Kawasaki

JET SKI® watercraft

800 SX-R

JET SKI® Watercraft Service Manual

Quick Reference Guide

This quick reference guide will assist you in locating a desired topic or procedure.

- Bend the pages back to match the black tab of the desired chapter number with the black tab on the edge at each table of contents page.
- Refer to the sectional table of contents for the exact pages to locate the specific topic required.

LIST OF ABBREVIATIONS

A	ampere(s)	lb	pound(s)
ABDC	after bottom dead center	m	meter(s)
AC	alternating current	min	minute(s)
ATDC	after top dead center	N	newton(s)
BBDC	before bottom dead center	Pa	pascal(s)
BDC	bottom dead center	PS	horsepower
BTDC	before top dead center	psi	pound(s) per square inch
°C	degree(s) Celsius	r	revolution
DC	direct current	rpm	revolution(s) perminute
F	farad(s)	TDC	top dead center
°F	degree(s) Fahrenheit	TIR	total indicator reading
ft	foot,feet	V	volt(s)
g	gram(s)	W	watt(s)
h	hour(s)	Ω	ohm(s)
L	liter(s)		

Read OWNER'S MANUAL before operating.

MAINTENANCE AND ADJUSTMENTS

Maintenance, replacement, or repair of the emission control devices and systems may be performed by any marine SI engine repair establishment or individual.

EMISSION CONTROL INFORMATION

Fuel Information

THIS ENGINE IS CERTIFIED TO OPERATE ON UNLEADED REGULAR GRADE GASOLINE ONLY.

A minimum of 87 octane of the antiknock index is recommended. The antiknock index is posted on service station pumps.

Emission Control Information

To protect the environment in which we all live, Kawasaki has incorporated an exhaust emission control system in compliance with applicable regulations of the United States Environmental Protection Agency.

Exhaust Emission Control System

This system reduces the amount of pollutants discharged into the atmosphere by the exhaust of this engine. The fuel, ignition and exhaust systems of this engine have been carefully designed and constructed to ensure an efficient engine with low exhaust pollutant levels.

Maintenance

Proper maintenance and repair are necessary to ensure that watercraft will continue to have low emission levels. This Service Manual contains those maintenance and repair recommendations for this engine. Those items identified by the Periodic Maintenance Chart are necessary to ensure compliance with the applicable standards.

Tampering with Emission Control System Prohibited

Federal law prohibits the following acts or the causing thereof: (1) the removal or rendering inoperative by any person other than for purposes of maintenance, repair, or replacement, of any device or element of design incorporated into any new engine for the purposes of emission control prior to its sale or delivery to the ultimate purchaser or while it is in use, or (2) the use of the engine after such device or element of design has been removed or rendered inoperative by any person.

Among those acts presumed to consitute tampering are the acts listed below:

Do not tamper with the original emission related parts.

* CDI Ignition System
* Flame Arrester
* Fuel Filter Screen
* Spark Plugs
* Carburetor and internal parts

Foreword

This manual is designed primarily for use by trained mechanics in a properly equipped shop. However, it contains enough detail and basic information to make it useful to the owner who desires to perform his own basic maintenance and repair work. A basic knowledge of mechanics, the proper use of tools, and workshop procedures must be understood in order to carry out maintenance and repair satisfactorily. Whenever the owner has insufficient experience or doubts his ability to do the work, all adjustments, maintenance, and repair should be carried out only by qualified mechanics.

In order to perform the work efficiently and to avoid costly mistakes, read the text, thoroughly familiarize yourself with the procedures before starting work, and then do the work carefully in a clean area. Whenever special tools or equipment are specified, do not use makeshift tools or equipment. Precision measurements can only be made if the proper instruments are used, and the use of substitute tools may adversely affect safe operation.

For the duration of the warranty period, we recommend that all repairs and scheduled maintenance be performed in accordance with this service manual. Any owner maintenance or repair procedure not performed in accordance with this manual may void the warranty.

To get the longest life out of your "JET SKI" watercraft:

- Follow the Periodic Maintenance Chart in the Service Manual.
- Be alert for problems and non-scheduled maintenance.
- Use proper tools and genuine Kawasaki "JET SKI" watercraft parts. Special tools, gauges, and testers that are necessary when servicing Kawasaki "JET SKI" watercraft are introduced by the Special Tool Manual. Genuine parts provided as spare parts are listed in the Parts Catalog.
- Follow the procedures in this manual carefully. Don't take shortcuts.
- Remember to keep complete records of maintenance and repair with dates and any new parts installed.

How to Use This Manual

In this manual, the product is divided into its major systems and these systems make up the manual's chapters. The Quick Reference Guide shows you all of the product's system and assists in locating their chapters. Each chapter in turn has its own comprehensive Table of Contents.

For example, if you want ignition coil information, use the Quick Reference Guide to locate the Electrical System chapter. Then, use the Table of Contents on the first page of the chapter to find the Ignition Coil section.

Whenever you see these WARNING and CAUTION symbols, heed their instructions! Always follow safe operating and maintenance practices.

⚠ WARNING

This warning symbol identifies special instructions or procedures which, if not correctly followed, could result in personal injury, or loss of life.

CAUTION

This caution symbol identifies special instructions or procedures which, if not strictly observed, could result in damage to or destruction of equipment.

This manual contains four more symbols (in addition to WARNING and CAUTION) which will help you distinguish different types of information.

NOTE

o *This note symbol indicates points of particular interest for more efficient and convenient operation.*

- ● Indicates a procedural step or work to be done.
- o Indicates a procedural sub-step or how to do the work of the procedural step it follows. It also precedes the text of a NOTE.
- ★ Indicates a conditional step or what action to take based on the results of the test or inspection in the procedural step or sub-step it follows.

In most chapters an exploded view illustration of the system components follows the Table of Contents. In these illustrations you will find the instructions indicating which parts require specified tightening torque, oil, grease or a locking agent during assembly.

General Information

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Before Servicing

Before starting to service a watercraft, careful reading of the applicable section is recommended to eliminate unnecessary work. Photographs, diagrams, notes, cautions, warnings, and detailed descriptions have been included wherever necessary. Nevertheless, even a detailed account has limitations, a certain amount of basic knowledge is also required for successful work.

Especially note the following:

(1) Adjustments

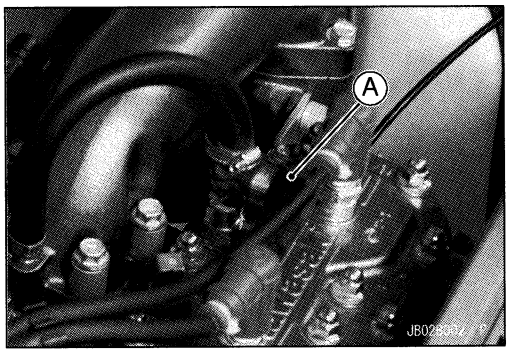
Adjustments shall be made in accordance with the Periodic Maintenance Chart or whenever troubleshooting or presence of symptoms indicate that adjustments may be required. Whenever running of the engine is required during maintenance it is best to have the watercraft in water.

