

# MAINTENANCE

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**MAINTENANCE**  
INSPECTION AND MAINTENANCE SCHEDULE

# INSPECTION AND MAINTENANCE SCHEDULE

Routine inspection and maintenance is necessary for all mechanized products. Periodic maintenance contributes to the product's life span. The following chart provides guidelines for outboard inspection and maintenance to be performed by an authorized Dealer.

**IMPORTANT:** Outboards used for rental operations, commercial applications, or other high hour use applications require more frequent inspections and maintenance. Inspection and maintenance should be adjusted according to operating conditions and use; and environmental conditions.

Engine Maintenance and Inspection Schedule						
Description	Engine Care Product	Frequency				
		Each Use	10-Hour Inspection	Every 50 Hours or 6 months	Every 100 Hours or Annually	Every 200 Hours or Biannually
Clamp screws, lubricate <sup>(1)</sup>	D	Every 60 days / Every 30 days in Saltwater				
Tilt/run lever shaft / tilt shaft, lubricate <sup>(1)</sup>	D	Every 60 days / Every 30 days in Saltwater				
Swivel bracket / tilt support bracket, lubricate <sup>(1)</sup>	D	Every 60 days / Every 30 days in Saltwater				
Shift lever shaft and detent / shallow water drive bracket, inspect and lubricate <sup>(1)</sup>	D	Every 60 days / Every 30 days in Saltwater				
Engine cover latch, lubricate <sup>(1)</sup>	D	Every 60 days / Every 30 days in Saltwater				
Throttle and shift linkage, lubricate <sup>(1)</sup>	D	Every 60 days / Every 30 days in Saltwater				
Choke, carburetor linkage / starter lockout, inspect and lubricate <sup>(1)</sup>	D	Every 60 days / Every 30 days in Saltwater				
Fish line trap, inspect		Every 60 days / Every 30 days in Saltwater				
Anti-corrosion anodes, check operation		✓	✓			
Water intake screens, check condition		✓	✓			
Overboard water pump indicator, check operation		✓	✓			
Steering system, check operation		✓	✓			
Throttle and shift operation, check function		✓	✓			
Emergency stop circuit and lanyard, check function		✓	✓			
Cooling system, flush		✓				
Emergency start cord, onboard and inspect		✓				
Operator's Guide, onboard		✓				
Clamp screws, tighten		✓				
Engine covers, clean and wax				✓		
Fuel system components, inspect and repair leaks <sup>(2)</sup>			✓	✓		
Fastener inspection, tighten loosened components			✓	✓		
Engine to transom mounting hardware, re-torque			✓		✓	
Cam follower, inspect and lubricate			✓		✓	
Thermostat, inspect and check operation			✓		✓	
Electric starter, lubricate			✓		✓	

**MAINTENANCE**  
**INSPECTION AND MAINTENANCE SCHEDULE**

3

<b>Engine Maintenance and Inspection Schedule</b>						
<b>Description</b>	<b>Engine Care Product</b>	<b>Frequency</b>				
		<b>Each Use</b>	<b>10-Hour Inspection</b>	<b>Every 50 Hours or 6 months</b>	<b>Every 100 Hours or Annually</b>	<b>Every 200 Hours or Biannually</b>
Electrical and ignition wires and connections, inspect			✓		✓	
Carburetor synchronization and linkage, inspect and lubricate <sup>(2)</sup>	D		✓		✓	
Idle speed, check			✓		✓	
Valve clearance, check			✓		✓	
Gearcase lubricant, replace	B		✓		✓	
Engine oil, change	H		✓		✓	
Engine oil filter, replace			✓			✓
Fuel filter, replace			✓			✓
Gearcase lubricant, inspect fill level and condition	B			✓		
Starter pinion shaft, inspect and lubricate <sup>(3)</sup>	F			✓		
Operator's Guide, review					✓	
Propeller shaft splines, inspect and lubricate	D				✓	
Spark plugs, replace <sup>(2)</sup>					✓	
Decarbonize	G				✓	
Ignition timing, check					✓	
Driveshaft splines, inspect and lubricate	E					✓
Water pump and impeller, inspect/replace						✓

(1) Also recommended at 10-Hour Inspection

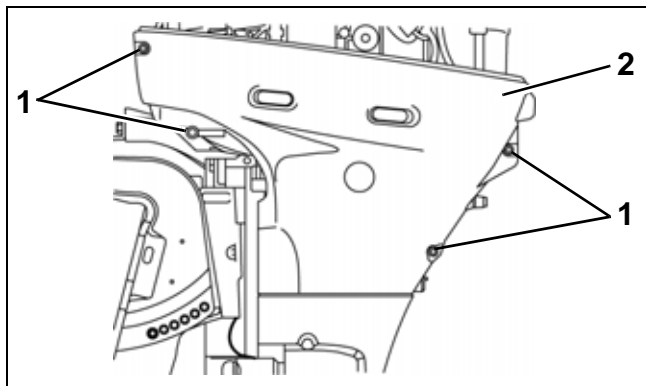
(2) Emission-related component

(3) Do not use light duty penetrating lubricants.

- A *Evinrude/Johnson* Anti-Corrosion Spray or *Evinrude/Johnson* "6 in 1" Multi-Purpose Lubricant
- B *HPF XR* gearcase lubricant
- C Power Trim/Tilt Fluid
- D *Triple-Guard* grease
- E *Evinrude/Johnson Molyube* P/N 175356
- F Starter Bendix Lube Only P/N 337016
- G *Evinrude/Johnson* Engine Tuner
- H *Evinrude/Johnson Ultra 4-Stroke* synthetic blend oil

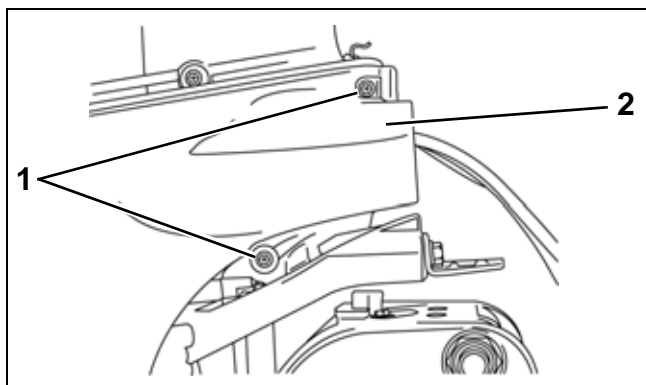
## ENGINE SIDE COVERS

Remove four (4) screws and the port side cover.



- 1. Screws (4)
  - 2. Port side cover
- 001722

Remove two (2) screws and the starboard side cover.



