

# ***Johnson***®

**2004**

## ***Operator's Guide***

**90 THRU 175 HORSEPOWER**

PL, PX, CX, GL



# Our First Words to the Owner/Operator

This Operator's Guide is an essential part of your *Johnson* outboard. It contains pertinent information which, if followed, will provide you with a thorough understanding needed for proper operation, maintenance, care and above all safety!

The safety section of this Guide comes first because it is our first priority and it should be yours too. It is strongly recommended that you read this Guide from front cover to rear cover. Following this recommendation will assure the completeness of the information that is essential to your safety, the safety of any passengers and other boaters. An Operator's Readiness Test has been prepared on the last page of this Guide.

Be safe! All passengers should be familiar with the proper operation of your boat and *Johnson* outboard. Be certain they fully understand and respect the controls and operation. Each operator is responsible for the safety of all passengers and other boaters. Please make safety your first priority and complete a boating safety course through your local Coast Guard, Power Squadron, Red Cross or State Boating Law Agency.

The pleasures of owning and operating a *Johnson* outboard can be significant. We strongly believe the rewards for following our recommendations will be worthwhile. Remember that YOU are the key to safety. Good safety practices not only protect you but also protect the people around you.

Having fun is what it's all about and, with your cooperation, the pertinent information in this Guide can ensure a safe and enjoyable experience.

Enjoy the great outdoors on the water...



## WARNING



**Be careful! Human error is caused by many factors: carelessness, fatigue, overload, preoccupation, unfamiliarity of operator with the product, drugs and alcohol to name a few. Damage to your boat and outboard can be fixed in a short period of time, but injury or death, has a lasting effect.**

**For your safety and the safety of others, read this Guide from cover to cover and follow all safety warnings and recommendations. Do not disregard any of the safety precautions and instructions.**

**Anyone operating your boat should first read and understand this Guide before they operate your boat and motor.**

The following trademarks are the property of Bombardier Motor Corporation of America or its affiliates:

*2+4® fuel conditioner*

*CarbX™*

*Evinrude®*

*Evinrude®/Johnson® anti-corrosion spray*

*Evinrude®/Johnson® Genuine Parts*

*Evinrude®/Johnson® XD25™ formula*

*Hi-Vis® gearcase lubricant*

*Johnson®*

*QuikStart™*

*Renegade® bass*

*S.L.O.W.™*

*SST®*

*System Check®*

*Touch-Trim™*

*Triple-Guard® grease*

*Twist-Grip™*

*Ultra-HPF™ gearcase lubricant*

*Viper™*

# Contents

<b>GENERAL INFORMATION</b> .....	<b>2</b>
SAFETY — THE RIGHT PLACE TO GET STARTED .....	2
PRODUCT REFERENCES, ILLUSTRATIONS AND SPECIFICATIONS .....	4
<b>BOMBARDIER LIMITED WARRANTY FOR JOHNSON 2-STROKE OUTBOARD</b> ENGINES SOLD IN THE UNITED STATES AND CANADA .....	5
<b>BOMBARDIER LIMITED WARRANTY FOR JOHNSON 2-STROKE OUTBOARD</b> ENGINES SOLD OUTSIDE THE UNITED STATES AND CANADA .....	8
<b>FEATURES</b> .....	10
ENGINE SPECIFICATIONS .....	12
REMOTE CONTROL .....	14
<b>ENGINE MONITORING</b> .....	<b>16</b>
<b>FUEL AND OIL</b> .....	<b>17</b>
FUEL .....	17
OIL .....	17
ADDITIVES .....	18
FUEL/OIL RATIO .....	18
MIXING FUEL AND OIL .....	18
FUEL SYSTEM .....	19
OIL SYSTEM .....	19
BREAK-IN (10 HOURS) .....	21
<b>ENGINE STARTING</b> .....	<b>22</b>
BEFORE START-UP .....	22
ENGINE STOPPING .....	24
SHIFTING AND SPEED CONTROL .....	24
FUEL ECONOMY .....	25
<b>OPERATION</b> .....	<b>26</b>
POWER TRIM AND TILT .....	26
PROPELLER SELECTION .....	29
MOORING .....	29
FLUSHING .....	30
ENGINE OVERHEATING .....	31
TRAILERING .....	32
IMPACT DAMAGE .....	33
STORING .....	33
SPECIAL OPERATING CONDITIONS .....	34
<b>MAINTENANCE</b> .....	<b>35</b>
10-HOUR INSPECTION .....	35
OFF-SEASON STORAGE .....	35
PRE-SEASON SERVICE .....	37
BATTERY .....	38
ADJUSTMENTS .....	39
LUBRICATION .....	40
WATER PRESSURE .....	42
FUEL LINE FILTER .....	42
FUSES .....	42
SPARK PLUGS .....	43
PROPELLER .....	43
ANTICORROSION ANODES .....	44
TROUBLE CHECK CHART .....	45
ENGINE MAINTENANCE AND INSPECTION SCHEDULE .....	46

# GENERAL INFORMATION

## SAFETY — THE RIGHT PLACE TO GET STARTED

This Operator's Guide contains essential information to help prevent personal injury and damage to equipment. It will acquaint the operator and passengers with the *Evinrude/Johnson* outboard and its controls, operation, maintenance and boating safety measures. Make sure all operators read, understand and follow the contents. This Guide should be kept in a waterproof bag with the product at all times during operation. If the product ownership is transferred, this Guide should be forwarded to the subsequent owners.

This Operator's Guide uses the following signal words identifying important safety messages. These safety alert signal words mean:

**ATTENTION!**  
**BECOME ALERT!**  
**YOUR SAFETY IS INVOLVED!**

	<b>DANGER</b>	
<b>Indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.</b>		

	<b>WARNING</b>	
<b>Indicates a potentially hazardous situation which, if not avoided, CAN result in severe injury or death.</b>		

	<b>CAUTION</b>	
<b>Indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate personal injury or property damage. It also may be used to alert against unsafe practices.</b>		

**IMPORTANT:** Identifies information that will help prevent damage to machinery and appears next to information that controls correct assembly and operation of the product.

Although the mere reading of such information does not eliminate the hazard, the understanding and application of the information will promote the correct use of your outboard engine.

A responsible, educated boater will fully appreciate the pleasures of boating and will be a safe boater. Boating Safety Classes are conducted by the U.S. Coast Guard Auxiliary, the U.S. Power Squadron and some Red Cross Chapters. For information about classes, call toll free 1-800-336-BOAT. For additional information about boating safety and regulations call: U.S. Coast Guard Boating Safety Hotline 1-800-368-5647. Outside North America please contact your DEALER or distributor for details about boating safety.

## SAFETY MEASURES — General

 To fully appreciate the pleasures, enjoyment and excitement of boating there are some basic rules that should be observed and followed by any boater. Some rules may be new to you and others may be common sense or obvious... irrespective, take them seriously! Failure to follow this safety information and safe boating rules could result in injury to you, your passengers or other water users.

 Become completely familiar with the control and operation of your boat and motor before embarking on your first trip or taking on a passenger(s). If you have not had the opportunity to do so with your DEALER, practice driving in a suitable area and feel the response of each control. Be familiar with all controls before applying the throttle above idle speed. As the operator, you are in control and responsible for safe operation.

## SAFETY MEASURES — Operation

 Be sure at least one of your passengers knows how to handle your boat in case of an emergency.

 All passengers should know the location of emergency equipment and how to use it.

 All safety equipment and personal flotation devices must be in good condition and suitable for your type of boat. Always comply with the regulations that apply to your boat.

 Contact with rotating propeller is likely to result in serious injury or death. Do not allow anyone near a propeller, even when the engine is off. Propeller blades can be sharp and can continue to turn even after the engine is shut off. Always shut off the engine when boat is near people in the water.

⚠ Whenever running the engine, assure there is proper ventilation to avoid the accumulation of carbon monoxide (CO), which is odorless, colorless, and tasteless, and can lead to unconsciousness, brain damage, or death if inhaled in sufficient concentrations. CO accumulation can occur while docked, anchored, or underway, and in many confined areas such as the boat cabin, cockpit, swim platform, and heads. It can be worsened or caused by weather, mooring and operating conditions, and other boats. Avoid exhaust fumes from your engine or other boats, provide proper ventilation, shut off your engine when not needed, and be aware of the risk of backdrafting and conditions that create CO accumulation. In high concentrations, CO can be fatal within minutes. Lower concentrations are just as lethal over long periods of time.

⚠ Proceed with caution and at very low speed in shallow water. Grounding or abrupt stops may result in personal injury or property damage. Also be alert for debris and objects in the water.

⚠ Be familiar with the waters you are operating in. The gearcase of this outboard extends below the water surface and could potentially come in contact with underwater obstructions. Contact with underwater obstructions may result in loss of control and personal injury.

⚠ Avoid standing up or shifting weight suddenly in light weight boats.

⚠ Keep your passengers seated in seats. The boat's bow, gunwale, transom and seat backs are not intended for use as seats.

⚠ Insist on the use of personal flotation devices, approved by the U.S. Coast Guard, by all passengers when boating conditions are hazardous, and by children and nonswimmers at all times.

⚠ Respect no wake zones, rights of other water users and the environment. As the "skipper" and owner of a boat you are responsible for damage to other boats caused by the wake of your boat. Allow no one to throw refuse overboard.

⚠ Know the marine traffic laws and obey them.

⚠ Remember, gasoline fumes are flammable and explosive. Always adhere to the fueling procedure contained in this Operator's Guide and those given to you by the fueling station. Always verify fuel level before use and during the ride. Apply the principle of 1/3 fuel to destination, 1/3 back and 1/3 reserve fuel supply. Do not carry spare fuel or flammable liquids in any storage or engine compartments.

⚠ Do not operate your boat if you are under the influence of drugs or alcohol.

⚠ High performance boats have a high power-to-weight ratio. If you are not experienced in the operation of a high performance boat, do not attempt to operate one at, or near, its top speed until you have gained that experience.

⚠ For more information, see your *Evinrude/Johnson* DEALER for a copy of **Introduction to High Performance Boating**, P/N 335763.

## **SAFETY MEASURES — Installation and Maintenance**

### **Outboard Installation**

⚠ The outboard must be correctly installed. Failure to correctly install the outboard could result in serious injury, death or property damage. We strongly recommend that your DEALER install your outboard to ensure proper installation.

⚠ Do not overpower your boat by using an engine that exceeds the horsepower indicated on the boat's capacity plate. Overpowering could result in loss of control. If your boat has no capacity plate, contact your DEALER or the boat's manufacturer.

### **Maintenance**

⚠ When replacement parts are required, use *Evinrude/Johnson* Genuine Parts or parts with equivalent characteristics, including type, strength and material. Using substandard parts could result in injury or product malfunction.

⚠ Only perform service procedures which are detailed in this Operator's Guide. Attempting to perform maintenance or repair on your outboard if you are not familiar with the correct service and safety procedure could cause personal injury or death. Further information can be obtained from your authorized *Evinrude/Johnson* DEALER. In many instances proper tools and training are required for certain service or repair procedures.

⚠ Maintain your boat and engine in top condition at all times. Adhere to the **Engine Maintenance and Inspection Schedule**.

⚠ Operate your boat and outboard prudently and have fun. Do not forget that all persons must assist other boaters in case of emergency.

⚠ Prevent injury from contact with rotating propeller; remove propeller before flushing or before performing any maintenance.

## PRODUCT REFERENCES, ILLUSTRATIONS AND SPECIFICATIONS



### WARNING



When replacement parts are required, use *Evinrude/Johnson Genuine Parts* or parts with equivalent characteristics, including type, strength and material. Using substandard parts could result in injury or product malfunction.

*Bombardier Motor Corporation of America* reserves the right to make changes at any time, without notice, to features, specifications and model availability. The right is also reserved to change any specification or part at any time without incurring any obligation to update older models. The information in the Guide is based on the latest specifications available at the time of publication.

Photographs and illustrations used in this Guide might not depict actual models or equipment but are intended as representative views for reference only. The continuing accuracy of this Guide cannot be guaranteed.

Certain features of systems discussed in this Guide might not be found on all models in all marketing areas.

#### Owner's Identification

**North America** — At the time of purchase, your DEALER will complete your outboard registration forms. Your portion provides proof of ownership and date of purchase.

**Outside North America** — See your DEALER or distributor for details.

#### Model and Serial Numbers

The model and serial numbers appear on a plate attached to the stern bracket or swivel bracket. Record your outboard's:

Model Number \_\_\_\_\_

Serial Number \_\_\_\_\_

Purchase Date \_\_\_\_\_

Ignition Key Number \_\_\_\_\_

#### Stolen Outboards

**North America** — Report your outboard as stolen to Customer and Dealer Support Services, 250 Sea Horse Drive, Waukegan, IL 60085 U.S.A. Give the outboard's model and serial numbers and enclose a copy of the police report.

**Outside North America** — Report the theft to the *Bombardier* distributor where the outboard was registered.

#### Technical Literature

*Bombardier Motor Corporation of America* offers technical literature specifically for your outboard. A service manual, a parts catalog, or an extra Operator's Guide can be purchased from your selling DEALER. For the name and location of the nearest *Evinrude/Johnson* DEALER in the United States and Canada log on to [www.evinrude.com](http://www.evinrude.com) or [www.johnson.com](http://www.johnson.com).

#### Declaration of Conformity

*Bombardier Motor Corporation of America* declares that the outboard to which this Operator's Manual applies conforms to the essential requirements outlined in **CE Machinery Directive 98-37-EC**, as amended.

George Broughton  
Director of Outboards

# BOMBARDIER LIMITED WARRANTY FOR *JOHNSON* 2-STROKE OUTBOARD ENGINES SOLD IN THE UNITED STATES AND CANADA

## 1. SCOPE OF THE LIMITED WARRANTY

Bombardier Motor Corporation of America\* ("Bombardier") warrants its *Johnson*® 2-stroke outboard engines sold by authorized *Johnson* dealers in the fifty United States and Canada ("Product") from defects in material or workmanship for the period and under the conditions described below.

