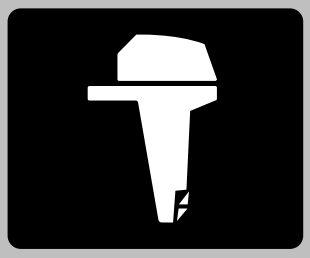
YAMAHA



F100B
F100C

SERVICE MANUAL

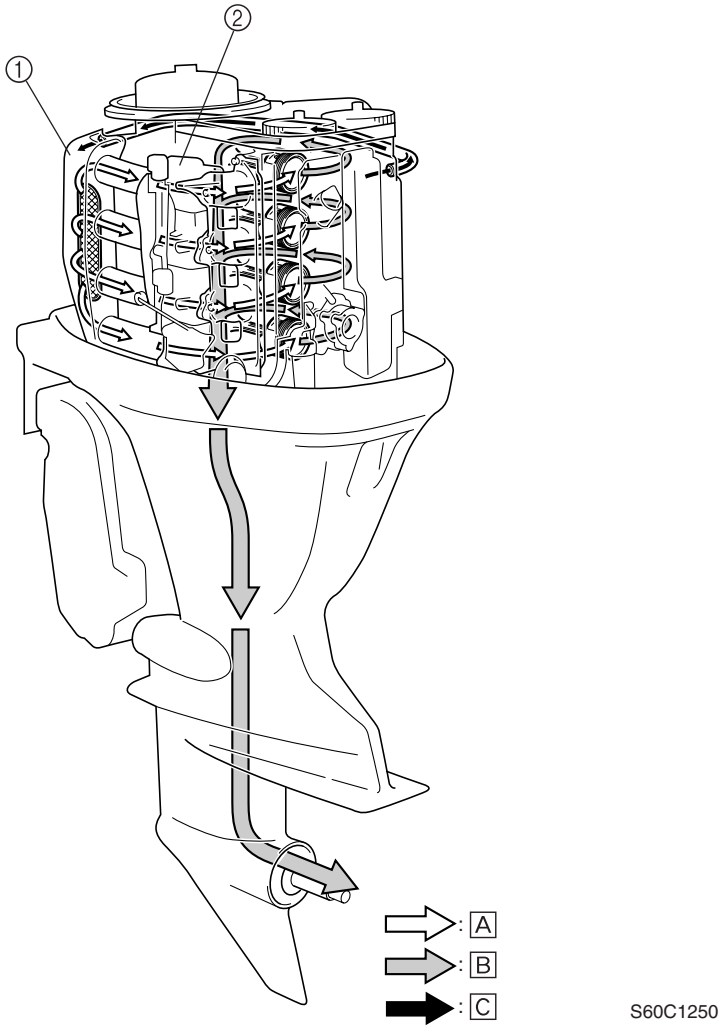
290429

60C-28197-5D-11

Features and benefits

Power unit

The F100B and F100C have been developed on the bases of the F100A, which has been recognized as being environmentally friendly, with established emission control, and which has received high marks as an efficiently superior model with a high fuel economy.
Blowby gas, which is discharged from the engine, is returned to the intake silencer and reburned to purify the exhaust gas.
The intake passage and exhaust passage have been arranged around the engine to make the entire engine compact. When compared to a small, 2-stroke, V4 engine it is compact like an in-line, three cylinder engine.



S60C1250

① Silencer
② Carburetor

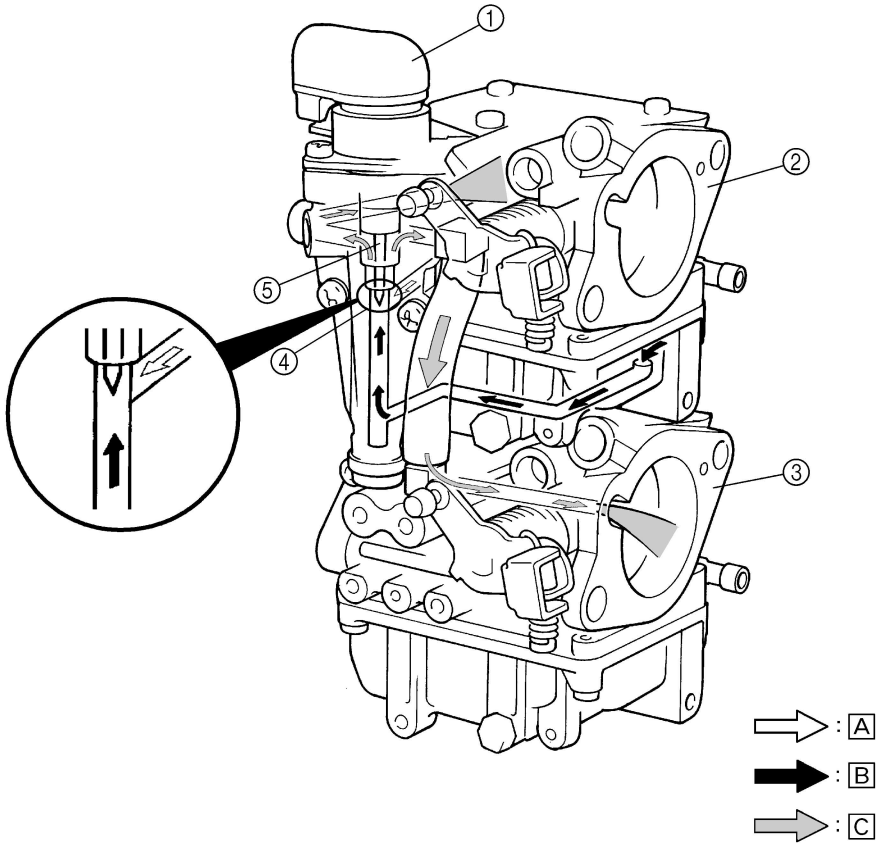
A Intake
B Exhaust gas
C Blowby gas

Technical tips

Carburetor

Prime start

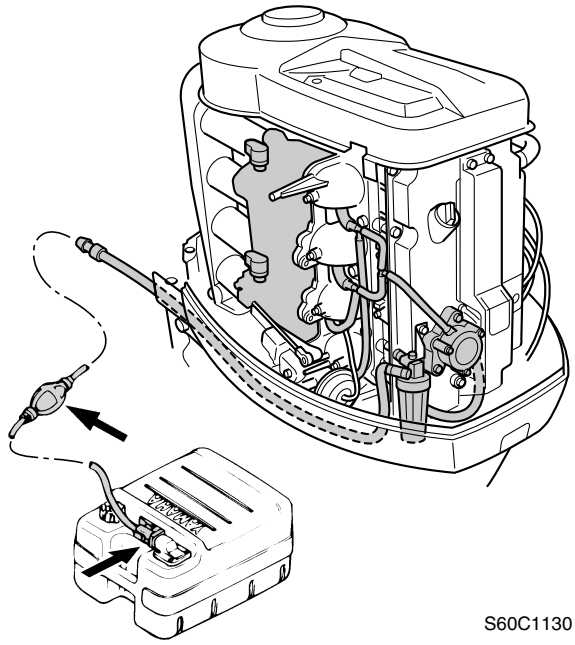
To facilitate the starting of a cold engine, an air-fuel mixture that is richer than normal is required. For this reason, the Prime Start system has been adopted in the F100B and F100C. In the Prime Start system, the thermo heater plunger is in a position that fully opens the fuel enrichment valve while the engine is being started. Thus, fuel enrichment is achieved during the starting of the engine, and continues while the engine is being warmed up. Once the engine is started, a signal is sent from the pulser coil to the CDI, and from the CDI to the Prime Start to allow the wax to expand. The expanded wax moves the thermo heater plunger in the direction to close the enrichment valve. As a result, the volume of fuel that passes through the fuel enrichment valve decreases. A few minutes after the engine has started, the thermo heater plunger completely closes the fuel enrichment valve, thus ending the fuel enrichment by the Prime Start system.



S60C1420

① Prime Start
② Carburetor #1/#3
③ Carburetor #2/#4
④ Fuel enrichment valve
⑤ Thermo heater plunger

A Air
B Fuel
C Air-fuel mixture



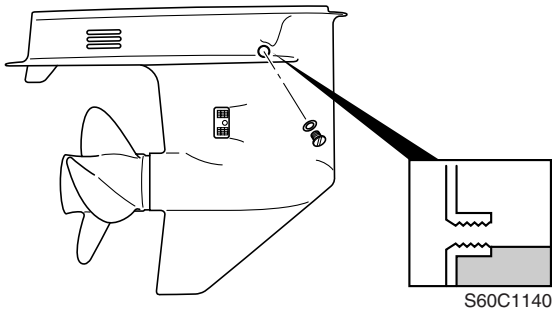
S60C1130

CAUTION:

This is a 4-stroke engine. Never use premixed fuel.

Checking the gear oil

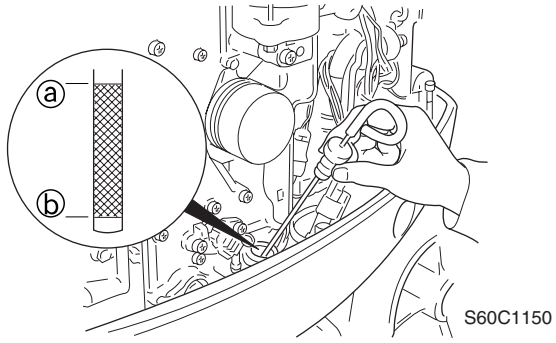
1. Check the gear oil level.



S60C1140

Checking the engine oil

1. Check the oil level.



S60C1150

NOTE:

- If the engine oil is above the maximum level mark ⓐ, drain sufficient oil until the level is between ⓐ and ⓑ.
- If the engine oil is below the minimum level mark ⓑ, add sufficient oil until the level is between ⓐ and ⓑ.

