



■ Engine

Tension Adjustment

- (0) Align No.1 TDC mark on the cam pulley with the alignment mark on the timing belt back cover.
- (1) Loosen the timing belt tensioner fastening bolts.
- (2) Turn the crankshaft counter-clockwise by six or more teeth of the timing belt drive pulley.
- (3) Turn the crankshaft clockwise by three teeth of the timing belt drive pulley.
- (4) Tighten the timing belt tensioner bolt to specified torque.

CAUTION:

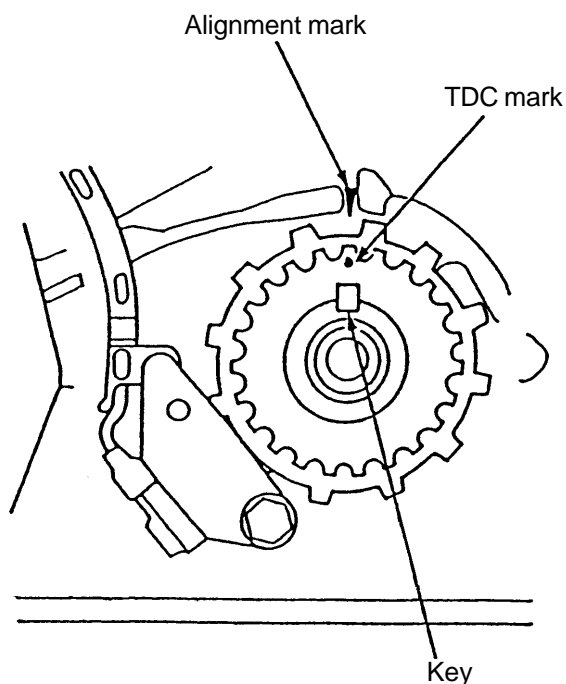
- Adjust the belt tension when the engine is cold after valve clearance adjustment.
- Leave the tensioner spring load-free during tension adjustment.

Installation

CAUTION:

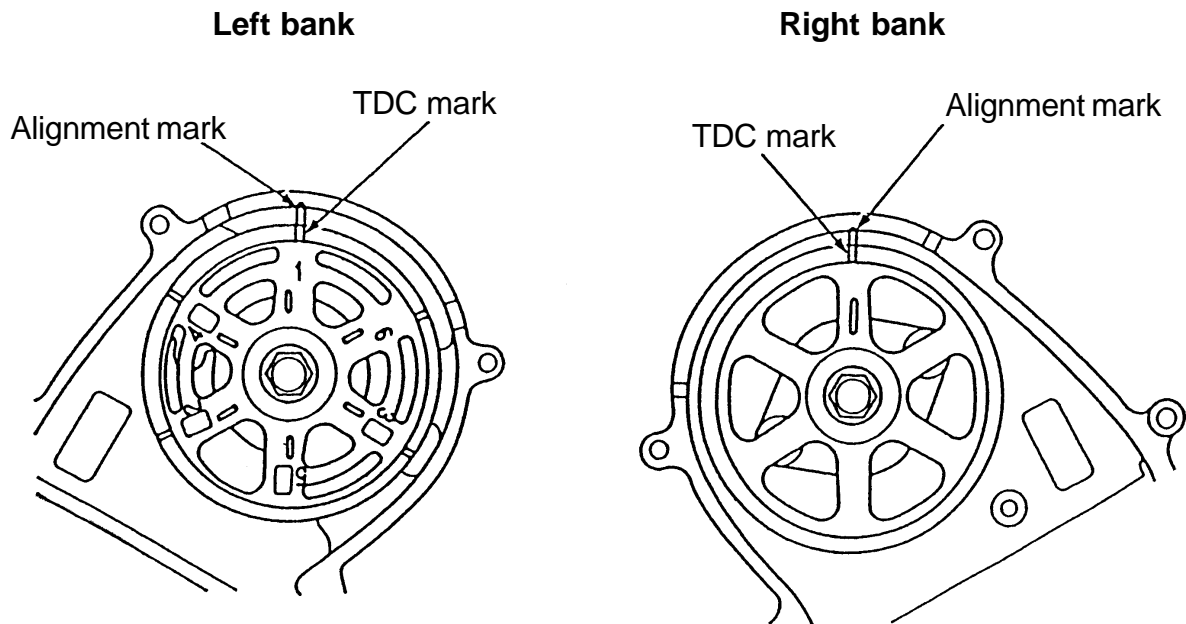
Before installation, be sure to wipe the upper and lower covers clean with a piece of waste cloth.

