

# Quick Reference Guide

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

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

## LIST OF ABBREVIATIONS

A	ampere(s)	lb	pounds(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)		

## COUNTRY AND AREA CODES

CA	Canada	US	United States
CAL	California		

# Foreword

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

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

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

To get the longest life out of your vehicle.

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

## How to Use This Manual

In this manual, the product is divided into its major systems and these systems make up the manual's chapters. The Quick Reference

Guide shows you all of the product's system and assists in locating their chapters. Each chapter in turn has its own comprehensive Table of Contents.

For example, if you want engine oil information, use the Quick Reference Guide to locate the Engine Lubrication System chapter. Then, use the Table of Contents on the first page of the chapter to find the Engine Oil section.

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

### WARNING

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

### CAUTION

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

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

### NOTE

○ *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 NOTE.
- ★ Indicates a conditional step or what action to take based on the results of the test or inspection in the procedural step or sub-step it follows.

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

# General Information

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## 1-2 GENERAL INFORMATION

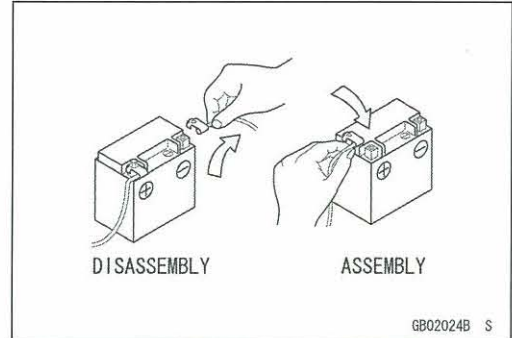
### Before Servicing

Before starting to perform an inspection service or carry out a disassembly and reassembly operation on a vehicle, read the precautions given below. To facilitate actual operations, notes, illustrations, photographs, cautions, and detailed descriptions have been included in each chapter wherever necessary. This section explains the items that require particular attention during the removal and reinstallation or disassembly and reassembly of general parts.

Especially note the following.

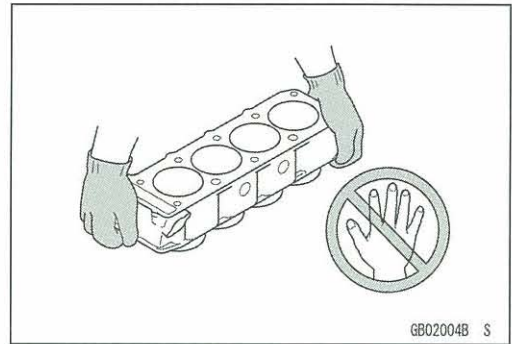
#### **Battery Ground**

Before completing any service on the vehicle, disconnect the battery cables from the battery to prevent the engine from accidentally turning over. Disconnect the ground cable (–) first and then the positive (+). When completed with the service, first connect the positive (+) cable to the positive (+) terminal of the battery then the negative (–) cable to the negative terminal.



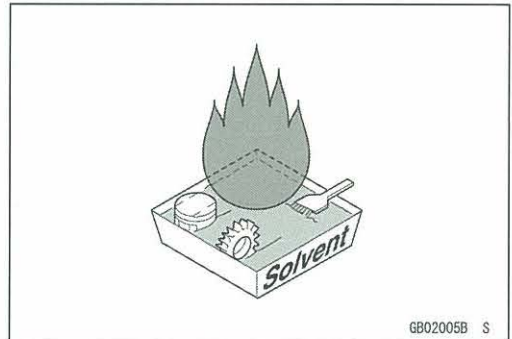
#### **Edges of Parts**

Lift large or heavy parts wearing gloves to prevent injury from possible sharp edges on the parts.



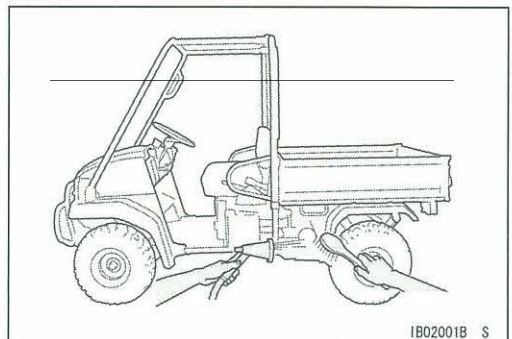
#### **Solvent**

Use a high-flash point solvent when cleaning parts. High-flash point solvent should be used according to directions of the solvent manufacturer.



#### **Cleaning Vehicle before Disassembly**

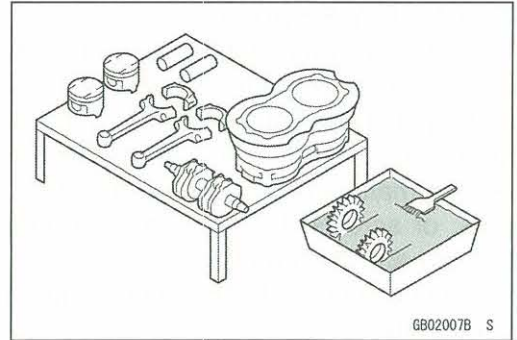
Clean the vehicle thoroughly before disassembly. Dirt or other foreign materials entering into sealed areas during vehicle disassembly can cause excessive wear and decrease performance of the vehicle.



**Before Servicing**

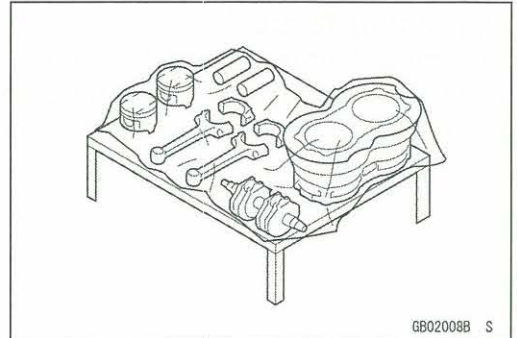
**Arrangement and Cleaning of Removed Parts**

Disassembled parts are easy to confuse. Arrange the parts according to the order the parts were disassembled and clean the parts in order prior to assembly.



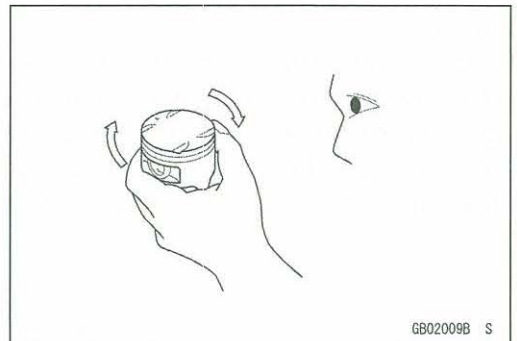
**Storage of Removed Parts**

After all the parts including subassembly parts have been cleaned, store the parts in a clean area. Put a clean cloth or plastic sheet over the parts to protect from any foreign materials that may collect before re-assembly.



