

Johnson[®]

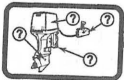
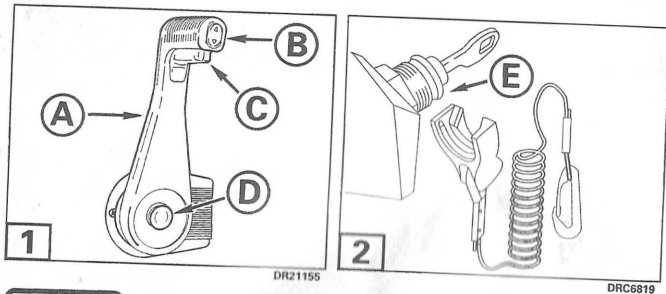


**OPERATION &
MAINTENANCE
MANUAL**

ENGLISH



J 90, 115 60 V4



REMOTE CONTROL

1 OMC concealed side mount control

Important When selecting the remote control system for your boat, specify OMC components. OMC offers remote controls, cables, and wiring kits designed specifically for your outboard.

OMC controls deliver the cable stroke your outboard needs for positive shift and throttle control, and they incorporate such safety and convenience features as:

- Start-in-gear prevention
- Plug-in compatibility with OMC modular wiring system

1 Other features of OMC remote controls:

- (A) Handle - shift and throttle
- (B) Trim/tilt switch (where equipped)
- (C) Neutral lock tab
- (D) Fast idle button

⚠ Safety Warning: If you choose a non-OMC remote control, be sure it has a start-in-gear-prevention feature. This feature can prevent injuries resulting from unexpected boat movement when the engine starts.

EMERGENCY STOP/KEY SWITCH

A combination emergency stop switch and key switch is a feature of OMC prewired remote controls and all OMC control wiring kits. Use of the emergency stop feature is highly recommended on any boat considered to have sensitive steering response. Such boats include small runabouts, high performance sport boats, and bass boats. In addition, the emergency stop feature should be used on any boat with less than 12 in. (305 mm) between the top of the driver's seat cushion and the edge of the boat next to it.

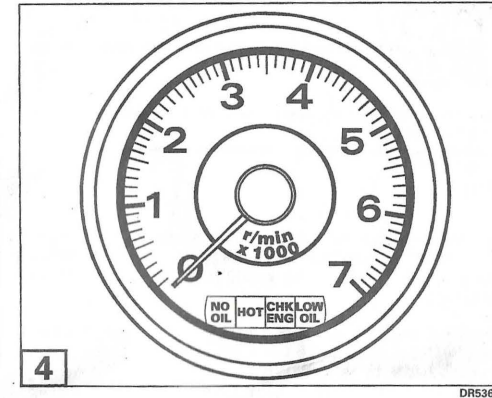
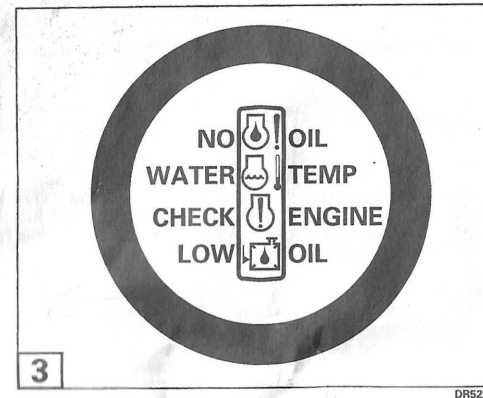
2 Connect the clip to the emergency stop/key switch (E). Snap the lanyard to a secure place on the operator's clothing or life vest - not where it might tear away instead of activating the stop switch. Disconnecting the clip and lanyard will stop the engine and prevent the boat from becoming a runaway if the driver moves beyond the range of the lanyard. If the lanyard is too long, it can be shortened by knotting or looping it. DO NOT cut and retie the lanyard.

In an emergency situation, the engine can be started without the clip in place. Follow the normal starting procedure. Reinstall a clip as soon as possible.

⚠ Safety Warning: Avoid knocking or pulling the clip off the stop switch during normal boating. Avoid bumping the key if operating without the clip on the switch. The resulting unexpected loss of forward motion can throw occupants forward, causing injury.

⚠ Safety Warning: Your emergency stop switch can be effective only when in good working condition.

- Keep the lanyard free from obstructions and entanglements.
- At each outing, test the system's operation. With the engine running, remove the clip from the switch by pulling the lanyard. If the engine does not stop running, see your DEALER.
- At each outing, inspect clip and lanyard for cuts, breaks, or wear. Replace worn or damaged parts.



WARNING SIGNALS

3 4 When you turn the key switch ON, the *System Check*® engine monitor horn self-tests by sounding a ½-second beep. The gauge self-tests by turning the warning lights on, then off in sequence. The self-test routine might occur more than once during engine start-up.

[Note] During engine start-up, pause with the key switch in the ON position to observe the gauge self-test. If the self-test does not happen as stated, or if the gauge self-tests during normal engine operation, see your DEALER.

3 4 The *System Check* engine monitor alerts you with a 10-second beep of the horn and a warning light on the gauge when certain engine problems occur. The appropriate warning light will stay on until the problem is corrected or the key switch is turned OFF.

[Note] Your outboard should be equipped with the *System Check* engine monitor. It was the responsibility of the boat manufacturer or selling dealer to install the system. **Operating your outboard without the *System Check* engine monitor could void your warranty for failures related to the circumstances outlined below.**

The functions monitored on your outboard are . . .

"NO OIL" _____

There is an oil delivery problem. Serious engine damage can occur quickly.

If you must operate your outboard to reach safety, do not exceed 1500 RPM.

If you want to continue to operate your outboard before repairs are made, check the oil tank for contents and condition:

- If the oil tank is empty, add the recommended oil.
- If the oil tank is not empty, add oil to the fuel tank at the correct ratio. Refer to **MIXING FUEL AND OIL** in the Fuel and Oil Section.

Have your DEALER check the condition of your outboard's oil injection system. He will check for air and oil leaks, damaged components, or a clogged oil filter. Your DEALER should purge the oil injection system and verify oil supply before returning your outboard to normal operation.

"WATER TEMP" or "HOT" _____

Your outboard is overheating. Serious engine damage can occur quickly.

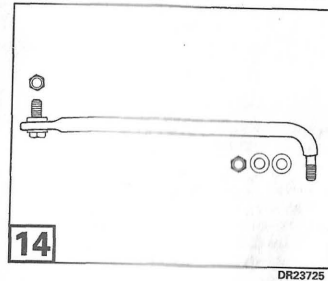
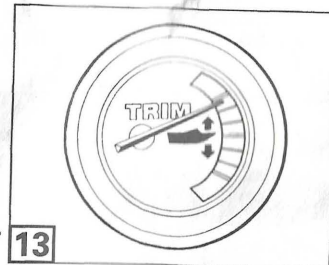
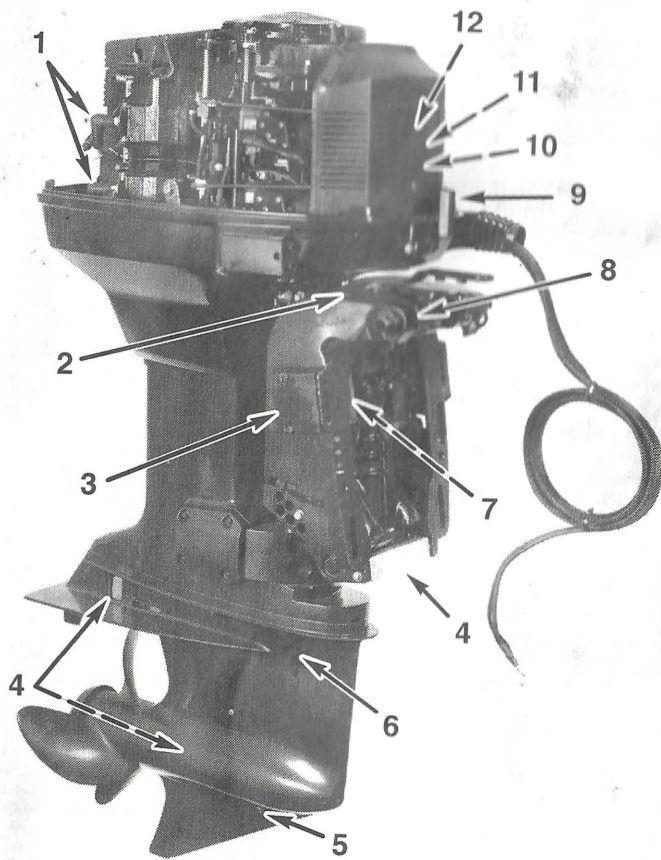
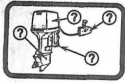
[Note] Refer immediately to **ENGINE OVERHEATING** in the Operation Section. Follow the directions to evaluate and possibly correct the problem.

"LOW OIL" _____

Oil in the oil tank is at "reserve" level (about ¼ full). Fill the oil tank with recommended oil as soon as possible to avoid emptying the tank. Refer to **Filling the Oil Tank** in the Fuel and Oil Section.

[Note] Serious engine damage will occur if you continue to operate your outboard after the oil supply is exhausted.



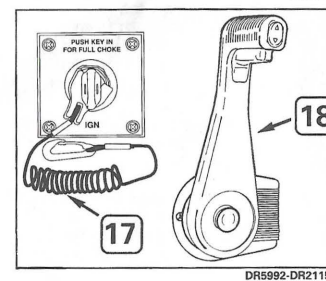
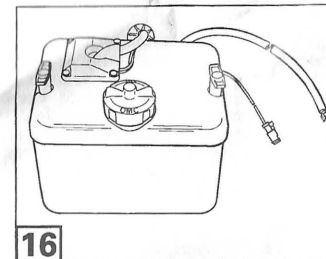
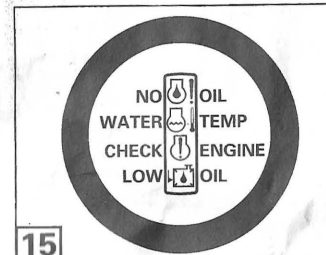
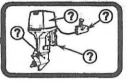


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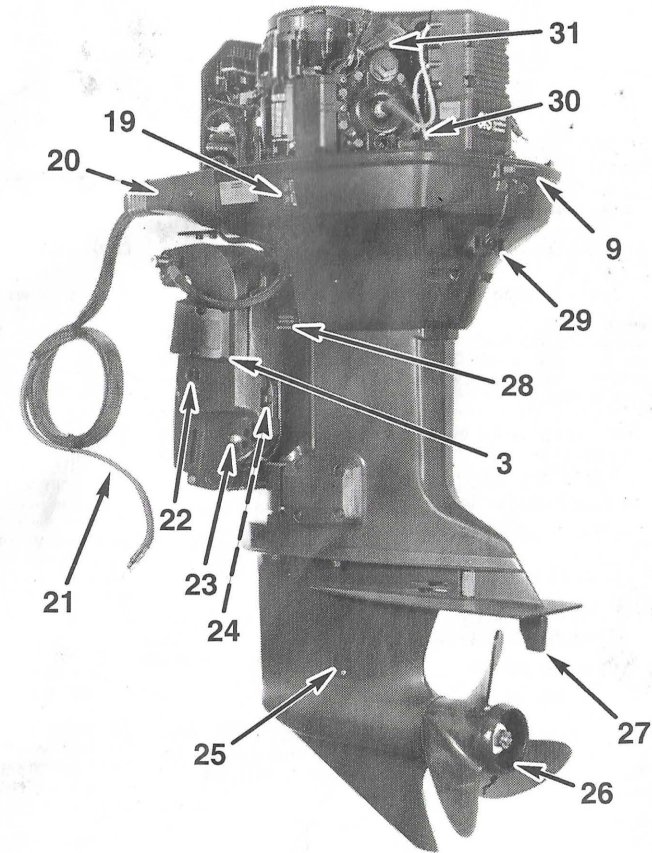
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* Not supplied in all marketing areas.