- (1) Remove all the spark plugs.
- (2) Align the TDC mark on the timing belt drive pulley with the alignment mark on the crankcase upper cover.





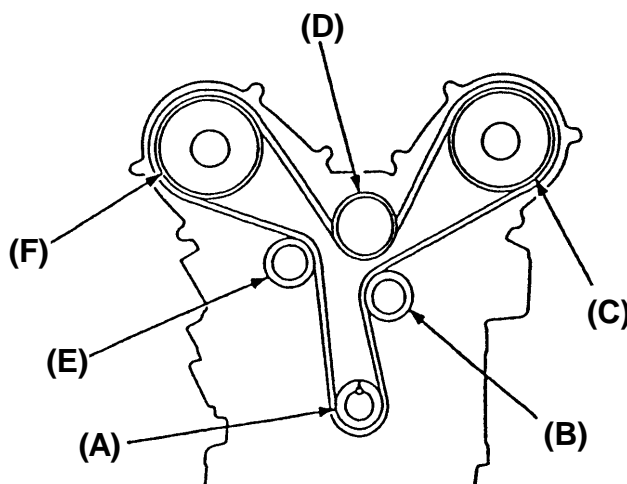
- (3) Align the TDC mark on the camshaft pulley at each bank with the alignment mark on the back cover.



- (4) Loosen the tension pulley fastening bolt by backing it off approximately 1 complete turn from the contact point of its bearing surface.
- (5) Install the timing belt on the pulleys in the following order.
 (A) Timing belt drive pulley (crankshaft) → (B) Idler pulley B (flangeless) → (C) Left-bank cam shaft pulley → (D) Idler pulley A (flanged) → (E) Tensioner pulley → (F) Right-bank camshaft pulley

CAUTION:

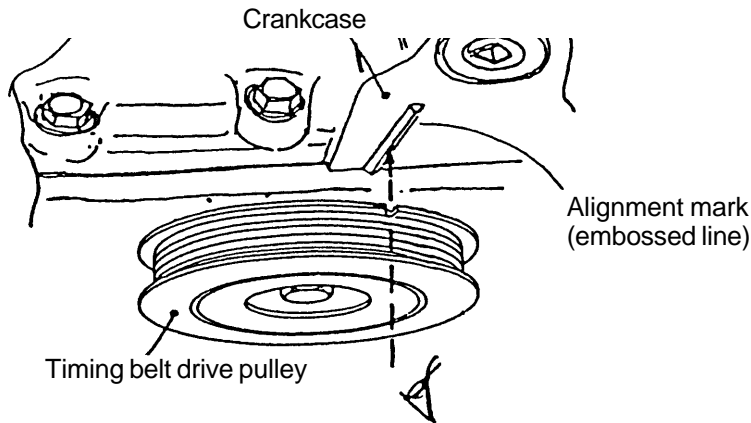
Install the timing belt using care not to damage it.



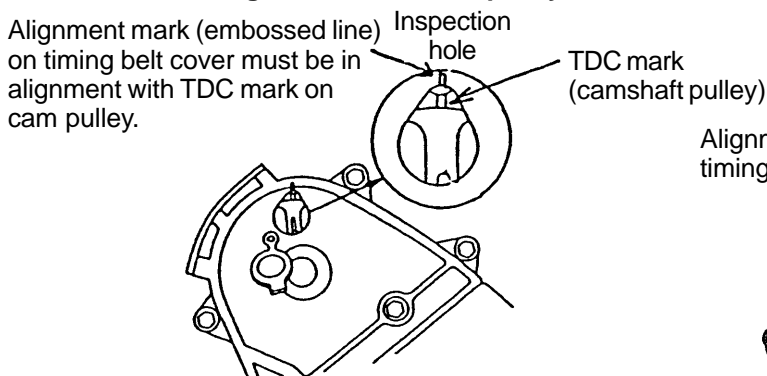


- (6) Check that the TDC marks on the timing belt drive pulley and cam shaft pulley are in alignment with the top-dead-center point of compression stroke of No. 1 piston.