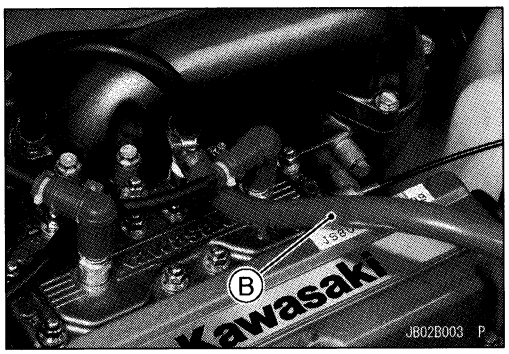
CAUTION

Do not run the engine without cooling water supply for more than 15 seconds, especially in high revolutionary speed or severe engine and exhaust system damage will occur.

(2) Auxiliary Cooling

An auxiliary cooling supply may be used if the watercraft cannot be operated in water during adjustments. If possible, always operate the watercraft in water rather than use an auxiliary cooling supply.





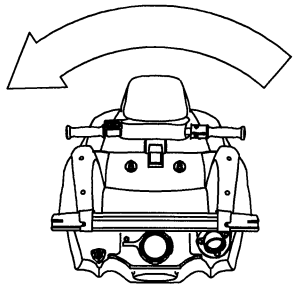
- Loosen the clamp and remove the cap [A].
- Connect the garden hose [B] to the hose fitting (see above).
- Attach the garden hose to a faucet. Do not turn on the water until the engine is running and turn it off immediately when the engine stops. The engine –requires 2.4 L/min (2.5 qts/min) at 1800 rpm and 7.0 L/min (7.4 qts/min) at 6000 rpm.

CAUTION

Insufficient cooling supply will cause the engine and/or exhaust system to overheat and severe damage will occur. Excessive cooling supply may kill the engine and flood the cylinders, causing hydraulic lock. Hydraulic lock will cause severe damage to the engine. If the engine dies while using an auxiliary cooling supply, the water must be shut off immediately.

Always turn the boat on its left side. Rolling to the right side can cause water in the exhaust system to run into the engine, with possible engine damage.

Before Servicing



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(3) Dirt

Before removal and disassembly, clean the "Jet Ski" watercraft. Any sand entering the engine will shorten the life of the watercraft. For the same reason, before installing a new part, clean off any dust or metal filings.

(4) Battery Ground

Disconnect the ground (–) wire from the battery before performing any disassembly operations on the "Jet Ski" watercraft. This prevents the engine from accidentally turning over while work is being carried out, sparks from being generated while disconnecting the wires from electrical parts, as well as damage to the electrical parts themselves. For reinstallation, first connect the positive wire to the positive (+) terminal of the battery

(5) Installation, Assembly

Generally, installation or assembly is the reverse of removal or disassembly. However, if installation or assembly sequence is given in this Service Manual, follow it. Note parts locations and cable, wire, and hose routing during removal or disassembly so they can be installed or assembled in the same way. It is preferable to mark and record the locations and routing whenever possible.

(6) Tightening Sequence

When installing bolts, nuts, or screws for which a tightening sequence is given in this Service Manual, make sure to follow the sequence. When installing a part with several bolts, nuts, or screws, start them all in their holes and tighten them to a snug fit, thus ensuring that the part has been installed in its proper location. Then, tighten them to the specified torque in the tightening sequence and method indicated. If tightening sequence instructions are not given, tighten them evenly in a cross pattern. Conversely, to remove a part, first loosen all the bolts, nuts, or screws that are retaining the part a 1/4–turn before removing them.

(7) Torque

When torque values are given in this Service Manual, use them. Either too little or too much torque may lead to serious damage. Use a good quality, reliable torque wrench.

(8) Force

Common sense should dictate how much force is necessary in assembly and disassembly. If a part seems especially difficult to remove or install, stop and examine what may be causing the problem. Whenever tapping is necessary, tap lightly using a wooden or plastic-faced mallet. Use an impact driver for screws (particularly for the removing screws held by non-permanent locking agent) in order to avoid damaging the screw heads.

(9) Edges

Watch for sharp edges, as they could cause injury through careless handling, especially during major engine disassembly and assembly. Use a clean piece of thick cloth when lifting the engine or turning it over.

(10)High-Flash Point Solvent

A high-flash point solvent is recommended to reduce fire danger. A commercial solvent commonly available in North America is standard solvent (generic name). Always follow manufacturer and container directions regarding the use of any solvent.

Before Servicing

(11)Gasket, O-Ring

Replace a gasket or an O-ring with a new part when disassembling. Remove any foreign matter from the mating surface of the gasket or O-ring to ensure a perfectly smooth surface to prevent oil or compression leaks.

(12)Liquid Gasket, Locking Agent

Clean and prepare surfaces where liquid gasket or non-permanent locking agent will be used. Apply them sparingly. Excessive amount may block engine oil passages and cause serious damage.

(13)Press

When using a press or driver to install a part such as a drive shaft holder bearing, apply a small amount of oil to the area where the two parts come in contact to ensure a smooth fit.

(14)Ball Bearing

Do not remove a ball bearing unless it is absolutely necessary. Replace any ball bearings that were removed with new ones. Install bearings with the manufacturer and size marks facing out, applying pressure evenly with a suitable driver. Apply force only to the end of the race that contacts the press fit portion, and press it evenly over the base component.

(15)Oil Seal and Grease Seal

Replace any oil or grease seals that were removed with new ones, as removal generally damages seals. Oil or grease seals should be pressed into place using a suitable driver, applying a force uniformly to the end of seal until the face of the seal is even with the end of the hole, unless instructed otherwise. When pressing in an oil or grease seal which has manufacturer's marks, press it in with the marks facing out.

(16)Circlip, Retaining Ring, and Cotter Pin

When installing circlips and retaining rings, take care to compress or expand them only enough to install them and no more. Install the circlip with its chamfered side facing load side as well.

Replace any circlips, retaining rings, and cotter pins that were removed with new ones, as removal weakens and deforms them. If old ones are reused, they could become detached while the "Jet Ski" watercraft is driven, leading to a major problem.

(17)Lubrication

Engine wear is generally at its maximum while the engine is warming up and before all the sliding surfaces have an adequate lubricative film. During assembly, make sure to apply oil to any sliding surface or bearing that has been cleaned. Old grease or dirty oil could have lost its lubricative quality and may contain foreign particles that act as abrasives; therefore, make sure to wipe it off and apply fresh grease or oil. Some oils and greases in particular should be used only in certain applications and may be harmful if used in an application for which they are not intended.

(18)Replacement Parts

When there is a replacement instruction, replace these parts with new ones every time they are removed.

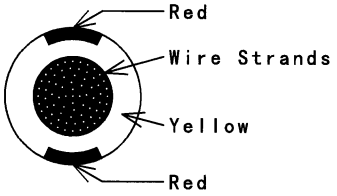
Replacement parts will be damaged or lose their original function once they are removed. Therefore, always replace these parts with new ones every time they are removed. Although the previously mentioned gasket, O-ring, ball bearing, needle bearing, grease seal, oil seal, circlip, and cotter pin have not been so designated in their respective text, they are replacement parts.

(19)Electrical Wires

All the electrical wires are either one-color or two-color. A two-color wire is identified first by the primary color and then the stripe color. For example, a yellow wire with thin red stripes is referred to as a "yellow/red" wire; it would be a "red/yellow" wire if the colors were reversed. Unless instructed otherwise, electrical wires must be connected to wires of the same color.

