

# **Kawasaki**

— ENGINES —

## OWNER'S MANUAL MANUAL DEL PROPIETARIO

4-STROKE ELECTRONIC FUEL INJECTION AIR-COOLED V-TWIN GASOLINE ENGINE  
MOTOR DE GASOLINA DE 4 TIEMPOS BICILÍNDRICO EN V CON REFRIGERACIÓN  
POR AIRE E INYECCIÓN ELECTRÓNICA DE COMBUSTIBLE

**FX781V EVO**  
**FX820V EVO**

P/N 99803-0337-01



**ENGLISH**

# **General-purpose Engine Owner's Manual**

Original instructions



# SAFETY AWARENESS

Whenever you see the symbols shown below, heed their instructions! Always follow safe operating and maintenance practices.

## **DANGER**

**DANGER** indicates a hazardous situation which, if not avoided, will result in death or serious injury.

## **WARNING**

**WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury.

## ***NOTICE***

**NOTICE** is used to address practices not related to personal injury.

## **NOTE**

○ *NOTE* indicates information that may help or guide you in the operation or service of the vehicle.

# READ THIS FIRST

For your safety, read this Owner's Manual and understand it thoroughly before operating this ENGINE.

## DANGER

Exhaust gas contains carbon monoxide, a colorless, odorless poisonous gas. Inhaling carbon monoxide can cause serious brain injury or death. **DO NOT** run the engine in enclosed areas. Operate only in a well-ventilated area. Gasoline is extremely flammable and can be explosive under certain conditions, creating the potential for serious burns. When refueling, servicing fuel system, draining gasoline and/or adjusting the carburetor: Stop engine and allow it to cool before refueling. **DO NOT** smoke. Make sure the area is well-ventilated and free from any source of flame or sparks, including the pilot light of any appliance. **DO NOT** fill the tank so the fuel level rises into the filler neck or level surface of level gauge. If the tank is overfilled, heat may cause the fuel to expand and overflow through the vents in the tank cap. Wipe off any spilled gasoline immediately. Engines can become extremely hot during normal operation. To prevent fire hazard: Keep the engine at least 1 m (3.3 ft) away from buildings, obstructions and other flammable objects. **DO NOT** place flammable objects close to the engine. **DO NOT** expose combustible materials to the engine exhaust. **DO NOT** use the engine on any forest covered, brush covered or grass covered unimproved land unless spark arrester is installed on the muffler. To avoid getting an electric shock, **DO NOT** touch spark plugs, plug caps or spark plug leads during engine running. To avoid a serious burn, **DO NOT** touch a hot engine or muffler. The engine becomes hot during operation. Before you service or remove parts, stop engine and allow the engine to cool. **DO NOT** place hands or feet near moving or rotating parts. Place a protective cover over pulley, V belt or coupling. **DO NOT** run engine at excessive speeds. This may result in injury. Always remove the spark plug caps from spark plugs when servicing the engine to prevent accidental starting.

Read warning labels which are on the engine and understand them. If any label is missing, damaged, or worn, get a replacement from an authorized Kawasaki engine dealer and install it in the correct position.

# 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 in the U.S.A.

## 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 (EPA) and the California Air Resources Board (CARB). Also, depending on when your engine was produced, it may have an assigned emissions durability period.

\* See below for the engine emissions durability period that may apply to your engine.

## Exhaust Emission Control System

The exhaust emission control system applied to this engine consists of an Electronic Fuel Injection (EFI) system and an ignition system having optimum ignition timing characteristics. The EFI system has been calibrated to provide specific air/fuel mixture characteristics and optimum fuel economy with a suitable air cleaner and exhaust system.

A sealed-type crankcase emission control system is also used to eliminate blow-by gasses. The blow-by gasses are led to a breather chamber through the crankcase and from there to the air cleaner.

## Engine Emission Compliance Period

California	All Other States
<b>Greater than 19 kW Less than 825 cc</b>	<b>Greater than 19 kW less than 30 kW Less than 1 L</b>
Durability period-1 000 hours	Durability Period-1 000 hours

★If your engine has an assigned emissions durability period it will be located on the certification label attached to the engine (IMPORTANT ENGINE INFORMATION).

## **High Altitude Performance Adjustment Information**

Engine models with fuel injection do not require high altitude performance adjustment.

## **Maintenance and Warranty**

Proper maintenance is necessary to ensure that your engine will continue to have low emission levels. This Owner's Manual contains those maintenance recommendations for your engine. Those items identified by the Periodic Maintenance Chart are necessary to ensure compliance with the applicable standards.

As the owner of the engine, you have the responsibility to make sure that the recommended maintenance is carried out according to the instructions in this Owner's Manual at your own expense.

The Kawasaki Limited Emission Control System Warranty requires that you return your engine to an authorized Kawasaki engine dealer for remedy under warranty. Please read the warranty carefully, and keep it valid by complying with the owner's obligations it contains.

## **Tampering with Emission Control System Prohibited**

Federal law and California State law prohibit the following acts or the causing there of: (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 constitute tampering, do not tamper with the original emission related parts below:

- Fuel injection system, and their internal parts
- Spark plugs
- Electronic ignition system
- Fuel filter element
- Air cleaner elements
- Crankcase
- Cylinder heads
- Breather chamber and internal parts
- Intake pipe and tube

# FOREWORD

We wish to thank you for purchasing this Kawasaki engine.

**Please read this Owner's Manual carefully before starting your new engine** so that you will be thoroughly familiar with the proper operation of your engine's control, its features, capabilities and limitations.

Also read the manual of the equipment to which this engine is attached.

To ensure a long, trouble-free life for your engine, give it the proper care and maintenance described in this manual. Always keep this manual at your fingertip so that you can refer to it whenever you need information. This manual should be considered a permanent part of the engine and should remain with the engine when it is sold.

Please note that the photographs and illustrations shown in this manual are based on Model FX820V EVO as a typical example among other similar models.

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This publication includes the latest information available at the time of printing. However, there may be minor differences between the actual product and illustrations and text in this manual.

All products are subject to change without prior notice or obligation.

