

Product: 1986-1991 Kawasaki jetski X-2 WaveRunner Service Repair Workshop Manual  
Full Download: <https://www.arepairmanual.com/downloads/1986-1991-kawasaki-jetski-x-2-waverunner-service-repair-workshop-manual/>

# Kawasaki

# jetski® X-2



## JET SKI® Watercraft Service Manual

Sample of manual. Download All 212 pages at:

<https://www.arepairmanual.com/downloads/1986-1991-kawasaki-jetski-x-2-waverunner-service-repair-workshop-manual/>

# QUICK REFERENCE GUIDE

**GENERAL INFORMATION**

**1**

**FUEL SYSTEM**

**2**

**ENGINE LUBRICATION SYSTEM**

**3**

**EXHAUST SYSTEM**

**4**

**ENGINE TOP END**

**5**

**ENGINE REMOVAL AND INSTALLATION**

**6**

**ENGINE BOTTOM END**

**7**

**COOLING AND BILGE SYSTEMS**

**8**

**DRIVE SHAFT**

**9**

**PUMP AND IMPELLER**

**10**

**STEERING**

**11**

**HULL/ENGINE HOOD**

**12**

**ELECTRICAL SYSTEM**

**13**

**STORAGE AND TRANSPORTING**

**14**

**APPENDIX**

**15**

**Supplement-1987 Model**

**16**

**Supplement-1988 Model**

**17**

**Supplement-1989 Model**

**18**

**Supplement-1990 Model**

**19**

**Supplement-1991 Model**

**20**

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.

Sample of content: Download All 212 pages at:

<https://www.aresairmanual.com/downloads/1986-1991-kawasaki-jetski-x-2-waverunner-service-repair-workshop-manual/>



**jet ski<sup>®</sup> X-2**

# **Jet Ski<sup>®</sup> Watercraft Service Manual**

## 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) per minute
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)		



**WARNING  
CONTAINS  
ASBESTOS**

Breathing asbestos  
dust is dangerous  
to health

Follow safety  
instructions

This warning may apply to any of the following components or any assembly containing one or more of these components:—

- Brake Shoes or Pads
- Clutch Friction Material
- Gaskets
- Insulators

**SAFETY INSTRUCTIONS**

- Operate if possible out of doors or in a well ventilated place.
- Preferably use hand tools or low speed tools equipped, if necessary, with an appropriate dust extraction facility. If high speed tools are used, they should always be so equipped.
- If possible, dampen before cutting or drilling.
- Dampen dust and place it in properly closed receptacle and dispose of it safely.

**Read OWNER'S MANUAL before operating.**

# 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 your warranty period,** especially, 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" watercrafts 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 preparing this manual, we divided the product into its major systems. These systems became the manual's chapters. All information for a particular system from adjustment through disassembly and inspection is located in a single chapter.

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.

The Periodic maintenance chart is located in the General Information chapter. The chart gives a time schedule for required maintenance operations.

If you want spark plug information, for example, go to the Periodic Maintenance Chart first. The chart tells you how frequently to clean and gap the plug. Next, 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 Spark Plug 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 five more symbols (in addition to WARNING and CAUTION) which will help you distinguish different types of information.

### NOTE

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

- Indicates a procedural step or work to be done.
- Indicates a procedural sub-step or how to do the work of the procedural step it follows. It also precedes the text of a WARNING, CAUTION, or 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.
- ☆ Indicates a conditional sub-step or what action to take based upon the results of the conditional 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

## Table of Contents

Before Servicing .....	1-2
Model Identification .....	1-5
General Specifications .....	1-6
Periodic Maintenance Chart .....	1-7
Torque and Locking Agent .....	1-8
Cable Routing .....	1-10

## 1-2 GENERAL INFORMATION

### 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.

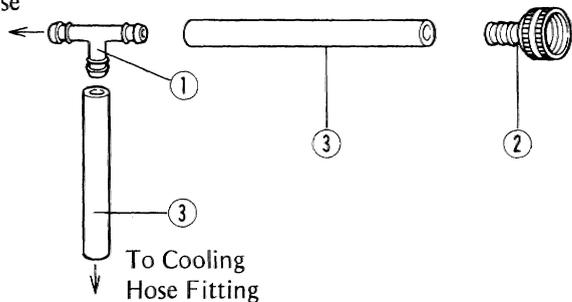
### CAUTION

- Do not run the engine without cooling water supply for more than 15 seconds or severe engine and exhaust system damage will occur.

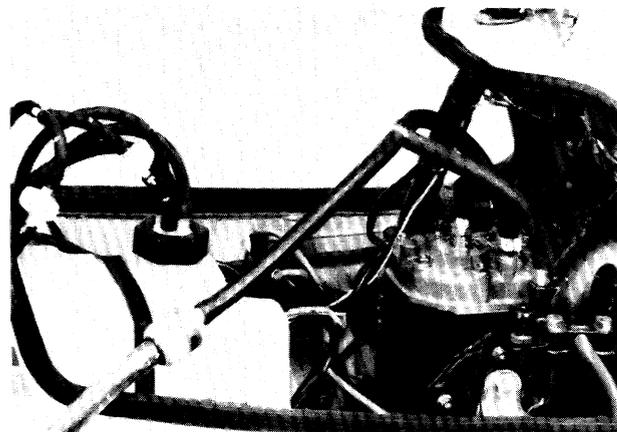
##### (2) Auxiliary Cooling

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. Obtain the following items: (1) a standard garden hose, (2) a garden hose adapter, which may be found at a hardware store, (3) two 3' lengths of 3/8" rubber hose, and (4) a 3/8" plastic "Tee" adapter, which may be found at an auto parts store.

To Cooling  
Hose



- "Tee" Adapter
- Garden Hose Adapter
- Rubber Hoses



- Screw the adapter onto the garden hose.
- Locate the cooling hose that loops from the cylinder head to the exhaust pipe. Disconnect the cooling hose from the exhaust pipe.
- Attach the adapters to the cooling and the two rubber hoses (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 1 800 rpm (idle) and 7.0 L/min (7.4 qts/min) at 6 000 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 cylinder, 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.

- (3) Dirt  
Before removal and disassembly, clean the watercraft. Any sand entering the engine, carburetor, or other parts will work as an abrasive and 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  
Remove the ground (—) lead from the battery before performing any disassembly operations on the watercraft. This prevents:
  - (a) the possibility of accidentally turning the engine over while partially disassembled.
  - (b) sparks at electrical connections which will occur when they are disconnected.
  - (c) damage to electrical parts.
- (5) Tightening Sequence  
Generally, when installing a part with several bolts, nuts, or screws, they should all be started in their holes and tightened to a snug fit. Then tighten them evenly in a cross pattern. This is to avoid distortion of the part and/or causing gas or oil leakage. Conversely when loosening the bolts, nuts, or screws, first loosen all of them by about a quarter of turn and then remove them.  
Where there is a tightening sequence indication in this Service Manual, the bolts, nuts, or screws must be tightened in the order and method indicated.
- (6) Torque  
The torque values given in this Service Manual should always be adhered to. Either too little or too much torque may lead to serious damage. Use a good quality, reliable torque wrench.
- (7) 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 removal of screws held by a locking agent) in order to avoid damaging the screw heads.
- (8) Edges  
Watch for sharp edges, especially during major engine disassembly and assembly. Protect your hands with gloves or a piece of thick cloth when lifting the engine or turning it over.
- (9) High Flash-point Solvent  
A high flash-point solvent is recommended to reduce fire danger. A commercial solvent commonly available in North America is Stoddard solvent (generic name). Always follow manufacturer and container directions regarding the use of any solvent.
- (10) Gasket, O-ring  
Do not reuse a gasket or O-ring once it has been in service. The mating surfaces around the gasket should be free of foreign matter and perfectly smooth to avoid oil or compression leaks.
- (11) Liquid Gasket, Non-permanent Locking Agent  
Follow manufacturer's directions for cleaning and preparing surfaces where these compounds will be used. Apply sparingly. Excessive amounts may block engine cooling passages and cause serious damage. An example of a non-permanent locking agent commonly available in North America is Loctite Lock N' Seal (Blue).
- (12) Press  
A part installed using a press or driver, such as a seal, should first be coated with oil on its outer or inner circumference so that it will go into place smoothly.
- (13) Ball Bearing  
When installing a ball bearing, the bearing race which is affected by friction should be pushed by a suitable driver. This prevents severe stress on the balls and races, and prevents races and balls from being dented. Press a ball bearing until it stops at the stop in the hole or on the shaft.
- (14) Oil Seal and Grease Seal  
Replace any oil or grease seals that were removed with new ones, as removal generally damages seals.  
When pressing in a seal which has manufacturer's marks, press it in with the marks facing out. Seals should be pressed into place using a suitable driver, which contacts evenly with the side of seal, until the face of the seal is even with the end of the hole.
- (15) Seal Guide  
A seal guide is required for certain oil or grease seals during installation to avoid damage to the seal lips. Before a shaft passes through a seal, apply a little lubricant, preferably high temperature grease on the lips to reduce rubber to metal friction.

## 1-4 GENERAL INFORMATION

### (16) Circlip, Retaining Ring

Replace any circlips and retaining rings that were removed with new ones, as removal weakens and deforms them. When installing circlips and retaining rings, take care to compress or expand them only enough to install them and no more.

### (17) Cotter Pin

Replace any cotter pins that were removed with new ones, as removal deforms and breaks them.

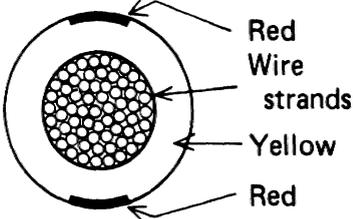
### (18) Lubrication

Engine wear is generally at its maximum while the engine is warming up and before all the rubbing surfaces have an adequate lubricative film. During assembly, oil or grease (whichever is more suitable) should be applied to any rubbing surface which has lost its lubricative film. Old grease and dirty oil should be cleaned off. Deteriorated grease has lost its lubricative quality and may contain abrasive foreign particles.

Don't use just any oil or grease. 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.

### (19) Electrical Wires

All the electrical wires are either single-color or two-color and, with only a few exceptions, must be connected to wires of the same color. On any of the two-color wires there is a greater amount of one color and a lesser amount of a second color, so a two-color wire is identified by first the primary color and then the secondary 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 to make red the main color.

