

CHAPTER 3

PERIODIC CHECK AND ADJUSTMENT

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MAINTENANCE INTERVAL CHART

Frequency of maintenance operations may be adjusted according to the operating conditions, but the following table gives general guidelines.

The mark (●) indicates the check-ups which may be carried out by owner.

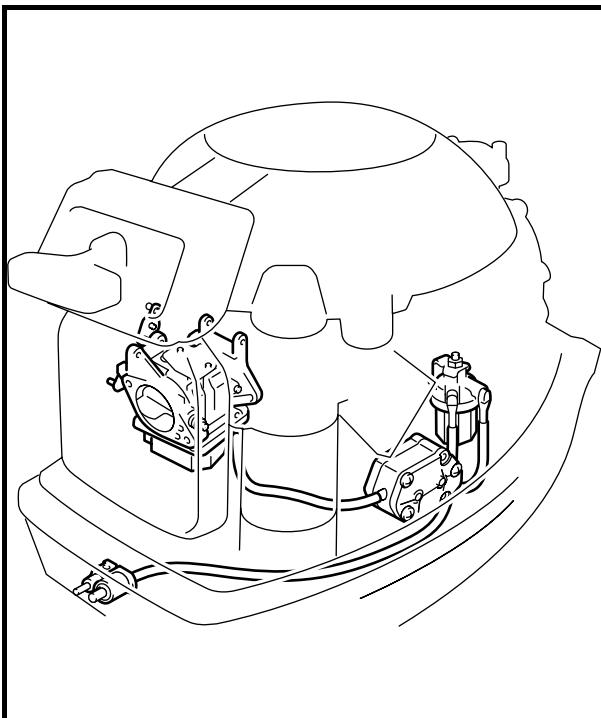
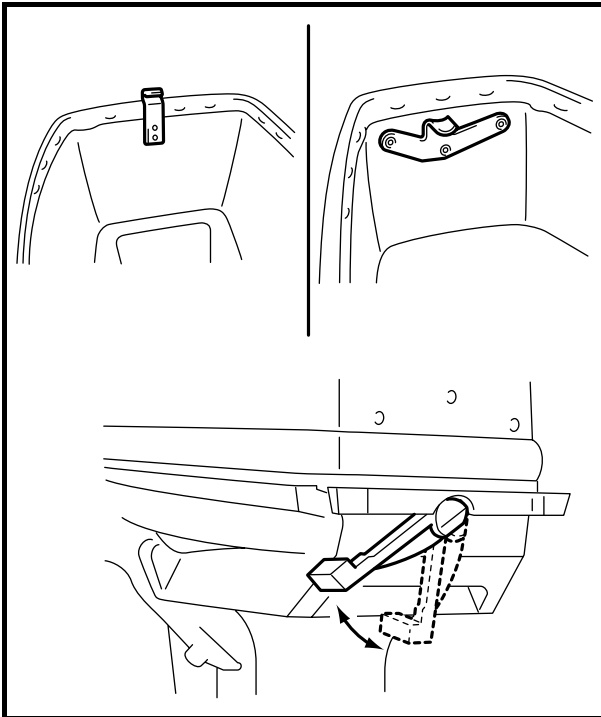
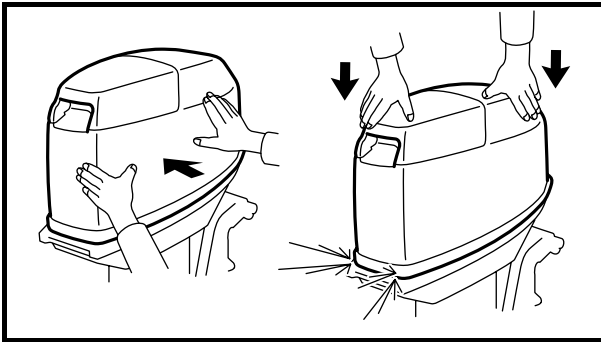
The mark (○) indicates work to be carried out by Yamaha dealer.

Item	Remarks	Initial		Every		Refer page
		10 hours	50 hours (3 months)	100 hours (6 months)	200 hours (1 year)	
FUEL SYSTEM						
Fuel filter	Clean	●	●	●		3-3
Fuel system	Check			○		3-2
Fuel tank	Clean				●	—
POWER UNIT						
Carburetor setting	Check	○		○		3-16
	Adjust	○		○		3-16
Cooling water passage	Clean	●		●	○	—
Exhaust leakage	Check	○	○	○		—
Water leakage	Check	○	○	○		—
CONTROL SYSTEM						
Ignition timing	Check	○		○		3-4
	Adjust	○		○		3-4
idle speed	Check			○		3-16
	Adjust			●		3-16
LOWER UNIT						
Gear oil	Change	●		●		3-20
Propeller	Check		○	○		3-23
GENERAL						
Spark plug	Clean	●	●	●		3-22
	Adjust	●	●	●		3-22
	Replace	●	●	●		3-22
Wiring and connectors	Check	○	○	○		—
Greasa points	Grease			●		3-24
Bolts and nuts	Retighten	○		○		3-24
Anode	Check	○	○	○		3-22
Motor exterior	Check		○	○		—

NOTE:

Cooling water passages:

When operating in salt water, turbid or muddy water, the engine should be flushed with clean water after each use.



TOP COWLING

CHECKING THE TOP COWLING FIT

Check:

- Top cowling
Cracks/damage → Replace.
- Hook
Bent → Correct.
- Rivet
Damage → Repair.
- Rubber of trim
Peel/tear → Repair.

NOTE:

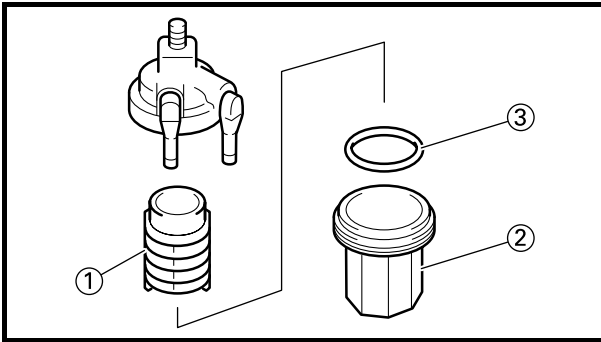
Hooks and latches are unadjustable.

FUEL SYSTEM

CHECKING THE FUEL LINE

Check:

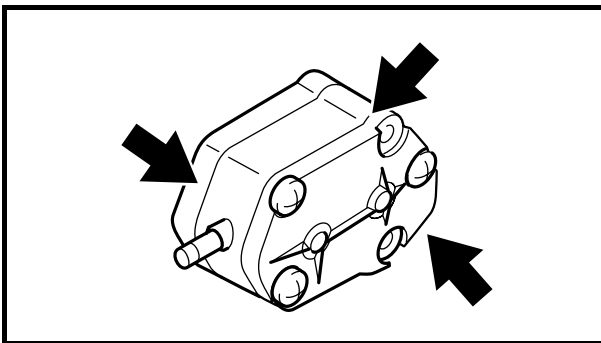
- Fuel hose
Cracks/damage/leak → Replace.
Refer to "FUEL JOINT, FUEL FILTER,
AND FUEL PUMP" on page 4-1.



CHECKING THE FUEL FILTER

Check:

- Fuel filter element ①
Foreign matter → Clean.
- Fuel filter cup ②
Cracks/damage/leak → Replace.
- O-ring ③
Cracks/damage → Replace.



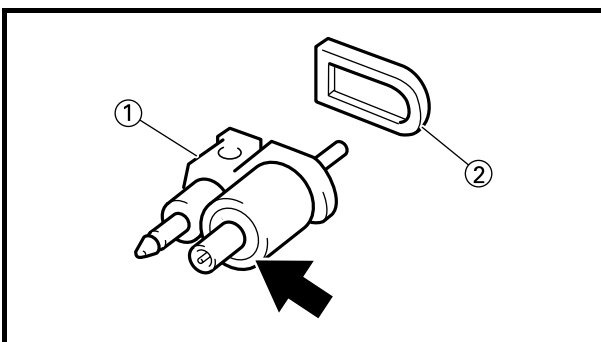
CHECKING THE FUEL PUMP

Check:

- Fuel pump
Cracks/damage/leak →
Repair/replace.
Refer to "DISASSEMBLING THE
FUEL PUMP" on page 4-3.

NOTE: _____

Observe pump with naked eyes.



CHECKING THE FUEL JOINT

Check:

- Fuel joint ①
Cracks/damage/leak → Replace.
- Seal ②
Cracks/damage → Replace.

CONTROL SYSTEM
ADJUSTING THE IGNITION TIMING

CAUTION:

Ignition timing adjustment on the running engine must be performed in the test tank with a test propeller installed on the engine.



Test propeller
90890-01629

⚠ WARNING

While checking the engine, do not touch the rotating part (flywheel), CDI unit, ignition coil, and any other hazardous areas.

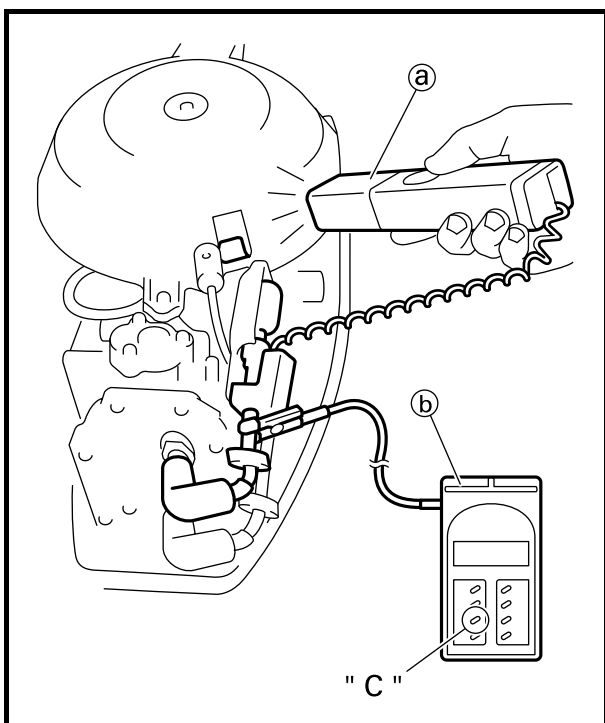
1. Check:
 - Ignition timing
 Out of specification → Adjust.