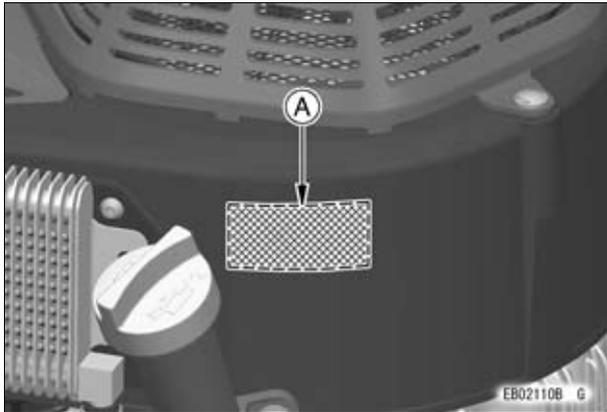
**KAWASAKI MOTORS, LTD.**

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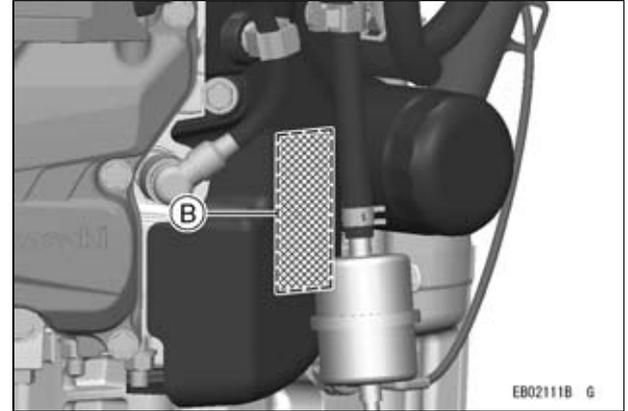
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# GENERAL INFORMATION

## Location of Safety Related Labels



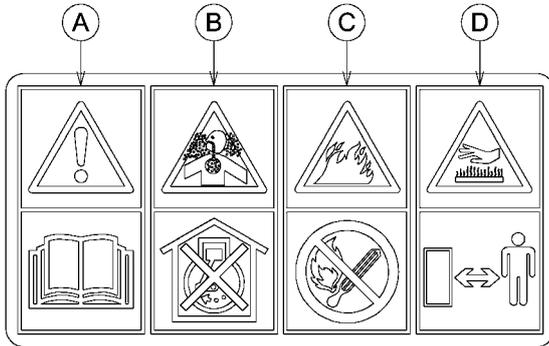
A. Warning Label



B. Product Label (Engine Serial Number)

## 10 GENERAL INFORMATION

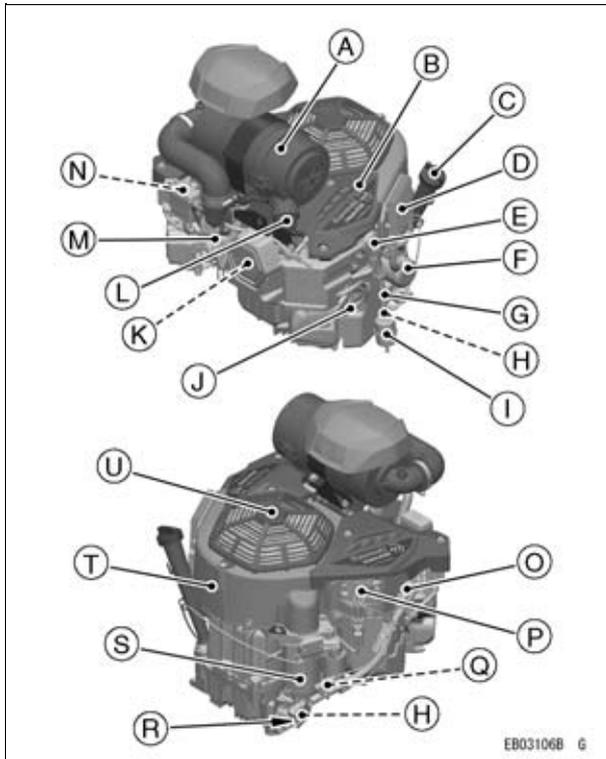
A)



EB02098BM2 S

- A. The Owner's manual contains important information on safe operation. Read it before operating engine.**
- B. Exhaust gas contains carbon monoxide, an odorless and deadly poison. Do not run Engine in an enclosed area.**
- C. Gasoline is extremely flammable and explosive. No open flames or other source of ignition.**
- D. Engines can become extremely hot during normal operation. Keep away from hot parts of the engine.**

## Location of Parts



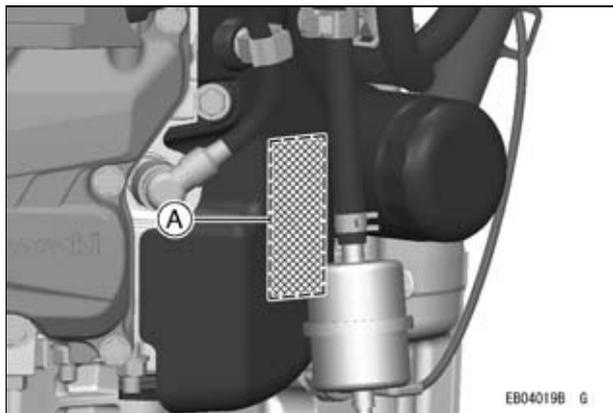
- A. Air Cleaner
- B. Cleanout Cover
- C. Oil Gauge/Oil Filler
- D. Oil Cooler
- E. Fuel Pump (Pulse)
- F. Oil Filter
- G. Fuel Tube
- H. Oil Drain Plugs
- I. Fuel Filter
- J. Spark Plug Cap/Spark Plug
- K. Fuel Pump (Electric)
- L. Cap (Dust Ejector Valve)
- M. Throttle Body/ECU
- N. 2 A/10 A Fuse
- O. Diagnostic Connector
- P. Voltage Regulator
- Q. 40 A Fuse
- R. Engine Main Harness Connector
- S. Starter Motor
- T. Fan Housing
- U. Guard/Air Intake Screen

## 12 GENERAL INFORMATION

### Engine Serial Number

The engine serial number is your only means of identifying your particular engine from others of the same model type.

This engine serial number is needed by an authorized Kawasaki engine dealer or equally qualified service facility when ordering parts.



**A. Engine Serial Number**

### Tune-up Specifications

ITEM	Specifications
Ignition Timing	Unadjustable
Spark Plugs: Gap	NGK BPR6ES 0.75 mm (0.030 in.)
Low Idle Speed	1 550 r/min (rpm)
High Idle Speed	3 600 r/min (rpm)
Valve Clearance	IN 0.10 – 0.15 mm (0.0039 – 0.0059 in.) EX 0.10 – 0.15 mm (0.0039 – 0.0059 in.)
Other Specifications	No other adjustment needed

#### NOTE

○ *High and low idle speeds may vary depending on the equipment on which the engine is used. Refer to the equipment specification.*

## Battery Capacity



### WARNING

Prevent sparks and/or electrical system damage by removing the negative (-) cable from the battery before attempting any repair or maintenance.

## Battery Capacity Recommended

### Minimum Recommended Battery Capacity

12 V 550 CCA Class

## Fuel

Use only clean, fresh, unleaded regular grade gasoline.

### NOTICE

Do not mix oil with gasoline.

## Octane Rating

The octane rating of a gasoline is a measure of its resistance to “knocking”. **Using a minimum of 87 octane by the antiknock index is recommended.** The antiknock index is posted on service station pumps in the U.S.A.

### NOTE

- If “knocking or “pinging” occurs, use a different brand of gasoline or higher octane rating.
- When not operating your kawasaki engine more than once per month, you can mix a fuel stabilizer with gasoline in the fuel tank. Fuel stabilizer additive could inhibit oxidation of fuel.