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* Not supplied in all marketing areas.



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Oil Injection System 10

FUEL

Use automotive gasoline with an octane rating equal to or higher than that specified in **Minimum Octane** chart. When using gasoline that contains MTBE or alcohol, follow these guidelines:

Using unleaded gasoline that contains methyl tertiary butyl ether (MTBE) is acceptable **ONLY** if the MTBE content does not exceed 15% by volume.

Using alcohol-extended fuels is acceptable **ONLY** if the alcohol content does not exceed:

- 10% ethanol by volume
- 5% methanol with 5% cosolvents by volume

Minimum Octane

Inside the U.S.	87 (R+M)/2 AKI
Outside the U.S.	90 RON

- The boat's fuel system may have different requirements regarding the use of alcohol fuels. Refer to the boat's owner manual.
- Alcohol attracts and holds moisture that can cause corrosion of metallic parts in the fuel system.
- Alcohol blended fuel can cause engine performance problems.
- All parts in the fuel system should be inspected frequently and replaced if signs of deterioration or leakage are found. Inspect at least annually.

⚠ Safety Warning: Fuel leakage can contribute to a fire or explosion.

OIL

Your outboard is a two-stroke engine. You must mix oil with the gasoline as specified in **FUEL/OIL RATIO**.

You must use an **NMMA-certified TC-W3®** oil. **Evinrude®** and **Johnson®** brand oils are formulated by **OMC** to give best engine performance while controlling piston and combustion chamber deposits, providing superior lubrication, and ensuring maximum spark plug life.

Note Failure to follow this recommendation could void the engine warranty if a lubrication-related failure occurs.

ADDITIVES

Note The only fuel additives approved by *Outboard Marine Corporation* for use in *Evinrude* and *Johnson* outboards are **OMC 2+4®** fuel conditioner and **OMC Carbon Guard™** fuel additive. Use of other fuel additives can result in poor performance or engine damage.

OMC 2+4 fuel conditioner will help prevent gum and varnish deposits from forming in fuel system components and will remove moisture from the fuel system. It can be used continuously and should be used during any period when your engine isn't being operated on a regular basis. Its use will reduce spark plug fouling, carburetor icing, and fuel system component deterioration.

OMC Carbon Guard fuel additive minimizes carbon deposit buildup in marine engines, when used as directed. Adding **OMC Carbon Guard** fuel additive to your engine's fuel will:

- Reduce piston ring sticking
- Provide better overall engine performance
- Contribute to increased engine life

Note Engines with over 100 hours of service – Decarbonize with **OMC Engine Tuner** before using **OMC Carbon Guard** additive in the fuel. See your DEALER.

FUEL/OIL RATIO

New Engine

During break-in, you must use a **50:1 (2% oil)** fuel/oil ratio in your fuel tank **in addition** to the operation of the oil injection system. Refer to Starting Section, **BREAK-IN**.

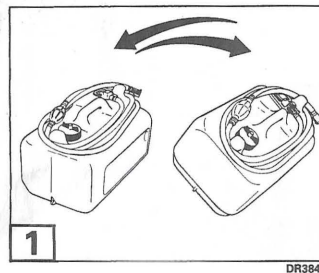
Normal Operation

Your motor is equipped with an oil injection system to automatically mix oil with the fuel.

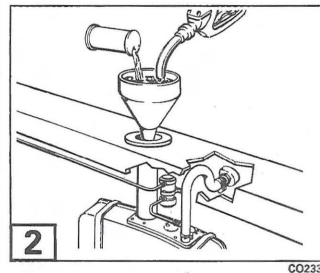
Note Operating this motor without the oil injection system requires modification that must be performed by your DEALER.

High Performance

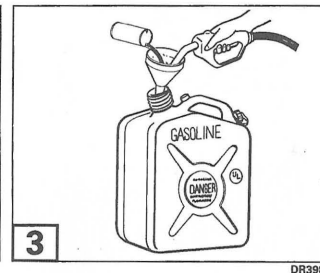
During high performance operation you must use a **50:1 (2% oil)** fuel/oil ratio in your fuel tank **in addition** to the operation of the oil injection system.



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DR3986

MIXING FUEL AND OIL

To provide your engine with extra oil, use the following chart and these guidelines to mix oil with the engine's fuel. Refer also to **FUEL/OIL RATIO**. Otherwise, keeping oil in the oil tank is all you need to do to satisfy the engine's oiling requirements.

⚠ Safety Warning: Gasoline is extremely flammable and highly explosive under certain conditions . . .

- Always stop motor before refueling
- Remove portable fuel tanks from boat to fill
- Always mix fuel outdoors, never indoors
- Never smoke or allow open flame or sparks nearby when mixing or refueling
- Prevent electrostatic spark by maintaining contact between fuel nozzle and fuel tank or metal funnel while refueling. Do not use a plastic funnel.

Ratio	Fuel		
	6 U.S. gallons	3 U.S. gallons	1 litre
50:1	16 fl. oz. oil	8 fl. oz. oil	20 ml oil
25:1	32 fl. oz. oil	16 fl. oz. oil	40 ml oil

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1 **Portable Tank** - Above and below 32° F (0° C), add one gallon of fuel. Pour in required amount of oil. Add remaining fuel. Install filler cap and tip tank gently to distribute oil.

2 3 **Permanently Installed Tank** - Above 32° F (0° C), pour oil slowly with the fuel as tank is filled. Below 32° F (0° C), add one gallon of fuel to a separate container. Pour in required amount of oil. Install filler cap and tip container gently to distribute oil. Slowly pour oil/fuel mixture into tank with fuel as tank is filled.

FUEL SYSTEMS

Portable

OMC portable fuel tanks and fuel hose assemblies are designed to provide correct fuel flow for your engine's requirements.

Built-In

Fuel distribution hoses in the boat must deliver fuel at the rate of flow needed by the engine. Minimum inside diameter of fuel hoses must be:

- 3/8 in. (9 mm)

Note Fuel systems with built-in tanks, particularly those that include antisiphon valves and filter/primer units, may have restrictions that will not allow the engine fuel pump to deliver sufficient fuel under all conditions. This can result in a loss of performance and possible engine damage. If a performance problem exists, see your DEALER.

⚠ Safety Warning: If your motor is equipped with a quick-disconnect fuel hose, disconnect the fuel hose from the motor and from the fuel tank when the motor is not being used for any period of time. Disconnecting the hose will avert fuel leaks in the hose or at the engine.

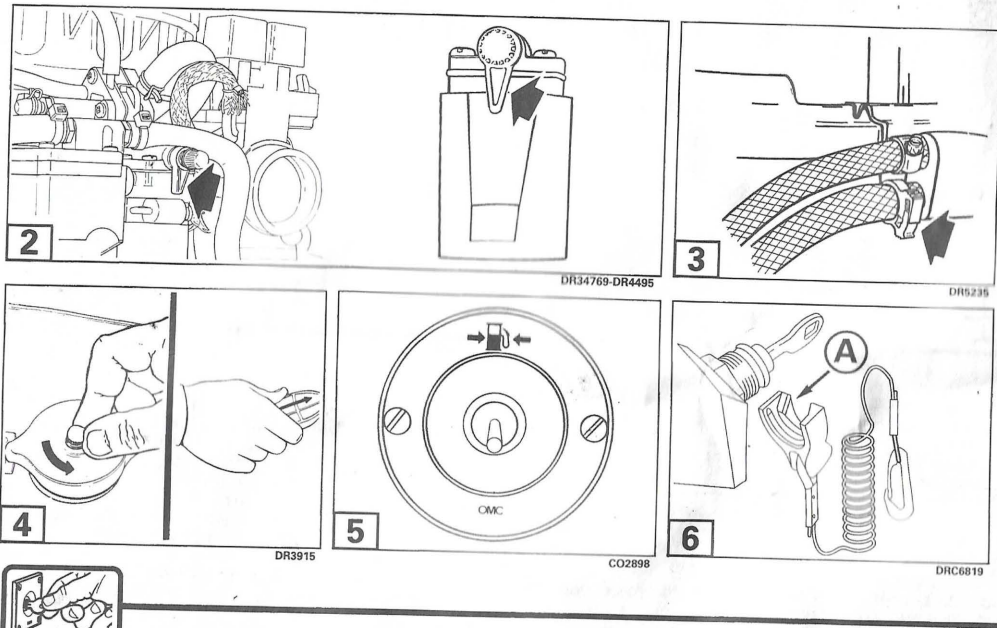
Note To avoid difficulty when restarting, never run the engine with the fuel hose disconnected or run the engine out of fuel.

Inspection

Inspect fuel system connections and components for leaks and condition **each time you refuel AND each time you remove the engine cover**.

AT LEAST once a year, **thoroughly** examine all components and all connections for leaks. Have your DEALER replace damaged components promptly.

⚠ Safety Warning: Failure to check for fuel leakage can allow a leak to go undetected. Ignition of this leakage could result in fire or explosion.



ENGINE STARTING

⚠ Safety Warning: DO NOT run the engine indoors. The engine emits toxic fumes when running.

⚠ Safety Warning: The engine cover is a machinery guard. DO NOT operate your outboard with the cover off unless you are performing maintenance or emergency starting procedures, and then – be careful to keep hands, hair, and clothing clear of all moving parts. Contact with moving parts will cause injury.

Important BEFORE cranking your engine, connect the battery as instructed in Maintenance Section, BATTERY. Cranking the engine without a properly connected battery will damage the electrical system.

Note Review and follow BREAK-IN if the engine is new.

Note DO NOT start the engine, or even crank it over, without first supplying water to its cooling system. Without water, the engine can be damaged.

Be sure the engine is in RUN position. Refer to Operation Section, POWER TRIM AND TILT or Tilting.

2 Be sure the primer solenoid lever is at RUN position.

⚠ Safety Warning: To avoid explosion and fire hazard, the primer solenoid lever must be set at RUN. With a pressurized fuel tank connected and the lever not at RUN, fuel can leak through the carburetor's air inlet.

3 If the fuel hose is not connected – slide it onto large nipple of fuel/oil hose adapter. Secure with clamp provided. Or, if using fuel hose adapter kit, snap the two fuel hose connectors together.

4 If equipped, open vent screw on fuel tank filler cap. Squeeze primer bulb, outlet end up, until firm.

5 Or, if equipped, activate electric primer pump for about 20 seconds.

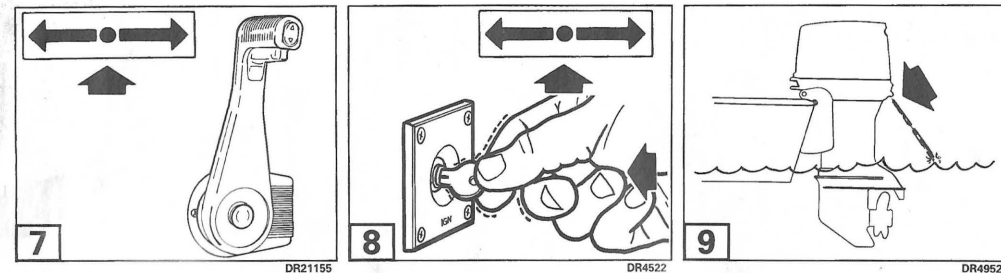
6 Connect the emergency stop clip **A** to the key switch; connect the lanyard to a secure place on the operator.

