
SEA-DOO
BRP
2008
SHOP MANUAL
4-TEC™
SERIES
219 100 313

SEA-DOO®

BRP

# 2009
# SHOP MANUAL SUPPLEMENT

# 4-TEC™ Series

**This Supplement must be used in conjunction with the 2008 Shop Manual P/N 219 100 313.**

219 100 369

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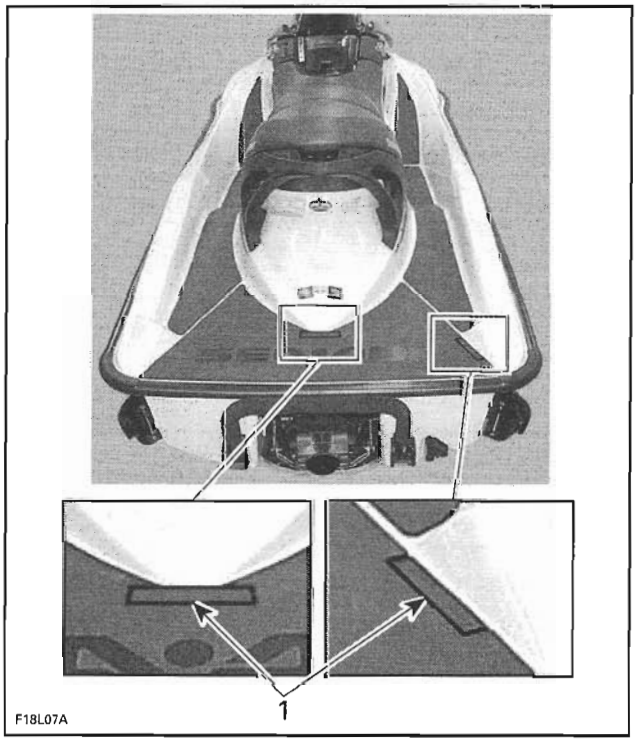
# VEHICLE INFORMATION

## Hull Identification Number (H.I.N.)

The hull identification number is composed of 12 digits:

| YDV | 12345 | L | 4 | 95 |
|---|---|---|---|---|
| | | | | Model year |
| | | | | Year of production |
| | | | | Month of production |
| | | | | Serial number (a letter may also be used as a digit) |
| | | | | Manufacturer |

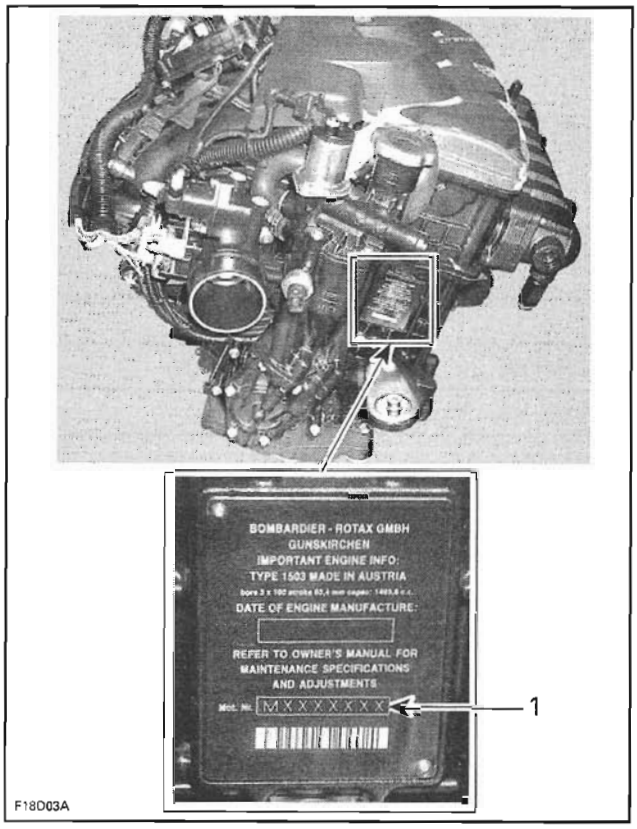
It is located on footboard at the rear of watercraft.




*TYPICAL*
*1. Hull Identification Number (H.I.N.)*

## Engine Identification Number (E.I.N.)

The Engine Identification Number is located on front end of the engine.

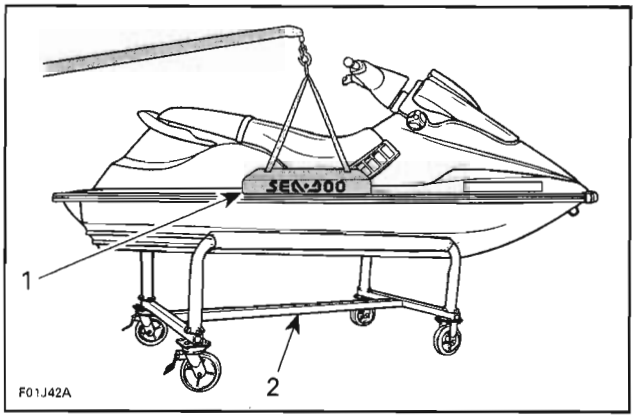



*1. Engine Identification Number (E.I.N.)*

# WORKING ON WATERCRAFT

To work on watercraft, securely install it on a stand. Thus, if access is needed to water inlet area, it will be easy to slide underneath watercraft.

The lift kit (P/N 295 100 205) can be used to install watercraft on a stand.




*TYPICAL*
*1. Lift kit*
*2. Work stand*

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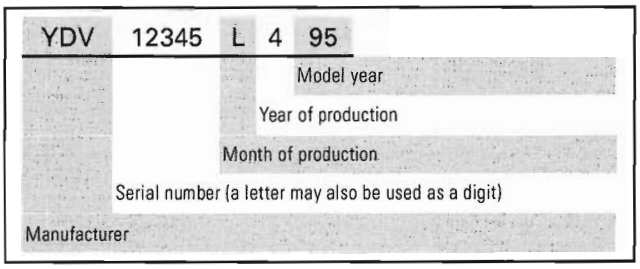
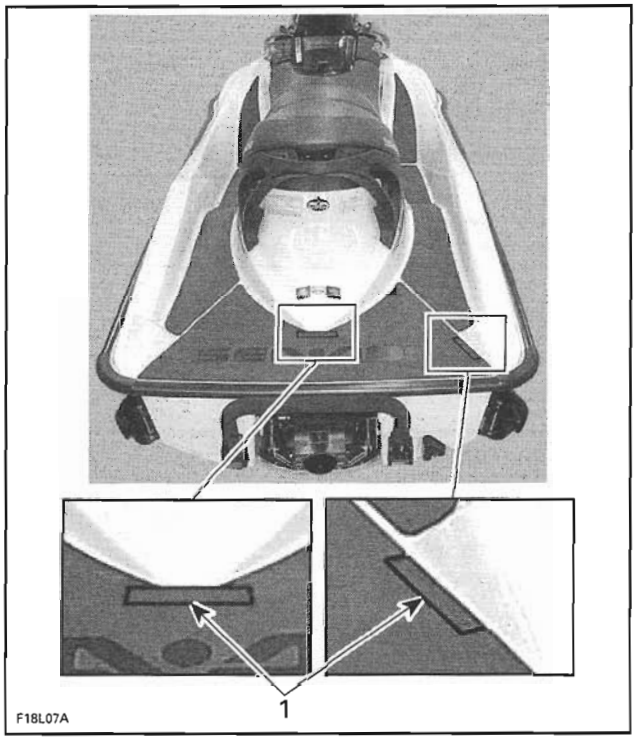



It is located on footboard at the rear of watercraft.