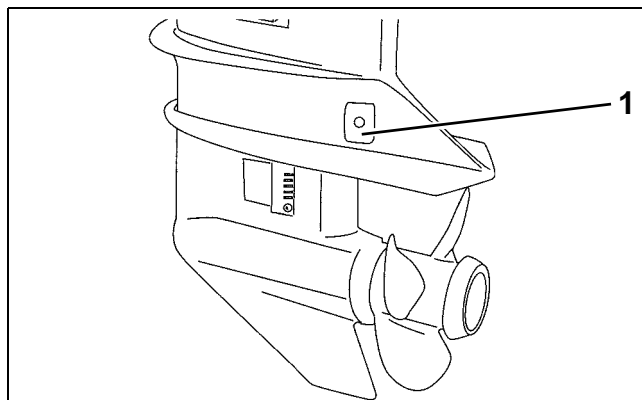
- 1. Screws (2)
  - 2. Starboard side cover
- 001723

## ANTI-CORROSION PROTECTION

### Sacrificial Anodes

Galvanic corrosion occurs in fresh or salt water. Salt, brackish, and polluted water can accelerate corrosion. "Sacrificial" anodes are intended to protect the underwater metal components of the outboard from galvanic corrosion.

Inspect anodes and metal components below the water level. Erosion of anodes is normal and indicates that the anodes are functioning properly.



- TYPICAL**  
1. Anode
- 000288R

### Test Procedure – Continuity

Calibrate a multimeter on the "HIGH" ohm scale. Connect the black (-) tester probe to engine ground and the red (+) tester probe to the anode surface. The multimeter should indicate little or no resistance.



270757

**IMPORTANT:** Anodes that are not eroding may indicate that the anodes are not properly grounded. The anodes and mounting screws must be clean and tight for effective corrosion protection.

For best anode performance:

- Replace all anodes that have eroded or disintegrated to two-thirds of their original size.
- After installation, apply some *Gasket Sealing Compound* to the anode mounting bolt head.
- Do not paint or apply protective coatings to anodes or anode fasteners.
- Do not use metal-based anti-fouling paint on the boat or outboard.

### Metallic Component Protection

Protect metal components on outboards from corrosion. Use the following products to minimize corrosion.

- *Anti-Corrosion Spray* provides a heavy, waxy coating to protect components.
- *“6 in 1” Multi-Purpose Lubricant* provides a thin film of anti-corrosion protection.

### Exterior Finish Protection

Maintain the outboard’s exterior finish to prevent corrosion and reduce oxidation.

- Use automotive wax to protect the outboard’s exterior finish from oxidation.
- Clean regularly using clean water and mild detergent soap.
- Touch-up damage to painted surfaces promptly.
- Protect moving components with appropriate lubricants.

## BATTERY AND BATTERY CONNECTIONS



### WARNING

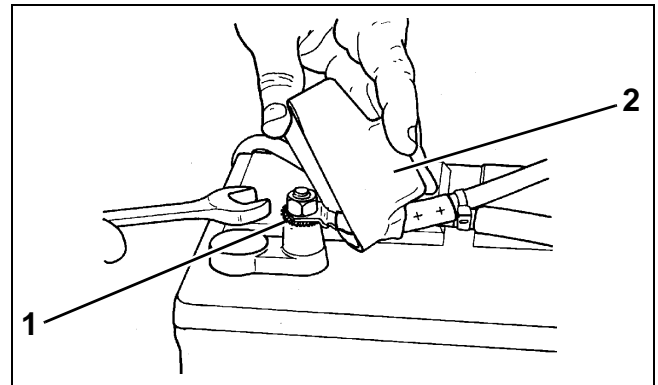


**Battery electrolyte is acidic. Handle with care. Wear eye protection. If electrolyte contacts any part of the body, immediately flush with water and seek medical attention.**

3

Check the battery connections frequently. Periodically remove the battery to clean and service the connections.

- Confirm that battery meets the minimum engine requirements.
- Connections must be clean and tight.
- Observe all wiring connections prior to disassembly.



1. Large surface star washer
2. Terminal cover

DR5103

Remove the battery cables from battery. Always disconnect the negative (–) battery cable **first**.

Remove, clean, and service the battery according to the manufacturer’s recommendations.

## MAINTENANCE

### CARBURETORS

Clean the terminals, the battery posts, and the connectors with a solution of baking soda and water. A wire brush or battery terminal tool can be used to remove corrosion buildup. Rinse and clean all surfaces.



#### WARNING



**Keep battery connections clean, tight, and insulated to prevent shorting or arcing, which can cause an explosion. If the battery mounting system does not cover the connections, install covers.**

Install the battery. Connect the battery cables to the battery. Always connect the positive (+) battery cable **first**. Tighten all connections securely.

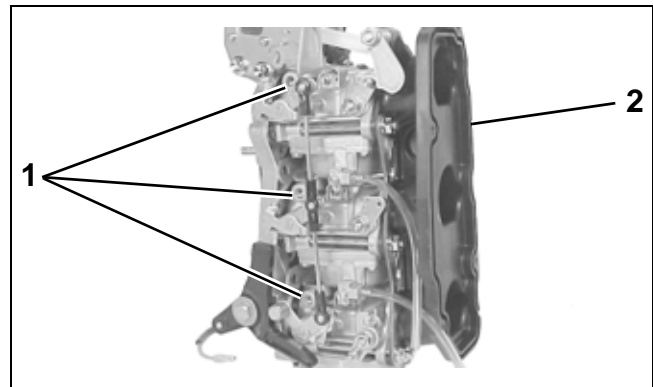
Coat all connections with *Triple-Guard* grease and insulate the electrical connections to prevent shorts or spark arcing.

## CARBURETORS

### General

Inspect the carburetor bodies, linkages, fuel inlet, and air silencer pipe for cracks and other damage. Replace any damaged components

The air silencer pipe minimizes audible noise related to air flow into the engine. It also collects any fluid residue that migrates from the leaf plate or the throttle body area. Periodically clean the air silencer pipe to remove any accumulations.



1. Carburetors (3)
2. Air silencer pipe

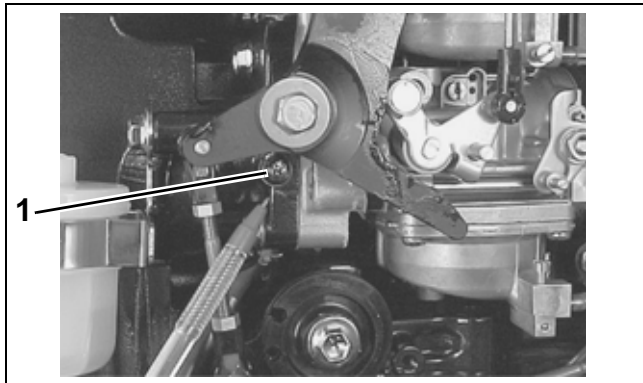
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### Synchronizing the Carburetor Throttle Valves

**IMPORTANT:** Before synchronizing the throttle valves, check the link mechanism and the carburetor valves for smooth operation.