Wire (cross-section)	Name of Wire Color
	Yellow/red

### (20) Replacement Parts

When there is a replacement instruction, replace these parts with new ones every time they are removed. These replacement parts will be damaged or lose their original function once removed.

### (21) 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	

### (22) Service Data

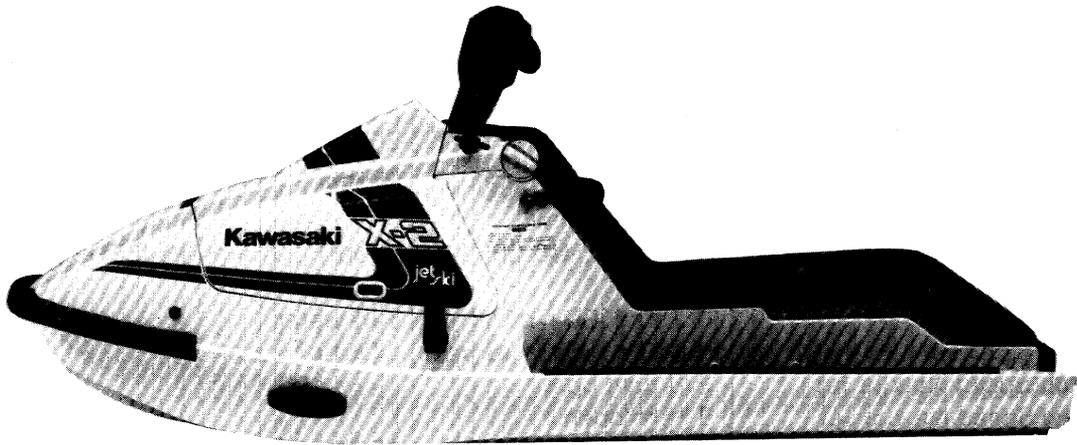
Numbers of service data in this text have following meanings:

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

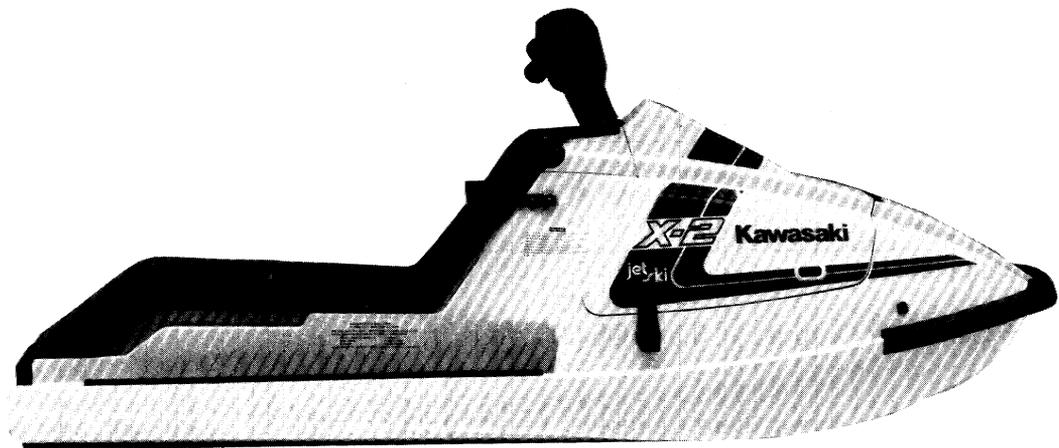
"Service limits": Indicate the usable limits. If the measurement shows excessive wear or deteriorated performance, replace the damaged parts.

.....  
Model Identification  
.....

JF650-A1 Left Side View



JF650-A1 Right Side View



## 1-6 GENERAL INFORMATION

### General Specifications

<b>Engine:</b>	
Type	2-stroke, vertical twin, crankcase reed valve, water cooled
Displacement	635 mL
Bore and Stroke	76.0 x 70.0 mm
Compression Ratio	7.2 : 1
Maximum Horsepower	38.2 kW (52 PS) @6 000 r/min (rpm)
Maximum Torque	64.7 N-m (6.6 kg-m, 47.7 ft-lb) @5 500 r/min (rpm)
Ignition	Magneto CDI
Lubrication System	Oil injection (break-in period: Oil injection and fuel mixture 50 : 1)
Carburetor	Keihin CDK34 diaphragm type (28 mm venturi)
Starting System	Electric Starter
<b>Turning Specifications:</b>	
Spark Plug	NGK BR7ES,  NGK B7ES
Gap	0.7 – 0.8 mm
Ignition Timing	17° BTDC @6 000 r/min (rpm), 2.0 mm @6 000 r/min (rpm)
Carburetor	
Idle Speed	1 250 ± 100 r/min (rpm) : In water 1 800 ± 100 r/min (rpm) : Out of water
High Speed Needle Jet	5/8 turn open
Low Speed Needle Jet	1 turn open
Compression Pressure	865 – 1 325 kPa (8.8 – 13.5 kg/cm <sup>2</sup> , 125 – 192 psi) (open throttle)
<b>Drive Shaft:</b>	
Coupling	Direct drive from engine
Jet Pump: Type	Axial flow, single stage
Thrust	2 060 N (210 kg, 463 lb)
Steering	Steerable nozzle
Braking	Water drag
<b>Performance:</b>	
† Maximum Speed	57 km/h
† Draft (Stationary)	220 mm
† Fuel Consumption	19 L/h @full throttle
<b>Dimensions:</b>	
Length	2 225 mm
Width	690 mm
Height	900 mm
Dry Weight	125 kg
Fuel Tank Capacity	16 L including 3 L reserve
<b>Engine Oil:</b>	
Type	2-stroke, N.M.M.A. Certified for Service TC-WII
Oil Tank Capacity	2.7 L
<b>Electrical Equipment:</b>	
Battery	12 V 19 Ah
Maximum Generator Output	3.5 A @6 000 r/min (rpm)

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

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

 : US Model

.....  
**Periodic Maintenance Chart**  
 .....

**NOTE**

○Complete the Pre-Ride Checklist before each outing

Description	Frequency	Initial 10 Hours	Every 25 Hours	Every 100 Hours
Check all hose clamps, nuts, bolts, and fasteners		●	●	
Torque cylinder head nuts		●	●	
Grease throttle cable fitting and choke cable fitting at carburetor			●	
Clean and gap spark plug (replace if necessary)			●	
Check battery level			●	
Lubricate choke cable and throttle case and cable			●	
Lubricate handlebar pivot (disassemble)			●	
Clean fuel filter screens			●	
Inspect fuel vent and engine oil vent check valves			●	
Adjust carburetor			●	
Flush bilge line and filter			●	
Flush cooling system (after each use in salt water)			●	
Inspect/clean flame arrestor			●	
Inspect impeller blade for damage (remove)				●
Inspect/replace coupling damper				●
Inspect/replace carburetor throttle shaft spring (replace carburetor if necessary)				●
Inspect steering and trim cables				●

## 1-8 GENERAL INFORMATION

### 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	kg-m	ft-lb	
<b>Fuel System:</b>				
Fuel Tap Knob Set Screw	—	—	—	L
Carburetor Mounting Nuts	7.8	0.80	69 in-lb	
Intake Manifold Mounting Nuts	7.8	0.80	69 in-lb	
Air Intake Cover Bolts	—	—	—	L
Throttle Case Socket Bolts	—	—	—	L
Fuel Tap Mounting Bolts	—	—	—	L
<b>Exhaust System:</b>				
Exhaust Pipe Bolts (8 mm Dia.)	25	2.5	18.0	
Exhaust Pipe Bolts (10 mm Dia.)	49	5.0	36	L
Water Pipe Joints	9.8	1.0	87 in-lb	SS
Exhaust Manifold Mounting Nuts	25	2.5	18.0	S
<b>Engine Top End:</b>				
Cylinder Head Nuts	29	3.0	22	S
Water Pipe Joint	9.8	1.0	87 in-lb	SS
Cylinder Base Nuts	34	3.5	25	
<b>Engine Removal/Installation:</b>				
Engine Mounting Bolts	36	3.7	27	L
Engine Mount Bolts	16	1.6	11.6	
Engine Bed Mounting Bolts ( ) : JF650-A1 through A5	20 (22)	2.0 (2.2)	14.5 (16.0)	L
<b>Engine Bottom End:</b>				
Flywheel Bolt	98	10.0	72	
Coupling	98	10.0	72	L
Magneto Cover Mounting Bolts	7.8	0.80	69 in-lb	L
Crankcase Bolts (6 mm Dia.)	7.8	0.80	69 in-lb	L, S
Crankcase Bolts (8 mm Dia.) ( ) : JF650-A1/A2	29 (25)	3.0 (2.5)	22 (18.0)	L, S
Water Drain Valve Mounting Bolts	—	—	—	L
Water Drain Valve Cover Bolts	—	—	—	L
<b>Drive Shaft:</b>				
Coupling	39	4.0	29	
Drive Shaft Holder Mounting Bolts	22	2.2	16.0	L

Fastener	Torque			Remarks
	N-m	kg-m	ft-lb	
<b>Pump and Impeller:</b>				
Water Pipe Joints	9.8	1.0	87 in-lb	SS
Steering Nozzle Pivot Bolts	—	—	—	L
Ball Joints	7.8	0.8	69 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	9.8	1.0	87 in-lb	L
Grate Mounting Bolts	—	—	—	L
<b>Steering:</b>				
Handlebar Weights	18	1.8	13	L
Handlebar Clamp Bolts	13	1.3	113 in-lb	L, S
Hand Grip Holder Screws	—	—	—	L
Steering Neck Pivot Shaft Nut	22	2.2	16	
Retaining Bolts	13	1.3	113 in-lb	L
Steering Holder Mounting Bolts	22	2.2	16	L
Steering Shaft Nut	22	2.2	16	
Ball Joints	7.8	0.8	69 in-lb	L
Trim Adjuster Knob Mounting Nut	23	2.3	16.5	
Spring Retainers	—	—	—	L
Trim Adjuster Knob Screw	—	—	—	L
Steering Arm Holder Bolts	18	1.8	13	
Steering Cable Nuts	18	1.8	13	
Trim Cable Nuts	18	1.8	13	
<b>Hull/Engine Hood:</b>				
Tandem Band Mounting Bolts	—	—	—	L
Deck Frame Mounting Bolts	13	1.3	113 in-lb	
Deck Frame Adjuster Locknuts	13	1.3	113 in-lb	
Deck Mounting Screws	5.9	0.6	52 in-lb	
Engine Hood Bracket Bolts	13	1.3	113 in-lb	L
Seat Lock Assembly Mounting Bolts	—	—	—	L
Bumper Bushings	—	—	—	L
<b>Electrical System:</b>				
Stop Switch Relay Mounting Bolts	—	—	—	L
Regulator/Rectifier Mounting Bolts	—	—	—	L
CDI Igniter Mounting Bolts	—	—	—	L
Spark Plugs	27	2.8	20	
Starter Relay Mounting Bolts	—	—	—	L
Starter Motor Mounting Bolts	—	—	—	L

## 1-10 GENERAL INFORMATION

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.