Recommended engine oil:
4-stroke motor oil
API: SE, SF, SG, or SH
SAE: 10W-30, 10W-40, or 20W-40
Oil capacity:
Without oil filter replacement:
4.5 L (4.8 US qt, 4.0 Imp qt)

Checking the battery

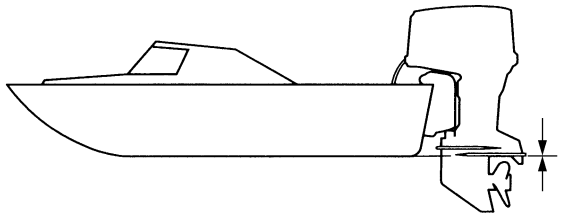
1. Check the capacity, electrolyte level, and specified gravity of the battery.

Battery capacity: 70–100 Ah
Minimum cold cranking performance:
380 A
Electrolyte specific gravity:
1.28 at 20 °C (68 °F)

2. Check that the positive and negative battery leads are securely connected.

Checking the outboard motor mounting position

1. Check the position of the anti-cavitation plate.



S60C1160

2. Check that the clamp brackets are secured with the clamp bolts.

Item	Unit	Model	
		F100BET	F100CET
Oil pump			
Discharge at 100 °C (212 °F) with 10W-30 engine oil	L (US gal, Imp gal)/min at 1,000 r/min	5.9 (1.56, 1.30)	
Thermostats			
Opening temperature	°C (°F)	50 (122)	
Fully open temperature	°C (°F)	60 (140)	
Valve open lower limit	mm (in)	4.3 (0.17)	
Fuel pump			
Discharge	L (US gal, Imp gal)/hr at 6,000 r/min	100 (26.4, 22)	
Pressure	kPa (kgf/cm^2, psi)	26–98 (0.26–0.98, 3.7–13.9)	
Carburetor			
ID mark		60C00	
Main jet	#	128	
Main air jet	#	75	
Pilot jet	#	42	
Pilot air jet	#	85	
Midrange jet	#	40	
Pilot screw	turns out	1 1/2–2 1/2	
Float height	mm (in)	12.5–15.5 (0.49–0.61)	
Engine idle speed	r/min	800–900	

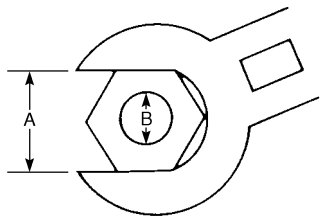
Lower unit

Item	Unit	Model	
		F100BET	F100CET
Gear backlash			
Pinion-to-forward gear	mm (in)	0.19–0.53 (0.007–0.021)	0.13–0.47 (0.005–0.019)
Pinion-to-reverse gear	mm (in)	0.86–1.26 (0.034–0.050)	—
Pinion shims	mm	0.10, 0.12, 0.15, 0.18, 0.30, 0.40, 0.50	
Forward gear shims	mm	0.10, 0.12, 0.15, 0.18, 0.30, 0.40, 0.50	
Reverse gear shims	mm	0.10, 0.12, 0.15, 0.18, 0.30, 0.40, 0.50	—

Part to be tightened	Thread size	Tightening torques		
		N·m	kgf·m	ft·lb
Power trim and tilt unit (F100B)				
Reservoir bolt	M6	5	0.5	3.6
Reservoir cap	—	7	0.7	5.1
PTT motor bolt	M6	5	0.5	3.6
Manual valve	—	3	0.3	2.2
Gear pump assembly bolt	M8	9	0.9	6.5
Gear pump bolt	M5	6	0.6	4.3
Tilt cylinder end screw	—	130	13	94
Tilt piston nut	—	100	10	72
Trim cylinder end screw	—	80	8.0	58
Power trim and tilt unit (F100C)				
Tilt cylinder end screw	—	90	9.0	65
Reservoir cap	—	7	0.7	5.1
Pump housing assembly	—	9	0.9	6.5
Trim cylinder end screw	—	80	8.0	58
Tilt piston bolt	M12	85	8.5	61
Gear pump bolt	M6	8	0.8	5.8
Main valve	—	11	1.1	8.0
Manual valve	—	2	0.2	1.4
Manual valve seat	—	4	0.4	2.9
Electrical unit				
Throttle position sensor screw	—	4	0.4	2.9

General torques

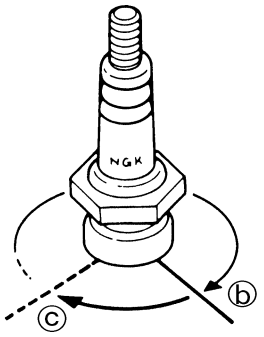
This chart specifies tightening torques for standard fasteners with a standard ISO thread pitch. Tightening torque specifications for special components or assemblies are provided in applicable sections of this manual. To avoid warpage, tighten multi-fastener assemblies in a crisscross fashion and progressive stages until the specified torque is reached. Unless otherwise specified, torque specifications require clean, dry threads.
Components should be at room temperature.



S60C2190

Nut (A)	Bolt (B)	General torque specifications		
		N·m	kgf·m	ft·lb
8 mm	M5	5	0.5	3.6
10 mm	M6	8	0.8	5.8
12 mm	M8	18	1.8	13
14 mm	M10	36	3.6	25
17 mm	M12	43	4.3	31

6. Install the spark plug, tighten it finger tight ⓑ, then to the specified torque with a spark plug wrench ⓒ.

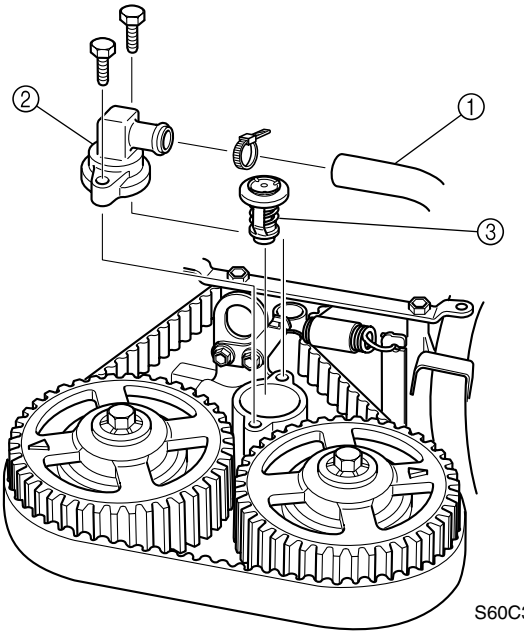


S60C3310

	Spark plug: 25 N·m (2.5 kgf·m, 18 ft·lb)

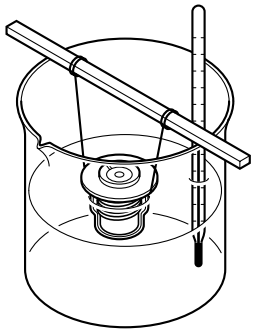
Checking the thermostat

1. Remove the flywheel magnet cover.
2. Disconnect the cooling water hose ①, and then remove the thermostat cover ② and thermostat ③.

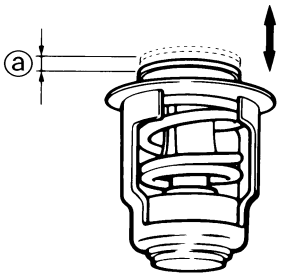


S60C3320

3. Suspend the thermostat in a container of water.
4. Place a thermometer in the water and slowly heat the water.


S60C3330

5. Check the thermostat valve opening at the specified water temperatures. Replace if out of specification.



S60C3340

Water temperature	Valve lift ⓐ
50 °C (122 °F)	0 mm (0 in)– (When the valve begins to open.)
above 60 °C (140 °F)	more than 4.3 mm (0.17 in)

6. Install the thermostat, new gasket, thermostat cover, and then connect the cooling water hose.
7. Install the flywheel magnet cover.

Checking the cooling water passage

1. Check the cooling water inlet cover ① and cooling water inlet ② for clogs. Clean if necessary.

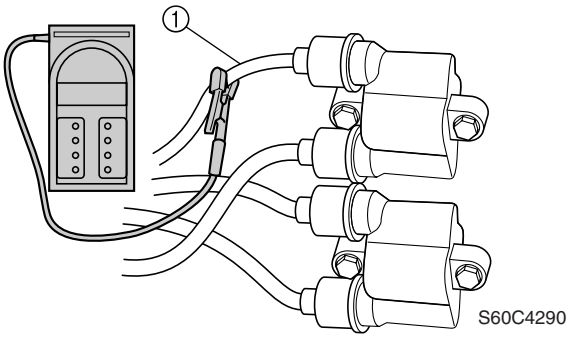
Fuel system

No.	Part name	Q'ty	Remarks
1	Throttle cam	1	
2	Throttle link rod	1	
3	Throttle position sensor	1	
4	Bracket	1	
5	Throttle control lever	1	
6	Bracket	1	
7	Washer	1	
8	Spring	1	
9	Washer	1	
10	Wave washer	1	
11	Collar	1	
12	Bolt	1	M6 × 35 mm
13	Bolt	1	M6 × 12 mm
14	Washer	1	
15	Wave washer	1	
16	Washer	1	
17	Collar	1	
18	Bolt	2	M6 × 25 mm
19	Collar	1	
20	Pin	1	
21	Spacer	1	
22	Screw	2	M5 × 25 mm
23	Screw	2	M5 × 10 mm

Synchronizing the carburetors

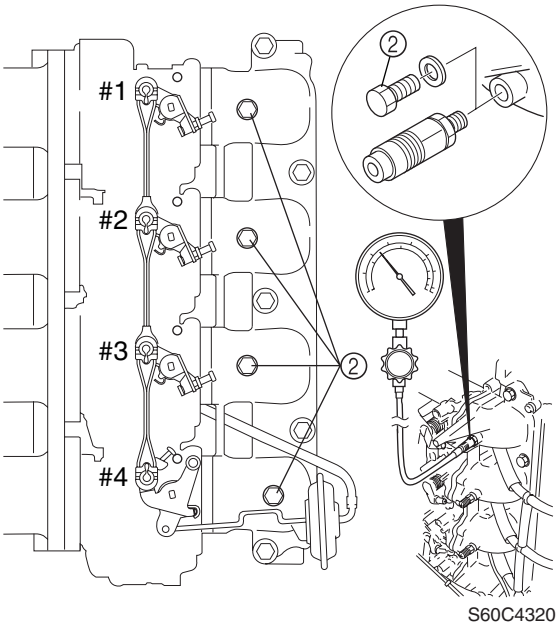
1. Start the engine and warm it up for 5 minutes to check the stability of the engine.