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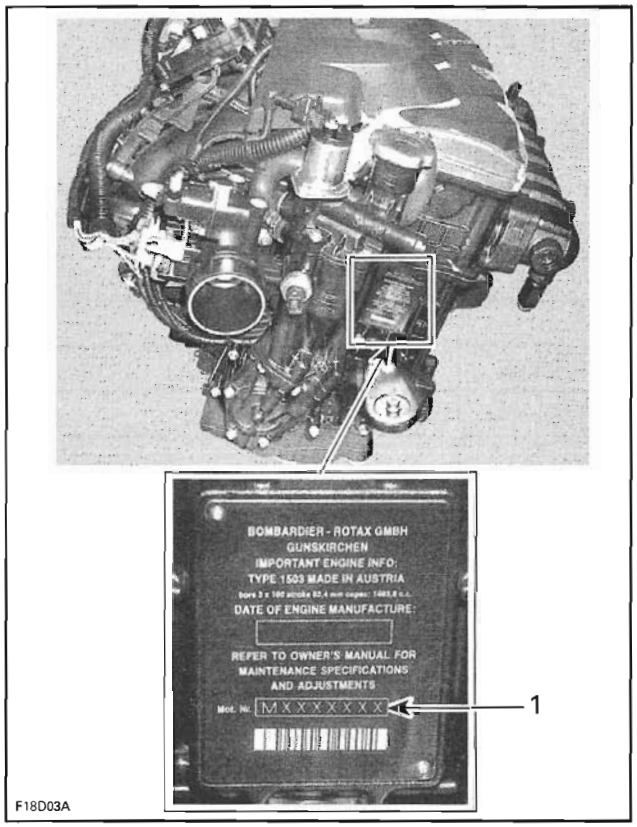


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## WORKING ON WATERCRAFT

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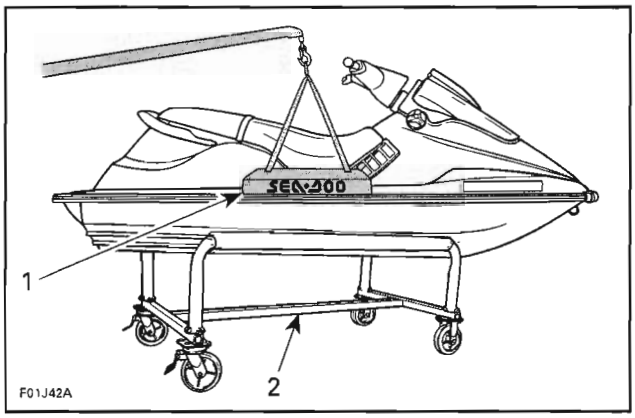



*TYPICAL*
*1. Lift kit*
*2. Work stand*

# ENGINE EMISSIONS INFORMATION

## Manufacturer's Responsibility

Beginning with 1999 model year engines, PWC manufacturers of marine engines must determine the exhaust emission levels for each engine horsepower family and certify these engines with the United States of America Environmental Protection Agency (EPA). An emissions control information label, showing emission levels and engine specifications, must be placed on each vehicle at the time of manufacture.

## Dealer Responsibility

When performing service on all 1999 and more recent SEA-DOO watercrafts that carry an emissions control information label, adjustments must be kept within published factory specifications.

Replacement or repair of any emission related component must be executed in a manner that maintains emission levels within the prescribed certification standards.

Dealers are not to modify the engine in any manner that would alter the horsepower or allow emission levels to exceed their predetermined factory specifications.

Exceptions include manufacturer's prescribed changes, such as altitude adjustments for example.

## Owner Responsibility

The owner/operator is required to have engine maintenance performed to maintain emission levels within prescribed certification standards.

The owner/operator is not to, and should not allow anyone to modify the engine in any manner that would alter the horsepower or allow emissions levels to exceed their predetermined factory specifications.

## EPA Emission Regulations

All new 1999 and more recent SEA-DOO watercrafts manufactured by BRP are certified to the EPA as conforming to the requirements of the regulations for the control of air pollution from new watercraft engines. This certification is contingent on certain adjustments being set to factory standards. For this reason, the factory procedure for servicing the product must be strictly followed and, whenever practicable, returned to the original intent of the design.

The responsibilities listed above are general and in no way a complete listing of the rules and regulations pertaining to the EPA requirements on exhaust emissions for marine products. For more detailed information on this subject, you may contact the following locations:

FOR ALL COURIER SERVICES:
U.S. Environmental Protection Agency
Office of Transportation and Air Quality
1310 L Street NW
Washington D.C. 20005

REGULAR US POSTAL MAIL:
1200 Pennsylvania Ave. NW
Mail Code 6403J
Washington D.C. 20460

INTERNET: http://www.epa.gov/otaq/

E-MAIL: otaqpublicweb@epa.gov

## TIGHTENING TORQUE

Tighten fasteners to torque mentioned in exploded views and/or text, When they are not specified, refer to following table.

**⚠ WARNING**

**Torque wrench tightening specifications must be strictly adhered to.**
**Locking devices (e.g.: locking tabs, elastic stop nuts, self-locking fasteners, cotter pins, etc.) must be replaced with new ones.**

In order to avoid a poor assembling, tighten screws, bolts or nuts in accordance with the following procedure:

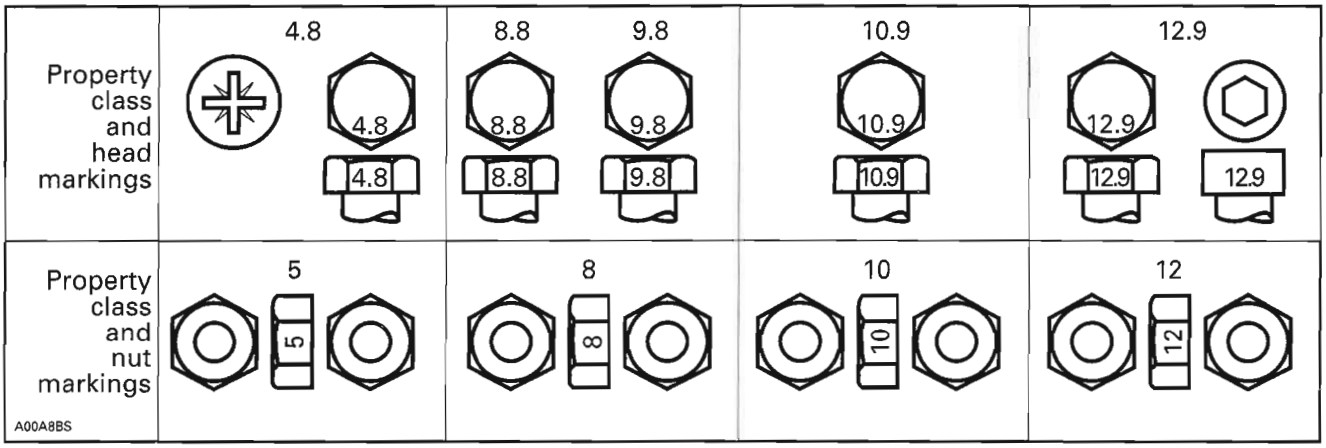
- Manually screw all screws, bolts and/or nuts.
- Apply the half of the recommended torque value.