Ignition timing (at idle)
25B, 30H: ATDC 2° ± 2°
Ignition timing (at full advance)
25B: BTDC 22° ± 2°
30H: BTDC 25° ± 2°



Engine idle speed
1,100 ± 50 r/min
Full throttle operating range
5,350 ± 100 r/min

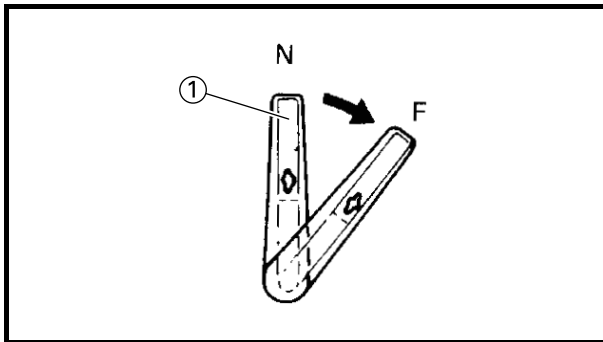


Checking steps

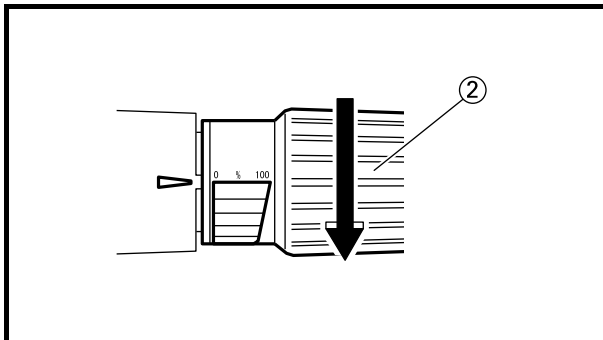
- (1) Install the timing light (a) onto the spark plug lead of cylinder #1.
- (2) Install the digital tachometer (b) onto the spark plug lead of cylinder #1.
- (3) Press the position key "C" on the digital tachometer.
- (4) Start the engine and allow it to warm up for a few minutes.



Timing light (a)
90890-03141
Digital tachometer (b)
90890-06760

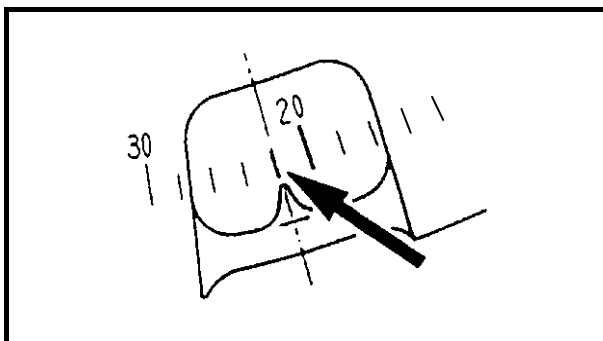


(5) Set the shift lever ① in forward position.



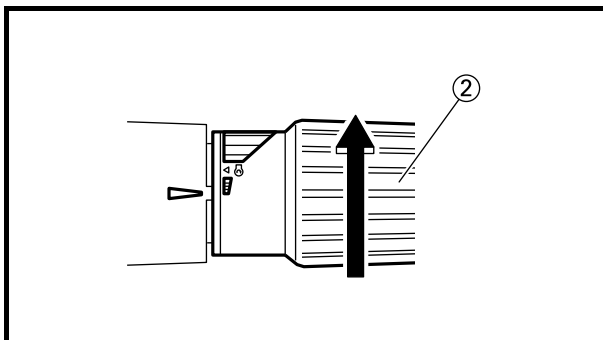
(6) Fully open the throttle ② by moving the throttle to the "FAST" position.

	Full throttle operating range 5,350 ± 100 r/min
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(7) Check the ignition timing by pointing the timing light at the timing indicator on the starter case.

	Ignition timing (at full advance) 25B: BTDC 22° ± 2° 30H: BTDC 25° ± 2°
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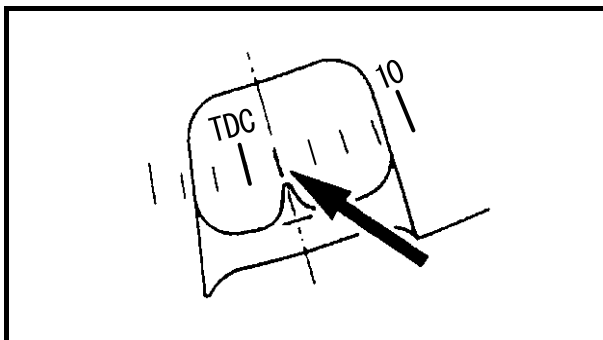


(8) Move the throttle ② to full-close position.

	Engine idle speed 1,100 ± 50 r/min
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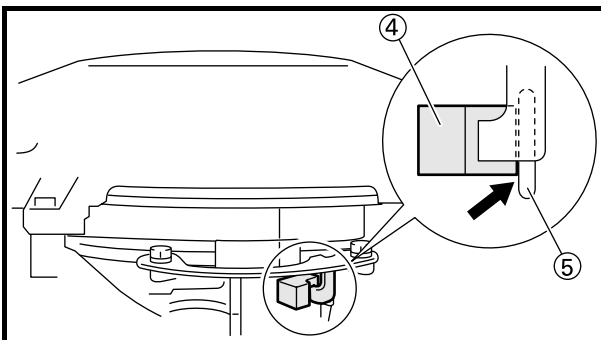
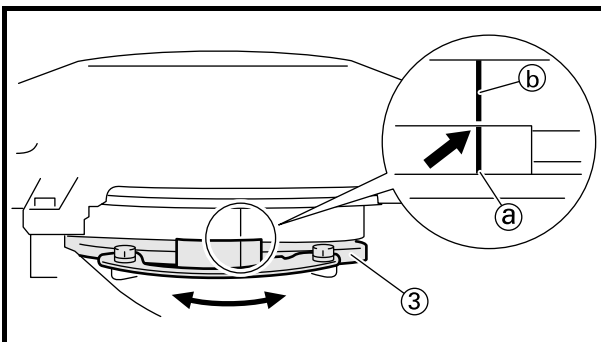
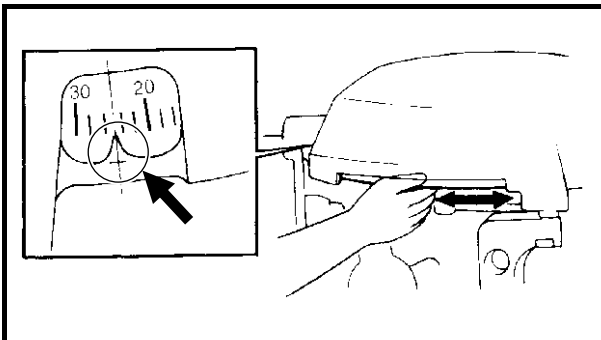
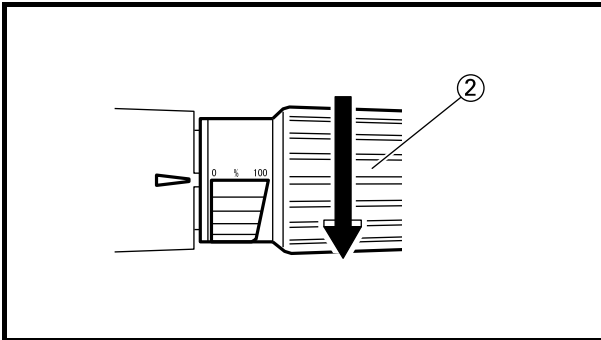
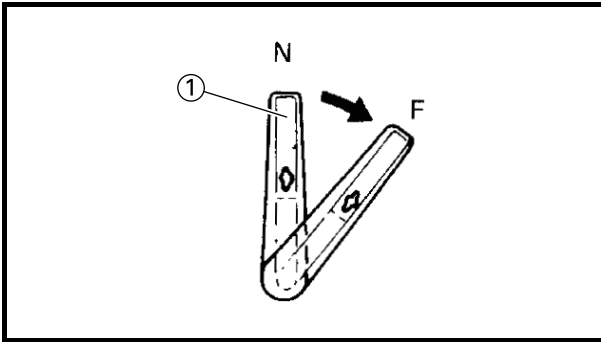
(9) Check the ignition timing by pointing the timing light at the timing indicator on the starter case.

	Ignition timing (at idle) 25B, 30H: ATDC 2° ± 2°
--	--



NOTE:

- Ignition timing adjustment is not required if the timing indicator reading falls within the specification.
- If the reading is out of specification, adjust the timing by the following procedure.



2. Adjustment with full-open throttle:
 - Magnet base stopper

CAUTION:

- Make sure that engine is not running.
- Remove the plug caps.

Adjustment steps

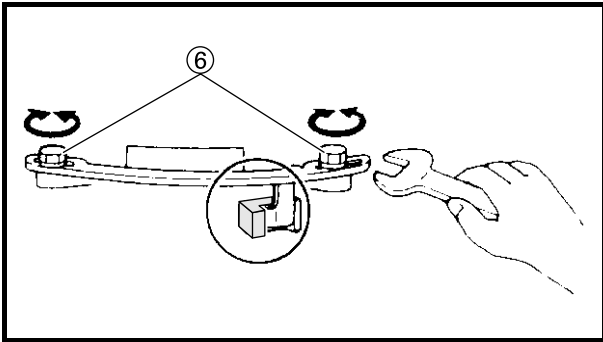
- (1) Set the shift lever ① in forward position.
- (2) Move the throttle ② to full-open position.

- (3) Slowly turn the flywheel clockwise to align the full advanced timing mark with the specified position on the timing indicator.

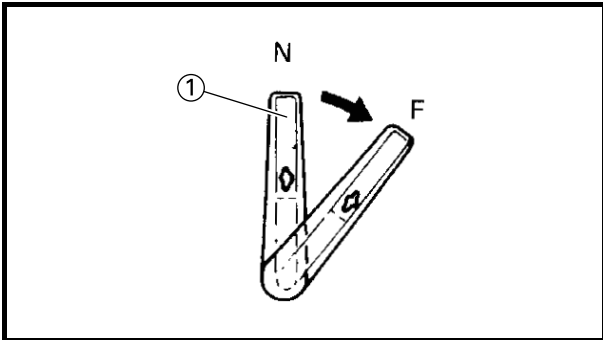
	Ignition timing (at full advance)
	25B: BTDC 22° ± 2°
	30H: BTDC 25° ± 2°

- (4) Turn the magnet base ③ until the timing mark ① stamped on the port side comes in line with the ignition mark ② on the rotor.

