SUZUKI DT30C (After 1987)

CONDENSED SERVICE DATA

NOTE: Metric fasteners are used throughout outboard motor.

TUNE-UP

Hp/rpm	30/5000-5600 rpm (18.6 kW)
Number of Cylinders	3
Bore	62 mm (2.44 in.)
Stroke	60 mm (2.36 in.)
Displacement	543 cc (33.1 cu. in.)
Spark Plug	NGK B7HS-10
Electrode Gap	0.9-1.0 mm (0.035-0.039 in.)
Ignition	CDI
Carburetor:	
Make	Mikuni
Model	B26-20
Fuel:Oil Ratio	Automatic Metering

SIZES-CLEARANCES

Piston Ring End Gap	0.15-0.35 mm (0.006-0.014 in.)
Wear Limit	0.8 mm (0.030 in.)
Piston Pin Diameter	15.995-16.000 mm (0.6297-0.6299 in.)
Wear Limit	15.980 mm (0.6291 in.)
Piston Pin Bore Diameter	16.002-16.010 mm (0.6300-0.6303 in.)
Wear Limit	16.030 mm (0.6311 in.)
Standard Piston Diameter	61.920-61.935 mm (2.4378-2.4384 in.)
Standard Cylinder Bore Diameter	62.000-62.015 mm (2.4409-2.4415 in.)
Piston-to-Cylinder Clearance	0.072-0.087 mm (0.0028-0.0034 in.)
Wear Limit	0.167 mm (0.0066 in.)
Max. Crankshaft Runout at Main Journal	0.05 mm (0.002 in.)

SIZES—CLEARANCES CONT.

Max. Connecting Rod Small End Side Shake	5.0 mm (0.20 in.)

TIGHTENING TORQUES

Cylinder Head:	
6 mm	8-12 N·m (6-9 ft.-lbs.)
8 mm	21-25 N·m (15-18 ft.-lbs.)
Crankcase:	
6 mm	8-12 N·m (6-9 ft.-lbs.)
8 mm	20-26 N·m (15-19 ft.-lbs.)
Flywheel Nut	130-150 N·m (96-111 ft.-lbs.)
Standard Screws-	
Unmarked or Marked "4":	
5 mm	2-4 N·m (18-35 in.-lbs.)
6 mm	4-7 N·m (35-62 in.-lbs.)
8 mm	10-16 N·m (7-12 ft.-lbs.)
10 mm	22-35 N·m (16-26 ft.-lbs.)
Stainless Steel:	
5 mm	2-4 N·m (18-35 in.-lbs.)
6 mm	6-10 N·m (53-88 in.-lbs.)
8 mm	15-20 N·m (11-15 ft.-lbs.)
10 mm	34-41 N·m (25-30 ft.-lbs.)
Marked "7":	
5 mm	3-6 N·m (27-53 in.-lbs.)
6 mm	8-12 N·m (6-9 ft.-lbs.)
8 mm	18-28 N·m (13-21 ft.-lbs.)
10 mm	40-60 N·m (29-44 ft.-lbs.)

LUBRICATION

The power head is lubricated by oil mixed with the fuel. Model DT30C is equipped with automatic oil injection. Recommended oil is Suzuki Outboard Motor Oil or a good quality NMMA certified TC-WII engine oil. Recommended fuel is regular or unleaded gasoline having an 85 minimum octane rating. Manufacturer does not recommend using gasoline containing alcohol additives. However, unleaded gasoline containing ethanol (grain alcohol) may be used providing ethanol content does not exceed five percent and minimum octane rating is 85.

NOTE: Manufacturer recommends NOT using any gasoline containing methanol (wood alcohol).

During break-in (first 10 hours of operation) of a new or rebuilt engine, mix a recommended oil with the fuel at a 50:1 ratio in combination with the oil injection system to ensure adequate lubrication during break-in process. Be certain oil and fuel is thoroughly mixed in fuel tank. After initial 10 hours of operation, switch to straight gasoline in the fuel tank.

Illustrations courtesy Suzuki

The lower unit gears and bearings are lubricated with oil contained in the gearcase. Recommended gearcase oil is Suzuki Outboard Motor Gear Oil or a suitable equivalent SAE 90 hypoid gear oil. Gearcase capacity is approximately 230 mL (7.8 ozs.). Lower unit oil should be changed after the first 10 hours of operation and after every 100 hours or seasonally thereafter. Reinstall drain and vent plugs securely, using a new gasket if necessary, to ensure watertight seal.

FUEL SYSTEM

CARBURETOR. Three Mikuni B26-20 carburetors are used. Refer to Fig. SZ11-35 for exploded view. Initial setting of pilot air screw (12) is 1½ to 2 turns out from a lightly seated position. Final adjustment should be made with engine at normal operating temperature and running in forward gear. Adjust idle speed with idle speed switch located on outside of lower cover so engine idles at approximately 650-700 rpm. Adjust pilot air screw so engine idles smoothly and will accelerate cleanly without hesitation. Readjust idle speed to 650-700 rpm is necessary.

Main fuel metering is controlled by main jet (5). Standard main jet for normal operation is #125. Standard pilot jet (11) for normal operation is #70 on 1988 models and #67.5 on 1989 models.

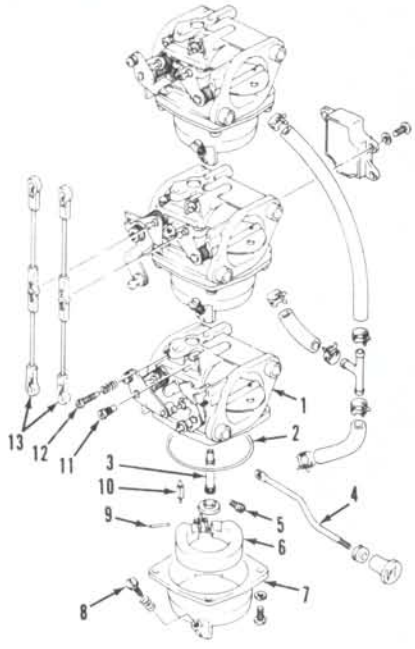

Fig. SZ11-35—Exploded view of Mikuni B26-20 carburetors used.

1. Body
2. Gasket
3. High speed nozzle
4. Choke rod
5. Main jet
6. Float
7. Float bowl
8. Drain screw
9. Float pin
10. Needle valve
11. Pilot jet
12. Pilot screw
13. Throttle control rods

To check float level, remove float bowl (7) and invert carburetor body (1). Measure float level from float bowl mating surface to bottom of float at 180 degrees from needle valve as shown in Fig. SZ11-36. Float level should be 16.5-18.5 mm (0.65-0.73 in.). Bend tang on float to adjust float level.

FUEL FILTER. A fuel filter assembly is used to filter the fuel prior to entering the fuel pump. Periodically unscrew bowl (5—Fig. SZ11-37) and withdraw filter element (4). Clean bowl and filter element in a suitable solvent and blow dry with clean compressed air. Inspect filter element for excessive blockage or other damage and renew if necessary. Reassemble in reverse order of disassembly. Renew "O" ring (3) and seal (2) upon reassembly.

FUEL PUMP. A diaphragm-type fuel pump is used. Refer to Fig. SZ11-38 for exploded view. Fuel pump is mounted on the side of power head cylinder block and is actuated by crankcase pulsations.

When servicing pump, scribe reference marks on pump body to aid alignment during reassembly. Defective or questionable components should be renewed. Diaphragm should be renewed if air leaks or cracks are noted, or if deterioration is evident.

REED VALVES. The reed valves are located behind the intake manifold. The intake manifold must be removed to access reed block and valves assembly.

Renew reed valves (2—Fig. SZ11-39) if petals are broken, cracked, warped, rusted or bent, or if tip of petal stands open in excess of 0.2 mm (0.008 in.) from seat area. Do not attempt to bend or straighten a damaged reed petal. Reed stop opening (O) should be 3.8 mm (0.15 in.). When reassembling reed valve assembly, apply Suzuki Thread Lock 1342 or a suitable equivalent thread locking compound to threads of screws (4).

SPEED CONTROL LINKAGE. To adjust speed control linkage, loosen throttle lever adjusting screws (1—Fig. SZ11-40) on top and bottom carburetors and rotate throttle levers (2) counterclockwise to full closed position. Hold levers (2) closed and retighten screws (1). Adjust throttle link (4) so throttle arm (3) is against stopper (5) and clearance (C) is 0.5-1.5 mm (0.020-0.060 in.) with throttle in fully closed position. Make sure throttle plates are synchronized at full closed and full open positions.