**CAUTION: Be sure to use proper tightening torque for the proper strength grade.**

NOTE: When possible, always apply torque on the nut.

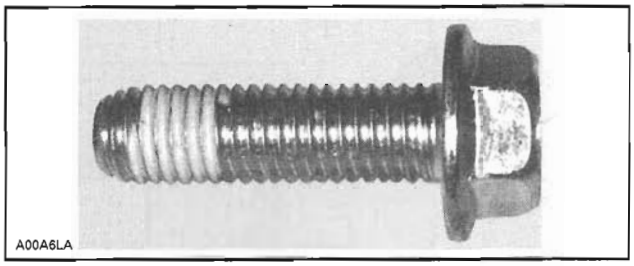
- Torque at the recommended torque value.

NOTE: Always torque screws, bolts and/or nuts in a crisscross sequence.




| FASTENER SIZE | FASTENER GRADE/TORQUE | | | |
|---|---|---|---|---|
| | **5.8** Grade | **8.8** Grade | **10.9** Grade | **12.9** Grade |
| M4 | 1.5 – 2 N•m (13 – 18 lbf•**in**) | 2.5 – 3 N•m (22 – 27 lbf•**in**) | 3.5 – 4 N•m (31 – 35 lbf•**in**) | 4 – 5 N•m (35 – 44 lbf•**in**) |
| M5 | 3 – 3.5 N•m (27 – 31 lbf•**in**) | 4.5 – 5.5 N•m (40 – 47 lbf•**in**) | 7 – 8.5 N•m (62 – 75 lbf•**in**) | 8 – 10 N•m (71 – 89 lbf•**in**) |
| M6 | 6.5 – 8.5 N•m (58 – 75 lbf•**in**) | 8 – 12 N•m (71 – 106 lbf•**in**) | 10.5 – 15 N•m (93 – 133 lbf•**in**) | 16 N•m (142 lbf•**in**) |
| M8 | 15 N•m (133 lbf•**in**) | 25 N•m (18 lbf•ft) | 32 N•m (23 lbf•ft) | 40 N•m (30 lbf•ft) |
| M10 | 29 N•m (21 lbf•ft) | 48 N•m (35 lbf•ft) | 61 N•m (45 lbf•ft) | 73 N•m (53 lbf•ft) |
| M12 | 52 N•m (38 lbf•ft) | 85 N•m (63 lbf•ft) | 105 N•m (77 lbf•ft) | 128 N•m (94 lbf•ft) |
| M14 | 85 N•m (63 lbf•ft) | 135 N•m (100 lbf•ft) | 170 N•m (125 lbf•ft) | 200 N•m (148 lbf•ft) |

## SELF-LOCKING FASTENERS PROCEDURE




*TYPICAL — SELF-LOCKING FASTENER*

The following describes the most common application procedures when working with self-locking fasteners.

Use a metal brush or a tap to clean the hole properly then use a solvent, let act during 30 minutes and wipe off. The solvent utilization is to ensure the adhesive works properly.

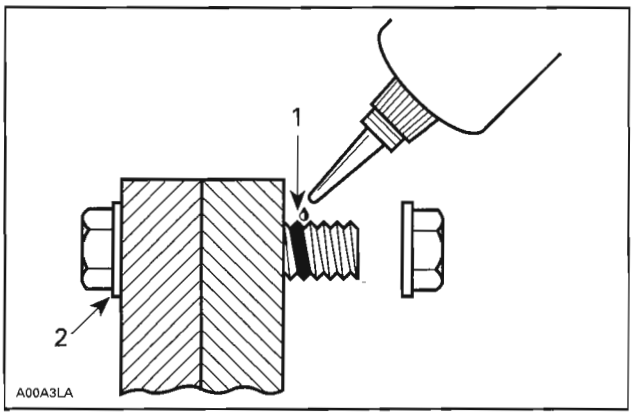
## LOCTITE® APPLICATION PROCEDURE

The following describes the most common application procedures when working with Loctite products.

**NOTE:** Always use proper strength Loctite product as recommended in this shop manual.

### Threadlocker

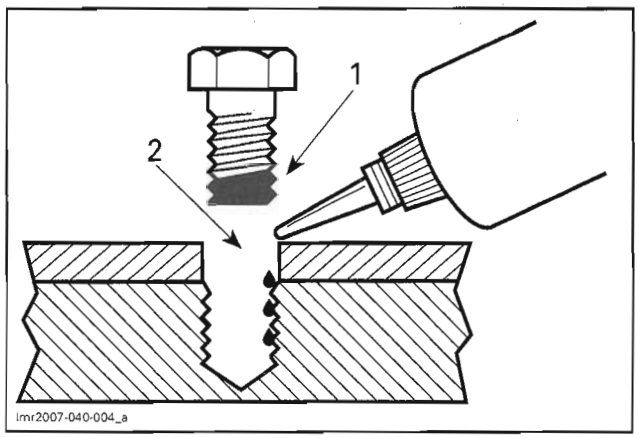
#### Uncovered Holes (bolts and nuts)




*1. Apply here*
*2. Do not apply*

- Clean threads (bolt and nut) with solvent.
- Apply Loctite Primer N (P/N 293 800 041) on threads and allow to dry.
- Choose proper strength Loctite threadlocker.
- Fit bolt in the hole.
- Apply a few drops of threadlocker at proposed tightened nut engagement area.
- Position nut and tighten as required.

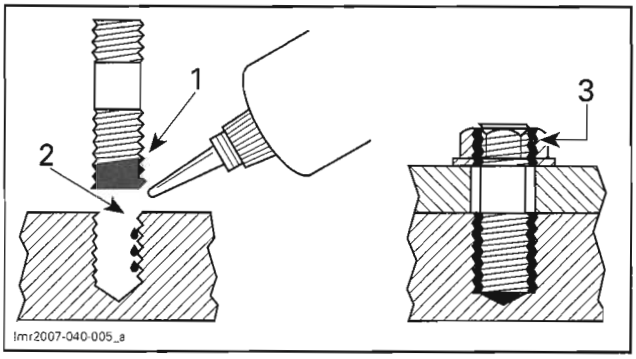
#### Blind Holes




*1. On threads*
*2. On threads and at the bottom of hole*

- Clean threads (bolt and hole) with solvent.
- Apply Loctite Primer N (P/N 293 800 041) on threads (bolt and nut) and allow to dry for 30 seconds.
- Choose proper strength Loctite threadlocker.
- Apply several drops along the threaded hole and at the bottom of the hole.
- Apply several drops on bolt threads.
- Tighten as required.