2. Attach the special service tool to high-tension cord #1 ①.

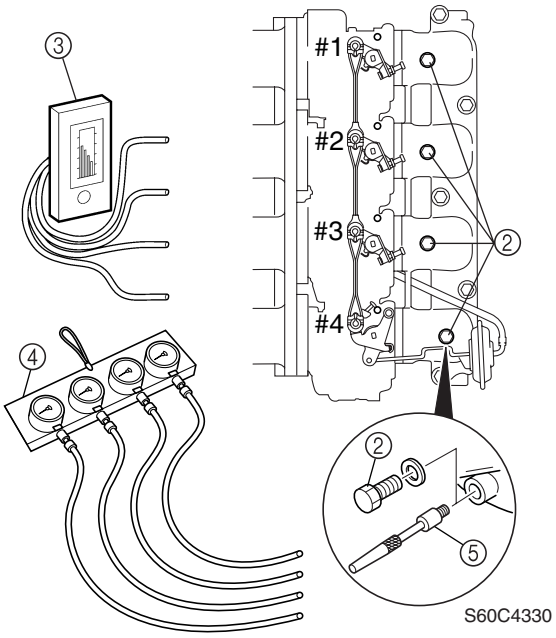


Digital tachometer: 90890-06760

3. Remove all of the plugs ② and attach the special service tool and adapters to the carburetor assembly as shown.

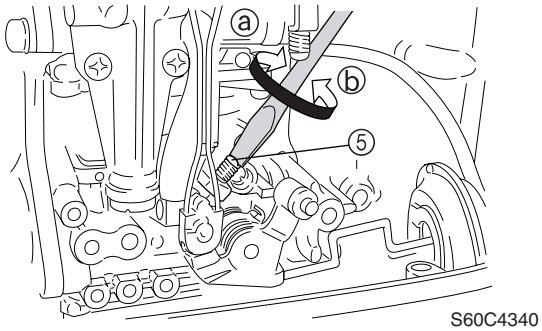


Vacuum gauge: 90890-03159



Vacuum gauge (digital) (commercially obtainable) ③:
Vacuum gauge (4 analog meters) (commercially obtainable) ④:
Vacuum gauge adaptor (commercially obtainable) ⑤:

4. Adjust the idle speed to 1,000 r/min by turning the throttle stop screw ⑤ on carburetor #4 in direction ⓐ or ⓑ.



NOTE:
- To increase idle speed, turn the throttle stop screw in direction ⓐ.
- To decrease idle speed, turn the throttle stop screw in direction ⓑ.

5. Measure the vacuum pressure of carburetor #4.

10. Measure the valve pad thickness with a micrometer.
    Select the necessary valve pad by calculating its thickness with the following formula.

Necessary valve pad thickness = Removed valve pad thickness + Measured valve clearance – Specified valve clearance

Example:
If the “Removed valve pad thickness” is 2.10 mm, the “Checked valve clearance” is 0.30 mm and the “Specified valve clearance” is 0.20 mm, then the necessary valve pad thickness = 2.10 + 0.30 – 0.20 = 2.20 mm

11. Install the necessary valve pad into the valve lifter.

12. Install the camshafts, camshaft caps, driven sprockets, and timing belt, and then tighten the tensioner bolt.

Camshaft cap bolt: 1st: 8 N·m (0.8 kgf·m, 5.8 ft·lb) 2nd: 17 N·m (1.7 kgf·m, 12 ft·lb)

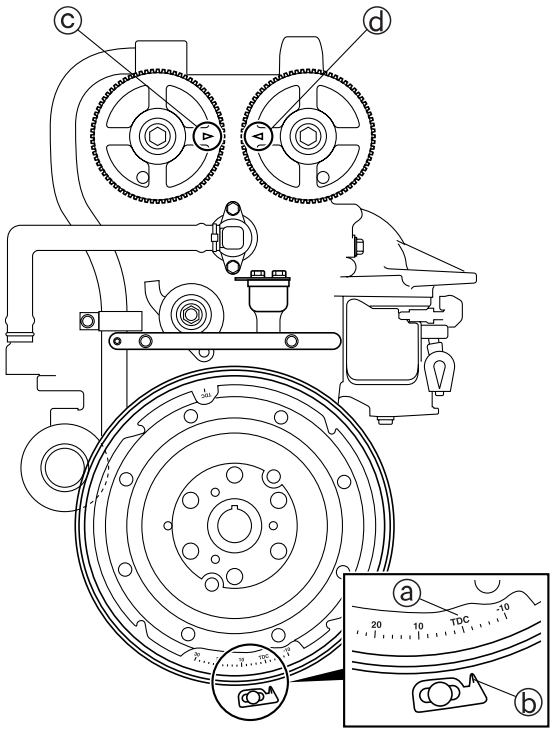
13. Check the valve clearance. Adjust if necessary.

14. Loosen the tensioner bolt, and then remove the timing belt and driven sprockets.

15. Install the cylinder head cover and driven sprockets.

Cylinder head cover: 8 N·m (0.8 kgf·m, 5.8 ft·lb) Driven sprocket: 60 N·m (6.0 kgf·m, 43 ft·lb)

16. Check that the TDC mark ⓐ on the flywheel magnet is aligned with the pointer ⓑ, and that “▲” marks ⓒ and ⓓ on the driven sprockets are aligned. Adjust if necessary.



S60C3280

CAUTION:
- **Do not turn the flywheel magnet counterclockwise, otherwise the valve system may be damaged.**
- **Do not remove the ignition timing pointer.**

17. Install the timing belt, and then tighten the tensioner bolt finger tight.

18. Turn the flywheel magnet clockwise two turns, and then check that the alignment marks are aligned.

19. Tighten the tensioner bolt to the specified torque.

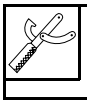
Tensioner bolt: 39 N·m (3.9 kgf·m, 28 ft·lb)

20. Install the spark plugs, and then connect the high-tension cords and fuel hoses.

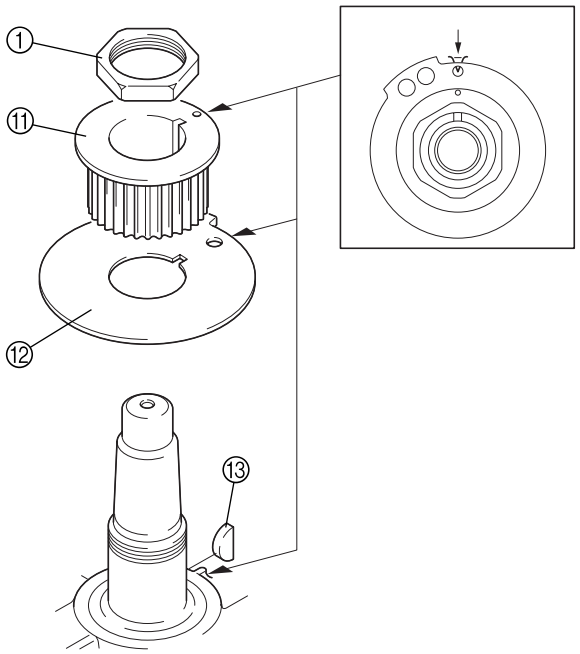
Spark plug: 25 N·m (2.5 kgf·m, 18 ft·lb)

5

NOTE:
Do not turn the camshaft when loosening the driven sprocket bolt.

	Flywheel holder: 90890-06522

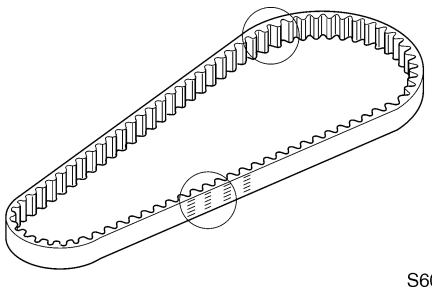
6. Remove the nut ①, drive sprocket ⑪, retaining plate ⑫, and Woodruff key ⑬.



S60C5200

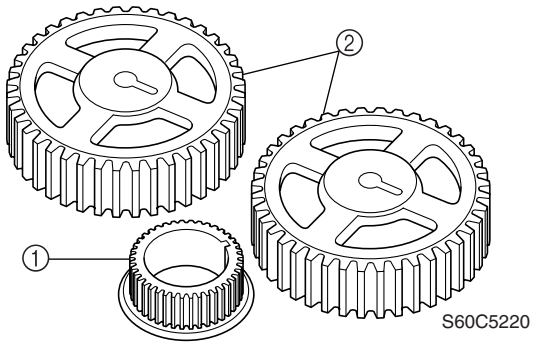
Checking the timing belt and sprockets

1. Check the interior and exterior of the timing belt for cracks, damage, or wear. Replace if necessary.



S60C5210

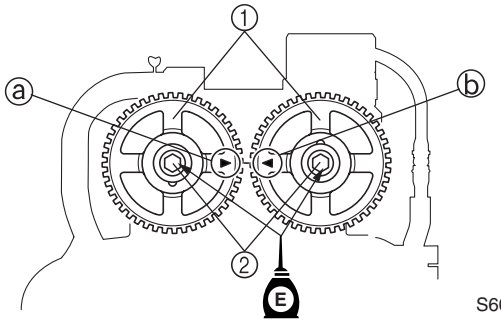
2. Check the drive sprocket ① and driven sprockets ② for cracks, damage, or wear. Replace if necessary.