Important The engine will start and run without the clip connected to the key switch. However, we strongly recommend that the operator use the clip and lanyard anytime the engine is running. Refer to Features Section, EMERGENCY STOP/KEY SWITCH.

7 Move remote control handle to NEUTRAL.

Note To avoid engine damage after start-up:

- DO NOT exceed 2500 RPM in NEUTRAL.
- DO NOT exceed 1500 RPM in NEUTRAL for extended periods of time.



Cold Engine

Important DO NOT advance the throttle for start-up unless you need to clear a flooded engine. Advancing the throttle overrides the QuikStart™ electronic starting system. After start-up, this system runs the engine at fast idle until it warms up, then automatically slows it to normal idle speed.

Note Each time the key switch is turned from OFF to ON, the warning system will self-test. If it fails to self-test, see your DEALER.

8 Turn the key clockwise to START position and push/hold key IN to PRIME. (Primer works only while the engine is cranking or running.)

Crank the engine no longer than 10 seconds at a time.

Note The starter motor can be damaged if operated continuously longer than 10 seconds.

Release the key after the engine starts.

⚠ Safety Warning: DO NOT attempt to shift into gear when the engine is running at fast idle. Shifting under this condition can cause gear damage, and the resulting sudden boat movement could cause injury.

If the engine did not start, release the key momentarily, then try again.

Note Overpriming will “flood” the engine. If it floods or otherwise fails to start, refer to the Maintenance Section, TROUBLE CHECK CHART.

Important If your outboard doesn't react normally to this starting procedure or fails to start, refer to Maintenance Section, TROUBLE CHECK CHART.

After Engine Starts

8 If the engine starts but needs more fuel to prevent stalling, briefly push the key in several times until the engine warms and runs smoothly.

Note DO NOT turn the key switch to the START position while the engine is running. Damage to the starter and flywheel will result.

9 Check the water pump indicator. A steady stream of water indicates the water pump is working. Swivel the water pump indicator so the water stream can be seen from the helm. With dual engines, direct each stream so both can be seen from the helm. Refer to Operation Section, FLUSHING.

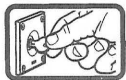
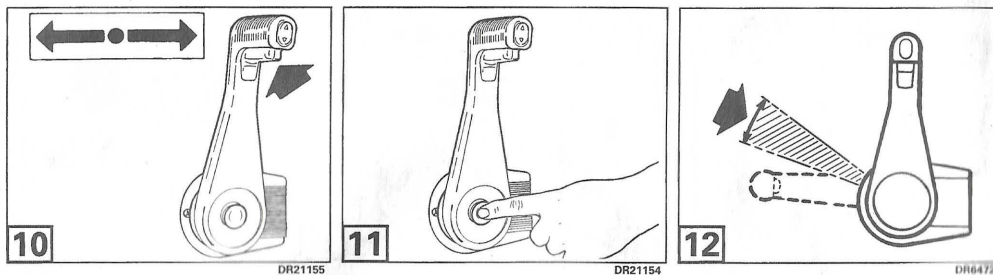
Note If a steady stream of water from the water pump indicator is not visible, stop the engine. Refer to Operation Section, ENGINE OVERHEATING.

Warm Engine

Follow Cold Engine procedure except warm engines do not normally require priming. If your engine fails to start, then prime.

Important Immediately after the warm engine starts, the QuikStart™ electronic starting system will hold the engine at fast idle for about 5 seconds, then will automatically reduce it to normal idle speed.

⚠ Safety Warning: DO NOT attempt to shift the motor into gear when the engine is running at fast idle. Shifting under this condition can cause gear damage, and the resulting sudden boat movement could cause injury.



SHIFTING AND SPEED CONTROL

Note Carefully check the function of all control and engine systems before leaving the dock. DO NOT shift the engine into FORWARD or REVERSE while it is shut off.

If the following directions are not suitable for your boat's control, see your DEALER before proceeding.

Shifting

10 With engine running and control handle in NEUTRAL:

- If locked in NEUTRAL, unlock the control handle (lift the neutral lock tab by squeezing the hand grip).
- Briskly and decisively, move the control handle fore or aft – until it engages the gear detent.

Note When shifting from FORWARD to REVERSE or from REVERSE to FORWARD, pause at NEUTRAL until the engine is at idle speed and the boat has slowed.

Speed Control

- After gear engagement, move the control handle slowly in the same direction to increase speed.

Fast Idle in Neutral

11 **Note** Avoid excessive engine RPM in NEUTRAL – adjust the throttle so the engine does not overspeed. On models with QuikStart™ electronic starting system, use the Fast Idle in Neutral feature only to clear a flooded condition.

- With the control handle in NEUTRAL, push the fast idle button while using the other hand to move the control handle forward, past the forward gear detent and into the throttle range. If equipped with a neutral lock tab, squeeze it to begin handle travel.
- When ready to shift, move the control handle back to NEUTRAL. Engine speed will reduce and the shift function will automatically engage for movement into FORWARD or REVERSE.

ENGINE STOPPING

Move the control handle to NEUTRAL.

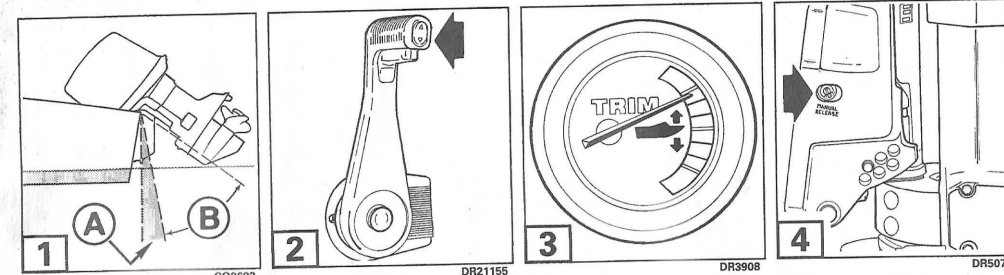
Turn key switch counterclockwise to OFF.

Leave the key switch OFF when the motor is not running or the battery will discharge completely. Remove the key when the boat will be unattended.

Note To avoid difficulty when restarting, never run the engine with the fuel hose disconnected or run the engine out of fuel.

FUEL ECONOMY

12 The economy throttle range can save fuel, depending on boat load and hull design. When boat reaches top speed, throttle back from FULL SPEED to the economy throttle range. You will save fuel without a noticeable loss of speed.



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POWER TRIM AND TILT

⚠ Safety Warning: Any malfunction of the power trim and tilt unit could result in loss of shock absorber protection if an underwater obstruction is hit. Malfunction can also result in loss of reverse thrust capability.

1 The trim system features a trim range A of 21°:

- You can pivot the engine to any position within this range while underway and at any boat speed.
- The power trim is normally used to improve acceleration, speed, and ride quality and to adjust for changing water conditions.

1 The tilt system will tilt your engine an additional 54°:

- While positioned within the tilt range B , DO NOT run the engine faster than idle speed. If idling a tilted engine, keep its water intakes submerged at all times.
- The power tilt is often used to tilt the engine for clearance when beaching, mooring, or launching.

Tilting

2 To operate the power tilt, push and hold the trim/tilt switch in the bow-up A or bow-down B position. The engine will tilt up or down until the switch is released or the engine reaches the end of its travel.

If the tilted engine's cover contacts the boat's motor well, limit the maximum tilt by following the procedures in Maintenance Section, **ADJUSTMENTS, Tilt Limiter Cam.**

Trimming

2 To operate the power trim, push and hold the trim/tilt switch in the desired bow direction, either bow-up A or bow-down B . The engine will move until the switch is released or the engine reaches its maximum position.

The boat will be properly trimmed when the trim angle provides a bow position that results in the best boat performance for your operating conditions.

You must use a speedometer and tachometer to determine boat and engine performance at different trim positions.

To familiarize yourself with power trim, make test runs with the boat's bow at various positions. Note the time it takes for the boat to plane, the tachometer and speedometer readings, and the ride and action of the boat.

Trim Gauge

3 The trim gauge indicates the bow position that is achieved by the trim angle of your motor.

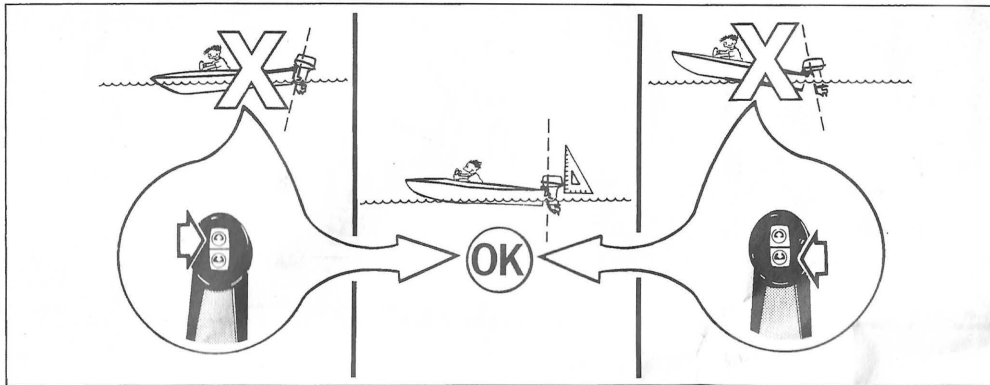
Manual Release

4 If needed, the outboard will tilt up or down manually:

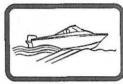
- Turn the manual release screw counterclockwise, slowly, until it lightly contacts its retaining ring – about 3½ turns.
- Reposition the engine.
- Tighten the manual release screw to hold the engine in its new position.

⚠ Safety Warning: Keep everyone clear of a tilted engine when backing out the manual release screw. The engine could drop suddenly and forcibly. Be sure to tighten the manual release screw after manually repositioning the engine. Tightening the screw also reactivates the engine's shock absorber protection and reverse thrust capability.

If you lower the engine to its full bow-down position, be sure to operate it in a suitable manner. Refer to **Bow-Down.**



DR3100



Bow-Up

BOW-UP position will give the best fuel economy and highest top speed.

Operating Conditions:

- In the bow-up position, your boat may tend to pull to the left. If this condition exists, correct it by applying a clockwise force with the steering wheel to keep on a straight path. The trim tab can also be adjusted to compensate for steering wheel torque, but adjust the trim tab only if bow-up is commonly used. Refer to Maintenance Section, **Trim Tab**.
- When the motor is trimmed to full bow-up position, the boat's bow will tend to rise above the water.
- Excessive bow-up trim may cause propeller ventilation, resulting in propeller slippage.

⚠ Safety Warning: When operating in rough water or crossing a wake, excessive bow-up trim may result in the boat's bow suddenly rising skyward; possibly ejecting occupants.

⚠ Safety Warning: Some boat/motor/propeller combinations may encounter boat instability and/or high steering torque when operated at high speed at or near the motor's trim range limits (full bow-up or bow-down). Boat stability and steering torque can also vary due to changing water conditions. If any adverse conditions occur, reduce throttle and/or adjust trim angle to maintain control. If you experience boat instability and/or high steering torque, see your DEALER to correct these conditions.

Bow-Down

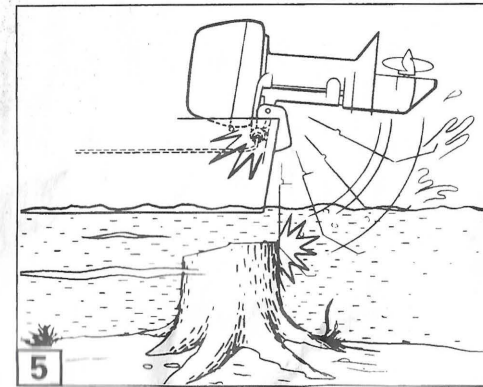
BOW-DOWN position will give the best acceleration onto plane and the best towing power for skiing. The bow-down position is normally used for accelerating from a standing start or from idle speed.