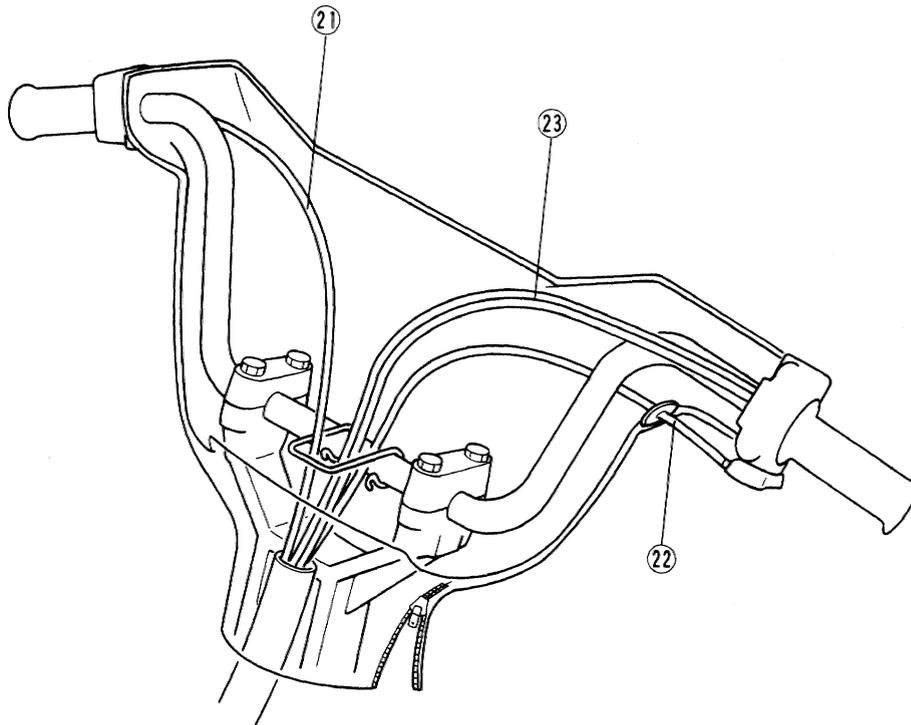
### General Fasteners (stainless bolt and nut)

Threads dia.(mm)	Torque		
	N-m	kg-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

---

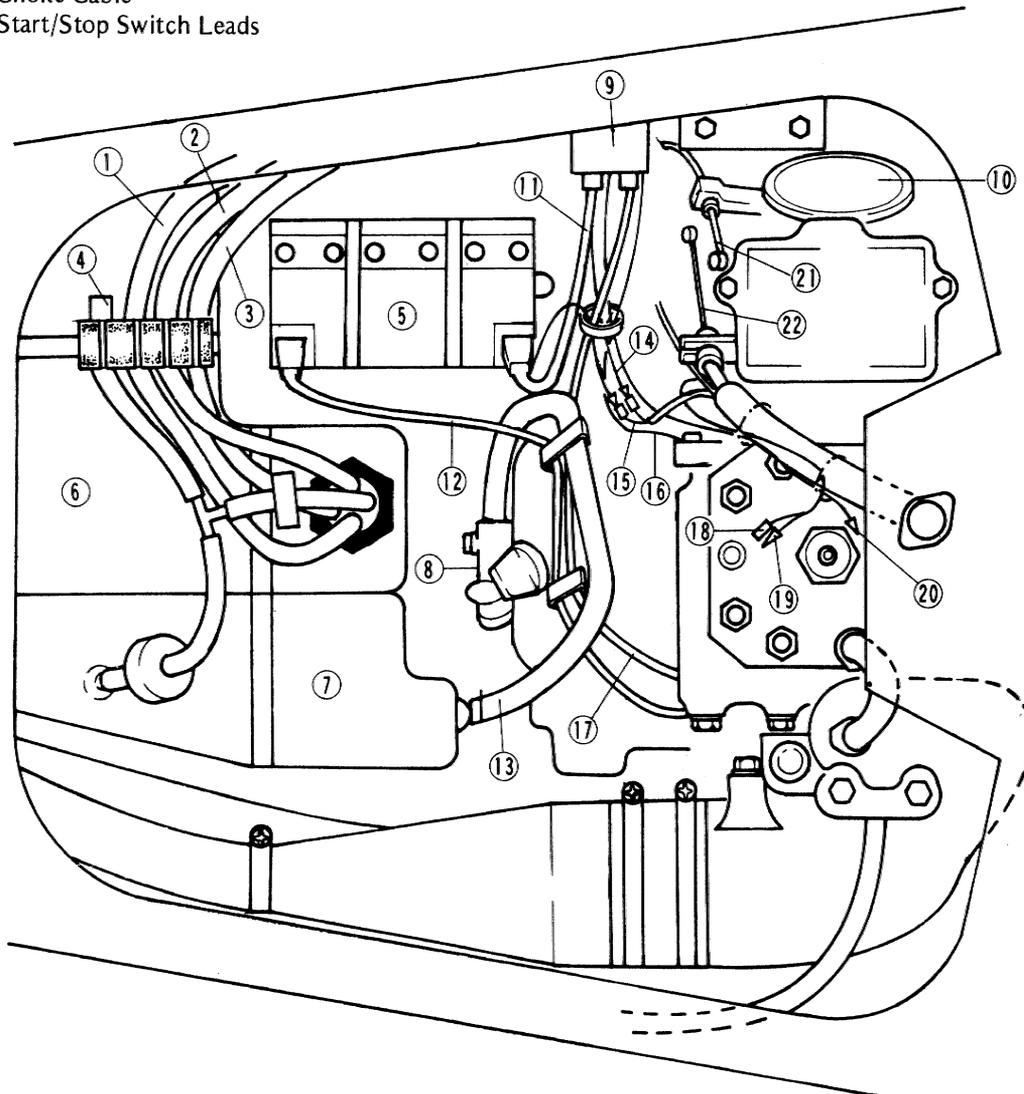
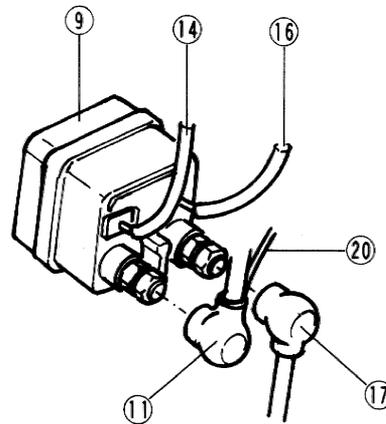
### Cable Routing

---

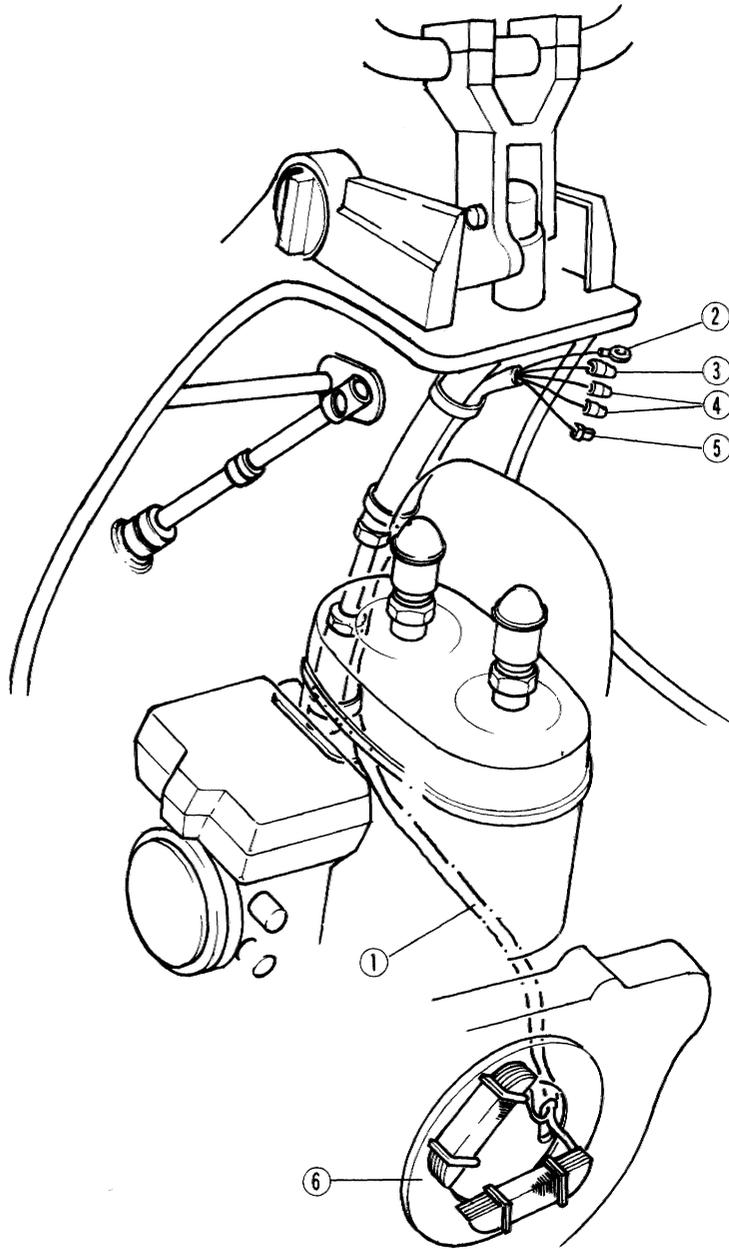


## GENERAL INFORMATION 1-11

1. Fuel Hose (RES)
2. Fuel Hose (Return)
3. Fuel Hose (ON)
4. Air Vent Hose
5. Battery
6. Fuel Tank
7. Oil Tank
8. Oil Pump
9. Starter Relay
10. Carburetor
11. Battery Cable (+)
12. Battery Cable (-)
13. Oil Inlet Hose
14. Start Switch Lead (White)
15. Start Switch Lead (Orange)
16. Starter Relay Ground Lead (Black)
17. Starter Cable
18. Stop Switch Lead (Black)
19. Stop Switch Lead (Blue)
20. Regulator/Rectifier Lead (White)
21. Throttle Cable
22. Choke Cable
23. Start/Stop Switch Leads