## 2. WARRANTY COVERAGE PERIOD

This limited warranty will be in effect from the date of purchase by the first retail consumer or the date the Product is first put to use, whichever occurs first, for a period of:

TWENTY-FOUR (24) CONSECUTIVE MONTHS for private, recreational use; or

TWELVE (12) CONSECUTIVE MONTHS for commercial use. The Product is used commercially when it is used in connection with any work or employment that generates income, during any part of the warranty period. The Product is also used commercially when, at any point during the warranty period, it is installed on a boat that has commercial tags or is licensed for commercial use.

The repair or replacement of parts or the performance of service to Product under this warranty does not extend the life of this limited warranty beyond its original expiration date. All *Evinrude*®/*Johnson Genuine Parts* and accessories installed by an authorized dealer at the time of sale, including but not limited to propellers, bear the standard Bombardier parts and accessories one-year limited warranty.

## 3. CONDITIONS TO HAVE WARRANTY COVERAGE

This warranty coverage is available only on *Johnson* 2-stroke outboard engines purchased as new and unused from a dealer authorized to distribute *Johnson* products in the country in which the sale occurred ("Dealer"), and then only after the Bombardier specified pre-delivery inspection process has been completed and documented by the purchaser and Dealer. Warranty coverage only becomes available upon proper registration of Product by Dealer or owner.

Only the original purchaser and any subsequent owners who reside in the United States and Canada and have purchased Product from a U.S. or Canadian Dealer are eligible for warranty registration and warranty coverage hereunder. Such limitations are necessary in order to allow Bombardier to protect the safety of its products, its consumers, and the general public.

As outlined in the Operator's Guide, timely routine required maintenance must be performed to maintain warranty coverage. Bombardier may require proof of proper maintenance prior to authorizing warranty coverage.

## 4. WHAT TO DO TO OBTAIN WARRANTY COVERAGE

The registered owner must notify an authorized Dealer within two (2) days of the appearance of a defect. Owner must bring Product, including any defective part therein, to Dealer promptly after the appearance of the defect, and in any event, within the warranty period, and must provide Dealer with reasonable opportunity to repair the defect. The expenses of transporting Product to and from Dealer for warranty service are to be borne by the owner.

If the Product has not previously been registered, the owner may also be required to present proof of purchase to Dealer for warranty repairs. Owner is required to sign the repair/work order prior to the start of the repair in order to validate the warranty repair.

All parts replaced under this warranty become the property of Bombardier.

## 5. WHAT BOMBARDIER WILL DO

Bombardier's obligations under this warranty are limited to, at its sole discretion, repairing or replacing parts of Product found to be defective in material or workmanship, in the reasonable judgment of Bombardier. Such repair or replacement of parts will be done without charge for parts and labor, at any authorized Dealer. Bombardier's responsibility is limited to making the required repairs or replacements of parts with new or Bombardier-certified re-manufactured parts. No claim of breach of warranty shall be cause for cancellation or rescission of the sale of Product to owner.

In the event that warranty service is required outside of the fifty United States or Canada, owner will bear responsibility for any additional charges due to local practices and conditions, such as, but not limited to, freight, insurance, taxes, license fees, import duties, and any and all other financial charges, including those levied by governments, states, territories and their respective agencies.

Bombardier reserves the right to improve, modify or change Products from time to time without assuming any obligation to modify Products previously manufactured.

## 6. EXCLUSIONS – *The following are not warranted under any circumstances:*

- Replacement of parts due to normal wear and tear;
- Routine maintenance parts and services including but not limited to: maintenance requirements, engine and lower unit oil changes, lubrication, valve and linkage adjustments and replacement of fuses, zinc anodes, thermostats, timing belts, starter motor bushings, trim motor brushes, filters, propellers, propeller bushings and spark plugs;
- Damage caused by improper or lack of installation, maintenance, winterization and/or storage, failure to follow the procedures and recommendations in the Operator's Guide;
- Damage resulting from removal of parts, improper repairs, service, maintenance, or modification, or use of parts or accessories not manufactured or approved by Bombardier, which in its reasonable judgment, are either incompatible with Product or adversely affect its operation, performance, or durability, or resulting from repairs done by a person that is not an authorized Dealer;
- Damage caused by abuse, misuse, abnormal use, neglect, racing, improper operation or operation of the Product in a manner inconsistent with the recommended operation described in the Operator's Guide;
- Damage resulting from external damage, accident, submersion, water ingestion, fire, theft, vandalism or any act of God;
- Operation without proper fuel, oil or lubrication, or with fuels, oils or lubricants which are not suitable for use with the Product (see the Operator's Guide);
- Damage resulting from rust or corrosion;
- Damage caused from cooling system blockage by foreign material;
- Damage resulting from sand or debris in the water pump;
- Cosmetic or paint changes due to exposure to the elements.

This warranty **will be voided in its entirety and rendered null and void** where:

- Product has been altered or modified in such a way so as to adversely affect its operation, performance or durability, or change its intended use, horsepower or emission levels; or
- Product is or has been used for racing at any point, even by a prior owner.

## **7. LIMITATIONS OF LIABILITY**

**ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED IN DURATION TO THE LIFE OF THE EXPRESS LIMITED WARRANTY.**

**ALL INCIDENTAL, CONSEQUENTIAL, DIRECT, INDIRECT OR OTHER DAMAGES OF ANY KIND ARE EXCLUDED FROM COVERAGE UNDER THIS WARRANTY INCLUDING, BUT NOT LIMITED TO:** expense for gasoline, expense for transporting Product to and from Dealer, removal of Product from a boat and reinstallation, mechanic's travel time, in-and-out of water charges, slip or dock fees, trailering or towing, storage, telephone, cell phone, fax or telegram charges, rental of a like or replacement Product or boat during warranty services or down time, taxi, travel, lodging, loss of or damage to personal property, inconvenience, cost of insurance coverage, loan payments, loss of time, loss of income, revenue or profits, or loss of enjoyment or use of Product.

**SOME STATES, PROVINCES, OR JURISDICTIONS DO NOT ALLOW FOR THE DISCLAIMERS, LIMITATIONS OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, OR OTHER EXCLUSIONS IDENTIFIED ABOVE. AS A RESULT, THEY MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC RIGHTS, AND YOU MAY ALSO HAVE OTHER LEGAL RIGHTS WHICH MAY VARY FROM STATE TO STATE, OR PROVINCE TO PROVINCE.**

No distributor, Dealer or any other person is authorized to make any affirmation, representation or warranty regarding Product other than those contained in this limited warranty and, if made, shall not be enforceable against Bombardier. Bombardier reserves the right to modify this warranty at any time, being understood that such modification will not alter the warranty conditions applicable to the Products sold while this warranty is in effect.

## **8. TRANSFER**

If the ownership of Product is transferred during the warranty coverage period, this warranty shall also be transferred and be valid for the remaining coverage period provided that the former or new owner promptly contacts Bombardier or Dealer and gives the name and address of the new owner.

## **9. CONSUMER ASSISTANCE**

- In the event of a controversy or dispute in connection with this Bombardier limited warranty, Bombardier recommends that you first try to resolve the issue at the dealership level by discussing the issue with Dealer's service manager or owner;
- If further assistance is required, please contact the Bombardier Customer Support Services, 250 Sea Horse Drive, Waukegan, IL 60085, 1-847-689-7090.

Revision April 2003

\* Engines sold in Canada are distributed and serviced by Bombardier Inc.

## **BOMBARDIER LIMITED WARRANTY FOR *JOHNSON* 2-STROKE OUTBOARD ENGINES SOLD OUTSIDE THE UNITED STATES AND CANADA**

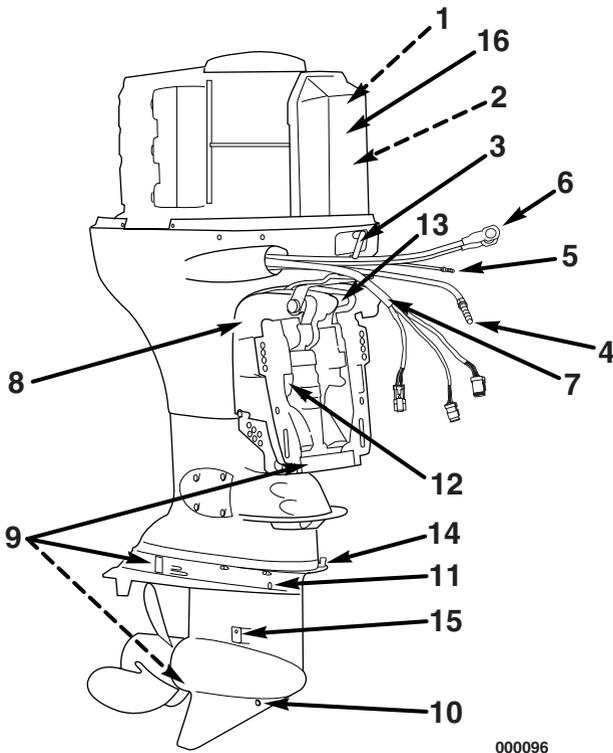
For a copy of the Limited Warranty, see your Bombardier distributor/dealer authorized to distribute *Johnson* 2-stroke products in the country in which the sale occurs.

If further assistance is required, please contact Bombardier Customer Support Services, 250 Sea Horse Drive, Waukegan, Illinois, 60085, or the affiliate of Bombardier where the Product was registered for warranty.

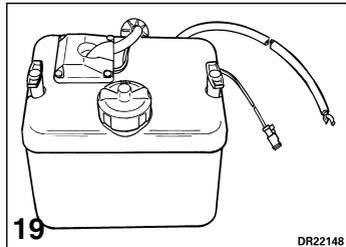
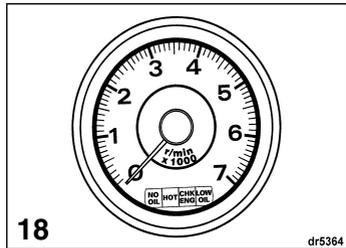
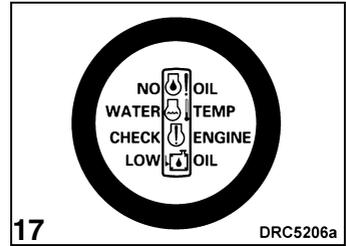
**BOMBARDIER**  
*RECREATIONAL PRODUCTS*



# FEATURES

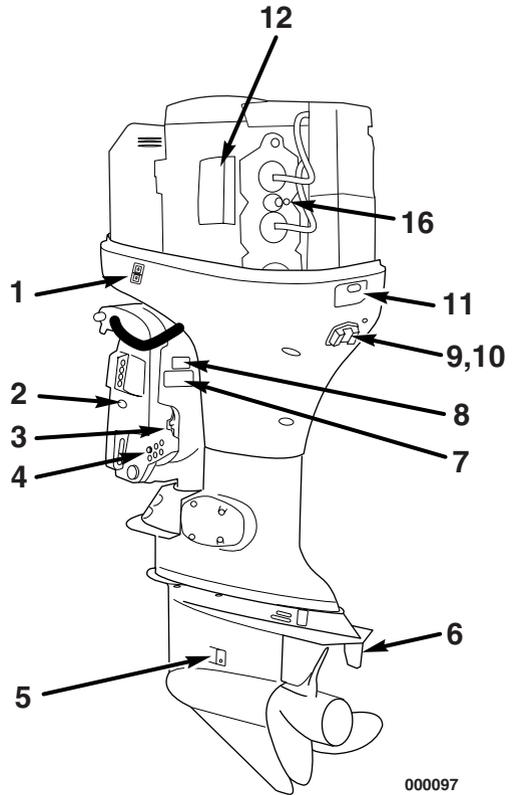
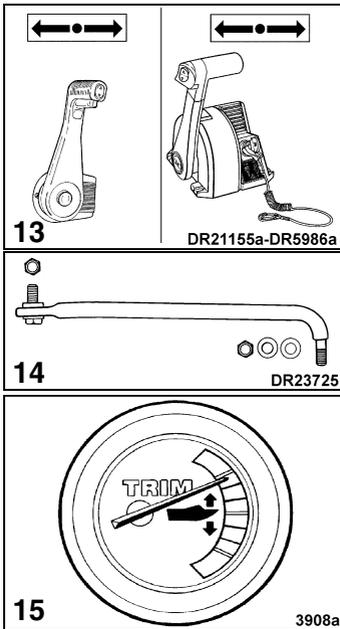


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Item	Description	Item	Description
1	Maintenance Valve	11	Lubricant Level Plug
2	Fuel Filter	12	Power Trim & Tilt Reservoir
3	Engine Cover Latch	13	Tilt Limiter Cam
4	Fuel Fitting	14	Speedometer Pick-up Connector
5	Oil Supply Fitting	15	Water Intake
6	Battery Cable	16	Air Silencer
7	Engine Wire Harness	17	System Check Gauge <sup>(1)</sup>
8	Tilt Support	18	System Check Tachometer <sup>(1)</sup>
9	Anti-Corrosion Anodes	19	Oil Tank Kit <sup>(1)</sup>
10	Lubricant Drain/Fill Plug		

(1) not supplied with outboard



Item	Description	Item	Description
1	Trailing Tilt Switch	9	Flushing Port
2	Power Trim & Tilt: Manual Release	10	Water Pump Indicator
3	Trailing Bracket	11	Motor Cover Latch
4	Trim Limiter Rod	12	Fuse/Spare Fuse Holder
5	Water Intake	13	Remote Control <sup>(1)</sup>
6	Trim Tab	14	Steering Connector Kit
7	ECI Label	15	Trim Gauge <sup>(1)</sup>
8	Model & Serial Number Plate	16	Water Pressure Tap