If throttle cables require adjustment, loosen cable adjustment nuts and adjust cables so core wires are tight with no free movement in drum (6). Make sure arm (3) contacts stopper (5) when throt-

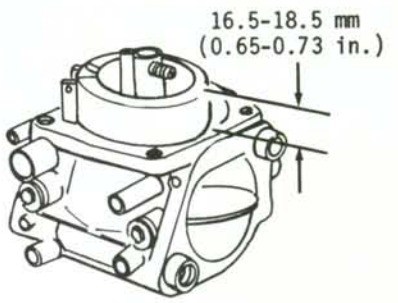

Fig. SZ11-36—Measure float level from float bowl mating surface to bottom of float 180 degrees from needle valve as shown. Bend tang on float to adjust float level.

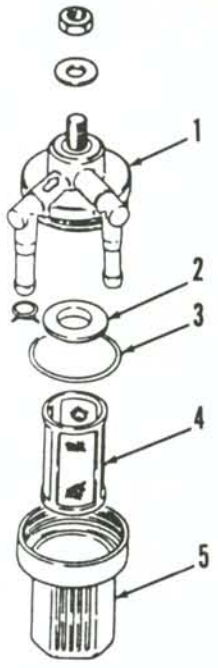

Fig. SZ11-37—Exploded view of fuel filter assembly.

1. Base
2. Seal
3. "O" ring
4. Filter
5. Bowl

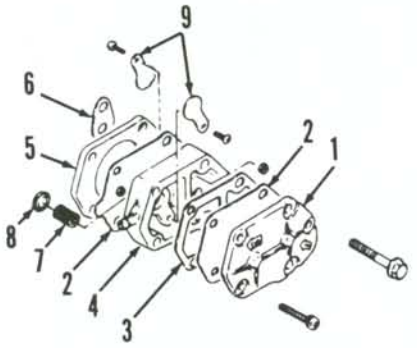

Fig. SZ11-38—Exploded view of fuel pump assembly.

1. Cover
2. Diaphragm
3. Gasket
4. Valve body
5. Plate
6. Gasket
7. Spring
8. Spring seat
9. Check valve

tle is fully closed. Oil injection pump control linkage should be checked and/or adjusted after speed control linkage adjustment. Refer to OIL INJECTION section.

OIL INJECTION

CONTROL LINKAGE ADJUSTMENT. Make sure speed control linkage is properly adjusted. Initial length of pump control rod (5—Fig. SZ11-41) should be 77.5 mm (3.05 in.) as shown. With throttle in fully closed position, clearance (C) between lever stopper (6) and boss (7) on pump housing should be 1 mm (0.040 in.) or less, but stopper (6) should not contact boss (7). To adjust, loosen nuts (4) and adjust length of rod (5) as necessary. Make sure nuts (4) are securely tightened after adjustment. After adjusting pump control linkage, recheck speed control linkage and readjust if necessary. Refer to SPEED CONTROL LINKAGE section.

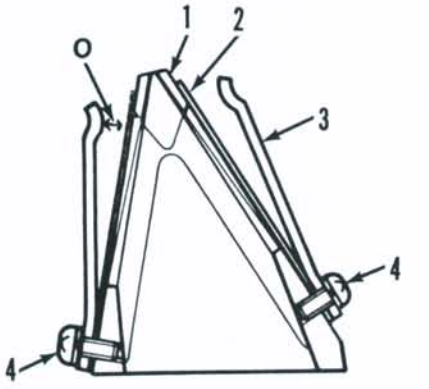

Fig. SZ11-39—Cross-sectional view of reed block and valves assembly.

1. Reed block
2. Reed petal
3. Reed stop
4. Screw
O. Reed stop opening

OIL FLOW SENSOR. Inline filter contained in oil flow sensor should be periodically removed and cleaned in a suitable nonflammable solvent. Manufacturer recommends renewing filter if excessive plugging or contamination is noted.

To test oil flow sensor, remove sensor and connect a suitable ohmmeter between sensor red wire with blue tracer and black wire. Plug sensor inlet and connect a vacuum source to sensor outlet. With vacuum applied, ohmmeter should show continuity. Remove vacuum source and sensor should show infinity.

BLEEDING PUMP. To bleed trapped air from oil supply lines or pump, proceed as follows: Fill fuel tank with a 50:1 mixture of recommended gasoline and oil. Fill oil tank with a recommended oil. Loosen bleed screw (B—Figs. SZ11-41 or SZ11-42) two or three turns. Start engine and allow to idle at 650-700 rpm until no air bubbles are noted at bleed screw (B).

CHECKING OIL PUMP OUTPUT. Start engine and allow to warm-up for approximately five minutes. Stop engine, disconnect oil pump control rod from carburetor and remove oil tank. Connect oil gage 09900-20205 or a suitable equivalent to oil pump supply hose. Fill oil gage with a recommended oil until oil is even with an upper reference mark. Bleed system as previously described. With oil pump control rod in fully closed position, start engine and allow to run at 1500 rpm for five minutes. Oil consumption should be 1.0-1.9 mL (0.035-0.065 oz.) in five minutes at 1500 rpm. Move oil pump control rod to fully open position, restart engine and allow to run at 1500 rpm for two minutes. Oil consumption should be 1.2-1.7 mL (0.04-0.06 oz.) in two minutes at 1500 rpm. Renew oil pump assembly (2—Fig. SZ11-42) if pump output is not as specified. After reinstalling oil tank, bleed air from oil injection system as previously described.

NOTE: Results of oil pump output test may vary according to weather conditions, testing error or other conditions. The manufacturer recommends repeating output test procedure two or three times to ensure the proper test results are obtained.

COOLING SYSTEM

WATER PUMP. A rubber impeller-type water pump is mounted between the drive shaft housing and gearcase. Key (7—Fig. SZ11-43) in the drive shaft is used to turn the impeller (6). If cooling system malfunction is encountered, check water intakes for plugging or partial restriction. If water intakes are clear, remove gearcase as outlined in LOWER UNIT section and check condition of water pump, water passages and sealing surfaces.

When water pump is disassembled, inspect impeller (6) and plate (8) for excessive wear or other damage. Turn

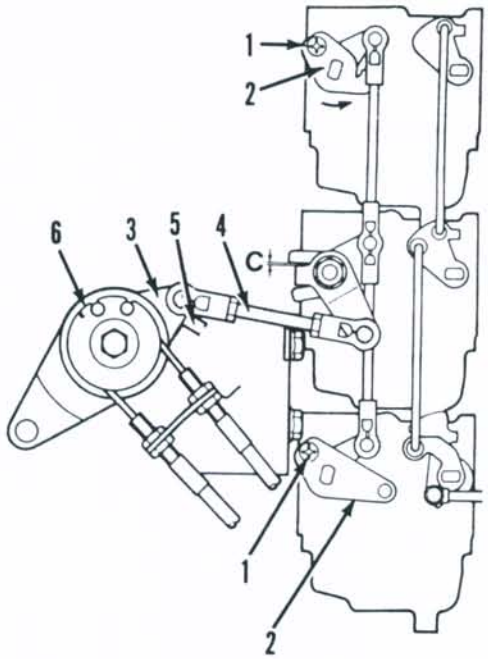

Fig. SZ11-40—View of speed control linkage. Adjust linkage as described in text.

1. Screw
2. Throttle lever
3. Throttle arm
4. Link rod
5. Stopper
6. Cable drum

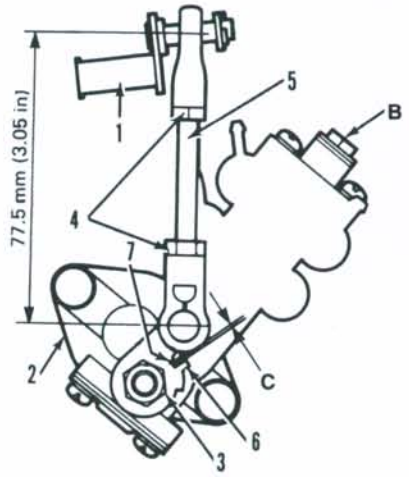

Fig. SZ11-41—View of oil injection pump and control linkage. Refer to text for control linkage adjustment.