## 1-12 GENERAL INFORMATION



1. Stator Leads
2. Ground to the regulator/rectifier mounting bolt.
3. To Regulator/Rectifier Lead (Black)
4. To Regulator/Rectifier Lead (Yellow)
5. To CDI Ignitor Lead (Black/Red)
6. Stator

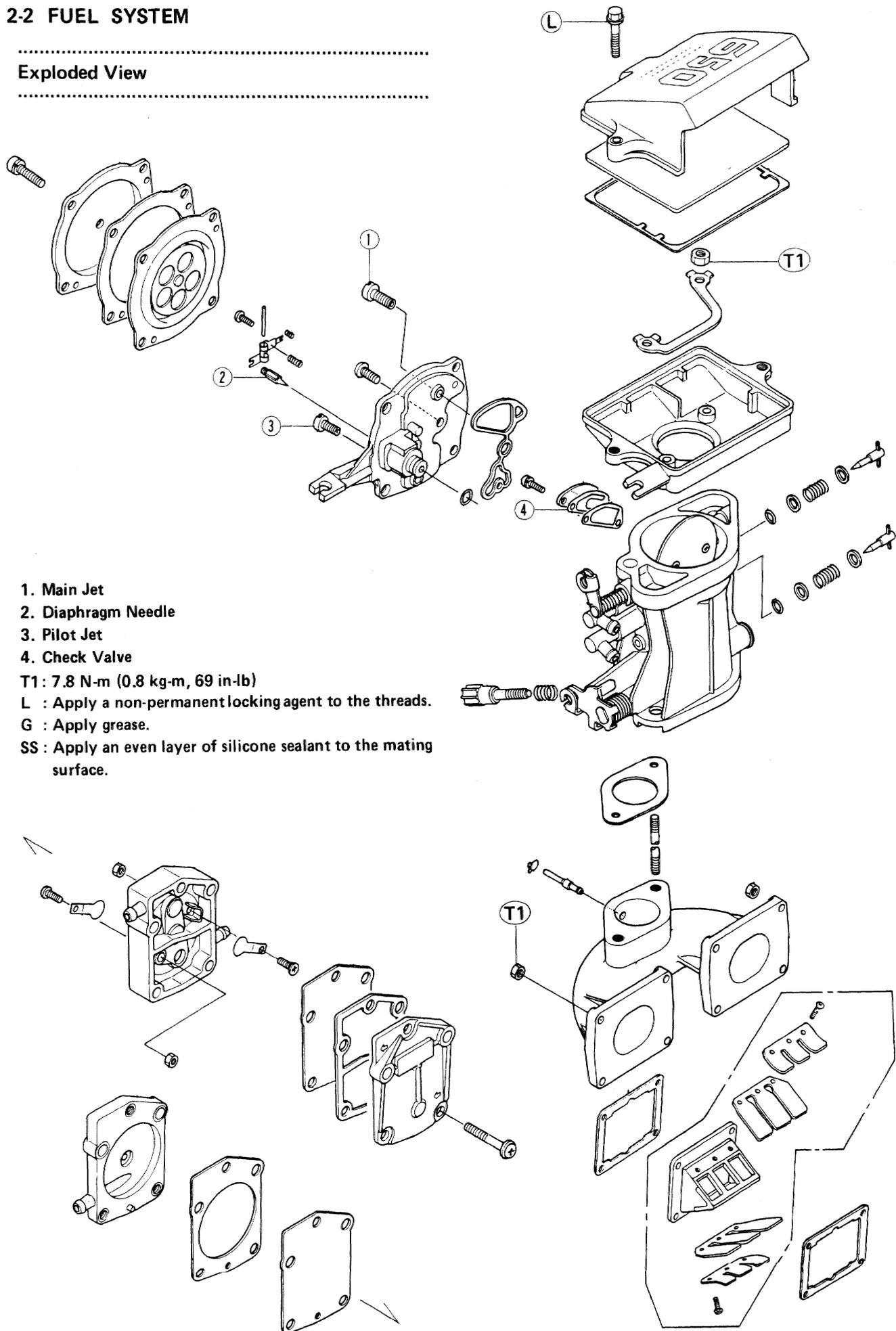
# FUEL SYSTEM

## Table of Contents

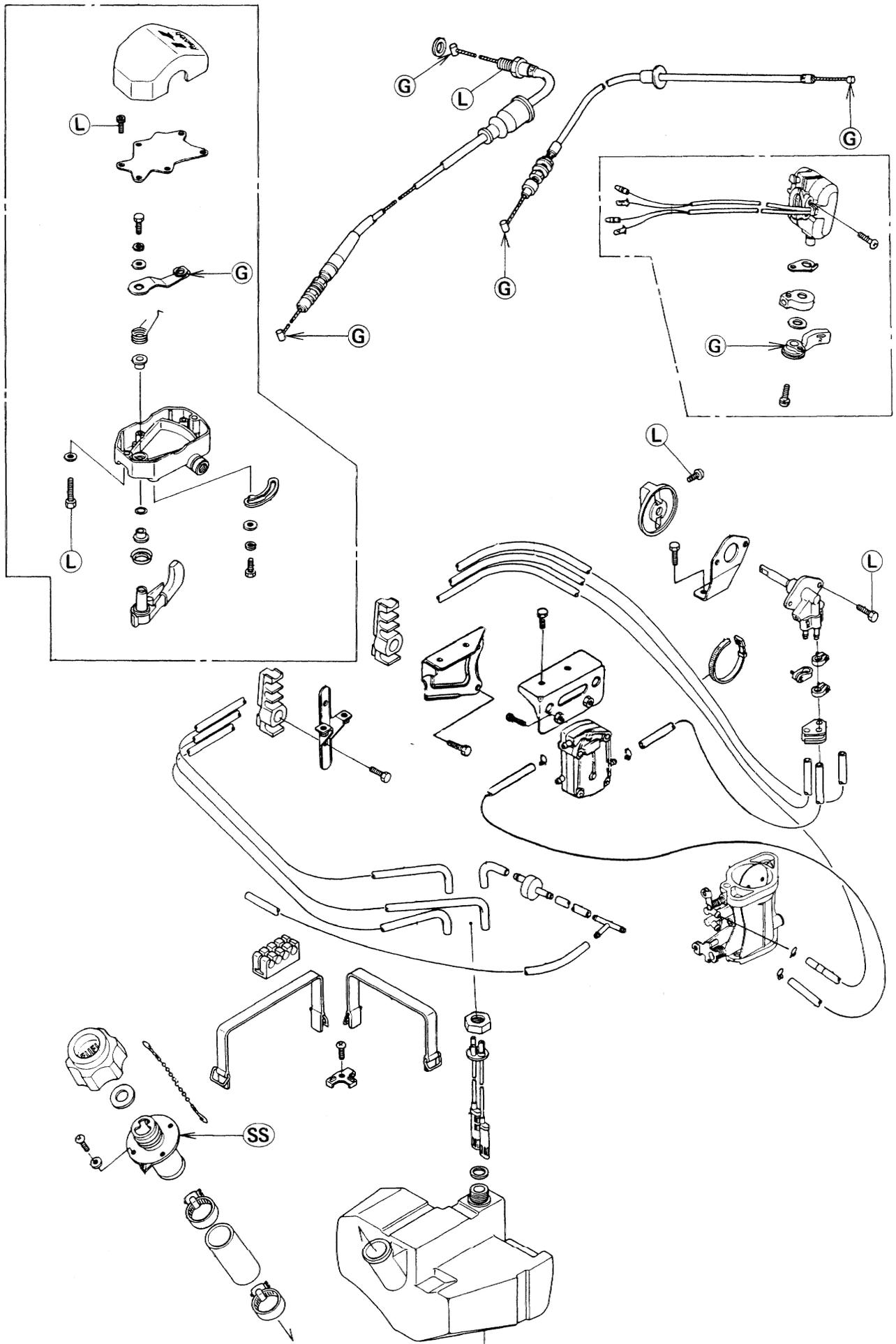
Exploded View . . . . .	2-2	Flame Arrester . . . . .	2-14
Specifications . . . . .	2-4	Flame Arrester Removal . . . . .	2-14
Special Tools . . . . .	2-4	Flame Arrester Installation . . . . .	2-15
Fuel System Diagram . . . . .	2-4	Flame Arrester Cleaning . . . . .	2-15
Throttle Case and Cable . . . . .	2-5	Intake Manifold, Reed Valve . . . . .	2-15
Throttle Cable Adjustment . . . . .	2-5	Intake Manifold Removal . . . . .	2-15
Throttle Case Removal/Disassembly . . . . .	2-5	Intake Manifold Installation Notes . . . . .	2-15
Throttle Case Assembly/Installation . . . . .	2-6	Reed Valve Removal . . . . .	2-16
Throttle Cable Removal . . . . .	2-6	Reed Valve Installation Notes . . . . .	2-16
Throttle Cable Installation . . . . .	2-7	Reed Valve Inspection . . . . .	2-16
Throttle Case and Cable Lubrication . . . . .	2-7	Valve Holder Inspection . . . . .	2-16
Throttle Case Inspection . . . . .	2-7	Valve Stop Inspection . . . . .	2-17
Throttle Cable Inspection . . . . .	2-8	Fuel Tank . . . . .	2-17
Choke Cable . . . . .	2-8	Fuel Tank Removal . . . . .	2-17
Choke Cable Adjustment . . . . .	2-8	Fuel Tank Installation . . . . .	2-17
Choke Lever and Cable Removal . . . . .	2-8	Fuel Tank Cleaning . . . . .	2-17
Choke Lever and Cable Installation . . . . .	2-9	Fuel Filler and Tube Removal . . . . .	2-18
Choke Cable Inspection . . . . .	2-9	Fuel Filler and Tube Installation . . . . .	2-18
Choke Cable Lubrication . . . . .	2-9	Fuel Filter Screen Cleaning . . . . .	2-18
Fuel Pump . . . . .	2-9	Fuel Vent Check Valve . . . . .	2-19
Fuel Pump Removal . . . . .	2-9	Fuel Vent Check Valve Mounting . . . . .	2-19
Fuel Pump Installation Note . . . . .	2-10	Fuel Vent Check Valve Inspection . . . . .	2-19
Fuel Pump Disassembly . . . . .	2-10	Fuel Tap . . . . .	2-19
Fuel Pump Assembly Notes . . . . .	2-10	Fuel Tap Removal/Installation . . . . .	2-19
Carburetor . . . . .	2-10	Fuel Tap Cleaning . . . . .	2-20
Idle Speed Adjustment . . . . .	2-10		
Mixture Screw Adjustment . . . . .	2-10		
High Altitude Performance Adjustment . . . . .	2-11		
Carburetor Removal . . . . .	2-11		
Carburetor Installation . . . . .	2-12		
Carburetor Disassembly . . . . .	2-12		
Carburetor Assembly . . . . .	2-13		
Carburetor Cleaning and Inspection . . . . .	2-13		
Float Arm Level Inspection and Adjustment . . . . .	2-14		