Before Servicing

Two-Color Electrical

Wire(cross-section)	Color Indicated on the Wire	Color Indicated on the Wiring Diagram
	Yellow/Red	Y/R

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(20)Inspection

When parts have been disassembled, visually inspect these parts for the following conditions or other damage. If there is any doubt as to the condition of them, replace them with new ones.

Abrasion	Crack	Hardening	Warp
Bent	Dent	Scratch	Wear
Color change	Deterioration	Seizure	

(21)Specifications

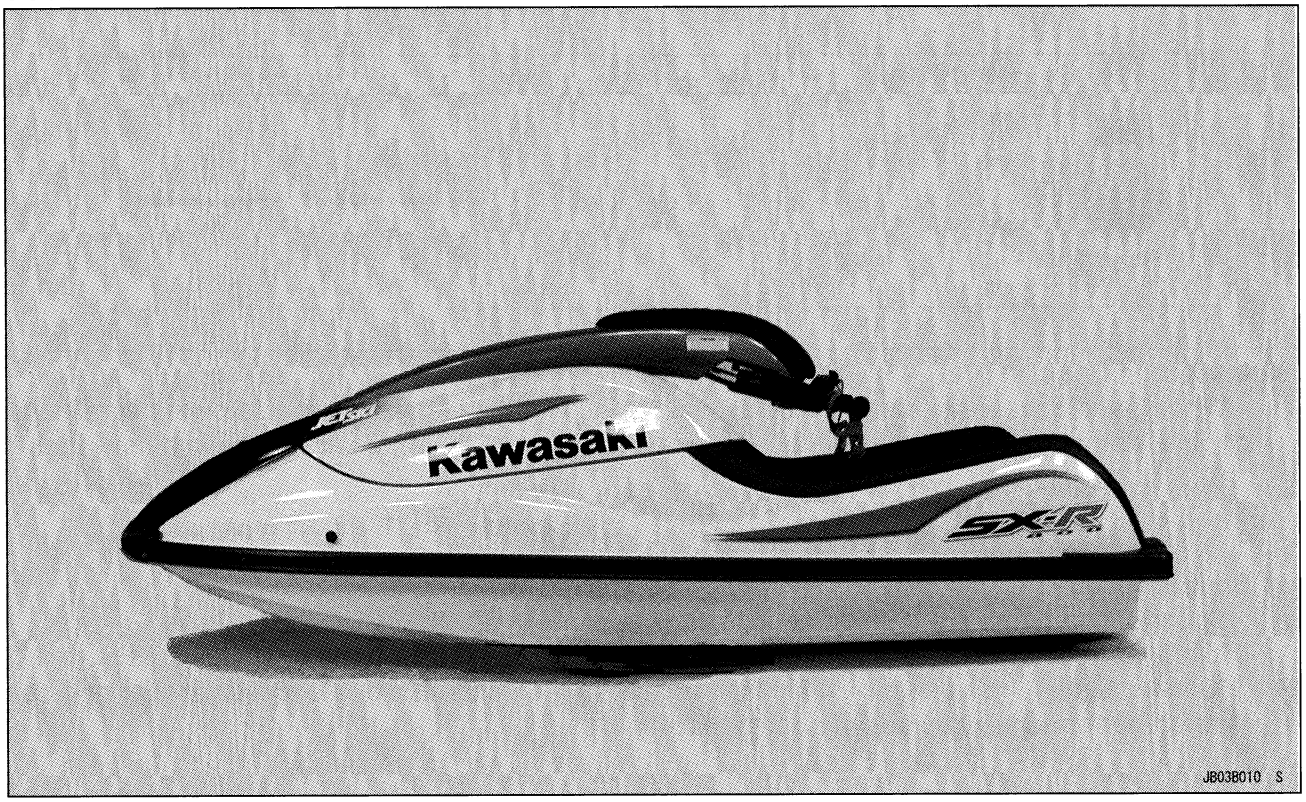
Specification terms are defined as follows:

"Standards" show dimensions or performances which brand-new parts or systems have.

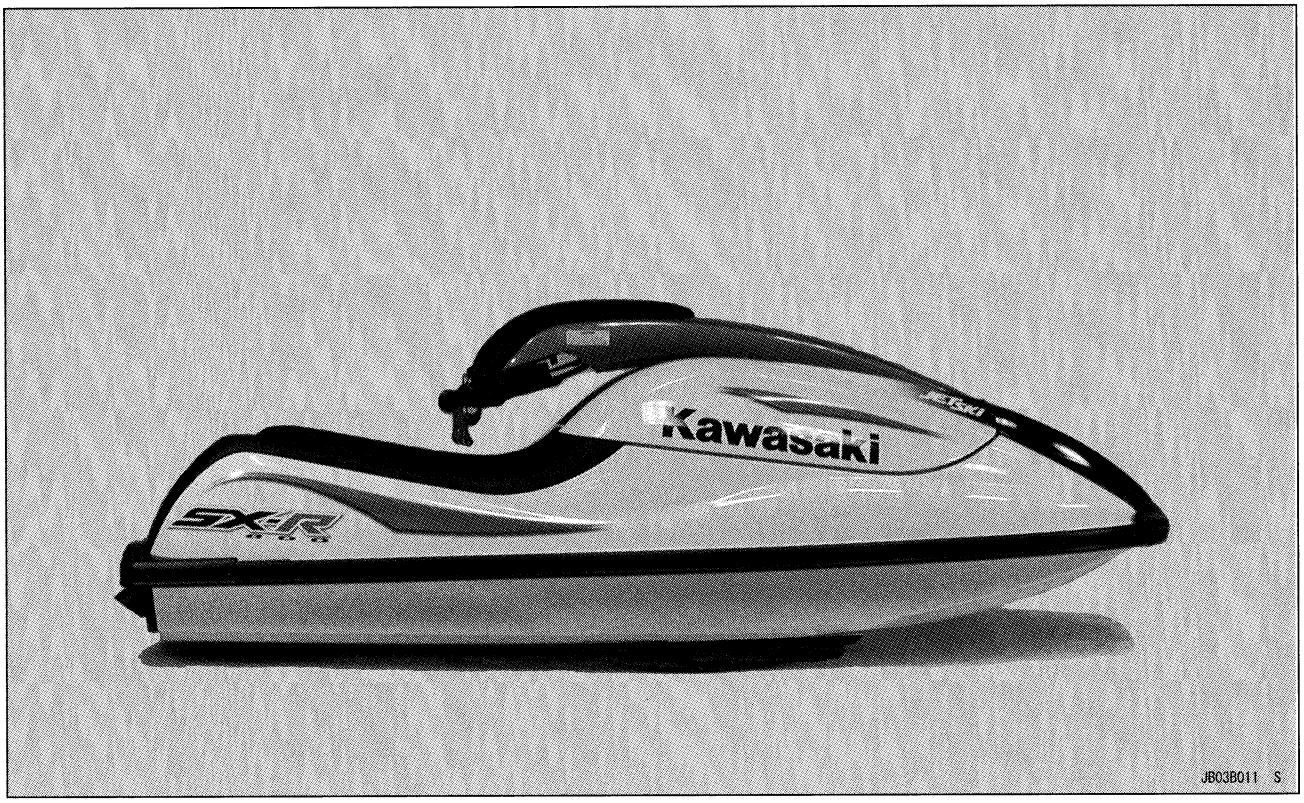
"Service Limits" indicate the usable limits. If the measurement shows excessive wear or deteriorated performance, replace the damaged parts.