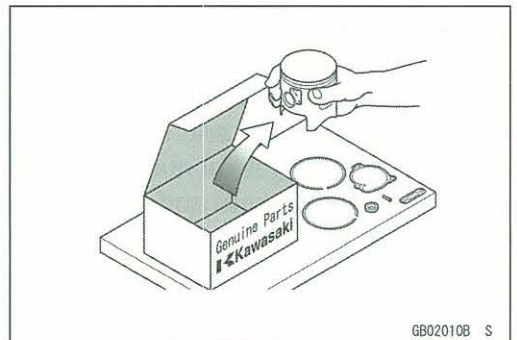
**Inspection**

Reuse of worn or damaged parts may lead to serious accident. Visually inspect removed parts for corrosion, discoloration, or other damage. Refer to the appropriate sections of this manual for service limits on individual parts. Replace the parts if any damage has been found or if the part is beyond its service limit.



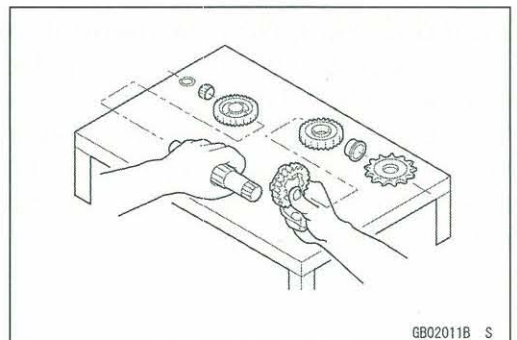
**Replacement Parts**

Replacement Parts must be KAWASAKI genuine or recommended by KAWASAKI. Gaskets, O-rings, oil seals, grease seals, circlips or cotter pins must be replaced with new ones whenever disassembled.



**Assembly Order**

In most cases assembly order is the reverse of disassembly, however, if assembly order is provided in this Service Manual, follow the procedures given.



## 1-4 GENERAL INFORMATION

### Before Servicing

#### **Tightening Sequence**

Generally, when installing a part with several bolts, nuts, or screws, start them all in their holes and tighten them to a snug fit. Then tighten them according to the specified sequence to prevent case warpage or deformation which can lead to malfunction. Conversely when loosening the bolts, nuts, or screws, first loosen all of them by about a quarter turn and then remove them. If the specified tightening sequence is not indicated, tighten the fasteners alternating diagonally.

#### **Tightening Torque**

Incorrect torque applied to a bolt, nut, or screw may lead to serious damage. Tighten fasteners to the specified torque using a good quality torque wrench.

#### **Force**

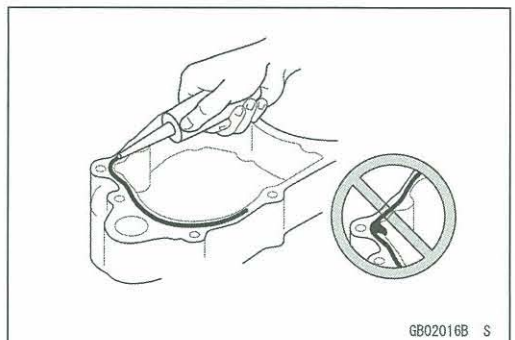
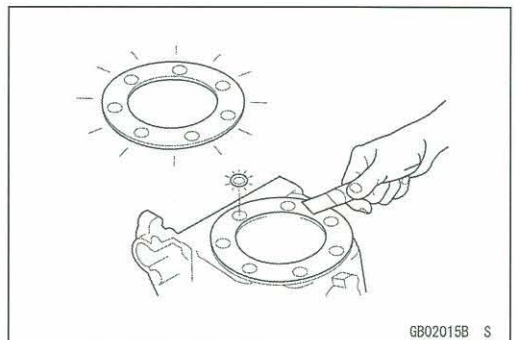
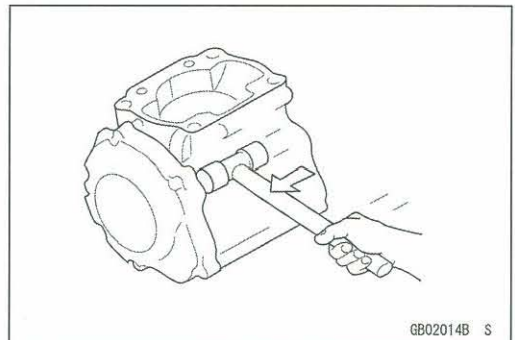
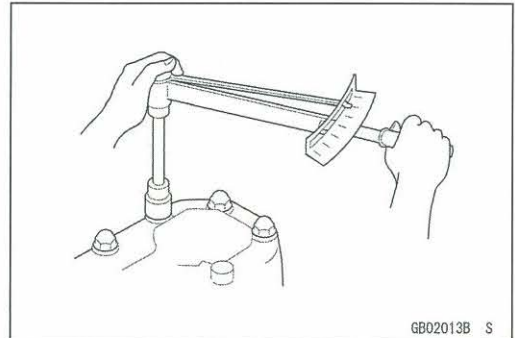
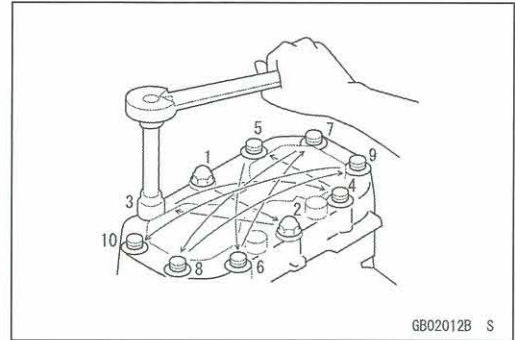
Use common sense during disassembly and assembly, excessive force can cause expensive or hard to repair damage. When necessary, remove screws that have a non-permanent locking agent applied using an impact driver. Use a plastic-faced mallet whenever tapping is necessary.

#### **Gasket, O-ring**

Hardening, shrinkage, or damage of both gaskets and O-rings after disassembly can reduce sealing performance. Remove old gaskets and clean the sealing surfaces thoroughly so that no gasket material or other material remains. Install the new gaskets and replace the used O-rings when re-assembling.