Operating Conditions:

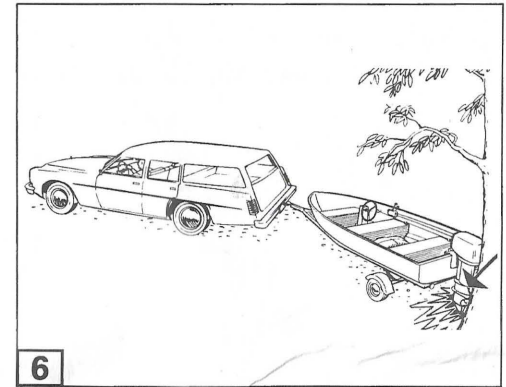
- In the bow-down position, your boat may tend to pull to the right. If this condition exists, correct it by applying a counterclockwise force with the steering wheel to keep on a straight path. The trim tab can also be adjusted to compensate for this steering wheel torque, but adjust the trim tab only if bow-down is commonly used. Refer to Maintenance Section, **Trim Tab**.
- When the motor is trimmed to full bow-down position, the boat's bow will tend to go deeper into the water (plow).

Important Some boats plow, or are difficult to plane, when operated in the trim's lowest position. If your boat handles unsuitably when trimmed fully bow-down, set the angle adjusting rod or trim limiter rod to limit the travel of the power trim. If your motor is not equipped with this rod, purchase one from your DEALER.

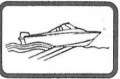
⚠ Safety Warning: If the bow of the boat plows the water at high speeds, the boat may bow steer or spin suddenly; possibly ejecting occupants.



DR4411



DR4412



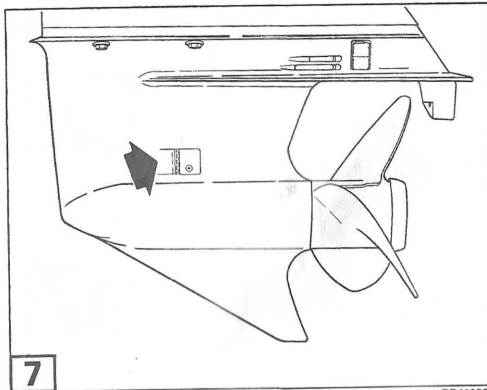
IMPACT DAMAGE

5 Your engine has a shock absorption system designed to withstand damage from impact with underwater objects at low to moderate speeds. However, high speed impacts with rigid underwater objects like pilings or boulders can be beyond the capability of the absorption system. Such impacts can result in serious damage to your engine and injury to boat occupants from the engine or its parts entering the boat. Occupants can also be ejected or injured by falling against portions of the boat as a result of rapid deceleration following impacts. When boating in unfamiliar, shallow, or debris-laden waters, seek information on safe boating areas and navigation hazards from a reliable local source. Reduce your speed and keep a sharp lookout!

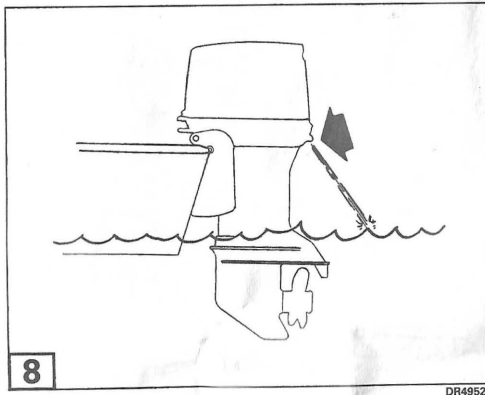
6 The engine's shock absorption system does not work while operating in reverse. If you back into an object, either in the water or while trailering, your boat and engine can be seriously damaged.

If you hit any object, stop immediately and examine the engine for loosening of attaching hardware and clamp screws, if equipped. Inspect for damage to swivel and stern brackets, steering components, and components in the area of impact. Also, examine the boat for structural damage. Tighten any loosened hardware. If the collision occurred in the water, proceed slowly to harbor. Before boating again, have your DEALER thoroughly inspect all components.

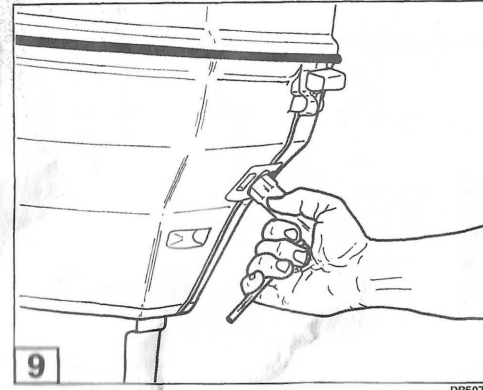
⚠ Safety Warning: Failure to inspect for damage could result in sudden, unexpected component failure, loss of boat control, and personal injury. Unrepaired damage could reduce your boat and engine's ability to resist future impacts.



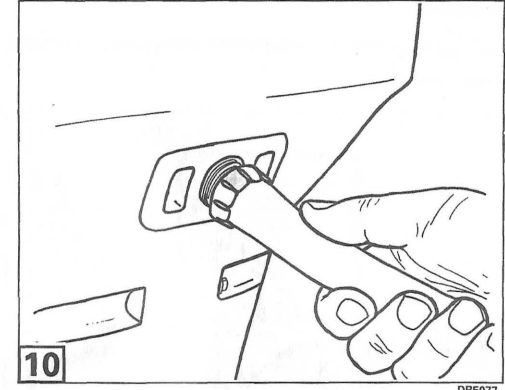
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ENGINE OVERHEATING

Note Do not run your engine – even for a brief start-up – without supplying water to it. Refer to **FLUSHING**.

7 While boating, the engine's water intakes must stay completely submerged and unobstructed. Observe proper transom height and trim angle.

8 While running, make sure the engine's water pump indicator discharges a steady stream of water. Check the indicator often, especially when operating in weeds, in mud, in debris-laden water, at an extreme trim angle, or in shallow-water drive (if equipped).

If the engine overheats, its *S.L.O.W.*™ warning system will automatically limit RPM to approximately 2500. You must restore cooling and **RESET** the warning system (shut off the engine) before the engine will operate normally.

IF the *S.L.O.W.* system activates, **OR** . . .

IF the stream from the water pump indicator becomes intermittent or stops, reduce speed to idle and:

- Shift to REVERSE. Run slowly for about 10 seconds.
- Shift to NEUTRAL. If debris is blocking the water intakes, shifting might clear them.

IF shifting does not restore water flow:

- SHUT OFF the engine.
- Clean the intake screens and water pump indicator.
- Restart the engine and run at idle.

IF cleaning the screens and indicator does not restore the water pump indicator's steady discharge, **SHUT OFF** the engine and do not attempt to operate it. See your DEALER.

IF shifting or cleaning does restore water flow:

- Continue to IDLE the engine until it cools.
- RESET the warning system.
- See your DEALER as noted below.

Important RESET – After the engine has cooled, **shut it off**. Restart the engine for normal operation.

Note After an overheat, have your DEALER:

- Torque the cylinder head screws

FLUSHING

⚠ Safety Warning: DO NOT run the engine indoors. The engine emits toxic fumes when running.

Flush your engine with fresh water as soon as possible after each use in salty, polluted, or brackish water to minimize the formation of deposits that can clog cooling passages.

Flush the engine on the trailer or at dockside while it is:

- tilted or vertical, running or stopped . . .

Outboard Vertical – Running

⚠ Safety Warning: Prevent injury from contact with rotating propeller; remove the propeller before flushing.

1. Place the engine in vertical position in a well-ventilated area with good drainage.
- 9** 2. Remove the plug from the flushing port.
- 10** 3. Install flushing device (if needed) and garden hose.
4. Start the water – keep pressure between 20 – 40 psi (140 – 300 kPa).
5. Start the engine – **run it at idle only** and flush it for at least five minutes.
- 9** 6. Shut off the engine, remove the flusher (if used), and install the plug. If the plug is also the water pump indicator, turn it so the water streams out to the side, where it can be seen easily from the helm.
7. Leave the outboard in vertical position long enough to completely drain the powerhead.

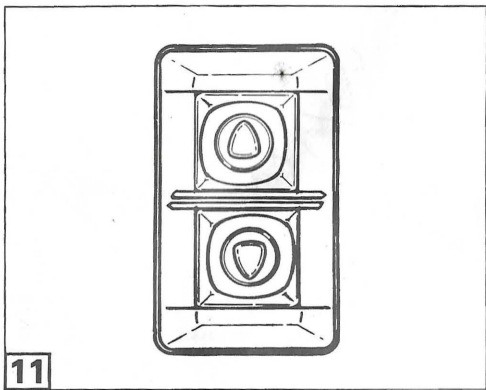
Outboard Tilted – MUST NOT be Running

- 9** 1. Remove the plug from the flushing port.
- 10** 2. Install flushing device (if needed) and garden hose.
3. Start the water and flush the engine for at least five minutes – keep pressure between 20 – 40 psi (140 – 300 kPa).
- 9** 4. Remove the flusher (if used); install the plug. If the plug is also the water pump indicator, turn it so the water streams out to the side, where it can be seen easily from the helm.
5. Lower the outboard to vertical position long enough to completely drain the powerhead.

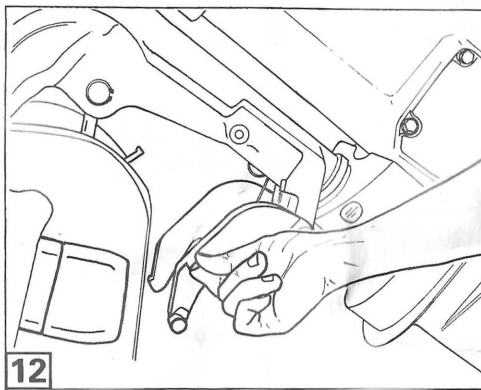
Outboard Vertical – Not Running

- Follow **Outboard Tilted** instructions.

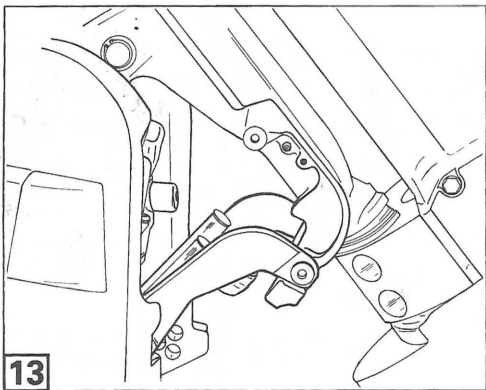




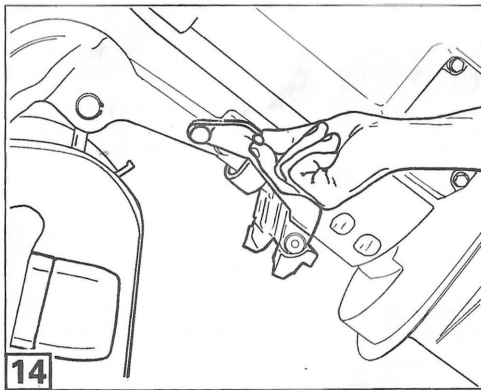
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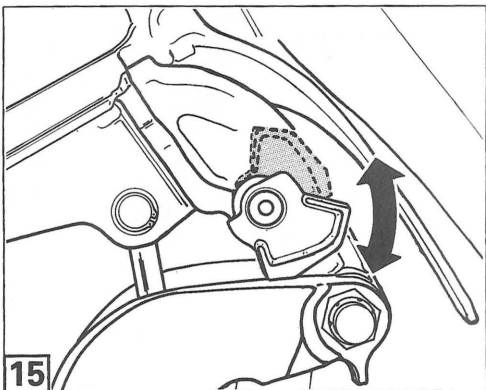
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TRAILERING

Trawling Tilt Switch

Note DO NOT use the tilt support lever when trailering.