S60C5220

Installing the sprockets and timing belt

1. Check that "▲" marks ⓐ and ⓑ on the driven sprockets ① are aligned, and then tighten the bolts ②.



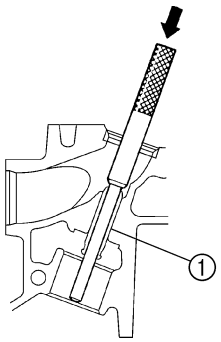
S60C5230

2. Install the retaining plate ③, Woodruff key ④, drive sprocket ⑤, and nut ⑥, and then tighten the nut.

5

Replacing the valve guides

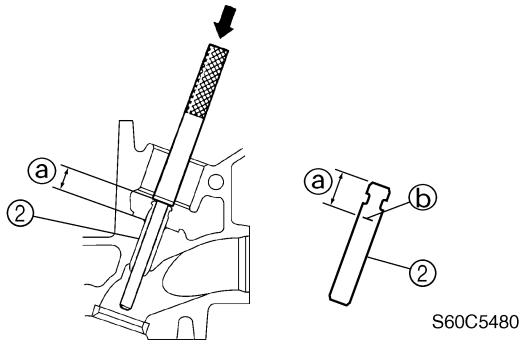
1. Remove the valve guide ① by striking the special service tool from the combustion chamber side.



S60C5470

Valve guide remover/installer: 90890-04064

2. Install the new valve guide ② by striking the special tool from the camshaft side to the specified position ⓐ.



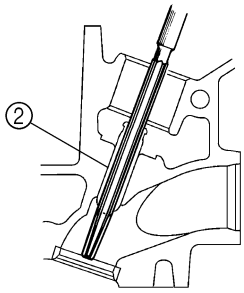
S60C5480

NOTE:
- Before installing the valve guide, mark its installation position ⓑ as shown.
- Apply engine oil to the surface of the new valve guide.

Valve guide position ⓐ: 11.5 mm (0.45 in)

Valve guide remover/installer: 90890-04064

3. Insert the special service tool into the valve guide ②, and then ream the valve guide.



S60C5490

NOTE:
- Turn the valve guide reamer clockwise to ream the valve guide.
- Do not turn the reamer counterclockwise when removing the reamer.

Valve guide reamer: 90890-04066

4. Measure the valve guide inside diameter. Replace the valve guide if out of specification.

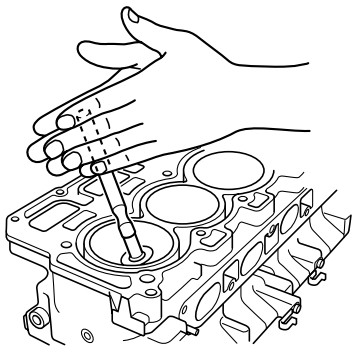
Valve guide inside diameter: 6.01–6.02 mm (0.2367–0.2370 in)

Checking the valve seat

1. Eliminate carbon deposits from the valve with a scraper.

2. Apply a thin, even layer of Mechanic's blueing dye (Dykem) onto the valve seat.

3. Lap the valve slowly on the valve seat with a valve lapper (commercially obtainable) as shown.


S60C5500

5

No.	Part name	Q'ty	Remarks
1	Exhaust cover	1	
2	Oil filter	1	
3	Gasket	1	**Not reusable**
4	Bolt	1	
5	Gasket	1	**Not reusable**
6	Gasket	1	**Not reusable**
7	Thermo sensor	1	
8	Retainer	1	
9	Bolt	2	M6 × 16 mm
10	Clamp	1	
11	Bolt	1	M6 × 10 mm
12	Gasket	1	**Not reusable**
13	Grommet	1	
14	Pressure control valve	1	
15	Spring	1	
16	Cover	1	
17	Bolt	3	
18	Grommet	1	
19	Anode	1	
20	Cover	1	
21	Bolt	2	M8 × 25 mm
22	Bolt	1	M6 × 20 mm
23	Bolt	18	M6 × 30 mm

Ⓐ Tightening sequence

5. Select the suitable bearing from the table below according to the calculated values.

Crankshaft bearing selection table (20 °C [68 °F])		
Cylinder body journal diameters – crankshaft journal diameters (mm)	Bearing (cylinder side)/thrust bearing	Bearing (crankcase side)
6.023–6.026	Green	Yellow*
6.027–6.034	Blue	Green*
6.035–6.042	Blue	Blue
6.043–6.049	Red	Blue*
6.050–6.058	Red	Red

CAUTION:

- **The (*) mark indicates that the color of the upper and lower bearings are different.**
- **Be sure to install the main bearings in the middle of the cylinder body and crankcase journal so they do not block the oil holes.**

NOTE:

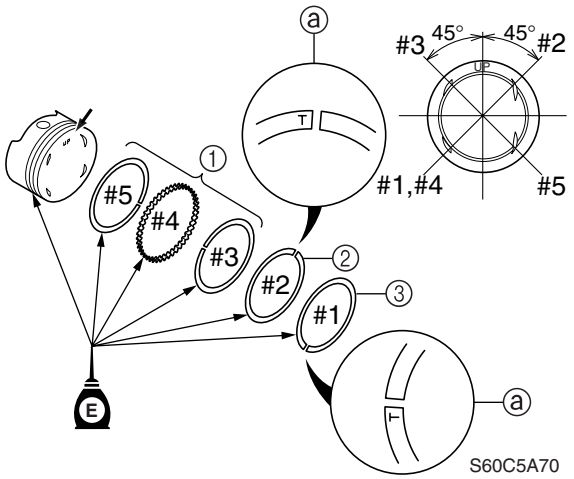
Crankshaft bearing #3 is a thrust bearing.

6. If the difference between the cylinder body journal diameter and crankshaft journal diameter is more than the maximum value (6.058 mm), replace the crankshaft.

Assembling the cylinder body

1. Install the oil ring ①, second ring ②, and top ring ③ to the piston with the "T" mark ⓐ on the piston rings facing upward.

2. Offset the piston ring end gaps as shown.



S60C5A70

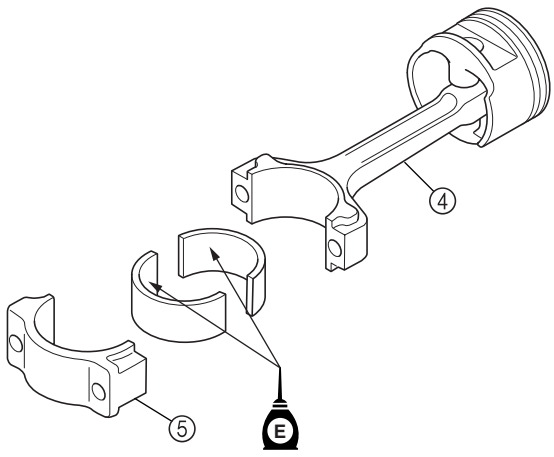
CAUTION:

Do not scratch the piston or break the piston rings.

NOTE:

After installing the piston rings, check that they move smoothly.

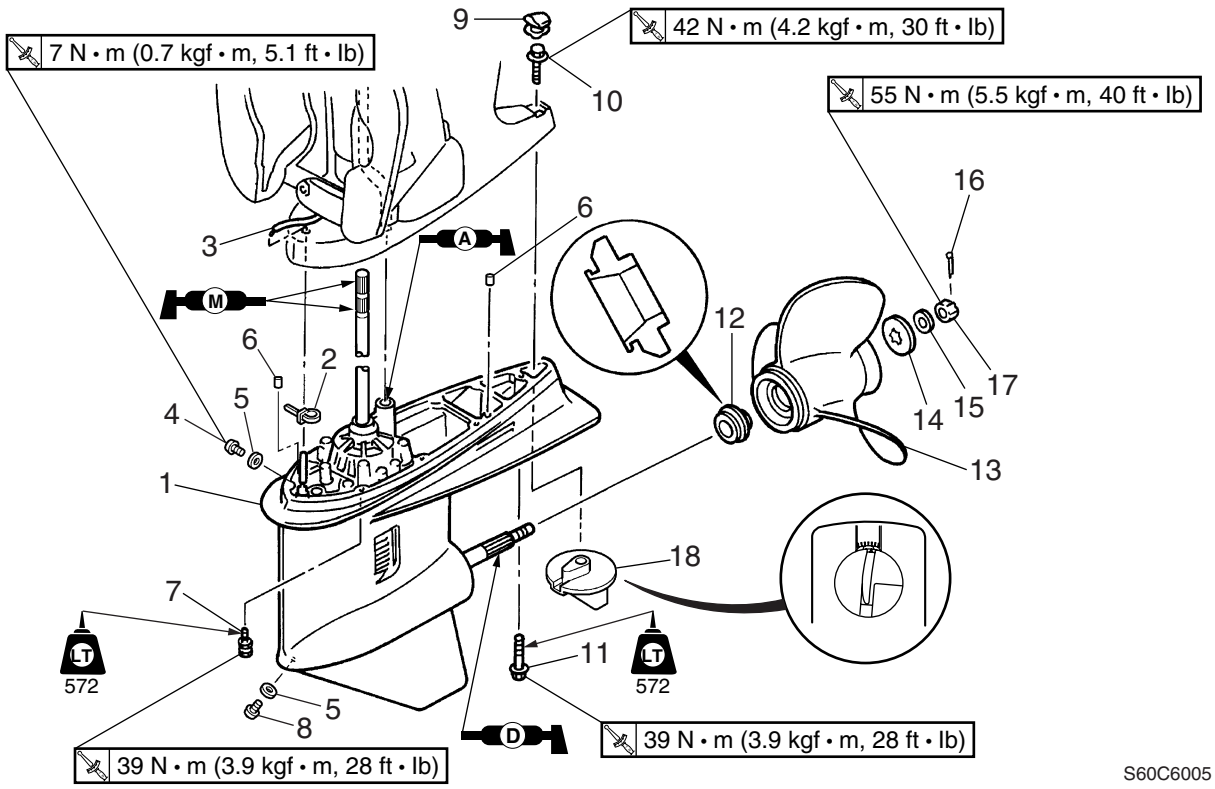
3. Install the upper half of the bearing into the connecting rod ④ and the lower half into the connecting rod cap ⑤.