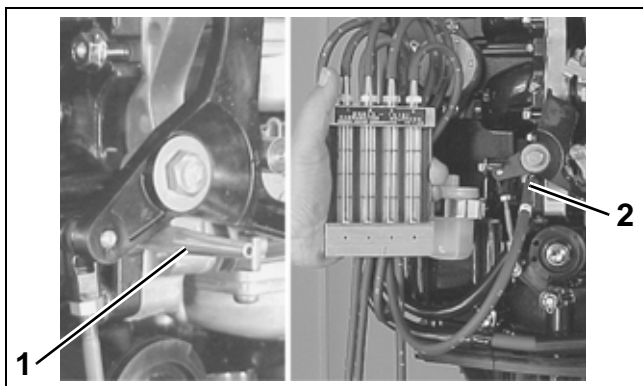
Remove the engine starboard side cover. Refer to “ENGINE SIDE COVERS” on page 54.

Remove the impulse plug of the No. 3 intake manifold.



1. *Impulse plug* 001336

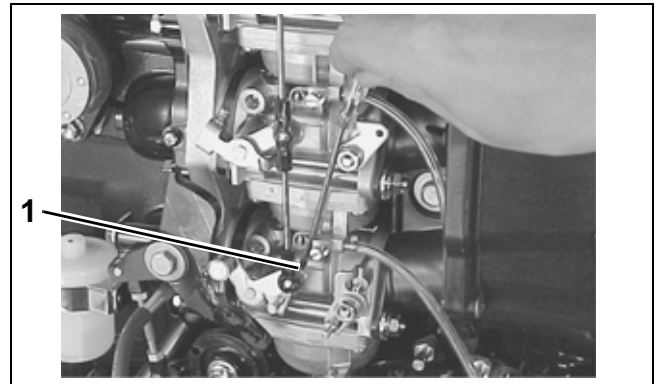
Install a carburetor synchronizer gauge adapter in the hole. Connect the hose of No. 3 tube in the carburetor synchronizer to the adapter.



1. *Gauge adapter*  
2. *No. 3 tube hose* 001337

Start the engine and allow the engine to warm up to normal operating temperature. Make sure that the choke valve is fully open.

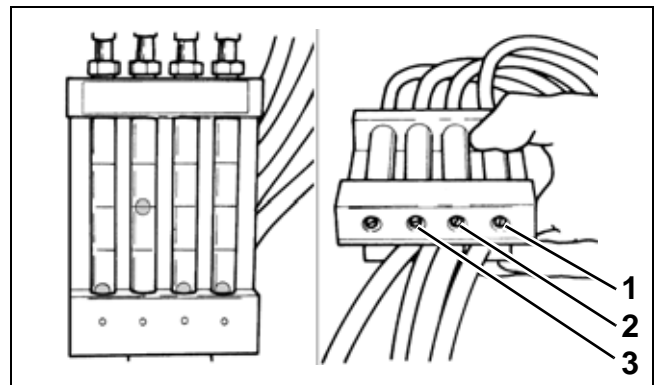
Check the idle speed, then rotate the idle adjusting screw of the No. 3 carburetor to set the idle speed in neutral gear at 850 to 950 RPM.



1. *Idle adjusting screw* 001338

Turn the balancer air screw until the steel ball is at the center line of the tube.

Repeat for the No. 1 and No. 2 synchronizer tubes.



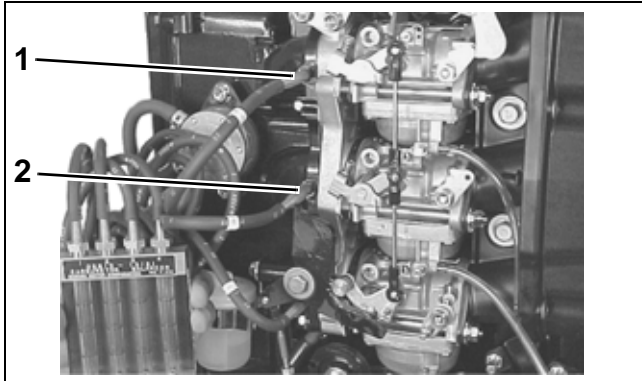
1. *Balancer air screw - No. 1 tube*  
2. *Balancer air screw - No. 2 tube*  
3. *Balancer air screw - No. 3 tube* 001339

Remove the impulse plugs from No. 1 and No. 2 intake manifolds, then install the carburetor synchronizer gauge adapters in these holes.

## MAINTENANCE

### CARBURETORS

Connect each synchronizer tube hose to its corresponding adapter.

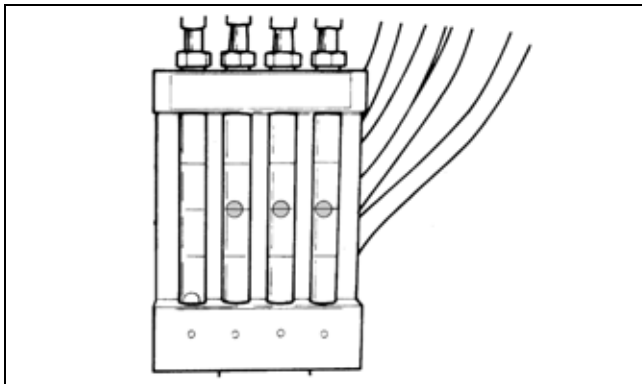


1. No. 1 intake manifold position
2. No. 2 intake manifold position

001342

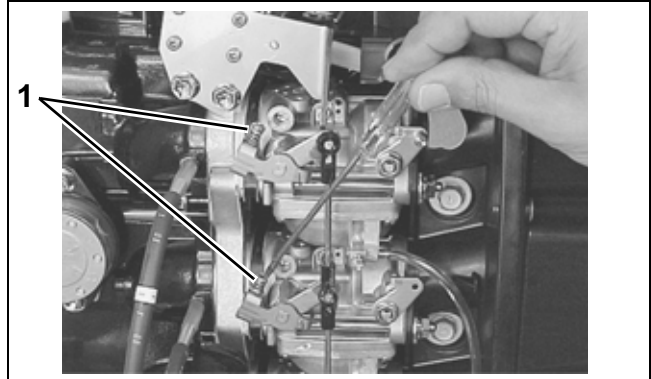
Start the engine.

**IMPORTANT:** When synchronizing the throttle valves, only synchronize them in the idle position. With the engine warmed up and idling in neutral gear at 850 to 950 RPM, the steel balls must be at the same height in each of the tubes.



001343

Adjust the throttle valve screw(s) until the carburetors are synchronized (steel balls at the same height in each of the tubes) and the engine idles smoothly.



1. Throttle valve screw

001344

**IMPORTANT:** If the engine speed has been raised or lowered due to the adjustment, it is necessary to reset the engine to the specified idle speed by turning the idle adjusting screw of the No.3 carburetor.

