POLARIS®
WATERCRAFT

2002 OCTANE SERVICE MANUAL

PART NUMBER 9918096

2002 OCTANE PERSONAL WATERCRAFT SERVICE MANUAL

Foreword

This manual is designed primarily for use by Polaris personal watercraft service technicians in a properly equipped shop. Persons using this manual should have a sound knowledge of mechanical theory, tool use, and shop procedures in order to perform the work safely and correctly. The technician should read the text and be familiar with service procedures before starting the work. Certain procedures require the use of special tools. Use only the proper tools, as specified. Cleanliness of parts and tools as well as the work area is of primary importance.

This manual includes procedures for disassembly and reassembly, inspection, maintenance, component identification and unit repair, along with service specifications for the 2002 OCTANE Personal Watercraft. A table of contents is placed at the beginning of each chapter to aid the user in locating specific areas of information.

Care is taken to ensure that all information in this manual was technically correct at the time of publication. However, all materials and specifications are subject to change without notice.

Comments or suggestions about this manual may be directed to: Engineering Services, Technical Writer, Polaris Sales Inc., 2100 Highway 55, Medina, MN 55340.

2002 Octane Service Manual (PN 9918096)

UNDERSTANDING SAFETY LABELS AND INSTRUCTIONS

Throughout these instructions, important information is brought to your attention by the following symbols:

The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

⚠ DANGER

Failure to follow DANGER instructions will result in severe injury or death to the operator, passenger, bystander or person inspecting or servicing the watercraft.

⚠ WARNING

Failure to follow WARNING instructions could result in severe injury or death to the operator, passenger, bystander or person inspecting or servicing the watercraft.

CAUTION:

A CAUTION indicates special precautions that must be taken to avoid minor personal injury, or watercraft or property damage.

NOTE:

A NOTE provides key information to clarify instructions.

Polaris acknowledges the following products mentioned in this manual:

Loctite, Registered Trademark of the Loctite Corporation
FLEXLOC, Registered Trademark of SPS Technologies
MityVac, Registered Trademark of Neward Enterprises
Torx, Trademark of Textron
Teflon, Trademark of DuPont
Alemite, Trademark of Alemite Corporation

NOTE:

The Polaris Octane engine, hull, and components were designed and built by Polaris solely for use in competition by qualified International Jet Sports Boating Association (IJSBA) competition members.

The Octane carburetors are designed not to allow the engine to maintain idle speed. ANY modification to the stock carburetors, or throttle control system designed to override this feature constitutes a violation of EPA Clean Air Act.

The 2002 Polaris Octane is a limited–build, race–only watercraft. Polaris reserves the right to change specifications at any time without incurring obligations.

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Chapter 1 / General Information

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2002 PWC Identification Numbers

The engine I.D. number and hull I.D. number are used to register the watercraft. They are unique numbers that distinguish each watercraft from others of the same model.

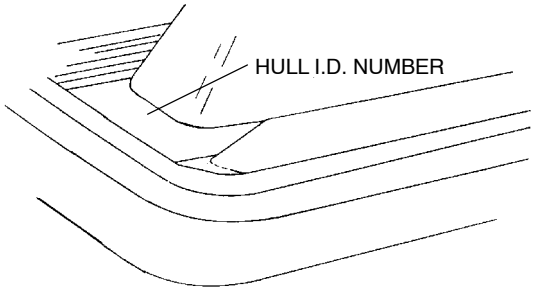
If the watercraft is ever stolen these numbers will help identify it. The owner should keep a record of these numbers in a place other than the watercraft.

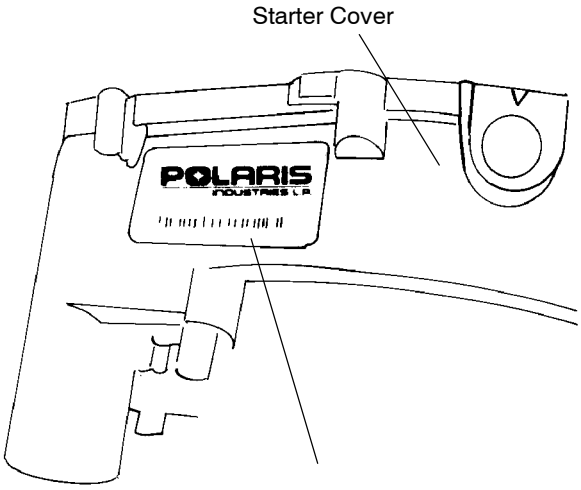
Hull Number Identification

US	PLE	00000	A	0	02
Country of Manufacture	Manufacturers I.D.	Serial Number	Month of Manufacture	Year of Manufacture	Model Year of Craft

Month Code: A = January; B = February; etc.

Year Of Manufacture: 1 = 2001; 2 = 2002; etc.





2002 Octane Publication Part Numbers

Model	Model Number	Owner's Manual	Parts Book	Microfiche
Octane	W025402D	9917128 9918073 (Supplement)	9918094	9918095

2002 OCTANE
W025402D

Length: . . . . 90 in. . . . 228.6cm
Width: . . . . . 29.5 in. . 74.93cm
Height: . . . . . 29 in. . . . 73.66cm
Dry Weight: . 330 lbs. . 149.7 kg.
Category: . . Race Only - Stand Up
Riders: 1
Fuel Capacity: 4.5 US Gallons (MAX) 17L (MAX)
Oil Capacity: N/A - Pre-mix.

⚠ CAUTION

The Octane is not equipped with oil injection. Fuel must be pre-mixed with oil at a 40:1 ratio*.

The preferred method for mixing fuel and oil together is to have a fuel container 1/2 full of the amount of fuel you want to mix. Weigh the required amount of oil in a plastic cup, then empty into fuel container and mix. After mixing, add the remaining fuel.

Formula: 1 US Gallon = 128oz. ÷ 40 (Ratio) = 3.2 oz. for 1 US Gallon of fuel.

Two-cycle Engine Fuel-To-Oil Ratio Chart	
Gallons of Fuel	**40:1 Ratio**
5	16 ounces
10	32 ounces

* Engine “break-in” ratio is 32:1. Please reference chapter two.