#### **Liquid Gasket, Non-permanent Locking Agent**

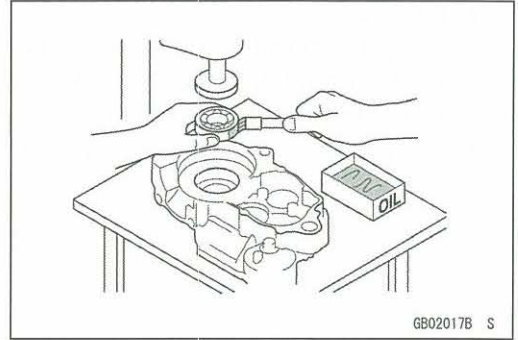
For applications that require Liquid Gasket or a Non-permanent Locking Agent, clean the surfaces so that no oil residue remains before applying liquid gasket or non-permanent locking agent. Do not apply them excessively. Excessive application can clog oil passages and cause serious damage.



## Before Servicing

### Press

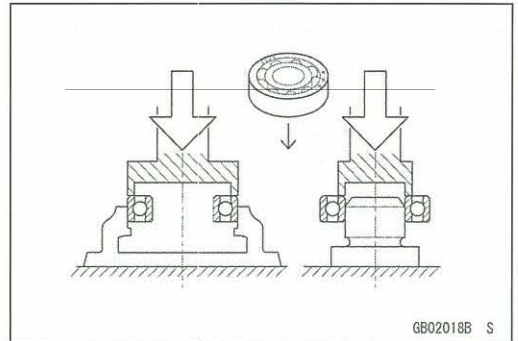
For items such as bearings or oil seals that must be pressed into place, apply small amount of oil to the contact area. Be sure to maintain proper alignment and use smooth movements when installing.



### Ball Bearing and Needle Bearing

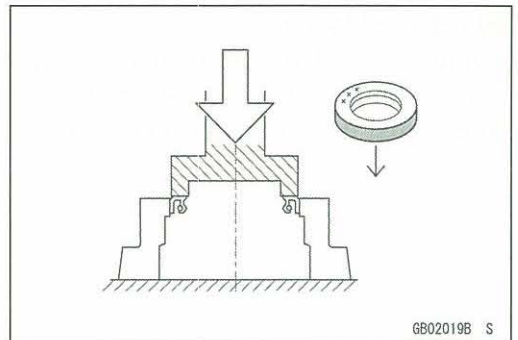
Do not remove pressed ball or needle unless removal is absolutely necessary. Replace with new ones whenever removed. Press bearings with the manufacturer and size marks facing out. Press the bearing into place by putting pressure on the correct bearing race as shown.

Pressing the incorrect race can cause pressure between the inner and outer race and result in bearing damage.

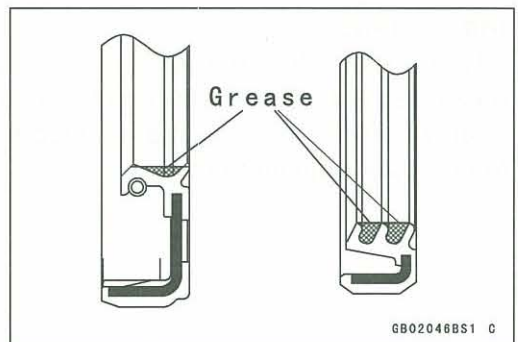


### Oil Seal, Grease Seal

Do not remove pressed oil or grease seals unless removal is necessary. Replace with new ones whenever removed. Press new oil seals with manufacture and size marks facing out. Make sure the seal is aligned properly when installing.

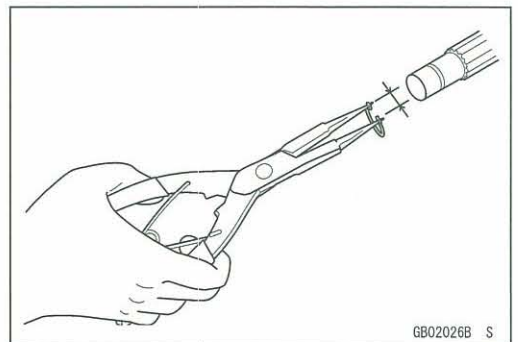


Apply specified grease to the lip of seal before installing the seal.



### Circlips, Cotter Pins

Replace the circlips or cotter pins that were removed with new ones. Take care not to open the clip excessively when installing to prevent deformation.



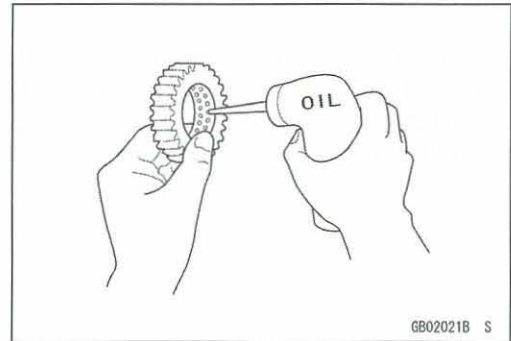


## 1-6 GENERAL INFORMATION

### Before Servicing

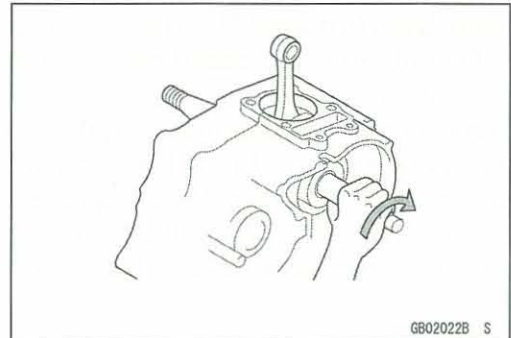
#### **Lubrication**

It is important to lubricate rotating or sliding parts during assembly to minimize wear during initial operation. Lubrication points are called out throughout this manual, apply the specific oil or grease as specified.



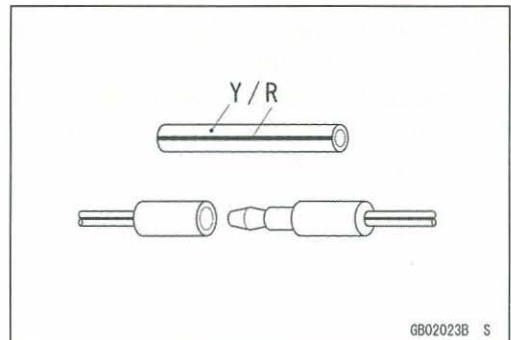
#### **Direction of Engine Rotation**

When rotating the crankshaft by hand, the free play amount of rotating direction will affect the adjustment. Rotate the crankshaft to positive direction (clockwise viewed from right side).