Shift into FORWARD, then check the in-gear idle speed. This should be approximately 850 RPM.

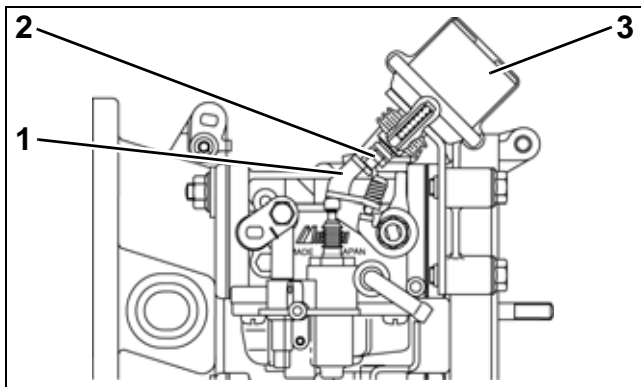
Stop the engine. Remove the synchronizer gauge adapters and install the impulse plugs.



## Dashpot Adjustment

The dashpot provides a controlled return to idle speed when the throttle is closed. A properly functioning and adjusted dashpot holds the engine speed briefly at approximately 1500 RPM, then slowly decelerates the engine to idle speed.

The dashpot's ability to perform a controlled return to idle as designed should always be checked and adjusted if necessary after synchronizing the carburetor throttle valves.

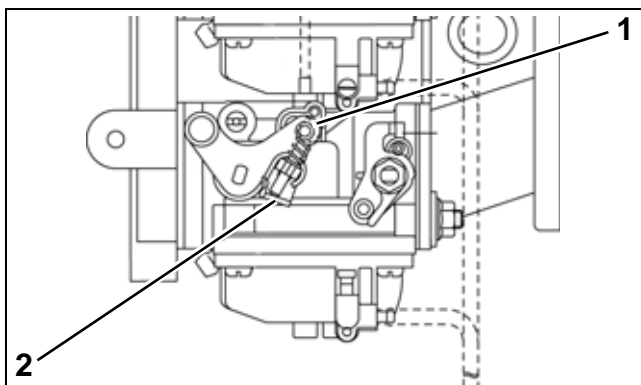


1. Accelerator pump lever
2. Rod
3. Dashpot unit

001345

Start the engine and allow the engine to warm up to normal operating temperature.

Turn the No. 3 carburetor idle adjusting screw to set engine speed at 4000 RPM. Count the number of turns it takes to achieve this speed from idle.



1. Idle adjusting screw
2. Throttle stop

001346

**IMPORTANT:** Dashpot adjustments must be made in neutral gear.

Stop the engine. Remove the flywheel cover or recoil starter.

Operate the throttle at the wide open position. Then return the throttle gradually to idle speed while watching the tip of the dashpot rod. The tip of the rod must contact the accelerator pump lever at the same time that the No 3 carburetor idle adjusting screw contacts the throttle stop.

If these two contacts do not occur at the same time, adjust the dashpot rod. Turning the rod clockwise moves the rod inward. Turning the rod counterclockwise moves the rod outward.

To reset the engine idle speed, return the No.3 carburetor idle adjusting screw to its original position according to the number of turns that were counted earlier.

Install the flywheel cover or recoil starter.

Start the engine and, if necessary, adjust the engine speed to the specified in-gear idle speed of approximately 850 RPM.

As a final adjustment check, shift into forward gear and quickly decelerate to full closed throttle from several different throttle positions. This checks the dashpot's ability to provide a controlled return to idle speed each time the throttle is closed.

## ENGINE OIL AND FILTER

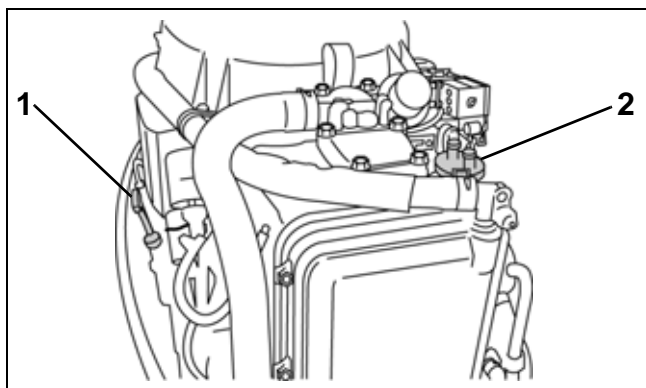
### Checking the Engine Oil Level

**IMPORTANT:** Check the engine oil level before every use.

Place the engine upright on a level surface.

Remove the top engine cover.

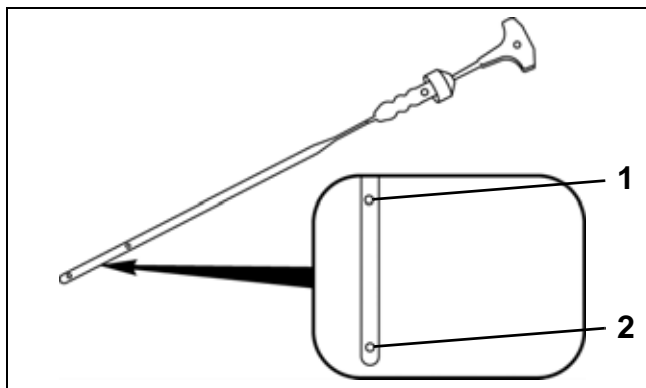
Remove the oil level dipstick and wipe it with a clean rag. Then insert the dipstick completely into the dipstick hole and remove it.



1. Oil level dipstick  
2. Oil filler cap  
001309

The oil level should be between the full mark and the low mark.

If the oil level is low, remove the oil filler cap and add the recommended oil. Check the oil level again.



1. Full mark  
2. Low mark  
001310

### Changing the Engine Oil and Filter

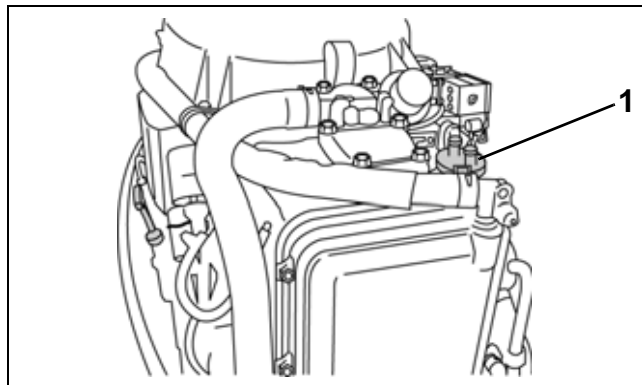
**IMPORTANT:** Whenever the engine oil filter is being replaced, change the engine oil at the same time. The engine oil should be changed while the engine is warm.

#### Draining

Place the engine upright on a level surface.