## 2-2 FUEL SYSTEM

### Exploded View



# FUEL SYSTEM 2-3



## 2-4 FUEL SYSTEM

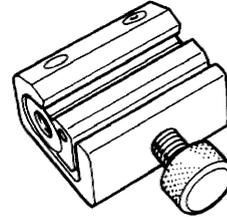
### Specifications

#### Carburetor

Type	Keihin CDK34 Diaphragm
Size	28 mm Venturi
Mixture Screws	
Low Speed	1 turn open
High Speed	5/8 turn open
Main Jet	125
Pilot Jet	48
Float Arm Level	1.5 ±0.5 mm

### Special Tool

Pressure Cable Luber: K56019-021



#### Idle Speed

1,250 ±100 rpm (in water)

1,800 ±100 rpm (out of water)

#### Fuel Tank

Capacity: 16 L (including 3 L reserve)

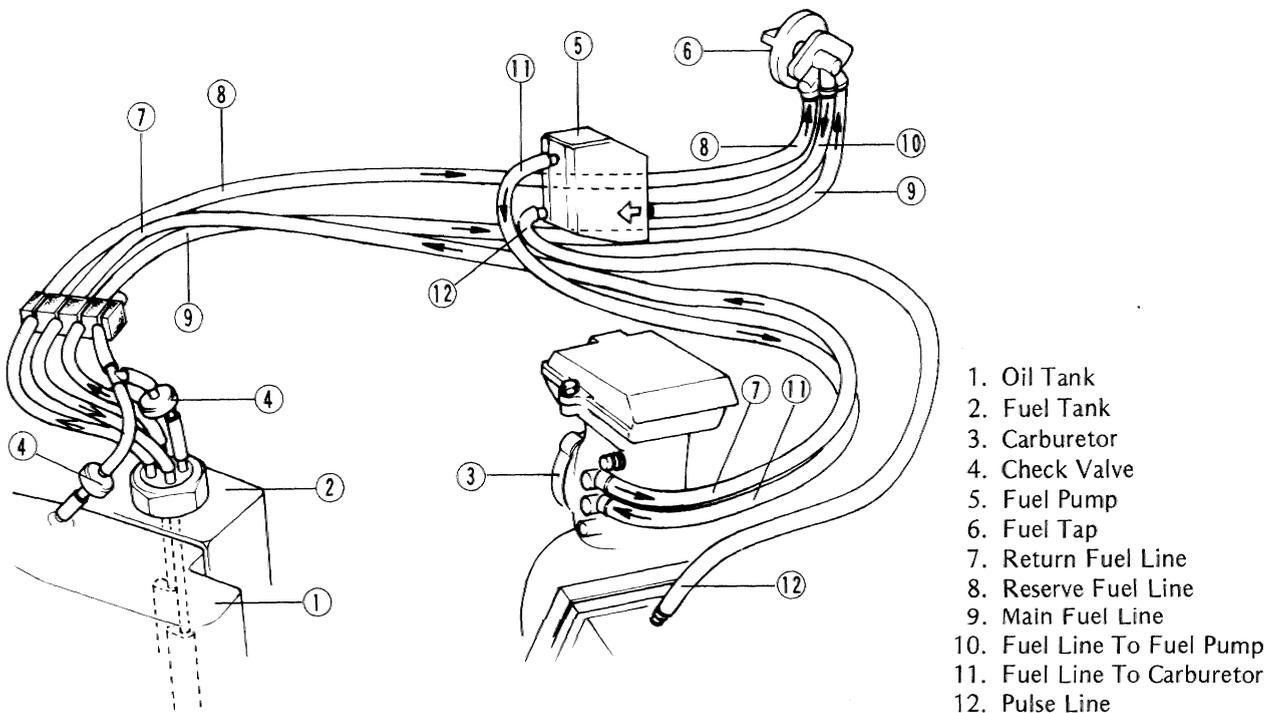
#### Reed Valve Warp

Service Limit: 0.2 mm

### Fuel System Diagram

#### NOTE

○The reserve hose (marked RES.) must always be corrected to the longer pipe inside the tank.



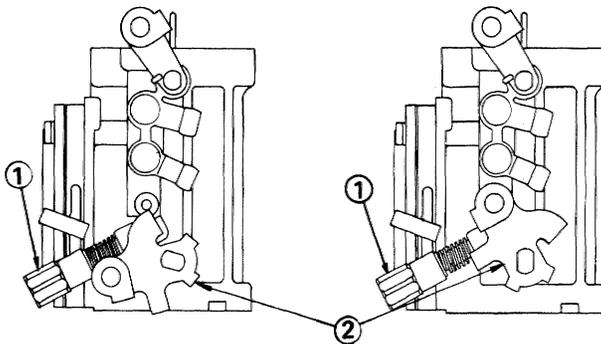
**Throttle Case and Cable**

**Throttle Cable Adjustment**

- Position the handlebar in the most rear position.
- Check throttle cable adjustment.
- With the throttle lever released, the stop on the throttle pivot arm should rest against the idle adjust screw, and there should be slight slack in the throttle cable.
- When the throttle lever is fully applied (pushed), the stop on the throttle pivot arm should be all the way up against the stop on the carburetor.

THROTTLE CLOSED (RELEASED)

THROTTLE OPEN (APPLIED)



- 1. Idle Adjust Screw
- 2. Throttle Shaft Lever

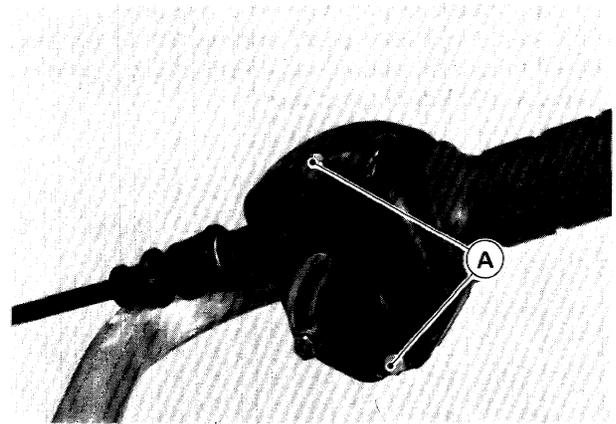
- If necessary, adjust the throttle cable.
- Loosen and turn the locknuts at the bracket until the stop on the throttle pivot arm hits against the idle adjust screw with slight cable slack.
- Tighten the locknuts securely.



A. Locknuts

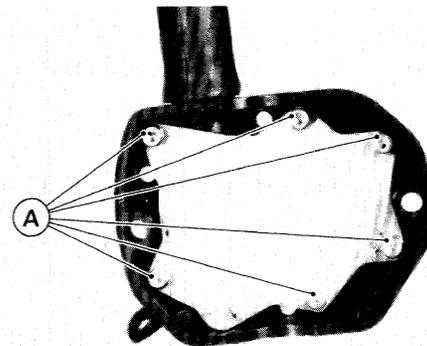
**Throttle Case Removal/Disassembly**

- Disconnect the throttle cable from the carburetor (see Throttle Cable Removal).
- Remove the handlebar pad.
- Remove the throttle case.
- Remove the throttle case bolts and separate the case halves.



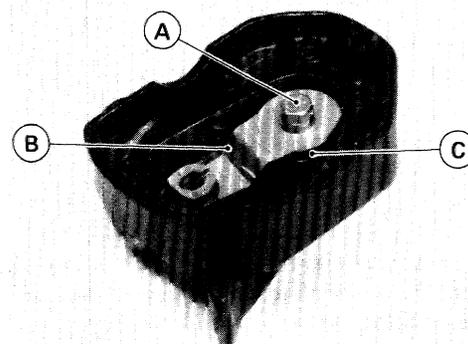
A. Throttle Case Bolts

- Unscrew the socket bolts and remove the steel plate.



A. Socket Bolts

- Remove the throttle cable (see Throttle Cable Removal).
- Disassemble the throttle case.
- Remove the throttle lever bolt, lockwasher, and flat washer, and lift the throttle case lever and return spring from the case.

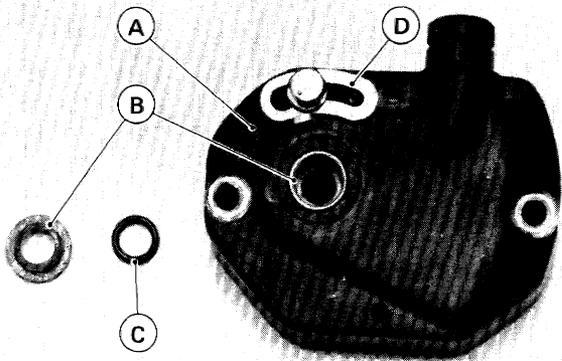


A. Bolt  
B. Throttle Case Lever

C. Return Spring

## 2-6 FUEL SYSTEM

- Pull the throttle control lever out of the case.
- Pull the control lever pivot bushings out of the case. One is toward the outside and the other is to the inside. There is an O-ring between them.