- (5) Check that the magnet base stopper ④ is in contact with the stopper on the engine body (full-open end stopper)⑤.



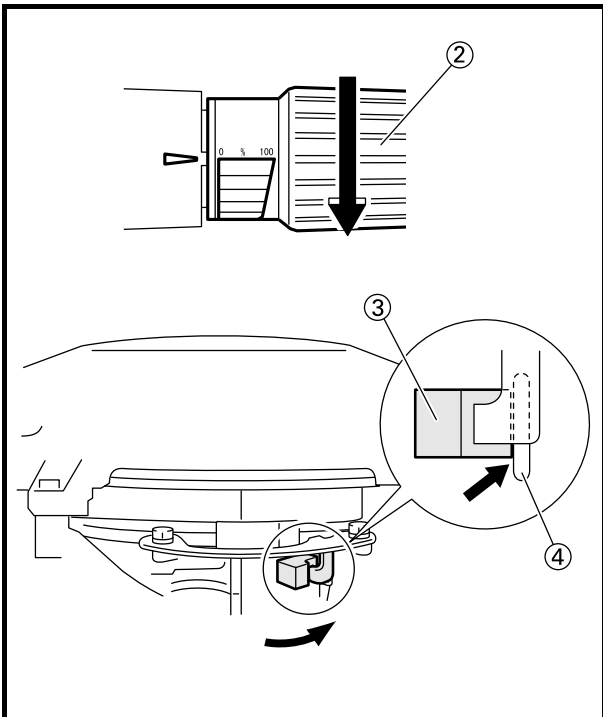
(6) If they are not in contact, loosen the set bolt ⑥, adjust until they are correctly in contact with each other, and secure the bolt again.



3. Adjusting the carburetor control link:
- Accelerator cam
 - Carburetor control link

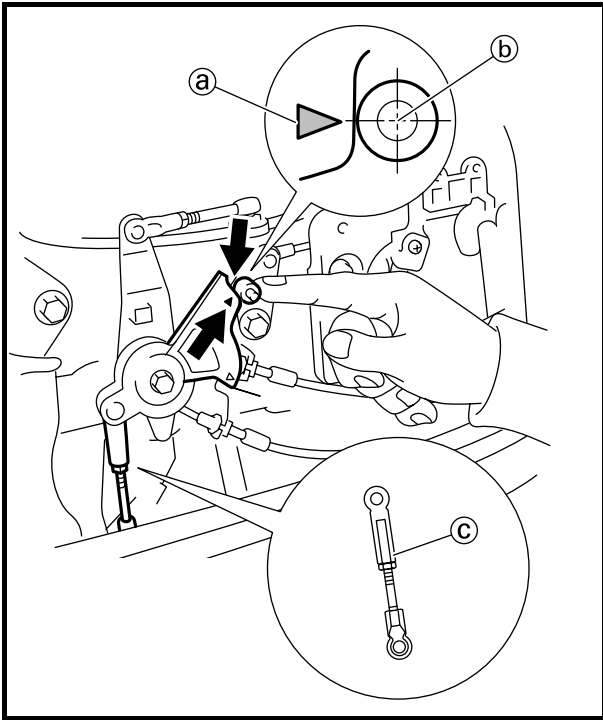
Adjustment steps

(1) Set the shift lever ① in forward position.

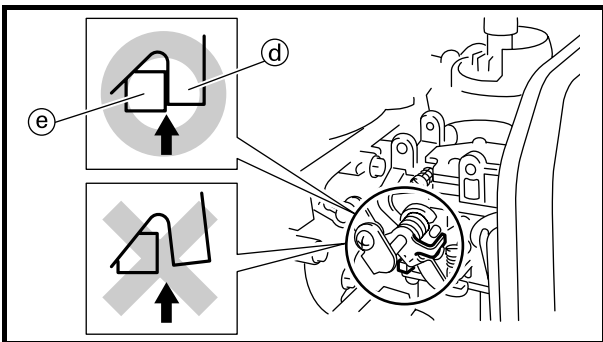


(2) Move the throttle ② to full-open position.

(3) Make sure that the magnet base stopper ③ is in contact with the stopper on the engine body (full-open end stopper) ④.



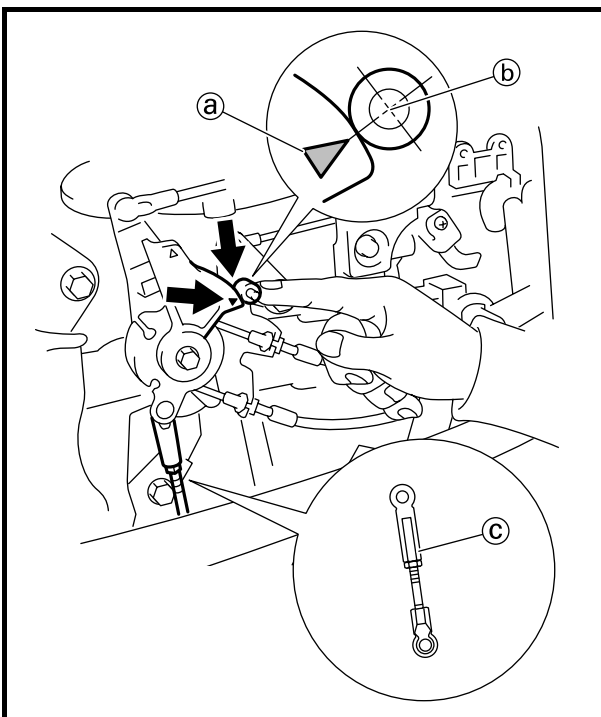
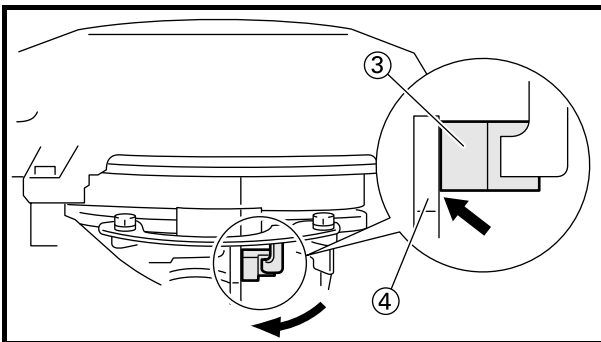
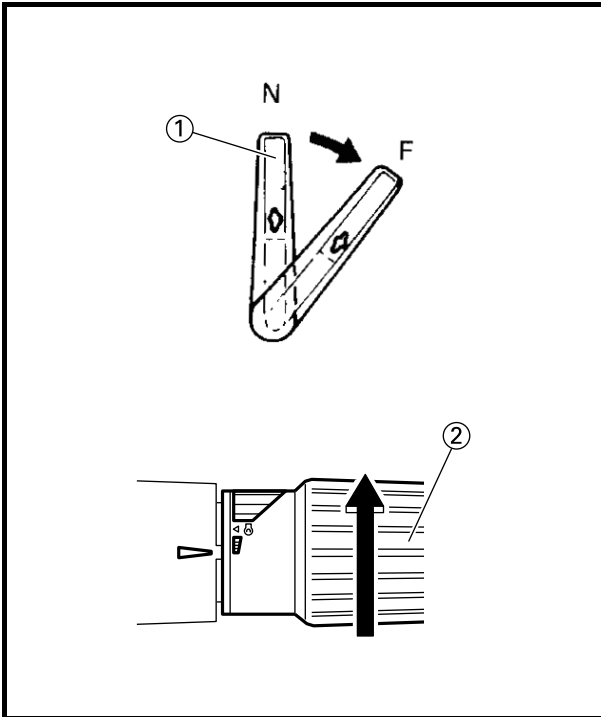
- (4) Check that full-open position mark (a) on the accelerator cam is aligned with the center of the cam roller (b).
- (5) If they are not aligned, adjust the joint link length (c) until the full-open position mark (a) comes to the center of the cam roller (b).



- (6) Check that full-open stopper (d) of the carburetor control link is in contact with the stopper on the carburetor body (e).

NOTE:

After adjustment, open and close the throttle repeatedly for several times to reassure that the full-open position of the accelerator cam and the positioning of the carburetor control link stopper are correct.



4. Adjustment with full-close throttle:
- Accelerator cam
 - Carburetor control link

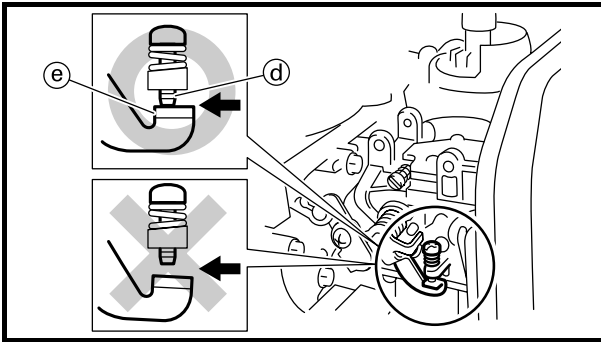
Adjustment steps

- (1) Set the shift lever ① in forward position.
- (2) Move the throttle ② to full-close position.

- (3) Make sure that the magnet base stopper ③ is in contact with the stopper on the engine body (full-close end stopper) ④.

- (4) Check that full-close position mark ① on the accelerator cam is aligned with the center of the cam roller ②.