1. Throttle lever
2. Pump assy.
3. Pump lever
4. Adjustment nuts
5. Control rod
6. Stopper
7. Boss
B. Bleed screw

Illustrations courtesy Suzuki

drive shaft clockwise (viewed from top) while placing pump housing (5) over impeller. Avoid turning drive shaft in opposite direction after water pump is reassembled.

THERMOSTAT. A thermostat is used to regulate operating temperature. Test thermostat by submersing in heated water with a suitable thermometer. Thermostat should start to open at 48°-52° C (118°-126° F). Thermostat can be removed for inspection or renewal after removing thermostat cover located in cylinder head.

ENGINE TEMPERATURE SENSOR. Engine temperature sensor is located at lower side of engine block. Sensor is normally open and changes to closed circuit when engine temperature reaches 32°-38° C (89.6°-100.4° F) on 1988 models and 36°-44° C (97°-111° F) on 1989 models. When sensor is open, ignition timing is automatically advanced approximately five degrees which increases idle speed and allows engine to warm-up quicker. When sensor closes, ignition timing and idle speed return to normal idle setting.

WATER FLOW SENSOR. Water flow sensor is located in cylinder head cover. Water flow sensor is designed to warn operator should cooling water flow to engine become insufficient. To test sensor, remove sensor from cylinder head cover and make sure sensor float moves freely. If not, remove pin securing float and carefully clean float and pin with water. Note that one side of pin hole in sensor is smaller than other side. Drive pin out toward larger hole. Connect a suitable ohmmeter between sensor wires and move float up and down. Ohmmeter reading should be zero ohm with float in down position and infinity with float in up position.

IGNITION

A breakerless, integrated circuit, capacitor discharge ignition system is used. Refer to Fig. SZ11-44 for wiring diagram. An integral ignition control module monitors throttle valve position (throttle valve sensor) and flywheel position (counter coil) and calculates and automatically adjusts ignition timing for optimum performance at all speeds above idle. Refer to Fig. SZ11-45. With throttle valves fully closed (idle speed), timing and idle speed are controlled by idle speed switch. Refer to IDLE SPEED SWITCH section.

TROUBLE-SHOOTING. If ignition malfunction occurs, check condition of spark plugs, and all wires and connections before trouble-shooting ignition system. Use only approved procedures to prevent damage to the components. The fuel system should be checked first to make certain that faulty operation is not the result of incorrect fuel mixture or contaminated fuel. Use Suzuki Pocket Tester 09900-25002 or a suitable ohmmeter to test ignition components and circuits. Refer to Figs. SZ11-44 and SZ11-46 when trouble-shooting ignition system.

CONDENSER CHARGING COIL. Flywheel must be removed for access to condenser charging coil. Make sure a suitable puller is used to remove flywheel. Disconnect condenser charging coil (5—Fig. SZ11-46) and connect tester between black wire with red tracer and green wire. Resistance should be 170-250 ohms. Renew condenser charging coil if resistance is not as specified.

PULSER COIL. Three pulser coils (2, 4 and 6—Fig. SZ11-46) are used, and if removed, must be reinstalled in original position on stator or engine will not start. Note color of pulser coil wires or mark coils for reference. Pulser coils-to-flywheel air gap should be 0.75 mm (0.03 in.) on 1988 models and 0.5 mm (0.020 in.) as shown in Fig. SZ11-47.

To test pulser coils, separate connectors leading from pulser coils. Attach one tester lead to a good engine ground and remaining tester lead to red wire with black tracer on number 1 coil, white wire with black tracer on number 2 coil and red wire with white tracer on number 3 coil. Renew pulser coil(s) if resistance is not within 170-250 ohms.

COUNTER COIL. Separate connector leading from counter coil (7—Fig. SZ11-46). Connect tester leads to orange wire with green tracer and black wire (1988 models) or black wire with green tracer (1989 models). Counter coil can be considered acceptable if resistance is within 160-240 ohms. Air gap between counter coil and flywheel ring gear teeth should be 0.5 mm (0.020 in.).

NOTE: Air gap between counter coil and flywheel ring gear teeth must be set to exactly 0.5 mm (0.020 in.) for proper operation of outboard motor. Make sure air gap is properly adjusted.

IGNITION COILS. Three ignition coils are used. Refer to Fig. SZ11-46. Separate wires at connectors leading from ignition coils and disconnect spark plug wires from coils. To test primary windings, connect tester between the following wires: Number 1 coil—orange wire and black wire; number 2 coil—blue wire and black wire; number 3 coil—gray wire and black wire. Primary winding resistance on all coils should be 0.1-0.4 ohm. Renew coil(s) if primary resistance is not as specified.

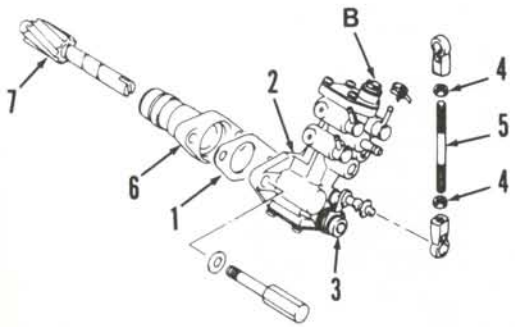

Fig. SZ11-42—Exploded view of oil injection pump assembly.

1. Gasket
2. Pump assy.
3. Pump lever
4. Adjusting nut
5. Control rod
6. Retainer
7. Driven gear

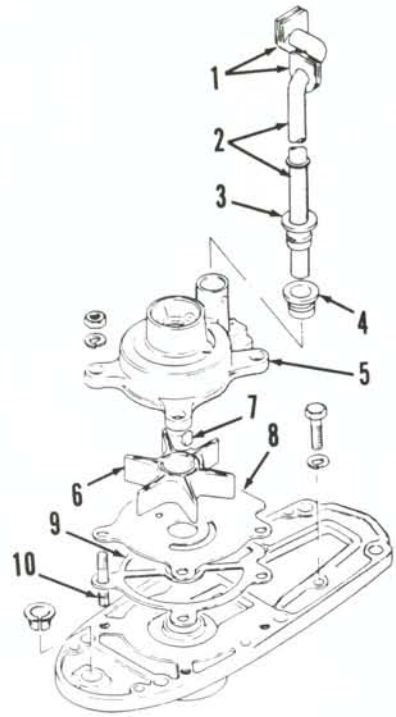

Fig. SZ11-43—Exploded view of water pump assembly.

1. Grommet
2. Water tube
3. Grommet
4. Grommet
5. Housing
6. Impeller
7. Key
8. Plate
9. Gasket
10. Stud

Illustrations courtesy Suzuki

To test secondary windings, attach one tester lead to each spark plug wire terminal and remaining tester lead to orange wire on number 1 coil, blue wire on number 2 coil and gray wire on number 3 coil. Renew coil(s) if resistance is not within 1900-2700 ohms.

THROTTLE VALVE SENSOR. To test throttle valve sensor (5—Fig. SZ11-48), remove alignment pin attached to cover over throttle valve sensor and insert alignment pin (1) into hole in sensor and sensor cam (3). Align slot in cam (3) with throttle shaft. Disconnect throttle valve sensor connector (4). Connect test harness 09930-89530 or suitable jumper wires to a battery as shown in Fig. SZ11-48. Battery voltage must be nine volts or more. Connect positive (+) lead of a suitable digital voltmeter to test harness light green wire with red tracer and voltmeter negative (−) lead to battery negative (−) terminal as shown. With throttle fully closed, voltmeter reading should be 0.45-0.55 volt. If not, remove rubber cap (2) and turn adjustment screw (under cap) as necessary to obtain the correct voltage reading. Note that turning adjustment screw clockwise will increase voltage and counterclockwise will decrease voltage.

NOTE: The manufacturer recommends using only a nonmetallic screwdriver to turn sensor adjusting screw or sensor voltmeter reading may not be valid. If metal screwdriver must be used, remove screwdriver from area of throttle valve sensor after adjustment to prevent erroneous voltmeter reading.

If sensor output voltage at closed throttle is below 0.45 volt, idle speed ignition timing will be fixed at 5 degrees BTDC and idle speed switch will be inoperative. If sensor output voltage at closed throttle is above 0.55 volt, ignition timing at idle speed will not be correct. Refer to IDLE SPEED SWITCH section.

Once the specified voltage reading is obtained at closed throttle, remove alignment pin and open carburetor to wide-open throttle. Voltmeter reading should now be 2.7 volts or more. Do not attempt to adjust wide-open throttle sensor voltage. If wide-open throttle sensor voltage is not 2.7 volts or higher, renew sensor.