## Oxygenated Fuel

Oxygenates (either ethanol or MTBE) are added to the gasoline. If you use the oxygenates, be sure it is unleaded and meets the minimum octane rating requirement.

The followings are the EPA approved percentages of fuel oxygenates.

## 14 GENERAL INFORMATION

ETHANOL: (Ethyl or Grain Alcohol)

You may use gasoline containing up to 10% ethanol by volume.

MTBE: (Methyl Tertiary Butyl Ether)

You may use gasoline containing up to 15% MTBE by volume.

METHANOL: (Methyl or Wood Alcohol)

You may use gasoline containing up to 5% methanol by volume, as long as it also contains cosolvents and corrosion inhibitors to protect the fuel system. Gasoline containing more than 5% methanol by volume may cause starting and/or performance problems. It may also damage metal, rubber, and plastic parts of your fuel system.



### **WARNING**

**Gasoline is extremely flammable and can be explosive under certain conditions, creating the potential for serious burns. Turn the ignition switch off. Do not smoke. Make sure the area is well ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.**

- Place the engine on level surface before fueling.
- Remove the fuel tank cap.
- Slowly pour fuel into the tank through the fuel strainer.
- Close the tank cap securely.

# STARTING

## Start Engine

### **⚠ DANGER**

Exhaust gas contains carbon monoxide, a colorless, odorless poisonous gas. Inhaling carbon monoxide can cause serious brain injury or death. **DO NOT** run the engine in enclosed areas. Operate only in a well-ventilated area.

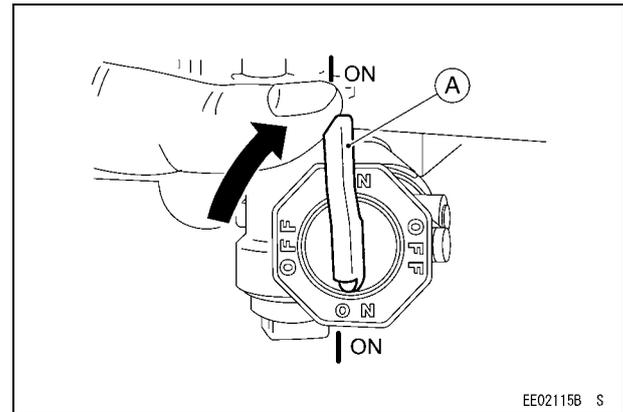
### **⚠ WARNING**

Engine exhaust may ignite combustible materials and cause a fire. Keep the area around the exhaust outlet clear. Locate the unit so that the exhaust outlet points toward an open area and is located at least one meter (3.3 feet) from any obstructions.

### **NOTE**

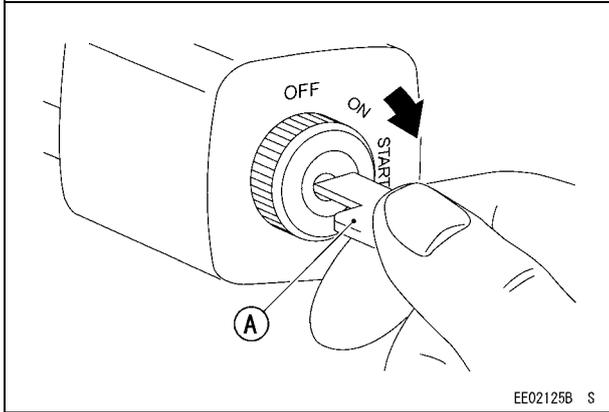
- Be aware of the following in order to start the engine easily in cold weather.
- Use proper oil for expected temperature (See Oil Change section in the MAINTENANCE chapter).
- Use fresh gasoline.

- Protect the engine or the equipment from direct exposure to weather when not in operation.
- Before starting the engine, disconnect all possible external loads.
- Open the fuel valve on the equipment.
- Put the key into the ignition switch and turn to the “ON” or “RUN” position.
- Move the throttle lever on the equipment to its low speed or “SLOW” position.
- Turn the key to the “START” position on the ignition switch. Normally the engine will start within 3 seconds.



**A. Fuel Valve**

## 16 STARTING



A. Engine Switch Key

### ***NOTICE***

Do not run the electric starter continuously for more than 5 seconds, otherwise the battery may discharge quickly. If the engine does not start right away, wait 15 seconds and try again.

### ***NOTICE***

Whenever you start engine, make sure warning light is not illuminated after engine starts. If warning light comes on, stop engine immediately and check oil level (if equipped).

# OPERATING

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## Warming Up

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To warm up the engine, run it for 3 to 5 minutes with the throttle lever in the “SLOW” speed position. Then move the throttle lever on the equipment to its “FAST” speed position before putting the equipment under load.

<b><i>NOTICE</i></b>
<b>Allow engine to warm up sufficiently (3 to 5 minutes at idle) before applying a load. This will allow oil to reach all engine parts, and allow piston clearance to reach design specifications.</b>

<b><i>NOTICE</i></b>
<b>While warming up the engine, make sure the warning light (oil pressure) on dash is not on. The warning light must not be illuminated during engine operation (if equipped).</b>

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## Engine Inclination

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This engine will operate continuously at angles up to 25° in any direction.

Refer to the operating instructions of the equipment this engine powers. Because of equipment design or application, there may be more stringent restrictions regarding the angle of operation.

<b><i>NOTICE</i></b>
<b>Do not operate this engine continuously at angles exceeding 25° in any direction. Engine damage could result from insufficient lubrication.</b>

## 18 OPERATING

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### **MIL (Malfunction Indicator Light)**

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The equipment has a MIL to indicate malfunction of the EFI system.

When the ECU of the engine detects the EFI system trouble, MIL illuminates.

The MIL illuminates whenever the ignition key is turned to "ON" or trouble occurs in the EFI system.

The MIL goes off soon after the engine running. If the MIL does not illuminate after ignition key is turned to "ON" or MIL illuminates while engine running, consult your authorized Kawasaki engine dealer or equally qualified service facility.

### **Reduced Power Mode (Engine speed reduced to low idle)**

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When the ECU detects conditions of the engine as stated below, the ECU reduces the engine speed to low idle (Reduced Power Mode).

If the engine enters the reduced power mode, stop the engine as soon as safely possible and refer to the troubleshooting guide at the end of this book.

Service an engine that has entered reduced power mode as soon as possible. Operating in reduced power mode for extended periods of time can cause engine failure.

#### **Causes of Reduced Power Mode**

- Overheat of the engine (MIL on)
- Oil pressure is low (if the oil switch is equipped/-MIL off, Oil pressure light on)
- Throttle valve control malfunction (internal ECU malfunction/MIL on)
- Throttle position sensor malfunction (internal Throttle body malfunction/MIL on)
- Hand throttle input sensor malfunction (MIL on)
- Battery voltage is less than 10 V or more than 17 V (MIL on).