Model Identification

JS800-A1 Left Side View:



JS800-A1 Right Side View:



General Specifications

Items	JS800-A1
Engine:	
Type	2-stroke, 2-cylinder, crankcase reed valve, water cooled
Displacement	781 mL (47.7 cu in.)
Bore and stroke	82 × 74 mm (3.23 × 2.91 in.)
Compression ratio	7.2 : 1
Maximum horsepower	58.85 kW (80 PS) @6 250 r/min (rpm)
Maximum torque	94.2 N·m (9.6 kgf·m, 69.5 ft·lb) @5 750 r/min (rpm)
Ignition system	Magneto CDI (Digital)
Lubrication system	Gas/oil premix ratio 60 : 1
Carburetion system	MIKUNI BN40-38 × 2
Starting system	Electric starter
Tuning Specifications:	
Spark plug: Type	NGK BR8ES
Gap	0.7 ~ 0.8 mm (0.028 ~ 0.031 in.)
Terminal	Solid post
Ignition timing	13° BTDC @1 250 r/min ~ 20.2° BTDC @4 000 r/min (rpm)
Carburetor: Idle Speed	1 250 ± 100 r/min (rpm) — in water
	1 700 ± 100 r/min (rpm) — out of water
Compression pressure	892 ~ 1 373 kPa (9.1 ~ 14 kgf/cm², 129 ~ 199 psi)
	@ 490 r/min (rpm)
Drive System:	
Coupling	Direct drive from engine
Jet pump: Type	Axial flow single stage
Thrust	3 100 N (317 kgf, 697 lb)
Steering	Steerable nozzle
Braking	Water drag
Performance:	
†Minimum turning radius	3.2 m (10.5 ft)
†Fuel consumption	32 L/h (8.5 US gal/h) @ full throttle
†Cruising range	40 km (75 mile) @ full throttle 32 minutes
Dimensions:	
Overall length	2 300 mm (90.55 in.)
Overall width	730 mm (28.7 in.)
Overall height	735 mm (28.9 in.)
Dry weight	159 kg (351 lb)
Fuel tank capacity	17 L (4.5 US gal) including 3 L (0.8 US gal) reserve
Engine Oil:	
Type	2-stroke, N.M.M.A. Certified for Service TC-W3
Electrical Equipment:	
Battery	12 V 18 Ah
Maximum generator out put	6.6 A/14V @6 000 r/min (rpm)

†: This information shown here represents results under controlled conditions, and the information may not be correct under other conditions.

Specifications subject to change without notice, and may not apply to every country.

Unit Conversion Table

Prefixes for Units:

Prefix	Symbol	Power
mega	M	× 1 000 000
kilo	k	× 1 000
centi	c	× 0.01
milli	m	× 0.001
micro	μ	× 0.000001

Units of Mass:

kg	×	2.205	=	lb
g	×	0.03527	=	oz

Units of Volume:

L	×	0.2642	=	gal (US)
L	×	0.2200	=	gal (imp)
L	×	1.057	=	qt (US)
L	×	0.8799	=	qt (imp)
L	×	2.113	=	pint (US)
L	×	1.816	=	pint (imp)
mL	×	0.03381	=	oz (US)
mL	×	0.02816	=	oz (imp)
mL	×	0.06102	=	cu in.

Units of Force:

N	×	0.1020	=	kg
N	×	0.2248	=	lb
kg	×	9.807	=	N
kg	×	2.205	=	lb

Units of Length:

km	×	0.6214	=	mile
m	×	3.281	=	ft
mm	×	0.03937	=	in.

Units of Torque:

N·m	×	0.1020	=	kgf·m
N·m	×	0.7376	=	ft·lb
N·m	×	8.851	=	in·lb
kgf·m	×	9.807	=	N·m
kgf·m	×	7.233	=	ft·lb
kgf·m	×	86.80	=	in·lb

Units of Pressure:

kPa	×	0.01020	=	kgf/cm²
kPa	×	0.1450	=	psi
kPa	×	0.7501	=	cmHg
kgf/cm²	×	98.07	=	kPa
kgf/cm²	×	14.22	=	psi
cm Hg	×	1.333	=	kPa

Units of Speed:

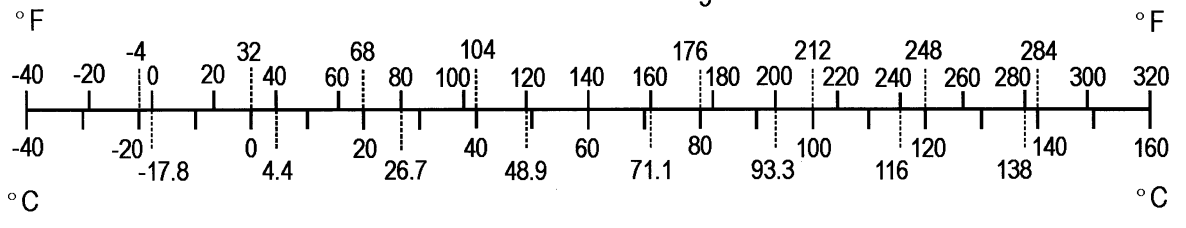
km/h	×	0.6214	=	mph

Units of Power:

kW	×	1.360	=	PS
kW	×	1.341	=	HP
PS	×	0.7355	=	kW
PS	×	0.9863	=	HP

Units of Temperature:

$$\frac{9(°C+40)}{5} - 40 = °F \qquad \frac{5(°F+40)}{9} - 40 = °C$$



Periodic Maintenance

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2-2 PERIODIC MAINTENANCE

Periodic Maintenance Chart

Frequency / Description	Initial 10 Hours	Every 25 Hours	Every 100 Hours	See Page
Check all hoses, clamps, nuts, bolts, and fasteners	●	●		2 - 23
Lubricate throttle cable fitting and choke cable fitting at carburetor		●		2 - 20
Lubricate choke cable and throttle cable and throttle cable fitting at throttle case		●		2 - 20
Clean and gap spark plugs (replace if necessary)		●		2 - 19
Inspect battery charging condition		●		2 - 18
Lubricate steering cable ball joints and steering nozzle pivots		●		2 - 20
Clean fuel filter screens		●		2 - 11
Adjust carburetor		●		2 - 8
Flush bilge line and filter		●		2 - 16
Flush cooling system (after each use in salt water)		●		2 - 15
Inspect/clean flame arrester		●		2 - 13
Inspect impeller blade for damage (remove)			●	2 - 16
Inspect/replace coupling damper			●	2 - 14
Inspect carburetor throttle shaft spring (replace carburetor if necessary)			●	2 - 14
Inspect steering cable			●	2 - 17
Lubricate handlebar pivot (disassemble)		●		2 - 18
Inspect fuel vent check valve		●		2 - 12

Torque and Locking Agent

The following tables list the tightening torque for the major fasteners requiring use of a non-permanent locking agent or silicone sealant.

Letters used in the "Remarks" column mean:
L: Apply a non-permanent locking agent to the threads.
SS: Apply silicone sealant to the threads.
S: Tighten the fasteners following the specified sequence.