2002 Octane	
Model Number	W025402D
Engine	
Platform	Polaris Marine 800 Twin
Engine Model Number	W77-DCSP-01
Engine Displacement	777cc
Number of Cylinders	2
Bore & Stroke (mm)	84 x 70
Compression Ratio (Effective)	6.7:1
Rated Horsepower	100
Maximum Torque	N/A
Cooling System	Water Cooled
Thermostat Opening Temperature	None
Overheat Warning	Overboard Water Outlets
Induction Type	Case Reed
Lubrication	Pre-Mix (40:1)
Oil Requirements	Polaris TC-W3
RPM Limiter	7200 RPM
Exhaust System	Factory Pipe - Water Cooled / Injected
Sound Reduction	None
Carburetion	
Fuel Delivery	2-40mm Keihin
Fuel Requirement	87 Oxygenated / 89 Non-Oxygenated
Idle Speed (In Water)	N/A
Electrical	
Ignition System	Digital CDI / Flywheel Magneto
Magneto Generator Output	5A / 60W @ 4500 RPM
Spark Plug	NGK BR9ES
Spark Plug Gap	.024 - .028 in. (.61 - .71mm)
Timing Degrees BTDC	20° @ 3000 RPM
Battery	12V / 19A
Circuit Breaker / (Fuses)	15 A Circuit Breaker
Starting	Electric Start - Two Button Start / Stop
Propulsion	
Jet Pump Type	Aggressor Pump, Single Stage Axial Flow, 12 Vane Stainless Steel Stator
Impeller Rotation	Counter Clockwise (From AFT)
Coupling Type	Spider Coupler / Direct Drive
Minimum Depth For Operation	2 ft. (60cm.)
Pivoting Angle	N/A
Impeller Type	3 Blade, Stainless Steel, Progressive Pitch Radial Blade
Impeller Diameter	140mm (5.511 in.)
Reverse System	None
Hull / Body	
Hull Design	Double Concave Wammer - V
Hull Material	FRC (Fiberglass Reinforced Composite)
Top Deck Material	FRC (Fiberglass Reinforced Composite)

Standard Torque Specifications

The following torque specifications are to be used as a general guideline. Use standard torque values for the appropriate size fastener when torque values are not specified. **Always consult the specific manual section for torque values of fasteners and use of locking agent.**

RECOMMENDED TORQUE SPECIFICATION STAINLESS STEEL FASTENERS (SAE)		
Bolt Size	**Threads/Inch**	**Torque**
8	18 & 32	28 in. lbs.
10	24 & 32	40 in. lbs.
1/4	20 & 28	8 ft. lbs.
5/16	18 & 24	14 ft. lbs.
3/8	16	25 ft. lbs.
3/8	24	28 ft. lbs.
7/16	14	40 ft. lbs.
1/2	13	58 ft. lbs.
1/2	20	70 ft. lbs.

RECOMMENDED TORQUE SPECIFICATION STAINLESS STEEL FASTENERS (METRIC)	
Bolt Size	**Torque**
5mm	45-52 in. lbs.
6mm	66-78 in. lbs.
8mm	13-16 ft. lbs.
10mm	26-30 ft. lbs.
12mm	40-44 ft. lbs.

- To convert in. lbs. to ft. lbs. divide by 12
- To convert ft. lbs. to Nm multiply foot pounds by 1.356.
- To convert Nm to ft. lbs. multiply Nm by .7376.

Decimal Equivalent Chart

1/64	.0156	
1/32	.0312	1 mm = .0394″
3/64	.0469	
1/16	.0625	
5/64	.0781	2 mm = .0787″
3/32	.0938	
7/64	.1094	3 mm = .1181″
1/8	.1250	
9/64	.1406	
5/32	.1563	4 mm = .1575″
11/64	.1719	
3/16	.1875	5 mm = .1969″
13/64	.2031	
7/32	.2188	
15/64	.2344	6 mm = .2362″
1/4	.25	
17/64	.2656	7 mm = .2756″
9/32	.2813	
19/64	.2969	
5/16	.3125	8 mm = .3150″
21/64	.3281	
11/32	.3438	9 mm = .3543″
23/64	.3594	
3/8	.375	
25/64	.3906	10 mm = .3937″
13/32	.4063	
27/64	.4219	11 mm = .4331″
7/16	.4375	
29/64	.4531	
15/32	.4688	12 mm = .4724″
31/64	.4844	
1/2	.5	13 mm = .5118
33/64	.5156	
17/32	.5313	
35/64	.5469	14 mm = .5512″
9/16	.5625	
37/64	.5781	15 mm = .5906″
19/32	.5938	
39/64	.6094	
5/8	.625	16 mm = .6299″
41/64	.6406	
21/32	.6563	17 mm = .6693″
43/64	.6719	
11/16	.6875	
45/64	.7031	18 mm = .7087″
23/32	.7188	
47/64	.7344	19 mm = .7480″
3/4	.75	
49/64	.7656	
25/32	.7813	20 mm = .7874″
51/64	.7969	
13/16	.8125	21 mm = .8268″
53/64	.8281	
27/32	.8438	
55/64	.8594	22 mm = .8661″
7/8	.875	
57/64	.8906	23 mm = .9055″
29/32	.9063	
59/64	.9219	
15/16	.9375	24 mm = .9449″
61/64	.9531	
31/32	.9688	25 mm = .9843
63/64	.9844	
1	1.0	