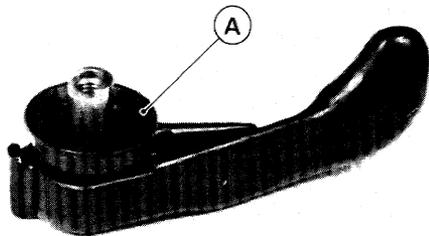


A. Lower Case  
B. Bushings  
C. O-ring  
D. Throttle Limiter

- Remove the lockbolt and take out the throttle limiter.

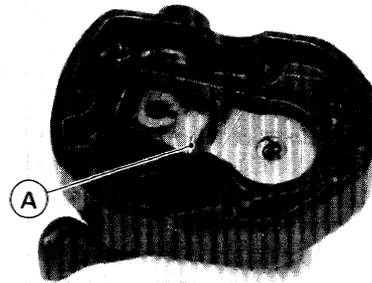
### Throttle Case Assembly/Installation

- Throttle case assembly/installation is the reverse of removal/disassembly. Note the following.
- Be sure the rubber seal is in place on the throttle lever pivot.



A. Rubber Seal

- ★ If there is any doubt as to the condition of the rubber coating on the steel plate or the rubber seal on the throttle lever pivot, replace it with a new one.
- Lubricate the throttle case and cable before assembly/installation (see Throttle Case and Cable Lubrication).
- Be certain that the return spring is correctly installed on the throttle lever.



A. Return Spring Hook

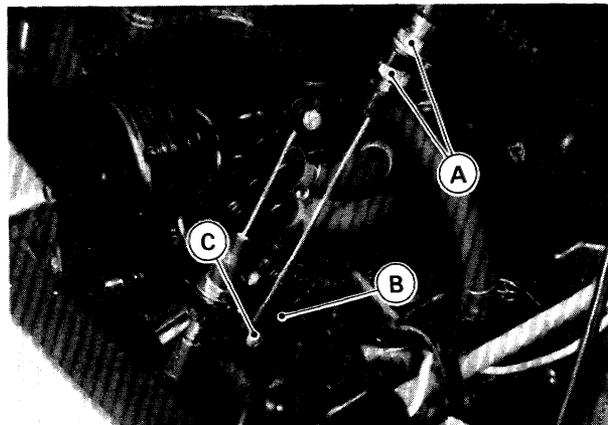
- Apply a non-permanent locking agent to the socket bolts threads.
- Swing the throttle control lever so that the carburetor throttle valve is fully open.
- Locate the throttle limiter with the throttle lever fully open.

### WARNING

- Operation with an improperly assembled throttle case could result in an unsafe riding condition.
- Adjust the throttle cable (see Throttle Cable Adjustment).

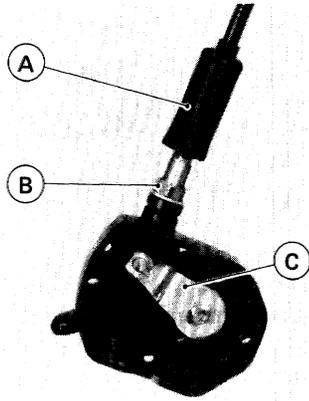
### Throttle Cable Removal

- Disconnect the throttle cable from the carburetor.
- Loosen the adjuster locknuts and slide the cable from the arrester case.
- Slide the cable tip from the throttle shaft lever.



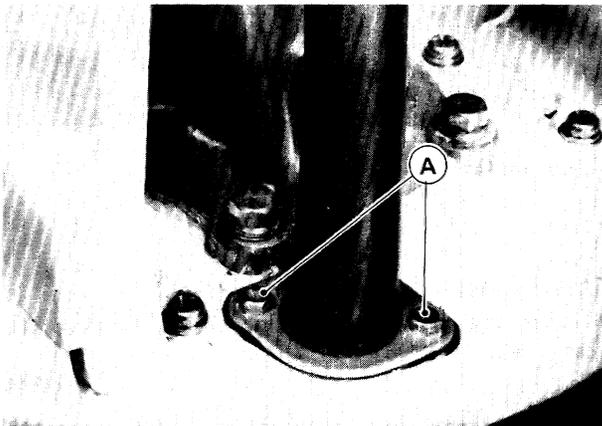
A. Locknuts  
B. Throttle Shaft Lever  
C. Cable Tip

- Remove the handlebar pad.
- Remove and disassemble the throttle case to free the upper end of the cable from the case (see Throttle Case Removal/Disassembly).
- Slide the rubber boot out of the place.
- Pull the cable tip from the throttle lever catch.
- Unscrew the throttle cable fitting nut.



- A. Rubber Boot
- B. Throttle Cable Fitting Nut.
- C. Throttle Case Lever

- Remove the boot holder bolts and lift the cable boot slightly to facilitate throttle cable removal.



- A. Bolts

- Holding the cable boot, pull out the throttle cable.

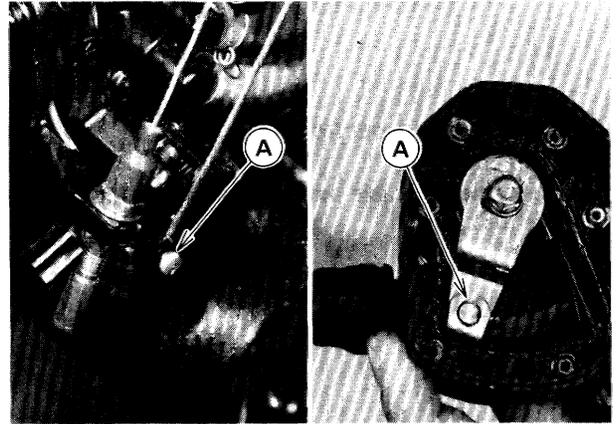
**Throttle Cable Installation**

- Throttle cable installation is the reverse of removal. Note the following.
- Route the throttle cable correctly (see Cable Routing in the General Information chapter).
- Adjust the throttle cable (see Throttle Cable Adjustment).

**Throttle Case and Cable Lubrication**

Whenever the throttle case is disassembled, and in accordance with the Periodic Maintenance Chart, perform the following.

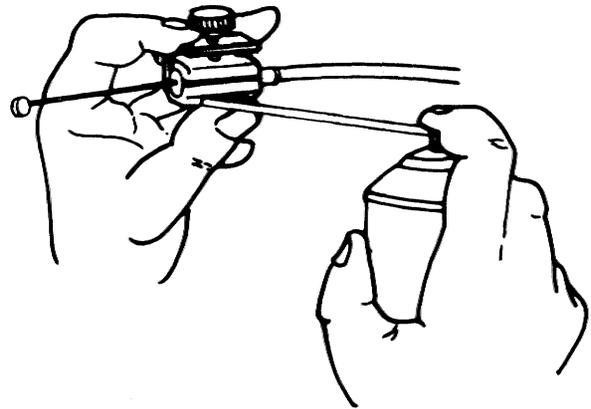
- Apply water resistant grease to the tips of the throttle cable ends.



- A. Apply grease.

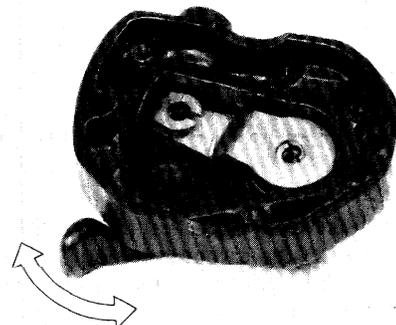
- Lubricate the cable by seeping oil between the cable and cable housing.

**Cable Lubrication**



**Throttle Case Inspection**

- With the throttle cable disconnected from the throttle lever, the lever should move freely and return smoothly by spring tension.

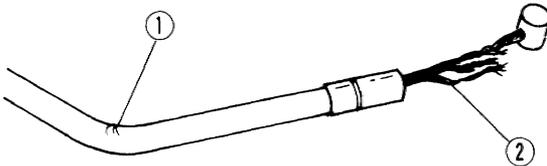


## 2-8 FUEL SYSTEM

- ★If the lever binds, disassemble the throttle case, and clean and lubricate the throttle case (see Throttle Case and Cable Lubrication).
- Examine the lever and case for cracks. Replace the case assembly if it is cracked.

### Throttle Cable Inspection

- Examine the cable.
- ★If the cable or cable housing is kinked or frayed, replace the cable.



1. Kinked Housing      2. Frayed Cable

- Be certain that the throttle cable moves freely in both directions.
- Loosen the adjuster locknuts, and slide the cable from the throttle shaft lever.
- Slide the inner cable back and forth in the cable housing.
- ★If the cable does not move freely, replace it.

---

### Choke Cable

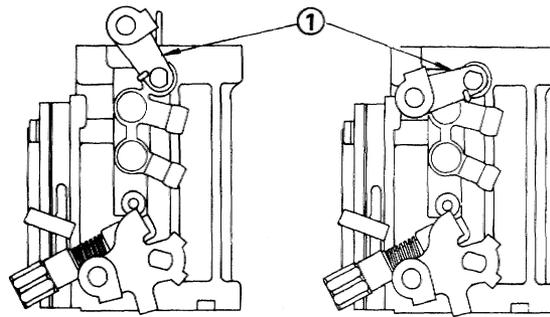
---

#### Choke Cable Adjustment

- When the choke lever is pushed to the right, the choke butterfly valve in the carburetor should be completely open. Check that the choke pivot arm is up all the way with minimal cable slack. This will fully open the choke butterfly valve in the carburetor.