(1) not supplied with outboard

## ENGINE SPECIFICATIONS

<b>90, 115 Models</b>	
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 <sup>(1)</sup>	<b>90</b> – 90 HP (67.2 kw) @ 5000 RPM <b>115</b> – 115 HP (85.8 kw) @ 5000 RPM
Idle RPM in Gear <sup>(2)</sup>	650 ± 50
Ignition Timing –Idle <sup>(2)</sup> W.O.T.	4° ± 1° 20° ± 1°
Emission Control System: per SAE J1930 <sup>(2)</sup>	EM (Engine Modification)
Fuel Requirements <sup>(2)</sup>	87 Pump Posted AKI (90 RON) – Refer to <b>Fuel and Oil</b>
Oil	Supplied by oil injection system
Warning Signals	Engine Overheat, Low Oil, No Oil
Ignition Features	<i>QuikStart™</i> and <i>S.L.O.W.™</i>
Battery, Minimum	360 CCA (465 MCA) OR 50 ampere-hour, 12 volt
Spark Plug <sup>(2)(3)</sup> Torque	Refer to ECI Label 18 to 21 ft. lbs. (24 to 28 N-m)
Fuses	P/N 514021
Fuel Filter	P/N 433190
Alternator	20-Amp, Fully Regulated
Gearcase – Lubricant Capacity	<i>Evinrude/Johnson Ultra-HPF™</i> gearcase lubricant <b>PL, VL Models</b> – 26 fl. oz. (770 ml) <b>PX Models</b> – 44 fl. oz. (1300 ml)
Pwr. Trim/Tilt – Fluid Capacity	21 fl. oz. (622 ml)
Propeller <sup>(4)</sup>	Refer to <b>Propeller Selection</b>
Fuel Tank <sup>(4)</sup>	Capacity – 6 U.S. gallons (22.7 liters)
Weight <sup>(5)</sup>	<b>L Models</b> – 335 lbs. (152 kg) <b>X Models</b> – 352 lbs. (160 kg)
Sound at Driver's Ear (LpA) ICOMIA 39.94	80.8 dB(A)
Transom Height	<b>L Models</b> – 19 1/2 to 20 in. (495 to 508 mm) <b>X Models</b> – 24 1/2 to 25 in. (622 to 635 mm)

<b>150, 175 Models</b>	
Displacement	158 cu. in. (2589 cc)
Engine Type	Two-Cycle, 60° V, 6 Cylinder Loop-Charged
Full Throttle Operating Range	4500 to 5500 RPM
Power <sup>(1)</sup>	<b>150</b> – 150 HP (112 kw) @ 5000 RPM <b>175</b> – 175 HP (131 kw) @ 5000 RPM
Idle RPM in Gear <sup>(2)</sup>	650 ± 50
Ignition Timing –Idle <sup>(2)</sup> W.O.T.	6° ± 2° 20° ± 1°
Emission Control System: per SAE J1930 <sup>(2)</sup>	EM (Engine Modification)
Fuel Requirements <sup>(2)</sup>	87 Pump Posted AKI (90 RON) – Refer to <b>Fuel and Oil</b>
Oil	Supplied by oil injection system
Warning Signals	Engine Overheat, Low Oil, No Oil, Fuel Restriction
Ignition Features	<i>QuikStart™</i> and <i>S.L.O.W.™</i>
Battery, Minimum	500 CCA (620 MCA) <b>OR</b> 60 amp-hour, 12 volt
Spark Plug <sup>(2)(3)</sup> Torque	Refer to ECI Labels 18 to 21 ft. lbs. (24 to 28 N-m)
Fuses	P/N 514021
Fuel Filter	P/N 433190
Alternator	35-Amp, Fully Regulated
Gearcase – Lubricant Capacity	<i>Evinrude/Johnson Ultra-HPF™</i> gearcase lubricant 44 fl. oz. (1300 ml) Standard Rotation
Pwr. Trim/Tilt – Fluid Capacity	21 fl. oz. (622 ml)
Propeller <sup>(4)</sup>	Refer to <b>Propeller Selection</b>
Fuel Tank <sup>(4)</sup>	Capacity – 6 U.S. gallons (22.7 liters)
Weight <sup>(5)</sup>	<b>L Models</b> – 387 lbs. (176 kg) <b>X Models</b> – 407 lbs. (185 kg)
Sound at Driver's Ear (LpA) ICOMIA 39.94	78.2 dB(A)
Transom Height	<b>L Models</b> – 19 1/2 to 20 in. (495 to 508 mm) <b>X Models</b> – 24 1/2 to 25 in. (622 to 635 mm)

- (1) Rated following the standards of ICOMIA 28.83, ISO 3046, and NMMA.
- (2) Emission Control Information.
- (3) Any other spark plug will cause ignition problems.
- (4) Not supplied in all marketing areas.
- (5) Does not include propeller or fuel.

## REMOTE CONTROL



### WARNING

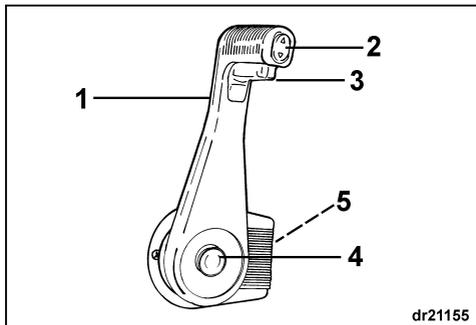


If you choose a non-Evinrude/Johnson remote control, be sure it has a start-in-gear prevention feature. This feature can prevent injuries resulting from unexpected boat movement when the engine starts.

**IMPORTANT:** When selecting the remote control system for your boat, specify *Evinrude/Johnson* components. *Evinrude/Johnson* offers remote controls, cables and wiring kits designed specifically for your *Evinrude/Johnson* outboards. *Evinrude/Johnson* controls deliver the cable stroke your outboard needs for positive shift and throttle control, and they incorporate such safety and convenience features as:

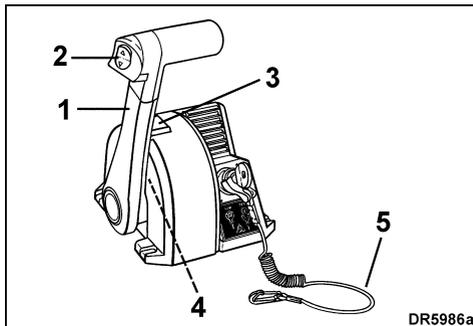
Start-in-gear prevention

Plug-in compatibility with *Evinrude/Johnson* modular wiring system



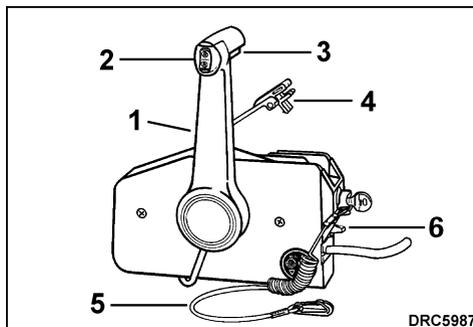
*Evinrude/Johnson* Concealed side mount control

1. Handle - shift and throttle
2. Trim/tilt switch (where equipped)
3. Neutral lock tab
4. Fast idle button
5. Throttle Friction Control



*Evinrude/Johnson* Binnacle mount control

1. Handle - shift and throttle
2. Trim/tilt switch (where equipped)
3. Fast idle button
4. Throttle Friction Control
5. Emergency stop clip and lanyard



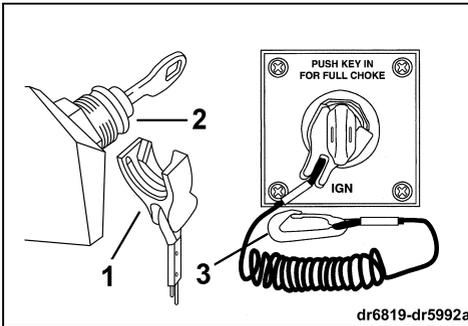
*Evinrude/Johnson* Side mount control

1. Handle - shift and throttle
2. Trim/tilt switch (where equipped)
3. Neutral lock tab
4. Fast idle lever
5. Emergency stop clip and lanyard
6. Throttle Friction Control

## Emergency Stop/Key Switch

A combination emergency stop switch and key switch is a feature of *Evinrude/Johnson* prewired remote controls and all *Evinrude/Johnson* control wiring kits. Use of the emergency stop feature is highly recommended on all boats.

Connect the clip to the emergency stop/key switch. 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.



1. Clip
2. Emergency stop / key switch
3. Lanyard



## 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.**

**Your emergency stop switch can be effective only when in good working condition. At each outing, inspect clip and lanyard for cuts, breaks, or wear. Replace worn or damaged parts.**

**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.**

# ENGINE MONITORING

**IMPORTANT:** Your outboard must be equipped with the *System Check*® (or equivalent) engine monitor. Operating your outboard without the *System Check* (or equivalent) engine monitor will void your warranty for failures related to the functions monitored on your engine.

When you turn the key switch ON, the *System Check* engine monitor horn performs a self-test by sounding a 1/2-second beep. The gauge self-tests by turning the warning lights on, then off in sequence. During engine start-up, pause with the key switch in the ON position to observe the horn and gauge perform the self-test. If the self-test does not happen as stated, see your DEALER.

The *System Check* engine monitor alerts the operator 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 key switch is turned OFF.**

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 to the oil tank; and
- Add oil to the fuel tank at the correct ratio until the oil system can be purged of air.

**IMPORTANT:** Serious engine damage will occur if you operate the engine after the oil supply is exhausted. Never run the oil tank dry. If the tank is run dry, you must purge the oil system of air. Refer to **Oil System**.

If the oil tank is **not empty**, add oil to the fuel tank at the correct ratio. Refer to **Fuel and Oil**.

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 verify oil supply before returning your outboard to normal operation.

**"WATER TEMP" or HOT**

The engine is overheating. Serious engine damage can occur quickly.

If the engine is overheating, it will also limit engine speed to 2500 RPM. This additional protection feature is referred to as *S.L.O.W.*™ If the engine was running faster than 2500 RPM when the *S.L.O.W.* system activated, it will shake noticeably.

**IMPORTANT:** Refer immediately to **Engine Overheating**

**150 and 175 Models**

**"CHECK ENGINE" or "CHK ENG"**

Fuel supply is being restricted. Reduce speed to idle. If the warning light goes off as speed is reduced, operate at the reduced speed until you can:

Inspect all fuel system parts for kinks or blockage. Clean or replace the fuel filter(s). Refer to **Fuel Line Filter**.

**IMPORTANT:** If the warning light glows even at idle, shut OFF the outboard and perform the tasks listed above. If you cannot restore fuel flow, do not run the outboard – see your DEALER.

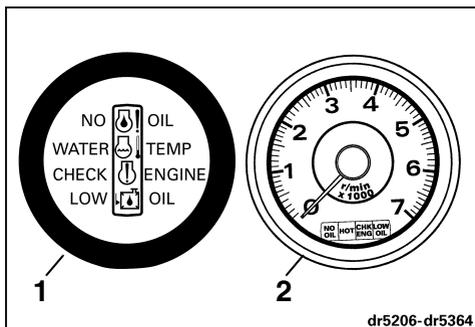
**"LOW OIL"**

Oil in the oil tank is at "reserve" level (about 1/4 full). Fill the oil tank with recommended oil as soon as possible to avoid emptying the tank. Refer to **Filling the Oil Tank**.

**CAUTION**

In the *S.L.O.W.* mode, the engine speed is limited. Under certain conditions, the engine's limited speed may reduce maneuverability of your boat.

If the *S.L.O.W.* mode is activated and you are unable to correct the problem, seek assistance and/or return to safe harbor. Serious engine damage, engine shutdown, and/or reduced maneuverability may be imminent.



dr5206-dr5364

1. *System Check* Gauge
2. *System Check* Gauge with Tachometer

**"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.

# FUEL AND OIL

## FUEL



### WARNING



Gasoline is extremely flammable and highly explosive under certain conditions. Follow the instructions in this section explicitly. Improper handling of fuel could result in property damage, serious injury, or death.

Always turn off the engine before fueling.

Never permit anyone other than an adult to refill the fuel tank.

Do not fill the fuel tank all the way to the top, or fuel may overflow when it expands due to heating by the sun.

Remove portable fuel tanks from the boat before fueling.

Always wipe off any fuel spillage.

Do not smoke, or allow open flames or sparks, or use electrical devices such as cellular phones in the vicinity of a fuel leak or while fueling.

Always work in a well ventilated area.

Your outboard is certified to operate on unleaded 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; or

5% methanol with 5% cosolvents by volume

## Minimum Octane

Inside the U.S.

87 (R+M)/2 AKI

Outside the U.S.

90 RON

Your outboard has been designed to operate using the above fuels; however, be aware of the following:

The boat's fuel system may have different requirements regarding the use of alcohol fuels. Refer to the boat's owner Guide.

Alcohol attracts and holds moisture that can cause corrosion of metallic parts in the fuel system.

Alcohol blended fuel can cause engine performance problems.

**IMPORTANT:** Always use fresh gasoline. Gasoline will oxidize and weather; the result is loss of octane, volatile compounds, and the production of gum and varnish deposits which can damage the outboard.



### WARNING



Leaking fuel is a fire and explosion hazard. All parts in the fuel system should be inspected frequently and replaced if signs of deterioration or leakage are found. Inspect the fuel system each time you refuel, each time you remove the engine cover, and annually.

## OIL

**Evinrude/Johnson XD25 formula outboard oil is recommended for your outboard.** It contains a richer additive package than other TC-W3 oils, minimizing carbon build-up and deposits on pistons and bearing surfaces. It provides 25% greater detergency than minimum TC-W3 requirements.

*Evinrude/Johnson* brand oils are formulated to give best engine performance while controlling piston and combustion chamber deposits, providing superior lubrication and ensuring maximum spark plug life.

If *Evinrude/Johnson* XD25 formula outboard oil is not available, you must use an NMMA-certified TC-W3 oil such as *Evinrude/Johnson* direct injection oil or *Evinrude* biodegradable outboard oil.