Conversion Chart

Unit of Measure	Multiplied by	Converts to
ft. lbs.	x 12	= in. lbs.
in. lbs.	x .0833	= ft. lbs.
ft. lbs.	x 1.356	= Nm
in. lbs.	x .0115	= kg-m
Nm	x .7376	= ft. lbs.
kg-m	x 7.233	= ft. lbs.
kg-m	x 86.796	= in. lbs.
kg-m	x 10	= Nm
in.	x 25.4	=mm
mm	x .03937	= in.
in.	x 2.54	= cm
mile (mi.)	x 1.6	= km
km	x .6214	= mile (mi.)
Ounces (oz.)	x 28.35	= Grams (g)
Grams (g)	x 0.035	= Ounces (oz.)
lb.	x .454	= kg
kg	x 2.2046	= lb.
Cubic inches (cu in)	x 16.387	= Cubic centimeters (cc)
Cubic centimeters (cc)	x 0.061	= Cubic inches (cu in)
Imperial pints (Imp pt)	x 0.568	= Liters (l)
Liters (l)	x 1.76	= Imperial pints (Imp pt)
Imperial quarts (Imp qt.)	x 1.137	= Liters (l)
Liters (l)	x 0.88	= Imperial quarts (Imp qt.)
Imperial quarts (Imp qt.)	x 1.201	= US quarts (US qt.)
US quarts (US qt.)	x 0.833	= Imperial quarts (Imp qt.)
US quarts (US qt.)	x 0.946	= Liters (l)
Liters (l)	x 1.057	= US quarts (US qt.)
US gallons (US gal)	x 3.785	=Liters (l)
Liters (l)	x 0.264	= US gallons (US gal)
Pounds - force per square inch (psi)	x 6.895	= Kilopascals (kPa)
Kilopascals (kPa)	x 0.145	= Pounds - force per square inch (psi)
Kilopascals (kPa)	x 0.01	= Kilograms - force per square cm
Kilograms - force per square cm	x 98.1	= Kilopascals (kPa)

°C to °F: 9 (°C + 40) ÷ 5 – 40 = °F
°F to °C: 5 (°F + 40) ÷ 9 – 40 = °C

SAE Tap Drill Sizes

Thread Size	Drill Size	Thread Size	Drill Size
#0-80	3/64	1/2-13	27/64
#1-64	53	1/2-20	29/64
#1-72	53	9/16-12	31/64
#2-56	51	9/16-18	33/64
#2-64	50	5/8-11	17/32
#3-48	5/64	5/8-18	37/64
#3-56	45	3/4-10	21/32
#4-40	43	3/4-16	11/16
#4-48	42	7/8-9	49/64
#5-40	38	7/8-14	13/16
#5-44	37	1-8	7/8
#6-32	36	1-12	59/64
#6-40	33	1 1/8-7	63/64
#8-32	29	1 1/8-12	1 3/64
#8-36	29	1 1/4-7	1 7/64
#10-24	24	1 1/4-12	1 11/64
#10-32	21	1 1/2-6	1 11/32
#12-24	17	1 1/2-12	1 27/64
#12-28	4.6mm	1 3/4-5	1 9/16
1/4-20	7	1 3/4-12	1 43/64
1/4-28	3	2-4 1/2	1 25/32
5/16-18	F	2-12	1 59/64
5/16-24	I	2 1/4-4 1/2	2 1/32
3/8-16	O	2 1/2-4	2 1/4
3/8-24	Q	2 3/4-4	2 1/2
7/16-14	U	3-4	2 3/4
7/16-20	25/64		

Metric Tap Drill Sizes

Tap Size	Drill Size	Decimal Equivalent	Nearest Fraction
3 x .50	#39	0.0995	3/32
3 x .60	3/32	0.0937	3/32
4 x .70	#30	0.1285	1/8
4 x .75	1/8	0.125	1/8
5 x .80	#19	0.166	11/64
5 x .90	#20	0.161	5/32
6 x 1.00	#9	0.196	13/64
7 x 1.00	16/64	0.234	15/64
8 x 1.00	J	0.277	9/32
8 x 1.25	17/64	0.265	17/64
9 x 1.00	5/16	0.3125	5/16
9 x 1.25	5/16	0.3125	5/16
10 x 1.25	11/32	0.3437	11/32
10 x 1.50	R	0.339	11/32
11 x 1.50	3/8	0.375	3/8
12 x 1.50	13/32	0.406	13/32
12 x 1.75	13/32	0.406	13/32

Service Glossary

ABDC: After bottom dead center.

ACV: Alternating current voltage.

Alternator: Electrical generator producing voltage alternating current.

BBDC: Before bottom dead center.

BDC: Bottom dead center.

BTDC: Before top dead center.

Bow: The front of a watercraft

C: Celsius

CC: Cubic centimeters.

CDI: Capacitor discharge ignition. Ignition system which stores voltage generated by the stator plate exciter coil in a capacitor or condenser (in CDI box). At the proper moment a voltage generated by the stator plate pulser coil closes an electronic switch (thyristor) in the CDI box and allows the voltage in the capacitor to discharge into the primary windings of the ignition coil.

CI: Cubic inches.

Condenser/Capacitor: A storage reservoir for electricity, used in both E.T. and CDI systems.

Crankshaft Run-Out: Run-out or "bend" of crankshaft measured with a dial indicator while crankshaft is supported between centers on V blocks or resting in lower half of crankcase. Measure at various points especially at the PTO end.

DCV: Direct current voltage.

Detonation: The spontaneous ignition of the unburned fuel/air mixture *after* normal ignition spark occurs. Piston looks "hammered" through, rough appearance around hole. Possible causes: 1) Compression ratio too high for the fuel octane; 2) low octane fuel; 3) over-advanced ignition timing.

Dial Bore Gauge: A cylinder measuring instrument which uses a dial indicator. Good for showing taper and out-of-round in the cylinder bore.

End Seals: Rubber seals at each end of the crankshaft.

F: Fahrenheit

ft.: Foot/feet.

Foot Pound: Ft. lb. A force of one pound at the end of a lever one foot in length, applied in a rotational direction.

g: Gram. Unit of weight in the metric system. There are 28 grams in one ounce.

gal.: Gallon.

Head Volume (Uninstalled): Cylinder head capacity in cc, head removed from engine with spark plug installed.

High Tension Lead: The heavy insulated wire which carries the high secondary voltage from the coil to the spark plug.

Holed Piston: Piston in which a hole has formed on the dome. Possible causes: 1) detonation; 2) pre-ignition.

HP: Horsepower.

ID: Inside diameter.

Ignition Coil: A type of transformer which increases voltage in the primary windings (approx. 200V) to a higher voltage in the secondary windings (approx. 14KV - 32KV) through induction. Secondary voltage must be high enough to ionize the air gap at the spark plug.

Ignition Generating Coil: Exciter coil, primary charge coil. Stator plate coil which generates primary ignition voltage.

in.: Inch/inches.

kg/cm ^{2} : Kilograms per square centimeter.

Kg-m: Kilogram meters.

Km: Kilometer.

Kilogram meter: A force of one kilogram at the end of a lever one meter in length, applied in a rotational direction.