11 Use the switch on the lower engine cover to conveniently operate the power tilt from outside the boat.

⚠ Safety Warning: Keep everyone clear of stern area when raising or lowering the outboard. Personal injury can result from contact with moving parts of the outboard.

Trail your boat with the motor in a vertical position. If your trailer does not provide adequate road clearance, the motor can be trailered while tilted by using the motor's trawling bracket.

Trawling Bracket

To engage bracket – Tilt the motor fully using the tilt switch inside the boat or the trawling tilt switch.

12 Pull down the trawling bracket. A detent will hold the bracket in position.

13 Lower the motor until the trawling bracket locks into place in the stern brackets.

To disengage bracket – Tilt the motor fully.

⚠ Safety Warning: Use the power tilt to lift and support the motor BEFORE disengaging the trawling bracket. If the system has lost oil pressure while on the trawling bracket and will not tilt the motor off of it, manually tilting the motor could allow it to cause injury by dropping suddenly and unexpectedly when the trawling bracket is disengaged.

14 Return the trawling bracket to its stowed position.

Lower the motor to its vertical position.

STORAGE

Note To avoid difficulty when restarting, never run the engine with the fuel hose disconnected or run the engine out of fuel.

Note If you must tilt the motor to remove it from the water, lower it and allow the cooling system to drain completely as soon as you clear the launch area.

Between uses, store your motor in a vertical position.

For recommendations on extended periods of storage, refer to Maintenance Section, **OFF-SEASON STORAGE**.



TILT SUPPORT

Note DO NOT use the tilt support lever while trailering. Refer to **TRAILERING**.

15 Engage the tilt support lever if you intend to leave the motor tilted for a period of time:

- Tilt the motor UP using the trawling tilt switch.
- Flip the tilt support lever down.
- Lower the motor until the tilt support lever rests solidly on the stern brackets.

Disengage the tilt support lever:

- Tilt the motor UP.

⚠ Safety Warning: Always use the power tilt to lift and support the motor BEFORE you disengage the tilt support lever. If oil pressure is lost while using the tilt support lever, the motor can drop suddenly when the support is disengaged. If the power tilt will not lift the motor, do not attempt to force the tilt support lever from its position on the stern brackets. See your DEALER.

- Flip the tilt support lever up.
- Lower the motor to operating position.

MOORING

You may moor your boat with the motor's gearcase out of the water by using its tilt feature. Depending on the model, refer to **TILTING** or **POWER TRIM AND TILT**.

Also, refer to **TILT SUPPORT**.

PROPELLER SELECTION

To select the correct propeller for your boating application, your boat and motor MUST be water tested. See your DEALER for assistance.

Refer to Maintenance Section, **PROPELLER**, before removing or installing propeller.

Note The correct propeller for your boat, under normal load conditions, will allow the engine to run near the midpoint of the RPM operating range at full throttle. Refer to Maintenance Section, **SPECIFICATIONS**.



SPECIAL OPERATING CONDITIONS

Salt Water

Flush the engine internally after use in salt, polluted, or brackish water to help prevent mineral deposits from clogging cooling passages. Refer to **FLUSHING**.

Note During use in salt or brackish water, additional anodic protection for the boat and outboard may be required.

During long periods of mooring, tilt the gearcase out of the water – except in freezing temperatures. Upon removal from salt water, leave the outboard in a vertical position until its cooling system has drained.

Weedy Water

Weeds block water intakes and cause the engine to overheat. Weeds on the propeller create vibration.

Run at slow speeds and in REVERSE frequently to clear weeds from the propeller. Check the water pump indicator often. Remove all weeds before operating at higher speed.

Shallow Water

Note DO NOT operate your outboard with its gearcase dragging on the lake bed; damage can occur. Depending on your model, refer to **SHALLOW-WATER DRIVE** or **TILTING** or **POWER TRIM AND TILT**.

Boat Bottom and Engine External Surfaces

The condition of your boat's bottom affects performance. A covering of marine growth reduces speed. For maximum performance, keep the boat's running surface clean by wiping it dry after each use and washing it occasionally.

After operating your outboard, rinse it with fresh water and wipe it dry. Apply **OMC Anti-Corrosion Spray** to any surface subject to corrosion, but avoid the anti-corrosion anode(s).

Periodically, wash the entire boat and outboard with soapy water and apply a coat of automotive wax. Leave the engine cover in place when washing the outboard.

High Altitude

If you boat at altitudes above 3000 ft. (900 m), your engine might benefit from a lower pitched propeller, different carburetor calibration, or both. See your DEALER.

Note To avoid permanent powerhead damage, be sure that an engine modified for high altitude operation is properly identified and returned to original calibration and propeller size if operated below 3000 ft. (900 m).

Freezing Weather

BEFORE operating your outboard in freezing weather, check its gearcase lubricant. Refer to Maintenance Section, **LUBRICATION**, **Gearcase**. If you find evidence of leakage, the gearcase requires service. See your DEALER.

DURING operation in freezing weather, keep the gearcase submerged at all times.

Upon removal from the water, leave the engine in a vertical position until its cooling system has drained.

Note Water that has leaked into the gearcase or remained in the cooling system (or other components) can freeze, causing serious engine damage.

Note If your outboard's gearcase is equipped with an integral speedometer pickup, all water must be cleared from the hose to prevent gearcase damage. Refer to Maintenance Section, **OFF-SEASON STORAGE**.

Submerged Engine

If your engine has been underwater, **have it serviced immediately upon recovery**. If immediate service is unavailable, resubmerge it in fresh water to avoid prolonged exposure to the atmosphere.

After submersion, all boat and engine electrical, fuel, and oiling systems must be inspected for signs of water intrusion. Your DEALER should perform this service.

Under Tow

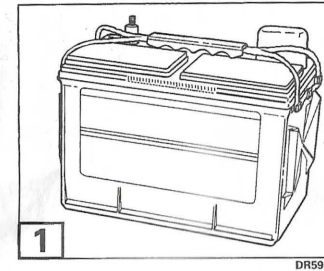
Should you require a tow from another boat:

- Shift your engine to NEUTRAL
- Tilt its gearcase out of the water
- Off-load all persons into another boat
- Keep towing speed slower than planing speed

Dual Engine Operation

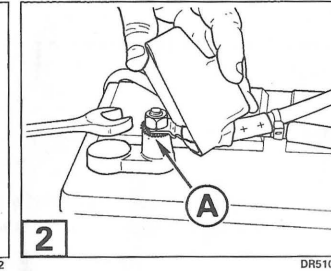
When you are maneuvering at slow speed, be sure both engines are running, even if one or both are in NEUTRAL.

If it is necessary to return to harbor with one engine not running, you should not attempt to operate the boat above planing speed. Tilt the inoperative engine high enough to keep its propeller out of the water.



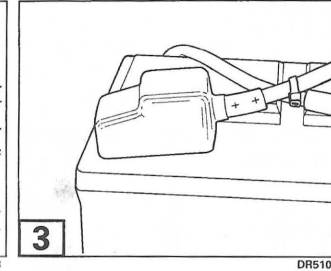
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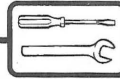
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Specifications	24	Off-Season Storage	32
Water Pressure	25	Preseason Service	33
Fuse	25	Maintenance Schedule	34
Lubrication	26	Warranty Service	36
Adjustments	28	20-Hour Check	36
Anticorrosion Anodes	29	Owner's Service Responsibility	36
Propeller	30	Customer Satisfaction	36
Fuel Line Filter	31	Trouble Check Chart	37
Spark Plugs	31	Symbols	38

BATTERY

Batteries, terminals, and restraint systems are not supplied with the motor. See your DEALER.

1 Each motor needs one battery that is:

- 12-volt, heavy-duty, designated "marine"
- Vented/refillable or maintenance-free
- Rated according to the minimum requirements in **SPECIFICATIONS**

Deep-cycle batteries are suitable IF they meet or exceed the minimum CCA requirements.

Ask your DEALER about your engine's requirements before installing longer battery cables, a battery switch, or a battery isolator.

Before servicing the battery or the engine, remove both battery cables from the battery, BLACK (negative) cable first. Keep metal objects from contacting either battery post.

Note Service electrical components only while the motor is NOT running. Be careful when identifying positive and negative battery cables and posts. If you touch the wrong post with a battery cable, even briefly, the motor's charging unit will be damaged.

Warning: Battery electrolyte is acidic – handle with care. If electrolyte contacts any part of the body, immediately flush with water and seek medical attention.

Installation

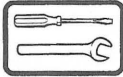
Read and understand the safety information supplied with your battery BEFORE you begin installation.

Important

- Place the battery in a hold-down system and in a location that is easily accessible for frequent checking and recharging.
- 2 • Place a large-surface star washer (A) over the battery's positive (+) post. Stack cables from accessories (if any) on the star washer, then install the RED battery cable from the motor. Finish the connection with a hex nut and tighten it firmly with a wrench.
- Connect the motor's BLACK battery cable to the battery's negative (-) post in the same manner.
- 3 • Apply **OMC Triple-Guard®** grease to exposed areas of battery posts and cable ends to prevent corrosion. Cover the connections.

Warning: Keep the battery connections clean, tight, and insulated to prevent their shorting or arcing and causing an explosion. If the battery mounting system does not cover the connections, install protective covers. Check often to see that connections stay clean and tight.


Note DO NOT use wing nuts on battery connections even if they came with the battery. Wing nuts can loosen and cause errant warning signals or electrical system damage.



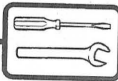
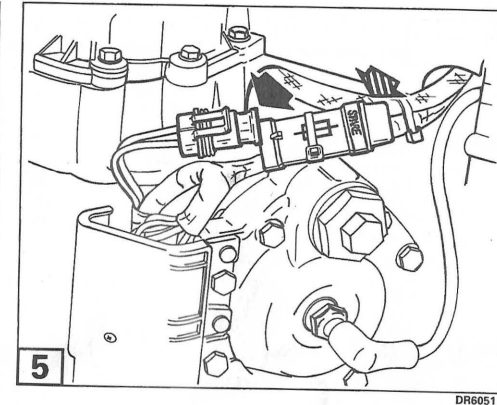
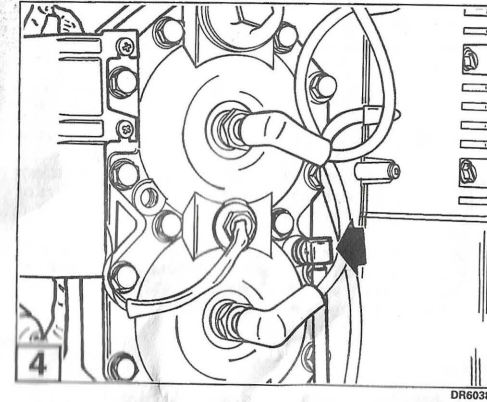
⚠ Safety Warning: To avoid accidental starting of engine while servicing, twist and remove all spark plug leads.

⚠ Safety Warning: When replacement parts are required, use **OMC® Genuine Parts** or parts with equivalent characteristics, including type, strength and material. Using substandard parts could result in injury and product failure.