# STOPPING

## Stopping the Engine

### Ordinary Stop

- Move throttle lever to “SLOW” position.
- Keep running at the “SLOW” speed for about one minute.

### ***NOTICE***

**Engine damage can occur from run-on or after-burning if engine is stopped suddenly from high speed loaded operation. Reduce engine speed to “SLOW” for one minute before shutting engine off.**

- Turn the engine switch or the switch key to “OFF” position.

### Emergency Stop

- Immediately turn the engine switch or the switch key to “OFF” position.
- Close the fuel valve on the equipment.

### **WARNING**

**Leaving the equipment with the key hanging in the ignition can allow operation by someone who does not know how to operate it. It may cause serious accident with injury. Always remove the key from unattended equipment.**

# ADJUSTMENT

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## Engine Speed Adjustment

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### NOTE

- *Do not tamper with the EFI system setting to increase the engine speed. Every EFI system is adjusted at the factory.*
- *If any adjustment is necessary, see an authorized Kawasaki engine dealer or equally qualified service facility to perform the adjustment.*

# MAINTENANCE

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

## 22 MAINTENANCE

### Periodic Maintenance Chart

 **WARNING**

Prevent accidental starting during engine service by removing the spark plug caps.

#### NOTE

○ The service intervals can be used as a guide. Service more frequently as necessary by operating conditions.

MAINTENANCE	INTERVAL						
	Daily	Every 50 hr.	Every 100 hr.	Every 200 hr.	Every 250 hr.	Every 300 hr.	Every 500 hr.
Check and add engine oil.	●						
Check for loose or lost nuts and screws.	●						
Check for fuel and oil leakage.	●						
Check battery electrolyte level.	●						
◆ Check or clean air intake screen.	●						
Check cleanout cover.		●					
◆ Clean dust and dirt from cylinder and cylinder head fins.			●				
Tighten nuts and screws.			●				
Change engine oil.	Every 100 hours or 1 year whichever comes first						
◆ Check and clean oil cooler fins.			●				
Clean and regap spark plugs.			●				
Change oil filter.				●			
◆ Replace air cleaner primary element.					●		

<b>MAINTENANCE</b>	<b>INTERVAL</b>						
	<b>Daily</b>	<b>Every 50 hr.</b>	<b>Every 100 hr.</b>	<b>Every 200 hr.</b>	<b>Every 250 hr.</b>	<b>Every 300 hr.</b>	<b>Every 500 hr.</b>
◆ Check air cleaner secondary element.					●		
◇ Clean combustion chamber.						●	
◇ Check and adjust valve clearance.						●	
◇ Clean and lap valve seating surface.						●	
◆ Replace air cleaner secondary element.							●

◆ : Service more frequently under dusty or dirty conditions.

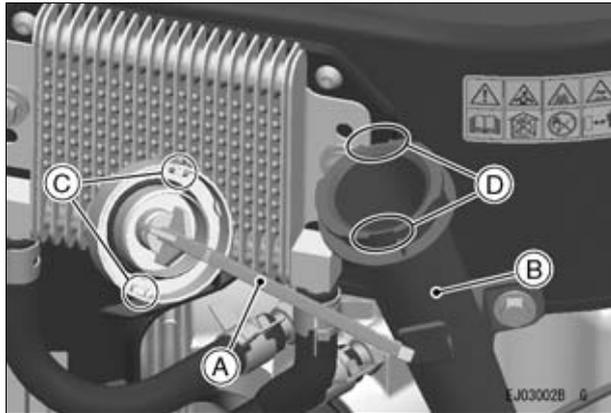
◇ : Service to be performed by an authorized Kawasaki engine dealer or equally qualified service facility.

## 24 MAINTENANCE

### Oil Level Check

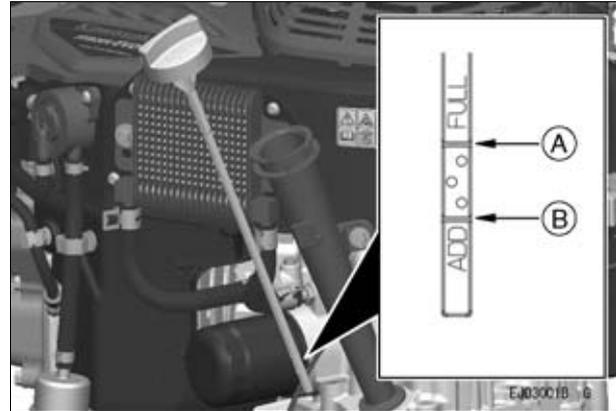
Check the engine oil daily before starting the engine otherwise shortage of the engine oil may cause serious damage to the engine such as seizure.

- Place the engine on level surface. Clean area around the oil gauge before removing it.
- Remove the oil gauge and wipe it with a clean cloth.
- Insert the oil gauge into tube **WITHOUT TURNING IT IN** so that the projections of the cap fit to the cutouts of the tube.



- A. Oil Gauge**
- B. Tube**
- C. Projections**
- D. Cutouts**

- Remove the oil gauge to check the oil level. The level should be between “ADD” and “FULL” marks.



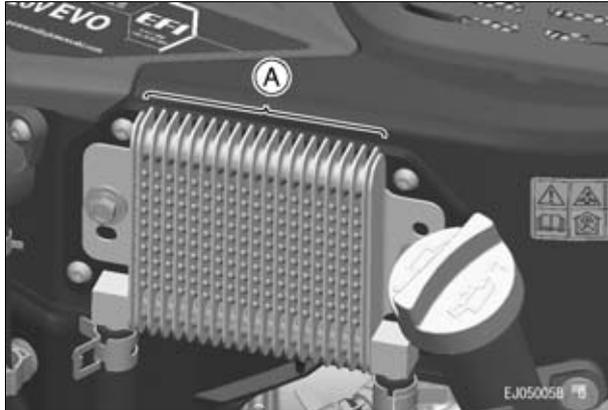
- A. “FULL” Mark**
- B. “ADD” Mark**

- If the oil level is too high, remove the excess oil through the oil filler opening using a syringe or some other suitable device.
- If the oil level is too low, add oil to reach the correct level. Use the same type and brand of oil that is already in the engine.
- Install and tighten the oil gauge until its click.

## Oil Cooler Service

Check and clean oil cooler fins every 100 hours.

- Clean dirt off the outside fins with a brush or compressed air.



A. Oil Cooler Fins

## Oil Change

Change oil every 100 hours or 1 year whichever comes first.