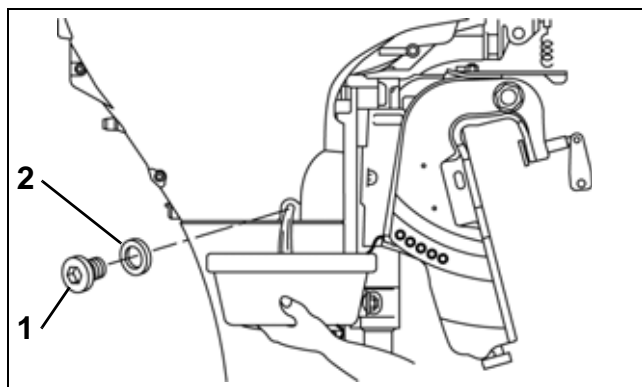
Remove the top engine cover.

Remove the oil filler cap.



1. Oil filler cap  
001309

Place a suitable container under the engine oil drain plug. Remove the drain plug and the gasket and allow the engine oil to drain into the container.

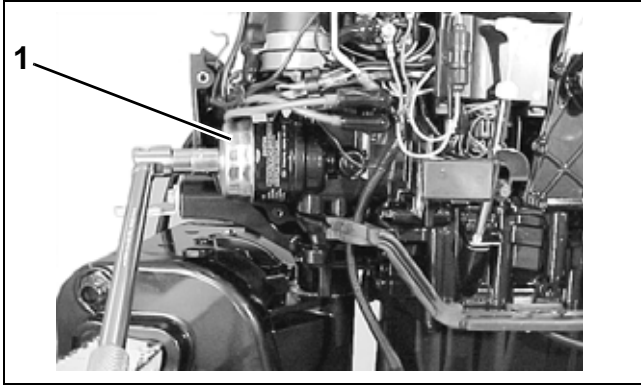


1. Oil drain plug  
2. Gasket  
001312

### Oil Filter Replacement

Remove the engine port side cover. Refer to **ENGINE SIDE COVERS** on p. 54.

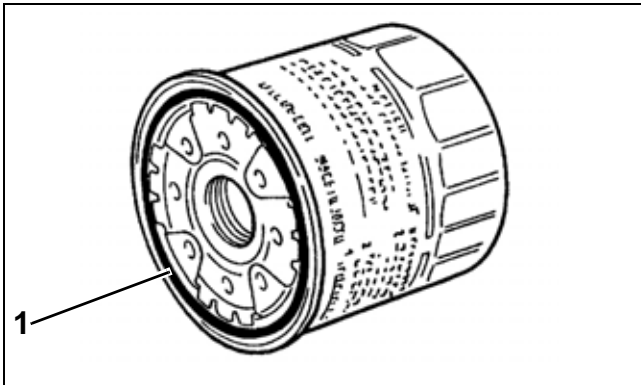
Use an oil filter wrench to loosen the oil filter.



1. Oil filter wrench 001313

Apply oil to the O-ring of the new oil filter.

Screw the new filter on by hand until the O-ring contacts the filter mounting surface. Then use an oil filter wrench to tighten the filter by another 3/4 of a turn, or approximately 124 in. lbs. (14 N·m).

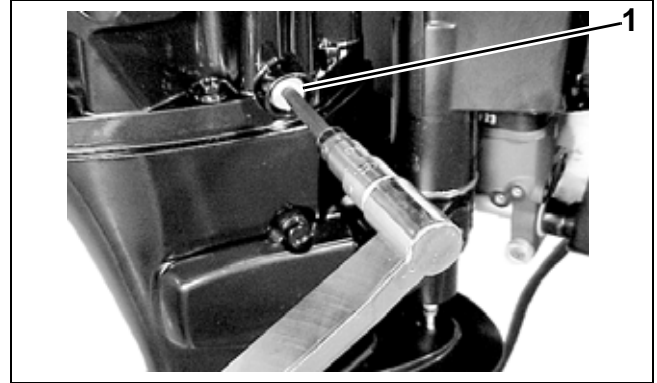


1. O-ring 001314

Install the engine port side cover.

### Filling

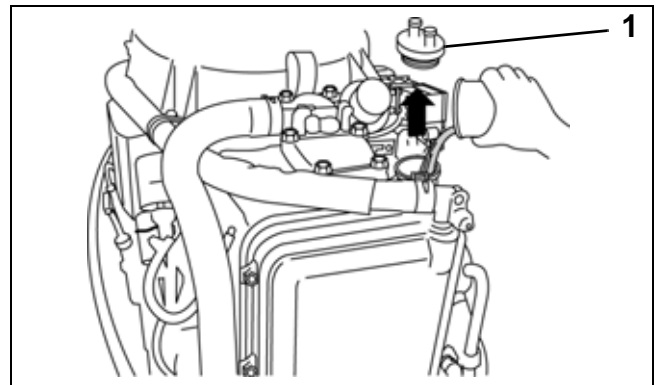
Install a **new** gasket and the engine oil drain plug. Tighten the drain plug to a torque of 115 in. lbs. (13 N·m).



1. Oil drain plug 001316

Pour the correct amount of the recommended engine oil into the oil filler opening, then install the oil filler cap.

<b>Engine Oil Capacities</b>	
Oil change only	3.2 qt. (3.0 l)
Oil and filter change	3.4 qt. (3.2 l)



1. Oil filler cap 001311

Start and run the engine for several minutes at idle speed.

Check the oil filter for leakage.

Turn off the engine and wait for approximately two minutes, then check the engine oil level. Refer to **Checking the Engine Oil Level** on p. 60.

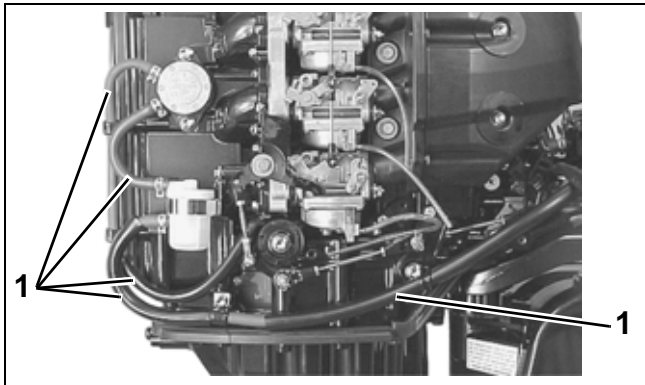
# FUEL SYSTEM

## Hoses and Connections

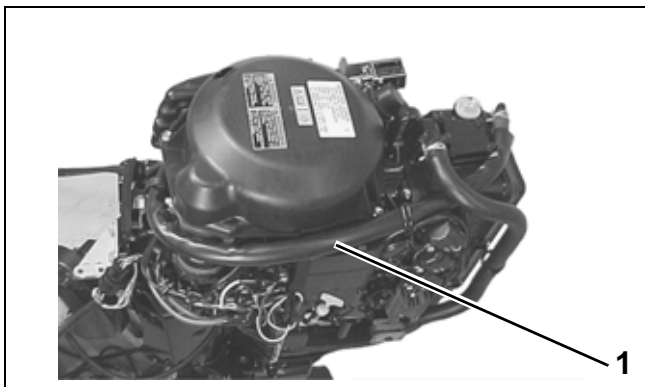
**WARNING**

Failure to check for fuel leakage could allow a leak to go undetected, resulting in fire or explosion.