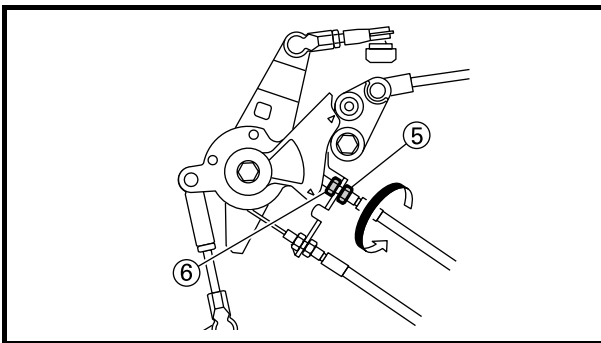
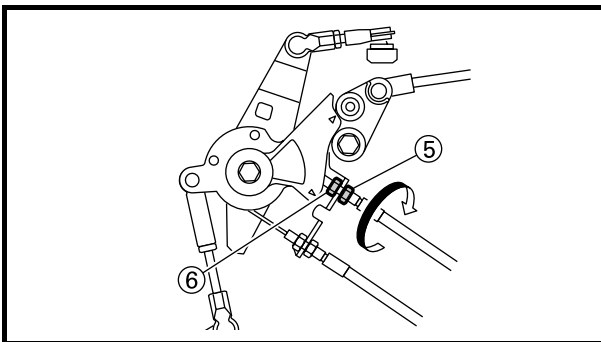
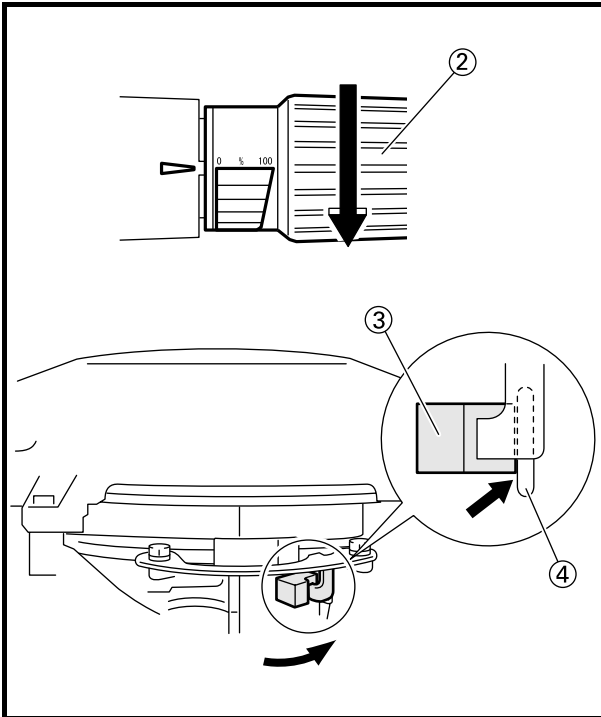
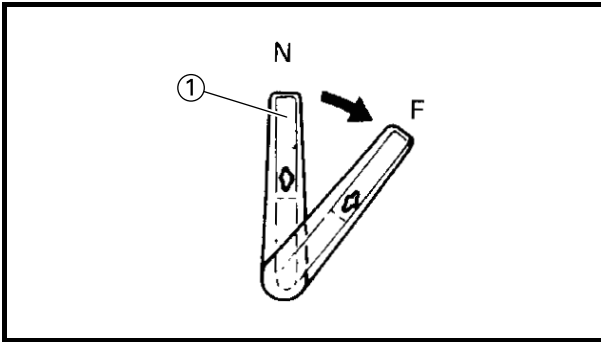
- (5) If they are not aligned, adjust the joint link length ③ until the full-close position mark ① comes to the center of the cam roller ②.



(6) Check that the throttle lever (e) is in contact with the throttle stop screw (d) on the carburetor.

NOTE:

After adjustment, open and close the throttle repeatedly for several times to reassure that the full-close position of the accelerator cam and the positioning of the throttle stop screw on the carburetor are correct.



5. Adjusting the throttle cable:
- Throttle cable

Adjusting steps

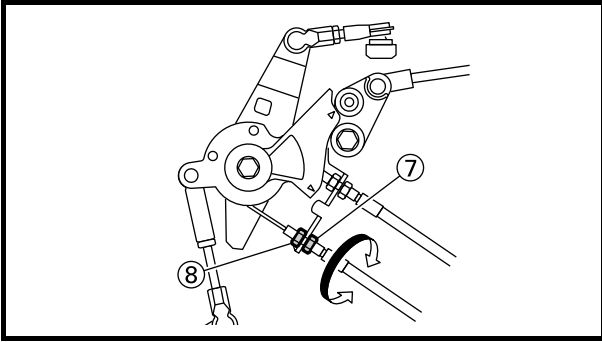
(1) Set the shift lever ① in forward position.

(2) Move the throttle ② to full-open position.

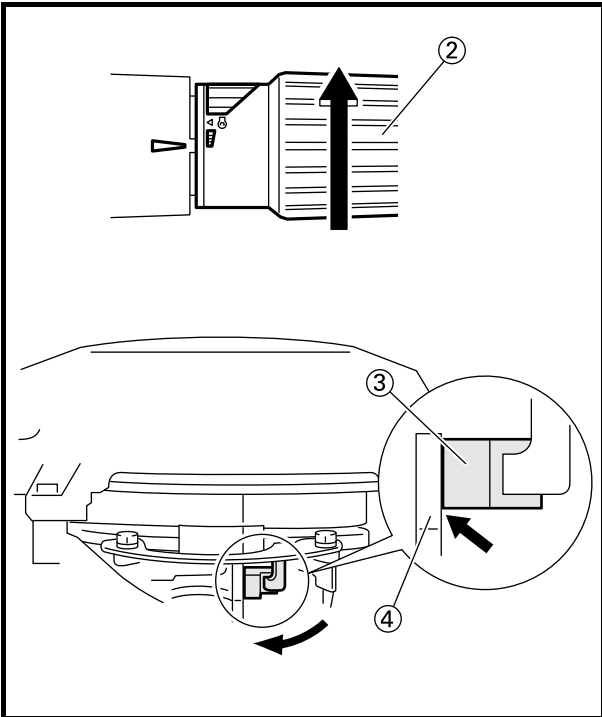
(3) Check that the magnet base stopper ③ is in contact with the stopper on the engine body (full-open end stopper)④.

(4) If the stoppers come in contact before the throttle is fully open, loosen the lock nut ⑥ on the throttle-opening cable, turn-in the adjusting nut ⑤ until the correct positioning is attained, and then secure it by the lock nut ⑥.

(5) If the stoppers do not come in contact at full-open throttle, then turn-out the adjusting nut ⑤ on the throttle-opening cable until the correct positioning is attained, and secure it by the lock nut ⑥.



(6) After confirming the positive contact of stoppers at full-open throttle position, turn the adjusting nut (7) on the throttle-closing cable so that the cable has a little slack, and then secure it by the lock nut (8).

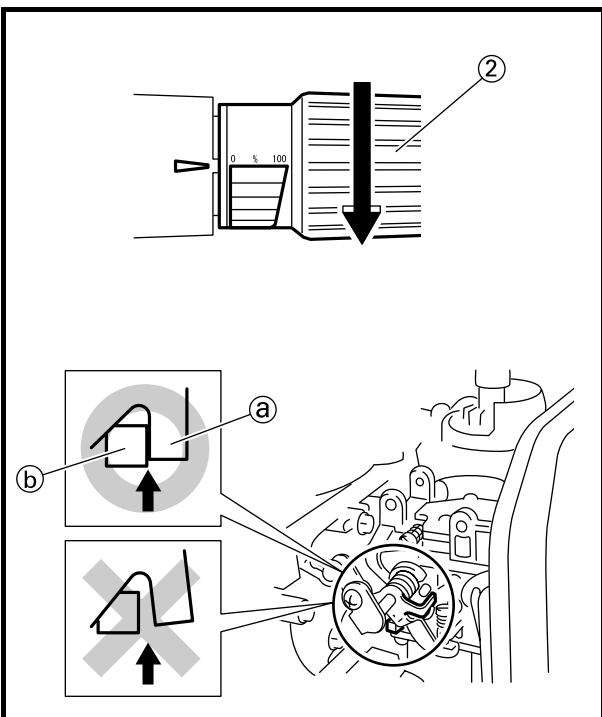


(7) Once the adjustment under full-open throttle is completed, move the throttle (2) to full-close position.

(8) Make sure that the magnet base stopper (3) is in contact with the stopper on the engine body (full-close end stopper) (4).

NOTE:

After adjustment, open and close the throttle repeatedly for several times to reassure that full-open position and full-close position of the accelerator cam are correct.



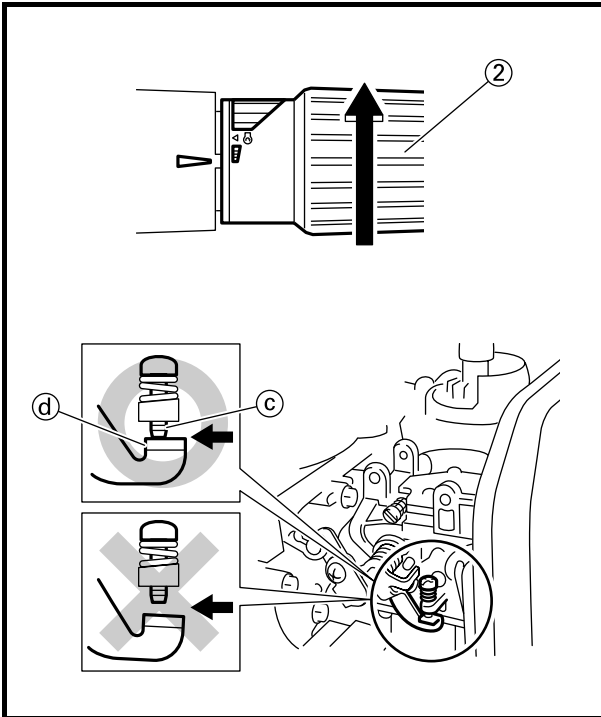
(9) Move the throttle (2) to full-open position.

(10) Check that full-open stopper (a) of the carburetor control link is in contact with the stopper on the carburetor body (b).

NOTE:

If they are not in contact, adjust the carburetor control link.

Refer to "Adjusting the carburetor control link:" on page 3-7.



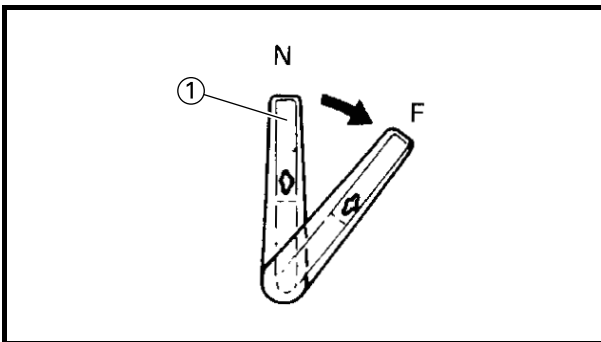
(11) Move the throttle (2) to full-close position.

(12) Check that the throttle lever (d) is in contact with the throttle stop screw (c) on the carburetor.

NOTE:

If they are not in contact, perform the adjustment with full-close throttle.