### NOTE

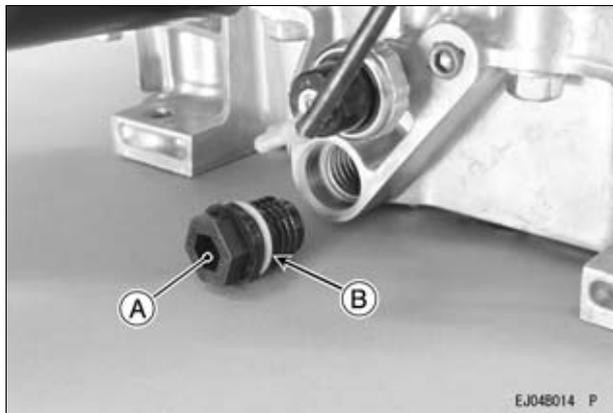
○ *If a torque wrench is not available, this item should be serviced by an authorized Kawasaki engine dealer or equally qualified service facility.*

- Run the engine to warm oil.
- Place the engine on level surface.
- Stop the engine.
- Remove the oil drain plug and drain the oil into a suitable container while engine is warm.

### **WARNING**

**Hot engine oil can cause severe burns. Allow engine temperature to drop from hot to warm level before draining and handling oil.**

## 26 MAINTENANCE



**A. Oil Drain Plug**  
**B. O-ring**

- Replace the O-ring with a new one.
- Apply grease to the O-ring.
- Tighten the oil drain plug.

### Tightening Torque

#### Oil Drain Plug:

**6.9 N·m (0.70 kgf·m, 61 in·lb)**

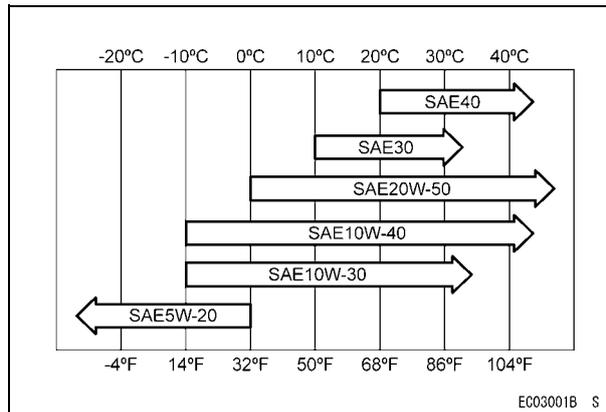
- Fill with good quality engine oil specified in the table.
- Check the oil level (See Oil Level Check section).

### Recommended Engine Oil

Type:  
API SJ or SL

### Engine Oil Viscosity

Choose the viscosity according to the temperature as follows:



### NOTE

- Although 10W-40 engine oil is the recommended oil for most conditions, the oil viscosity may need to be changed to accommodate atmospheric conditions. Using 20W-50 oil in higher ambient temperatures may reduce oil consumption.

### Engine Oil Capacity

FX781V EVO	1.9 L (2.0 US·qt) [when oil filter is not removed]
FX820V EVO	2.1 L (2.2 US·qt) [when oil filter is removed]

**WARNING**

Engine oil is a toxic substance. Dispose of used oil properly. Contact your local authorities for approved disposal methods or possible recycling.

**Oil Filter Change**

Change the oil filter every 200 hours.

- Drain the engine oil into a suitable container (See Oil Change section).

**NOTICE**

**Before removing the oil filter, place suitable pan under filter connection.**

- Rotate the oil filter counterclockwise to remove it.
- Replace the oil filter with a new one.
- Coat a film of clean engine oil on the seal of new filter.
- Install new filter rotating it clockwise until the seal contacts the mounting surface. Then rotate the filter 2/3 turn more by hand.
- Install the oil drain plug and refill with fresh oil (See Oil Change section).
- Run the engine for about 3 minutes, stop the engine.
- Check any oil leakage around the filter and oil level (See Oil Level Check section).

## 28 MAINTENANCE

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### Air Cleaner Service

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<b><i>NOTICE</i></b>
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<b>Do not run the engine with the air cleaner removed.</b>
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#### Air Cleaner

These air cleaner elements are not recommended to be cleaned. Replace each air cleaner element with a new one at the maintenance time as shown in the maintenance chart.

<b><i>NOTICE</i></b>
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<b>To prevent excessive engine wear, do not run the engine with the air cleaner removed.</b>
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<b><i>NOTICE</i></b>
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<b>Do not wash air cleaner elements. Do not oil air cleaner elements. Do not use pressurized air to clean air cleaner elements.</b>
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#### NOTE

○ *Operating in dusty or dirty condition may require more frequent maintenance.*

#### Primary Element

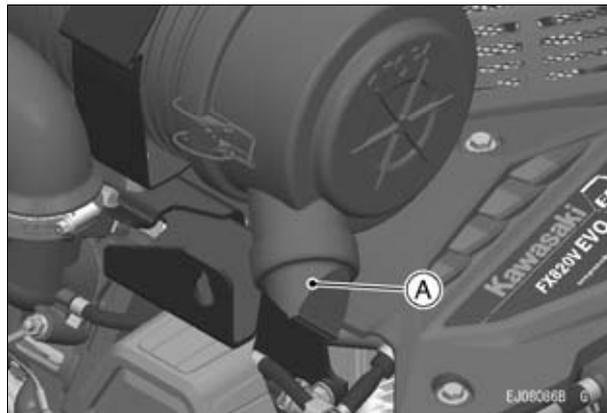
Replace the primary element every 250 hrs.

#### Secondary Element

- Replace the secondary element with a new one, if the secondary element is dirty when the primary element is checked.
- Replace the secondary element with a new one every 500 hrs.

#### Cap (Dust Ejector Valve)

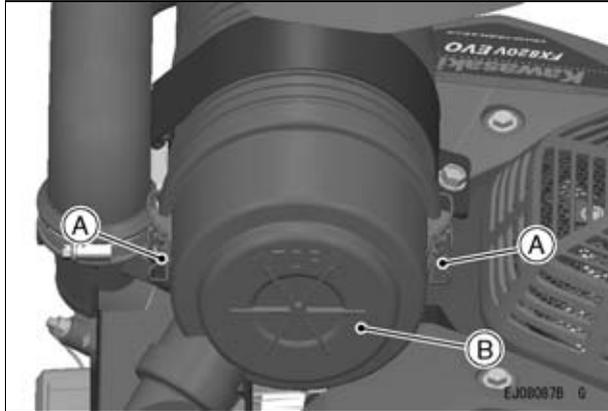
Pinch and open the cap on the case of the air cleaner body to expel dust and/or water accumulated inside.



**A. Cap (Dust Ejector Valve)**

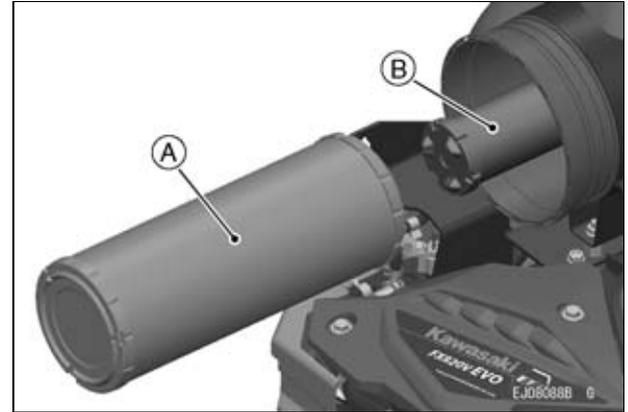
### Replace the air cleaner element

- Unfasten the retaining clamps and remove the case from the air cleaner body.