Service Glossary - Continued

l or ltr: Liter. One liter = 1.0567 U.S. quarts.

lbs/in ^{2} : Pounds per square inch.

Inch Pound: In. lb. 12 in. lbs. = 1 ft. lb.

Left Side: The left hand side of the vehicle. Referred to based on normal operating position of the driver.

m: Meter/meters.

Mag: Magneto.

Magnetic Induction: As a conductor (coil) is moved through a magnetic field, a voltage will be generated in the windings. This is how mechanical energy is converted to electrical energy in the lighting coil, ignition generating coils and trigger coil.

mi.: Mile/miles.

mm: Millimeter. Unit of length in the metric system. 1mm = .040″.

N-m: Newton meters.

OD: Outside diameter.

Ohm: The unit of electrical resistance opposing current flow.

Open Circuit: An electrical circuit which is incomplete. (e.g. poor connections or broken wire preventing the flow of current).

oz.: Ounce/ounces.

Piston Clearance: Total distance between piston and cylinder wall.

Piston Erosion: Piston dome melts. Usually occurs at the exhaust port area. Possible causes: 1) lean fuel/air mixture; 2) improper spark plug heat range.

Pre-Ignition: A problem in combustion where the fuel/air mixture is ignited before normal spark ignition. Piston looks melted at area of damage. Possible causes: 1) Spark plug heat range incorrect (too hot) 2) spark plug not properly torqued; 3) “glowing” piece of head gasket, metal burr or carbon in the combustion chamber; 4) lean fuel/air mixture.

Primary Circuit: This circuit is responsible for the voltage build up in the CDI capacitor. In a CDI system the parts include the exciter coil, the trigger coil, the wires from stator plate to CDI box and to the ignition coil primary windings.

psi.: Pounds per square inch.

pts: Pint/pints

PTO: Power take off.

qt.: Quart/quarts.

RPM: Revolutions per minute.

Resistance: In the mechanical sense, friction or load. In the electrical sense, ohms. Both result in energy conversion to heat.

Right Side: The right hand side of the vehicle. Always Referred to based on normal operating position of the rider.

Running Time: Ignition timing at specified RPM.

Secondary Circuit: This circuit consists of the ignition coil secondary windings, high tension wire and ground through the spark plug air gap.

Seized Piston: Galling of the sides of a piston. Usually there is a transfer of aluminum from the piston onto the cylinder wall. Possible causes: 1) improper lubrication; 2) excessive temperatures; 3) insufficient piston clearance; 4) stuck piston rings.

Short Circuit: An electrical circuit which is completed before the current reaches the intended component. (e.g. a bare wire touching a grounded component.

Spark Plug Reach: Length of threaded portion of spark plug. Polaris uses 3/4” (2 cm) reach plugs.

Static Timing: Ignition timing when engine is at zero RPM.

Stator Plate: The plate mounted under the flywheel supporting the primary ignition components and lighting coil.

TDC: Top dead center. Piston’s most outward travel from crankshaft.

Trigger Coil: Pulser coil. Generates the voltage for triggering (closing) the thyristor and timing the spark in CDI systems. Small coil mounted at the top of the stator plate next to the ignition generating coil.

Voltage Regulator: An electrical device which prevents overcharging of the battery or overloading of electrical components as engine RPM increases.

Service Guidelines

In order to perform service work efficiently and to prevent costly errors, the technician should begin by reading the text in this manual to become familiar with procedures before beginning. Pictures and illustrations have been included with the text as an aid. Notes, cautions and warnings have also been included for clarification of text and safety concerns. However, a knowledge of mechanical theory, tool use, and shop procedures is necessary to perform the service work safely and satisfactorily. Use only genuine Polaris service parts.

⚠ Cleanliness of parts and tools as well as the work area is of primary importance. Dirt and foreign matter will act as an abrasive and cause damage to precision parts. Clean the vehicle before beginning service. Clean new parts before installing.

⚠ Watch for sharp edges which can cause personal injury. Protect hands with gloves when working with sharp components.

⚠ If difficulty is encountered in removing or installing a component, look to see if a cause for the difficulty can be found. If it is necessary to tap the part into place, use a soft face hammer and tap lightly.

⚠ Some of the fasteners were installed with locking agents. Use of impact drivers or wrenches will help avoid damage to fasteners.

⚠ Always follow torque specifications as outlined throughout this manual. Incorrect torquing may lead to serious machine damage or, as in the case of steering components, can result in injury or death for the rider(s).

⚠ If a torquing sequence is indicated for nuts, bolts or screws, start all fasteners in their holes and hand tighten. Then, following the method and sequence indicated in this manual, tighten evenly to the specified torque value. When removing nuts, bolts or screws from a part with several fasteners, loosen them all about 1/4 turn before removing them.

⚠ If the condition of any gasket or O-Ring is in question, replace it with a new one. Be sure the mating surfaces around the gasket are clean and smooth in order to avoid leaks.

⚠ Some procedures will require removal of retaining rings or clips. Because removal weakens and deforms these parts, they should always be replaced with new parts. When installing new retaining rings and clips use care not to expand or compress them beyond what is required for installation.

⚠ Because removal damages seals, replace any oil or grease seals removed with new parts. A suitable driver should be used when installing a new seal to prevent distortion or damage.

⚠ Polaris recommends the use of Polaris lubricants and greases, which have been specially formulated for the top performance and best protection of our machines. In some applications, such as the engine, warranty coverage may become void if other brands are substituted.

⚠ Grease should be cleaned from parts and fresh grease applied before reassembly of components. Deteriorating grease loses lubricity and may contain abrasive foreign matter.

⚠ Whenever installing batteries, care should be taken to avoid the possibility of explosion resulting in serious burns. Always connect the positive (red) cable first and the negative (black) cable last. When working with batteries, always wear safety glasses or a face shield and protective gloves. Battery electrolyte contains sulfuric acid and is poisonous! Serious burns can result from contact with the skin, eyes or clothing. **ANTIDOTE:** External - Flush with water. Internal - Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Call physician immediately. Eyes - Flush with water for 15 minutes and get prompt medical attention.