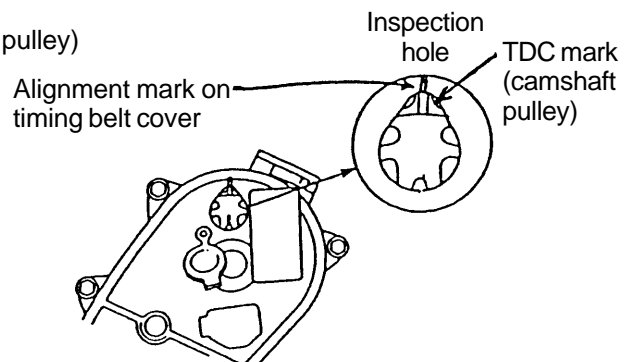
Timing belt drive pulley



Right-bank camshaft pulley



Left-bank cam shaft pulley



- (7) After the belt tension adjustment is completed, tighten the tensioner bolts to specified torque (36.3 – 42.1Nm).
- (8) Install the left-bank and right-bank timing belt covers.
- (9) Install the crankshaft pulley and tighten the pulley bolt to specified torque. Make the timing belt conform to the pulley by giving the crankshaft 5 to 6 turns.
- (10) Once again, check that the TDC marks on the timing belt drive pulley and camshaft pulley are in alignment with the top-dead-center position of compression stroke of No. 1 piston.
- (11) If the timing belt drive pulley and/or cam shaft pulley are not in alignment with No. 1 piston top-dead-center position, redo the installation of the timing belt on the pulleys from the beginning.

NOTE:

To remove the timing belt, follow the installation sequence in reverse.



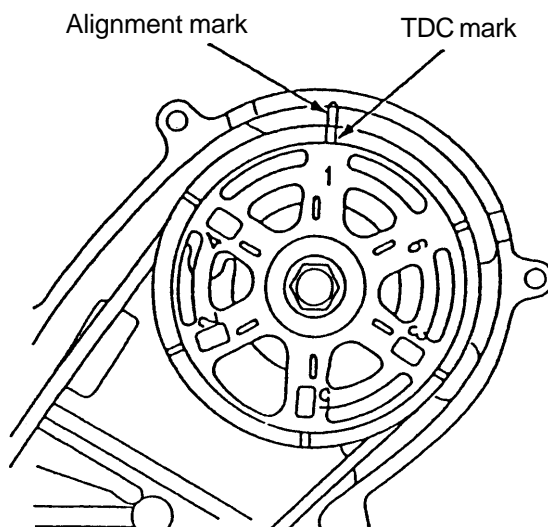
Tappet Clearance Adjustment

CAUTION:

- Carry out the adjustment at normal temperature (10 – 40°C in oil temperature).
- Adjust tappet clearance with each piston at the top-dead-center position of its compression stroke (both intake and exhaust rocker arms are not lifted).

- (1) Remove the engine cover and side cover.
- (2) Remove the rear bracket and stay.
- (3) Remove the silencer.
- (4) Remove the inlet manifold upper cover.
- (5) Remove the inlet manifold.
- (6) Remove the timing belt upper cover.
- (7) Position the camshaft pulley to the top dead center of compression stroke of No. 1 piston.

NOTE: Align No.1 piston TDC mark with the alignment mark on the back cover.