SPECIFICATIONS

	Specification	Page
Displacement	105.4 cu. in. (1726 cc)	•
Engine Type	Two-Cycle, 60° V, 4-Cylinder, Loop-Charged	•
Full Throttle Operating Range	4500 to 5500 RPM	•
Power ①	90 – 90 HP (67,2 kw) @ 5000 RPM 115 – 115 HP (85,8 kw) @ 5000 RPM	•
Fuel Requirements	87 Pump Posted AKI (90 RON) – Refer to 	8
Fuel/Oil Ratio	Supplied by oil injection system	8
Warning Signals	Engine Overheat, Low Oil, No Oil	7
Ignition Features	<i>QuikStart™</i> and <i>S.L.O.W.™</i>	13, 18
Battery, Minimum	12-volt, 360 CCA (465 MCA) with 90 minutes reserve capacity OR 50 Ampere-Hour	23
Spark Plug (4) <i>Champion</i> : ② Torque	QL78YC @ 0.030 in. (0,8 mm) gap 18-21 ft. lbs. (24-28 N-m)	31
Fuse	OMC P/N 514021 (20-Amp)	25
Fuel Filter	OMC P/N 433190	31
Alternator	20-Amp, Fully Regulated	•
Gearcase – Lubricant Capacity	OMC Ultra-HPF™ Gearcase Lube PL – 26 fl. oz. (770 ml) PX – 33 fl. oz. (980 ml)	26
Power Trim/Tilt – Fluid Capacity	21 fl. oz. (622 ml)	26
Propeller ③	Refer to Operation Section, PROPELLER SELECTION	21
Fuel Tank ③	Capacity – 6 U.S. Gallons (22,7 Litres)	9
Weight	PL – 319 lbs. (145 kg) PX – 336 lbs. (152 kg)	•
Transom Height	PL – 19½ to 20 in. (495 to 508 mm) PX – 24½ to 25 in. (622 to 635 mm)	•
Sound at Driver's Ear (L _{pA}) ICOMIA 39.94	80.8 dB(A)	•

- ① Rated following the standards of ICOMIA 28.83, ISO 3046, and NMMA.
- ② Other spark plugs will cause ignition problems.
- ③ Not supplied in all marketing areas.



WATER PRESSURE

An optional water pressure gauge is recommended to monitor cooling system pressures. Noticing changes in water pressure can help prevent engine overheating.

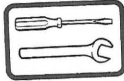
4 The water pressure gauge must be connected at this point to ensure the most accurate pressure readings. Follow the installation instructions included with the water pressure gauge.

FUSE

Note Always carry spare fuses.

5 Use the spare fuse holder to hold an extra fuse.

5 The fuse is located in the fuse holder. Replace a blown fuse. Refer to **SPECIFICATIONS**.



LUBRICATION

OMC Triple-Guard® Grease	OMC Ultra-HPF™ Gearcase Lube	OMC Power Trim/Tilt and Power Steering Fluid
A	B	C

DR4850

Frequency

- At least every 30 days - salt or polluted water
- At least every 60 days - fresh water
- Before a period of storage
- More often, as experience indicates

Note The recommended OMC lubricants have been formulated to protect bearings and gears. They must be used to avoid damage caused by improper lubrication.

Figure	Lubrication Point	Lubricant
1	Gearcase*	B
2	Steering*	A
3	Power Trim/Tilt Reservoir	C
4	Swivel Bracket, Tilt Support	A
5	Tilt Tube	A
6	Throttle and Shift Linkage	A

*Recommended Dealer Performed Service.

Gearcase

Replace gearcase lubricant after first 20 hours of operation. Check level and condition of lubricant after next 30 hours of operation. Add lubricant if necessary.

Thereafter, check level and condition of lubricant every 50 hours. Replace lubricant every 100 hours of operation or once each season, whichever occurs first. Refill with OMC Ultra-HPF™ gearcase lube. If not available, use OMC Hi-Vis® gearcase lube. See your DEALER.

With motor in normal operating position:

1. Remove drain/fill plug ① and lubricant level plug ② from side of gearcase and completely drain gearcase of old lubricant.
2. Examine drained lubricant for metal filings, milky appearance, or black color with burnt odor. If old lubricant has any of those characteristics, see your DEALER. If drained lubricant is in good condition, continue.
3. Place tube of lubricant in drain/fill hole and fill slowly until lubricant appears at lubricant level hole. See SPECIFICATIONS for gearcase capacity.
4. Install lubricant level plug ② before removing tube from drain/fill hole. Drain/fill plug ① can then be installed without loss of lubricant.
5. Securely tighten both plugs.

Steering System

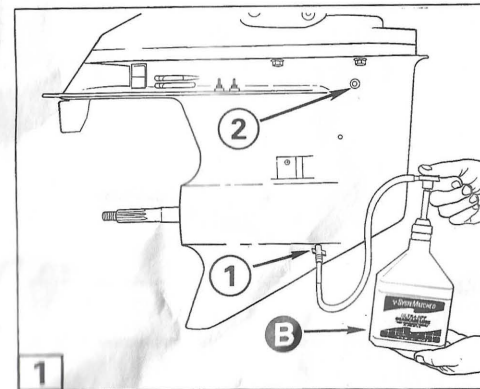
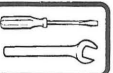
2. The installer was instructed to grease the steering cable ram during installation. Periodic regreasing of the steering cable ram with OMC Triple-Guard® grease is required. Refer to Frequency. Refer to steering system manufacturer's information when servicing boat's steering system.

⚠ Safety Warning: Failure to regrease as recommended could result in steering system corrosion. Corrosion can affect steering effort, making operator control difficult.

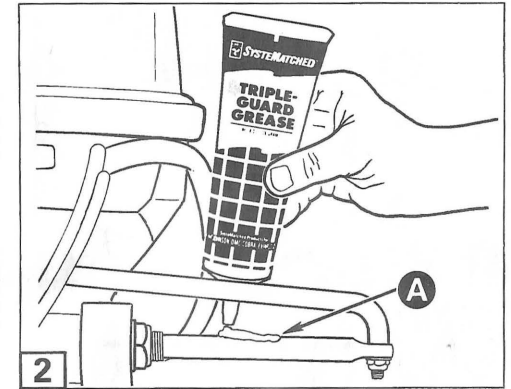
Power Trim and Tilt Fluid Reservoir

3. Tilt the motor up and engage the tilt support. Depending on your model, refer to Operation Section, **Tilting** or **TILT SUPPORT**. Remove filler cap and check fluid level. If necessary, add enough OMC Power Trim/Tilt and Power Steering Fluid to bring the fluid level even with the bottom of the fill cap hole when the unit is at full tilt.

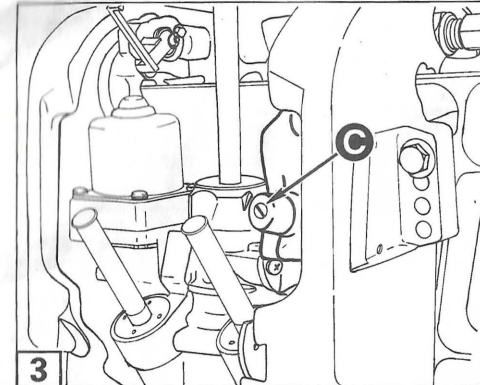
Important Correct fluid level must be maintained to ensure operation of the impact protection built into this unit.



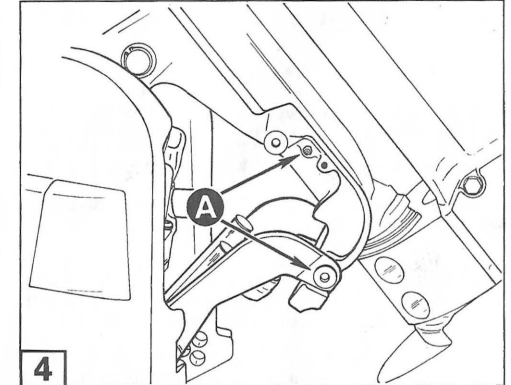
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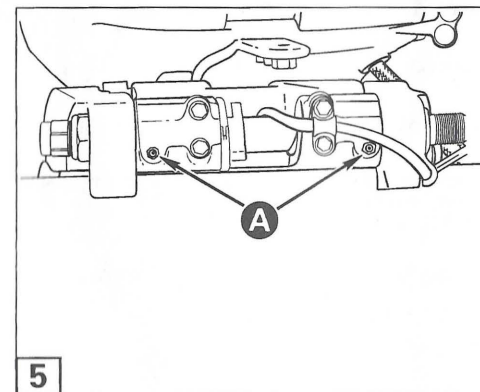
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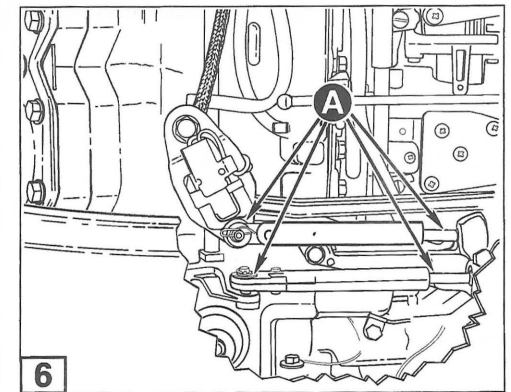
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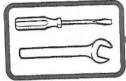
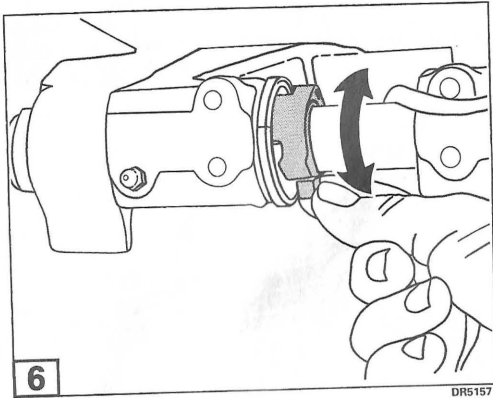
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ADJUSTMENTS

Tilt Limiter Cam

6 If your outboard contacts the boat's motor well while tilting, adjust the tilt limiter cam to limit maximum tilt-up:

- Place the outboard in its normal operating position.
- Rotate the tilt limiter cam – pull its tab forward and up to REDUCE the amount of tilt UP.
- Check your adjustment – tilt the outboard fully and adjust further, if necessary. Return the outboard to vertical position for each adjustment, and repeat your check after each adjustment.

⚠ Safety Warning: Adjusting the tilt limiter cam will NOT prevent the outboard from tilting fully and contacting the motor well if the gearcase hits an object at high speed. Such contact could damage the outboard and boat and injure boat occupants.

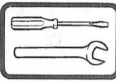
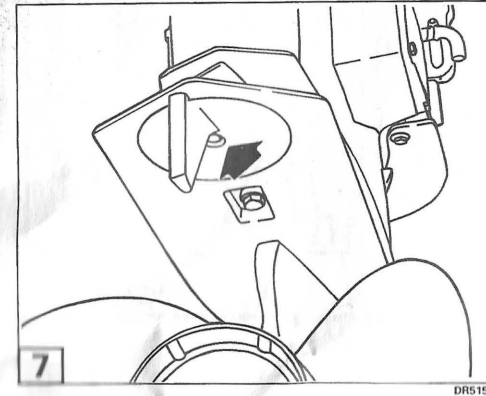
Idle Speed

Idle speed and carburetor adjustments are preset at the factory. If you are experiencing poor running quality, see your DEALER.

Carburetor

High speed fuel calibration is maintained by the fixed high speed jet in the carburetor. Fixed jets are not adjustable.

Low speed fuel calibration is set at the factory with a range of adjustment provided. If your engine displays poor running quality at low speed or idle, ask your DEALER to perform the necessary adjustments.



Trim Tab

⚠ Safety Warning: Improper trim tab adjustment can cause difficult steering.

A propeller will generate steering torque when the propeller shaft is not running parallel to the water's surface. The trim tab is adjustable to compensate for this steering torque.