Check the condition of all hoses and connections related to the fuel system. If any leakage, cracks, swelling, or other damage is found, replace the hose(s).



1. Fuel hoses 001362

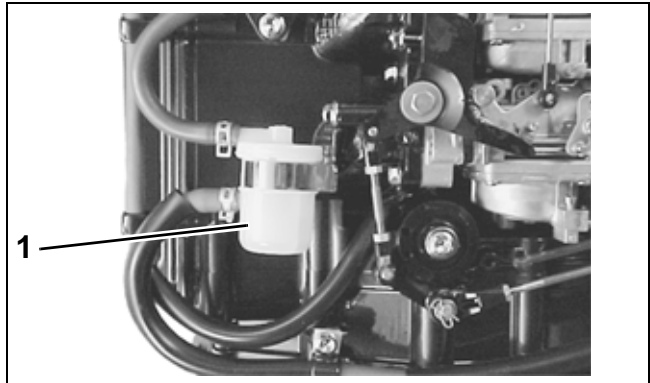


1. Breather hose 001363

## Fuel Filter

If water accumulation, sediment, leakage, cracks, or other damage is found, replace the fuel filter.

To remove the fuel filter, disconnect the hoses from the filter and remove the filter from the bracket.



1. Fuel filter

001364

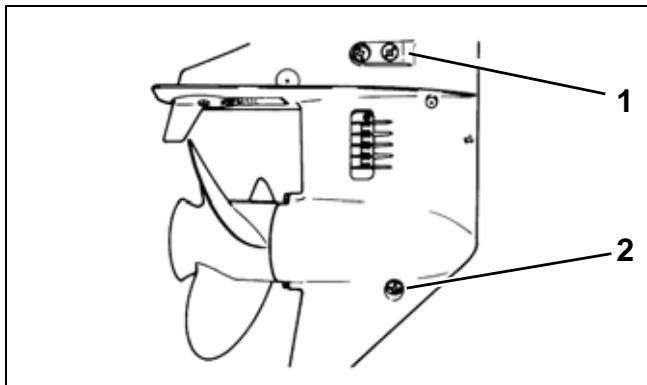
# GEARCASE

## Draining

**WARNING**

Gearcase lubricant may be under pressure and/or hot if plug is removed from recently operated outboard. Take precaution to avoid injury.

Remove the lubricant level plug, then the lubricant drain/fill plug. Allow the lubricant to drain from the gearcase into a suitable container.



1. Lubricant level plug  
2. Lubricant drain/fill plug  
001825

## Inspection

Inspect the lubricant for metal chips. The presence of metal **fuzz** usually indicates normal wear of the gears, bearings, and shafts within the gearcase. Metal **chips** might indicate extensive internal damage.

Inspect the lubricant for water contamination. Water in the lubricant can be milky in appearance. However, normal aeration can also cause the same appearance.

To check for water contamination, drain some of the lubricant into a suitable glass container. Allow the drained oil to settle for a minimum of one hour to determine whether there is an abnormal amount of water in the oil. Some gearcase lubricants are designed to mix with a volume percentage of water from normal water vapor condensation within the gearcase.

Overheated lubricant will give the lubricant a black color and burned odor.

Internal gearcase inspection is recommended when lubricant is contaminated or shows signs of failure.

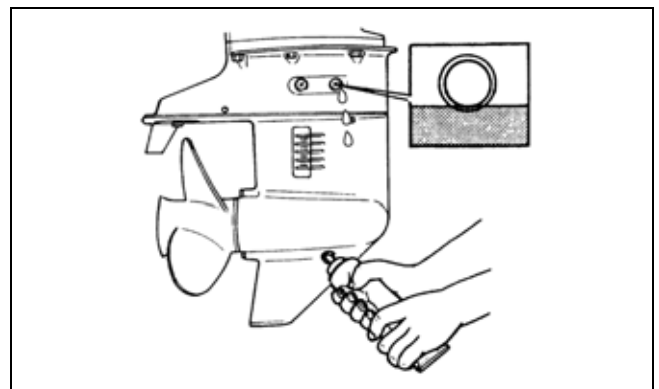
## Filling

Place the engine upright on a level surface.

Remove the lubricant level plug and the lubricant drain/fill plug.

Slowly fill the gearcase with *Evinrude/Johnson HPF XR* gearcase lubricant until it appears at the oil level hole. Filling the gearcase too quickly can cause air pockets within the gearcase, causing the gearcase to not fill completely. The gearcase oil capacity is approximately 8 fl. oz. (230 ml).

Clean the plug seal area. Install and tighten the lubricant level plug with a **new** seal, then install and tighten the lubricant drain/fill plug with a **new** seal.



001318

## Water Intake Screens

Inspect the condition of the water intake screens. Clean or replace as needed.

## MAINTENANCE

### IDLE SPEED

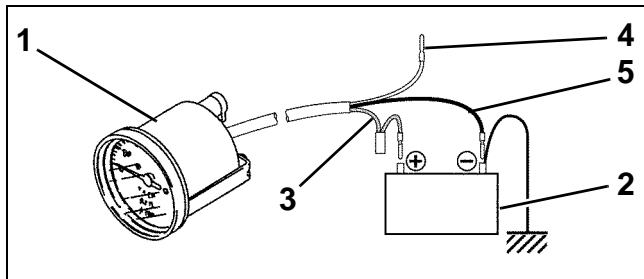
## IDLE SPEED

**IMPORTANT:** Before synchronizing the throttle valves, check the link mechanism and the carburetor valves for smooth operation.

Start the engine and allow the engine to warm up to normal operating temperature.

Connect a tachometer to the engine in the following manner:

- Yellow lead wire to Yellow / Black lead wire of the power pack
- Gray lead wire to the positive (+) terminal of a 12V battery
- Black lead wire to the negative (-) terminal of a 12V battery
- Set the pole selection switch in the tachometer to "12".