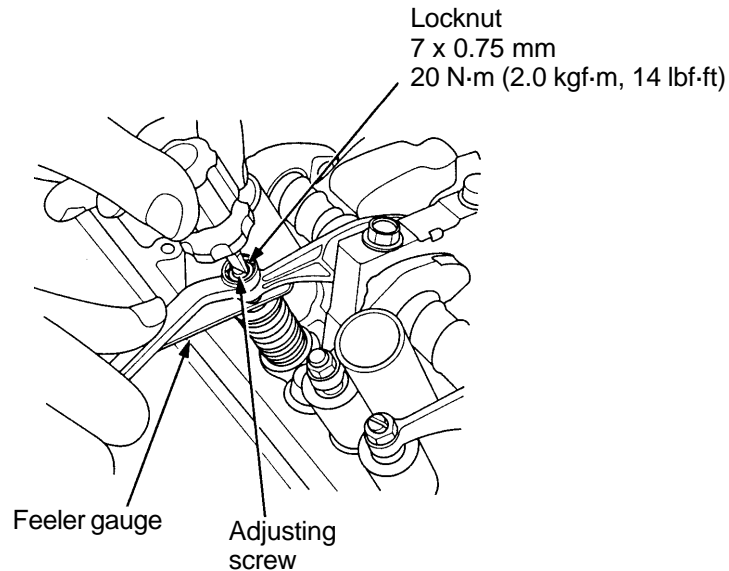


- (8) Loosen lock nut on each rocker arm adjust screw. Turning the adjust screw, adjust tappet clearance.

[Standard tappet clearance]

Intake: 0.20 – 0.24 mm

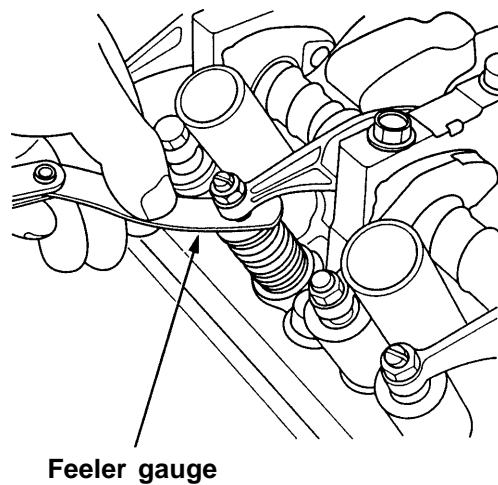
Exhaust: 0.28 – 0.34 mm



- (9) Tighten the lock nut and measure the tappet clearance again with a feeler gauge.

CAUTION:

Be sure to use a torque wrench when tightening the lock nuts.



- (10) Position the camshaft pulley to the top-dead-center points of compression stroke of other pistons, and repeat the steps (8) and (9).



- (4) Return the control lever to the neutral position.
- (5) Turning the adjust nut on the close-side throttle cable, align the match mark and roller center on the throttle cam.
- (6) Tighten the throttle cable adjust nuts.

CAUTION:

If the control lever is stuck when the engine is not operating, shift it carefully while lightly turning the propeller or propeller shaft. An attempt to shift forcibly may damage the control system.

Checking Water Separator with Water Level Sensor

Remove the engine cover. Visually check the water separator cup. If water is collected and/or foreign matter are accumulated in the cup, disassemble and inspect the water separator. The same applies when "water filled" warning buzzer sounds.

WARNING:

During the work below, keep away from any heat source.

Disassembly

- (1) Disconnect 2P coupler of the water level sensor.
- (2) Remove the suspension from the strainer bracket, then from the water separator.
- (3) Clip the fuel tube firmly not to let fuel out.
- (4) Remove the fuel tube.
- (5) Remove three screws holding the separator cup to the separator body, and separate them.
- (6) Remove water and foreign matters from inside the cup.

Inspection

Perform the steps (1) through (3) to check the water separator for abnormality. Replace the water separator if necessary.