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Fuel System:				
Carburetor mounting bolts	18	1.8	13 in·lb	L
Carburetor main jet	1.8	0.18	16 in·lb	
Carburetor pilot jet	0.7	0.07	6.2 in·lb	
Carburetor float arm pin screw	0.98	0.10	8.7 in·lb	
Carburetor cover screws	3.4	0.35	30 in·lb	
Carburetor plate screws	2.0	0.20	18 in·lb	
Inlet manifold mounting nuts	9.8	1.0	87 in·lb	
Air inlet cover mounting bolts	8.8	0.9	78 in·lb	L
Flame arrester case mounting bolts	8.8	0.9	78 in·lb	L
Handle pole cover screws	1.5	0.15	13 in·lb	
Choke cable adjust nuts	20	2.0	14	
Throttle cable adjust nuts	20	2.0	14	L
Exhaust System:				
Exhaust pipe mounting bolts	29	3.0	22	L
Front muffler mounting bolts	29	3.0	22	L
Water pipe joints	11	1.1	95 in·lb	SS
Exhaust manifold mounting nuts	20	2.0	14.5	S
Expansion chamber mounting bolts	29	3.0	22	L
Muffler bracket mounting bolts	29	3.0	22	L
Water box muffler bracket mounting screws	5	0.5	43 in·lb	L
Engine Top End:				
Cylinder head nuts	29.4	3.0	22	S
Cable holder bolts	29.4	3.0	22	L
Cylinder base nuts	34	3.5	25	
Water pipe joint	7.8 ~ 14	0.8 ~ 1.4	69 ~ 122 in·lb	SS
Fitting	7.8 ~ 14	0.8 ~ 1.4	69 ~ 122 in·lb	L
Cylinder stud	—	—	—	L

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Engine Removal/Installation:				
Engine mounting bolts	36	3.7	27	L
Engine bed mounting bolts	49	5.0	36	L
Engine mount bolts	16	1.6	12	L
Engine Bottom End:				
Flywheel bolt	130	13.5	96	L
Stator mounting bolts	12	1.2	8.5	
Coupling	130	13.5	96	L
Magneto cover mounting bolts	8.8	0.9	78 in·lb	L
Crankcase bolts (6 mm dia.)	8.8	0.9	78 in·lb	L, S
Crankcase bolts (8 mm dia.)	29	3.0	22	L, S
Magneto cover cap bolts	8.8	0.9	78 in·lb	L
Set screw	8.8	0.9	78 in·lb	L
Crankshaft sensor bracket screw	8.8	0.9	78 in·lb	L
Grommet clamp screws	8.8	0.9	78 in·lb	L
Electric case cap bolts	8.8	0.9	78 in·lb	L
Cooling and Bilge Systems:				
Water pipe joint	9.8	1.0	87 in·lb	SS
Drive System:				
Coupling	39	4.0	29	L
Drive shaft holder mounting bolts	22	2.2	16.0	L
Pump and Impeller:				
Water pipe joint	9.8	1.0	87 in·lb	SS
Steering nozzle pivot bolts	8.8	0.9	78 in·lb	L
Pump outlet mounting bolts	—	—	—	L
Pump cap bolts	—	—	—	L
Impeller	98	10.0	72	
Pump mounting bolts	22	2.2	16.0	L
Pump cover mounting bolts	6.9	0.7	61 in·lb	L
Grate mounting bolts	7.8	0.8	69 in·lb	L
Steering cable ball joint	—	—	—	L
Handle Pole and Handlebar:				
Steering support bracket mounting bolts	—	—	—	L
Steering pivot stud	38	3.9	28	L (small)
Handle pole cover screws	1.5	0.15	13 in·lb	

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Handle pole pivot shaft	13	1.3	9.4	
Handle pole pivot shaft nut	33	3.4	25	
Handlebar clamp screws	18	1.8	13.0	L
Handle pole bracket bolts	19	1.9	14	L
Hull/Engine Hood:				
Front cover screws	—	—	—	L
Exhaust outlet bolts	—	—	—	L
Battery bracket bolts	—	—	—	L
Strap bolts	—	—	—	L
Strap bracket bolt	—	—	—	L
Engine hood plate bolts	—	—	—	L
Electric case bracket bolts	—	—	—	L
Electrical System:				
Electric case connector mounting bolts	8.8	0.9	78 in·lb	L
Spark plugs	27	2.8	20	
Joints	3.9	0.4	35 in·lb	
Starter relay lead mounting nuts	4.4	0.45	39 in·lb	
Electric case mounting bolts	8.8	0.9	78 in·lb	L
Temperature sensor mounting bolt	8.8	0.9	78 in·lb	L
Temperature sensor	27	2.8	20	
Regulator/rectifier mounting bolts	8.8	0.9	78 in·lb	L
CDI igniter mounting bolts	8.8	0.9	78 in·lb	L
Ignition coil mounting bolts	8.8	0.9	78 in·lb	L
Electric case bolts	8.8	0.9	78 in·lb	L
Switch housing mounting screws	3.9	0.4	35 in·lb	
Battery ground cable mounting bolt	8.8	0.9	78 in·lb	L
Starter motor cable (+) mounting nut	7.8	0.8	69 in·lb	
Starter motor mounting bolts	8.8	0.9	78 in·lb	L
Starter motor retaining bolts	6.3	0.6	56 in·lb	L

Torque and Locking Agent

This table relating tightening torque of the stainless bolt and the nut to thread diameter, lists the basic torque for the bolts and nuts. Use this table for only the bolts and nuts which do not require a specific torque value.

General Fasteners (stainless bolt and nut)

Threads dia. (mm)	Torque		
	N·m	kgf·m	ft·lb
6	5.9 ~ 8.8	0.60 ~ 0.90	52 ~ 78 in·lb
8	16 ~ 22	1.6 ~ 2.2	11.6 ~ 15.9
10	30 ~ 41	3.1 ~ 4.2	22 ~ 30

Specifications

Item	Standard	Service Limit
Fuel System:		
Idle speed:		
in water	1 250 ± 100 r/min (rpm)	– – –
out of water	1 700 ± 100 r/min (rpm)	– – –
Electrical System:		
Battery voltage	12.6 V or more	– – –
Spark plug gap	0.7 ~ 0.8 mm (0.028 ~ 0.031 in.)	– – –

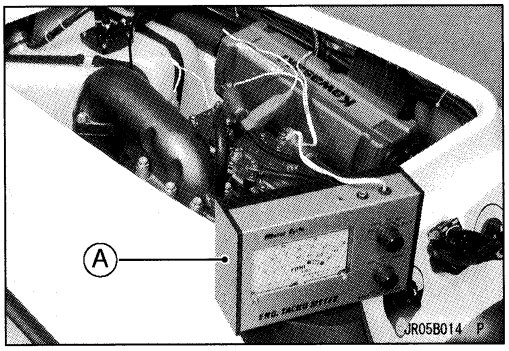
Periodic Maintenance Procedures

Fuel System:

Idle Speed Adjustment

The normal idle speed setting is the lowest stable speed.