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

## ADDITIVES

**IMPORTANT:** Only use fuel additives approved by *Bombardier* for your outboard. Use of other fuel additives can result in poor performance or engine damage.

*Evinrude/Johnson 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 is not being operated on a regular basis. Its use will reduce spark plug fouling, fuel system icing, and fuel system component deterioration.

## 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 **Break-In (10 hours)**.

### Normal Operation

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

**IMPORTANT:** 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.

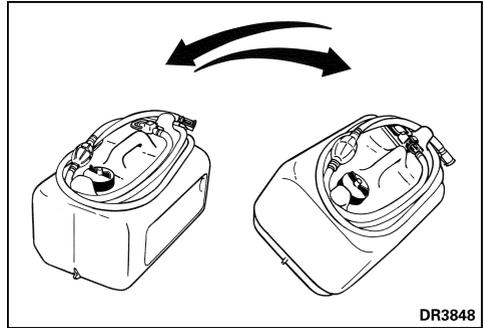
## MIXING FUEL AND OIL

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

Ratio	Fuel		
	6 U.S. Gallons	3 U.S. Gallons	1 Liter
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

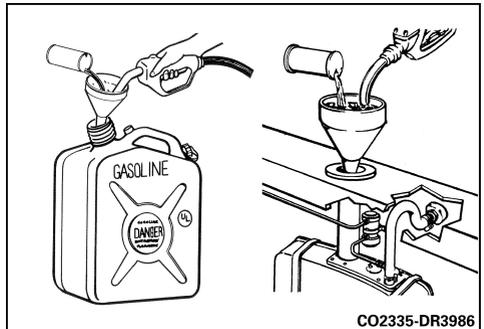
## Portable Tank

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.



## 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.



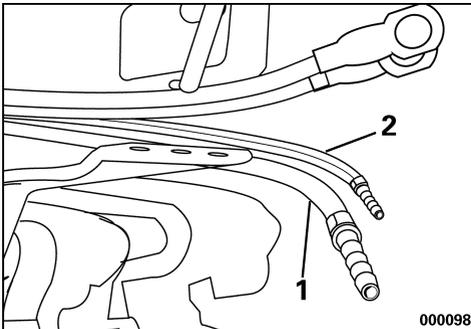
## FUEL SYSTEM

**WARNING**

**The outboard must be correctly installed. Failure to correctly install the outboard could result in property damage, serious injury, or death. It is strongly recommended your DEALER install your outboard to ensure proper installation.**

If the fuel hose is disconnected for any reason, seal it to prevent spillage. Cap the fuel fitting to prevent contamination.

Connect the fuel hose to the 3/8 in. (9 mm) fuel fitting. Fasten hose securely with clamp (18.5 mm) from owner's kit.



1. Fuel hose and fuel fitting – 3/8 in. (9 mm)
2. Oil supply fitting – 1/4 in. (6 mm) - Yellow stripe

**IMPORTANT:** 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).

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.

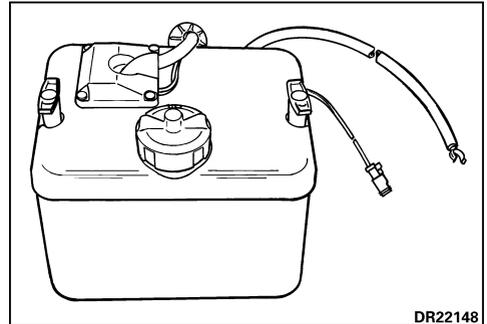
To avoid difficulty when restarting, never run the engine with the fuel hose disconnected, or run the engine out of fuel.

## OIL SYSTEM

**IMPORTANT:** You MUST prime the oil injection system BEFORE you prime the fuel system. Refer to **Installing the Oil Supply Hose** If the fuel system is primed first, see your DEALER. After this initial connection, the oiling system should NOT need priming unless problems occur due to an air leak in the oil line or an empty oil tank.

If the oil hoses are disconnected for any reason, seal them to prevent spillage. Install caps on the oil fittings to prevent contamination.

You must use an oil tank equipped with a filter and oil supply hose. The oil system must be purged if air is in the oil supply hose. Refer to **Installing the Oil Supply Hose**.



Install the oil tank by following the instructions provided with the unit.

**IMPORTANT:** Consider the installation location of the oil tank carefully. The oil tank is vented to the atmosphere. To avoid serious powerhead damage, be sure the oil tank is installed in a location that does not allow constant exposure to sunlight, rain, bilge water or spray. Periodically inspect the oil tank for evidence of water.

### Filling the Oil Tank

Remove the filler cap and fill the tank with recommended outboard lubricant, as specified in **Fuel and Oil**. Replace the filler cap and tighten securely.

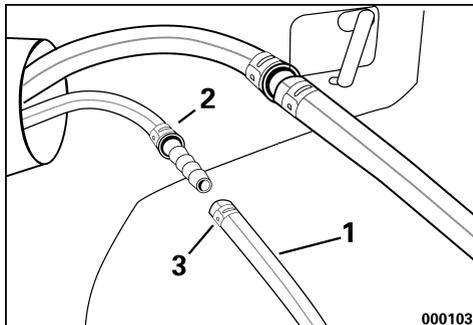
**IMPORTANT:** Always keep a supply of oil in the tank. If you run the tank dry, you **MUST** purge the oil system of air before using the engine. Anytime the oil hose is disconnected, use a 50:1 (2% oil) fuel/oil mixture in your fuel tank until oil consumption is verified. Failure to verify oil consumption could result in extensive engine damage due to lack of lubrication.

### Installing the Oil Supply Hose

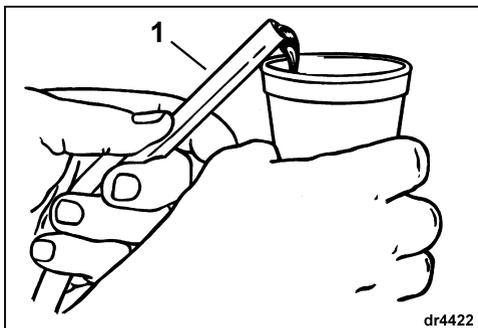
**IMPORTANT:** To avoid engine damage from lack of lubrication, make sure you purge the system. **Make sure all connections are airtight.** Anytime the oil supply hose has been disconnected, you must prime the oil system before reconnecting the supply hose and operating the engine.

Hold the open end of the oil supply hose fitting over a container. With its outlet end up, squeeze the oil fill bulb repeatedly until about 8 oz. (250 ml) of oil have been pumped and the supply hose is purged of all air.

Connect the oil supply hose to the oil inlet fitting on the motor. Secure with the clamp (13.8 mm) from the owner's kit. Finish priming the system by squeezing the oil fill bulb two more times.



1. Oil supply hose – 1/4 in. (6 mm) - Yellow stripe
2. Oil inlet fitting – 1/4 in. (6 mm) - Yellow stripe
3. Clamp (13.8 mm) from owner's kit



1. Oil supply hose from oil tank – 1/4 in. (6 mm)

## BREAK-IN (10 HOURS)

**IMPORTANT:** Follow this procedure to protect your new outboard during its initial hours of operation. Careful break-in allows internal engine components to “seat” properly, resulting in maximum engine performance.

Failure to carefully follow the break-in procedures can result in engine damage.

During break-in, you must use extra oil. Use a 50:1 (2% oil) fuel/oil mixture in the fuel tank **in addition** to the operation of the oil injection system. After the break-in period, check the oil tank to see if the oil level has dropped, indicating oil usage. If the oil level has **not** dropped, have your DEALER check the oil system before using unmixed gasoline in the fuel tank.

Perform the **10-Hour** break-in procedure with the boat and engine in the water, using an appropriate propeller.

DO NOT perform break-in using a flushing device.

DO NOT start-up or run the engine out of the water.

DO NOT leave a running engine unattended.

**IMPORTANT: Before the start-up of your new engine:**

- Read **Engine Starting, Engine Stopping, and Shifting and Speed Control**.
- Perform prelaunch checks of all equipment.

**Launch the boat and start the engine according to the procedures in Engine Starting.**

- Verify water pump operation often. Look for a steady stream of water from the water pump indicator. If the stream of water stops, shut off the engine to prevent damage. Find and correct the cause, or see your DEALER before you continue.
- Verify shift function by shifting into gear and observing that the boat moves and that the movement is in the same direction as the shifter. Refer to **Shifting and Speed Control**.
- Change the RPM often. Avoid holding a throttle setting longer than 15 minutes.

**1. First 10 minutes of operation** — Operate the engine in gear at fast idle **only**.

**2. Next 50 minutes** — Operate engine in gear below 3500 RPM.

**DO NOT** hold a constant throttle setting. Change engine speed every 15 minutes.

With easy planing boats, use full throttle to quickly accelerate boat onto plane. Immediately reduce throttle to one-half as soon as the boat is on plane. BE SURE boat remains on plane at this throttle setting.

**3. Second Hour** — Use full throttle to accelerate boat onto plane, then reduce throttle setting to three-quarters. BE SURE boat remains on plane at this throttle setting.

At intervals, apply full throttle for periods of one to two minutes, returning to three-quarters throttle for a cooling period.

Change engine speed every 15 minutes.

**4. Next Eight Hours** — Avoid continuous full throttle operation for extended periods.

Change the engine speed every 15 minutes.

**DO NOT** exceed recommended maximum engine RPM. Refer to **Engine Specifications**.

# ENGINE STARTING



## DANGER



**DO NOT** run the engine indoors or without adequate ventilation or permit exhaust fumes to accumulate in confined areas. Engine exhaust contains carbon monoxide which, if inhaled, can cause serious brain damage or death.



## WARNING



The engine cover is a machinery guard. **DO NOT** operate your outboard with the cover off unless you are performing maintenance, and then be careful to keep hands, hair, and clothing clear of all moving parts. Contact with moving parts could cause injury.



## DANGER



Contact with a rotating propeller is likely to result in serious injury or death. Assure the engine and prop area is clear of people and objects before starting engine or operating boat. Do not allow anyone near a propeller, even when the engine is off. Blades can be sharp and the propeller can continue to turn even after the engine is off. Always shut off the engine when near people in the water.

## BEFORE START-UP

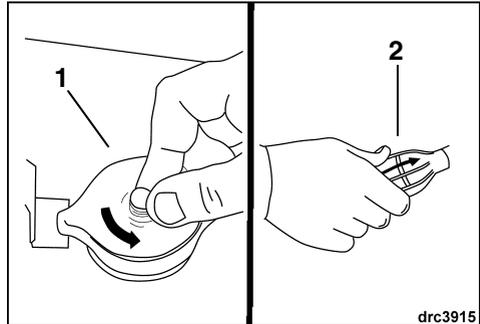
If the fuel hose and/or oil hoses are not connected, refer to **Fuel System** and **Oil System**, to install them now.

Review and follow **Break-In (10 hours)** if the engine is new.

You **MUST** supply water to the engine before attempting to start it. Engine damage can occur quickly. Refer to **Engine Overheating** or **Flushing**.

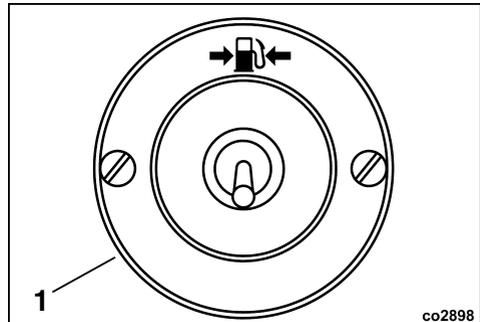
Be sure the engine is in the normal operating position. Refer to **Power Trim and Tilt** or **Tilting**.

If the fuel tank has an operable vent, open it. Squeeze the fuel primer bulb, outlet end up, until firm.



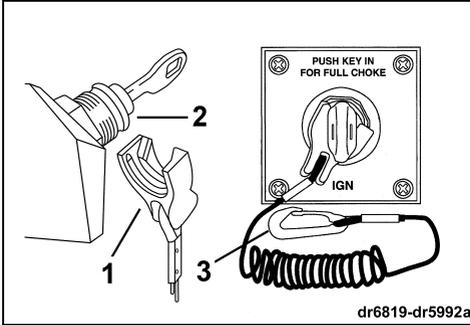
1. Fuel tank operable vent
2. Fuel primer bulb

If equipped with an electric fuel primer pump, activate it for about 20 seconds.



1. Electric fuel primer pump switch

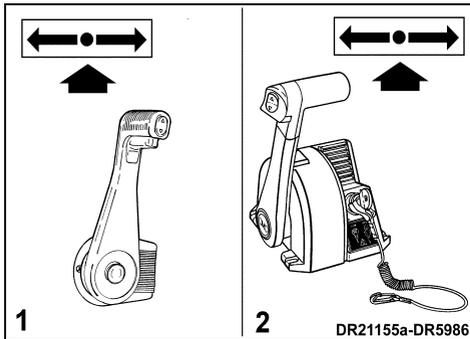
Connect the clip to the emergency stop/key switch. Snap the lanyard to a **secure** place on the operator's clothing or life vest — not where it might tear away instead of activating the stop switch.



1. Clip
2. Emergency stop / key switch
3. Lanyard

**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 **Emergency Stop/Key Switch**.

Move the remote control handle to **NEUTRAL**. Refer to **Shifting and Speed Control**.



1. Concealed side mount control
2. Binnacle mount control

### Start-up (Cold Engine)

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

⚠

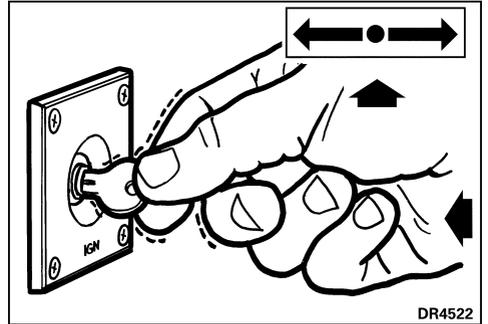
## WARNING

⚠

**DO NOT attempt to shift the engine into FORWARD or REVERSE while it is running at fast idle. Shifting under this condition can result in sudden boat movement, resulting in injury.**

Starting a cold engine normally requires use of the engine primer. To activate the primer, steadily **PUSH/HOLD** the key switch **IN** while cranking or running the engine.