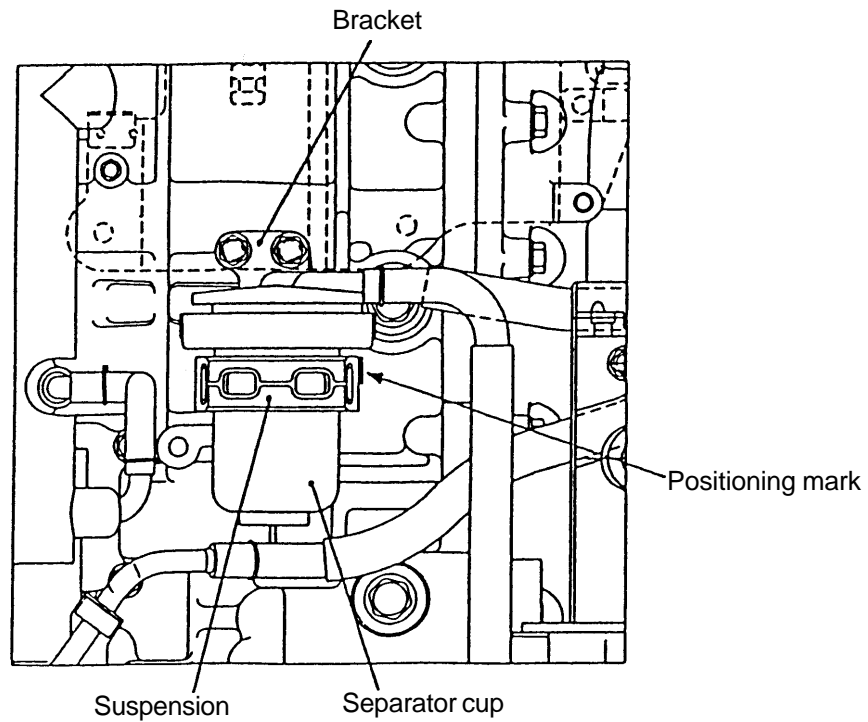
- (1) With the separator cup off, check that the float moves smoothly.
- (2) With the separator cup off, check that there is no continuity between two terminals of 2P coupler when the water level sensor is maintained in the horizontal position.
- (3) With the separator cup off, check that there is continuity between two terminals of 2P coupler when the water level sensor is maintain upside down.
- (4) Check the O-ring sealing the cup and element for hairline fracture, crack and setting. Replace if necessary.



Reassembly

Follow the disassembly sequence in reverse.

- Screw tightening torque: 3.4+/-0.7 Nm
- Align the fuel joint (outlet side) of the strainer to the positioning mark of the suspension.
- Check for fuel leakage after reassembly.





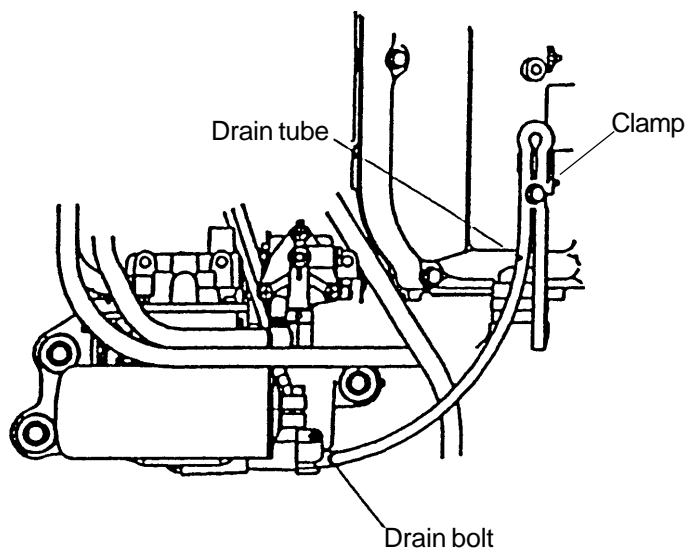
Draining Fuel from Vapor Separator and Checking Vapor Separator

WARNING:

During the work below, keep away from any heat source.

Draining Fuel

- (1) Disconnect the drain tube clamped at the bottom of the left-bank cylinder head cover, and put the tube end out to the front of the side cover.
- (2) Loosen the drain bolt of the vapor separator.