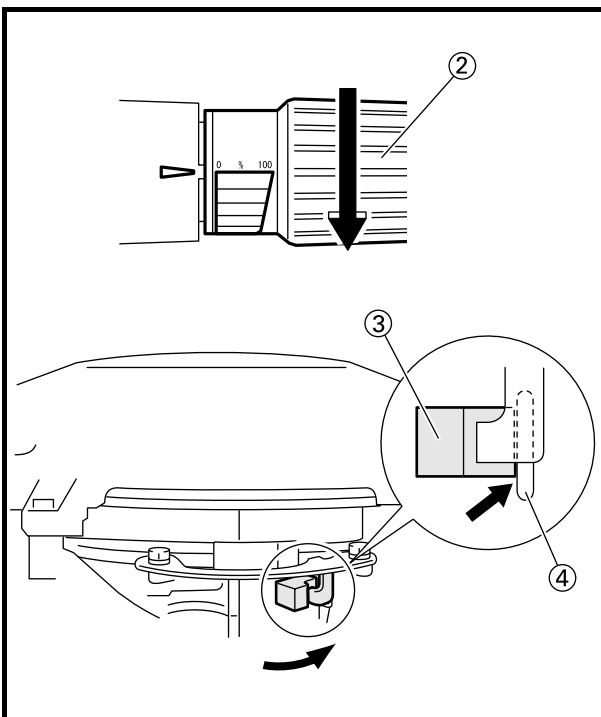
Refer to "Adjustment with full-close throttle:" on page 3-9.



6. Adjusting the throttle control lever:
• Throttle control lever

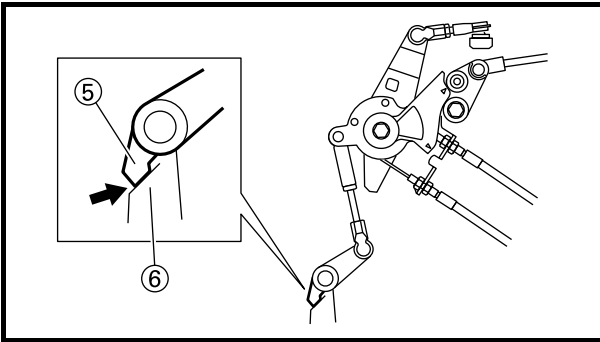
Adjustment steps

(1) Set the shift lever (1) at the forward position.

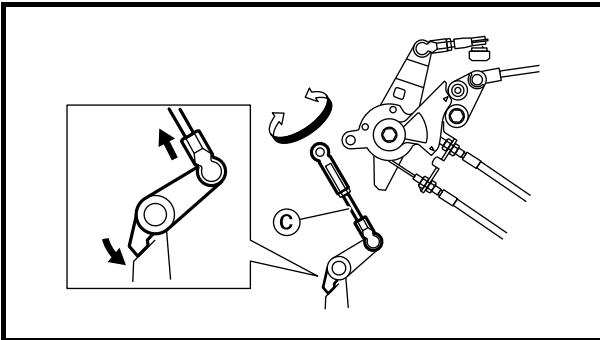


(2) Move the throttle (2) to full-open position.

(3) Check that the magnet base stopper (3) is in contact with the stopper on the engine body (full-open end stopper) (4).

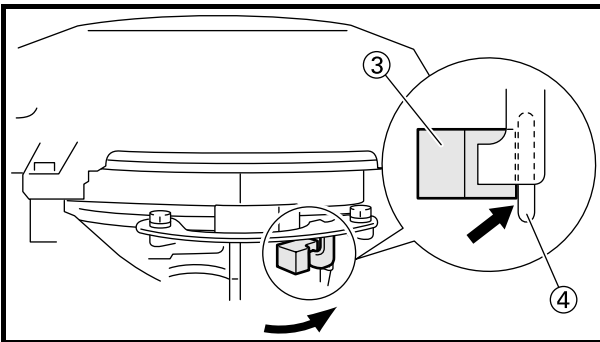


(4) Check that the throttle control lever (5) is in contact with the stopper (6) on the bottom cowling.



(5) If they are not in contact, adjust the length of the joint link (c) so that the throttle control lever seats on the stopper on the bottom cowling.

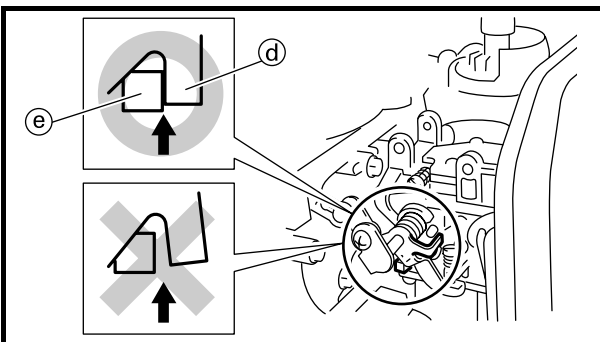
NOTE: _____
After adjustment, open and close the throttle repeatedly for several times to reassure the correct positioning.



(6) Check that the magnet base stopper (3) is in contact with the stopper on the engine body (full-open end stopper) (4).

NOTE: _____
If they are not in contact, perform the adjustment with full-open throttle.

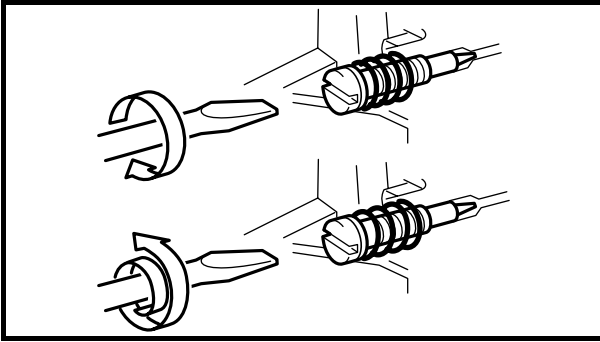
Refer to "Adjustment with full-open throttle:" on page 3-6.



(7) Check that full-open stopper (d) of the carburetor control link is in contact with the stopper on the carburetor body (e).

NOTE: _____
If they are not in contact, adjust the carburetor control link.

Refer to "Adjusting the carburetor control link:" on page 3-7.



7. Adjusting the engine idle speed:
- Engine idle speed

Adjustment steps

- (1) Adjust the pilot screw.



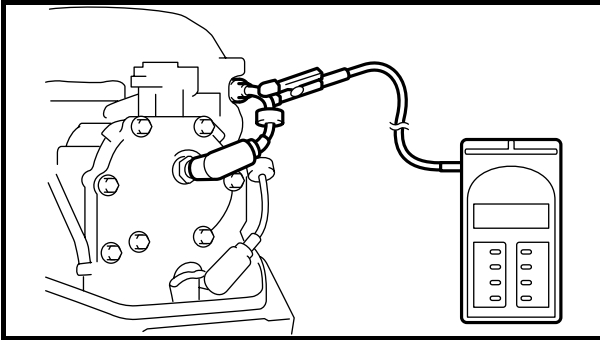
Pilot screw turn-out
1 - 1/4 ± 3/4

- (2) Adjust the idling stop screw.



Engine idle speed
1,100 ± 50 r/min

Refer to "ADJUSTING THE ENGINE IDLE SPEED" on page 3-16.





ADJUSTING THE ENGINE IDLE SPEED

NOTE:

- The engine should be warmed up for the adjustment. Correct adjustment cannot be obtained when the engine is cold.
- Make sure that the pilot screw adjustment is normal before implementing idling stop screw adjustment.

1. Measure:

- Engine idle speed
Out of specification → Adjust.



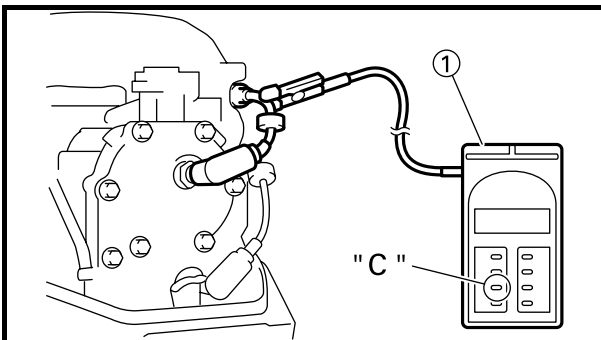
Engine idle speed
1,100 ± 50 r/min

CAUTION:

Install the engine in the test tank to check the engine idle speed.

Measuring steps

- (1) Start the engine and allow it to warm up for a few minutes.
- (2) Install the digital tachometer ① onto the spark plug lead of cylinder #1.
- (3) Press the position key "C" on the digital tachometer.



Digital Tachometer.....①
90890-06760

2. Adjust:

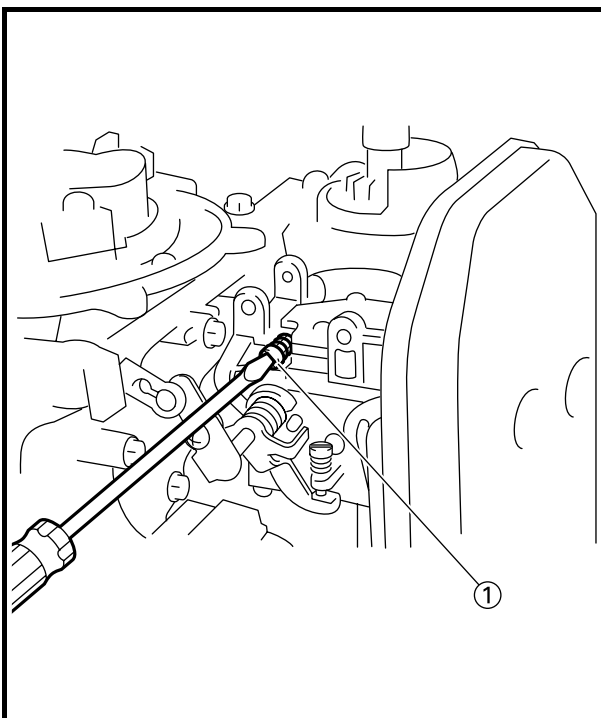
- Carburetor pilot screw

CAUTION:

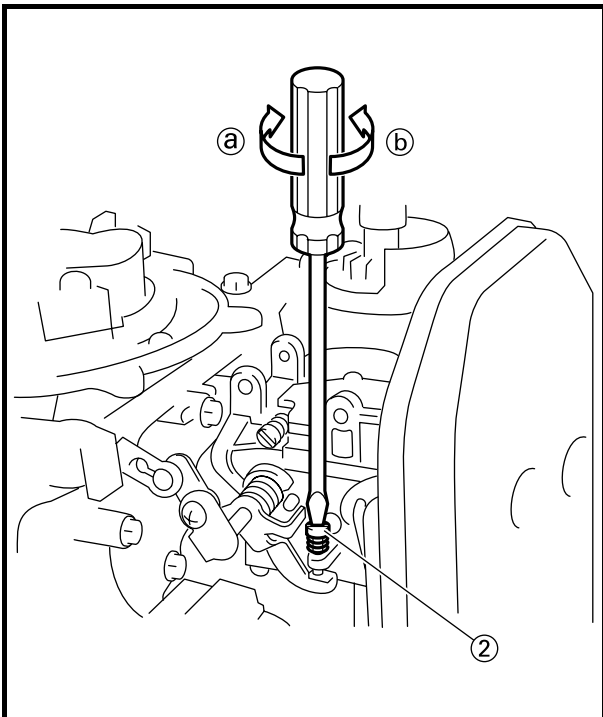
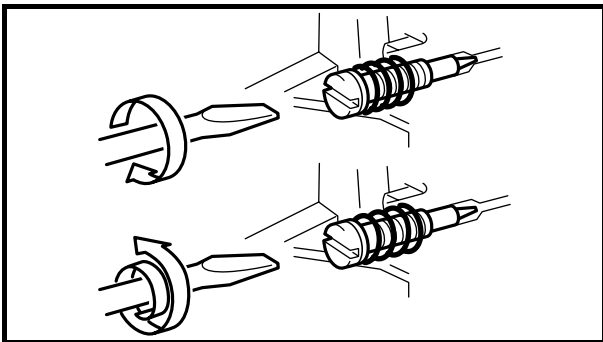
Do not adjust the carburetor when it is operating properly. Excessive adjustment may cause the engine poor performance.