If throttle valve sensor is removed or renewed, install as follows: Insert alignment pin (1) as shown to align cam and sensor shaft. Align slot in sensor cam with carburetor throttle shaft and install sensor on carburetor. Lightly tighten mounting screws (7) to allow for adjustment of sensor position on carburetor. Connect test harness and

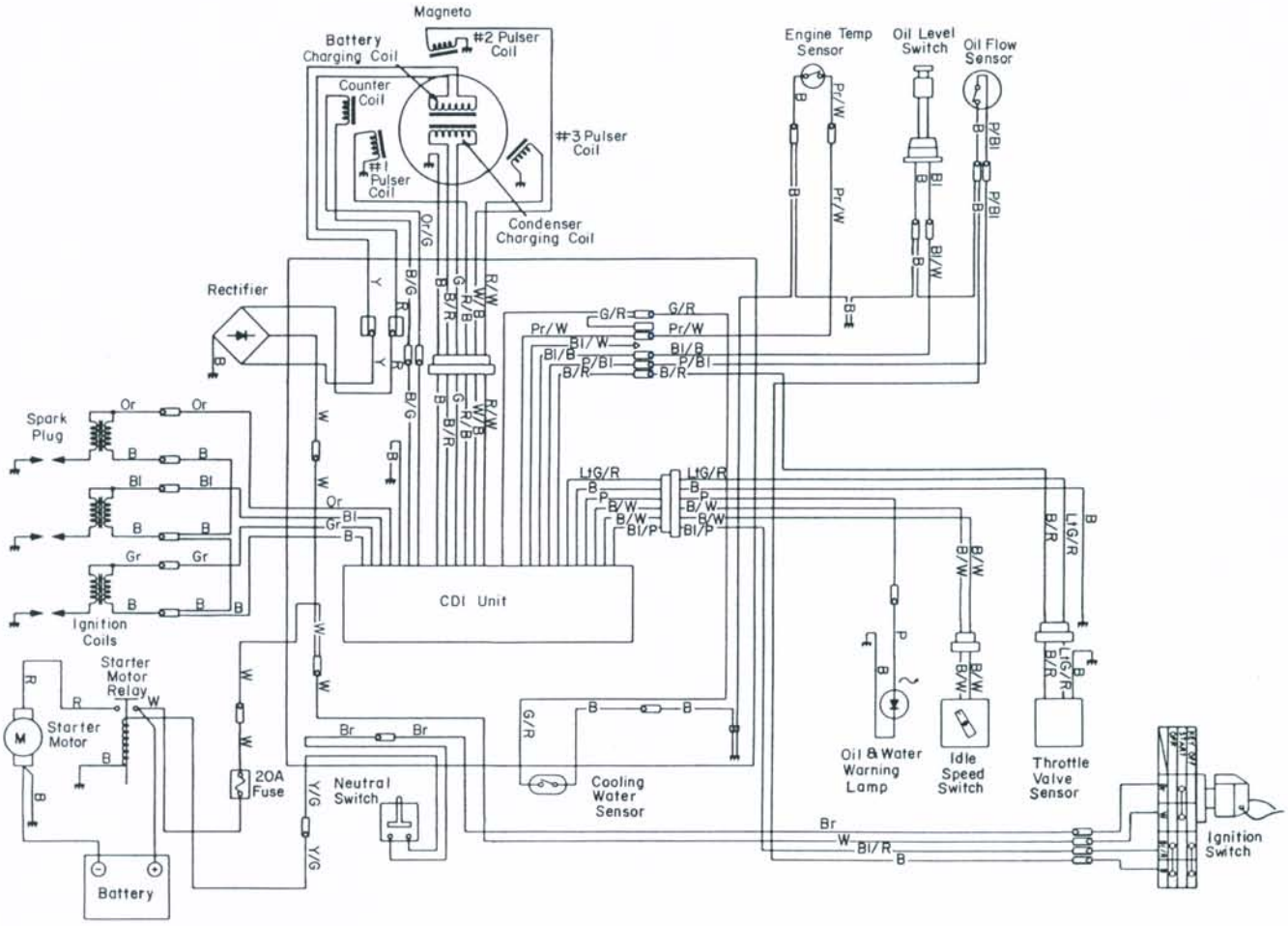

Fig. SZ11-44—Wiring diagram of electrical system on models equipped with electric starter.

B. Black
G. Green
P. Pink
R. Red
Y. White
W. White
Bl. Blue
Br. Brown
Gr. Gray
Or. Orange
Pr. Purple
B/G. Black with green tracer
B/R. Black with red tracer
B/W. Black with white tracer
G/R. Green with red tracer
R/B. Red with black tracer
R/G. Red with green tracer
R/W. Red with white tracer
R/Y. Red with yellow tracer
W/B. White with black tracer
W/R. White with red tracer
Y/B. Yellow with black tracer
Y/G. Yellow with green tracer
Bl/B. Blue with black tracer
Bl/P. Blue with pink tracer
Bl/R. Blue with red tracer
Bl/W. Blue with white tracer
Or/G. Orange with green tracer
P/Bl. Pink with blue tracer
Pr/W. Purple with white tracer
Lt G/R. Light green with red tracer

Illustrations courtesy Suzuki

digital voltmeter as shown in Fig. SZ11-48. Make sure battery voltage is nine volts or more. Sensor output voltage at closed throttle should be 0.45-0.55 volt. If not, move position of sensor on carburetor to obtain specified voltage and securely tighten screws (7). Recheck voltage after tightening screws (7) and if necessary, remove cap (2) and turn adjustment screw to obtain 0.45-0.55 volt. Be sure to reinstall cap (2). After obtaining the correct voltage at closed throttle, remove alignment pin and check sensor output voltage at wide-open throttle. Voltage should be 2.7 volts or higher. Do not attempt to adjust wide-open throttle voltage.

IDLE SPEED SWITCH. Idle speed switch (8—Fig. SZ11-46) malfunction can be quickly verified by checking ignition timing and engine rpm while switching position of idle speed switch. Make sure engine is at idle speed when checking timing.

NOTE: A defective or maladjusted throttle valve sensor may cause idle speed switch to be inoperative or ignition timing at idle speed to be incorrect. Prior to testing idle speed switch, make sure throttle valve sensor is operating properly and correctly adjusted. Refer to THROTTLE VALVE SENSOR section.

Ignition timing at idle speed should be as shown in Fig. SZ11-49. Note that each position of switch should change engine idle speed approximately 50 rpm. If timing and engine rpm do not change with each switch position, idle speed switch is defective and must be renewed.

To test idle speed switch with Suzuki Pocket Tester 09900-25002 or a suitable ohmmeter, disconnect idle switch and connect tester between black wires with white tracer (Fig. SZ11-44). Switch resistance on 1988 models should be as follows: Position (A—Fig. SZ11-49)—zero ohm; position (B)—2200 ohms; position (C)—4700 ohms; position (D)—13,000 ohms; position (E)—infinity. Switch resistance on 1989 models should be as follows: Position (A—Fig. SZ11-49)—zero ohm; position B—11,000 ohms; position C—22,000 ohms; position D—68,000 ohms; position E—infinity. Renew idle speed switch if resistance values are not as specified.

If no components are found to be defective in the previous tests and ignition system malfunction is still suspected, install a known good CDI module and recheck engine operation.

CHARGING SYSTEM

BATTERY CHARGING COIL. Refer to Fig. SZ11-44. Flywheel must be removed for access to battery charging coil. Be sure to use a suitable flywheel puller to remove flywheel. To test coil, separate wires at connectors leading from battery charging coil. On manual start models, connect one lead of Suzuki Pocket Tester 09900-25002 to terminal of yellow wire with red tracer and remaining tester lead to terminal of yellow wire. On models equipped with

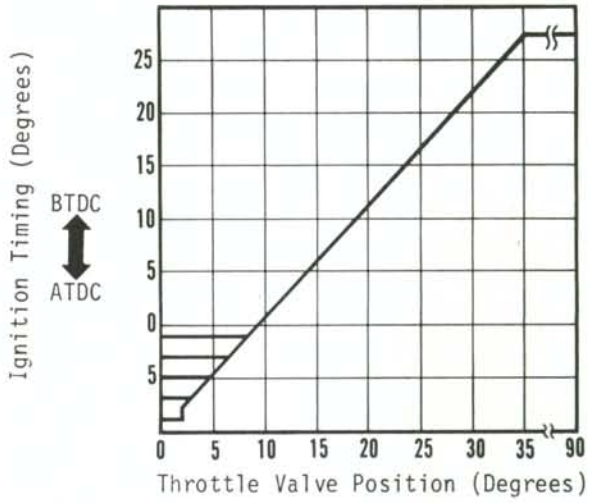

Fig. SZ11-45—Chart showing ignition timing in relation to throttle valve position.