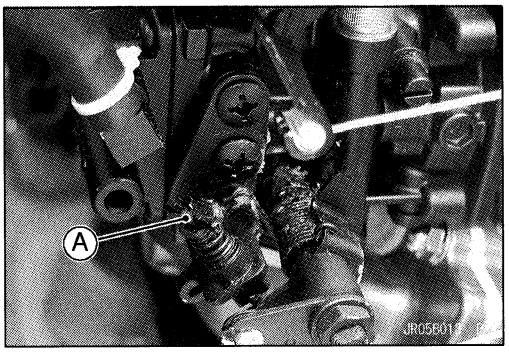
- Remove the engine hood (see Hull/Engine Hood chapter).
- Start the engine.
- Check the engine speed, using the engine revolution tester [A] for high accuracy.



- Turn the idle adjusting screw [A] as required to reach this setting.

Idle Speed

in water:	**1 250 ± 100 r/min (rpm)**
out of water:	**1 700 ± 100 r/min (rpm)**



Carburetor Synchronization

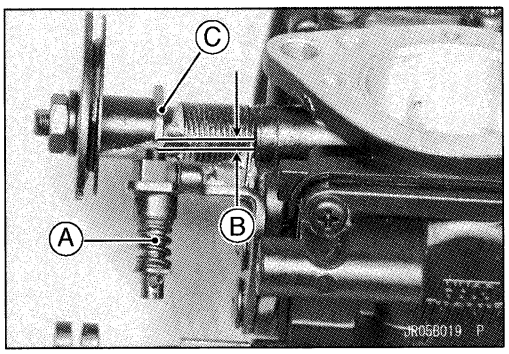
- Remove the carburetor (see Fuel System chapter).

CAUTION
Do not turn the pilot screws carelessly during synchronization. You may cause poor running at low engine speed.

- Check the mixture screws settings (see Fuel System chapter).

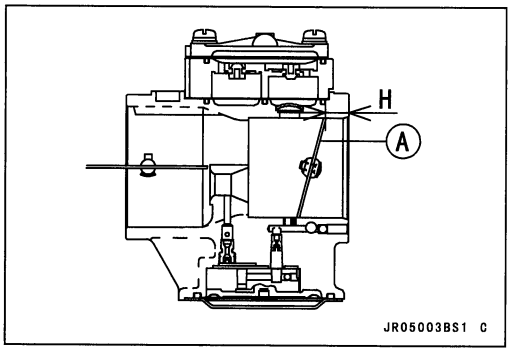
★If the setting is incorrect, adjust them (see Fuel System chapter).

- Turn out the idle adjusting screw [A] until there is a clearance [B] between the adjusting screw end and throttle shaft lever [C].
- Turn in the idle adjusting screw until the adjusting screw end just touches the throttle shaft lever.

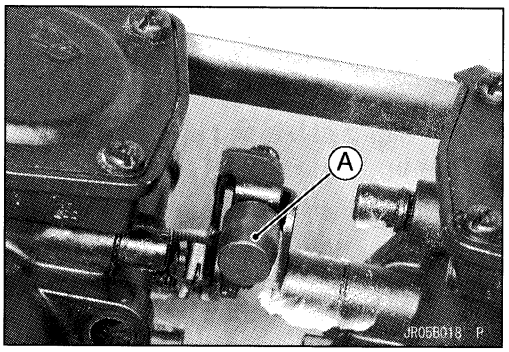


Periodic Maintenance Procedures

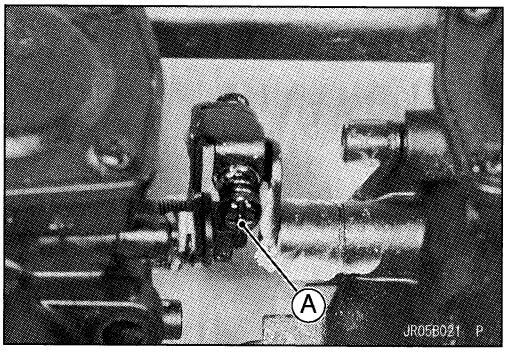
- Turn in the adjusting screw 3/4 turn from the point to keep the specified throttle valve [A] opening in the front carburetor.
- Measure the distance from the bottom of the carburetor bore lower end to the valve edge shown as "H".



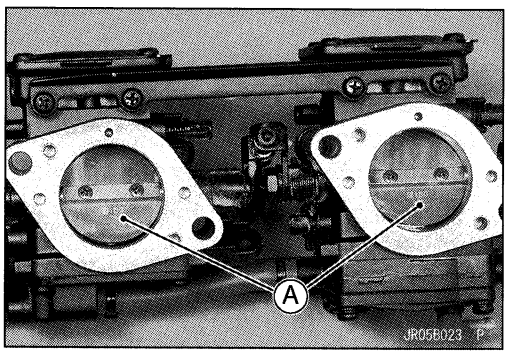
- Remove:
  Synchronizing Screw Cap [A]



- Turn the synchronizing screw [A] so that the valve edge in the rear carburetor keeps the same distance within ± 0.2 mm (0.008 in.) tolerance as in the front carburetor.



- Open and close the throttle a few times to make sure that the throttle valves [A] are synchronized. Readjust if necessary.
- Install the carburetor.
- Adjust the idle speed, throttle control and choke cables.



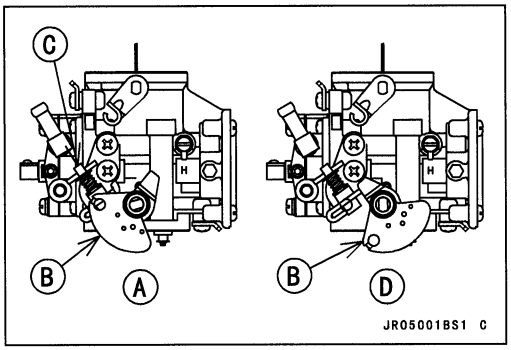
Periodic Maintenance Procedures

Throttle Cable Adjustment

- Remove the engine hood (see Hull/Engine Hood chapter).
- Check throttle cable adjustment.

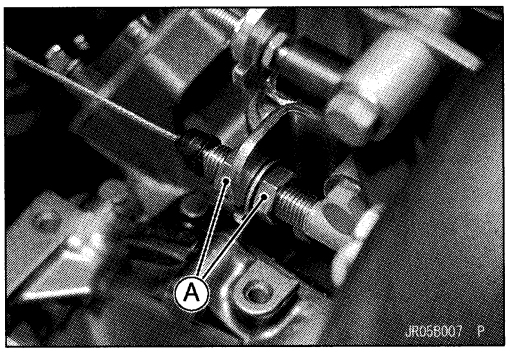
o With the throttle lever released [A], the lower stop on the shaft lever [B] should rest against the idle adjust screw [C], and there should be slight slack in the throttle cable.

o When the throttle lever is fully applied (pulled) [D], the upper stop on the shaft lever [B] should be all the way up against the stop on the carburetor.



- If necessary, adjust the throttle cable.
- Loosen and turn the locknuts [A] at the bracket until the stop on the shaft lever hits against the idle adjust screw with slight cable slack.
- Tighten the locknuts securely.

Torque - Throttle Cable Adjustment Nuts: 20 N·m (2.0 kgf·m, 25 ft·lb)



- Check that the throttle lever moves smoothly from full open to close, and the throttle closes quickly and completely in all steering positions by the return spring.