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Chapter 2 / Maintenance

Recommended Maintenance Products

Oil and Lubricants	
High Performance Racing 2-Cycle Oil	
Quart	2873025
Gallon	2873023
16 Gallon	2873919
55 Gallon	2873024
Nature Oil Biodegradable 2-Cycle Oil	
Gallon	2872607
55 Gallon	2872926
Fuel System Maintenance Products	
Carbon Clean Plus	2871326
Isopropyl Fuel De-Icer	2870505
Premium Fuel Stabilizer	2870652
Grease	
Grease Gun Kit	2871312
All Season Premium Grease	
3 oz. / 4 pack	2871322
14 oz. Tube	2871423
Starter Grease	2871460
Nyogel Grease	2871329
General Maintenance Products	
Fogging Oil	
12 oz. Aerosol	2870791
1 Quart	2871517
Brake & Clutch Cleaner	2872889
Carb & Throttle Body Cleaner	2872890
Multi-Purpose Lubricant	2872891
Electrical Contact Cleaner	2872892
Engine Degreaser	2872893
Revival / Detailing Kit	
Revival / Detailing Kit	2871589
Restore Swirl / Scuff Eliminator	2871966
Finish Wax	2871965
Vinyl and Rubber Protectant	2871964
T 9 Metal Protectant	2871064
Retaining / Sealing Products	
Loctite™ Products	
Threadlock 242	2871950
Threadlock 262	2871952
Threadlock 271	2871954
Loctite™ 5699	2871849
Marine-Grade Silicone	8560054

Periodic Maintenance Schedule

DESCRIPTION	Pre-Ride	Pre-season	1 Mo./ 25 Hrs	3 Mo./ 50 Hrs	6 Mo./ 100 Hrs	Tune Up Item
ENGINE						
Engine corrosion protection/fogging (daily-salt water)	L**	L	L			
Exhaust cooling hoses elbow fittings in pump		I/C		I/C		•
Exhaust hose condition		I		I		
Engine mounts (Replace if removed for engine service)		I			I	•
Water inlet and outlet hoses and clamps		I	I	I	R	
Spark plugs / Compression test		I/R		I	I/R	•
Engine fastener re-torque (cyl head / cyl base, exhaust)		I		I	I	•
FUEL SYSTEM						
Fuel filter		R	I			•
Throttle and choke cables	I	I/L/A		L		•
Carburetor (see engine fogging procedure) synchronize		A/C			A	•
Fuel cap gasket	I	I	I	I	R	
Fuel lines, related hose clamps, check valves and hose inspection, fuel system pressurization		I			I	•
Vent system check-valves; hose routing		I				•
Fuel system pressure/vacuum test		I				
Fuel Tank Hold-Down Straps	I	I	I			
JET PUMP						
Drive shaft coupler assembly and bearing housing		I/L	I/L*		I/L	•
Bilge system pick-up screens and hoses	I/C	I/C				•
Cooling water inlet screen / hoses, clamps	I/C	I/C				•
Jet pump intake grate fasteners and condition		I		I		•
Impeller condition and impeller clearance		I			I	•
ELECTRICAL						
Battery condition, fluid level	I	I				•
Battery vent hose condition/routing (must be clear)		I		I		•
Battery and starter cables(clean connections / tight)		I		I	I	•
Ground cables-condition, corrosion, fastener torque		I		I	I	
Lanyard cord/engine stop switch	I	I				•

KEY

I=Inspect, A=Adjust C=Clean R=Replace item L=Lubricate

* Perform every 15 hrs. or one month when operated in salt water. **Perform daily when operated in salt water.

Engine Break-In Procedure

Properly “breaking-in” the engine is important to the life of any engine. The first tank of fuel is considered the “break-in” period. To “break-in” the engine, use a 32:1 fuel-to-oil ratio. After the “break-in” period, use a 40:1 fuel-to-oil ratio.

The preferred method for mixing fuel and oil together is to have a fuel container 1/2 full of the amount of fuel you want to mix. Weigh the required amount of oil in a plastic cup, then empty into fuel container and mix. After mixing, add the remaining fuel.

Formula: 1 US Gallon = 128oz. ÷ 40 (Desired Ratio) = 3.2 oz. for 1 US Gallon of fuel.

Two-cycle Engine Fuel-To-Oil Ratio Chart		
Gallons of Fuel	**32:1 (Break In)**	**40:1 Ratio (Normal Operation)**
5	20 ounces	16 ounces
10	40 ounces	32 ounces

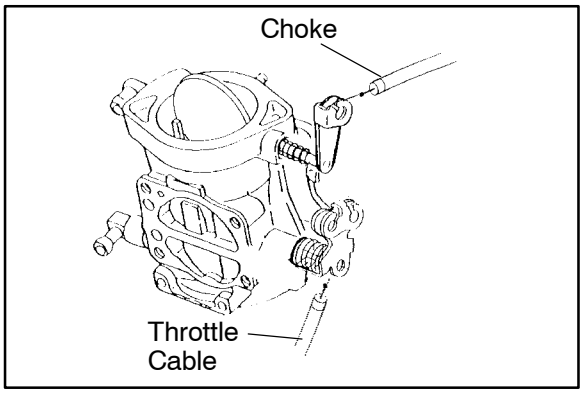
General Lubrication

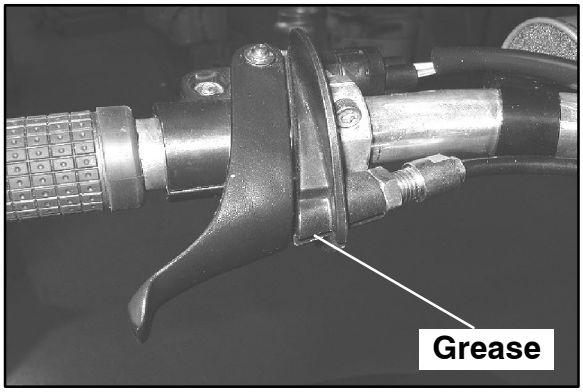
Throttle / Choke Cable

1. Depress throttle lever and apply lube onto cable.
2. Apply and release throttle several times to work lubricant down cable.

NOTE: Cable seal can be moved to allow grease into cable. Verify that seals are installed in proper location after oiling.