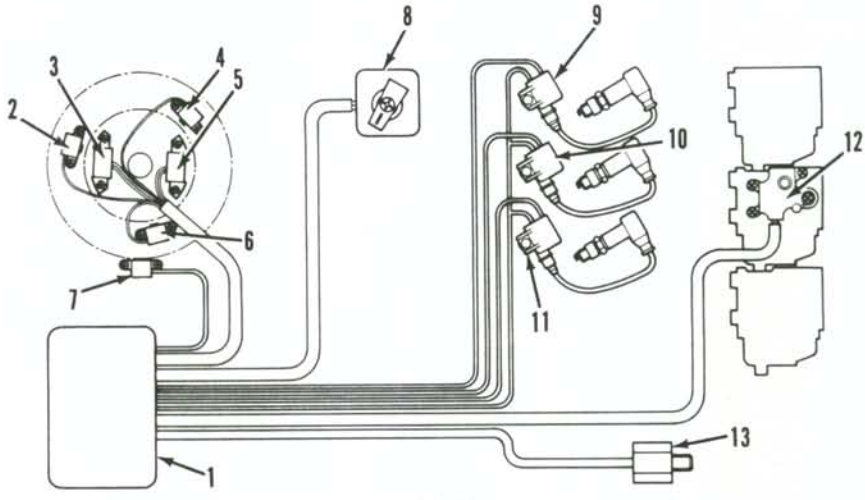

Fig. SZ11-46—Diagram of ignition system components.

1. CDI module
2. Number 2 pulser coil
3. Battery charging coil
4. Number 3 pulser coil
5. Condenser charging coil
6. Number 1 pulser coil
7. Counter coil
8. Idle speed switch
9. Number 1 ignition coil
10. Number 2 ignition coil
11. Number 3 ignition coil
12. Throttle valve sensor
13. Engine temperature sensor

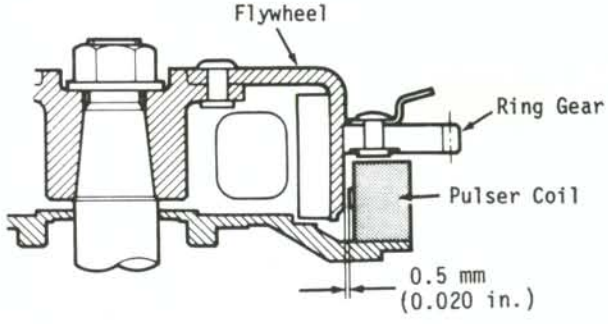

Fig. SZ11-47—Air gap between pulser coils and flywheel should be 0.75 mm (0.029 in.) on 1988 models and 0.5 mm (0.020 in.) on 1989 models measured.

Illustrations courtesy Suzuki

electric start, connect one tester lead to red wire and remaining tester lead to yellow wire. Battery charging coil can be considered acceptable if resistance is within 0.2-0.6 ohm.

RECTIFIER. Use Suzuki Pocket Tester 09900-25002 or equivalent ohmmeter to test rectifier. Refer to Fig. SZ11-50 for view of rectifier assembly and to chart in Fig. SZ11-51 for rectifier test data. Renew rectifier if test results are not as shown in chart.

POWER HEAD

REMOVE AND REINSTALL. To remove power head, remove engine cover, disconnect neutral start interlock cable from lever and remove rewind starter assembly. Remove electric parts holder cover and rectifier cover. Disconnect battery cables, disconnect CDI module wires, and remove CDI module and electric parts holder. Remove oil tank and disconnect throttle valve sensor, choke solenoid, warning lamp, idle speed switch and fuel hose. Disconnect ignition coil wires, remove silencer cover and disconnect choke lever. Remove eight cap screws and separate power head from drive shaft housing.

Before reinstalling power head, make certain drive shaft splines are clean, then apply a light coat of water-resistant grease to shaft splines. Install power head on drive shaft housing while rotating propeller shaft to assist alignment of drive shaft and crankshaft splines. Apply a suitable silicone sealant to threads of retaining screws, then tighten screws to 15-20 N·m (11-15 ft.-lbs.). Remainder of installation is the reverse of removal procedure. Refer to SPEED CONTROL LINKAGE for adjustment procedure.

DISASSEMBLY. Disassemble power head as follows: Remove exhaust tube, carburetors, throttle control lever, rectifier, starter relay and starter motor. Remove fuel filter, fuel pump, oil pump, oil hoses, choke solenoid and intake manifold screws. Carefully pry off intake manifold using a screwdriver or suitable tool. Use caution not to damage mating surfaces. Remove rewind starter mounting brackets, ignition coils, engine temperature sensor, counter coil and starter pulley. Use a suitable puller and remove flywheel. Remove stator assembly, cylinder head, exhaust cover, thermostat cover and thermostat. Remove 14 crankcase screws and carefully separate crankcase from cylinder block. Crankshaft assembly can now be removed from crankcase.

REASSEMBLY. Refer to specific service sections when reassembling the crankshaft, connecting rods, pistons and reed valves. Make sure all joint and gasket surfaces are clean and free from nicks and burrs. Cylinder head and block mating surfaces should not be warped in excess of 0.30 mm (0.012 in.). Cylinder head and block mating surfaces may be lapped using #400 or finer emery paper. Use caution when lapping to not remove any more material than necessary to true mating surfaces. Make sure all carbon, salt, dirt and sand are cleaned from the combustion chambers, exhaust ports and water passages. Lubricate crankpin bearings and cylinder walls with Suzuki Outboard Motor Oil or a suitable NMMA certified TC-WII engine oil. Coat crankcase-to-cylinder block mating surface with Suzuki Bond 1207B or suitable equivalent sealant. Tighten crankcase screws in sequence shown in Fig. SZ11-52. Tighten 6 mm screws to 8-12 N·m (6-9 ft.-lbs.) and 8 mm screws to 20-26 N·m (15-19 ft.-lbs.). Make sure two long clamps (L) are mounted on crankcase where shown. Rotate crankshaft after reassembling crankcase to check for locking or abnormal noise. If locking or abnormal noise is noted, crankcase must be disassembled to determine cause and repaired. Tighten cylinder head screws in sequence shown in Fig. SZ11-53. Tighten 6 mm screws to 8-12 N·m (6-9 ft.-lbs.) and 8 mm screws to 21-25 N·m (15-18 ft.-lbs.). Install clamps (C) where shown. Make sure mating surface of flywheel is clean prior to installation. Tighten flywheel nut to 130-150 N·m (96-111 ft.-lbs.) using appropriate tools. Refer to CONDENSED SERVICE DATA for other fastener tightening values.

PISTONS, PINS, RINGS AND CYLINDERS. Refer to CONDENSED SERVICE DATA for pistons, pins, rings

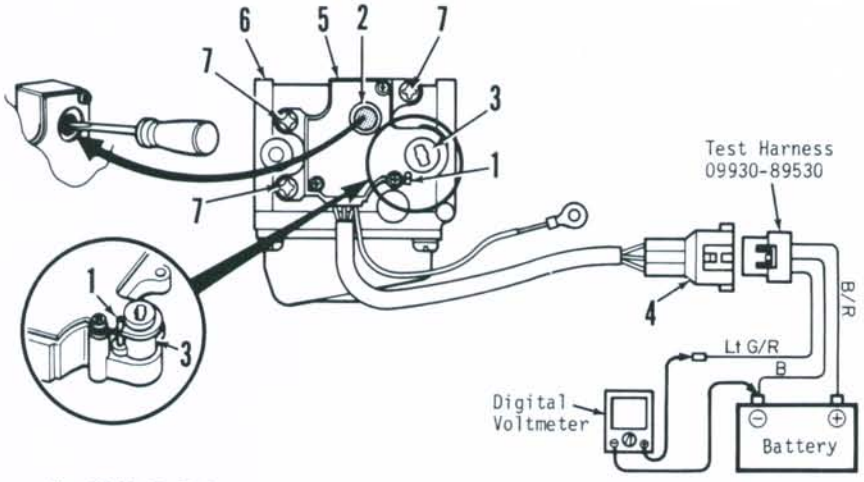

Fig. SZ11-48—Refer to text for throttle valve sensor testing and installation procedure.