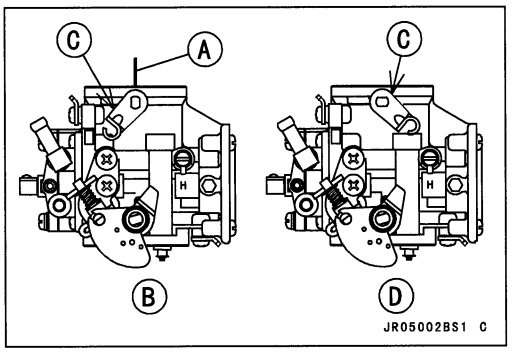
★If the throttle lever does not return properly, check the throttle cable routing, cable adjustments, and cable damage. Then lubricate the throttle cable.

- Run the engine at the idle speed, and turn the handlebar all the way to the right and left, or/and up and down to ensure that the idle speed does not change.

★If the idle speed increase, check the throttle cable adjustment and the cable routing.

Choke Cable Adjustment

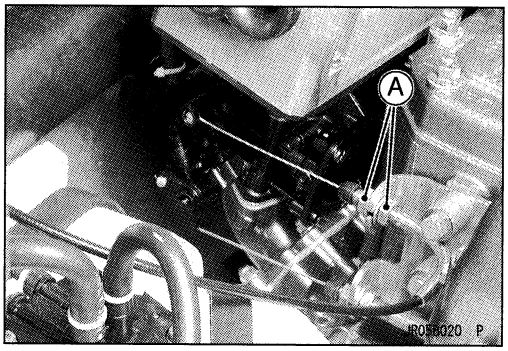
- Remove the engine hood (see Hull/Engine Hood chapter).
- When the choke knob is turned to the "OFF" position, the choke butterfly valve [A] in the carburetor should be completely open [B]. The choke pivot arm [C] should stand all the way toward the starboard side of the boat with minimal cable slack.
- When the choke knob is turned to the "ON" position, the choke butterfly valve in the carburetor should be completely closed [D]. Check that the choke pivot arm [C] stands all the way toward the port side of the boat without cable slack.



Periodic Maintenance Procedures

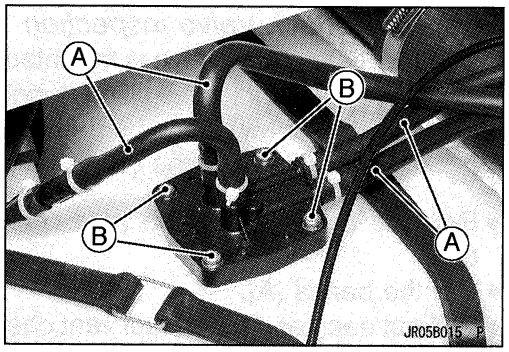
- If necessary, adjust the choke cable.
  - Turn the choke knob to the "OFF" position (counterclockwise completely).
  - Loosen the adjust nuts [A] and turn the nuts to allow a little cable slack.
  - Tighten the locknuts.

Torque - Choke Cable Adjust Nuts: 20 N·m (2.0 kgf·m, 25 ft·lb)



Fuel Filter Screen Cleaning

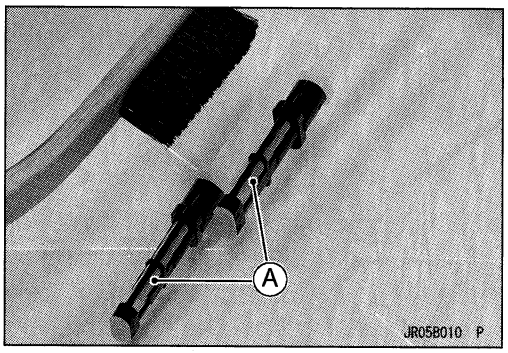
- Remove the engine hood (see Hull/Engine Hood chapter).
- Cut the bands of the fuel tubes.
- Pull out each tubes [A] from the fuel filter assembly fittings.
- Unscrew the fuel filter assembly mounting screws [B].
- Remove the fuel filter assembly.



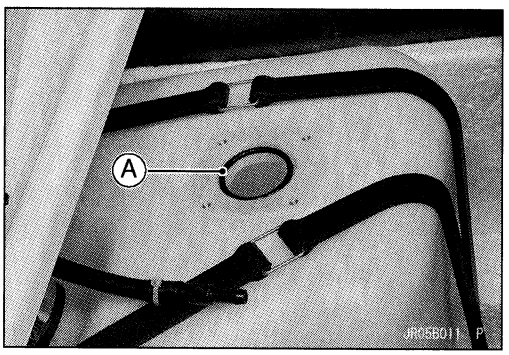
- Wash the fuel filler screens [A] in non-flammable or high flash-point solvent. Use a brush to remove any contaminants trapped in the screens.

⚠ WARNING

Clean the fuel filter screens in a well-ventilated area, and take care that there are no sparks or flame any where near the working area; this includes any appliance with a pilot light. Do not use gasoline or a low flash-point solvent. A fire or explosion could result.

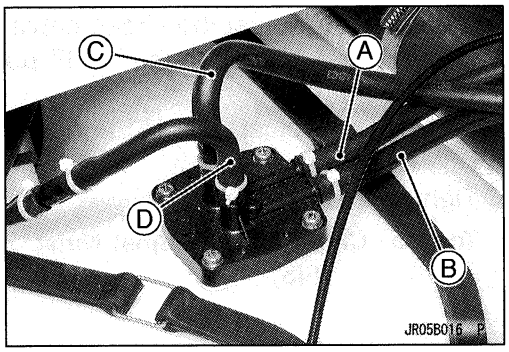


- When installing the fuel filter assembly, note the following.
  - Be sure the O-ring [A] on the fuel tank is in position.



Periodic Maintenance Procedures

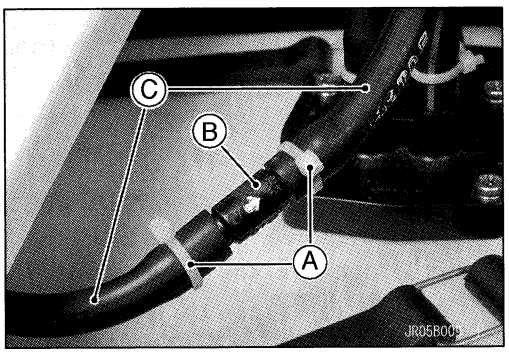
o Tighten the mounting screws.
o Be sure the hoses are connected correctly with their fittings.
Reserve Line [A]
Main (ON) Line [B]
Return Line [C]
Fuel Tank Vent Line [D]



Fuel Vent Check Valve Inspection

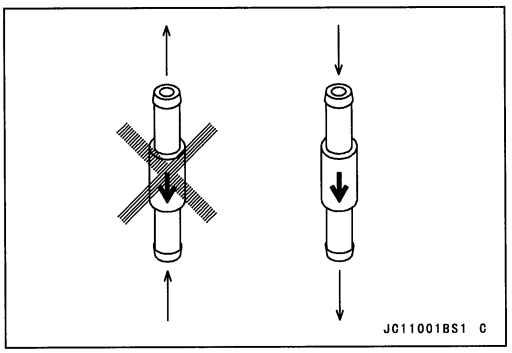
The fuel vent check valve is mounted in the fuel tank vent hose to prevent fuel from spilling during riding. Air can flow into the tank to allow fuel to be drawn out by the fuel pump, but fuel cannot flow out the check valve.