Adjustment steps

- (1) Turn in the pilot screw ① until they are lightly seated.
- (2) Turn out the pilot screws by specified number of turns.



Pilot screw turn-out
1 - 1/4 ± 3/4



(3) Make sure that the idle speed is stable when the throttle is opened and closed for several times.

NOTE:

If the idle speed is not stable, disassemble and readjust the carburetor.

3. Adjust:

- Engine idle speed

Adjustment steps

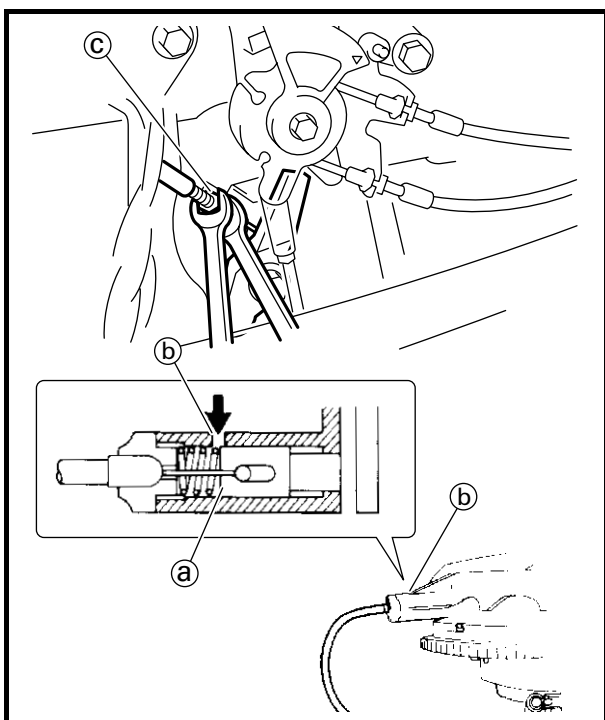
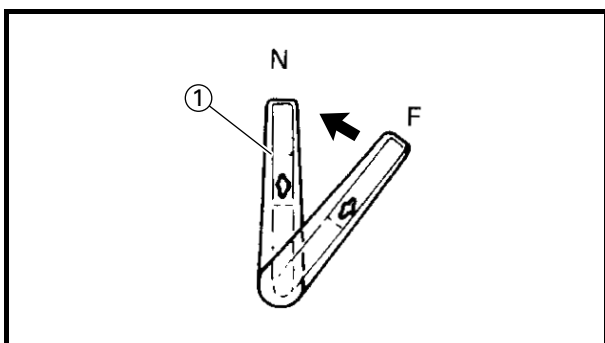
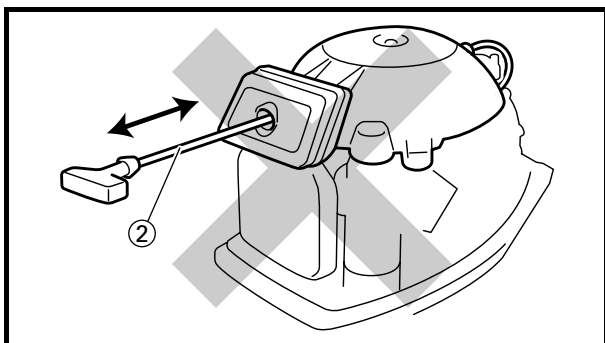
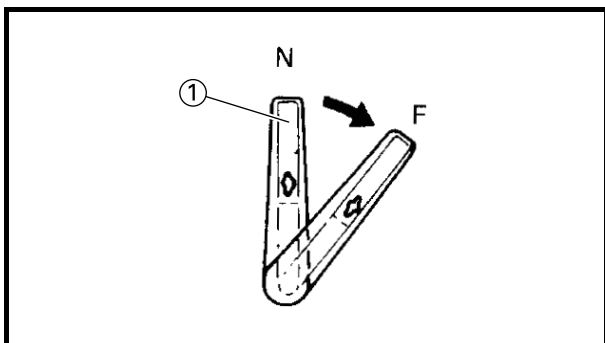
(1) Turn the idling stop screw (2) of carburetor in direction (a) or (b) until the specified engine idle speed is obtained.

Direction (a)	Engine idling speed increases .
Direction (b)	Engine idling speed decreases .

(2) Check the engine idling stability by opening and closing the throttle for several times. If engine idling is unstable, adjust the pilot screw.

NOTE:

After adjustment, open and close the throttle for several times and keep it idling for at least 15 seconds. Check if engine idle speed is stable.



ADJUSTING THE START-IN-GEAR PROTECTION DEVICE

CAUTION:

- Make sure that the engine is not running.
- Remove the plug caps.

1. Check:

- Start-in-gear protection device

Checking steps

- (1) Set the shift lever ① in forward or reverse position.
- (2) Check that the starter rope ② cannot be pulled out.
- (3) If the starter rope can be pulled out, perform the adjustment.

2. Adjust:

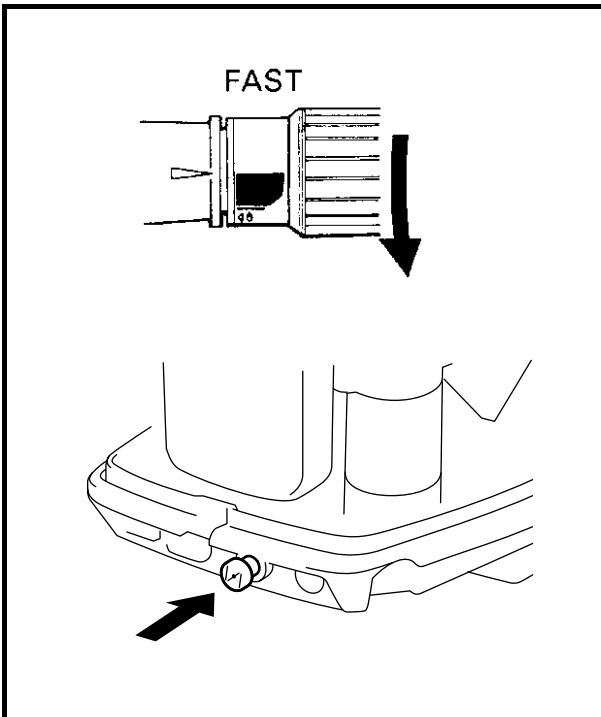
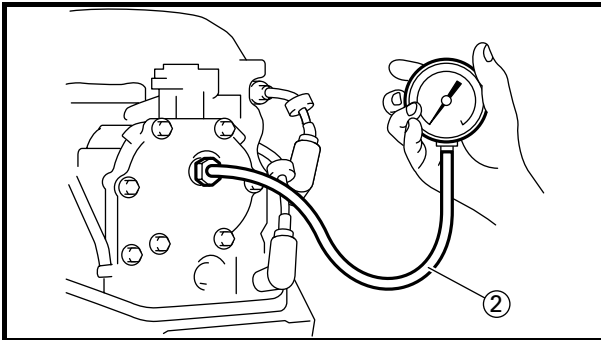
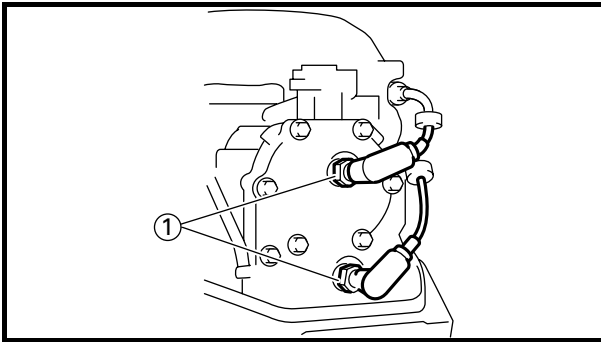
Adjustment steps

- (1) Set the shift lever ① in neutral position.

- (2) Turn in or out the adjusting nut ③ on the starter stop wire so that the starter stopper end ④ is aligned with the hole on the starter case ⑤.

NOTE:

- Check again that the starter rope can not be pulled out when the shift is engaged.
- Check again that the starter rope can be pulled out when the shift is in neutral.



POWER UNIT MEASURING THE COMPRESSION PRESSURE

NOTE:

The engine should be warmed up before measuring the compression pressure. Correct measurement cannot be obtained when the engine is cold.

Measure:

- Compression pressure
Below minimum compression pressure → Check or replace piston, piston rings, cylinder head, and cylinder head gasket.



Compression pressure (reference value)

25B: 730 kPa
(7.3 kgf/cm², 105.9 psi)

30H: 740 kPa
(7.4 kgf/cm², 107.3 psi)

Minimum compression pressure

25B: 580 kPa
(5.8 kgf/cm², 84.1 psi)

30H: 590 kPa
(5.9 kgf/cm², 85.6 psi)

Measuring steps

- (1) Remove the spark plug ①.

CAUTION:

Before removing the spark plug, clean the spark plug well area to prevent any dirt from falling into the cylinder that is being checked.

- (2) Install the compression gauge ② into the spark plug hole.