1. Alignment pin
2. Cap (adjustment screw)
3. Sensor cam
4. Connector
5. Throttle valve sensor assy.
6. Carburetor
7. Mounting screw

B. Black
B/R. Black with red tracer
LtG/R. Light green with red tracer

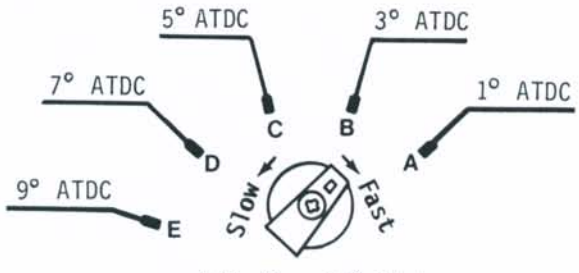

Fig. SZ11-49—Ignition timing at idle speed should be as shown at the corresponding idle speed switch positions.

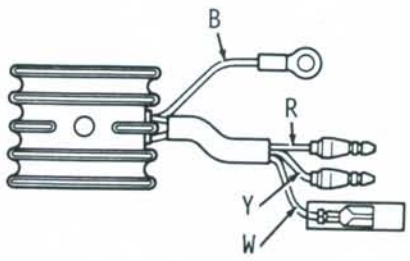

Fig. SZ11-50—View of rectifier assembly. Refer to chart in Fig. SZ11-51 to test rectifier.

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and cylinder service specifications. Each piston is fitted with two piston rings. Pistons are equipped with locating pins in ring grooves to prevent piston ring rotation. Measure piston diameter 23 mm (0.9 in.) up from bottom of skirt at a right angle to piston pin bore. Pistons and rings are available in standard size and 0.25 mm (0.010 in.) and 0.50 mm (0.020 in.) oversize. Install pistons on connecting rods so arrow on piston crown will face exhaust ports upon reassembly. All cylinders should be bored to next oversize if any cylinder is out-of-round or tapered in excess of 0.10 mm (0.004 in.).

CRANKSHAFT, CONNECTING RODS AND BEARINGS. Connecting rods, bearings and crankshaft are a press together unit. Crankshaft should be disassembled ONLY by experienced service personnel using appropriate service equipment.

Determine connecting rod bearing wear from side-to-side movement as shown in Fig. SZ11-55. Normal side-to-side movement (A) is 5.0 mm (0.197 in.) or less. If movement exceeds 5.0 mm (0.197 in.), connecting rod, crankpin and crankpin needle bearing should be renewed. Maximum allowable crankshaft runout is 0.05 mm (0.002 in.) measured at bearing surfaces with ends of crankshaft supported in V-blocks.

Apply Suzuki Super Grease "A" or a suitable equivalent to seal lips. When installing crankshaft assembly into cylinder block, make sure seals properly engage grooves in block. Make sure bearing pins properly engage notches in cylinder block.

MANUAL STARTER

Refer to Fig. SZ11-56 for exploded view of manual rewind starter assembly. To remove starter assembly, remove screw (18) and clamp (19), detach neutral start cable (12) and remove three screws securing starter assembly to power head. To disassemble starter, remove cotter pin (13), washer (14), arm (15), spring (16) and lever (17). To relieve rewind spring tension, invert starter housing and grasp a section of rope, place rope into notch (N—Fig. SZ11-57) provided in rope pulley (7). Holding rope as shown, allow pulley (7) to rotate clockwise relieving rewind spring tension. Remove screw (2—Fig. SZ11-56), plate (3) and friction spring (4). Remove pawl (5) and spring (6), then carefully lift out rope pulley (7) making sure rewind spring (8) remains in housing (11). Using suitable hand and eye protection, carefully remove rewind spring (8) from housing (11).

Inspect all components for excessive wear or other damage and renew as necessary. Reassemble starter in the reverse order of disassembly noting the following: Starting with inner coil, wind rewind spring into housing in clockwise direction. Apply a suitable water-resistant grease to rewind spring. Wind rope onto pulley (7) 2½ turns in counterclockwise direction (viewed from flywheel side) and install pulley (7) into housing. Make sure pulley properly engages hook on inner coil of rewind spring. Apply water resistant grease to both sides of plate (3). To preload rewind spring, place rope into notch of rope pulley as shown in Fig. SZ11-57 and rotate rope pulley four turns counterclockwise. Release rope and allow remaining rope to wind onto pulley. Install starter assembly on power head and connect neutral start cable. With clutch lever in neutral position, slot (S—Fig. SZ11-58) should align with mark (N) on housing (11). With clutch lever in forward or reverse gear, slot (S) should be centered between marks (M). Loosen screw (18) and move cable (12) to adjust. Make sure starter will operate only in neutral position.

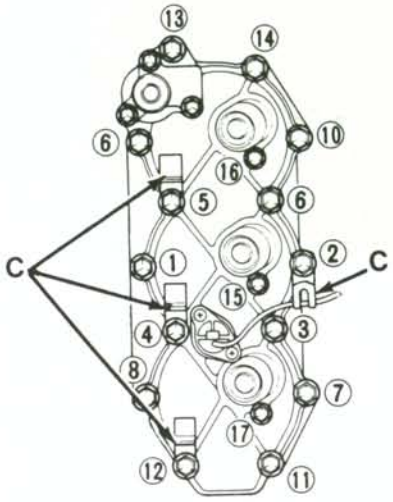

Fig. SZ11-53—Tighten cylinder head screws in sequence shown. Tighten 6 mm screws to 8-12 N·m (6-9 ft.-lbs.) and 8 mm screws to 21-25 N·m (15-18 ft.-lbs.). Note location of clamps (C).

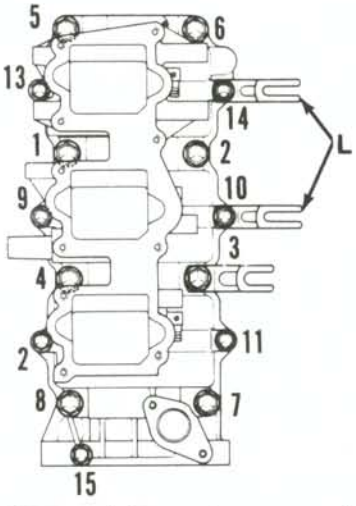

Fig. SZ11-52—Tighten crankcase screws in sequence shown. Tighten 6 mm screws to 8-12 N·m (6-9 ft.-lbs.) and 8 mm screws to 20-26 N·m (15-19 ft.-lbs.). Make sure long clamps (L) are positioned as shown.

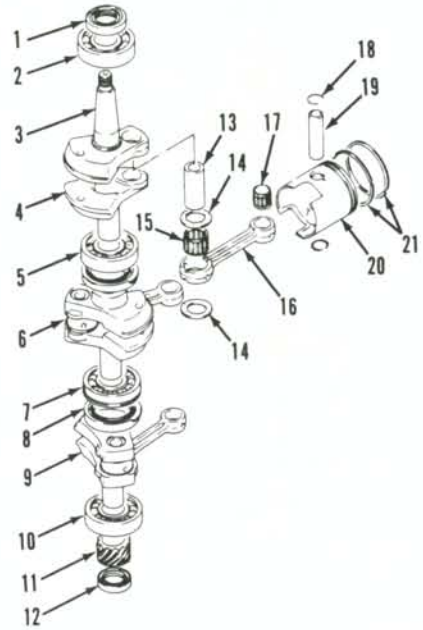

Fig. SZ11-54—Exploded view of piston and crankshaft assembly.

1. Seal
2. Main bearing
3. Crank half
4. Crank half
5. Main bearing
6. Center crankshaft assy.
7. Main bearing
8. Seal
9. Lower crankshaft assy.
10. Main bearing
11. Oil pump drive gear
12. Seal
13. Crank pin
14. Thrust washer
15. Needle bearing
16. Connecting rod
17. Needle bearing
18. Retainer
19. Piston pin
20. Piston
21. Piston rings

⊖ LEAD OF TESTER	⊕ LEAD OF TESTER: Black	White	Yellow	Red
Black		5,500 - 8,500Ω	2,200 - 3,200Ω	2,200 - 3,200Ω
White	∞		∞	∞
Yellow	∞	2,200 - 3,200Ω		∞
Red	∞	1,700 - 2,700Ω	∞	

Fig. SZ11-51—Refer to Fig. SZ11-50 and use chart shown to test rectifier assembly.