Important A single trim tab adjustment will relieve steering effort under only one set of speed, motor angle, and load conditions. No single adjustment can relieve steering effort under all speed, motor angle, and load conditions.

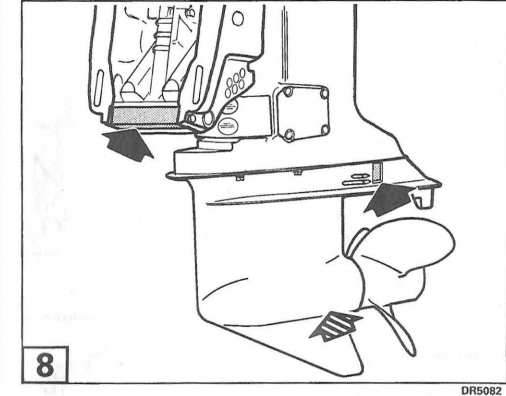
If the boat pulls to the left or right when its load is evenly distributed, adjust the trim tab as follows:

7 With the motor shut OFF, loosen the trim tab screw. If the boat pulled to the right, move the rear of the trim tab slightly to the right. If the boat pulled to the left, move the rear of the trim tab slightly to the left.

- Tighten the trim tab screw to a torque of 35-40 ft. lbs. (47-54 N·m).
- Test the boat and, if needed, repeat the procedure until steering effort is as equal as possible.

High motor installations – The trim tab might be above the water when the motor is trimmed out. Steering effort might increase. Steering effort will be reduced if you trim the motor in and submerge the trim tab.

Dual standard rotation motors – Move both trim tabs equally and in the same direction.



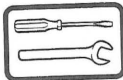
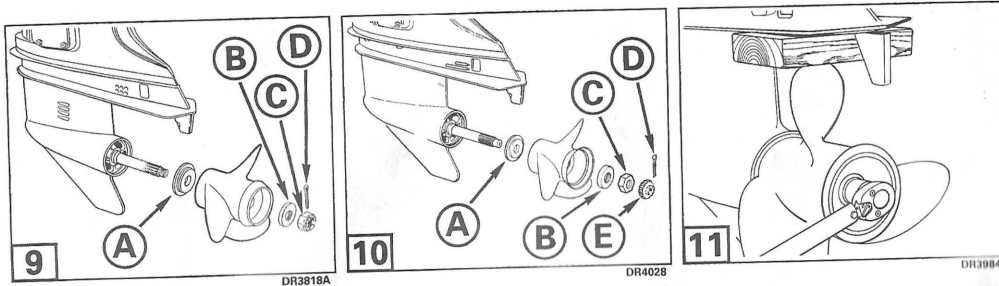
ANTICORROSION ANODES

8 Your motor is equipped with one or more anodes that protect it from galvanic corrosion. Refer to Features section for anode location. Disintegration of the anode is normal and indicates it is working. Check each anode periodically. Replace anodes smaller than 2/3 their original size. See your DEALER for replacements.

Galvanic corrosion destroys underwater metal parts and can occur in fresh or salt water; however, salt, brackish, and polluted waters will accelerate corrosion.

Metal-based antifouling paint on the boat or motor and the use of improperly installed shore power in the area of your moored boat will also accelerate corrosion.

Note NEVER paint the anode, its fasteners, or its mounting surface. Painting will reduce its corrosion protection.



PROPELLER

⚠ Safety Warning: To avoid accidental starting of engine while changing propellers, twist and remove all spark plug leads.

[Note] Apply OMC Triple-Guard® grease to the entire propeller shaft before installing the propeller. At least annually, remove the propeller and check for debris. Clean the shaft and regrease it before reinstalling a propeller.

9 10 Installation

- Thrust bushing (A) – Slide onto shaft with shoulder facing aft.
- Propeller – Slide onto propeller shaft, engaging the splines and seating it on the thrust bushing.
- Spacer (B) – Engage the propeller shaft splines.

11 • Wedge a block of wood between the propeller blade and the anti-ventilation plate.

9 PL:

- Propeller nut (A) – Install and tighten to a torque of 120 in. lbs. (14 N-m).
- Cotter pin (C) – Continue to tighten propeller nut until nut slots and cotter pin hole are aligned. Install new cotter pin and bend ends to secure.
- Remove block of wood. Make sure engine is in NEUTRAL; give propeller a spin. It must turn freely.

10 PX:

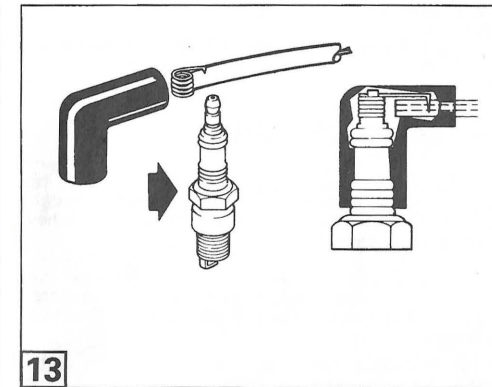
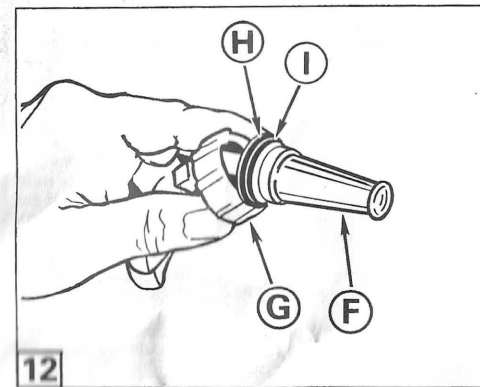
- Propeller nut (A) – Install and tighten to a torque of 70-80 ft. lbs. (95-108 N-m).
- Keeper (B) – Install on propeller nut, aligning keeper slots and cotter pin hole.
- Cotter pin (C) – Install new cotter pin and bend ends to secure.
- Remove block of wood. Make sure engine is in NEUTRAL; give propeller a spin. It must turn freely.

Repair

If your propeller hits a solid object, the impact is absorbed by the rubber bushing in the hub to help prevent damage to the engine. A strong impact can damage the hub and propeller blades. Damage to blades can cause unusual and excessive vibration. Damage to the hub can cause excessive engine RPM with little forward movement.

[Note] Avoid or limit operation using a damaged propeller. Carry a spare propeller.

Keep your propeller in good condition. Use a file to smooth slight damage to blade edges. See your DEALER for repair of serious damage.



FUEL LINE FILTER

[Note] Disassemble, inspect, and clean the filter during the 20-HOUR CHECK.

Thereafter, inspect and clean the filter seasonally or every 100 hours, whichever comes first, to ensure best motor performance. Refer to SPECIFICATIONS.

⚠ Safety Warning: To prevent excessive fuel spillage, disconnect fuel line from motor before disassembly.

12 The filter is located on the fuel component bracket. To service, proceed as follows:

- Remove air silencer.
- Loosen fuel filter nut (H) and remove the fuel filter element (F). Do not lose fuel filter gasket (G) or O-ring (I).
- Wash filter element with clean solvent and blow dry.
- Replace O-ring and fuel filter gasket if cut or damaged.
- Reinstall fuel filter making sure that fuel inlet nipple aligns with hose. Tighten fuel filter nut securely and clean up any spilled fuel.
- Check for leaks by connecting fuel line to motor and squeezing primer bulb until definite resistance is felt in bulb.

⚠ Safety Warning: Failure to inspect your work could allow fuel leakage to go undetected. This could become a fire or explosion hazard.

SPARK PLUGS

⚠ Safety Warning: Avoid abusive handling which could crack ceramic portion of spark plug. Damaged spark plugs can emit sparks. Sparks can ignite fuel vapors under the engine cover.

Inspect spark plugs periodically. Replace if electrodes are badly worn, insulators are cracked, or if they are badly fouled.

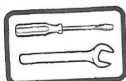
To remove spark plugs, twist and remove all spark plug leads. Unscrew spark plugs and remove from cylinder head.

To install spark plugs, wipe spark plug seats clean with a clean rag. Install spark plugs finger tight, then tighten to specified torque. Refer to SPECIFICATIONS.

[Note] Avoid engine damage:

- Install spark plugs into COOL cylinder head
- Do not overtighten

13 Before installing the spark plug lead, apply a light coat of OMC Triple-Guard® grease to the ribbed portion of the spark plug insulator and the opening of the spark plug cover. This will help prevent corrosion between the spring terminal and the spark plug.



OFF-SEASON STORAGE

Your warranty does not cover engine failure caused by neglect. Temperature and humidity changes while in storage can cause corrosion of internal engine parts when they are not properly protected.

We recommend you have your DEALER prepare your outboard for off-season storage. To do the off-season preparations yourself, gather these supplies and perform the steps that follow:

- OMC 2+4® Fuel Conditioner – see note
- OMC Triple-Guard® Grease
- OMC Ultra-HPF™ Gearcase Lube
- OMC Storage Fogging Oil – Injection Can

Note Stabilize the engine's fuel supply with OMC 2+4 fuel conditioner during the last hours of operation to ensure proper stabilization, following instructions on the container for mixture.

⚠ Safety Warnings: Prevent injury from contact with rotating parts. Before you start the engine . . .

- Shift it to NEUTRAL
- Keep hands, clothes, and hair clear of powerhead
- Remove the propeller if you use a flushing device

Note Provide a water supply to the engine and start it – run it at idle only.

- To run the engine in a tank or on a hose, refer to Operation Section, FLUSHING.

Note To avoid difficulty when restarting, never run the engine with the fuel hose disconnected and never run the engine out of fuel.

14 OMC Storage Fogging Oil – Connect can to its fitting on the primer solenoid. Following instructions on the can, fog the engine.

Stop the engine. Turn off the water source, if used.

Store the engine on the boat (or an engine stand) in a vertical, self-draining position.

Note If you cannot store your engine in the recommended vertical position, be sure the cooling system is drained completely. Never place the gearcase higher than the powerhead. Any water remaining in the exhaust passages can run into the cylinders and cause serious damage.

If you remove an "installed" engine, examine all hardware you loosened or removed from it and its steering, throttle, and shift systems. Replace damaged or missing parts with genuine OMC parts, or equivalent.

⚠ Safety Warning: Failure to carefully reattach the engine and its control systems with factory-specified hardware can result in sudden, unexpected loss of boat control.

Oil hose – Leave the oil hose connected. If you must disconnect it to remove the engine for storage, cap the fitting and plug the hose as directed in Fuel and Oil Section OIL INJECTION SYSTEM.

Spark plugs – Remove and examine them. Clean or discard them, if necessary. Refer to SPARK PLUGS.

Spray fogging oil into the spark plug holes. Slowly, rotate the flywheel several revolutions to distribute the oil and to drain water from the water pump.

Install spark plugs; tighten as specified in SPARK PLUGS.

⚠ Safety Warning: Prevent accidental start-up during storage; leave spark plug leads disconnected.

Fuel filter(s) – Clean or change.

Screws, bolts, and nuts – Tighten any that are loose.

Electrical, ignition, oil, and fuel systems – Check for misplaced leads and damaged or deteriorated parts. Be sure starter solenoid terminal boot and all connectors are in place.

Propeller – Remove and examine. If damaged, see your DEALER. Clean the propeller shaft and lubricate it. Refer to PROPELLER.

15 Gearcase speedometer pickup – Disconnect the speedometer hose at the upper connection. With air pressure no more than 25 psi, blow all water from the gearcase speedometer pickup system. Reconnect speedometer pickup after all the water has been removed.

Lubrication – Refer to LUBRICATION to drain and refill the gearcase and to lubricate the lube points on the engine.

Touch up painted surfaces and wax the engine's exterior.