- (3) Tilt up the outboard motor.
- (4) When fuel is drained from the drain tube, put the outboard motor back in the horizontal position.
- (5) After fuel has been drained out, tighten the drain bolt and clamp the drain tube securely to the cylinder head cover.



Checking Low Pressure Fuel Strainer

WARNING:

During the work below, keep away from any heat source.

Checking

Remove the engine cover and visually check the cup of the low pressure strainer. If water is collected and/or foreign matters are accumulated in the cup, disassemble and clean the low pressured fuel strainer as follows. The same applies when the element is clogged.

Disassembly and Cleaning

- (1) Remove the suspension from the strainer bracket, then from the strainer.
- (2) Clip the fuel tube not to let fuel out.
- (3) Remove the fuel tube.
- (4) Remove three screws holding the strainer cup to the strainer body, and separate them.
- (5) Remove water and foreign matters completely from the strainer cup.
- (6) If the element is clogged, replace it.
- (7) Check the O-ring sealing the cup and element for hairline fracture, crack and permanent set.
Replace if necessary.

Reassembly

Follow the disassembly sequence in reverse.

- Screw tightening torque: 3.4 ± 0.7 Nm
- Make sure that the position of the strainer fuel joint (outlet side) matches the positioning mark on the suspension.
- After reassembly, check that the strainer has no fuel leaks.

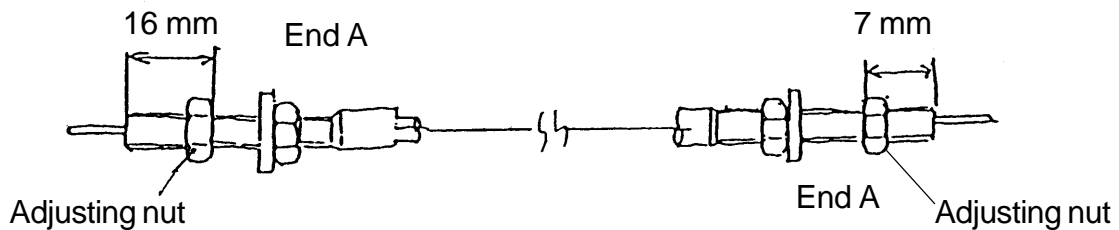


■ Frame

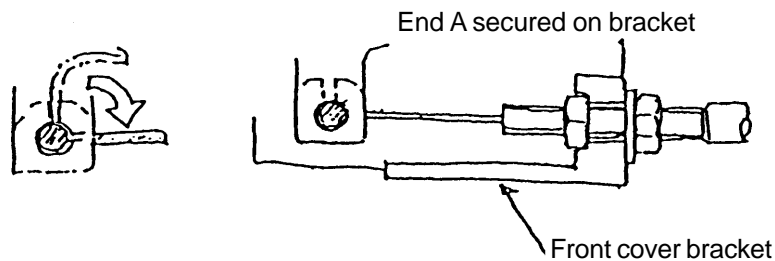
Adjustment of cover lock cables

Perform the following adjustment steps with the underside cover removed.

- (1) Move the adjusting nuts on the cable ends A and B of the cover lock cable B (shorter cable) to the positions shown below.



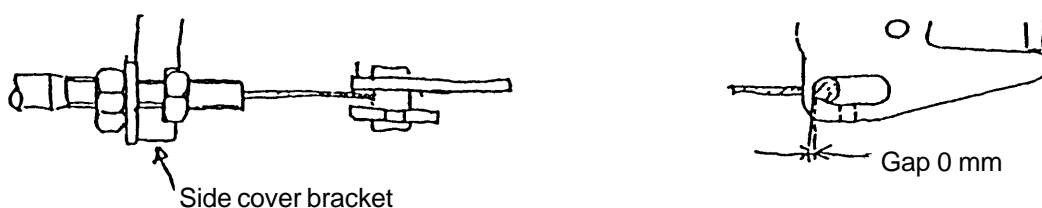
- (2) Insert the hook of the cable extending from the end A of the cover lock cable B into the front lock arm, fit the end A in the groove of the front cover bracket, then tighten the washer-attached nut to secure the end A on the bracket.