#### Stud in Blind Holes



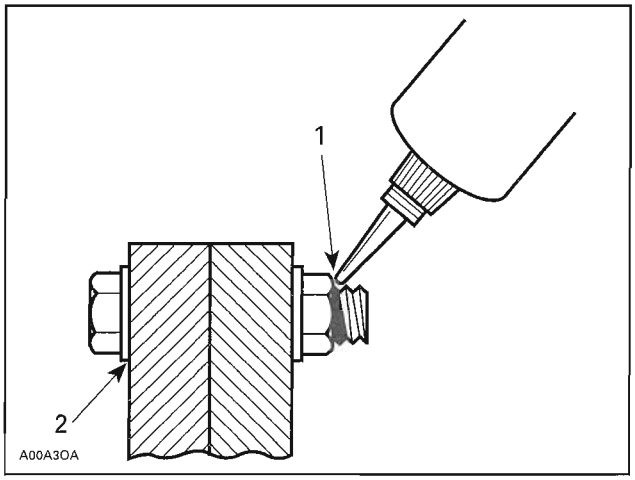

*1. On threads*
*2. On threads and in the hole*
*3. Onto nut threads*

- Clean threads (stud and hole) with solvent.
- Apply Loctite Primer N (P/N 293 800 041) on threads and allow to dry.
- Put 2 or 3 drops of proper strength Loctite threadlocker on female threads and in hole.

NOTE: To avoid a hydro lock situation, do not apply too much Loctite.

- Apply several drops of proper strength Loctite on stud threads.
- Install stud.
- Install cover, etc.
- Apply drops of proper strength Loctite on uncovered threads.
- Tighten nuts as required.

### Pre-Assembled Parts

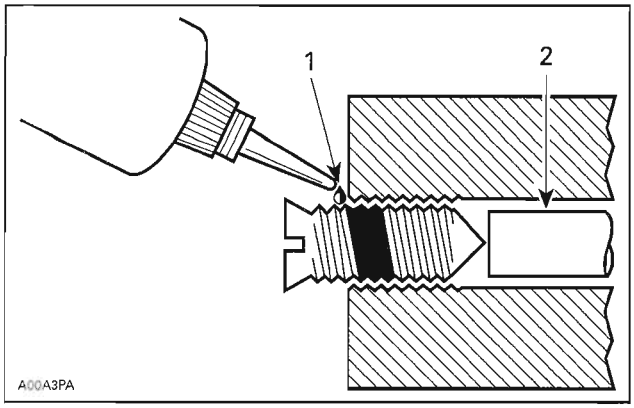



*1. Apply here*
*2. Do not apply*

- Clean bolts and nuts with solvent.
- Assemble components.
- Tighten nuts.
- Apply drops of proper strength Loctite on bolt/nut contact surfaces.
- Avoid touching metal with tip of flask.

NOTE: For preventive maintenance on existing equipment, retighten nuts and apply proper strength Loctite on bolt/nut contact surfaces.

### Adjusting Screw

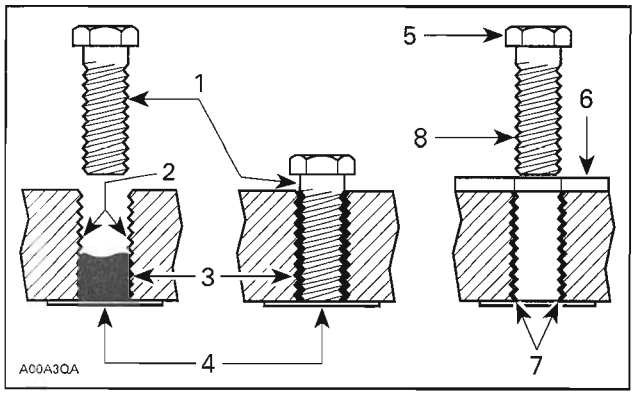



*1. Apply here*
*2. Plunger*

- Adjust screw to proper setting.
- Apply drops of proper strength Loctite threadlocker on screw/body contact surfaces.
- Avoid touching metal with tip of flask.

NOTE: If it is difficult to readjust, heat screw with a soldering iron (232°C (450°F)).

## Stripped Thread Repair




*1. Release agent*
*2. Stripped threads*
*3. Form-A-Thread*
*4. Tapes*
*5. Cleaned bolt*
*6. Plate*
*7. New threads*
*8. Threadlocker*

### Standard Thread Repair

– Follow instructions on Loctite FORM-A-THREAD 81668 package.
– If a plate is used to align bolt:

a. Apply release agent on mating surfaces.
b. Put waxed paper or similar film on the surfaces.

– Twist bolt when inserting it to improve thread conformation.

NOTE: NOT intended for engine stud repairs.

### Repair of Small Holes/Fine Threads

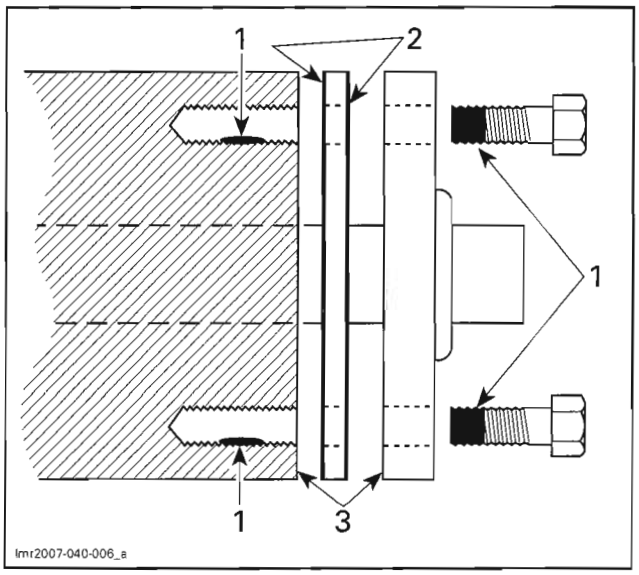
**Option 1:** Enlarge damaged hole, then follow *STANDARD THREAD REPAIR* procedure.

**Option 2:** Apply FORM-A-THREAD on the screw and insert in damaged hole.

### Permanent Stud Installation (light duty)

- Use a stud or thread on desired length.
- DO NOT apply release agent on stud.
- Do a *STANDARD THREAD REPAIR*.
- Allow to cure for 30 minutes.
- Assemble.

## Gasket Compound




*1. Proper strength Loctite*
*2. Loctite Primer N (P/N 293 800 041) and Loctite 518 (P/N 293 800 038) on both sides of gasket*
*3. Loctite Primer N only*

- Remove old gasket and other contaminants with Loctite Chisel (gasket remover (P/N 413 708 500). Use a mechanical mean if necessary.

NOTE: Avoid grinding.

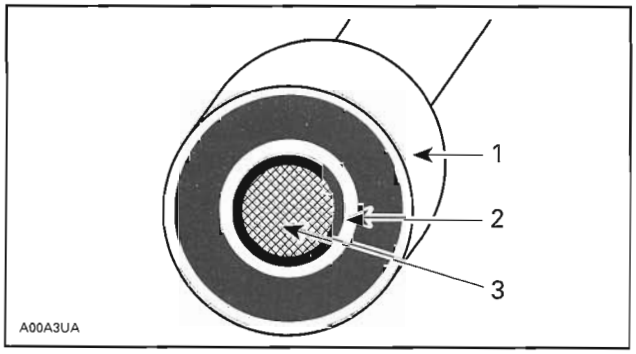
- Clean both mating surfaces with solvent.
- Spray Loctite Primer N on both mating surfaces and on both sides of gasket. Allow to dry 1 or 2 minutes.
- Apply Loctite 518 (P/N 293 800 038) on both sides of gasket, using a clean applicator.
- Place gasket on mating surfaces and assemble immediately.

NOTE: If the cover is bolted to blind holes (above), apply proper strength Loctite in the hole and on threads. Tighten.

- If holes are sunken, apply proper strength Loctite on bolt threads.
- Tighten as usual.

