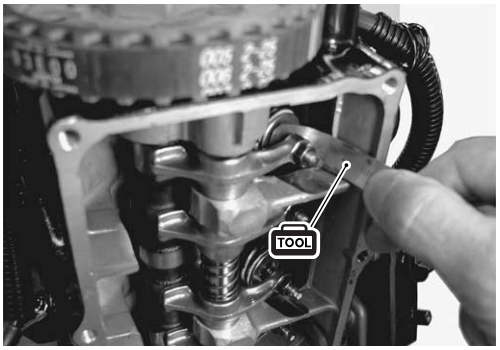
* *The piston must be at its TDC position on a compression stroke to check or adjust the valve clearance.*
* *The valve clearance specification is for COLD engine condition.*
* *The valve clearance specification is different for the intake (IN) valves and the exhaust (EX) valves.*

5. Insert the thickness gauge between the valve stem end and the valve adjusting screw on the rocker arm.

TOOL 09900-20803: Thickness gauge

Valve clearance (when cold):
IN. 0.08 – 0.12 mm (0.003 – 0.005 in)
EX. 0.13 – 0.17 mm (0.005 – 0.007 in)

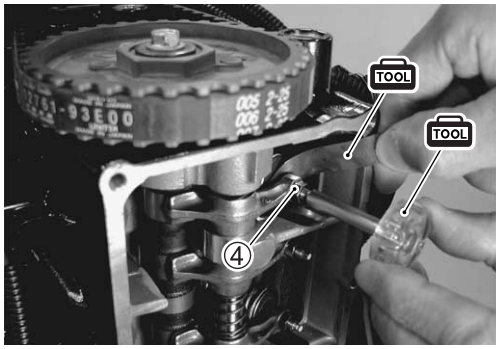
If the measurement is out of the specification, adjust the valve clearance.



ADJUSTMENT

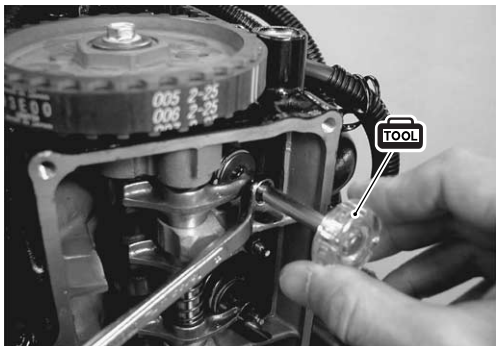
6. Loosen the valve adjusting lock nut ④.
7. Turn the valve adjusting screw using the valve adjuster driver to bring the valve clearance to within the specification.

TOOL 09900-20803: Thickness gauge
09917-14910: Valve adjustment driver



8. Tighten the valve adjusting lock nut while holding the valve adjusting screw.

Valve adjusting lock nut: 10 N·m (1.0 kgf-m, 7.0 lb-ft)



9. Recheck the valve clearance.
10. Tighten the cylinder head cover bolts to the specified torque.

Cylinder head cover bolt: 10 N·m (1.0 kgf-m, 7.0 lb-ft)

CAUTION

Do not re-use the gasket once removed. Always use a new gasket.