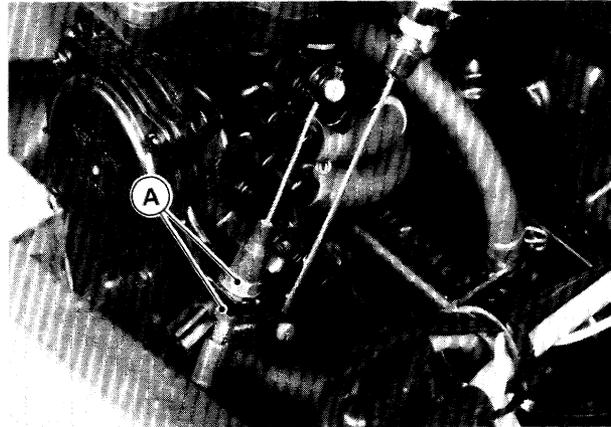
CHOKE OPEN  
(PUSHED TO RIGHT)

CHOKE CLOSED  
(PUSHED TO LEFT)



1. Choke Pivot Arm

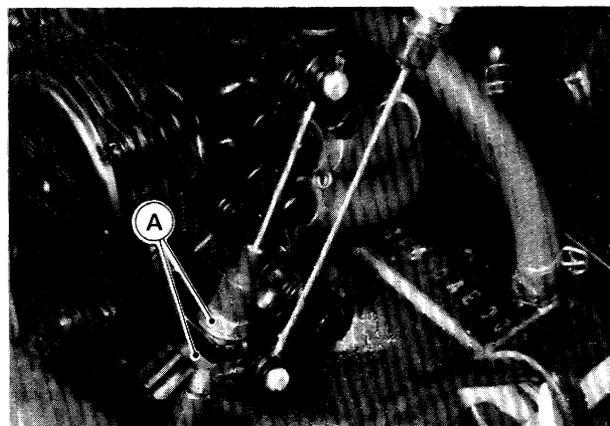
- If necessary, adjust the choke cable.
- Push the choke lever all the way to the right.
- Loosen the locknuts at the bracket.
- Turn the locknuts to allow a little cable slack and then tighten the locknuts.



A. Locknuts

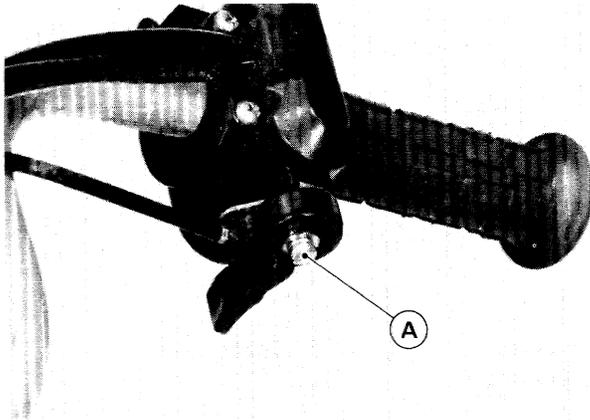
#### Choke Lever and Cable Removal

- Loosen the locknuts and slide the cable from the carburetor.



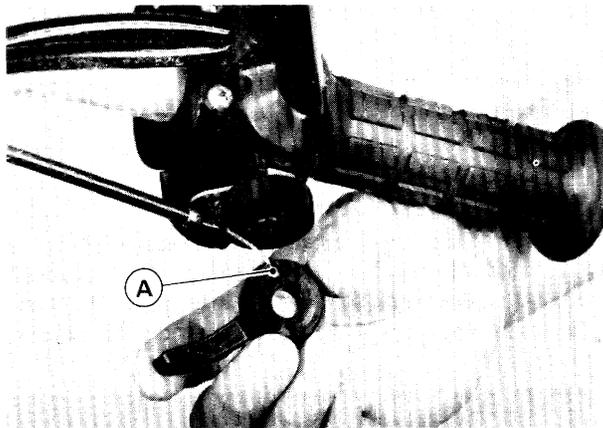
A. Locknuts

- Slide the cable tip from the pivot arm.
- Unscrew the choke lever pivot screw and take off the choke lever.



A. Pivot Screw

- Free the choke cable upper end from the lever.



A. Choke Cable Upper End

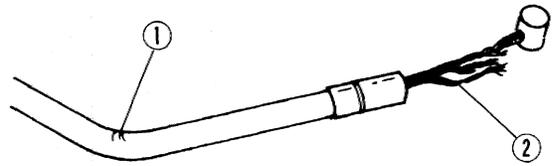
- Pull the choke cable out the top of the cable boot.

#### **Choke Lever and Cable Installation**

- Choke cable installation is the reverse of removal. Note the following.
- Route the choke cable correctly (see Cable Routing in the General Information chapter).
- Adjust the choke cable (see Choke Cable Adjustment).

#### **Choke Cable Inspection**

- Examine the cable.
- ★If the cable or cable housing is kinked or frayed, replace the cable.



1. Kinked Housing

2. Frayed Cable

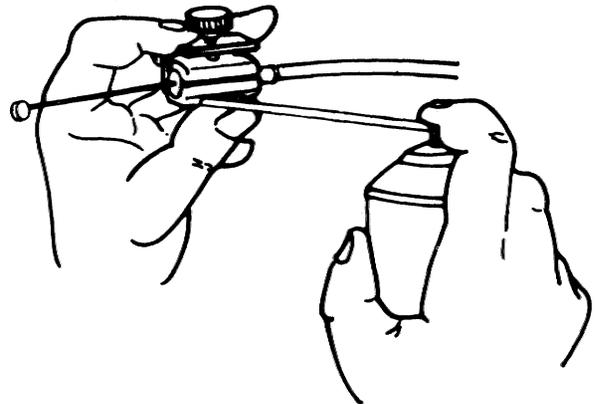
- With the choke cable disconnected at the both ends, the cable should move freely within the cable housing.
- ★If the cable does not move freely, replace it.

#### **Choke Cable Lubrication**

Whenever the choke cable removed, lubricate the choke cable as follows.

- Apply water resistant grease to the tips of the choke cable ends.
- Lubricate the choke cable by seeping oil between the cable and cable housing.

#### **Cable Lubrication**



- Attached the choke cable to the carburetor and adjust the choke cable (see Choke Cable Adjustment).

---

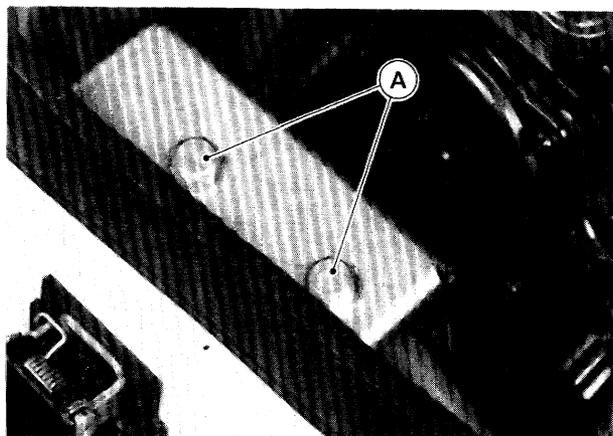
### **Fuel Pump**

---

#### **Fuel Pump Removal**

- Remove the fuel pump bracket bolts and remove the fuel pump with the hoses attached.
- Disconnect the fuel hoses from the fuel pump.

## 2-10 FUEL SYSTEM

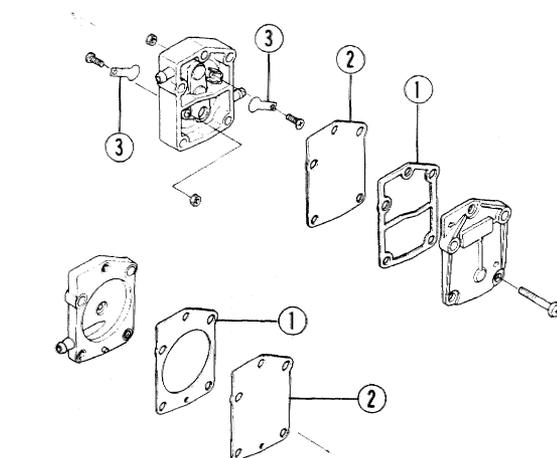
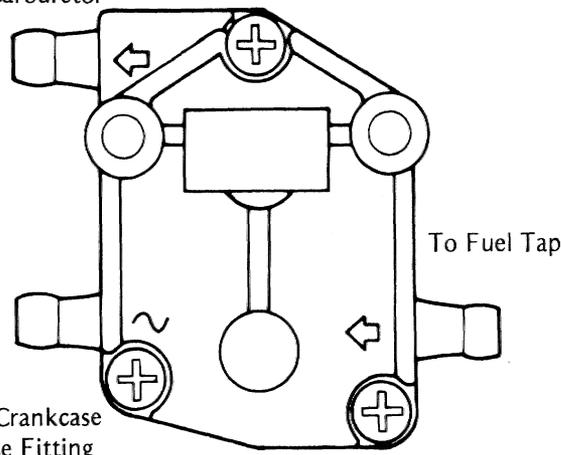


A. Bracket Bolts

### Fuel Pump Installation Note

- Connect the fuel hoses as shown.

To Carburetor



- 1. Gasket
- 2. Diaphragm
- 3. Check Valve

### Fuel Pump Assembly Notes

- Visually inspect the check valves, and replace them if necessary.
- Use all new gaskets and replace other parts as required.

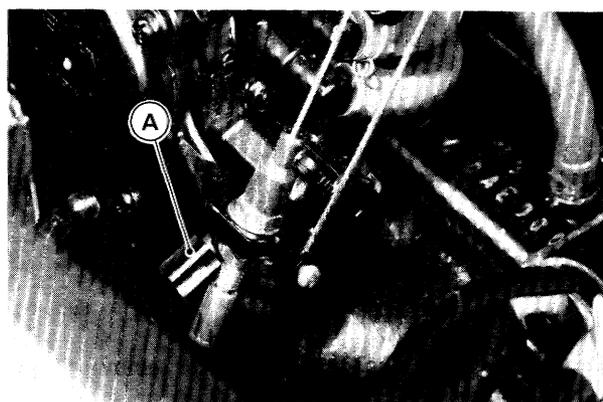
---

### Carburetor

---

### Idle Speed Adjustment

- The normal idle speed setting is the lowest at which the watercraft will run reliably while still producing enough thrust to circle back to the rider after spill. Turn the idle adjusting screw as required to reach this setting.



A. Idle Adjusting Screw

**Idle Speed:** 1,250 ±100 rpm (in water)  
1,800 ±100 rpm (out of water)

### Fuel Pump Disassembly

- Remove the fuel pump.

**CAUTION**

○ The fuel pump contains delicate diaphragms that are easily damaged, and gaskets that must be replaced if the unit is disassembled. Therefore, the pump should not be disassembled unless leakage is evident or internal damage is suspected. Have spare parts available beforehand.