Turn the key switch fully clockwise to the **START** position. Crank the engine no longer than 10 seconds.



**IMPORTANT:** The starter motor can be damaged if operated continuously for more than 10 seconds.

Upon start-up, release the key.

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

Each time the key switch is turned from **OFF** to **ON**, the warning system will self-test. Refer to **Engine Monitoring**. If the warning system fails to self-test during start-up, see your **DEALER**.

If your outboard does not react normally to this starting procedure or if it fails to start, refer to **Trouble Check Chart**.

## After Engine Starts

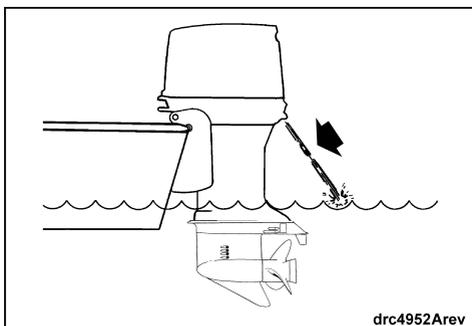
DO NOT turn the key switch to START while the engine is running. Damage to the starter system could result.

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.

Allow the engine to idle in NEUTRAL for about 5 minutes to warm up before shifting.

**IMPORTANT:** To avoid engine damage, after start-up do not exceed 2000 RPM in NEUTRAL. Do not exceed 1500 RPM in NEUTRAL for extended periods of time.

Check the water pump indicator. A steady stream of water indicates the water pump is working. If a steady stream of water from the water pump indicator is not visible, stop the engine. Refer to **Engine Overheating**.



Engine temperature will determine the length of the period of fast idle after start-up — the warmer the engine, the shorter the period of fast idle.

### Start-up (Warm Engine)

Follow **Start-up (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.

## ENGINE STOPPING

Move control handle to NEUTRAL.

Turn key switch counterclockwise to OFF. Remove the key when the boat will be unattended.

To avoid difficulty when restarting, never stop the engine by running it with the fuel hose disconnected or otherwise running it out of fuel.

## SHIFTING AND SPEED CONTROL

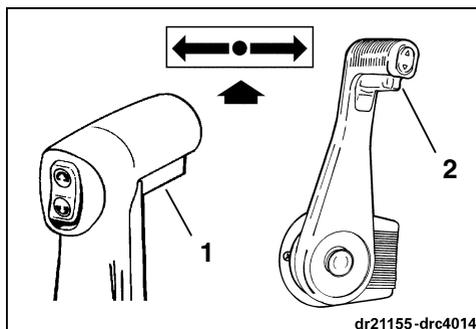
**IMPORTANT:** Carefully check the function of all control and engine systems before leaving the dock. DO NOT shift the engine into FORWARD or REVERSE while it is shut off. If the following directions are not suitable for your boat's control, see your DEALER before proceeding.

### Shifting

With engine running and control handle in NEUTRAL:

#### Side Mount and Concealed Side Mount Control

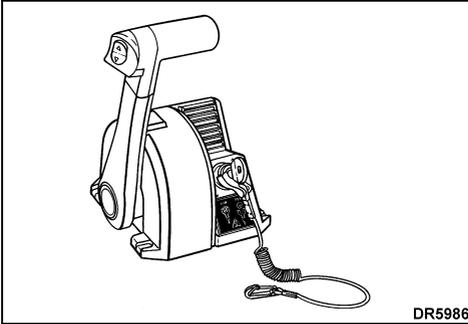
Unlock the control handle (lift the neutral lock tab by squeezing the hand grip). Briskly and decisively, move the control handle fore or aft — until it engages the gear detent.



1. Side Mount NEUTRAL Lock Tab Hand Grip
2. Concealed Side Mount NEUTRAL Lock Tab Hand Grip

### Binnacle Mount Control

Briskly and decisively, move the control handle fore or aft — until it engages the gear detent.



**IMPORTANT:** 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

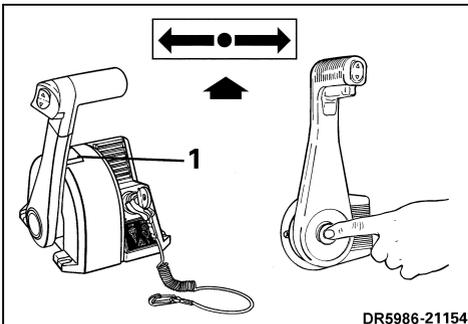
After gear engagement, move the control handle slowly in the same direction to increase speed.

### Fast Idle in NEUTRAL

#### Concealed Side Mount and Binnacle Mount Controls

**IMPORTANT:** Avoid excessive engine RPM in NEUTRAL — adjust the throttle so the engine does not overspeed.

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.



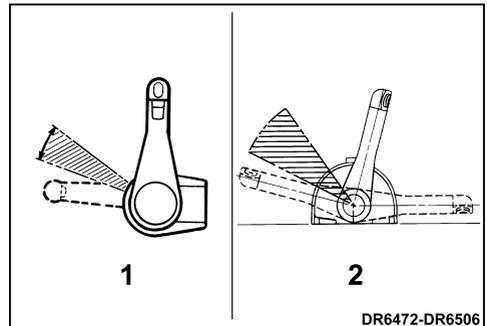
1. Fast idle button

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.

On models with *QuikStart* electronic starting or fuel injection, use the Fast Idle in NEUTRAL feature only to clear a flooded condition. Refer to **Trouble Check Chart**.

### FUEL ECONOMY

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.



1. Concealed side mount control
2. Binnacle mount control

# OPERATION



## DANGER



**DO NOT** run the engine indoors or without adequate ventilation or permit exhaust fumes to accumulate in confined areas. Engine exhaust contains carbon monoxide which, if inhaled, can cause serious brain damage or death.

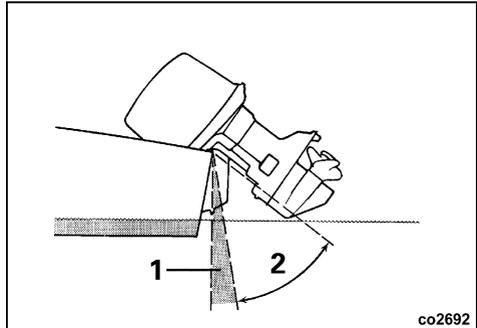


## DANGER



Contact with a rotating propeller is likely to result in serious injury or death. Assure the engine and prop area is clear of people and objects before starting engine or operating boat. Do not allow anyone near a propeller, even when the engine is off. Blades can be sharp and the propeller can continue to turn even after the engine is off. Always shut off the engine when near people in the water.

The power tilt is often used to tilt the engine for clearance when beaching, mooring, or launching.



1. Trim range
2. Tilt range

### Trim Gauge

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

## POWER TRIM AND TILT



## 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.

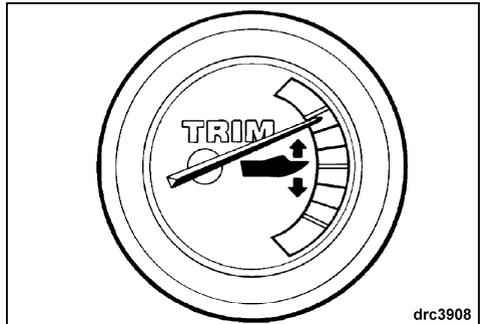
The trim system features a trim range of 21°:

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.

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

While positioned within the tilt range, **DO NOT** run the engine faster than idle speed. If idling a tilted engine, keep its water intakes submerged at all times.



### Manual Release



## WARNING



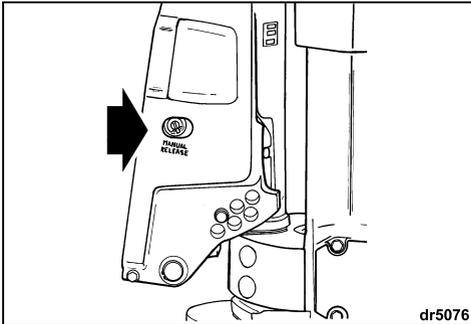
**Keep everyone clear of a tilted engine when backing out the manual release screw. The engine could drop suddenly and forcibly. Be sure to tighten the manual release screw after manually repositioning the engine. Tightening the screw also reactivates the engine's shock absorber protection and reverse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

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

Turn the manual release screw counterclockwise, slowly, until it **lightly** contacts its retaining ring — about 3 and 1/2 turns.

Reposition the engine.

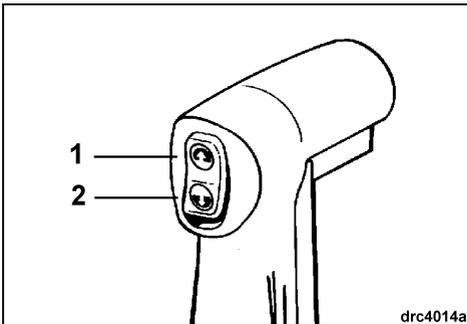
Tighten the manual release screw to hold the engine in its new position.



1. Manual release screw

### **Tilting**

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



1. Bow up
2. Bow down

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

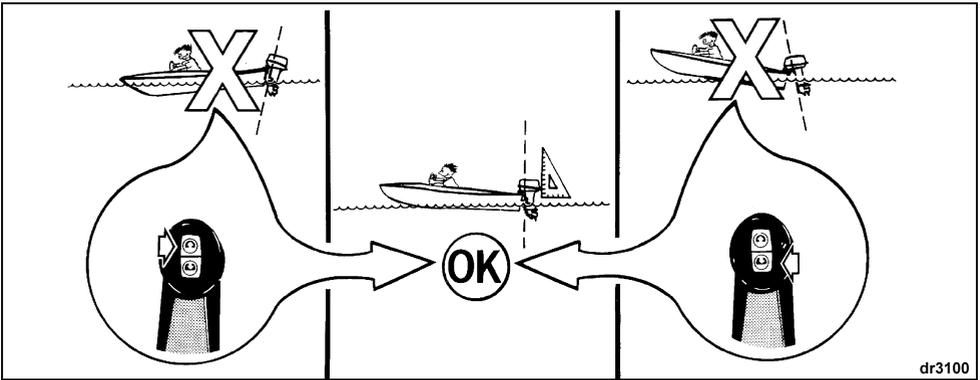
### **Trimming**

To operate the power trim, push and hold the trim/tilt switch in the desired bow direction, either bow-up or bow-down. 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 help maintain steering stability and good performance, always maintain the proper trim angle, which varies depending on the combination of boat, motor, propeller, and operating conditions.

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.



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 **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.

### **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 **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.

**⚠ 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.**

**⚠ WARNING ⚠**

**If the bow of the boat plows the water at high speeds, the boat may bow steer or spin suddenly, possibly ejecting occupants.**

**⚠ 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.**

## PROPELLER SELECTION

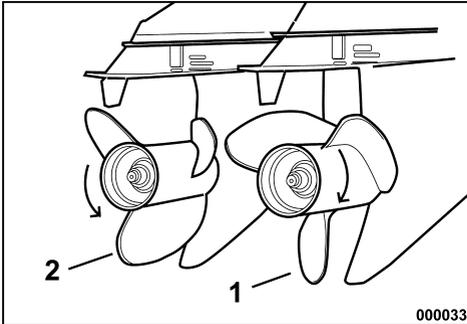
To select the correct propeller for your boating application, your boat and motor **MUST** be water tested. See your DEALER for assistance.

Refer to **Propeller**, before removing or installing propeller.

**IMPORTANT:** 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 **Engine Specifications**.

Right-hand propellers are considered standard rotation propellers. When propelling a boat forward, the propeller rotates in a right-hand (clockwise) direction as viewed from the rear.

Left-hand propellers are considered counter-rotation propellers. When propelling a boat forward, the propeller rotates in a left-hand (counterclockwise) direction as viewed from the rear.



1. Right-hand (clockwise)
2. Left-hand (counterclockwise)

## 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**.

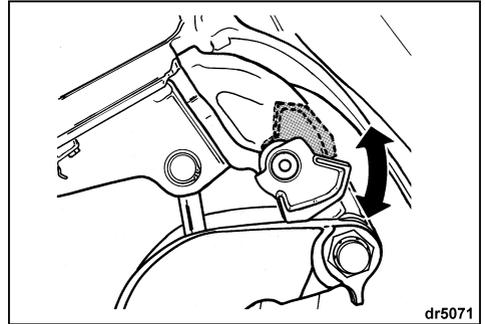
**IMPORTANT:** DO NOT use the tilt support lever while trailering. Refer to **Trailering**.

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

Tilt the motor UP using the trailering 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.

Flip the tilt support lever up.

Lower the motor to operating position.

dr5071



## WARNING



If you have a dual engine installation that includes a counter-rotating engine and you remove the propellers, always check to be sure they are installed on the correct engines before aggressively operating your boat. Shift each motor individually into FORWARD or REVERSE, at idle speed only. If the boat moves opposite the direction indicated by the remote control handle, the wrong propeller has been installed on the motor being checked. Install the correct propeller and confirm your installation using the above method before any attempt is made to operate the boat.