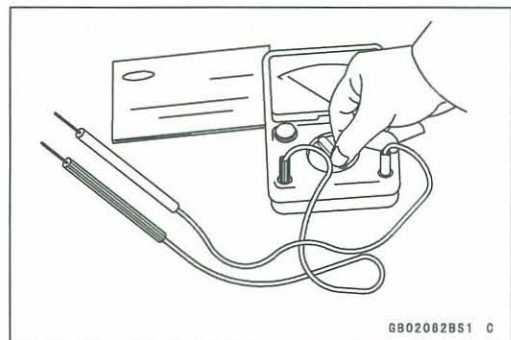
#### **Electrical Wires**

A two-color wire is identified first by the primary color and then the stripe color. Unless instructed otherwise, electrical wires must be connected to those of the same color.



#### **Instrument**

Use a meter that has enough accuracy for an accurate measurement. Read the manufacturer's instructions thoroughly before using the meter. Incorrect values may lead to improper adjustments.



Model Identification

KAF620R9F Left Side View



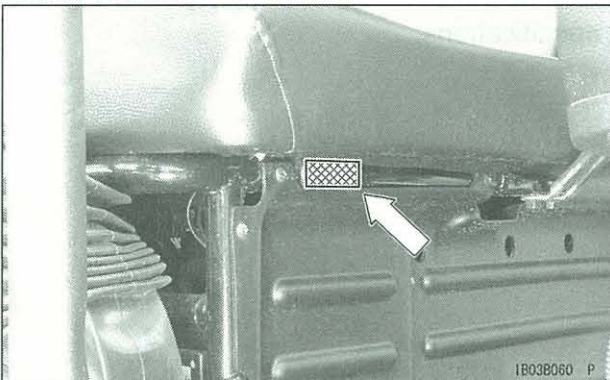
1B03B056 P

KAF620M9F Right Side View



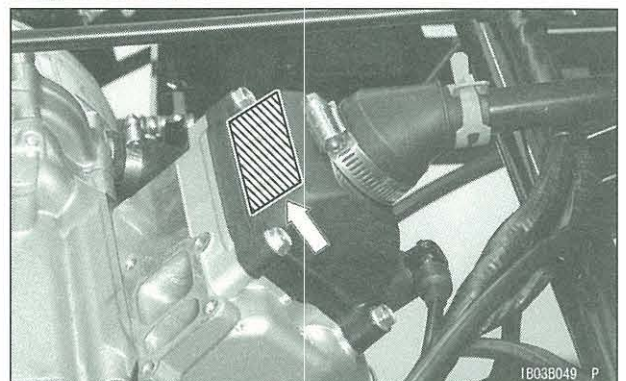
1B03B057 P

Frame Number



1B03B060 P

Engine Number



1B03B049 P

## 1-8 GENERAL INFORMATION

### Model Identification

KAF620S9F Left Side View



1B03B058 P

KAF620S9F Right Side View



1B03B059 P

The KAF620S is a camouflage-surface-treated model and identical to the KAF620R, the base model, in every other aspect: controls, features, and specifications.

**General Specifications**

Items	KAF620R9F/S9F
<b>Dimensions</b>	
Overall Length	3 305 mm (130.12 in.)
Overall Width	1 486 mm (58.50 in.)
Overall Height	1 925 mm (75.79 in.)
Wheelbase	2 165 mm (85.24 in.)
Track:	
Front	1 160 mm (45.67 in.)
Rear	1 180 mm (46.46 in.)
Ground Clearance	180 mm (7.09 in.)
Seat Height:	
Front	870 mm (34.25 in.)
Rear	885 mm (34.84 in.)
Curb Mass	(US and CA) 709 kg (1 563 lb)
	(CAL) 710 kg (1 566 lb)
Front	327 kg (721 lb)
Rear	(US and CA) 382 kg (842 lb)
	(CAL) 383 kg (845 lb)
Fuel Tank Capacity	23.5 L (6.2 US gal.)
Cargo Bed (L × W × H):	
Long Bed	1 280 × 1 212 × 287 mm (50.39 × 47.72 × 11.30 in.)
Short Bed	770 × 1 212 × 287 mm (30.31 × 47.72 × 11.30 in.)
Seating Capacity:	
Front	2
Rear	2
<b>Performance</b>	
Minimum Turning Radius	3.9 m (12.8 ft)
<b>Engine</b>	
Type	4-stroke, OHV, 2-cylinders
Cooling System	Liquid-cooled
Bore and Stroke	76 × 68 mm (2.99 × 2.68 in.)
Displacement	617 cm <sup>3</sup> (37.6 cu in.)
Compression Ratio	10.3:1
Maximum Horsepower	14.7 kW (20 PS) @3 600 r/min (rpm)
	(US) (CAL) — — —
Maximum Torque	47.0 N·m (4.8 kgf·m, 34.7 ft·lb) @2 500 r/min (rpm)
Carburetion System	FI (Fuel Injection) MIKUNI AC34
Starting System	Electric starter
Ignition System	Battery and coil (transistorized)
Ignition Timing	5/750 ~ 22/4 000 (BTDC°/rpm)
Cylinder Numbering Method	Front to rear, 1-2
Firing Order	Front to rear, 1-2

# 1-10 GENERAL INFORMATION

## General Specifications

Items	KAF620R9F/S9F
Valve Timing: Inlet: Open Close Duration Exhaust: Open Close Duration Lubrication System Engine Oil: Type Viscosity Capacity	#1 68° BTDC/#2 64° BTDC #1 76° ABDC/#2 80° ABDC 324° 94° BBDC 48° ATDC 322° Forced lubrication (wet sump) API SF or SG, API SH, SJ or SL with JASO MA, MA1 or MA2 SAE 10W-40 1.8 L (1.9 US qt)
<b>Drive Train</b> Primary Reduction System: Type Reduction Ratio Transmission Gear Ratio: Forward: High Low Reverse: Low Final Drive System: Type Reduction Ratio Overall Drive Ratio: Forward: High Low Reverse: Low Front Final Gear Case Oil: Type Viscosity Capacity Transmission Oil: Type Viscosity Capacity	Belt drive torque converter 3.9 ~ 0.85 1.821 (51/28) 3.750 (51/28 × 25/20 × 28/17) 4.220 (41/20 × 25/20 × 28/17) 2-speed, automatic, reverse gear drive (4WD/2WD) 5.4 (81/15) 8.360 17.212 19.372 API "GL-5 or GL-6" hypoid gear oil for LSD (Limited Slip Differential gears) SAE 85W-140, SAE 90 or SAE 140 0.4 L (0.4 US qt) API "GL-6" hypoid gear oil SAE 90: above 5°C (41°F) SAE 80: below 5°C (41°F) 2.5 L (2.6 US qt)