- Remove the engine hood (see Hull/Engine Hood chapter).
- Cut the bands [A].
- Pull out each end of the fuel vent check valve [B] from the vent tubes [C].

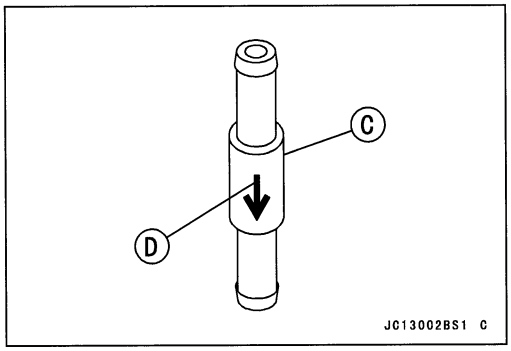


- Blow through the fuel vent check valve from catch end.

★If the check valve will allow air to flow as shown, it is OK.
★If air will flow through the check valve in both direction or in neither direction, the check valve must be replaced.



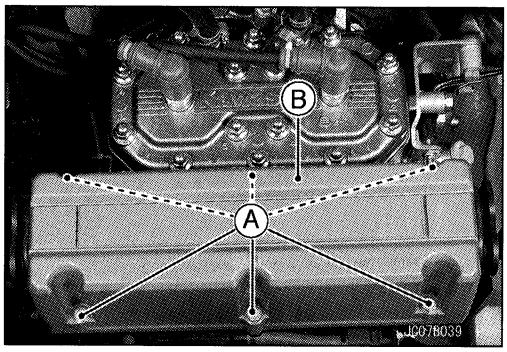
- The fuel vent check valve [C] must be mounted so that the arrow [D] on its case is pointing toward the fuel tank.



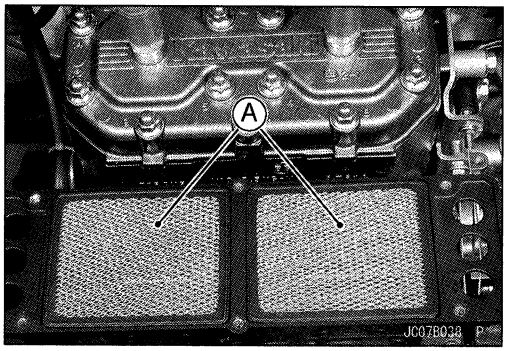
Periodic Maintenance Procedures

Flame Arrester Cleaning and Inspection

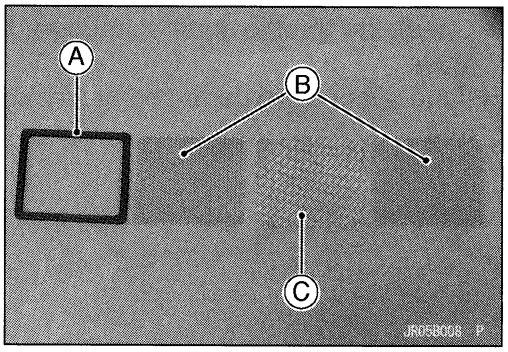
- Remove:
  Engine Hood (see Hull/Engine Hood chapter)
  Air Inlet Cover Mounting Bolts [A]
  Air Inlet Cover [B]



- Remove:
  Flame Arresters [A]



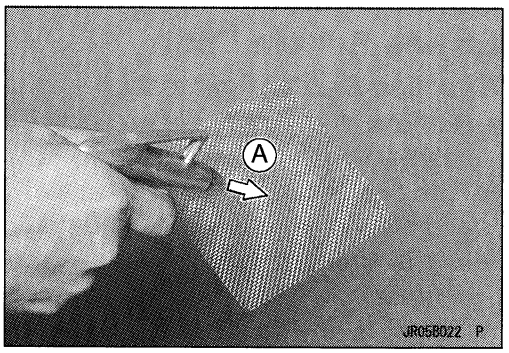
- Disassemble the flame arrester.
  Rubber Holder [A]
  Expanders [B]
  Screen [C]



- Blow each parts of the flame arrester clean with compressed air [A].

⚠ WARNING

Eye protection should be worn when compressed air is used to dry parts. Do not direct air toward anyone. Use 172 kPa (1.75 kgf/cm², 25 psi) maximum nozzle pressure.



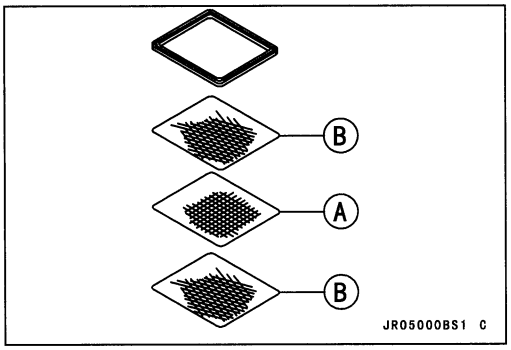
- Visually inspect the flame arrester.

★If the rubber holder, screen and expanders are broken, replace them as a set.

Periodic Maintenance Procedures

- When assembling the flame arrester, put the screen [A] between two expander [B].
- Apply a non-permanent locking agent to the threads of the air inlet cover bolts.

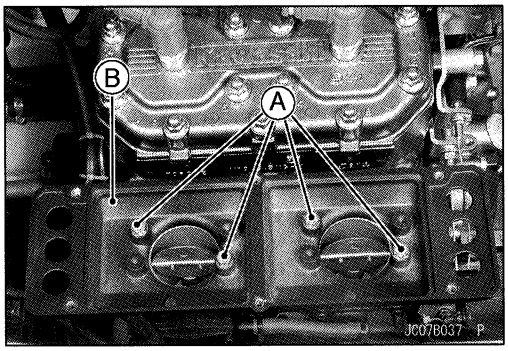
Torque - Air Inlet Cover Bolts: 7.8 N·m (0.8 kgf·m, 69 in·lb)



Throttle Shaft Spring Inspection

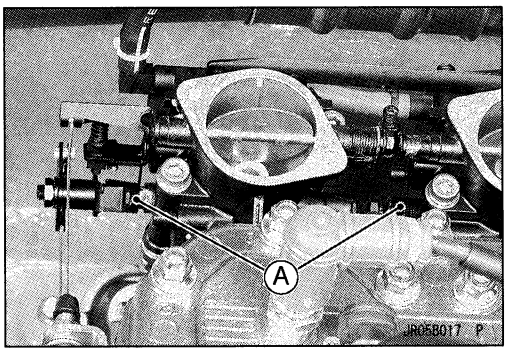
- Remove:

Flame Arrester (see Flame Arrester Cleaning and Inspection)
Flame Arrester Case Bolts [A]
Flame Arrester Case [B]



- Check the throttle shaft springs [A] by pulling the throttle lever.

★If the springs are damaged or weak, replace the carburetors.



Engine Bottom End:

Coupling Damper Inspection

- Remove the engine (see Engine Removal/Installation chapter).
- With the engine removed, remove the coupling damper and inspect it for wear [A] and deterioration.

★If it is grooved or misshapen, replaced it with a new damper.

★If there is any doubt as to coupler condition, replace it.