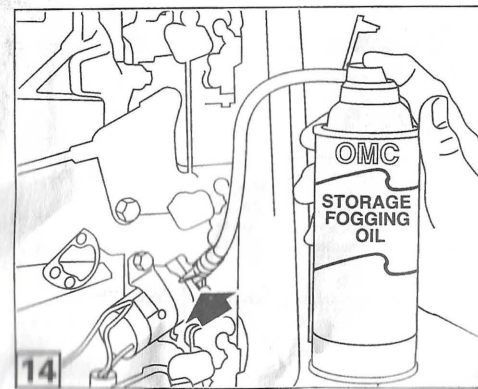
Battery – Clean it, check its condition, and store it in a cool, dry place, out of direct sunlight. Check its electrolyte level and charge it periodically during the storage period.

Oil tank – Fill with recommended oil to reduce or prevent condensation from forming in the tank during storage.

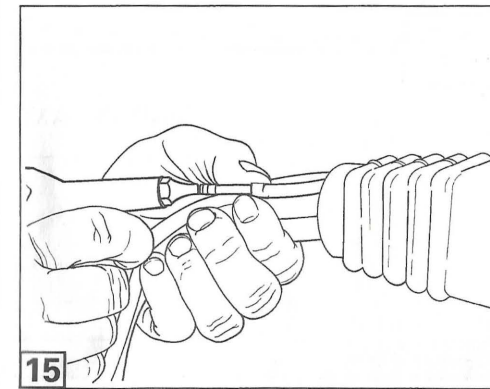
Portable fuel tank – Disconnect the hose from the tank. Remove the hose from the engine if the fitting is a quick-disconnect. If not, and the hose is secured to the engine, leave it connected. Secure the hose to protect it.

⚠ Safety Warning: Store fuel tanks in a well-ventilated area, away from heat and open flame. Prevent escape of liquid or vapors which could accidentally ignite . . .

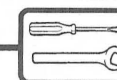
- Close the filler cap vent screw, if equipped
- Be sure the disconnected fuel hose doesn't leak



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PRESEASON SERVICE

Remove your outboard from storage and prepare it for a season of reliable service by performing a general check and a few preventive maintenance procedures.

Examine all loosened or removed hardware and any steering, throttle, and shift systems. Replace damaged or missing parts with genuine OMC parts, or equivalent.

⚠ Safety Warning: Failure to carefully reattach the outboard and its control systems with factory-specified hardware can result in sudden, unexpected loss of boat control.

Oil injection – If the oil hose was disconnected for off-season storage, follow OIL INJECTION SYSTEM in Fuel and Oil Section to reinstall the hose, re-establish oil flow, and verify oil consumption.

With the propeller removed, check the gearcase for leakage. If leakage is evident, the gearcase seals should be replaced. See your DEALER.

Check the condition of anticorrosion anodes. Refer to ANTI-CORROSION ANODES.

Install the propeller unless you will run the engine on a garden hose for your preseason servicing. If so, wait to install the propeller until after you shut off the engine and disconnect the garden hose.

- Refer to PROPELLER for installing information.
- Refer to Operation Section, FLUSHING, for information on supplying water with a garden hose or running the engine in a water tank.

⚠ Safety Warning: Prevent injury from contact with rotating propeller – do not run the engine on a garden hose with the propeller installed.

Connect spark plug leads. Refer to SPARK PLUGS.

Top off the fuel tank with fresh fuel.

If you use a battery, make sure it is fully charged; then install it. Refer to BATTERY.

⚠ Safety Warning: Do not use a booster battery and jumper cables to start the engine. Fumes vented can lead to explosion and fire.

Refer to Warning Signals Section and review your engine's warning system self-test routine. During your preseason start-up, make sure the warning system self-tests properly. If it doesn't, see your DEALER.

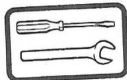
Follow ENGINE STARTING in the Starting Section and start the engine. Let it idle while you:

- Observe running quality – if poor, refer to TROUBLE CHECK CHART or see your DEALER.
- Observe water pump operation. Water must flow from the water pump indicator in a steady stream. If it doesn't, shut off the engine and investigate. Refer to Operation Section, ENGINE OVERHEATING.

Stop the engine and check the fuel system for leaks.

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

Important Decarbonize pistons and rings at least annually using OMC Engine Tuner. Refer to MAINTENANCE SCHEDULE. Allow tuner to soak for 8 to 16 hours. Run the engine at fast idle for at least 15 minutes to clear all tuner from the engine.



WARRANTY SERVICE

A copy of your engine's **Limited Warranty** is at the end of this manual. Read its terms and conditions carefully. Contact your DEALER if you have a question.

If repairs are necessary during the warranty period, they must be made by an **authorized Evinrude or Johnson** dealer to be considered for warranty reimbursement.

The warranty protects you from expense caused by defects in material or workmanship. **NOT covered is damage caused by such things as:**

- Incorrect engine installation, operation, application, or maintenance
- Cosmetic or paint changes due to exposure to the elements
- Cooling system blockage by foreign materials
- Water entry through the intake or exhaust system or from submersion
- Using parts or accessories that adversely affect operation, performance, or durability
- Alterations or modifications that affect operation, performance, durability, or intended use

Also not covered by warranty are extra expenses such as:

- Routine maintenance and care
- Transporting the product to and from the dealer
- In and out of water costs
- Boat rental while repairs are performed

Your insurance might cover some of these costs.

20-HOUR CHECK

After 20 hours of operation, your new engine will be "broken in" and its mechanical parts will have "seated." At that time all systems should be checked and any adjustments needed should be made.

Your DEALER will perform this 20-hour check at your request and expense (based on local rates), according to what your engine needs – refer to **MAINTENANCE SCHEDULE, 20-Hour Check** for a partial list.

Follow consistent preventive maintenance by having your DEALER check and service your engine once a year or after each 100 hours of operation, whichever comes first.

OWNER'S SERVICE RESPONSIBILITY

Routine maintenance and care of your outboard is your responsibility, but many procedures are best performed by your DEALER.

Following are examples of routine maintenance situations:

- Cleaning, replacing spark plugs, thermostats, fuel filters, etc., with specified replacement components
- Cleaning deposits off pistons, piston rings, exhaust systems, combustion chambers
- Repairing, replacing water pump components
- Replacing anti-corrosion anodes, propellers
- Checking, adding, replacing fluids
- Verifying warning system functions, if equipped

Following are examples of routine maintenance situations that, due to exhaust emission concerns and related civil penalties, should be done only by your DEALER:

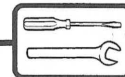
- Cleaning or adjusting components in ignition, fuel, and oil systems
- Replacing components for altitude requirements
- Repairing, replacing components such as pistons, rings, cylinders, valves due to wear

CUSTOMER SATISFACTION

Thank you for your confidence in **OMC** power products. Your satisfaction is very important to *Outboard Marine Corporation* and its dealers. Concerns about your **OMC** product can usually be satisfactorily addressed during your initial service appointment. If not, take these steps:

- 1) Talk with the dealership's service manager. Be specific about your concerns and expectations. Most problems will be resolved at this level.
- 2) If you are still not satisfied, contact the general manager or owner of the dealership.
- 3) If your dealership cannot resolve the problem, write to **OMC Technical Service Group** at 200 Sea Horse Drive, Waukegan, Illinois, 60085. When you write provide:
 - Model and serial numbers of your **OMC** product
 - A complete description of your concern
 - The name of your **OMC** dealership
 - Your daytime phone number

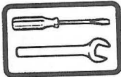
We will all work toward a satisfactory solution!



TROUBLE CHECK CHART

Note If you are unable to identify or solve the problem, contact your DEALER.

Symptom	Possible Cause
Starter motor will not operate	<ul style="list-style-type: none"> ● Shift handle not in NEUTRAL ● Battery and electrical connections loose or corroded ● Blown 20-amp fuse. Refer to FUSE.
Engine will not start	<ul style="list-style-type: none"> ● Starting procedure not followed. Refer to Starting Section. ● Fuel tank empty ● Fuel hose disconnected, kinked ● Fuel system contaminated with water or dirt ● Fuel pump filter obstructed ● COLD ENGINE: Engine not primed ● WARM ENGINE: Engine flooded. Raise fast idle lever and crank engine in 10-second periods. ● Spark plugs incorrect. Refer to SPECIFICATIONS. ● Spark plugs improperly gapped, carboned, burned, or wet ● Ignition system component failure
Engine will not idle properly	<ul style="list-style-type: none"> ● Motor angle excessive ● Carburetor mixture out of adjustment ● Spark plugs damaged or incorrect. Refer to SPECIFICATIONS. ● Fuel system contaminated with water or dirt ● Fuel/oil mixture incorrect ● Primer solenoid lever not at RUN position. Refer to Starting Section.
Engine loses power or will not accelerate	<ul style="list-style-type: none"> ● Spark plugs damaged or incorrect. Refer to SPECIFICATIONS. ● Fuel pump filter obstructed ● Fuel system contaminated with water or dirt ● Water intakes obstructed and cooling system not operating correctly. Refer to Operation Section, ENGINE OVERHEATING. ● <i>S.L.O.W.</i> system activated. See symptom below.
Engine vibrates excessively	<ul style="list-style-type: none"> ● Propeller shaft bent ● Propeller damaged or fouled and restricted ● Fuel system contaminated with water or dirt ● Carburetor mixture out of adjustment ● Engine mount(s) damaged ● Steering friction screw loose (if so equipped) ● <i>S.L.O.W.</i> system activated. See symptom below.
Engine runs, but makes little or no progress	<ul style="list-style-type: none"> ● Propeller hub loose, slipping ● Propeller shaft bent ● Propeller damaged or fouled and restricted
Warning system activates	<ul style="list-style-type: none"> ● Refer to Warning Signals Section
<i>S.L.O.W.</i> system activates	<ul style="list-style-type: none"> ● Refer to Warning Signals Section

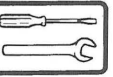


SYMBOLS

Symbols are used on parts of your outboard motor and in this manual to label and instruct. You must understand the meanings of these symbols to use your motor safely and correctly. After reading the following definitions, if you still have questions, ask your DEALER.

WARNING SYMBOLS	
	<ul style="list-style-type: none"> • Risk of serious injury • Be careful • Follow instructions
	<ul style="list-style-type: none"> • Shift motor to NEUTRAL before starting it • Follow instructions, or risk serious injury
	Emergency stop switch
	POISONOUS
	Fire hazard
	Pressurized
	Electricity of 50 volts or less, Source of alternating current

GAUGE SYMBOLS	
	Water temperature
	Water pressure
	Low oil
	No oil
	Oil pressure
	Crankcase oil
	Check engine - fuel restriction
	Fuel level
	Full, half-full, empty
	Tachometer
	Power trim/tilt
	Voltmeter/Battery
	<ul style="list-style-type: none"> • Voltmeter • Ammeter
	Hour meter



POSITION SYMBOLS	
Fuel primer	ON OFF
Primer	RUN ENRICH PRIME
Throttle	START Regulate
Shift	FORWARD NEUTRAL REVERSE
	TILT RUN
Power trim and tilt	RAISE LOWER

FUNCTION SYMBOLS	
	Emergency stop switch
	<ul style="list-style-type: none"> • Stop switch • STOP position of throttle
	Engine starter
	Choke
	Fuel shut off
	Fuse
	Latch

INSTRUCTION SYMBOLS	
	Read Operation & Maintenance Manual before operating
	<ul style="list-style-type: none"> • Use gasoline • Gasoline is present
	<ul style="list-style-type: none"> • Use kerosene • Kerosene is present
	Fuel/Oil ratio 50:1 (mix 50 parts gasoline with 1 part 2-cycle oil)