**General Specifications**

Items	KAF620R9F/S9F
<p><b>Frame</b></p> <p>Type: Steel tube, Ladder</p> <p>Caster (Rake Angle): 7.5°</p> <p>Camber: 0.8°</p> <p>Trail: 35 mm (1.4 in.)</p> <p>Tire:</p> <p>    Front and Rear: 23 × 11.00-10, Tubeless</p> <p>Rim Size:</p> <p>    Front and Rear: 10 × 8.5</p> <p>Steering Type: Rack and pinion (Electric power steering)</p> <p>Suspension:</p> <p>    Front:</p> <p>        Type: MacPherson strut</p> <p>        Wheel Travel: 100 mm (3.9 in.)</p> <p>    Rear:</p> <p>        Type: De Dion axle</p> <p>        Wheel Travel: 70 mm (2.8 in.)</p> <p>Brake Type:</p> <p>    Front and Rear: Drum (Hydraulic)</p> <p>    Parking Brake Type: Drum (Mechanical internal expansion)</p>	
<p><b>Electrical Equipment</b></p> <p>Battery: (US) 12 V 14 Ah (CA) 12 V 18 Ah</p> <p>Headlight:</p> <p>    Type: Semi-sealed beam</p> <p>    Bulb: 12 V 35 W × 2</p> <p>Brake/Tail Light: 12 V 21/5 W × 2</p> <p>Alternator:</p> <p>    Type: Three-phase AC</p> <p>    Rated Output: 23 A/12 V @3 000 r/min (rpm)</p>	
<p><b>Load Capacity</b></p> <p>Maximum Vehicle Load (Including Occupants and Cargo): 603 kg (1 330 lb)</p> <p>Maximum Cargo Bed Load:</p> <p>    Long Bed: 363 kg (800 lb)</p> <p>    Short Bed: 182 kg (401 lb)</p>	

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

# 1-12 GENERAL INFORMATION

## Unit Conversion Table

### Prefixes for Units:

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

### Units of Mass:

kg	×	2.205	=	lb
g	×	0.03527	=	oz

### Units of Volume:

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

### Units of Force:

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

### Units of Length:

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

### Units of Torque:

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

### Units of Pressure:

kPa	×	0.01020	=	kgf/cm <sup>2</sup>
kPa	×	0.1450	=	psi
kPa	×	0.7501	=	cmHg
kgf/cm <sup>2</sup>	×	98.07	=	kPa
kgf/cm <sup>2</sup>	×	14.22	=	psi
cmHg	×	1.333	=	kPa

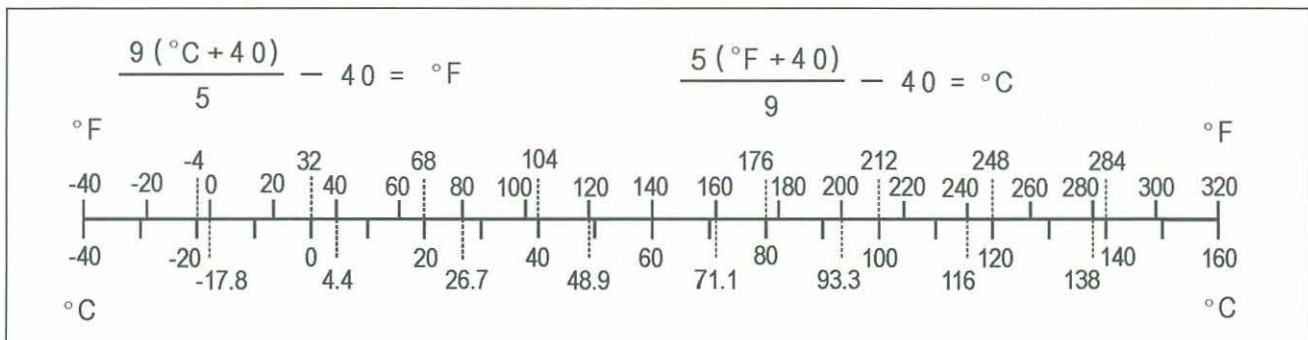
### Units of Speed:

km/h	×	0.6214	=	mph
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### Units of Power:

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

### Units of Temperature:



# Periodic Maintenance

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Engine Top End .....	2-21	Steering .....	2-39
Valve Clearance Inspection .....	2-21	Steering Wheel Free Play	
Valve Clearance Adjustment.....	2-22	Inspection.....	2-39
Spark Arrester Cleaning.....	2-22	Steering Joint Dust Boot	
Converter System.....	2-23	Inspection.....	2-39
Converter Air Cleaner Element		Frame .....	2-40
Cleaning/Inspection.....	2-23	Seat Belt Inspection .....	2-40
Converter Dust or Water Draining	2-23	Electrical System .....	2-40
Converter Drive Belt Inspection ...	2-23	Spark Plug Cleaning/Inspection...	2-40
Drive Belt Deflection Inspection ...	2-24	Spark Plug Gap Inspection .....	2-40
Drive Belt Deflection Adjustment .	2-25	Brake Light Switch Inspection.....	2-41
Converter Driven Pulley Shoe		General Lubrication .....	2-41
Inspection.....	2-25	Bolts, Nuts, and Fasteners .....	2-42
Engine Lubrication.....	2-26	Tightness Inspection .....	2-42



## 2-2 PERIODIC MAINTENANCE

### Periodic Maintenance Chart

The scheduled maintenance must be done in accordance with this chart to keep the vehicle in good running condition. **The initial maintenance is vitally important and must not be neglected.**

OPERATION	FREQUENCY	Which ever comes first → ↓ Every	First Service	Regular Service		See Page
			After 50 h, or 1 000 km of use	Every 250 h, or 5 000 km of use	Every 500 h, or 10 000 km of use	
<b>ENGINE</b>						
Throttle pedal play - inspect			●		●	2-12
Idle speed - inspect			●	●		2-13
Air cleaner element - clean*			●	●		2-14
Air cleaner housing dust or water - drain*			●	●		2-14
Fuel hoses or pipe and connections - inspect*			●	●		2-15
Fuel hoses - replace	4 years					2-15
Evaporative emission control system - inspect (CAL Model)			●	●		2-17
Coolant - change	2 years					2-17
Radiator - clean*			●	●		2-20
Water hoses and connections - inspect	1 year		●		●	2-20
Valve clearance - inspect			●		●	2-21
Spark arrester - clean				●		2-22
Converter air cleaner element - clean*			●	●		2-23
Converter dust or water - drain*					●	2-23
Converter drive belt - inspect*				●		2-23
Converter drive belt deflection- inspect*				●		2-24
Converter driven pulley shoe - inspect*					●	2-25
Engine oil - change*	1 year		●	●		2-26
Oil filter - replace*			●		●	2-27
Transmission oil - change*	1 year		●		●	2-28

●: Clean, adjust, lubricate, torque, or replace parts as necessary.