- (3) Insert the hook of the cable extending from the end B of the cover lock cable B into the slot in the left side lock arm, fit the end B in the groove of the side cover bracket, then tighten the washer-attached nut to secure the end B on the bracket.

NOTE:

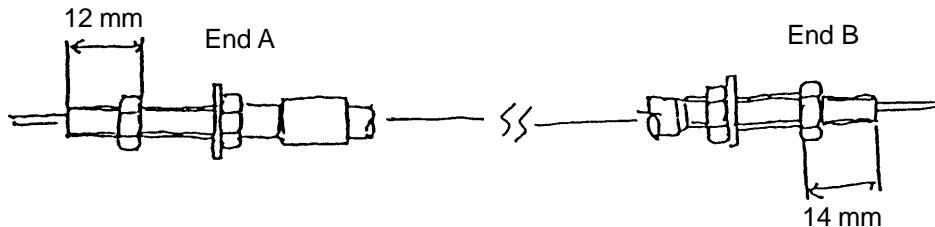
There should be no gap between the cable hook and the left edge of the slot in the side lock arm. If there is a gap, make an adjustment by turning the nuts.





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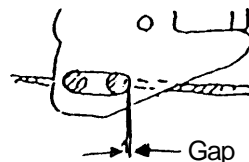
- (4) Move the adjusting nuts on the cable ends A and B of the cover lock cable A (longer cable) to the positions shown below.



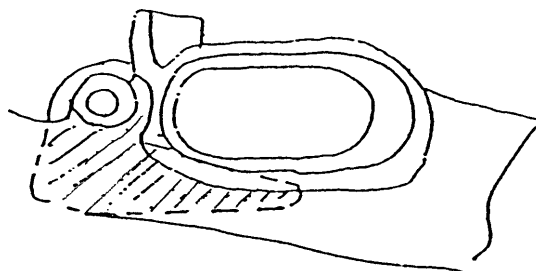
- (5) Insert the hook of the cable extending from the end A of the cover lock cable A into the right side lock arm, fit the end A in the groove of the right side bracket, then tighten the washer-attached nut to secure the end A on the bracket.
- (6) Insert the hook of the cable extending from the end B of the cover lock cable A into the slot in the left side lock arm, fit the end B in the groove of the left side bracket, then secure it in the same way as step (5).

NOTE:

There should be no gap between the cable hook and the right edge of the slot in the side lock arm. If there is a gap, make an adjustment by turning the nuts on the end B fitted in the left side bracket.



- (7) Move the cover lock release lever to check operation of the front lock arm and the right and left side lock arms. With the lever pulled up, the lock arms should not be visible through the engine cover's hook damper attaching hole when it is looked at from above the cover.





■ Typical outboard motor problems and measures against them

No.	Problem	Measures	
		Temporary measures	Preventive measures
1	Consumption of engine oil increases (due to use of such a poor quality fuel as that containing heater kerosene).	Replace engine oil.	Stop using a poor quality fuel and use only recommended fuel.
2	Engine oil leaks into fuel chamber (due to keeping the engine's cylinder head down for long time).	<ul style="list-style-type: none"> Remove the spark plugs and crank the engine to discharge oil. Clean the spark plugs. 	Avoid stowing or carrying the outboard motor with the cylinder head pointing down.
3	Corrosion in exhaust system components; escape of gas past exhaust valves; increased oil consumption (due to use of leaded gasoline with more than 0.013 grams of lead added per liter).	Replace the engine.	Use only the recommended fuel.
4	Heated oxygen sensor is faulty (due to use of leaded gasoline with more than 0.013 grams of lead added per liter).	Replace the heated oxygen sensor.	Use only the recommended fuel.
5	Engine covers interfere in two motor configuration.	<ul style="list-style-type: none"> Avoid tilting up only one motor. Replace engine covers. 	<ul style="list-style-type: none"> Always tilt up both motors simultaneously. Install optional tilt limit switch.
6	Motor well cover interferes with engine cover, or engine cannot be installed (due to inability to install engine cover) when motor is tilted up. (Motor well cover height: 1022 mm or lower)	<ul style="list-style-type: none"> Avoid tilting motor up. Modify motor well cover. 	<ul style="list-style-type: none"> Modify boat or motor well cover. Install optional tilt limit switch

■ Notes on handling of special components

Flush valve

The flush valve is located on the left bank of the engine. It forms part of the coolant passage that is ordinary separated from the outside by the relief valve. The valve is used to flush the coolant passages.