## Mounting on Shaft

### Mounting with a Press




*1. Bearing*
*2. Proper strength Loctite*
*3. Shaft*

- Clean shaft external part and element internal part.
- Apply a strip of proper strength Loctite on shaft circumference at insert or engagement point.

NOTE: Retaining compound is always forced out when applied on shaft.

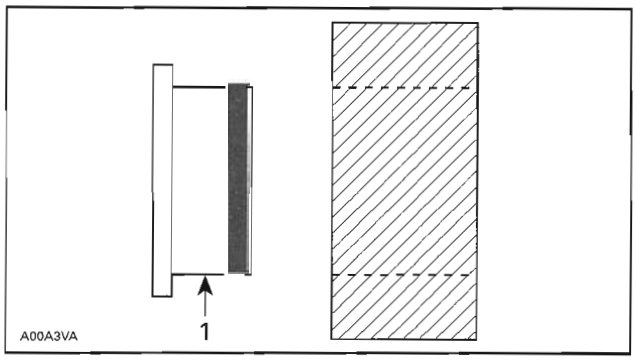
- DO NOT use antiseize Loctite or any similar product.
- No curing period is required.

### Mounting in Tandem

- Apply retaining compound on internal element bore.
- Continue to assemble as shown above.

## Case-In Components

### Metallic Gaskets




*1. Proper strength Loctite*

- Clean inner housing diameter and outer gasket diameter.

- Spray housing and gasket with Loctite Primer N (P/N 293 800 041).
- Apply a strip of proper strength Loctite on leading edge of outer metallic gasket diameter.

NOTE: Any Loctite product can be used here. A low strength liquid is recommended as normal strength and gap are required.

- Install according to standard procedure.
- Wipe off surplus.
- Allow it to cure for 30 minutes.

NOTE: Normally used on worn-out housings to prevent leaking or sliding.

It is generally not necessary to remove gasket compound applied on outer gasket diameter.

## MANUAL INFORMATION

The manual is divided into many major sections as you can see in the main table of contents at the beginning of the manual.

Each section is divided in various subsections, and again, each subsection has one or more division.

Illustrations and photos show the typical construction of the different assemblies and, in all cases, may not reproduce the full detail or exact shape of the parts shown. However, they represent parts which have the same or a similar function.

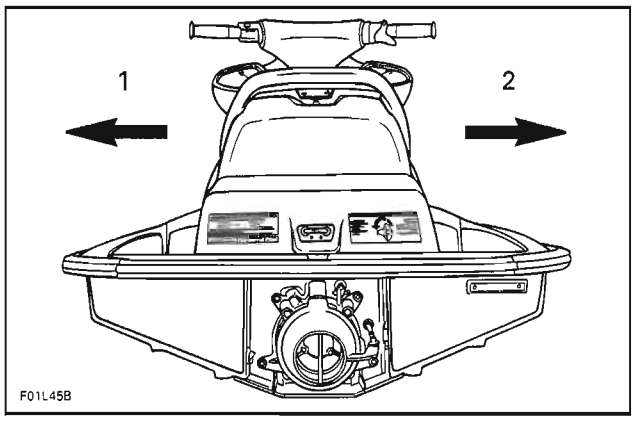
**CAUTION: Most components of those vehicles are built with parts dimensioned in the metric system. Most fasteners are metric and must not be replaced by customary fasteners or vice-versa. Mismatched or incorrect fasteners could cause damage to the vehicle or possible personal injury.**

As many of the procedures in this manual are interrelated, we suggest, that before undertaking any task, you read and thoroughly understand the entire section or subsection in which the procedure is contained.

A number of procedures throughout the book require the use of special tools. Before commencing any procedure, be sure that you have on hand all the tools required, or approved equivalents.

The use of RIGHT (starboard) and LEFT (port) indications in the text, always refers to driving position (when sitting on watercraft).

Besides, in the marine industry, FRONT is called BOW and REAR is called STERN.

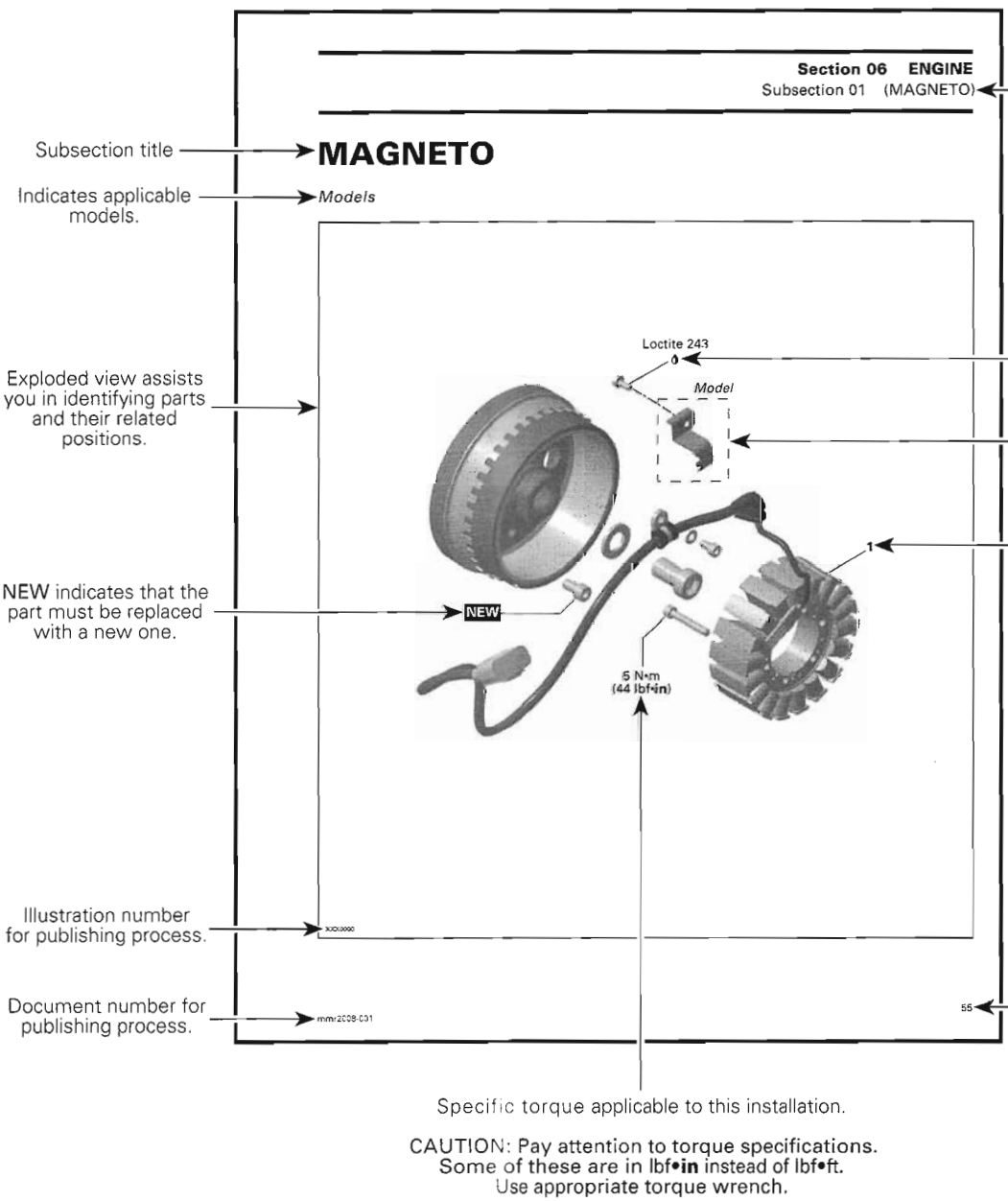



*1. Left (port)*
*2. Right (starboard)*

This manual uses technical terms which may be different from the ones of the *PARTS CATALOGS*.