## FLUSHING



### DANGER



**DO NOT run the engine indoors or without adequate ventilation or permit exhaust fumes to accumulate in confined areas. Engine exhaust contains carbon monoxide which, if inhaled, can cause serious brain damage or death.**

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 — Running*

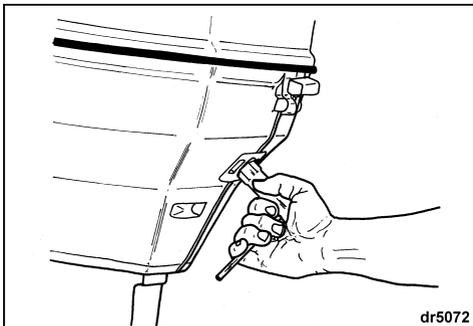


### WARNING



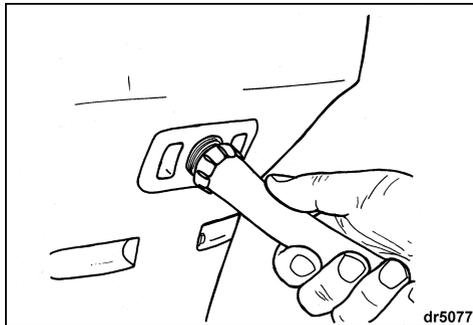
**Prevent injury from contact with rotating propeller; remove the propeller before flushing.**

- 1) Place the engine in vertical position in a well-ventilated area with good drainage.
- 2) Remove the plug from the flushing port.



- 3) Install flushing device (if needed) and garden hose.

- 4) Place the remote control lever in NEUTRAL with the propeller removed.
- 5) Start the water — keep pressure between 20 to 40 psi (140 to 300 kPa).



- 6) Start the engine — **run it at idle only** and flush it for at least five minutes.
- 7) 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.
- 8) Leave the outboard in vertical position long enough to completely drain the powerhead.

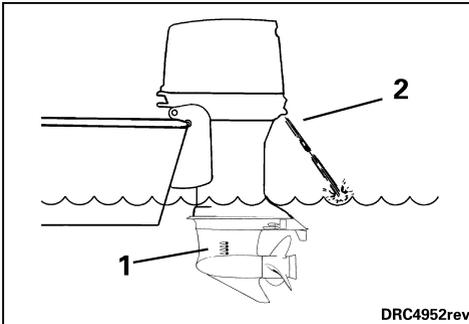
### *Outboard Not Running*

- 1) The outboard may be in a tilted or vertical position.
- 2) Remove the plug from the flushing port.
- 3) Install flushing device (if needed) and garden hose.
- 4) Start the water and flush the engine for at least five minutes — keep pressure between 20 to 40 psi (140 to 300 kPa).
- 5) 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.
- 6) Lower the outboard to vertical position long enough to completely drain the powerhead.

## ENGINE OVERHEATING

**IMPORTANT:** Do not run your engine — even for a brief start-up — without supplying water to it. Refer to **Flushing**.

While boating, the engine's water intakes must stay completely submerged and unobstructed. Observe proper transom height and trim angle. While the engine is running, the engine's water pump indicator must discharge a steady stream of water. Check the indicator often, especially when operating in weeds, muddy and debris-laden water, and at extreme trim angles.



1. Water intake screens
2. Water pump indicator

If the engine overheats, its *System Check* engine monitor will sound the warning horn and turn on the "WATER TEMP" or HOT light. Also, the *S.L.O.W.* protection system will immediately limit the engine's speed to 2500 RPM. If the engine was running faster than 2500 RPM when the *S.L.O.W.* system activated, it will shake noticeably.

To **RESET** the *S.L.O.W.* protection system, the engine must be shut **OFF** and the cooling temperature restored.

**IF** the *S.L.O.W.* protection system activates and the stream from the water pump indicator becomes intermittent or stops, reduce speed to idle and:

- Shift to **NEUTRAL**;
- SHUT OFF** the engine;
- Tilt the motor up;
- Clean the intake screens of any blockage;
- Clean the water pump indicator of any blockage;
- Lower the motor; and
- 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** cleaning the screens and indicator does restore the water pump indicator's steady discharge, you might have to run for two minutes in **NEUTRAL** to allow the engine to cool and the light to go off.

If the warning light stays on after two minutes, **STOP** the engine and see your **DEALER**.

**IMPORTANT:** You must restore cooling to the engine to avoid serious engine damage.

After any overheat, have your **DEALER**:

- Torque the cylinder head screws.
- Inspect the water pump for excessive wear or damage.
- Inspect the thermostats.
- Inspect the engine for leaks.

## TRAILERING



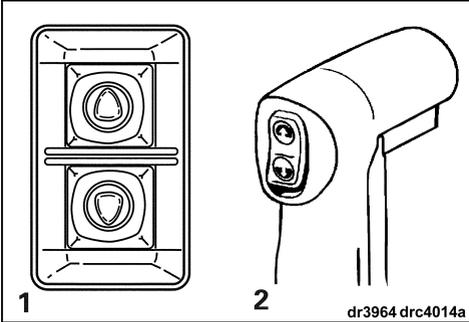
### WARNING



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

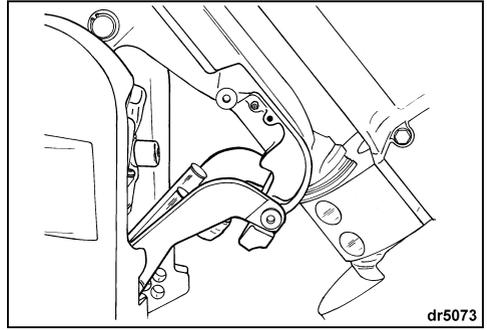
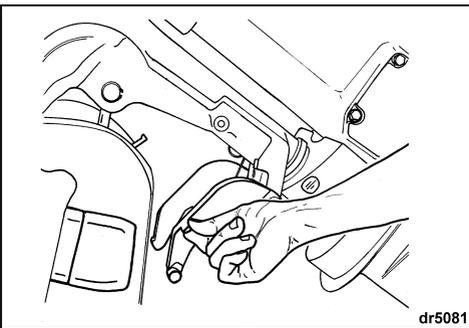
### Trailer Bracket

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

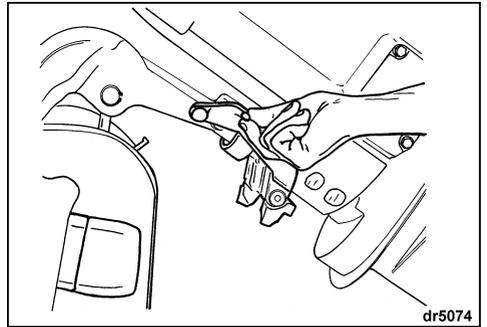


1. Trawling tilt switch
2. Tilt switch inside boat

Pull down the trawling bracket. A detent will hold the bracket in position. Lower the motor until the trawling bracket locks into place in the stern brackets.



**To disengage bracket** — Tilt the motor fully. Return the trawling bracket to its stowed position. Lower the motor to its vertical position.

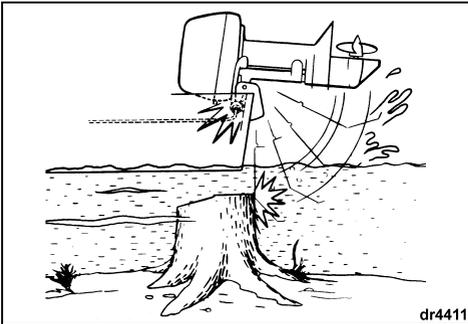


Trail your boat with the motor in a vertical position. If your trailer does not provide adequate road clearance, the motor can be trailered while tilted by using the motor's trawling bracket.

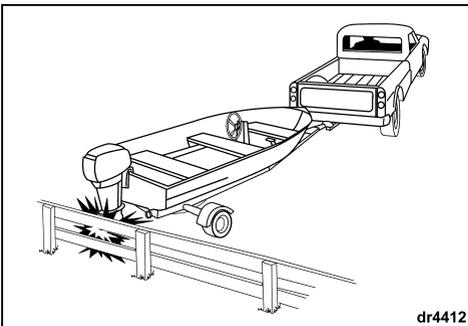
**IMPORTANT:** DO NOT use the tilt support lever when trailering.

## IMPACT DAMAGE

Your engine has a shock absorption system designed to help 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!



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.



## 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.**

## STORING

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

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 **Off-Season Storage**.

## 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. Your outboard has a built-in flushing port to facilitate flushing. Refer to **Flushing**.

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 it in a vertical position until its cooling system has drained.

### **Weedy Water**

Weeds block water intakes and cause your outboard to overheat. Weeds on the propeller create vibration and reduce boat speed.

Run at slow speeds and in REVERSE frequently to clear weeds from the propeller and water intakes. Check the water pump indicator often.

If REVERSE operation does not clear away weeds, SHUT OFF the engine. Remove weeds from propeller area and water intakes before operating at higher speed.

### **Boat Bottom and Engine External Finish**

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 *Evinrude/Johnson* anti-corrosion spray to any surface subject to corrosion, but avoid the anticorrosion 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.

**IMPORTANT:** 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).

### **Shallow Water**

**IMPORTANT:** Serious engine damage will occur if the gearcase is allowed to drag on the waterway bottom.

### **Freezing Weather**

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

Upon removing your motor from the water, leave it in a vertical position until its cooling system is drained.

**IMPORTANT:** Water that has leaked into the gearcase, or remained in the cooling system or other components can freeze, causing serious engine damage.

**IMPORTANT:** 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 **Off-Season Storage**.

### **Submerged Engine**

If your engine has been under water, **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.

### **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.

### **Under Tow**

Should you require a tow from another boat:

- Shift your engine to NEUTRAL;
- Tilt its gearcase out of the water; and
- Off-load all persons into another boat.

Keep towing speed slower than planing speed.

# MAINTENANCE

Maintenance, replacement, or repair of the emission control devices and systems may be performed by any marine SI (spark ignition) engine repair establishments or individual.



## WARNING



Only perform service procedures which are detailed in this Operator's Guide. Attempting to perform maintenance or repair on your outboard if you are not familiar with the correct service and safety procedures could cause injury or death.

Tampering with the carburetor to change horsepower or modify emission levels beyond factory settings or specifications will void the product warranty.

## 10-HOUR INSPECTION

After 10 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 10-hour Inspection at your request and expense (based on local rates), according to what your engine needs — refer to **Engine Maintenance and Inspection Schedule, 10-HOUR INSPECTION** 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.

## OFF-SEASON STORAGE

You must protect against natural environmental conditions that can be damaging to an outboard motor. Temperature and humidity changes while your outboard motor is not in use can cause corrosion of internal engine parts when they are not protected. Fuel remaining in your fuel tank and in the engine will oxidize and weather which can result in loss of octane and can cause gum deposits in the fuel system. Your warranty does not cover engine failure caused by these conditions. We strongly recommend that you have your DEALER prepare your outboard for the off-season.

To do the off-season storage preparations yourself, gather the supplies and perform the following steps:

- 2+4 fuel conditioner
- Triple-Guard grease
- Ultra-HPF gearcase lubricant
- Storage Fogging Oil spray can

Stabilize the engine's fuel supply with 2+4 fuel conditioner during the last hours of operation to ensure proper stabilization, **following instructions on the container for mixture. Be sure to run the engine long enough for the treated fuel to reach the engine.**



## WARNING



**Prevent injury from moving engine components. Before starting the engine:**

**Shift it to NEUTRAL.**

**Keep hands, clothes, and hair clear of powerhead.**

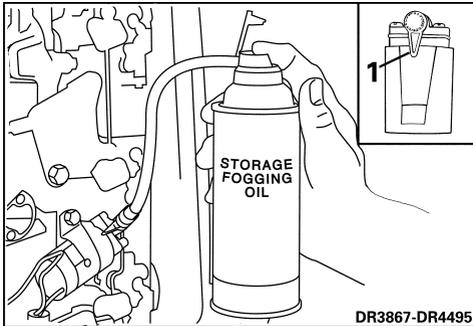
**Remove the propeller if you use a flushing device.**

**IMPORTANT:** Provide a water supply to the engine and start it. Run the engine at idle only.

To run the engine on a flusher, refer to **Flushing**.

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

**Storage Fogging Oil** — Connect the can to its fitting on the primer solenoid. Following instructions on the can, fog the engine. After you fog the engine be sure the primer solenoid lever is in the run position.



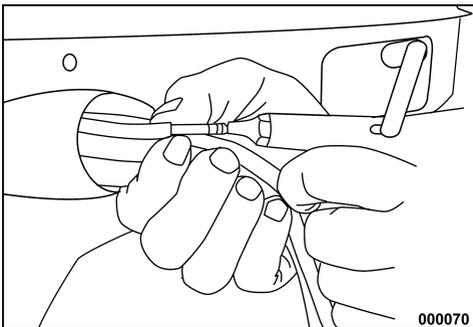
1. Run position

**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.

**Screws, bolts, nuts** — Tighten any that are loose.

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

**Gearcase speedometer pickup, if equipped** — Disconnect the speedometer hose at the upper connection. With air pressure no more than 25 psi (167 kPa), blow all water from the gearcase speedometer pickup system. Reconnect speedometer pickup after all the water has been removed.



**Lubrication** — Refer to **Lubrication Points** to drain and refill the gearcase and for lubricating points on the engine.

Touch up painted surfaces and wax the engine's exterior. Store the engine on the boat (or an engine stand) in a vertical, self-draining position.

**IMPORTANT:** 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 the engine and its steering, throttle, and shift systems. Replace damaged or missing parts with *Evinrude/Johnson Genuine Parts*, or equivalent.

**Battery** — Remove it, clean it, check its condition and water level, then charge it. Store it in a place that's cool and dry, out of direct sunlight. Check the water level and charge it periodically during the storage period.

**Oil system** — Leave the oil hoses connected. If you must disconnect them to remove the engine from the boat for storage, cap the fittings and plug the hoses.

**Oil tank** — Inspect the oil tank for contamination and/or water. 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.

**⚠ 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 drip.**

## PRE-SEASON 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 *Evinrude/Johnson Genuine Parts* or equivalent.



### 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 system** — Check for evidence of water in the oil tank. If present, see your DEALER. If no water is evident, top off the oil tank. Refer to **Fuel and Oil Section, Oil System**.

**Disconnected oil hoses** — Follow the directions in **Fuel and Oil, Oil System**, to reinstall the hoses and reestablish oil flow.