Flush procedure

- (1) Connect a water mouth joint to flushing hose.
- (2) Connect the hose to the flush valve.
- (3) Supply pure water to flush the coolant passages.

CAUTION:

Be sure to use a water mouth joint that matches both the hose and flush valve.



Anode metal

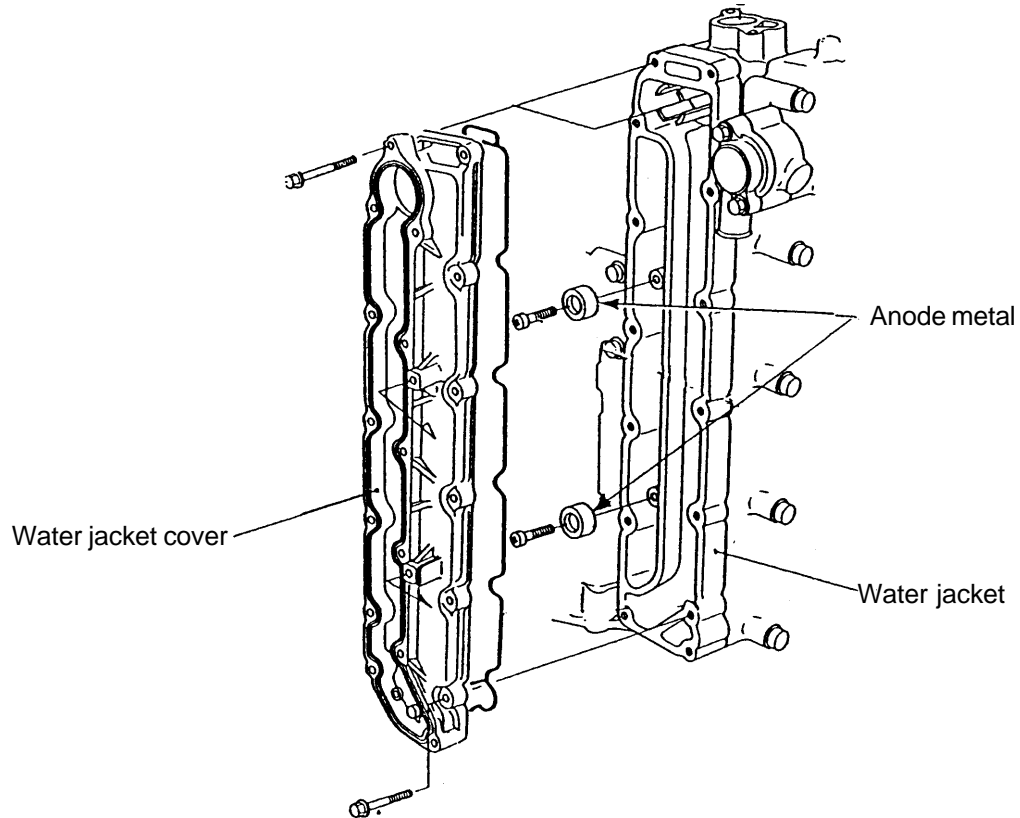
The anode metal has high potential difference from the surrounding metal, which enables it to make corrosion occur in itself, thus retarding propagation of corrosion to the surrounding metal. The BF200/225 uses a total of 6 pieces of anode metal: one each on the right and left sides of the gear case assembly and two each in right and left water jackets.

Anode metals on gear case





Anode metals in water jackets



- Replace the anode metal if it is found badly corroded as a result of inspection.
- Inspect the anode metal whenever the water jacket cover is removed for servicing. It should be inspected at least once every 5 years.