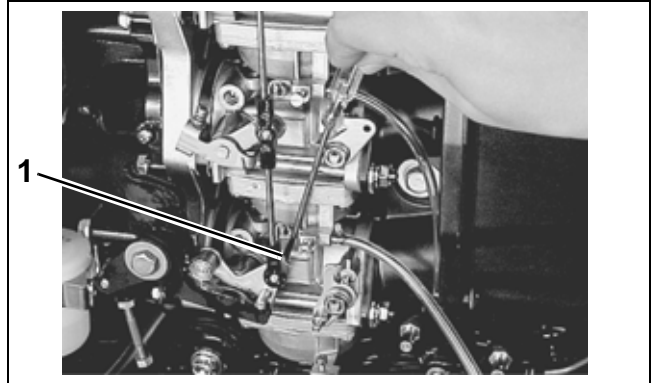


1. Tachometer
2. 12V battery
3. Gray lead wire
4. Yellow lead wire
5. Black lead wire

001331

**IMPORTANT:** Before adjusting idle speed, make sure that the carburetor throttle valves are properly synchronized. Refer to "Synchronizing the Carburetor Throttle Valves" on page 56.

If the idle speed is out of specification, adjust the idle speed by rotating the idle adjusting screw only. DO NOT rotate the throttle valve screws on the No. 1 or No. 2 carburetors.



1. Idle adjusting screw

001334

Check the idle speed after the engine speed has stabilized. The idle speed in NEUTRAL should be 850 to 950 RPM.

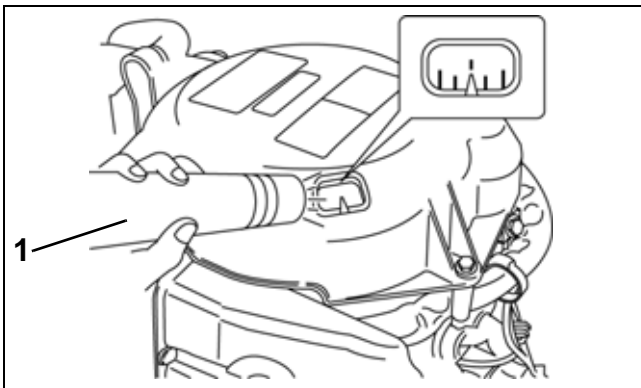
## IGNITION TIMING

Start the engine and allow the engine to warm up to normal operating temperature.

Make sure that the idle speed is adjusted properly. Refer to "IDLE SPEED" on page 64.

Attach a timing light cord to the No. 1 ignition coil high tension cord.

Check the ignition timing while operating the engine at 900 RPM. The timing should be approximately BTDC 5°.

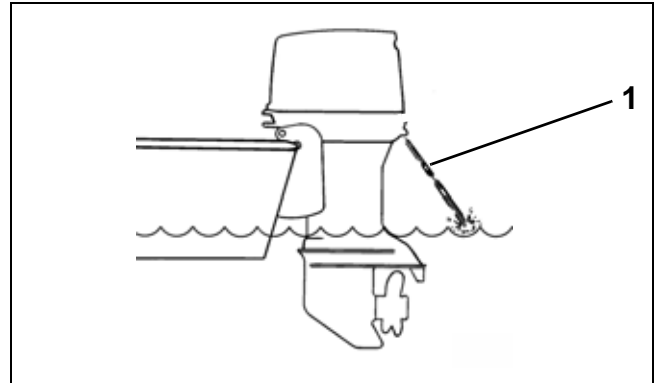


1. Timing light

001361

## OVERBOARD WATER PRESSURE INDICATOR

Check the function of overboard water pressure indicator. Clean or replace the hose or nozzle as needed.

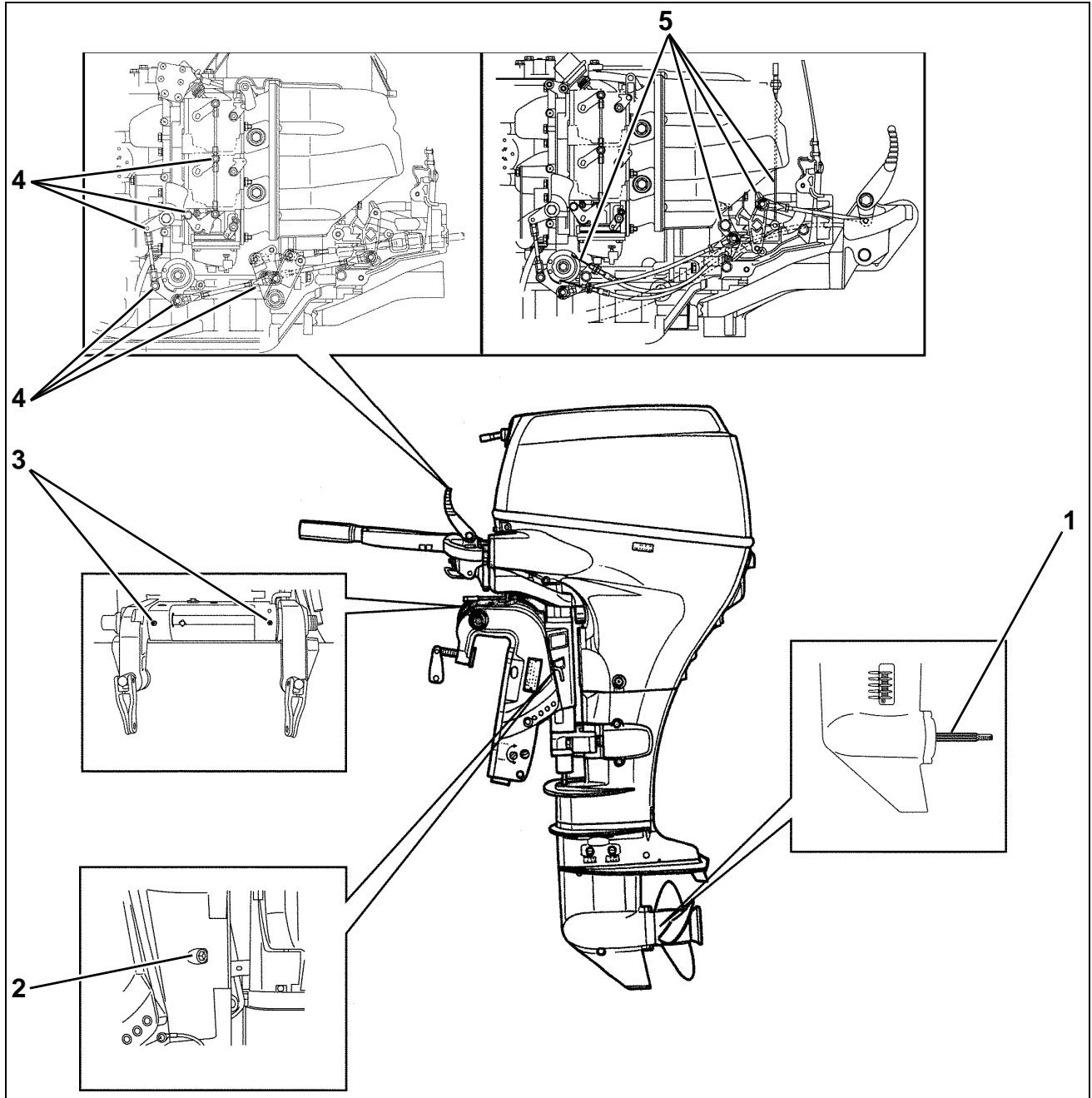


1. Overboard water pressure

DRC4952

# LUBRICATION POINTS

Apply *Triple-Guard* grease to the following lubrication points.