S60C5A80

5

Lower unit (F100B)

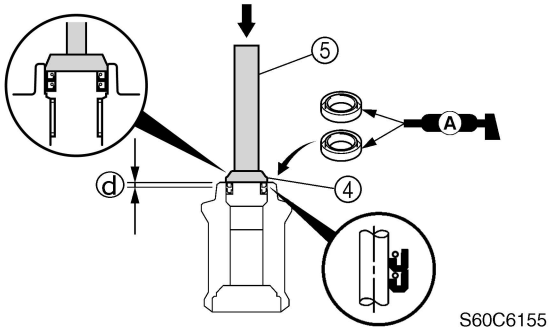


No.	Part name	Q'ty	Remarks
1	Lower unit	1	
2	Plastic tie	1	**Not reusable**
3	Hose	1	7 × 145 mm
4	Check screw	1	
5	Gasket	2	**Not reusable**
6	Dowel pin	2	
7	Bolt	6	M10 × 45 mm
8	Drain screw	1	
9	Grommet	1	
10	Bolt	1	M10 × 45 mm
11	Bolt	1	M10 × 70 mm
12	Spacer	1	
13	Propeller	1	
14	Washer	1	
15	Washer	1	
16	Cotter pin	1	**Not reusable**
17	Propeller nut	1	
18	Trim tab	1	

6

Depth ⓒ:
24.75–25.25 mm (0.97–0.99 in)

2. Apply grease to the new oil seals, and then install them into the propeller shaft housing to the specified depth.



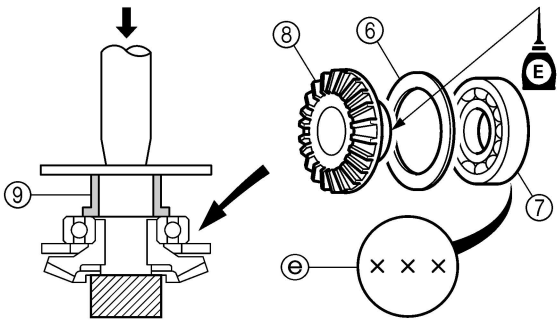
S60C6155

NOTE:
Install an oil seal halfway into the propeller shaft housing, then the other oil seal.

Bearing outer race attachment ④:
90890-06628
Driver rod LS ⑤: 90890-06606

Depth ⓓ:
4.75–5.25 mm (0.19–0.21 in)

3. Install the thrust washer ⑥ and ball bearing ⑦ to the reverse gear ⑧ using a press.

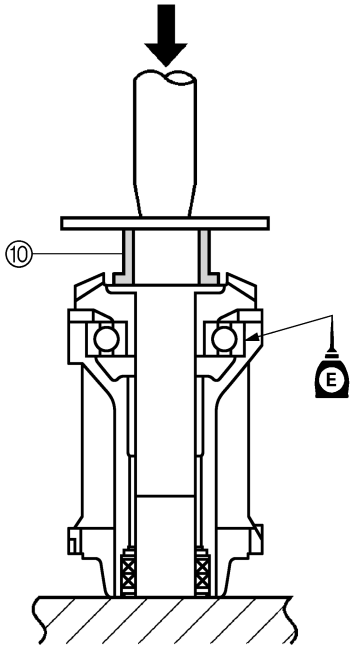


S60C6160

NOTE:
Install the ball bearing with the manufacture identification mark ⓔ facing outward (propeller side).

Bearing inner race attachment ⑨:
90890-06661

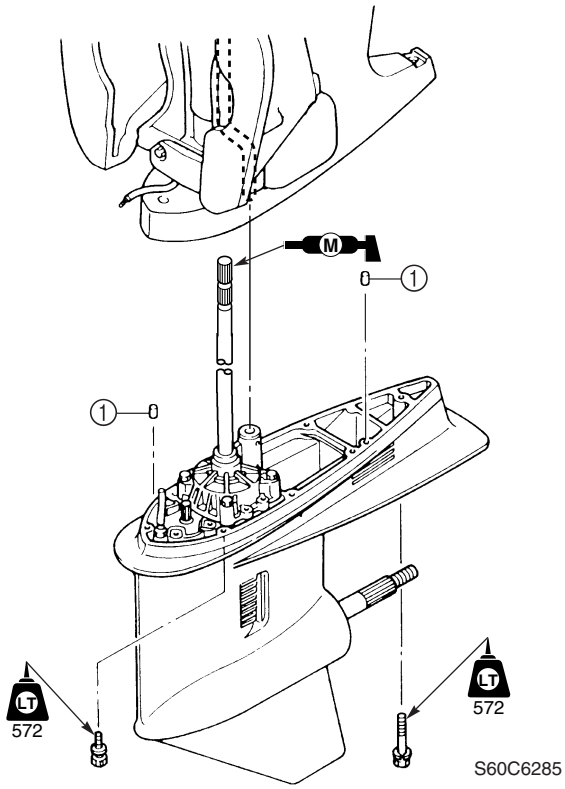
4. Install the reverse gear assembly to the propeller shaft housing using a press.



S60C6165

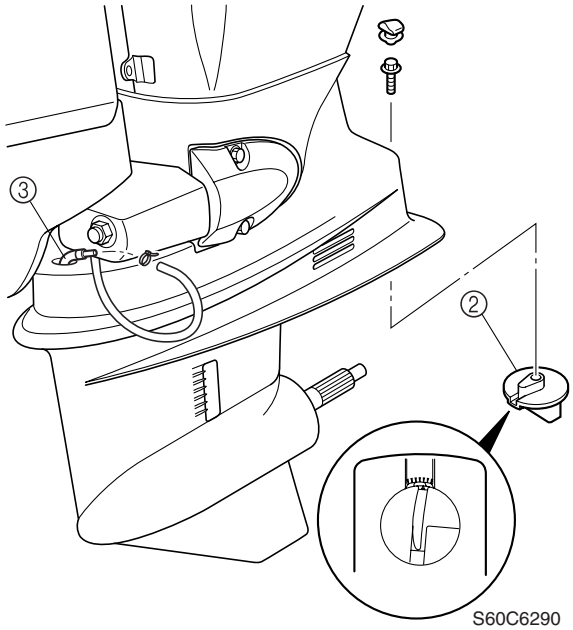
Bearing inner race attachment ⑩:
90890-06661

6

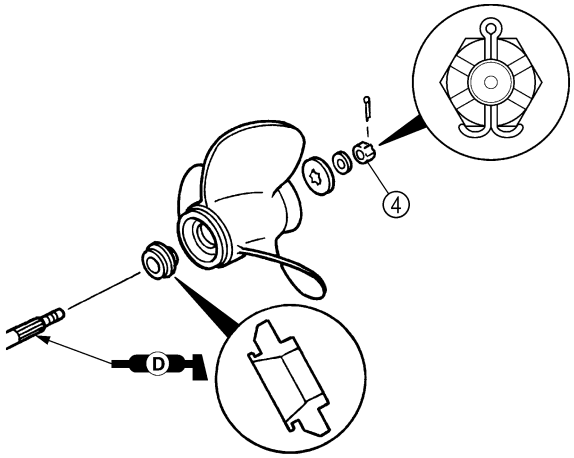


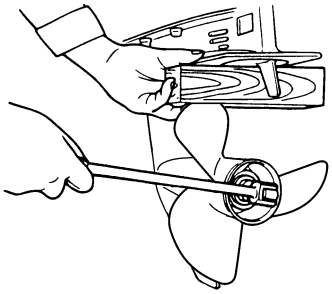
Mounting bolt:
39 N·m (3.9 kgf·m, 28 ft·lb)

4. Install the trim tab ② to its original position, and then connect the speedometer hose ③.



5. Install the propeller and propeller nut, and then tighten the nut finger tight. Place a block of wood between the anti-cavitation plate and propeller to keep the propeller from turning, and then tighten the nut to the specified torque.





⚠ WARNING

Do not hold the propeller with your hands when loosening or tightening it. Be sure to remove the battery leads from the batteries and the engine shut-off switch. Put a block of wood between the anti-cavitation plate and propeller to keep the propeller from turning.

NOTE:

If the grooves in the propeller nut ④ do not align with the cotter pin hole, tighten the nut until they are aligned.