**Undisturbed oil hoses** — If the oil hoses were left connected, no special attention to the oil system is required.

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

**Anticorrosion anodes** — Check condition. Refer to **Anticorrosion Anodes**.

Install the propeller unless you will run the engine on a flusher for your pre-season servicing. If so, install the propeller after you shut OFF the engine and disconnect the flusher. Refer to **Flushing**.

Refer to **Propeller** to install the propeller.



### WARNING



**Prevent injury from contact with a rotating propeller; remove the propeller before flushing.**

Top off fuel tank with fresh fuel.

**Battery** — Charge fully and install. Refer to **Battery**.



### WARNING



**Do not use a booster battery and jumper cables to start the engine. Fumes vented can cause explosion and fire, resulting in property damage, serious injury, or death.**

Refer to **Engine Monitoring** 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** 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 does not, shut OFF the engine and investigate. Refer to **Engine Overheating**.

Stop the engine and check the fuel system for leaks.



### WARNING



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

## BATTERY

Each outboard needs one battery that is:

- 12-volt, heavy-duty, designated "marine";
- Vented/refillable or maintenance-free; and
- Rated according to the minimum requirements in **Engine Specifications**.

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

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

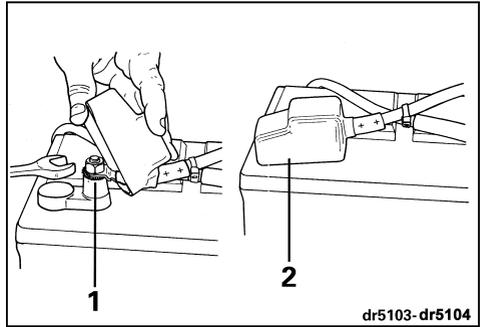
### Installation

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.

Place a large-surface star washer over the battery's positive (+) post. Stack the RED battery cable from the motor on the star washer, then install cables from accessories (if any). 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.



1. Large surface star washer
2. Cover

Tighten all connections securely and coat the installation with *Triple-Guard* grease.

**IMPORTANT: 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.

### Service

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

**IMPORTANT:** Service electrical components only while the outboard 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 charging system will be damaged.



### 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 covers. Check often to see that connections stay clean and tight.**



### WARNING



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

## ADJUSTMENTS

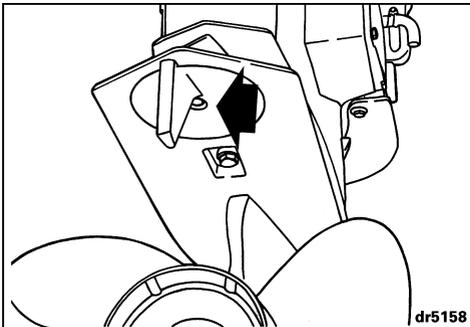
### Trim Tab



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:

**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 to 40 ft. lbs. (47 to 54 N·m).

Test the boat and, if needed, repeat the procedure until steering effort is as equal as possible.

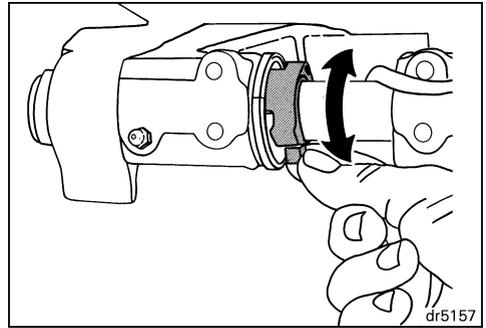
**High motor installations** — The trim tab might be above the water when the motor is trimmed out. Steering effort might increase. Steering effort will be reduced if you trim the motor in and submerge the trim tab.

**Dual standard rotation motors** — Move both of the trim tabs equally and in the same direction.

**Dual motors (one counter and one standard rotation)** — Set both trim tabs to the center position.

### Tilt Limiter Cam

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.



## LUBRICATION

### Gearcase

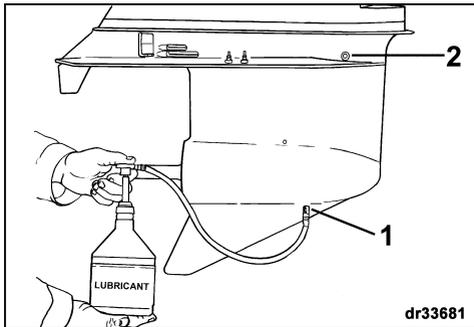
Replace gearcase lubricant after first 10 hours of operation. Check level and condition of lubricant after next 50 hours of operation. Add lubricant if necessary.

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 *Ultra-HPF* gearcase lubricant. If not available, *Hi-Vis®* or other marine gearcase lube can be used, however, long term durability may be affected with continued use. See your DEALER.

**IMPORTANT:** The recommended gear lubricants include special additives for marine applications. Do not use automotive gear lubricants, 2-stroke or 4-stroke engine oil, or any other oil or grease for gearcase applications.

With motor in normal operating position:

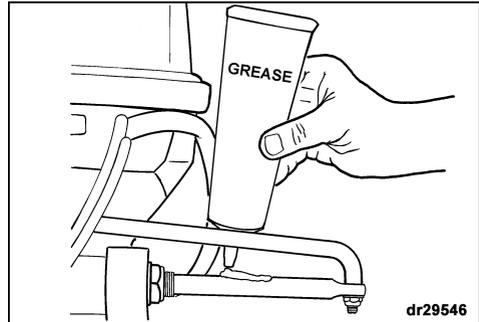
- 1) Remove drain/fill plug and lubricant level plug from side of gearcase and completely drain gearcase of old lubricant.
- 2) Examine drained lubricant for metal filings, milky appearance, or black color with burnt odor. If old lubricant has any of those characteristics, see your DEALER. If drained 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 **Engine Specifications** for gearcase capacity.
- 4) Install lubricant level plug before removing tube from drain/fill hole. Drain/fill plug can then be installed without loss of lubricant.
- 5) Securely tighten both plugs.



1. Drain/fill plug
2. Lubricant level plug

### Steering System

The installer was instructed to grease the steering cable ram during installation. Periodic regreasing of the steering cable ram with *Triple-Guard* grease is required. Refer to **Engine Maintenance and Inspection Schedule** for lubrication frequency. Refer to steering system manufacturer's information when servicing boat's steering system.

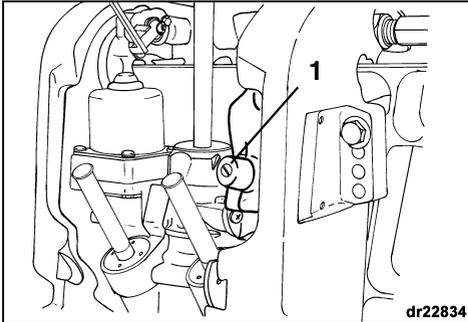


**WARNING**

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

Tilt the motor up and engage the tilt support. Depending on your model, refer to **Power Trim and Tilt**. Remove filler cap and check fluid level. If necessary, add enough *Evinrude/Johnson* 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.

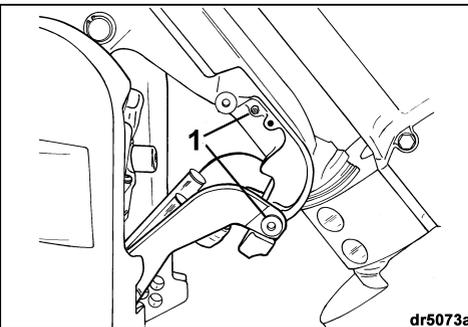


1. Filler cap

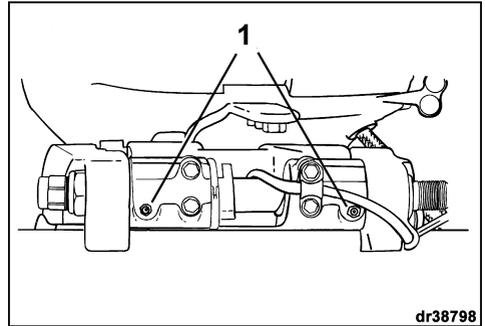
**IMPORTANT:** Correct fluid level must be maintained to ensure operation of the impact protection built into this unit.

## Lubrication Points

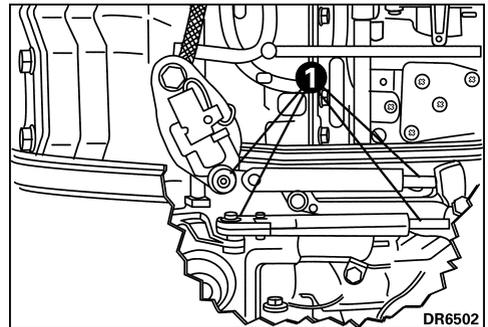
Refer to **Engine Maintenance and Inspection Schedule** for lubrication frequency and recommended lubricant.



1. Trawling bracket lubrication points.



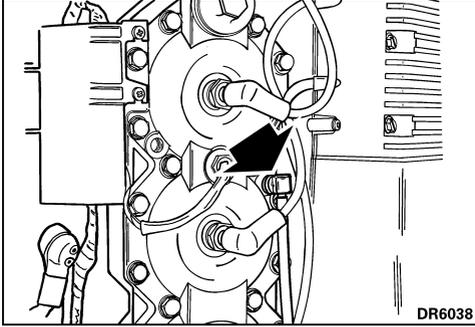
1. Tilt tube lubrication points.



1. Shift/Throttle lubrication points.

## WATER PRESSURE

An optional water pressure gauge is recommended to monitor cooling system pressures. Noticing changes in water pressure can help prevent engine overheating. The water pressure gauge must be connected at the correct point to ensure the most accurate pressure readings. Follow the installation instructions included with the water pressure gauge:



## FUEL LINE FILTER

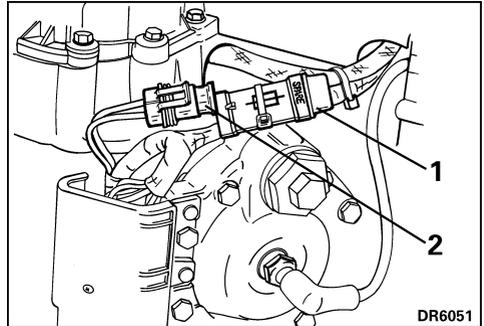
Refer to **Engine Maintenance and Inspection Schedule** for frequency.

An Authorized *Evinrude/Johnson* DEALER should service the fuel filter.

**IMPORTANT:** A restricted fuel delivery system will not allow the engine fuel pump to deliver sufficient fuel under all conditions. This can result in loss of performance and possibly **engine damage**.

## FUSES

**IMPORTANT:** Always carry spare fuses. Use the spare fuse holder to hold an extra fuse. Refer to **Engine Specifications**.



1. Spare fuse holder
2. Fuse

### Fuse Failure

A minor electrical problem can blow a fuse. Replace it with a fuse of the same rating.

Repeated failures of fuses in the same position indicate a serious problem. Do not replace it with higher rated fuses; see your DEALER for service.

## SPARK PLUGS

**WARNING**

The ignition system presents a serious shock hazard. The primary circuit operates in excess of 250 volts; the secondary circuit operates in excess of 25,000 volts. Use caution to avoid injury from shock or injury resulting from your reaction to shock. Do not handle primary or secondary ignition components while the engine is cranking or running.

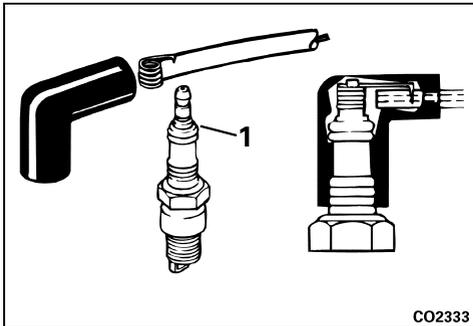
Inspect spark plugs periodically. Replace if electrodes are badly worn, insulators are cracked, or if they are badly fouled.

To remove spark plugs, twist and remove all spark plug leads. Unscrew spark plug 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 **Engine Specifications**.

**IMPORTANT:** Avoid engine damage by installing spark plugs into COOL cylinder head and not over-tightening.

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



1. Ribbed portion of the spark plug

## PROPELLER

**WARNING**

When servicing the propeller, always shift the outboard to NEUTRAL position, turn the key switch OFF and disconnect battery negative (-) cable so the engine cannot be started accidentally.

**IMPORTANT:** Apply *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.

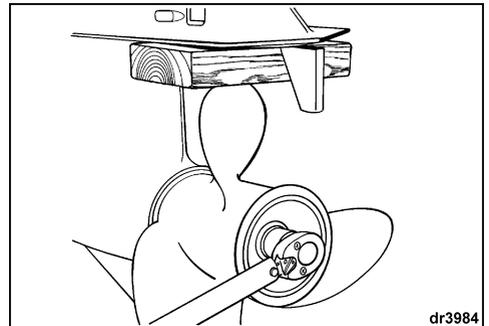
### Installation

Slide thrust washer onto shaft with shoulder facing aft.

Slide propeller onto shaft, engaging the splines and seating it on the thrust washer.

Slide spacer onto the shaft and engage the propeller shaft splines.

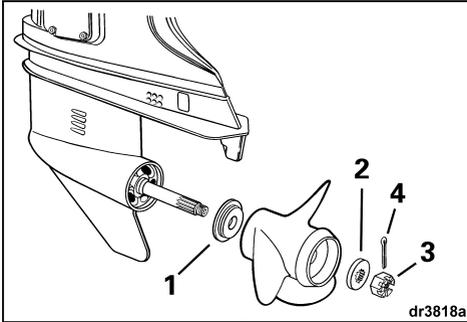
Wedge a block of wood between the propeller blade and the anti-ventilation plate.



## 90 PL, GL 115 PL, GL

Install propeller nut and tighten to a torque of 120 in. lbs. (14 N·m).

Continue to tighten propeller nut until nut slots and cotter pin hole are aligned. Install new cotter pin and bend ends to secure.