\*: Service more frequently when operated in mud, dust, or other harsh riding conditions.

Periodic Maintenance Chart

OPERATION	FREQUENCY	Whichever comes first → ↓ Every	First Service	Regular Service		See Page
			After 50 h, or 1 000 km of use	Every 250 h, or 5 000 km of use	Every 500 h, or 10 000 km of use	
<b>CHASSIS</b>						
Wheel nuts tightness - inspect			●	●		2-28
Tire wear - inspect*			●	●		2-29
Front final gear case oil - change*	1 year		●		●	2-29
Brake fluid level - inspect			●	●		2-30
Brake fluid - change	2 years					2-31
Brake pedal play - inspect*			●	●		2-32
Brake master cylinder cup and dust seal - replace	2 years					2-32
Brake hose and pipe - inspect			●	●		2-33
Brake hose - replace	4 years					2-34
Brake wear - inspect*				●		2-35
Brake wheel cylinder assembly - replace	2 years					2-36
Parking brake lever - inspect			●	●		2-38
Steering - inspect			●	●		2-39
Steering and axle shaft joint dust boots - inspect			●	●		2-39
Seat belt - inspect				●		2-40
Spark plug - clean and gap inspect				●		2-40
Brake light switch - inspect			●	●		2-41
General lubrication - perform*				●		2-41
Bolts, nuts, and fasteners tightness - inspect			●	●		2-42

●: Clean, adjust, lubricate, torque, or replace parts as necessary.

\*: Service more frequently when operated in mud, dust, or other harsh riding conditions.

## 2-4 PERIODIC MAINTENANCE

### Torque and Locking Agent

The following tables list the tightening torque for the major fasteners, and the parts requiring use of a non-permanent locking agent or liquid gasket.

Letters used in the "Remarks" column mean:

B: Apply brake fluid.

EO: Apply an oil to the threads, seated surface, or washer.

L: Apply a non-permanent locking agent to the threads.

MO: Apply molybdenum disulfide oil solution (mixture of the engine oil and molybdenum disulfide grease in a weight ratio 10:1).

R: Replacement Part

S: Tighten the fasteners following the specified sequence.

SS: Apply a silicone sealant to the threads.

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
<b>Fuel System</b>				
Air Cleaner Housing Bolts	20	2.0	15	
Control Panel Cover Bolts	4.0	0.41	35 in·lb	
ECU Mounting Bolts	8.8	0.90	78 in·lb	
Throttle Lever Mounting Nut	6.9	0.70	61 in·lb	
Water Temperature Sensor	22	2.2	16	
Throttle Sensor Screws	4.2	0.43	37 in·lb	
Subthrottle Valve Actuator Cover Screws	2.0	0.20	18 in·lb	
Canister Bracket Mounting Bolts (M8) (CAL)	19.6	2.0	14	
Canister Bracket Mounting Bolts (M6) (CAL)	8.8	0.90	78 in·lb	
Canister Mounting Bolts (CAL)	19.6	2.0	14	
Fuel Pump Mounting Bolts	4.0	0.41	35 in·lb	
<b>Cooling System</b>				
Coolant Drain Plugs	17	1.7	13	
Coolant Reservoir Mounting Bolt	4.4	0.45	39 in·lb	
Radiator Fan Mounting Bolts	4.9	0.50	43 in·lb	
Radiator Mounting Bolts	8.8	0.90	78 in·lb	
Radiator Screen Bolts	8.8	0.90	78 in·lb	
Water Pipe Bolts	8.8	0.90	78 in·lb	
Water Pump Cover Bolt (M8)	25	2.5	18	S
Water Pump Cover Bolts (M6)	8.8	0.90	78 in·lb	S
Water Pump Housing Bolt	8.8	0.90	78 in·lb	
<b>Engine Top End</b>				
Valve Adjusting Screw Locknuts	9.8	1.0	87 in·lb	
Cylinder Head Bolts	22	2.2	16	S
Cylinder Head Plug	22	2.2	16	
<b>Converter System</b>				
Drive Pulley Bolt	76	7.7	56	R
Drive Pulley Cover Bolts	12.5	1.3	111 in·lb	
Driven Pulley Bolt	93	9.5	69	L
Wear Shoe Screws	1.1	0.11	9.7 in·lb	L
Ramp Weight Nuts	6.9	0.70	61 in·lb	
Spider	275	28.0	203	

## PERIODIC MAINTENANCE 2-5

### Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Air Cleaner Housing Bolts	20	2.0	15	
Converter Case Bolts	20	2.0	15	
Converter Cover Bolts	7.0	0.71	62 in·lb	
Cooling Fan Cover Bolts	8.8	0.90	78 in·lb	
Heat Guard Plate Bolts	8.8	0.90	78 in·lb	
<b>Engine Lubrication System</b>				
Oil Pressure Switch	9.8	1.0	87 in·lb	SS
Engine Oil Drain Plug (M16)	22	2.2	16	
Engine Oil Drain Plug (M14)	32	3.3	24	
Crankcase Cover Bolts	25	2.5	18	
Oil Filter	17.6	1.8	13	EO
Oil Filter Stud Bolt	27	2.8	20	
<b>Engine Removal/Installation</b>				
Engine Mounting Bolts	44	4.5	32	
Engine Positioning Plate Bolts	20	2.0	15	
<b>Engine Bottom End</b>				
Connecting Rod Big End Cap Bolts	21	2.1	15	EO
Coolant Drain Plugs	17	1.7	13	
Crankcase Cover Bolts	22	2.2	16	
Oil Filter Stud Bolt	27	2.8	20	
<b>Transmission</b>				
Differential Gear Housing Bolts	57	5.8	42	L
Shift Arm Positioning Bolt	37	3.8	27	
Shift Shaft Lever Clamp Bolts	12	1.2	106 in·lb	
Shift Shaft Stop Bolts	7.8	0.80	69 in·lb	
Bearing Holder	118	12.0	87.0	MO
Engine Positioning Plate Bolts	20	2.0	15	
Hi/Low Gear Case Bolts	20	2.0	15	
Neutral Switch	15	1.5	11	
Transmission Case Bolts	8.8	0.90	78 in·lb	
Transmission Case Mounting Nuts	44.1	4.5	33	
Transmission Oil Drain Plug	15	1.5	11	
<b>Wheels/Tires</b>				
Wheel Nuts	137	14.0	101	
<b>Final Drive</b>				
Front Final Gear Case:				
Differential Case Torx Bolts	32	3.3	24	
Front Axle Cap Bolts	8.8	0.90	78 in·lb	
Gear Case Bracket Bolts	44.1	4.5	33	
Gear Case Mounting Nuts	44.1	4.5	33	
Oil Drain Plug	20	2.0	15	
Oil Filler Cap	29	3.0	21	
Pinion Gear Bearing Housing Nuts	25	2.5	18	