Polaris Premium Grease
PN 2871423



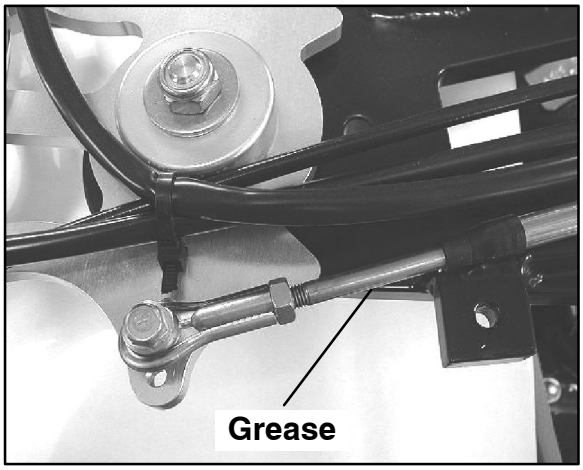


Steering Cable / Steering Joints

1. Expose inner cable and apply lubricant.

NOTE: Cable seal can be moved to allow grease into cable. Verify that seals are installed in proper location after oiling.

Polaris Premium Grease
PN 2871423



General Lubrication - Continued

Steering Nozzle

1. Lubricate nozzle pivot and trim pivot.

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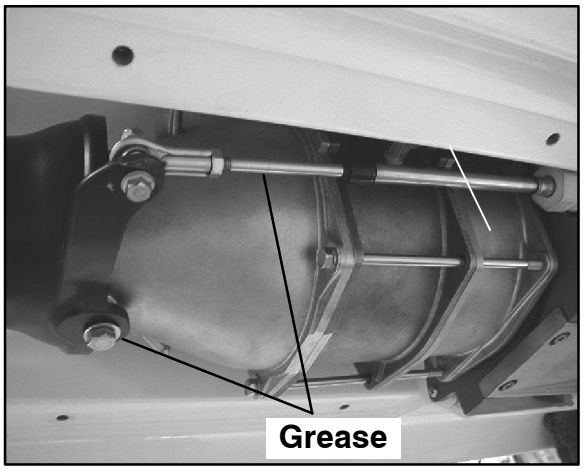
PN 2871423

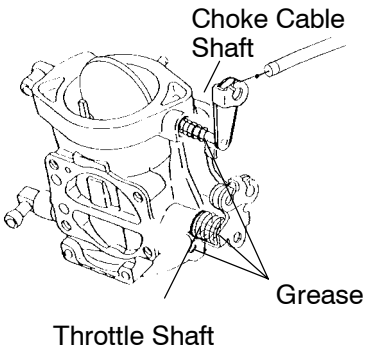


Throttle / Choke Shafts

1. Grease springs, exposed sections of cable, idle stop screw, throttle, and choke shafts at carburetor.

NOTE: Grease daily if used in salt water.

Premium All Season Grease
PN 2871423



Drive Shaft Maintenance

⚠ WARNING

The driveshaft shroud is designed to protect you from dangerous moving parts. It must be removed to access the coupler assembly.

CAUTION:

Grease should only be applied whenever the pump assembly, or driveshaft is removed from the watercraft. Only apply a light film of grease to the drive shaft threads and splines when assembling the pump. A very light film of grease can be used to assist in inserting the shaft through the bearing carrier.

All Season Grease PN 2871423
All Season Grease PN 2871322

Drive Shaft Coupler

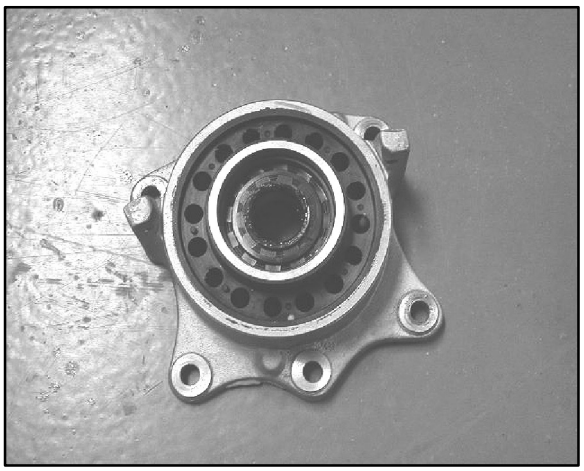
The drive shaft coupler assembly consists of three (3) parts. One spider coupler screws on to the PTO end of the crankshaft, the other spider coupler screws to the end of the drive shaft. Between the two spider couplers is a rubber dampener.

No maintenance is required unless the pump and drive shaft are removed from the watercraft, or the engine has been removed or shifted from its original position.

Bearing Housing

The bearing housing is bolted to the bulkhead. Within the housing sits a sealed bearing. Only a light film of grease should be applied to the inner bearing surface and seals to assist in inserting the drive shaft during assembly. The sealed bearing requires no maintenance unless bearing failure is suspected.

During watercraft inspections, verify the bearing carrier is bolted tightly to the bulkhead.



Electrical Components

Battery Safety

When removing and installing the battery, or when performing battery maintenance always heed the following warnings and cautions:

⚠ WARNING

Battery electrolyte is poisonous. It contains sulfuric acid. Serious burns can result from contact with the skin, eyes or clothing.

Antidote:

EXTERNAL - Flush with water.

INTERNAL - Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg or vegetable oil. Call a physician immediately.

EYES - Flush with water for 15 minutes and get prompt medical attention.

Batteries produce explosive gases. Keep sparks, flame, cigarettes, etc. away. Ventilate when charging or using in closed space. Always shield eyes when working near batteries. KEEP OUT OF THE REACH OF CHILDREN.

CAUTION:

The battery must be removed from the watercraft for maintenance and charging. Battery electrolyte may spill and damage the watercraft.