- A. Retaining Clamps**
- B. Case**

- Remove the primary element and the secondary element from the air cleaner body by pulling them out.



- A. Primary Element**
- B. Secondary Element**

- Install the new air cleaner elements into the air cleaner body.
- Reinstall the case then securely fasten the retaining clamps.

### Fuel Filter and Fuel Pump Service

#### **WARNING**

Many solvents are highly flammable and may cause serious burns. Improper use of solvents can result in fire or an explosion. Do not use gasoline or low flash-point solvents to clean the fuel filter and/or the fuel pump. Clean only in a well-ventilated area away from sources of sparks or flame, including any appliances with a pilot light.

- The fuel filter can not be disassembled. If the fuel filter gets clogged, replace it with a new one.
- The fuel pumps can not be disassembled. If the fuel pump fails, replace it with a new one.

### Spark Plug Service

#### **WARNING**

Engines can become extremely hot during normal operation. Hot engine components can cause severe burns. Stop the engine and allow it to cool before checking spark plugs.

Clean the spark plugs and reset the gap every 100 hours of operation.

#### **NOTE**

- *If a torque wrench is not available, this item should be serviced by an authorized Kawasaki engine dealer or equally qualified service facility.*
- Disconnect the spark plug caps from the spark plugs and remove the spark plugs.
- Clean the electrodes by scraping or using a non-metal brush (nylon etc.) to remove carbon deposits.
- Inspect for cracked porcelain, other wear or damage. Replace the spark plug with a new one if necessary.
- Check the spark plug gap and reset it if necessary. To change the gap, bend only the side electrode, using a spark plug tool.

#### **Spark Plug Gap**

<b>NGK BPR6ES</b>	<b>0.75 mm (0.030 in.)</b>
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- Tighten the spark plugs.

## Tightening Torque

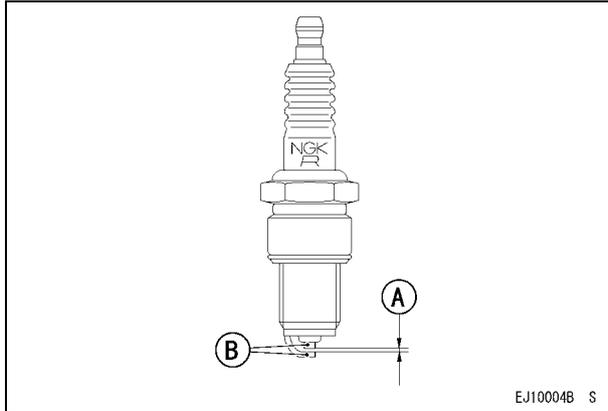
### Spark Plugs:

**22 N·m (2.2 kgf·m, 16 ft·lb)**

- Fit the spark plug caps on the spark plugs securely.
- Pull up the spark plug caps lightly to make sure of the installation of the spark plug caps.

### RECOMMENDED SPARK PLUG

NGK .....BPR6ES



- A. Spark Plug Gap
- B. Electrodes

EJ10004B S

## Fuse Service

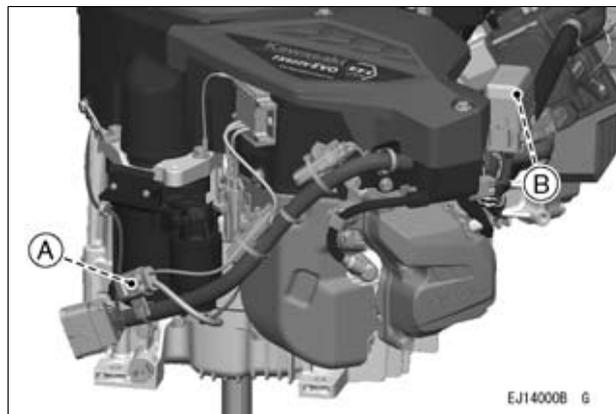
Fuses are arranged in the fuse cases located on the side and rear of the engine. If a fuse fails during operation, inspect the electrical system to determine the cause, and then replace it with a new fuse of proper amperage.

If the fuse fails repeatedly, there is something wrong with the electrical system. Have the engine checked by an authorized Kawasaki engine dealer or equally qualified service facility.

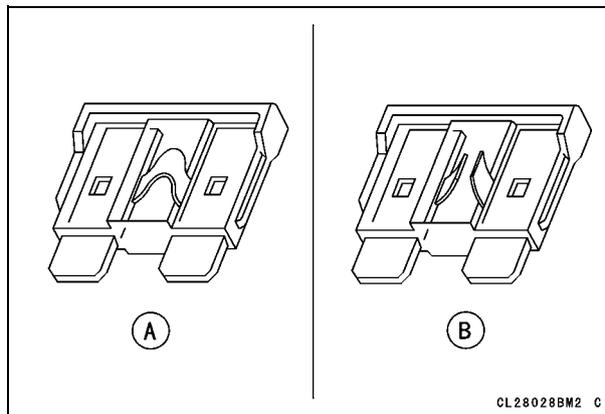
### **WARNING**

**Substituting fuses can cause wiring to overheat, catch fire and/or fail. Do not use any substitute for the standard fuse. Replace the blown fuse with a new one of the correct capacity.**

## 32 MAINTENANCE



- A. 40 A Main Fuse
- B. 2 A, 10 A Fuses



- A. Normal
- B. Failed

## Cooling System Cleaning

### NOTICE

Do not run engine before all cooling system parts are reinstalled to keep cooling as intended.

### Intake Screen

Before each operation, check that the air intake screen is free from grass and debris. Clean the screen if necessary.

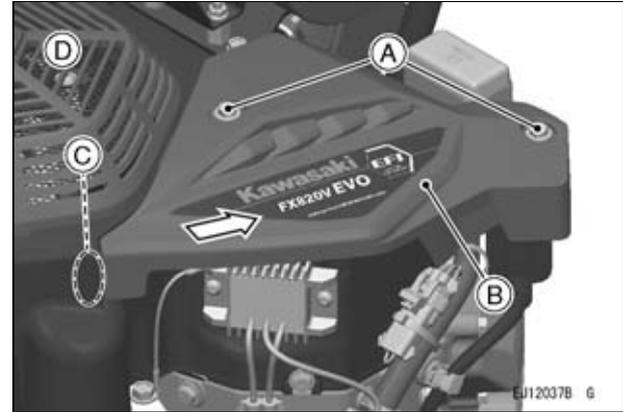
### Cleanout Cover

Every 50 hours of operation, check dust or debris inside fan housing. To check inside, remove the cleanout covers and see inside from the inspection ports of fan housing. Clean or blow the dust if needed. If it is difficult to clean the dust with the ports, remove the fan housing and clean the dirt completely.