Propeller nut ④:
55 N·m (5.5 kgf·m, 40 ft·lb)

6

No.	Part name	Q'ty	Remarks
1	Shift rod	1	
2	O-ring	1	**Not reusable** 1.9 × 10.6 mm
3	Oil seal	1	**Not reusable**
4	Bolt	2	M6 × 16 mm
5	Oil seal housing	1	
6	O-ring	1	**Not reusable** 3.1 × 55.6 mm
7	Circlip	1	
8	Screw	2	
9	Cover	1	
10	Bolt	2	M8 × 75 mm
11	Bolt	2	M8 × 50 mm
12	Seal	1	
13	Water pump housing	1	
14	Inner plate cartridge	1	
15	Insert cartridge	1	
16	Impeller	1	
17	Dowel pin	2	
18	Gasket	1	**Not reusable**
19	Outer plate cartridge	1	
20	Gasket	1	**Not reusable**
21	Oil seal housing	1	
22	O-ring	1	**Not reusable** 3.1 × 52.4 mm
23	Gasket	1	**Not reusable**
24	Oil seal	2	**Not reusable**
25	Woodruff key	1	

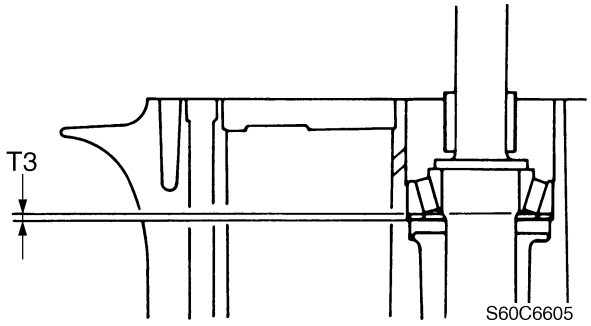
No.	Part name	Q'ty	Remarks
1	Drive shaft	1	
2	Taper roller bearing	1	**Not reusable**
3	Bearing outer race	1	**Not reusable**
4	Pinion shim	—	As required
5	Sleeve	1	
6	Hose	1	7 × 300 mm
7	Plastic tie	1	**Not reusable**
8	Joint	1	
9	Nut	1	
10	Water inlet cover	2	
11	Screw	1	
12	Seal	1	
13	Plate	1	
14	Forward gear shim	—	As required
15	Bearing outer race	1	**Not reusable**
16	Taper roller bearing	1	**Not reusable**
17	Needle bearing	1	
18	Forward gear	1	
19	Needle bearing	1	
20	Pinion	1	
21	Nut	1	
22	Lower case	1	

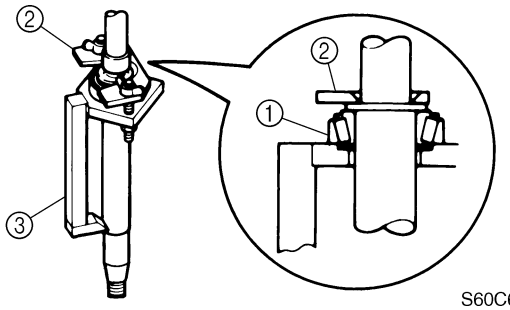
Shimming

NOTE:
- Shimming is not required when assembling the original lower case and inner parts.
- Shimming is required when assembling the original inner parts and a new lower case.
- Shimming is required when replacing the inner part(s).

Selecting the pinion shims

1. Install the drive shaft and drive shaft bearing ① to the shimming tools.





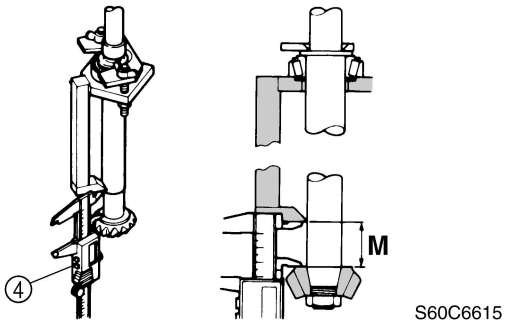
NOTE:
- Select the shim thickness (T3) by using the specified measurement(s) and the calculation formula.
- Install the shimming tool to the drive shaft so that the shaft is at the center of the hole.
- Tighten the wing nuts another 1/4 of a turn after they contact the fixing plate ②.

Pinion height gauge ③:
90890-06702

2. Install the pinion and pinion nut, and then tighten the nut to the specified torque.

Pinion nut:
93 N·m (9.3 kgf·m, 67 ft·lb)

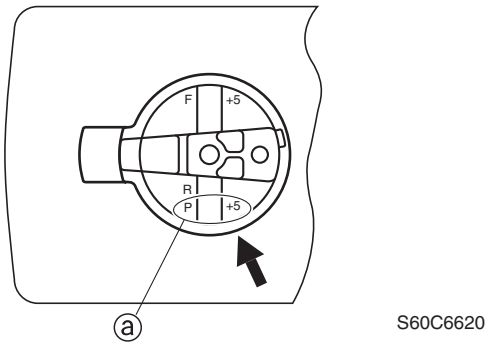
3. Measure the distance (M) between the shimming tool and the pinion as shown.



NOTE:
Measure the pinion at three points to find the clearance average.

Digital caliper ④: 90890-06704

4. Calculate the pinion shim thickness (T3) as shown in the examples below.



NOTE:
"P" is the deviation of the lower case dimension from standard. The "P" mark ⓐ is stamped on the trim tab mounting surface of the lower case in 0.01 mm units. If the "P" mark is unreadable, assume that "P" is zero and check the backlash when the unit is assembled.

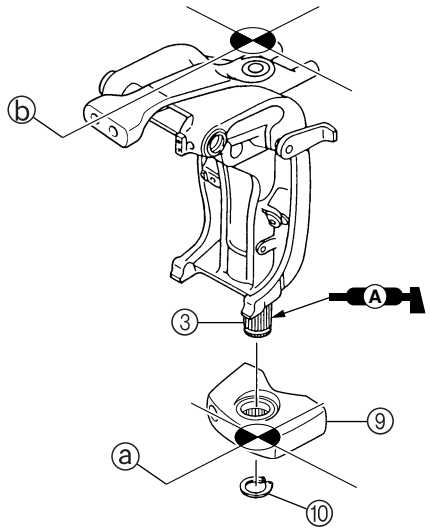
6

No.	Part name	Q'ty	Remarks
1	Tiller handle assembly	1	
2	Wiring harness extension	1	
3	Engine start switch lead	1	
4	PTT switch coupler	1	
5	Throttle cable	1	
6	Bolt	1	M6 × 20 mm
7	Clamp	1	
8	Shift cable	1	
9	Clip	1	
10	Nut	2	
11	Cover	1	
12	Bolt	1	M6 × 25 mm
13	Plate	1	
14	Bolt	2	M6 × 25 mm
15	Retaining plate	1	
16	Bolt	1	M6 × 25 mm
17	Plate	1	
18	Friction plate	1	
19	Friction piece	2	
20	Nut	2	
21	Collar	2	
22	Bolt	2	
23	Bolt	2	
24	Nut	1	
25	Washer	1	
26	Bracket	1	
27	Nut	2	
28	Steering lock shaft	1	
29	Steering lock knob	1	
30	Washer	2	

No.	Part name	Q'ty	Remarks
1	Muffler assembly	1	
2	Upper case	1	
3	Bolt	2	M12 × 193 mm
4	Washer	2	
5	Plate	1	
6	Upper mount	1	
7	Bolt	3	M8 × 45 mm
8	Grommet	1	
9	Bolt	4	M8 × 40 mm
10	Muffler seal	1	
11	Rubber seal	1	
12	Gasket	1	**Not reusable**
13	Screw	2	M6 × 15 mm
14	Baffle plate	1	
15	Damper	1	
16	Grommet	1	
17	Dowel pin	2	
18	Bolt	2	M14 × 235 mm
19	Washer	2	
20	Rubber washer	2	
21	Lower mount	2	
22	Washer	2	
23	Drive shaft bushing	1	
24	Circlip	1	

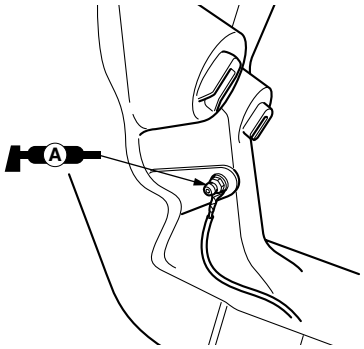
4. Install the steering arm ③ into the steering yoke ⑨ by aligning the center ⓐ of the yoke with the center ⓑ of the steering arm.

5. Install the circlip ⑩.

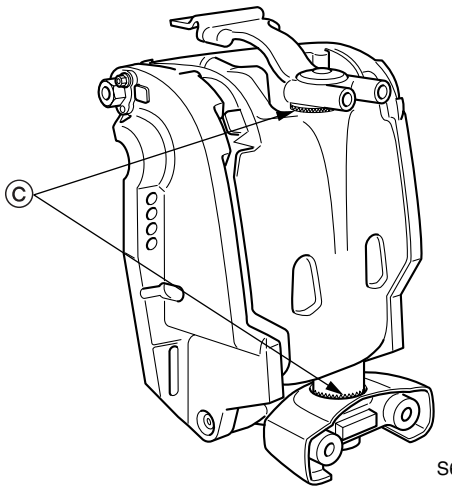


S60C7135

6. Inject grease into the grease nipple until grease comes out from both the upper and lower bushings ⓒ.



S60C7140

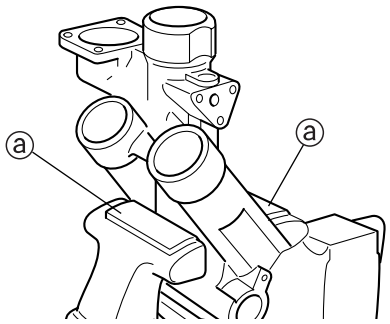


S60C7145

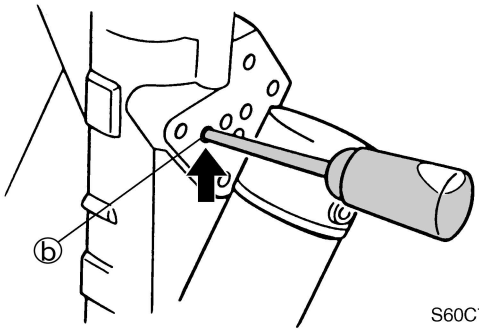
7

Installing the trim rams

1. Hold the cylinder body ① in a vise using aluminum plates ⓐ on both sides.



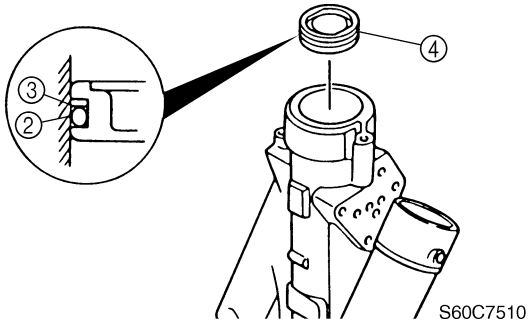
2. Add the specified amount of the recommended fluid through the cylinder body hole ⓑ.