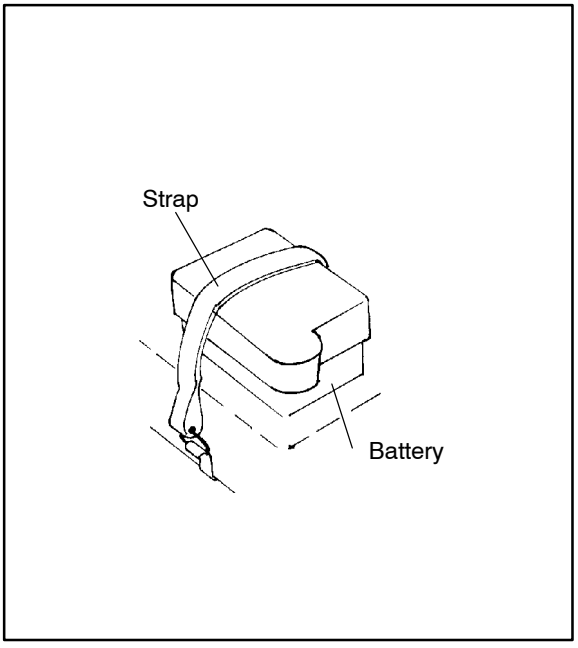
⚠ WARNING

Always disconnect the black (negative) cable first. Electrolyte or fuel vapors may be present in the engine compartment and a spark could ignite them which could cause personal injury. When re-installing battery connect black (negative) cable last.

Whenever installing batteries, care should be taken to avoid the possibility of explosion resulting in serious burns. Always connect the positive (red) cable first and the negative (black) cable last. When working with batteries, always wear safety glasses or a face shield and protective gloves. Battery electrolyte contains sulfuric acid and is poisonous! Serious burns can result from contact with the skin, eyes or clothing. **ANTIDOTE:** External - Flush with water. Internal - Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Call physician immediately. Eyes - Flush with water for 15 minutes and get prompt medical attention.

Battery Removal

1. Remove straps or bar holding electrical box and battery in position.
2. Remove cover from top of battery.
3. Remove battery vent tube from battery.
4. Disconnect black (negative) battery cable first.
5. Disconnect red (positive) battery cable next.
6. Lift battery out of watercraft, being careful not to tip it sideways and spill any electrolyte.



CAUTION:

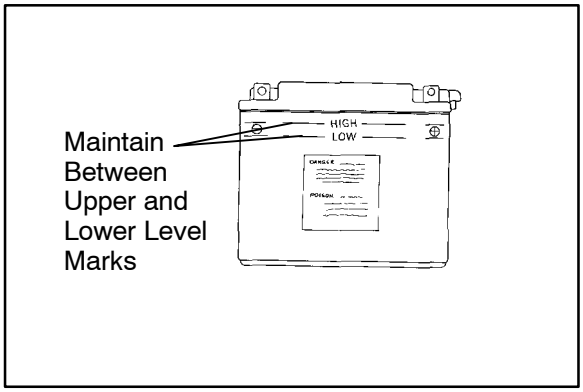
Battery electrolyte can damage the watercraft finish if spilled. If an electrolyte spill occurs, apply a generous amount of baking soda to the area and then rinse with fresh water.

Electrical Components - Continued

Replenishing Battery Fluid

The fluid level should be kept between the upper and lower level marks.

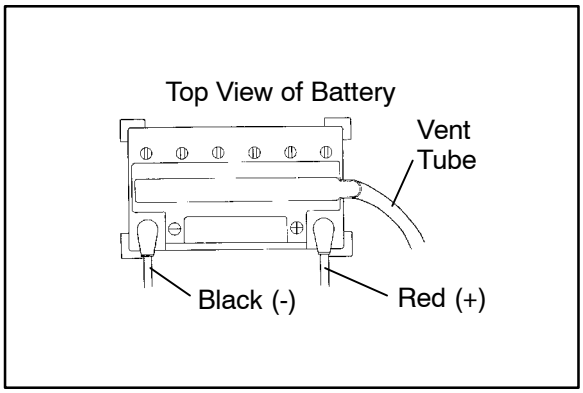
To refill use only distilled water. Tap water contains minerals which are harmful to a battery.



Battery Connections

Battery terminals and connections should be kept free of corrosion. If cleaning is necessary, remove the corrosion with a stiff wire brush. Wash thoroughly with a solution of baking soda and water (one tablespoon of baking soda to one cup of water). Rinse well with tap water and dry off with clean shop cloths. Coat the terminals and terminal bolts with Nyogel™ grease.

Nyogel™ Grease
PN 2871329



Battery Charging

CAUTION:

The battery must be removed from the watercraft for maintenance and charging. Battery electrolyte may spill and damage the watercraft.

Always disconnect the black (negative) cable first. Electrolyte or fuel vapors may be present in the engine compartment and a spark could ignite them which could cause personal injury. When re-installing battery connect black (negative) cable last.

⚠ WARNING

Keep the battery away from sparks and open flames during charging because the battery gives off gases which are explosive. If you smell fuel do not attempt to charge the battery. When using a battery charger connect the battery to the charger before turning on the charger. This prevents the possibility of sparks at the terminals which could ignite the battery gases. Do not connect charger cables to the battery unless the charger is unplugged.

1. Remove caps from cells. Add distilled water if necessary to bring electrolyte up to proper level.
2. Connect battery to a charger. Set charging rate at 1.9 amps (maximum) and charge battery for ten hours.

CAUTION:

During charging, if the electrolyte temperature rises above 115°F (45°C) or if battery feels hot when touched, reduce the charging rate to lower the temperature and increase the charging time.

3. After battery is charged, check fluid level. If it has dropped add distilled water to bring electrolyte up to proper level.
4. Check results of charging. The specific gravity of each cell must be 1.270 at room temperature. The voltage should be 14.5 - 15.5 V during charging; 12.2 - 12.8 V after charging.

Specific Gravity
1.270 or greater - Each Cell

Electrical Components - Continued

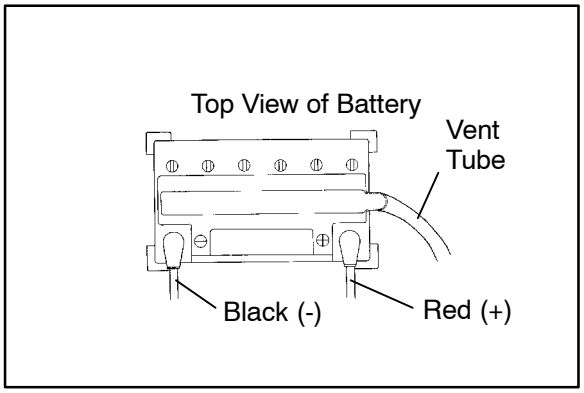
Battery Installation

⚠ WARNING

Always connect battery cables in the order specified. Red (positive) cable first, black (negative) cable last.