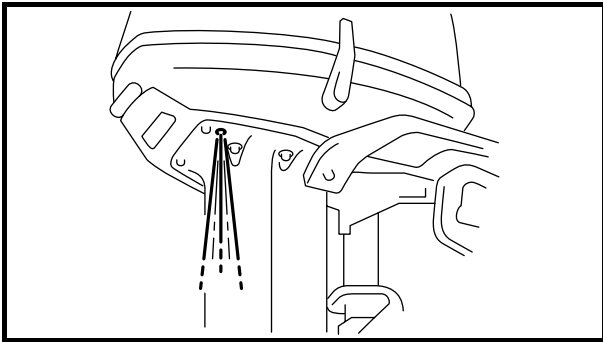


Compression gauge.....②
90890-03160

- (3) Fully open the throttle.
- (4) Fully open the choke. (Make the choke valve ineffective.)
- (5) Crank the engine by means of recoil starter until the compression gauge gives stable reading.
- (6) Remove the compression gauge ②.
- (7) Install the spark plug ①.



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



COOLING SYSTEM

CHECKING THE COOLING WATER DISCHARGE

Check:

- Pilot water
Does not flow → Clean and check the cooling water passage.

Checking steps

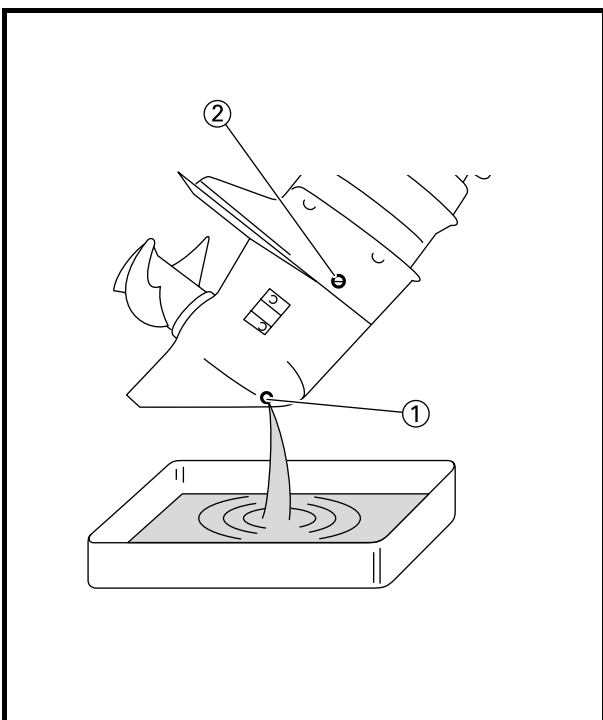
- (1) Place the lower unit in water.
- (2) Start the engine.
- (3) Check that water flows from the pilot water outlet.

LOWER UNIT

CHECKING THE GEAR OIL LEVEL

Check:

- Gear oil level
Level is low → Add gear oil to the proper level.



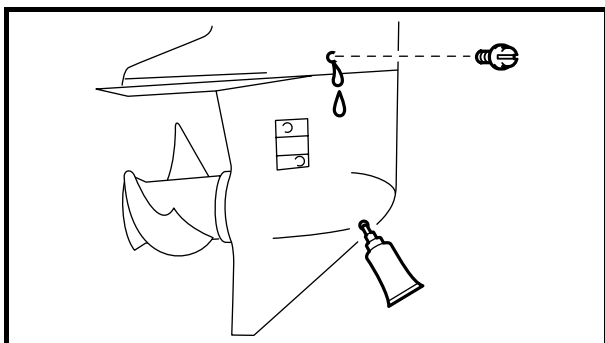
CHANGING AND CHECKING THE GEAR OIL

1. Check:

- Gear oil
Milky oil → Replace the oil seal.
Slug oil → Check the oil gears, bearings, and clutch dog.

Checking steps

- (1) Tilt up the outboard slightly.
- (2) Place a container under the gear oil drain screw ①.
- (3) Remove the gear oil drain screw and gear oil level check screw ②.



2. Fill:

- Gear oil
(with the specified amount of the recommended gear oil)



Recommended gear oil
Hypoid gear oil, SAE #90 (API GL-4)
Oil capacity
320 cm³ (10.8 US oz, 11.3 Imp oz)

Filling steps

- (1) Place the outboard in an upright position.
- (2) Insert the gear oil tube into the drain hole and slowly fill the gear oil until oil flows out of the check hole and no air bubbles are visible.
- (3) Install the gear oil level check screw and then quickly install the gear oil drain screw.

CHECKING THE LOWER UNIT (FOR AIR LEAKS)

Check:

- Lower unit holding pressure
Pressure drops → Check the seal and components.



Lower unit holding pressure
100 kPa (1.0 kg/cm², 14.5 psi) for
10 seconds

Checking steps

CAUTION:

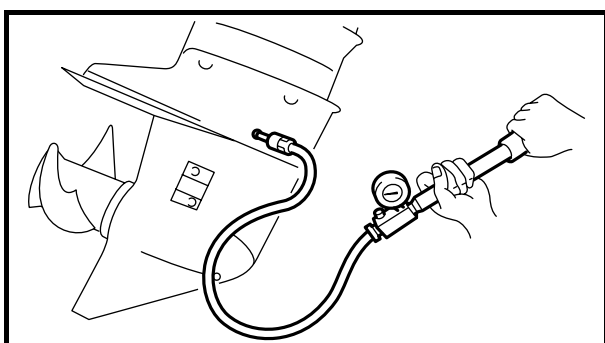
Do not overpressurize the lower unit. Excessive pressure may damage the oil seals.

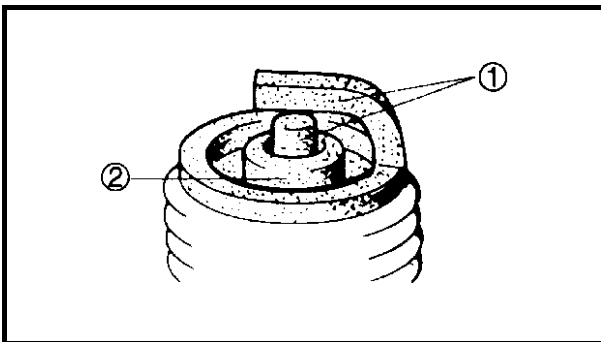
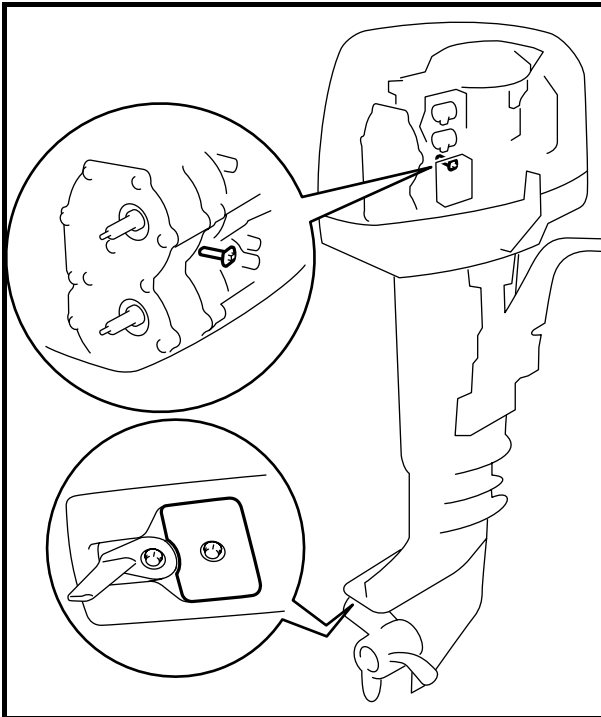
- (1) Remove the gear oil level check screw.
- (2) Install the pressure tester into the check hole.



Leakage tester
90890-06762

- (3) Apply the specified pressure.
- (4) The lower unit should hold the specified pressure for 10 seconds.





GENERAL

CHECKING THE ANODE

Check:

- Anodes
Scales → Clean.
Oil/grease → Clean.
Excessive wear → Replace.

CAUTION:

Do not oil, grease, or paint the anode, or it will not operate properly.

CHECKING THE SPARK PLUGS

1. Check:

- Electrodes ①
Cracks/excessive wear → Replace.
- Insulator color ②
Distinctly different color → Check the engine condition.



Color guide:

Medium to light tan color

Normal

Whitish color

- Lean fuel mixture

- Plugged jet (s)

- Wrong setting

Blackish color

- Rich mixture

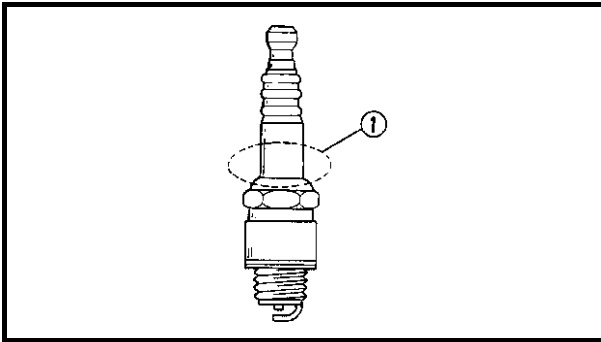
- Excessive oil usage

- Defective ignition system

- Defective spark plug

2. Clean:

- Spark plug
(use a spark plug cleaner or wire brush)

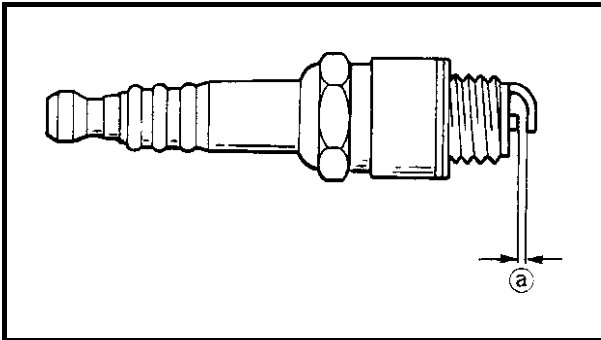


3. Check:

- Spark plug type ①
Incorrect → Replace.

Standard spark plug

- 25B:**
NGK BR7HS-10
30H:
NGK BR8HS-10

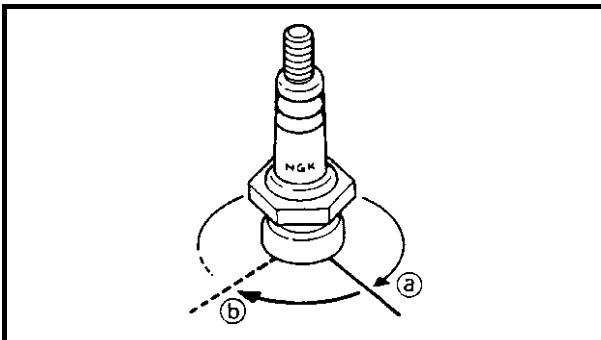


4. Measure:

- Spark plug gap ①
Out of specification → Replace.