### NOTE

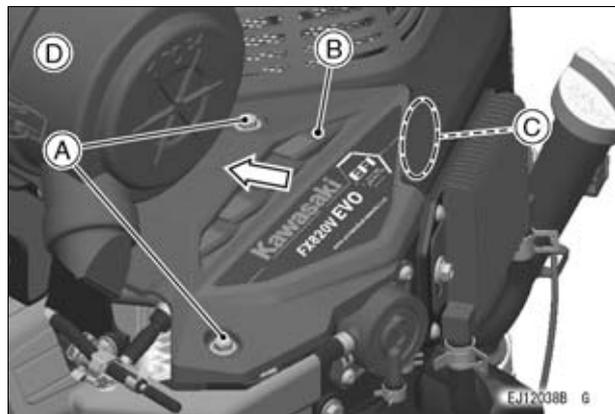
○ *If a torque wrench is not available, this item should be serviced by an authorized Kawasaki engine dealer or equally qualified service facility.*

- Remove the cleanout cover bolts.
- Pull the cleanout cover outside to clear the tab.
- Remove the cleanout covers.



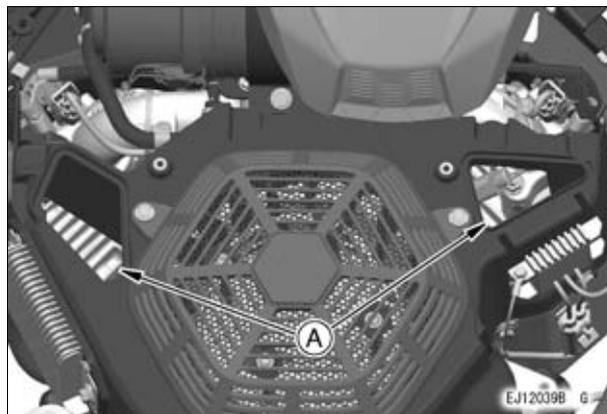
- A. Cleanout Cover Bolts
- B. Cleanout Cover
- C. Tab
- D. #1 Cylinder Side

## 34 MAINTENANCE



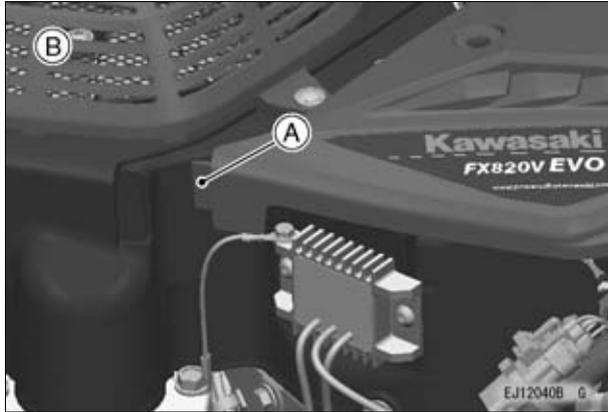
- A. Cleanout Cover Bolts**
- B. Cleanout Cover**
- C. Tab**
- D. #2 Cylinder Side**

- Check the inside from the inspection ports of fan housing and clean if necessary.



- A. Inspection Ports**

- Insert the tab inside the fan housing.



A. Tab  
B. #1 Cylinder Side



A. Tab  
B. #2 Cylinder Side

- Tighten the cleanout cover bolts.

### Tightening Torque

#### Cleanout Cover Bolts:

5.9 N·m (0.60 kgf·m, 52 in·lb)

### Cylinder and Cylinder Head Fins

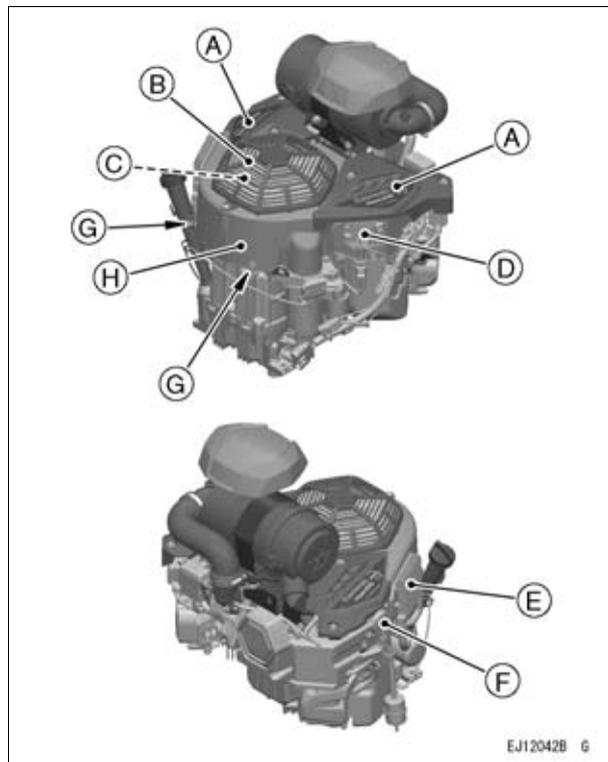
Every 100 hours of operation, check and clean the cooling fins and the inside of engine shrouds to remove grass, chaff or dirt clogging the cooling system and causing overheating.

### NOTE

- If a torque wrench is not available, this item should be serviced by an authorized Kawasaki engine dealer or equally qualified service facility.

## 36 MAINTENANCE

- Remove the cleanout cover bolts and cleanout covers [A].
- Remove the quick rivets and guard [B].
- Remove the air intake screen bolts and air intake screen [C].
- Remove the voltage regulator bolts and voltage regulator [D].
- Remove the oil cooler bolts, washers and oil cooler [E].
- Remove the fuel pump screws and fuel pump [F].
- Remove the fan housing bolts [G].
- Remove the fan housing [H].



- A. Cleanout Covers**
- B. Guard**
- C. Air Intake Screen**
- D. Voltage Regulator**
- E. Oil Cooler**
- F. Fuel Pump**
- G. Fan Housing Bolts**
- H. Fan Housing**

- Clean the cylinder and cylinder head fins.
- Install the removed parts.

## 38 MAINTENANCE

### Torque Table

Fastener	Size	Length	Qty	Torque		
				N·m	kgf·m	in·lb
Fan Housing Bolt	M6	11 mm	5	8.8	0.90	78
Oil Cooler Bolt	M6	16 mm	2	5.9	0.60	52
Air Intake Screen Bolt	M6	12 mm	4	5.9	0.60	52
Cleanout Cover Bolt	M6	9 mm	4	5.9	0.60	52

# STORAGE

## Engine Storage Procedure

When not operating your Kawasaki engine more than 30 days, add fuel stabilizer to fuel tank and run engine for 5 minutes then drain the fuel tank.