1. Install battery in its holder.
2. Install battery vent tube. It must be free from kinks, obstructions, or restrictions and securely installed. If not, battery gases could accumulate and cause an explosion. Avoid skin contact with electrolyte, severe burns could result.
3. Apply Nyogel™ grease to each cable bolt.

Nyogel™ Grease
PN 2871329



4. First, connect and tighten red (positive) cable.
5. Second, connect and tighten black (negative) cable.
6. Apply dielectric grease to each cable end and to terminal post area.
7. Reinstall battery cover and electrical box over battery and reconnect straps.
8. Verify that cables are properly routed.
9. Verify that vent hose is not kinked.

Battery Storage

1. Remove battery. Clean casing and terminals with baking soda and water (one tablespoon of baking soda to one cup water). Apply dielectric grease to battery terminals and all exposed cable connectors.
2. Top off battery with distilled water and charge to a specific gravity of 1.270 (test each cell). Recharge monthly as required to prevent battery discharge, sulfation, and freezing.
3. Store battery in a cool, dry place out of direct sunlight.

Electrical Components - Continued

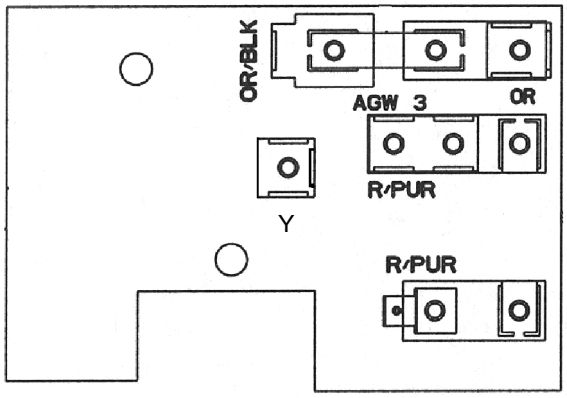
Electrical Connections

Apply Nyogel™ grease to battery posts and exposed cable connections.

Inspect electrical box for moisture, check wire sealing grommets, and apply Nyogel™ grease to terminal board connections.

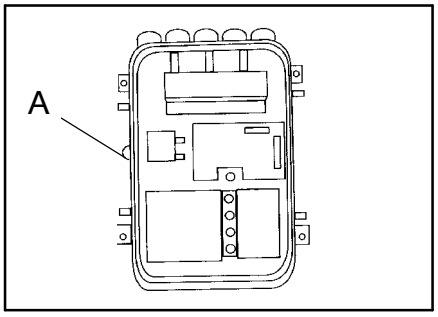
Nyogel™ Grease
PN 2871329

Terminal Board



Circuit Breaker - Carbureted Models

The electrical system is protected with a 15A circuit breaker. In order to reset the circuit breaker, locate and push the reset button (A) on top of the electrical box.



Fuses

Located between the ORANGE terminal posts and ORANGE/BLK terminal post is a 3 AMP fuse. The fuse protects the bilge pump and should be checked if the the bilge pump does not turn on when the engine is running.

Electrical Components - Continued

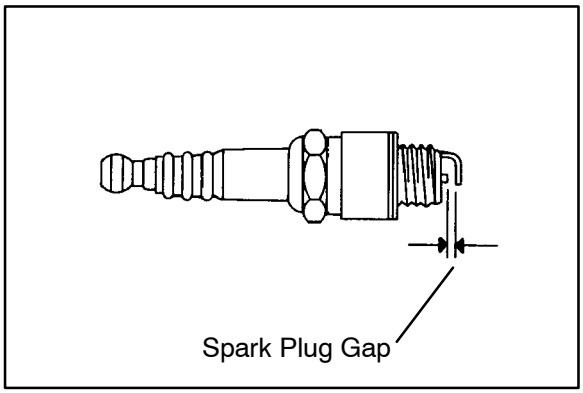
Spark Plugs

1. Disconnect high tension leads and remove spark plugs.
2. Inspect electrodes for wear, carbon buildup, or fouling (wet oily residue). Replace plugs if edges of electrodes are rounded or eroded.

CAUTION:

Severe engine damage may occur if the incorrect spark plug is used. Refer to spark plug gap chart in this page for spark plug type.

3. Clean with electrical contact cleaner or a glass bead spark plug cleaner only. A wire brush or coated abrasive should not be used.
4. Measure gap with a wire gauge and refer to specifications. Adjust if necessary by bending the side electrode carefully.
5. Coat spark plug threads with a small amount of anti-seize compound.
6. Install spark plug and torque to 18ft.lbs.
7. Make sure spark plug caps are screwed completely onto end of plug wire.
8. Apply a small amount of Nyogel™ grease to inside of plug caps and install.
9. Push cap onto plug until cap “snaps” into place.



Spark Plug Gap

2002 777Engine: NGK BR9ES
Gap: .024 - .028 in. (.6 - .7mm)

Nyogel™ Grease
PN 2871329

⚠ WARNING

Use only RESISTOR TYPE spark plugs.

Ignition Timing Specifications

Refer to Electrical Section for ignition timing adjustment procedure and timing chart.

Engine

Engine Mounts

Check tightness of all engine mounts including bolts that secure mounting plate to engine. Inspect rubber mounts for cracks. Tighten or replace if necessary. Always replace engine mounts when engine is removed for service.

Compression Test

A compression test is a good indicator of engine condition. For accurate readings, use a high quality gauge and make sure the battery is in good condition and fully charged.

Compression Gauge
PN 2870852

⚠ WARNING

The spark plug high tension leads must be securely grounded to the engine block to prevent a spark which may ignite fuel or fumes, causing a fire or explosion. Some models are manufactured with grounding posts mounted to the pop-off valve / thermostat housing. Attach spark plug wires to grounding posts whenever possible.

1. Remove all spark plug high tension leads and connect securely to ground on engine block.
2. Remove all spark plugs and install compression gauge in cylinder to be tested.
3. Using the starter motor, turn engine over with throttle wide open until a maximum reading is obtained (approximately 3-5 seconds). Record reading.
4. Repeat for the other cylinders and compare to each other cylinder. All readings must be within 5% of each other.

Compression (Open Throttle at Sea Level)

Standard -120-150 lbs./sq. in
8.40-10.5 kg/sq. cm

Service Limit - Greater than 5% variance between cylinders.