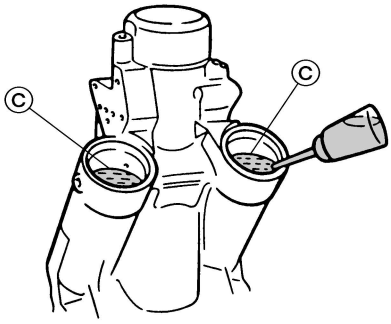
Recommended power trim and tilt fluid:
ATF Dexron II
Fluid quantity:
30 cm^3 (1.0 US oz, 1.1 Imp oz)

3. Install the new O-ring ② and backup ring ③ to the free piston ④.

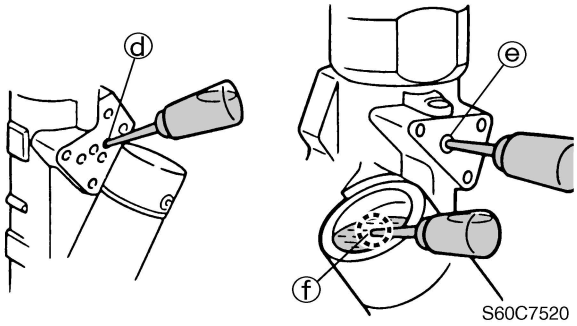
4. Push the free piston ④ into the tilt cylinder until it bottoms out.



5. Fill the trim cylinders ⓒ with the recommended fluid to the correct level as shown.

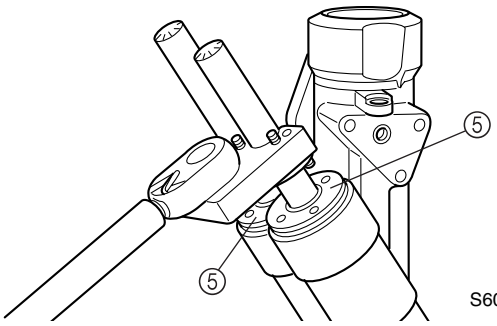


6. Add a small amount of the recommended fluid though cylinder body holes ⓓ, ⓔ, and ⓕ.



Recommended power trim and tilt fluid:
ATF Dexron II

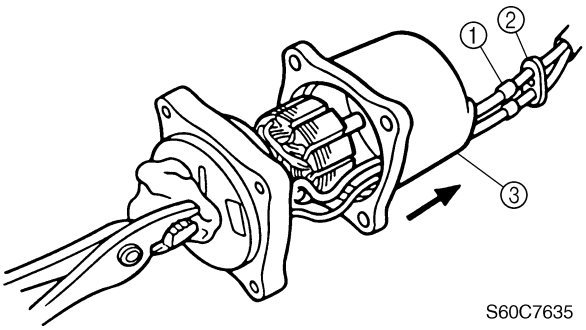
7. Install the trim piston assembly into the trim cylinder, and then tighten the trim cylinder end screw ⑤ to the specified torque.



Disassembling the power trim and tilt motor

1. Remove the PTT motor screws.

2. Remove the lead holder ① and spacer ② from the yoke ③, and then slide them towards the leads.



S60C7635

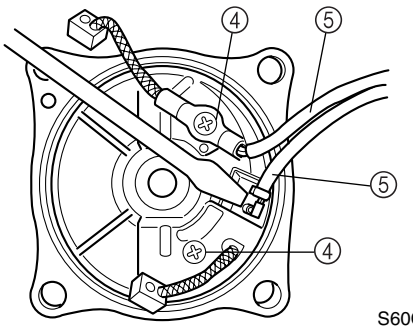
CAUTION:

- **Keep the PTT motor leads inside the yoke.**
- **Do not allow grease or oil to contact the commutator.**

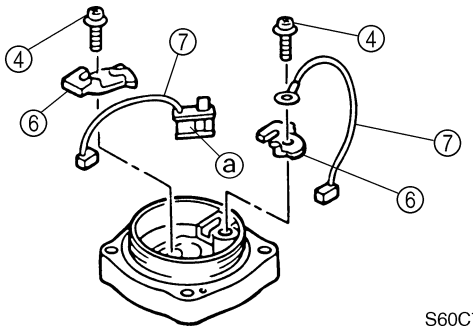
NOTE:

Place a clean cloth over the end of the armature shaft and carefully pull the armature from the yoke with a pair of pliers as shown.

3. Remove the screws ④, disconnect the PTT motor leads ⑤, and then remove the brush holders ⑥ and brushes ⑦.



S60C7640



S60C7645

CAUTION:

Do not touch the bimetal ⓐ, otherwise the operation of the breaker may be affected.

NOTE:

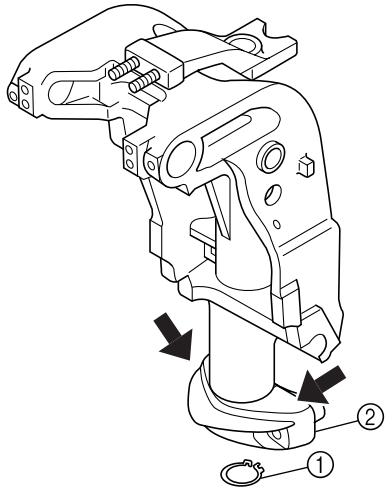
Hold the brush with a screwdriver as shown, and then disconnect the PTT motor lead (blue).

7

No.	Part name	Q'ty	Remarks
1	Upper case assembly	1	
2	Oil pump body	1	
3	Oil seal	1	**Not reusable**
4	Oil seal	1	**Not reusable**
5	Bolt	6	M6 × 45 mm
6	Screw	6	M6 × 10 mm
7	Cover	1	
8	Gasket	1	**Not reusable**
9	Shaft	1	
10	O-ring	2	**Not reusable**
11	Oil seal	1	**Not reusable**
12	Dowel pin	2	
13	O-ring	2	**Not reusable** 1.9 × 22.9 mm
14	Damper	2	
15	Nut	2	
16	Nut	2	
17	Washer	2	
18	Ground lead	1	
19	Grease nipple	1	
20	Washer	2	
21	Bolt	1	M6 × 10 mm

Removing the steering arm

1. Remove the circlip ①.
2. Remove the steering yoke ② by striking it with a plastic hammer.

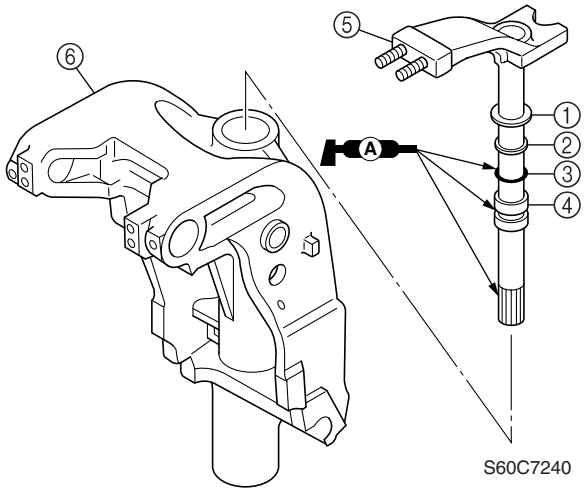


S60C7235

3. Remove the steering arm from the swivel bracket by pulling the arm off the bracket.

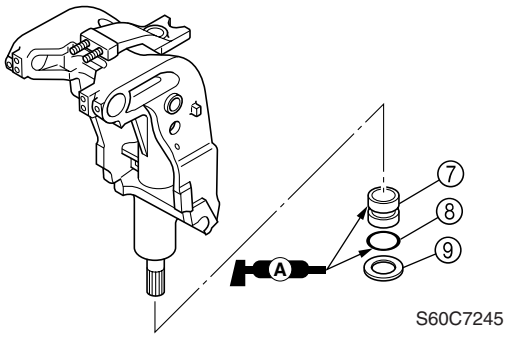
Installing the steering arm

1. Install the washer ①, bushing ②, O-ring ③, and bushing ④ onto the steering arm ⑤.
2. Place the swivel bracket ⑥ in an upright position, and then install the steering arm onto the swivel bracket.