When ordering parts always refer to the specific model *PARTS CATALOGS*.

## TYPICAL PAGE

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## TYPICAL PAGE



Tittle in bold indicates category of information to be carried out.

### GENERAL

NOTE: The following procedures can be done without removing the engine.

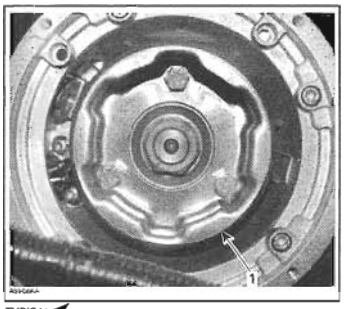
During assembly/installation, use the torque values and service products as in the exploded views.

Clean threads before applying a threadlocker. Refer to *SELF-LOCKING FASTENERS* and *LOCTITE APPLICATION* sections at the beginning of this manual for complete procedure.

Reference to a specific section or subsection.

**⚠ WARNING**

**Torque wrench tightening specifications must be strictly adhered to.**
**Locking devices (e.g.: locking tabs, elastic stop nuts, self-locking fasteners, etc.) must be replaced with new ones.**




*TYPICAL*
*1. Starting pulley*

"TYPICAL" indicates a general view which may not represent exact details.

Call-outs pertaining to above illustration.

### PROCEDURES

Indicates component procedures apply to.

MAGNETO FLYWHEEL

Magneto Flywheel Cleaning

Clean all metal components in a non-ferrous metal cleaner.

**CAUTION: Clean magneto flywheel using only a clean cloth.**

Indicates specific procedure to be carried out.

Magneto Flywheel Removal

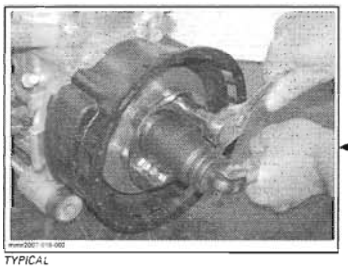
Remove muffler, refer to the *EXHAUST SYSTEM* section.

Remove acoustic panel.

Remove rewind starter.

Remove starting pulley **no. 2**.

NOTE: To remove starting pulley bolts, hold magneto flywheel with a socket as shown.



*TYPICAL*

Illustration always follows text to which it applies.

***Models***

*Remove the connecting flange retaining the rewind starter to the engine housing.*

Italic bold face typesetting indicates a procedure applicable to a specific model(s).

Bold face number following part name refers to exploded view at beginning of subsection.



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# MAINTENANCE CHART

The schedule should be adjusted according to operating conditions and use.

NOTE: The chart gives an equivalence between number of hours and months/year. Perform the maintenance operation to whatever time comes first.

IMPORTANT: Watercraft rental operations or intensive use of watercraft, will require greater frequency of inspection and maintenance.

| 4-TEC MODELS | | | | | | |
|---|---|---|---|---|---|---|
| A: ADJUST<br>C: CLEAN<br>I: INSPECT<br>L: LUBRICATE<br>R: REPLACE | FIRST 10 HOURS | EVERY 25 HOURS OR 3 MONTHS | EVERY 50 HOURS OR 6 MONTHS | EVERY 100 HOURS OR 1 YEAR | EVERY 200 HOURS OR 2 YEAR | |
| PART/TASK | | | | | | REFER TO |
| **ENGINE** | | | | | | |
| Engine oil and filter | R | | | R (1) | | *LUBRICATION SYSTEM* |
| Rubber mounts | I | | | I | | *ENGINE REMOVAL/INSTALLATION* |
| Exhaust system (2) | I | | | I, C (3) | | *EXHAUST SYSTEM* |
| Supercharger clutch | (4) | | | | | *SUPERCHARGER* |
| Lubrication/corrosion protection | | | L | | | *STORAGE PROCEDURES* |
| **COOLING SYSTEM** | | | | | | |
| Hose and fasteners | I | | | | | *COOLING SYSTEM* |
| Coolant | I | | | | R | |
| **FUEL SYSTEM** | | | | | | |
| Throttle cable | I | | | I (1) | | *STEERING SYSTEM* |
| Throttle body (IMPORTANT: see (5)) | I | | | L | | *ELECTRONIC FUEL INJECTION (EFI)* |
| Fuel cap, filler neck, fuel tank, fuel lines and connections | I | | | I | | *FUEL TANK/FUEL PUMP* |
| Fuel system leak test | I | | | I | | |
| Fuel tank straps | I | | | I | | |
| **AIR INTAKE SYSTEM** | | | | | | |
| Air intake silencer | I | | | I | | *AIR INTAKE SYSTEM* |
| Intercooler (255 engines) | | | | I, C | | *INTERCOOLER (255 ENGINES)* |
| **ELECTRICAL SYSTEM** | | | | | | |
| Spark plug | I | | | I | R | *IGNITION SYSTEM* |
| Electrical connections and fastening (ignition system, starting system, fuel injectors etc.) | I | | | I | | *ELECTRICAL SYSTEM* |
| Digitally Encoded Security System (DESS) | I | | | I | | *DIGITALLY ENCODED SECURITY SYSTEM* |
| Monitoring beeper | I | | | I | | *GAUGE/FUSES* |
| Battery and fasteners | I | | | I | | *CHARGING SYSTEM* |
| **ENGINE MANAGEMENT SYSTEM** | | | | | | |
| EMS sensors | | | | I | | *ENGINE MANAGEMENT SYSTEM* |
| EMS fault codes | I | | | I | | |

| 4-TEC MODELS | | | | | | |
|---|---|---|---|---|---|---|
| A: ADJUST<br>C: CLEAN<br>I: INSPECT<br>L: LUBRICATE<br>R: REPLACE | FIRST 10 HOURS | EVERY 25 HOURS OR 3 MONTHS | EVERY 50 HOURS OR 6 MONTHS | EVERY 100 HOURS OR 1 YEAR | EVERY 200 HOURS OR 2 YEAR | |
| PART/TASK | | | | | | REFER TO |
| **STEERING SYSTEM** | | | | | | |
| Steering cable and connections | I | | | I | | *STEERING SYSTEM* |
| Steering nozzle bushings | I | | | I | | |
| Off-power assisted steering (O.P.A.S.) | I | | | I | | *OFF-POWER ASSISTED STEERING SYSTEM (O.P.A.S.)* |
| **PROPULSION SYSTEM** | | | | | | |
| Drive shaft | | | | L (1) | | *DRIVE SYSTEM* |
| Carbon ring and rubber boot (drive shaft) | I | | | I | | |
| Reverse system, cable and connections | I | | | I | | *REVERSE SYSTEM* |
| VTS (Variable Trim System) (if so equipped) | I | | | I | | *VARIABLE TRIM SYSTEM (VTS)* |
| Drive shaft/impeller splines | | | | I, L | | *JET PUMP and DRIVE SYSTEM* |
| Impeller boot | I | | | I | | *JET PUMP* |
| Impeller shaft seal, sleeve and O-ring | | | | I (1) | | |
| Impeller and wear ring clearance | I | | | I | | |
| Sacrificial anode | (6) | | | | | |
| **HULL/BODY** | | | | | | |
| Ride plate and water intake grate | I | | | I | | *BODY/HULL* |
| Drain plugs (inside bilge), check for obstructions | I | | | I | | |
| Hull | I | | | I | | |
| Ski/wakeboard post and fasteners | I | | | | | |

(1) In fresh water, perform for storage period or after 100 hours of use whichever comes first. In salt water use, lubricate drive shaft as indicated to protect it from corrosion.