Illustrations courtesy Suzuki

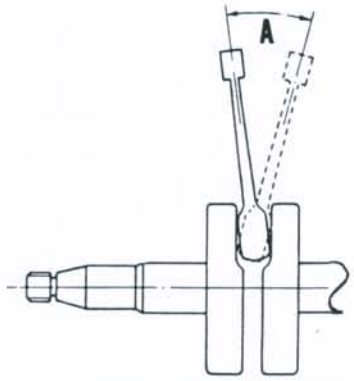

Fig. SZ11-55—Move connecting rod small end side-to-side to determine connecting rod, bearing and crankpin wear. Maximum allowable small end play (A) is 5.0 mm (0.197 in.).

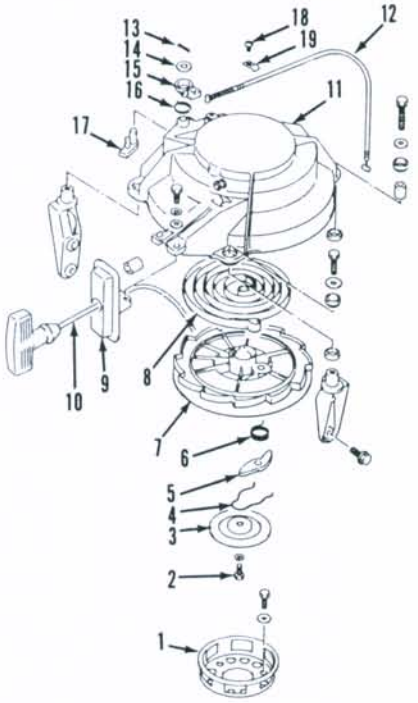

Fig. SZ11-56—Exploded view of manual starter assembly.

1. Cup
2. Screw
3. Plate
4. Friction spring
5. Pawl
6. Spring
7. Rope pulley
8. Rewind spring
9. Rope guide
10. Rope
11. Housing
12. Neutral start cable
13. Cotter pin
14. Washer
15. Arm
16. Spring
17. Lever
18. Screw
19. Clamp

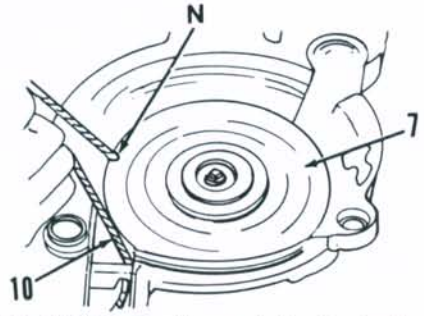

Fig. SZ11-57—To relieve rewind spring tension, grasp rope (10) as shown, place rope into notch (N) and allow pulley (7) to rotate clockwise.

ELECTRIC STARTER

Refer to Fig. SZ11-59 for exploded view of electric starter assembly used on models so equipped. Disassembly is evident after inspection of unit and referral to exploded view. Standard commutator outside diameter is 30 mm (1.18 in.). Renew armature (6) if commutator is worn to less than 29 mm (1.14 in.). Standard undercut between commutator segments is 0.5-0.8 mm (0.020-0.031 in.) with a minimum allowable undercut of 0.2 mm (0.008 in.). Renew brushes (8) if worn to 9 mm (0.354 in.) or less. During reassembly, make sure upper and lower alignment marks on frame (7) align with notches in end frames (5 and 10). Tighten through-bolts (11) to 15-20 N·m (11-15 ft.-lbs.). Bench test starter prior to installing on power head.

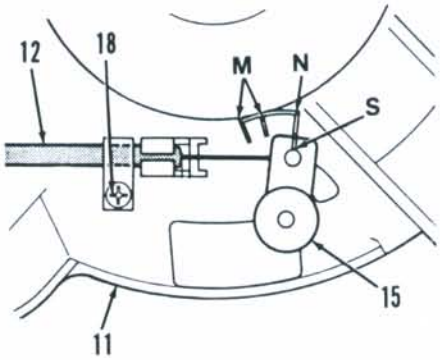

Fig. SZ11-58—With clutch lever in neutral position, slot (S) in arm (15) should align with mark (N) on housing (11). With clutch lever in forward or reverse gear, slot (S) should be in center of marks (M). Loosen screw (18) and move cable (12) to adjust.

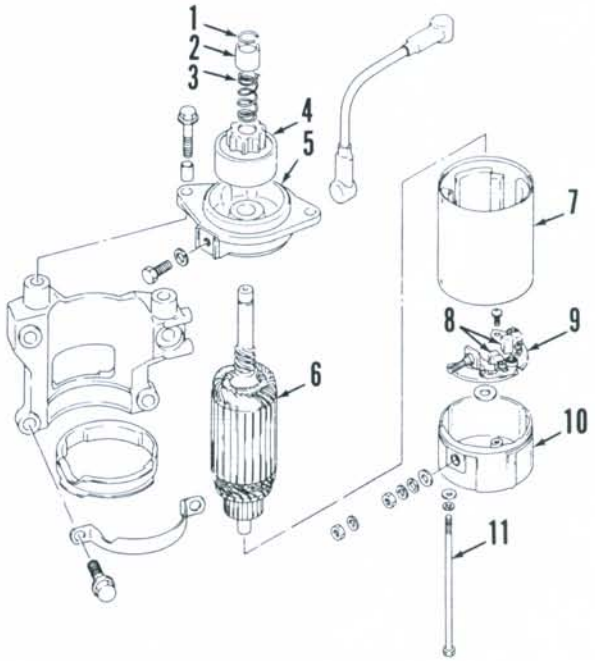

Fig. SZ11-59—Exploded view of electric starter assembly.

1. Retainer
2. Stop
3. Spring
4. Drive assy.
5. End frame
6. Armature
7. Frame
8. Brushes
9. Brush holder
10. End frame
11. Through-bolt

LOWER UNIT

PROPELLER AND DRIVE CLUTCH. Protection for the motor is built into a special cushioning clutch in the propeller hub. No adjustment is possible on the propeller or clutch. Three-blade propellers are used. Propellers are available from the manufacturer in various diameters and pitches and should be selected to provide optimum performance at full throttle within the recommended limits of 5000-5600 rpm.

R&R AND OVERHAUL. Refer to Fig. SZ11-60 for exploded view of lower unit gearcase assembly. During disassembly, note the location of all shims and washers to aid in reassembly.

To remove gearcase, first remove drain plug (25) and level plugs (23) and drain gearcase lubricant. Loosen shift rod locknut (6—Fig. SZ11-61) and turn adjustment nut (5) until upper and lower shift rods are separated. Remove six screws and separate gearcase assembly from drive shaft housing. Remove propeller and two screws securing bearing carrier (36—Fig. SZ11-60) to gearcase (27). Using a suitable slide hammer type puller, carefully extract bearing carrier and propeller shaft assembly. Remove water pump housing (4), impeller (6), key (5), plate (7) and gasket (8). Install drive shaft holder 09921-29610 or equivalent on upper spline of drive shaft (14), then remove pinion gear nut (30) by turning drive shaft. Remove two remaining screws securing bearing housing (9) to gearcase. Use two 6 mm screws positioned as shown in Fig. SZ11-62 and tighten screws in equal increments to

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withdraw upper bearing housing and drive shaft components. Reach into gearcase and remove pinion gear (29—Fig. SZ11-60), shim (28), forward gear (54), shim (55) and bearing (57). Refer to Fig. SZ11-63 and remove screw securing shift rod guide holder (10—Fig. SZ11-61). Lift lower shift rod assembly out top of gearcase.

Inspect all components for excessive wear or other damage. Apply a suitable water-resistant grease to lip area of all seals. Renew all seals, gaskets and "O" rings upon reassembly.