## 90 PL, GL 115 PL, GL

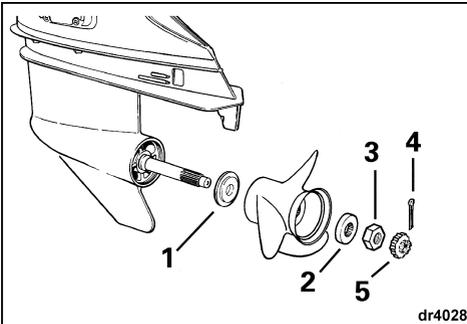
1. Thrust washer
2. Spacer
3. Propeller nut
4. Cotter pin

### All other models

Install propeller nut and tighten to a torque of 70 to 80 ft. lbs. (95 to 108 N·m).

Install keeper on propeller nut, align keeper slots and cotter pin hole.

Install new cotter pin and bend ends to secure.



### All other models

1. Thrust washer
2. Spacer
3. Propeller nut
4. Cotter pin
5. Keeper

Remove block of wood. Make sure engine is in NEUTRAL; give propeller a spin. It must turn freely.

## Repair

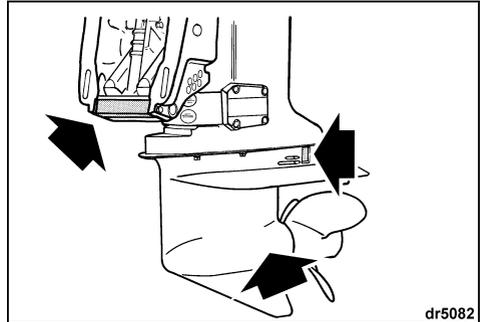
If your propeller hits a solid object, the impact is partially absorbed by the rubber bushing in the hub to help prevent damage to the engine. A strong impact can damage the hub and propeller blades. Damage to blades can cause unusual and excessive vibration. Damage to the hub can cause excessive engine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

**IMPORTANT:** 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.

## ANTICORROSION ANODES

Your motor is equipped with one or more anodes that protect it from galvanic corrosion. Refer to **Features** 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.

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

## TROUBLE CHECK CHART

**IMPORTANT: 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"> <li>• Shift handle not in NEUTRAL.</li> <li>• Battery and electrical connections loose or corroded.</li> <li>• Fuse blown. Refer to <b>Fuses</b>.</li> <li>• Battery Selector Switch OFF.</li> </ul>
Engine will not start	<ul style="list-style-type: none"> <li>• Not following starting instructions. Refer to <b>Engine Starting Section</b>.</li> <li>• Fuel tank empty.</li> <li>• Fuel hose disconnected, kinked.</li> <li>• Fuel system contaminated with water or dirt.</li> <li>• Fuel filter obstructed.</li> <li>• Engine not primed.</li> <li>• Engine flooded. Raise fast idle lever and crank engine in 10-second periods.</li> <li>• Spark plugs incorrect. Refer to <b>Engine Specifications</b>.</li> <li>• Spark plugs improperly gapped, carboned, burned or wet.</li> <li>• Ignition system component failure.</li> </ul>
Engine will not idle properly	<ul style="list-style-type: none"> <li>• Motor angle excessive.</li> <li>• Spark plugs damaged or incorrect. Refer to <b>Engine Specifications</b>.</li> <li>• Fuel system contaminated with water or dirt.</li> <li>• Carburetor mixture out of adjustment.</li> <li>• Fuel/oil mixture incorrect.</li> <li>• Primer solenoid lever not at RUN position. Refer to <b>Engine Starting</b>.</li> </ul>
Engine loses power	<ul style="list-style-type: none"> <li>• Spark plugs damaged or incorrect. Refer to <b>Engine Specifications</b>.</li> <li>• Fuel filter obstructed.</li> <li>• Fuel system contaminated with water or dirt.</li> <li>• Water intakes obstructed and cooling system not operating correctly. Refer to <b>Engine Overheating</b>.</li> <li>• Oiling system malfunction.</li> </ul>
Engine vibrates excessively	<ul style="list-style-type: none"> <li>• Propeller shaft bent.</li> <li>• Propeller fouled and restricted, blades bent or broken.</li> <li>• Fuel system contaminated with water or dirt.</li> <li>• Engine mount(s) damaged.</li> <li>• <i>S.L.O.W.</i> protection mode activated. Refer to <b>Engine Monitoring</b>.</li> <li>• Carburetor mixture out of adjustment.</li> </ul>
Engine runs, but makes little or no progress	<ul style="list-style-type: none"> <li>• Propeller hub loose, slipping.</li> <li>• Propeller blades bent or missing.</li> <li>• Propeller shaft bent.</li> <li>• Propeller fouled and restricted.</li> </ul>
Warning System Activates	<ul style="list-style-type: none"> <li>• Refer to <b>Engine Monitoring</b>.</li> </ul>

## ENGINE MAINTENANCE AND INSPECTION SCHEDULE

Routine maintenance is necessary for all mechanized products. Periodic maintenance contributes to the product's life span. The following maintenance chart provides guidelines for engine maintenance and inspection scheduled to be performed by you and/or by an authorized DEALER. The schedule should be adjusted according to operating conditions and use.

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

**IMPORTANT:** Schedules for rental operations, commercial applications or high hour use will require greater frequency of inspection and maintenance.

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
Mechanical steering, lubricate <sup>(1)</sup>	7	Every 60 days / Every 30 in Saltwater				
Tilt tube, inspect and lubricate <sup>(1)</sup>	7	Every 60 days / Every 30 in Saltwater				
Swivel bracket / tilt support bracket, inspect and lubricate <sup>(1)</sup>	7	Every 60 days / Every 30 in Saltwater				
Throttle and shift linkage, inspect and lubricate <sup>(1)</sup>	7	Every 60 days / Every 30 in Saltwater				
Remote control cables, lubricate <sup>(1)</sup>	7	Every 60 days / Every 30 in Saltwater				
Lubrication and corrosion protection for metallic components	4	Every 60 days / Every 30 in Saltwater				
Battery connections and condition, verify	7	O	D			
SystemCheck self-test and warning horn, verify operation		O	D			
Anticorrosion anodes, verify operation		O	D			
Water intake screens, verify condition		O	D			
Overboard waterpump indicator, verify operation		O	D			
Steering system check, verify function		O	D			
Throttle and shift operation, verify function		O	D			
Emergency stop circuit and lanyard, verify function		O	D			
Flush cooling system		O				
Operator's Guide, onboard		O				
Engine upper and lower motor covers, clean and wax				O		
Operator's Guide, review					O	
Fuel and oil system components, inspect and repair leaks <sup>(2)</sup>			D	D		
Fuel filter and oil filter(s) inspection, eliminate contamination			D			
Fastener inspection, tighten loosened components			D	D		
Air silencer, clean and inspect			D	D		
Thermostat, inspect and verify operation <sup>(2)</sup>			D		D	
Power tilt/trim fluid, inspect fluid level	6		D		D	

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
Engine to transom mounting hardware, re-torque (40 ft. lbs.)			D		D	
Electrical and ignition wires and connections, inspect			D		D	
Gearcase lubricant replace	5		D		D	
Powerhead synchronization and linkage, inspect <sup>(2)</sup>	7		D		D	
Gearcase lubricant, inspect fill level and condition of lube	5			D		
Fuel and oil filter(s) replace					D	
Propeller shaft splines, inspect and lubricate	7				D	
Starter pinion shaft, inspect and lubricate <sup>(3)</sup>	9				D	
Spark plugs, replace <sup>(2)</sup>					D	
Decarbonize	10				D	
Driveshaft splines, inspect and lubricate	8					D
Water pump, inspect and replace						D

- (1) Also recommended at 10-Hour Inspection
- (2) Emission-related component
- (3) Do not use light duty penetrating lubricants

- D** Dealer Performed Service
- O** Operator Performed Service
- 4** *Evinrude/Johnson* anti-corrosion spray or *Evinrude/Johnson* "6 in 1" multi-purpose lubricant
- 5** *Ultra-HPF* gearcase lubricant
- 6** Power Trim/Tilt Fluid
- 7** *Triple-Guard* grease
- 8** *Evinrude/Johnson Moly Lube* P/N 175356
- 9** Starter Bendix Lube Only P/N 337016
- 10** *Evinrude/Johnson* Engine Tuner



# **EVINRUDE**

# **Johnson**

## **GENUINE PARTS**

Welcome to the world of *Evinrude* and *Johnson* boating!

To optimize your outboard boating, **Bombardier** offers parts and accessories for your boat that integrate perfectly with your *Evinrude* or *Johnson* outboard. ***Evinrude* and *Johnson* Genuine Parts** and accessories are designed by the same engineering team that designed your outboard. We manufacture them to the same strict engineering standards and call them ***Evinrude* and *Johnson* Genuine Parts**.

You don't have to worry about product quality with ***Evinrude* and *Johnson* Genuine Parts**. Or, whether or not they will perform with your outboard. For example...

**OIL** — Protect your investment by using only *Evinrude* and *Johnson* lubricants. *Evinrude* and *Johnson* oils deliver superior lubrication in two cycle and four cycle outboards. The *Evinrude* and *Johnson* formulations minimize carbon deposits and keep the engine cleaner for optimal performance and longer life.

- *Evinrude* *Ficht Ram Injection* oil is a synthetic blend containing *CarbX™* combustion cleaner. This special additive has the cleaning power a direct injection outboard needs for peak performance. It exceeds TC-W3 requirements and also works well in carbureted outboards.
- *Evinrude* and *Johnson* *XD25* formula outboard oil contains a richer additive package than other TC-W3 oils, minimizing carbon build-up and deposits on pistons and bearing surfaces. It provides 25% greater detergency than minimum TC-W3 requirements.
- *Evinrude* Biodegradable outboard oil is a synthetic formula that doesn't smoke, doesn't smell, and doesn't leave a sheen on the water's surface. The formula is not only more responsible environmentally, it promotes the life of your outboard. It

exceeds TC-W3 requirements and applicable international standards. It's six times more biodegradable than mineral based lubricants.

**PROPELLERS** — They're specially designed and engineered to match the power curves of *Evinrude* and *Johnson* engines AND the type of boat you use. It doesn't matter whether you have an offshore cruiser, a bass boat, a fish and ski, a runabout or a small fishing boat. *Evinrude* and *Johnson* SST®, *Renegade®* Bass, *Viper™*, and *Offshore Renegade®* propellers ensure your boat performs at its best.

**INSTRUMENTS** — Several distinct lines of instruments monitor your boat and engine systems. These instruments combine superior accuracy and state-of-the-art features to give you precise, dependable information.

**ENGINE CARE PRODUCTS** — A complete line of products helps you protect your boating investment. *2+4 Fuel Conditioner*, Engine Tuner, fogging oil, paints, cleaners, greases, and more help maintain your engine at maximum performance and reliability.

**FUEL** — Fuel system and oil injection system components and optional equipment kits specifically engineered for your outboard.

**STEERING AND CONTROLS** — Steering system kits and remote controls specifically designed for your outboard to keep you in control. ***Evinrude* and *Johnson* Genuine Parts** control cables feature a patented liner lubrication process for longer life and smoother operation.

**ACCESSORIES** — Optional equipment kits, safety equipment, and performance products will help you enjoy your time on the water.

# CHANGE OF ADDRESS / CHANGE OF OWNERSHIP

If your address has changed or if there has been a change of ownership, be sure to fill out and mail the card provided on this page.

Such notification is likewise necessary for your own safety even after expiration of the original warranty, since Bombardier will be in a position to contact you if correction to your outboard becomes necessary.

Outside the U.S. and Canada, this card should be sent to the Bombardier division where the outboard was registered. Please contact your Dealer or Distributor.



Change of address

Change of ownership

Model number

Serial Number

## Old address / Previous owner

Last name

First name  M.I.

Address

City  State

Zip code  Country

Phone number

Signature \_\_\_\_\_ Date \_\_\_\_\_

## New address / New owner

Last name

First name  M.I.

Address

City  State

Zip code  Country

Phone number

Signature \_\_\_\_\_ Date \_\_\_\_\_

000063

AFFIX  
STAMP  
HERE



**EVINRUDE / JOHNSON**  
**DEALER SUPPORT SERVICES**  
**250 SEAHORSE DRIVE**  
**WAUKEGAN, IL 60085**

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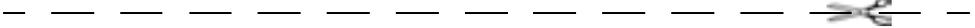


# Operator's Guide Confirmation of Receipt

## Your DEALER

Name:	_____
	_____
Address:	_____
	_____
	_____

Upon delivery of your new *Evinrude/Johnson* Outboard, complete and sign the form hereunder. Your DEALER will take receipt of the form for their records.



## Receipt

Name:	_____
	_____
Address:	_____
	_____
	_____
Owner of Model No:	_____
Serial No:	_____
	(To be completed by customer or selling DEALER)
<p>The dealer named on this document has instructed me on the operation, maintenance, safety features and warranty policy, all of which I understand and agree to be bound with. I am also satisfied with the predelivery set-up and inspection of my <i>Evinrude/Johnson</i> Outboard. I have also received a copy of the Operator's Guide.</p>	
Signature:	_____
Date:	_____

# Readiness Test and a Final Word to the Owner/Operator

The Operator's Readiness Test...

1. Did you read this Guide from front cover to rear cover?
2. Are you ready to take responsibility for the safe operation of your boat and motor?
3. Do you understand all the safety precautions and instructions contained in this Guide?
4. Do you understand that this Guide contains essential information to help prevent personal injury and damage to equipment?
5. Are you ready to follow the recommendations in this Guide and take a boating safety course before you operate your boat and motor?
6. Do you know who to ask if you have any questions about your boat and motor?
7. Do you know your local marine traffic laws?
8. Do you understand that human error can be caused by carelessness, fatigue, overload, preoccupation, unfamiliarity of operator with the product, drugs and alcohol, just to name a few?



## WARNING



**It is impossible for this Guide to cover every hazardous situation you may encounter; however, your understanding of and adherence to essential information contained in this Guide will build good judgment when boating. Always be alert and careful: a good foundation for safety.**