(2) Including intercooler on supercharged models.

(3) Daily flushing in salt water or foul water use.

(4) The supercharger requires replacement when the MAINTENANCE SUPERCHARGER message is displayed on the information center every 100 hours of operation or earlier depending on the riding style (speed, engine RPM's, water conditions). This is determined by the engine management system. The supercharger will need to be replaced within 5 hours of the message display by an authorized Sea-doo dealer.

(5) IMPORTANT: When use in salt water, the throttle body lubrication is highly recommended after every 10 hours of use. Failure to perform lubrication will result in damage to the throttle body.

6) In salt water use.

# PRESEASON PREPARATION

Proper vehicle preparation is necessary after the winter months or when a vehicle has not been used during several weeks.

Any worn, broken or damaged parts found during the storage procedure should have been replaced. If not, proceed with the replacement.

**⚠ WARNING**

Unless otherwise specified, engine should be turned off during preseason preparation procedure.

| PRESEASON PREPARATION | TO BE PERFORMED BY | | REFER TO |
|---|---|---|---|
| | CUSTOMER | DEALER | |
| ENGINE | | | |
| Exhaust system and intercooler hoses condition and fasteners inspection | | ✔ | *EXHAUST SYSTEM* |
| Oil level (1) | | ✔ | *LUBRICATION SYSTEM* |
| Corrosion protection | ✔ | | *STORAGE PROCEDURES* |
| COOLING SYSTEM | | | |
| Coolant level (2) | | ✔ | *COOLING SYSTEM* |
| Hoses and fasteners | | ✔ | |
| FUEL SYSTEM | | | |
| Fuel system leak test | | ✔ | *FUEL TANK/ FUEL PUMP* |
| Condition of fuel cap, filler neck, fuel tank, fuel lines and connections | | ✔ | |
| Fuel tank straps | ✔ | | |
| Refill fuel tank | ✔ | | Refer to the appropriate *OPERATOR'S GUIDE* |
| ELECTRICAL SYSTEM | | | |
| Spark plugs (3) | | ✔ | *IGNITION SYSTEM* |
| Battery condition/charging and installation | | ✔ | *CHARGING SYSTEM* |
| Monitoring beeper verification | | ✔ | *GAUGE/FUSES* |
| Digitally Encoded Security System (DESS) | | ✔ | *DIGITALLY ENCODED SECURITY SYSTEM* |
| ENGINE MANAGEMENT SYSTEM | | | |
| EMS fault codes | | ✔ | *ENGINE MANAGEMENT* |
| STEERING SYSTEM | | | |
| Steering adjustment and inspection | | ✔ | *STEERING SYSTEM* |
| Check O.P.A.S. condition | | ✔ | *OFF-POWER ASSISTED STEERING* |

| PRESEASON PREPARATION | TO BE PERFORMED BY | | REFER TO |
|---|---|---|---|
| | CUSTOMER | DEALER | |
| PROPULSION SYSTEM | | | |
| Shifter system condition and cable adjustment | | ✔ | *REVERSE SYSTEM* |
| Variable Trim System (VTS) condition (if so equipped) | | ✔ | *VTS SYSTEM* |
| Propulsion system inspection | | ✔ | *JET PUMP* and *DRIVE SYSTEM* |
| HULL AND BODY | | | |
| Inspection of bilge drain plugs | | ✔ | *BODY/HULL* |
| Ski/wakeboard post and fasteners (if so equipped) | ✔ | | |

(1) If oil and filter were not replaced at storage, proceed with oil change.

(2) Replace every 200 hours or 2 years.

# STORAGE PROCEDURE

## SERVICE TOOLS

| Description | Part Number | Page |
|---|---|---|
| quick connector | 293 710 077 | 7 |

## SERVICE PRODUCTS

| Description | Part Number | Page |
|---|---|---|
| anticorrosion spray | 219 700 304 | 5 |
| XP-S Lube | 293 600 016 | 5, 7 |
| Loctite 767 (antiseize lubricant) | 293 800 070 | 7 |
| BRP fuel stabilizer | 413 408 600 | 5 |
| Dow Corning 111 | 413 707 000 | 7 |
| storage oil | 413 711 600 | 7 |
| storage oil (US) | 413 711 900 | 7 |

## PROCEDURES

## PROPULSION SYSTEM

### Jet Pump Cleaning

Clean jet pump by spraying water in its inlet and outlet and then apply a coating of XP-S Lube (P/N 293 600 016) or equivalent.

**⚠ WARNING**

Always remove safety lanyard cap from post to prevent unexpected engine starting before cleaning the jet pump area. Engine must not be running for this operation.

### Jet Pump Inspection

Remove cone and check if jet pump is water contaminated; if so, refer to *JET PUMP* section for the repair procedure.

### Drive Shaft Corrosion Protection

If the vehicle is used in salt water, apply the anticorrosion spray (P/N 219 700 304) on drive shaft. Refer to *DRIVE SYSTEM* section.

## FUEL SYSTEM

### Fuel System Inspection

Verify fuel system. Check fuel hoses for leaks. Replace damaged hoses or clamps if necessary.

### Fuel System Protection

The BRP fuel stabilizer (P/N 413 408 600) or equivalent should be added in fuel tank to prevent fuel deterioration and fuel system gumming. Follow manufacturer's instructions for proper use.

**CAUTION:** Fuel stabilizer should be added prior to engine lubrication to ensure fuel system components protection against varnish deposits.

Fill up fuel tank completely. Ensure there is no water inside fuel tank.

**⚠ WARNING**

Always stop the engine before refueling. Fuel is inflammable and explosive under certain conditions. Always work in a well ventilated area. Do not smoke or allow open flames or sparks in the vicinity. Fuel tank may be pressurized, slowly turn cap when opening. When fueling, keep watercraft level. Do not overfill or top off the fuel tank and leave watercraft in the sun. As temperature increases, fuel expands and might overflow. Always wipe off any fuel spillage from the watercraft. Periodically inspect fuel system.

**CAUTION:** Should any water be trapped inside fuel tank, severe internal damage will occur to the fuel injection system.

### Throttle Body Lubrication

Lubricate throttle body. Refer to *ELECTRONIC FUEL INJECTION (EFI)* section.