Reassemble lower unit in reverse order of disassembly noting the following: Install dog clutch (51—Fig. SZ11-64) on propeller shaft (47) so side marked "F" is toward forward gear (54—Fig. SZ11-60). If removed, install pinion bearing (22) into gearcase using a suitable driver. Be sure lettered side of bearing (22) faces up. Apply Suzuki Thread Lock 1342 or a suitable equivalent to threads of pinion nut (30) and tighten nut to 27-30 N·m (20-22 ft.-lbs.). Forward gear-to-pinion gear backlash should be 0.1-0.2 mm (0.004-0.008 in.). Adjust thickness

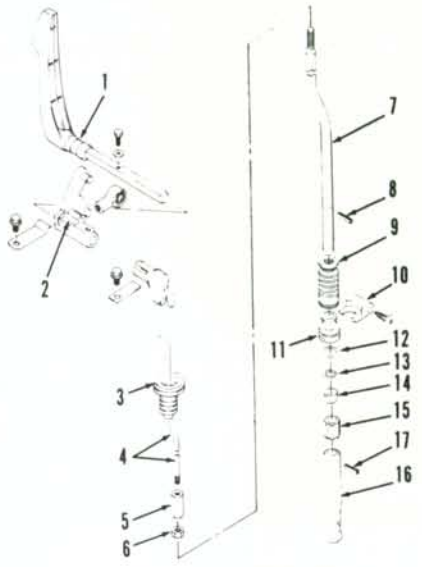

Fig. SZ11-61—Exploded view of shift control linkage components.

1. Shift lever
2. Lever
3. Boot
4. Upper shift rod
5. Adjustment nut
6. Locknut
7. Lower shift rod
8. Pin
9. Boot
10. Guide holder
11. Guide
12. "O" ring
13. "O" ring
14. Spacer
15. Magnet
16. Shift cam
17. Pin

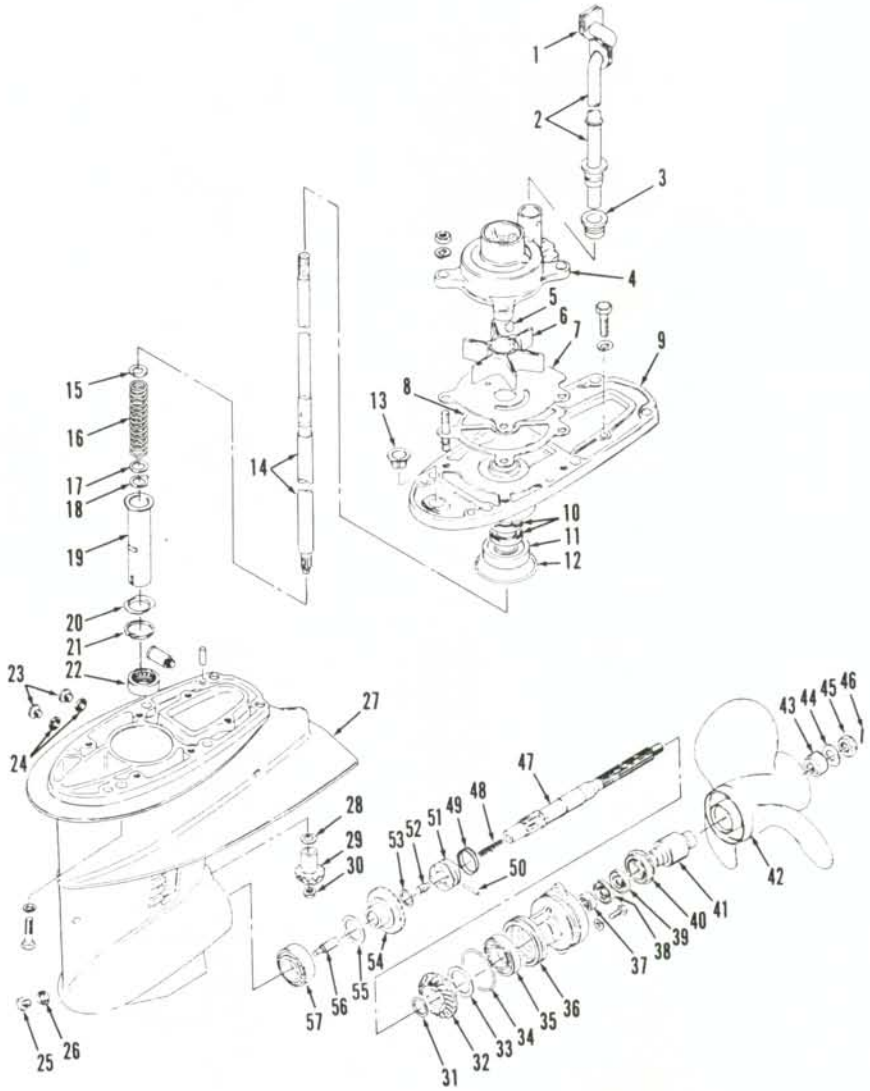

Fig. SZ11-60—Exploded view of lower unit gearcase assembly.

1. Grommet
2. Water tube
3. Grommet
4. Water pump housing
5. Key
6. Impeller
7. Plate
8. Gasket
9. Bearing housing
10. Seal
11. Bearing
12. "O" ring
13. Bushing
14. Drive shaft
15. Washer
16. Spring
17. Thrust washer
18. Washer
19. Collar
20. Barrier
21. Snap ring
22. Bearing
23. Level plug
24. Gasket
25. Drain plug
26. Gasket
27. Gearcase
28. Shim
29. Pinion gear
30. Nut
31. Shim
32. Reverse gear
33. Shim
34. "O" ring
35. Bearing
36. Bearing carrier
37. Bearing
38. Seal
39. Seal
40. Spacer
41. Bushing
42. Propeller
43. Spacer
44. Washer
45. Nut
46. Cotter pin
47. Propeller shaft
48. Spring
49. Retainer
50. Pin
51. Dog clutch
52. Pin
53. Thrust washer
54. Forward gear
55. Shim
56. Push rod
57. Bearing

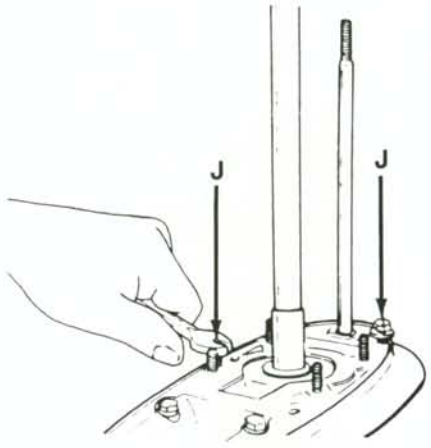

Fig. SZ11-62—Use two 6 mm jackscrews (J) to withdraw upper bearing housing with drive shaft components.

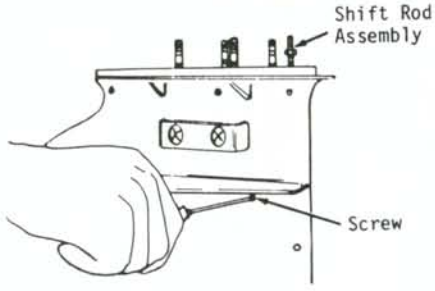

Fig. SZ11-63—To remove lower shift rod assembly, remove screw securing shift rod guide holder and pull shift rod out top of gearcase.

of shims (28 and 55) to obtain specified backlash. After obtaining the proper backlash, check pinion gear-to-forward gear mesh pattern. Add and subtract equally from shims (28 and 55) to obtain correct mesh pattern while maintaining the correct forward gear-to-pinion gear backlash. Assembled propeller shaft end play should be 0.2-0.4 mm (0.008-0.016 in.). Adjust thickness of shim (31) to obtain the specified propeller shaft end play. Recheck pinion gear backlash. If necessary, adjust thickness of reverse gear shim (33) so backlash is the same as previously adjusted forward gear-to-pinion gear backlash setting. Tighten propeller shaft bearing carrier (36) screws to 15-20 N·m (11-15 ft.-lbs.).

Adjust shift rod adjustment nut (5—Fig. SZ11-61) until the proper engagement of "Forward," "Neutral" and "Reverse" is obtained. Tighten locknut (6) to secure adjustment nut. Refer to LUBRICATION section and fill gearcase with the appropriate type and amount of lubricant.

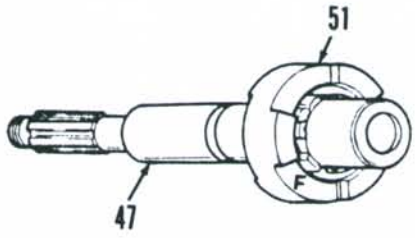

Fig. SZ11-64—Install dog clutch (51) on propeller shaft (47) so the "F" mark is facing forward.

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