Spark plug gap
0.9-1.0 mm (0.035-0.039 in)



5. Tighten:

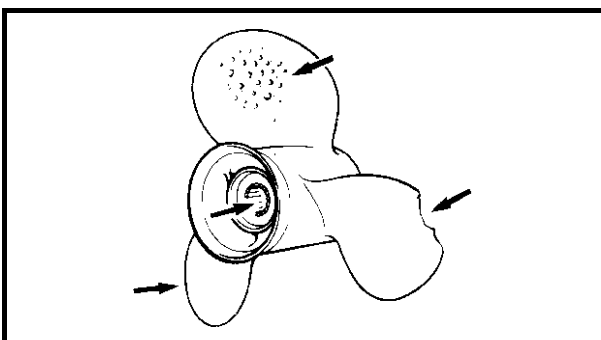
- Spark plug



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

NOTE:

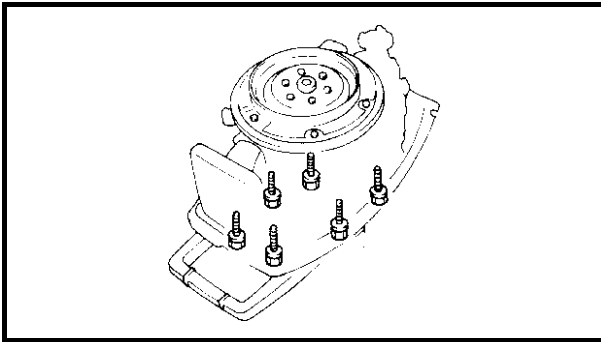
- Before installing the spark plug, clean the gasket surface and spark plug surface. Also, it is suggested to apply a thin film of anti-seize compound to the spark plug threads to prevent thread seizure.
- If a torque wrench is not available, a good estimate of the correct tightening torque is to finger tighten ① the spark plug and then tighten it another 1/4 to 1/2 of a turn ②.



CHECKING THE PROPELLER

Check:

- Propeller
- Spline
Wear/cracks/damage → Replace.



CHECKING BOLTS AND NUTS

Check:

- Power unit mount bolt
- Flywheel nut

Loose bolts / nuts → Tighten to the specified torque.



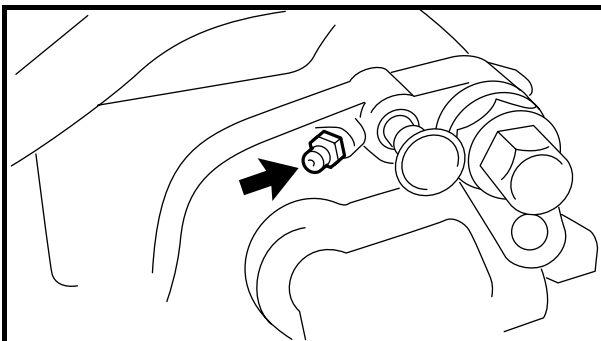
Power unit mount bolt

1st: 11 N•m (1.1 kgf•m, 8.1 ft•lb)

2nd: 22 N•m (2.2 kgf•m, 16 ft•lb)

Flywheel nut

140 N•m (14 kgf•m, 103 ft•lb)



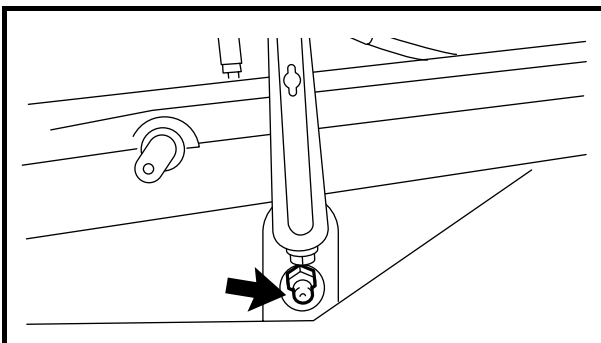
LUBRICATION POINTS

1. Apply:

- Yamaha grease A

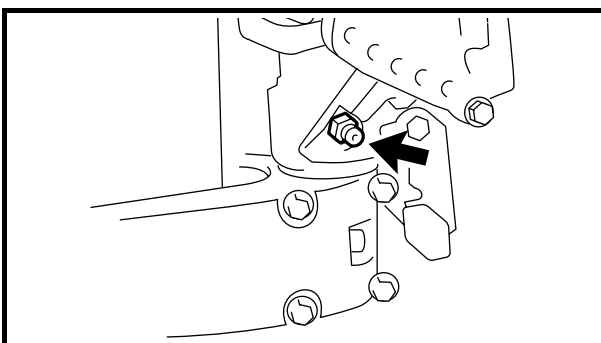
NOTE: _____

Using a grease gun, fill in the grease until it comes out of the bushing.



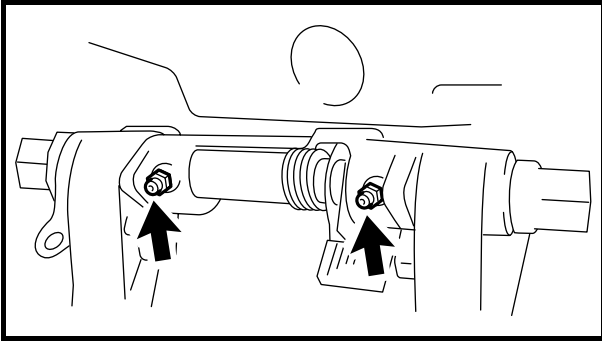
NOTE: _____

Use a grease gun.

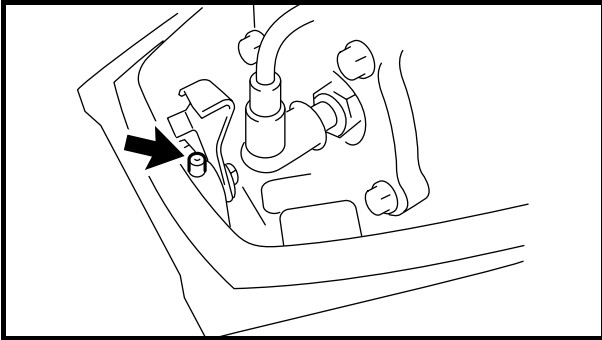


NOTE: _____

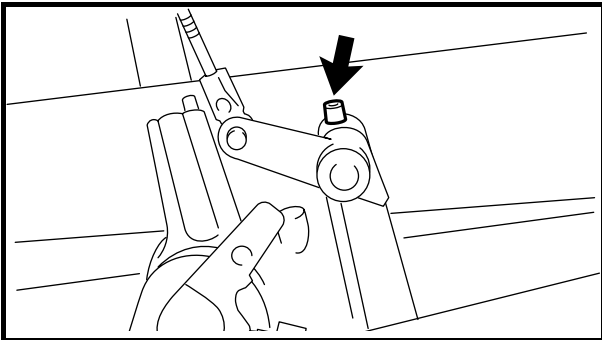
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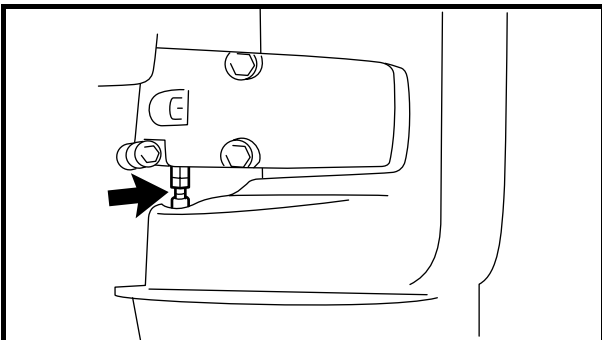
NOTE: _____
Using a grease gun, fill in the grease until it comes out of the bushing.



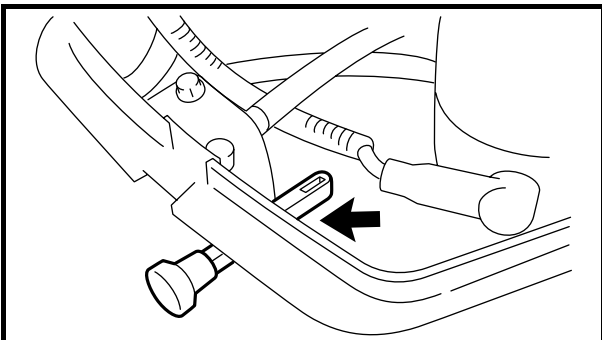
NOTE: _____
Use a grease gun.



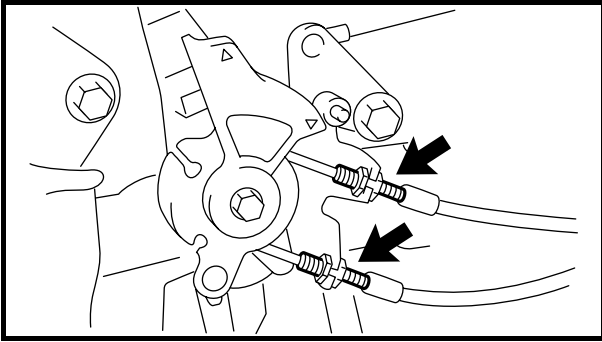
NOTE: _____
Use a grease gun.



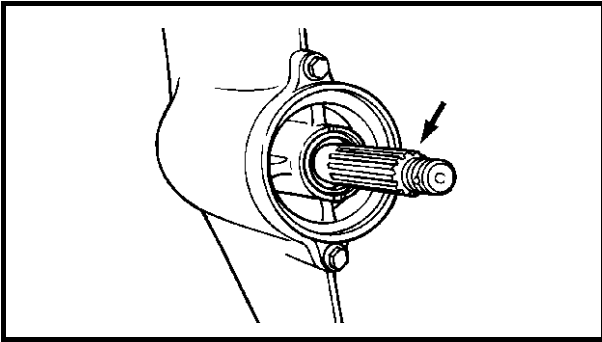
NOTE: _____
Grease the area where shift rod, shift connector, and the nut are fastened.



NOTE: _____
Grease the sliding face of the choke knob.



NOTE: _____
Grease the inner cable and the lock nut.



2. Apply:
 - Yamaha grease D