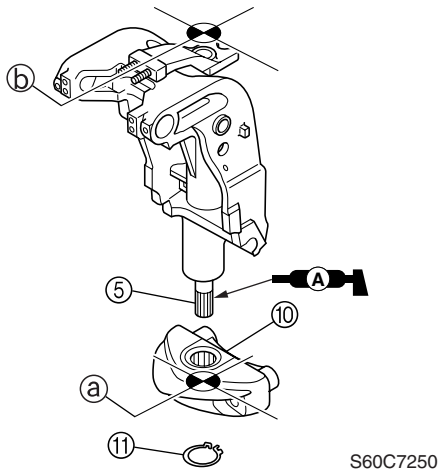
S60C7240

3. Install the bushing ⑦, O-ring ⑧, and washer ⑨ onto the swivel bracket.



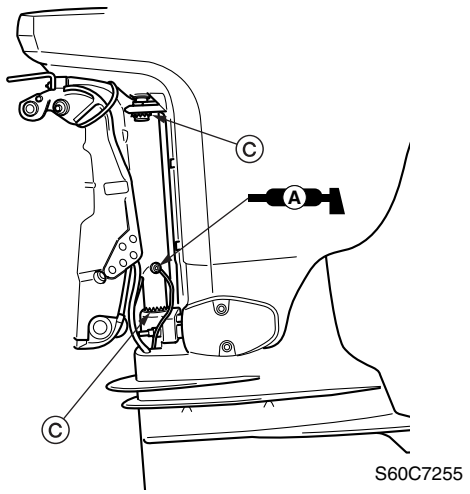
S60C7245

4. Install the steering arm ⑤ into the steering yoke ⑩ by aligning the center ⓐ of the yoke with the center ⓑ of the steering arm.
5. Install the circlip ⑪.



S60C7250

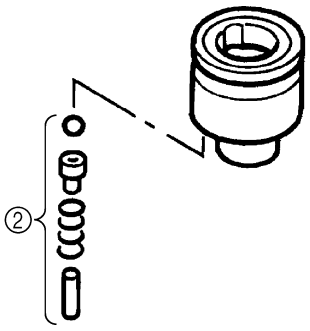
6. Inject grease into the grease nipple until grease comes out from both the upper and lower bushings ⓒ.



S60C7255

7

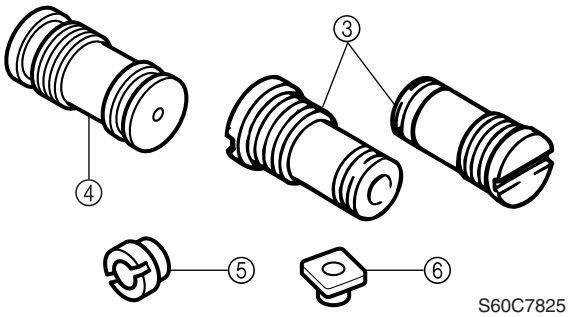
No.	Part name	Q'ty	Remarks
1	Trim cylinder	1	
2	Tilt ram	1	
3	Dust seal	1	**Not reusable**
4	Backup ring	1	
5	O-ring	1	**Not reusable** 2.4 × 22.6 mm
6	Tilt cylinder end screw	1	
7	O-ring	1	**Not reusable**
8	Backup ring	1	
9	O-ring	1	**Not reusable** 2.4 × 22.6 mm
10	Trim cylinder end screw	1	
11	O-ring	1	**Not reusable**
12	Plate	1	
13	Filter	1	
14	O-ring	1	**Not reusable**
15	Trim piston	1	
16	Backup ring	1	
17	O-ring	1	**Not reusable**
18	Ball	5	
19	Absorber valve pin	5	
20	Spring	5	
21	Plate	1	
22	Ball	1	
23	O-ring	1	**Not reusable** 3.5 × 35.7 mm
24	Backup ring	1	
25	Tilt piston	1	
26	Ball	4	
27	Absorber valve pin	4	
28	Spring	4	
29	Pin	4	
30	Pin	2	
31	Washer	1	
32	Bolt	1	M12 × 45 mm



S60C7820

3. Check main valves ③ and ④ for dirt or residue. Clean if necessary.

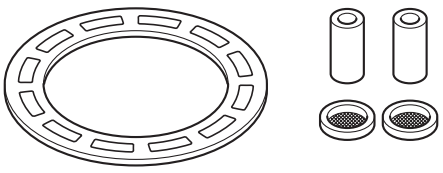
4. Check the manual valve seat ⑤ and relief valve seat ⑥ for dirt or residue. Clean if necessary.



S60C7825

Checking the filters

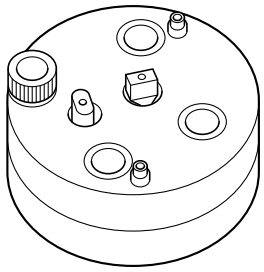
1. Check the filters for dirt or residue. Clean if necessary.



S60C7830

Checking the gear pump

1. Check the gear pump for damage. Replace if necessary.

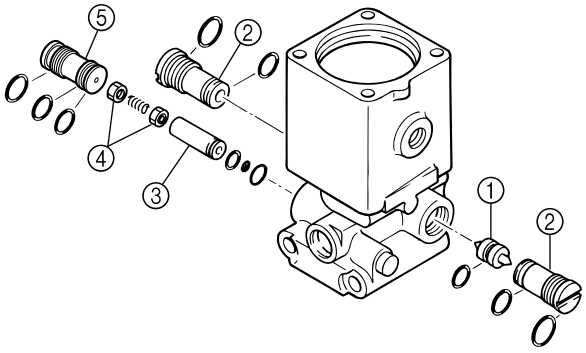


S60C7835

Assembling the gear pump

1. Install the shuttle piston ① and main valves ②, and then tighten the valves to the specified torque.

2. Install the relief valve seat ③, valve seats ④, and main valve ⑤, and then tighten the valve to the specified torque.



S60C7840

	Main valve ② and ⑤: 11 N·m (1.1 kgf·m, 8.0 ft·lb)

7

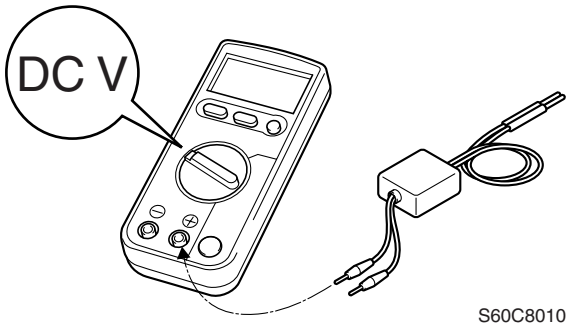
Checking the electrical components

Measuring the peak voltage

NOTE:

Before troubleshooting the peak voltage, check that all electrical connections are tight and free from corrosion, and that the battery is fully charged to 12 V.

The condition of the ignition system can be determined by measuring the peak voltage. Cranking speed is effected by many factors, such as fouled or weak spark plugs, or a weak battery. If one of these factors is present, the peak voltage will be lower than specification. In addition, if the peak voltage is lower than specification the engine will not operate properly.



S60C8010

⚠ WARNING

When checking the peak voltage, do not touch any of the connections of the digital tester leads.

NOTE:

- Use the peak voltage adaptor with the digital circuit tester.
- When measuring the peak voltage, set the selector on the digital circuit tester to the **DC voltage mode**.
- Connect the positive pin on the peak voltage adaptor to the positive terminal of the digital circuit tester.

Measuring the lower resistance

When measuring a resistance of 10 Ω or less with the digital circuit tester, the correct measurement cannot be obtained because of the internal resistance of the tester. To obtain the correct value, subtract the internal resistance from the displayed measurement.

Correct value =
displayed measurement – internal resistance

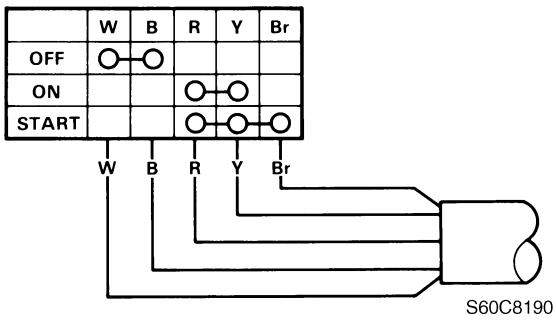
NOTE:

Obtain the internal resistance of the digital circuit tester by connecting both of its probes and checking the display.

8

Checking the engine start switch

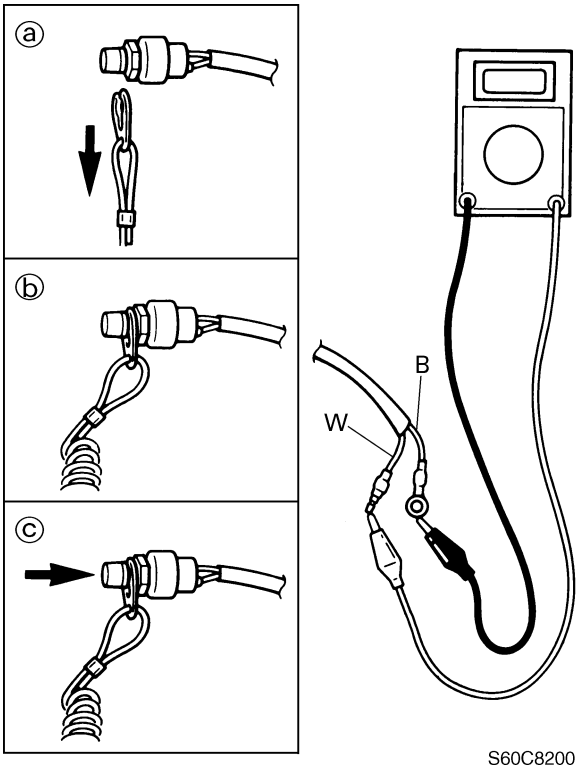
1. Check the engine start switch for continuity. Replace if there is no continuity.



	Lead color				
Switch position	White (W)	Black (B)	Red (R)	Yellow (Y)	Brown (Br)
OFF	○—○				
ON			○—○		
START			○—○	○—○	

Checking the engine shut-off switch

1. Check the engine shut-off switch for continuity. Replace if there is no continuity.



	Lead color	
	White (W)	Black (B)
Remove the lock plate ⓐ	○—○	
Install the lock plate ⓑ		
Push the button ⓒ	○—○	

8

TRBL SHTG ?

Troubleshooting

9

(Lubricating system)