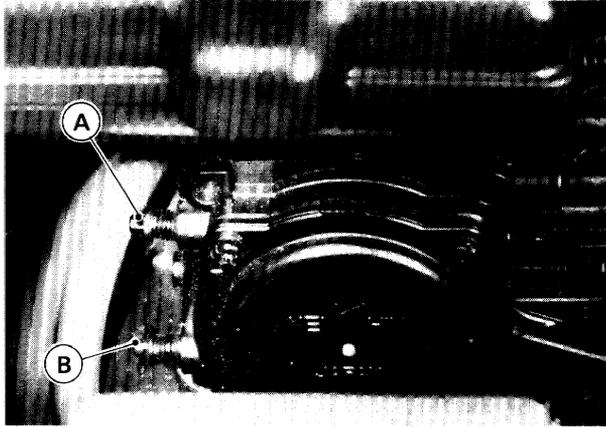
- Remove the fuel pump body screws.
- Carefully separate the pump assembly into its individual components. There are three body castings, two gaskets, and two diaphragms. The assembly may be stuck together, and care must be taken to avoid damaging the diaphragms and castings.

### Mixture Screw Adjustment

- To set each screw, turn it in until it seats lightly, and then back it out the specified number of turns.

**CAUTION**

- Do not force the mixture screws into their seats. You could damage the screws or the carburetor.



A. High                      B. Low

Mixture Screw	Turns out
Low Speed (lower)	1
High Speed (upper)	5/8

**CAUTION**

- Operating the watercraft with the high speed screw at too lean a setting (screwed in clockwise too far) could cause serious engine damage.
- Be careful if the engine cover is removed while the boat is in the water. You may submerge the watercraft.

These settings will normally give proper performance and fuel economy.

**High Altitude Performance Adjustment**

The normal carburetor settings are best for sea level. If the watercraft is used at the higher elevations, the lower atmospheric pressure makes the carburetion richer. To obtain the proper carburetor setting at higher elevations, turn in the high speed screw according to the following table.

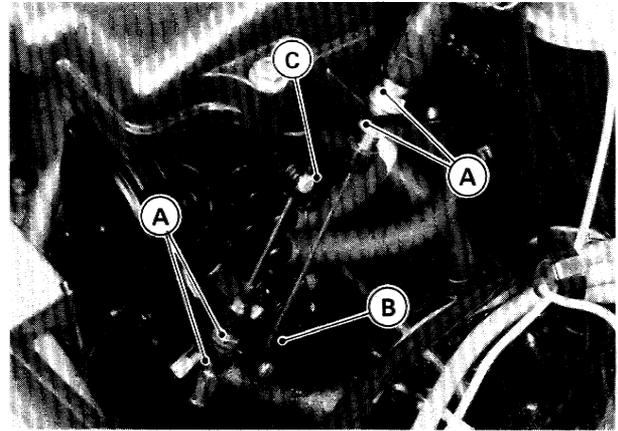
Altitude	m (ft)	Turn the high speed screw in the normal position
1 000	(3 300)	1/8 turn
2 000	(6 600)	1/4 turn
3 000	(10 000)	3/8 turn

**NOTE**

- The adjustment of the low speed screw is not required on the actual usage.

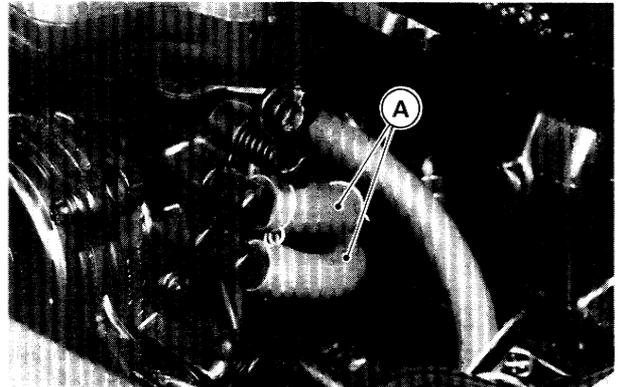
**Carburetor Removal**

- Loosen the throttle cable and choke cable adjuster locknuts.
- Disconnect the throttle and choke cables from the carburetor.



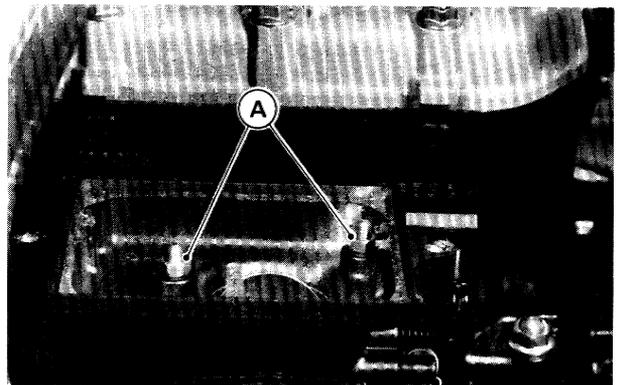
A. Locknuts                      C. Pivot Arm  
B. Throttle Pivot Arm

- Disconnect the fuel hoses from the carburetor.



A. Hoses

- Remove the flame arrester (see Flame Arrester Removal).
- Remove the carburetor mounting nuts and remove the arrester case.
- Lift the carburetor off the intake manifold.



A. Mounting Nuts

## 2.12 FUEL SYSTEM

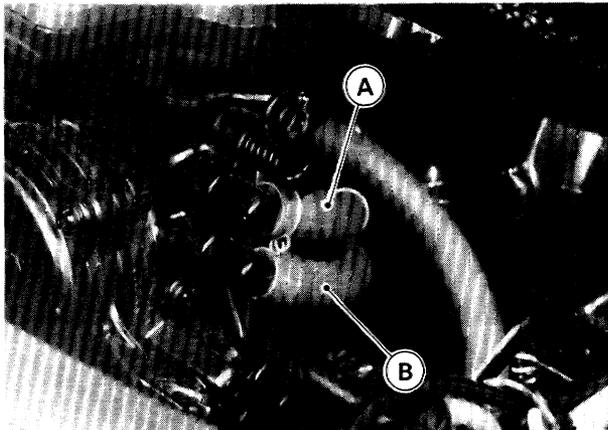
Product: 1986-1991 Kawasaki jetski X-2 WaveRunner Service Repair Workshop Manual

Full Download: <https://www.repairmanual.com/downloads/1986-1991-kawasaki-jetski-x-2-waverunner-service-repair-workshop-manual/>

### Carburetor Installation

Installation is the reverse of removal. Note the following.

- Install a new gasket under the carburetor.
- Tighten the carburetor mounting nuts to the specified torque (see Exploded View).
- Bend the tab portions of the double washer over the nuts.
- Connect the fuel hoses, as shown.

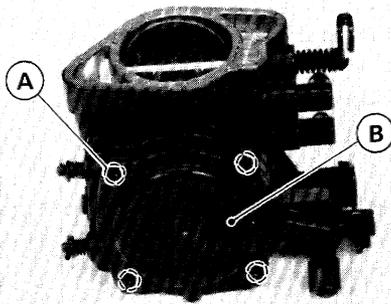


A. Return Line (To Fuel Tank)  
B. Main Line (From Fuel Pump)

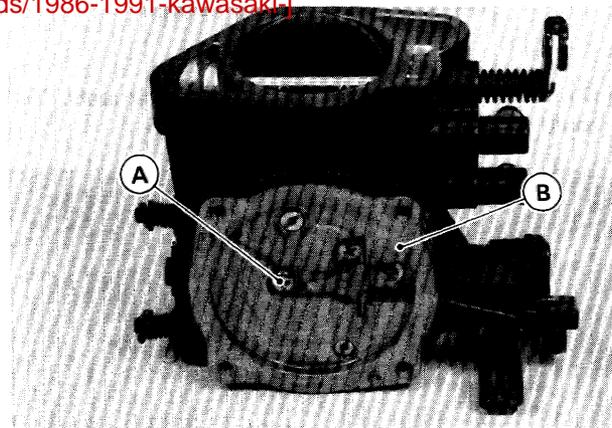
- Adjust the throttle and choke cables (see Throttle Cable Adjustment, Choke Cable Adjustment).

### Carburetor Disassembly

- Remove the carburetor (see Carburetor Removal).
- Unscrew the carburetor cover screws and take off the carburetor cover.

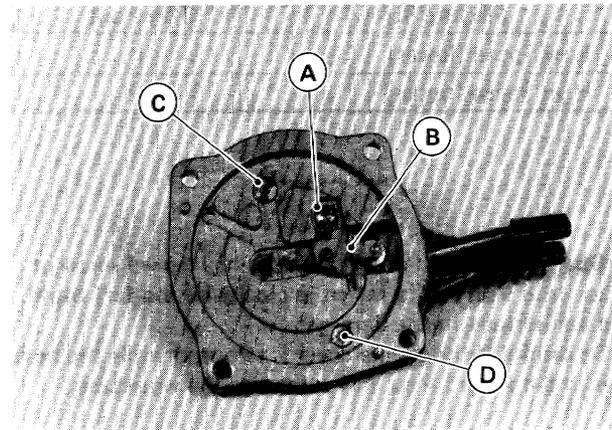


A. Screws  
B. Carburetor Cover



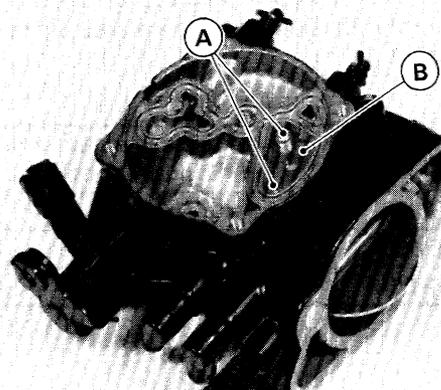
A. Screw  
B. Carburetor Case

- Unscrew the float arm set screw and remove the float arm, spring, and float valve.
- Unscrew the main jet and the pilot jet.



A. Set Screw  
B. Float Arm  
C. Main Jet  
D. Pilot Jet

- Remove the mounting screws and drop out the plate and check valve.



A. Screws  
B. Plate

Sample of manual. Download All 212 pages at:

<https://www.repairmanual.com/downloads/1986-1991-kawasaki-jetski-x-2-waverunner-service-repair-workshop-manual/>

Unscrew the carburetor case screw and separate the carburetor case from the carburetor body.