## 2-6 PERIODIC MAINTENANCE

### Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Pinion Gear Slotted Nut	118	12.0	87.0	MO
Ring Gear Bolts	49	5.0	36	
Ring Gear Cover Bolts (M10)	47	4.8	35	S
Ring Gear Cover Bolts (M8)	25	2.5	18	S
Bevel Gear Case:				
Bearing Holder	118	12.0	87.0	L
Bevel Gear Case Bolts	22	2.2	16	
Bevel Gear Case Holder Nuts	25	2.5	18	
Drive Gear Nut	118	12.0	87.0	MO
Driven Gear Shaft Nut	108	11.0	79.7	L
Housing Locknut	118	12.0	87.0	L
Propeller Shaft Bearing Housing Cover Bolts	3.4	0.35	30 in·lb	
Speed Sensor Bolt	8.8	0.90	78 in·lb	
Drive Shaft Cap Bolts	20	2.0	15	
<b>Brakes</b>				
Bleed Valves	7.8	0.80	69 in·lb	
Brake Hose Banjo Bolts	24.5	2.5	18	
Brake Panel Mounting Bolts	44.1	4.5	33	L
Brake Pipe Nipples	17.7	1.8	13	B
Front Axle Nuts	196	20.0	145	
Master Cylinder Push Rod Locknut	17.2	1.8	13	
Master Cylinder Reservoir Cap	3.5	0.36	31 in·lb	
Piston Stop Bolt	8.9	0.91	79 in·lb	
Reservoir Clamp Bolt	6.2	0.63	55 in·lb	
Wheel Cylinder Mounting Bolts	10.3	1.1	91 in·lb	
Rear Axle Nuts	304	31.0	224	
Wheel Cylinder Mounting Nuts	7.4	0.75	65 in·lb	
<b>Suspension</b>				
Damper Bracket Mounting Nuts	59	6.0	44	S
Front Suspension Arm Joint Nuts	78	8.0	58	
Front Suspension Arm Pivot Bolts	98	10.0	72.3	
Leaf Spring Mounting Nuts (Front)	98	10.0	72.3	
Leaf Spring Mounting Nuts (Rear)	59	6.0	44	
Rear Shock Absorber Mounting Nuts	59	6.0	44	
Strut Clamp Nuts	98	10.0	72.3	
Strut Locknuts	50	5.1	37	
Strut Mounting Locknuts	44	4.5	32	
Tie-Rod End Nuts	34	3.5	25	
<b>Steering</b>				
EPS Unit Mounting Bolts	20	2.0	15	
Rack Guide Spring Cap Locknut	39	4.0	29	
Steering Gear Assembly Bracket Bolts	52	5.3	38	L

## PERIODIC MAINTENANCE 2-7

### Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Steering Wheel Mounting Nut	52	5.3	38	
Strut Clamp Nuts	98	10.0	72.3	
Tie-Rod End Locknuts	49	5.0	36	
Tie-Rod End Nuts	34	3.5	25	
Universal Joint Clamp Bolts	20	2.0	15	
<b>Frame</b>				
Battery Holder Nuts	2.0	0.20	18 in·lb	
Center Bar Mounting Bolts	64	6.5	47	
Front Bar Mounting Bolts (Lower)	98	10.0	72.3	
Front Bar Mounting Bolts (Upper)	44	4.5	32	
Front Seat Bar Mounting Bolts	64	6.5	47	
Rear Bar Mounting Bolts (Lower)	64	6.5	47	
Rear Bar Mounting Bolts (Upper)	44	4.5	32	
Rear Bar Mounting Nuts (Middle)	44	4.5	32	
Screen Fixing Lever Screws	4.4	0.45	39 in·lb	L
Seat Belt Buckle Mounting Bolts	34.3	3.5	25	
Seat Belt Mounting Bolts	34.3	3.5	25	
Top Bar Mounting Bolts	44	4.5	32	
Rear End Subframe Mounting Nuts	44.1	4.5	33	
Tail Gate Fixing Lever Screws	4.4	0.45	39 in·lb	L
<b>Electrical System</b>				
Alternator Rotor Nut	118	12.0	87.0	
Battery Holder Nuts	2.0	0.20	18 in·lb	
Neutral Switch	15	1.5	11	
Oil Pressure Switch	9.8	1.0	87 in·lb	SS
Spark Plugs	17	1.7	13	
Speed Sensor Bolt	8.8	0.90	78 in·lb	
Starter Motor Cable Terminal Nut	8.8	0.90	78 in·lb	
Starter Motor Mounting Bolts	21.6	2.2	16	
ECU Mounting Bolts	8.8	0.90	78 in·lb	
Regulator/Rectifier Mounting Bolts	8.8	0.90	78 in·lb	
Water Temperature Sensor	22	2.2	16	

## 2-8 PERIODIC MAINTENANCE

### Torque and Locking Agent

The table below, relating tightening torque 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. All of the values are for use with dry solvent-cleaned threads.