After draining the fuel tank, run the engine at low idle until engine stalls.

### WARNING

**Gasoline is extremely flammable and can be explosive under certain conditions. Drain fuel before storing the equipment for extended periods. Drain gasoline in a well-ventilated area away from any source of flame or sparks, including any appliances with a pilot light. Store gasoline in an approved container in safe location.**

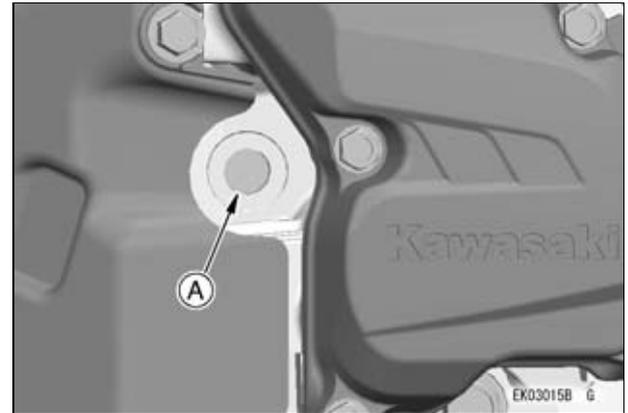
### WARNING

**Gasoline is a toxic substance. Dispose of gasoline properly. Contact your local authorities for approved disposal methods.**

- Remove the spark plugs and pour approx 1 – 2 mL (1/2 teaspoon) of engine oil through the spark plug holes then screw the spark plugs in after cranking the engine a few times. Slowly crank the

engine until you feel the compression then leave it there. This traps the air inside the cylinders and prevents rust inside the engine.

- Wipe the body with oily cloth.
- Wrap the engine with plastic sheeting and store it in a dry place.
- Change engine oil for next use after period of storage (See Oil Change section in the MAINTENANCE chapter).



A. Spark Plug Hole

# TROUBLESHOOTING GUIDE

If the engine malfunctions, carefully examine the symptoms and the operating conditions, and use the table below as a guide to troubleshooting.

Symptom		Probable Cause	Remedy
Engine won't start or output is low	Insufficient compression	Loose spark plugs	Tighten properly
		Faulty pistons, cylinders, piston rings, or head gaskets	◇
		Faulty valves	
		Loose cylinder head bolts	
	No fuel to combustion chamber	No fuel in fuel tank	Fill fuel tank
		Fuel valve is not in "ON" position.	Open fuel valve lever.
		Clogged fuel filter or tube	Change fuel filter or fuel tube
		Clogged air vent in tank cap	Clean fuel tank cap
		Faulty fuel system	◇
	Spark plugs fouled by fuel	Clogged air cleaner	Replace
		Incorrect grade/type of fuel	Change fuel
		Water in fuel	
		Over-rich fuel/air mixture	◇
		Faulty fuel system	

Symptom		Probable Cause	Remedy
	No spark or weak spark	Faulty spark plugs	Replace spark plugs
		Engine switch is in "OFF" position	Turn engine switch to "START" position (See <b>M</b> )
		Faulty ignition coils	◇
Low output	Engine overheats	Clogged air cleaner	Replace
		Air intake screen or cooling air path clogged with dirt	Clean
		Insufficient engine oil	Replenish or change oil
		Carbon build-up in combustion chamber	◇
	Engine speed won't increase	Faulty E-governor.	◇

◇: Service to be performed by an authorized Kawasaki engine dealer or equally qualified service facility.

**M** : For Control Panel Switch Type, move the throttle lever on the equipment away from it slow speed end to turn the engine switch to "START" position.

## 42 TROUBLESHOOTING GUIDE

### Reduced Power mode

Symptom		Probable Cause	Remedy
Engine speed reduced to low idle.	Overheat of the engine (MIL on)	Debris or dust is inside shroud	Clean (refer to Cooling System Cleaning section in the MAINTENANCE chapter)
		Temperature sensor or circuit malfunction	◇
	Low oil pressure (If oil switch is equipped) (MIL off/Oil lamp on)	Low oil level	Add oil (refer to Oil Level Check section in the MAINTENANCE chapter)
		Oil switch or circuit malfunction	◇
		Lubrication system malfunction	◇
	Hand throttle input sensor malfunction (MIL on)	Wiring issue or sensor malfunction	◇
	Internal ECU/throttle body malfunction (MIL on)	Throttle valve control malfunction	◇
		Throttle position sensor malfunction	◇
	Battery voltage abnormal (MIL on)	Battery voltage too low	Charge battery or Replace battery
		Electrical system trouble (Charging system malfunction, Internal ECU/throttle body malfunction)	◇

◇: Service to be performed by an authorized Kawasaki engine dealer or equally qualified service facility.

# ENVIRONMENTAL PROTECTION

To help preserve the environment, properly discard used batteries, oils and fluids, or other engine components.

Consult an authorized Kawasaki engine dealer or equally qualified service facility or local environmental waste agency for their proper disposal procedure. This also applies to disposal of the entire engine at the end of its life.

# SPECIFICATIONS

	FX781V EVO/FX820V EVO
Type	Air- cooled, 4-stroke OHV 6 Valves, V-twin cylinder, gasoline engine
Bore x Stroke	83 × 76 mm (3.3 × 3.0 in.)
Displacement	822 cm <sup>3</sup> (50.2 cu.in.)
Ignition System	Electronic ignition
Direction of rotation	Counterclockwise facing the PTO Shaft
Starting system	Electronic starter

## NOTE

○ *Specifications are subject to change without notice.*



**⚠ WARNING**

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

**⚠ ADVERTENCIA**

El escape del motor de este producto contiene productos químicos que, según el Estado de California, provocan cáncer, defectos de nacimiento o afectan a la fecundidad.

For repair or maintenance assistance contact an authorized Kawasaki engine dealer or equally qualified service facility.

For warranty assistance please contact an authorized Kawasaki engine dealer.

Kawasaki engine dealer locator can be found on our website: [www.kawasakienginesusa.com](http://www.kawasakienginesusa.com)

For further assistance email: [kawasakienginesupport@kmc-usa.com](mailto:kawasakienginesupport@kmc-usa.com) or call 877-364-6404

Para obtener asistencia en la reparación y mantenimiento, póngase en contacto con un distribuidor autorizado de motores Kawasaki o con un centro de servicio de similar cualificación.

Para obtener asistencia respecto a la garantía, póngase en contacto con un distribuidor autorizado de motores Kawasaki. El localizador de distribuidores de motores Kawasaki se encuentra disponible en nuestro sitio web: [www.kawasakienginesusa.com](http://www.kawasakienginesusa.com)

Si necesita más asistencia, envíe un correo electrónico a [kawasakienginesupport@kmc-usa.com](mailto:kawasakienginesupport@kmc-usa.com) o llame al 877-364-6404



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