## ENGINE

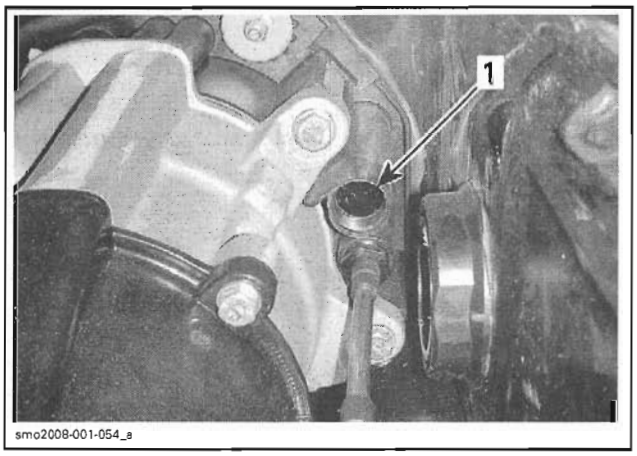
### Engine Oil and Filter Replacement

Change engine oil and filter. Refer to *LUBRICATION SYSTEM* section.

### Exhaust System Flushing

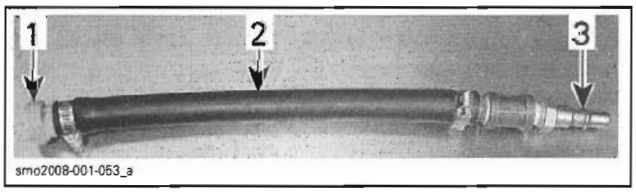
The exhaust system is self draining, but the intercooler (supercharged models) and exhaust manifold needs to be drained to avoid damages if watercraft is stored in area where freezing weather is present.

Using the flushing connector on jet pump support, inject pressurized air (around 689 kPa (100 PSI)) into system until there is no more water flowing from jet pump.




*1. Flushing connector — location may differ*

The following hose can be fabricated to ease draining procedure.




*TYPICAL*
*1. Flushing adaptor (P/N 295 500 473)*
*2. Hose 12.7 mm (1/2 in)*
*3. Air hose male adapter*

**CAUTION:** Failure to drain the intercooler (supercharged models) and exhaust manifold may cause severe damage to these components.

On **255 engines**, the intercooler might also have water on the air side caused by humidity condensation. Therefore, the intercooler needs to be drained on the air side.

To drain the air side of intercooler, do the following:

- Remove inlet and outlet air hoses.
- Remove the bleed hose.
- Detach straps retaining the intercooler.
- Position the intercooler with the air openings downward for approximately 30 minutes.

### Engine Coolant Replacement

Antifreeze should be replaced every 200 hours or every two years to prevent antifreeze deterioration.

**CAUTION: Failure to replace the antifreeze as recommended may allow its degradation that could result in poor engine cooling.**

If coolant is not replaced, test the coolant density using an antifreeze hydrometer.

Replace coolant if necessary. For the coolant replacement procedure, refer to *COOLING SYSTEM* section.

**CAUTION: Improper antifreeze density might lead coolant to freeze if vehicle is stored in area where freezing point is reached. This would seriously damage the engine.**

### Engine Lubrication

Engine must be lubricated to prevent corrosion on internal parts.

Lubrication of the engine is recommended at the end of the season and before any extended storage period to provide additional corrosion protection. This will lubricate the engine intake valves, the cylinders and the exhaust valves.

To lubricate the engine, proceed as follows:

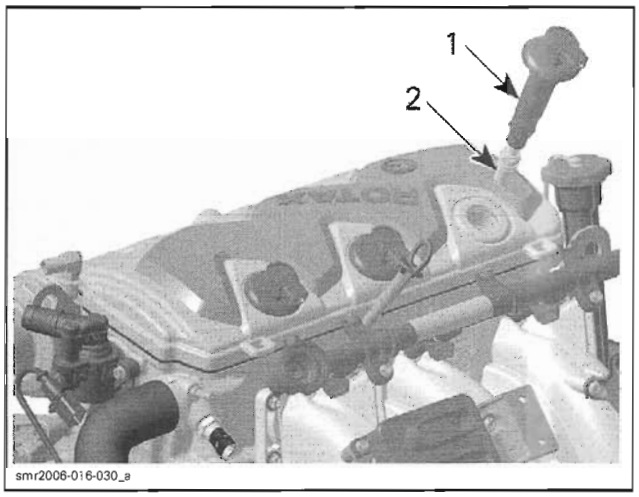
- Pull engine cover upward to remove it.
- Disconnect ignition coil connectors.

**⚠ WARNING**

When disconnecting coil from spark plug, always disconnect coil from main harness first. Never check for engine ignition spark from an open coil and/or spark plug in the engine compartment as spark may cause fuel vapor to ignite.

**CAUTION:** Never cut the locking ties of ignition coil connectors. This would allow mixing the wires between cylinders.

- Clean ignition coil areas to avoid falling dirt into cylinder.
- Remove ignition coils.
- Unscrew spark plugs.
- Using an ignition coil as a puller, remove spark plugs.




1. *Ignition coil*
2. *Spark plug*

- Spray storage oil (P/N 413 711 600) into each spark plug hole.

NOTE: For US citizens, use storage oil (US) (P/N 413 711 900) only.

**CAUTION: Do not inject storage oil into throttle body bore to avoid blocking idle bypass valve.**

To prevent fuel to be injected and also to cut the ignition at the engine cranking, proceed as follows.

- While engine is stopped, fully depress throttle lever and HOLD for cranking.
- Crank the engine a few turns to distribute the oil on cylinder wall.
- Apply Loctite 767 (antiseize lubricant) (P/N 293 800 070) on spark plug threads then reinstall them.
- Prior to inserting the ignition coil to its location, apply some Dow Corning 111 (P/N 413 707 000) around the seal area that touches the spark plug hole.
- Reinstall ignition coils.
- Ensure the seal seats properly with the engine top surface.
- Reconnect ignition coil connectors.
- To reinstall engine cover, push it downward until it snaps.

# ELECTRICAL SYSTEM

## Battery Removal

For battery removal, cleaning and storage, refer to *CHARGING SYSTEM* section.

# VEHICLE

## Ballast

*WAKE Models*

Ballast tanks should be removed from watercraft and flushed with fresh water to remove any marine organisms.

Connect a garden hose to ballast tanks filling hose using the quick connector (P/N 293 710 077) to ease cleaning.

Ballast tanks should be properly stored in a vertical position with drain plugs at the bottom and opened to ensure water drainage.

## Bilge Cleaning

Clean the bilge with hot water and mild detergent or with bilge cleaner.

Rinse thoroughly.

Lift front end of watercraft to completely drain bilge.

## Body Rinsing/Repair

Wash the body with soap and water solution (only use mild detergent). Rinse thoroughly with fresh water. Remove marine organisms from the hull.

Apply a good quality marine wax on body and hull.

**CAUTION: Never clean fiberglass and plastic parts with strong detergent, degreasing agent, paint thinner, acetone, etc.**

If any repairs are needed to body or to the hull, refer to *BODY/HULL* section.

Replace damaged labels/decals.

## Anticorrosion Treatment

Wipe off any residual water in the engine compartment.

Spray XP-S Lube (P/N 293 600 016) over all metallic components in engine compartment.

## Vehicle Protection

The seat and the seat extension should be partially left opened during storage. This will avoid engine compartment condensation and possible corrosion.

If the watercraft is to be stored outside, cover it with an opaque tarpaulin to prevent sun rays and grime from affecting the plastic components, watercraft finish as well as preventing dust accumulation.

**CAUTION:** The watercraft should never be left in water for storage, stored in direct sunlight or stored in a plastic bag.