1. Propeller shaft
2. Swivel bracket
3. Tilt tube
4. Throttle/shift linkage
5. Throttle/shift linkage (additional points for tiller handle models)

001380



# SPARK PLUGS



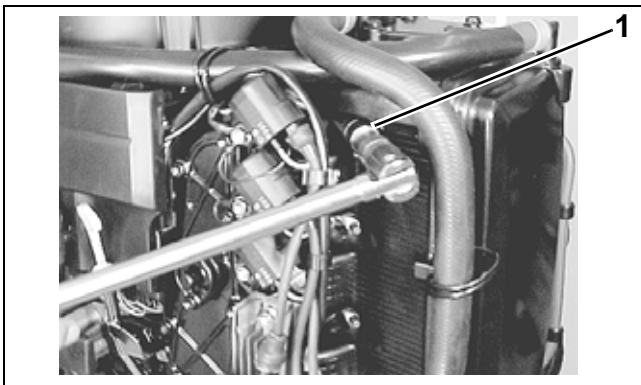
**CAUTION**



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

**Standard spark plug: NGK DCPR6E**

Remove the spark plug.

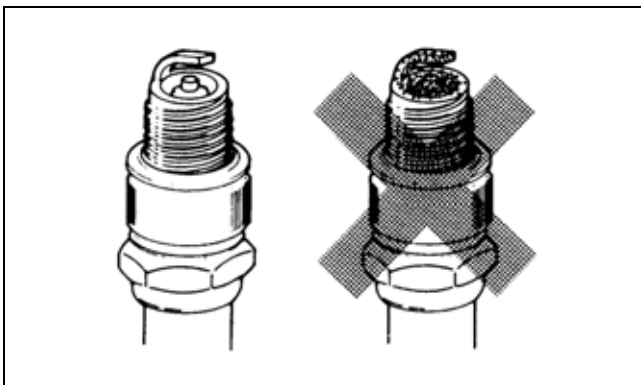


1. Spark plug

001319

Check the electrode. If it is extremely worn or burnt, replace the spark plug. Also, replace the spark plug if it has a broken insulator or damaged threads.

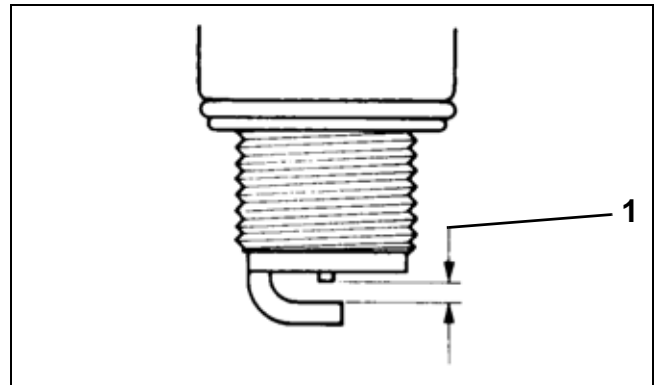
Check for carbon deposits on the spark plug bases. If carbon is present, remove it with a spark plug cleaning machine or by carefully using a pointed tool.



001320

Use a thickness gauge to measure the spark plug gap. The correct gap is 0.031 to 0.035 in. (0.8 to 0.9 mm).

If the gap is out of specification, adjust it within the specified range.



1. Spark plug gap

001322



**CAUTION**



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

During installation, tighten the spark plug to a torque of 160 in. lbs. (18 N·m).

Before installing the spark plug lead cover on the spark plug, apply a light coating of *Electrical Grease* to the ribbed portion of the spark plug ceramic and to the opening of the spark plug cover. This will help prevent corrosion between the spring terminal and the spark plug which can cause high tension arcing.

# VALVE CLEARANCE

## Checking

**IMPORTANT:** The engine must be cold when checking the valve clearance.

Remove the engine side covers. Refer to "ENGINE SIDE COVERS" on page 54.

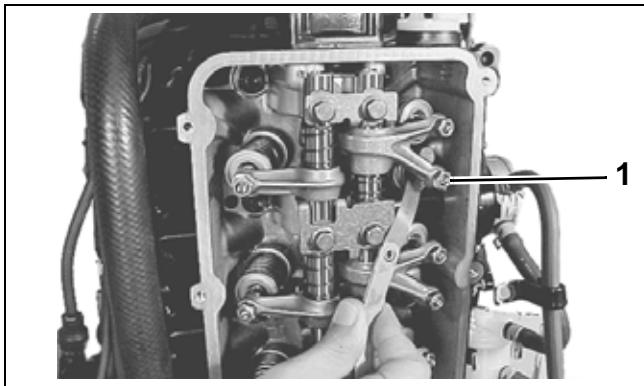
Remove the manual starter or flywheel cover, and the cylinder head cover. Refer to the **POWER-HEAD** section.

	<b>CAUTION</b>	
<b>Rotate the crankshaft clockwise to prevent damage to the water pump impeller.</b>		

Rotate the crankshaft **clockwise** until the No. 1 piston is at TDC on its compression stroke.

Measure the valve clearances for the No. 1 cylinder by inserting a thickness gauge between the valve stem end and the valve adjusting screw on the rocker arm. For both intake and exhaust valves, the valve clearance should be 0.005 to 0.007 in. (0.13 to 0.17 mm).

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



1. Valve 001327

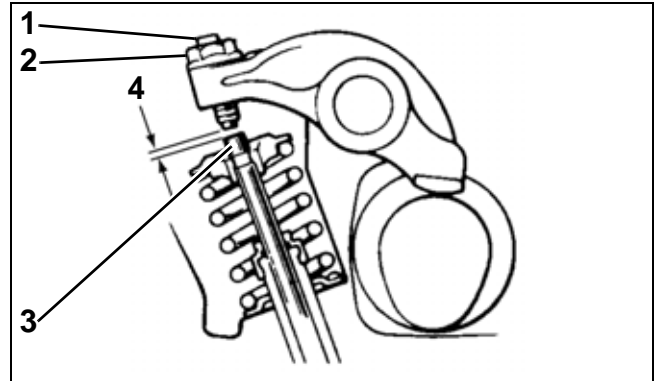
Rotate the crankshaft **clockwise** and repeat the procedure for the other two cylinders in turn.

## Adjusting

Loosen the locknut. Use a screwdriver to turn the valve adjusting screw to bring valve clearance to within the specification.

Hold the adjusting screw in place and tighten the locknut to a torque of 97 in. lbs. (11 N·m).

Check the valve clearance again.



- 1. Valve adjusting screw
- 2. Locknut
- 3. Valve stem
- 4. Valve clearance

001326