#### Basic Torque for General Fasteners of Engine Parts

Threads dia. mm (in.)	Mark of bolt head	Torque		
		N·m	kgf·m	ft·lb
6 (0.24)	4T	3.9 ~ 4.9	0.40 ~ 0.50	35 ~ 43 in·lb
6 (0.24)	7T	7.8 ~ 9.8	0.80 ~ 1.0	69 ~ 87 in·lb
6 (0.24)	9T	12 ~ 15	1.2 ~ 1.5	104 ~ 130 in·lb
8 (0.31)	4T	10 ~ 14	1.0 ~ 1.4	87 ~ 120 in·lb
8 (0.31)	7T	18 ~ 22	1.8 ~ 2.2	13 ~ 16
10 (0.39)	4T	20 ~ 24	2.0 ~ 2.4	14 ~ 17
10 (0.39)	7T	39 ~ 44	4.0 ~ 4.5	29 ~ 33

#### Basic Torque for General Fasteners of Frame Parts

Threads dia. mm (in.)	Torque		
	N·m	kgf·m	ft·lb
5 (0.20)	3.4 ~ 4.9	0.35 ~ 0.50	30 ~ 43 in·lb
6 (0.24)	5.8 ~ 7.9	0.60 ~ 0.80	52 ~ 69 in·lb
8 (0.31)	14 ~ 19	1.4 ~ 1.9	10 ~ 14
10 (0.39)	26 ~ 34	2.6 ~ 3.5	19 ~ 25
12 (0.47)	44 ~ 61	4.5 ~ 6.2	33 ~ 45

## PERIODIC MAINTENANCE 2-9

### Specifications

Item	Standard	Service Limit
<b>Fuel System</b>		
Throttle Pedal Free Play	5 ~ 10 mm (0.2 ~ 0.4 in.)	---
Idle Speed	900 ~ 1 000 r/min (rpm)	---
<b>Cooling System</b>		
Coolant:		
Type	Permanent type of antifreeze (Soft water and ethylene glycol plus corrosion and rust inhibitor chemicals for aluminum engine and radiators)	---
Color	Green	---
Mixed Ratio	Soft water 50%, coolant 50%	---
Freezing Point	-35°C (-31°F)	---
Total Amount	4.6 L (4.9 US qt)	---
<b>Engine Top End</b>		
Valve Clearance (When Cold)	0.25 mm (0.0098 in.)	---
<b>Converter System</b>		
Belt Width	30.3 mm (1.19 in.)	28.8 mm (1.13 in.)
Belt Deflection	28 ~ 33 mm (1.1 ~ 1.3 in.)	45 mm (1.8 in.)
Wear Shoe Width	---	16.3 mm (0.64 in.)
<b>Engine Lubrication System</b>		
Engine Oil:		
Type	API SF or SG API SH, SJ or SL with JASO MA, MA1 or MA2	---
Viscosity	SAE 10W-40	---
Capacity	1.0 L (1.1 US qt) (when filter is not removed) 1.3 L (1.4 US qt) (when filter is removed)	---
Oil Level	Between F and L marks on dipstick	---
<b>Transmission</b>		
Transmission Oil:		
Type	API "GL-6" Hypoid gear oil	---
Viscosity	SAE90: above 5°C (41°F) SAE80: below 5°C (41°F)	---
Capacity	2.5 L (2.6 US qt)	---
Oil Level	Between H and L lines on dipstick	---
<b>Wheels/Tires</b>		
Tire Tread Depth	13.2 mm (0.52 in.)	3 mm (0.12 in.)
<b>Final Drive</b>		
Front Final Gear Case Oil:		
Type	API "GL-5 or GL-6" hypoid gear oil for LSD (Limited Slip Differential gears)	---
Viscosity	SAE85W-140, SAE90 or SAE140	---
Capacity	0.4 L (0.4 US qt)	---
Oil Level	Filler opening level	---



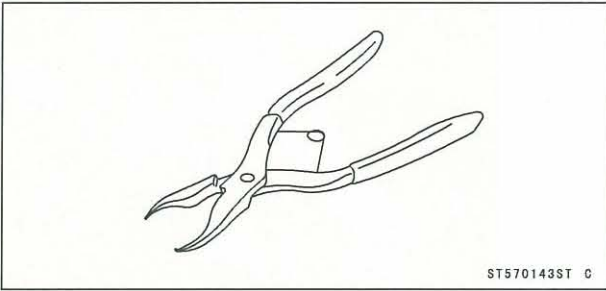
## 2-10 PERIODIC MAINTENANCE

### Specifications

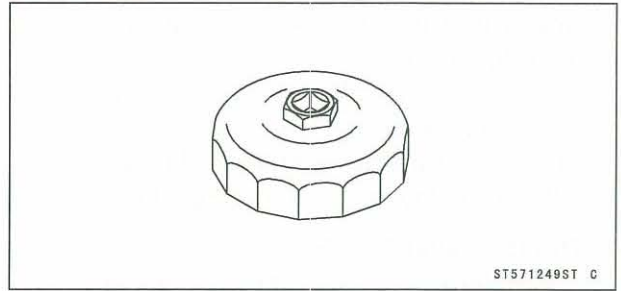
Item	Standard	Service Limit
<b>Brakes</b>		
Brake Fluid:		
Type	DOT3	---
Fluid Level	Between upper and lower level lines	---
Brake Pedal Play	2 ~ 10 mm (0.08 ~ 0.39 in.)	---
Brake Drum Inside Diameter	180.000 ~ 180.160 mm (7.0866 ~ 7.0929 in.)	180.75 mm (7.116 in.)
Brake Shoe Lining Thickness	4.5 mm (0.18 in.)	1.0 mm (0.04 in.)
Parking Brake Lever Travel	8 ~ 12 notches (clicks) at 200 N (20 kgf, 44 lb)	---
<b>Steering</b>		
Steering Wheel Free Play	0 ~ 20 mm (0 ~ 0.79 in.)	---
<b>Electrical System</b>		
Spark Plug Gap	0.7 ~ 0.8 mm (0.028 ~ 0.031 in.)	---
Brake Light Switch Timing	ON after 10 mm (0.39 in.) of pedal travel	---

**Special Tools**

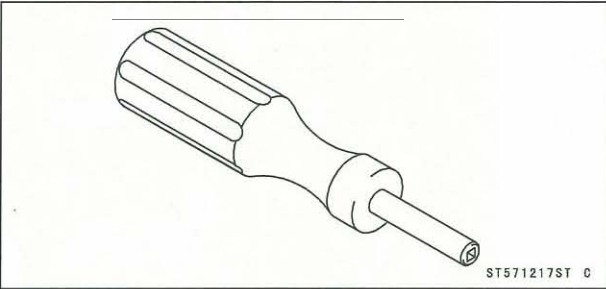
**Inside Circlip Pliers:**  
**57001-143**



**Oil Filter Wrench:**  
**57001-1249**



**Valve Adjusting Screw Holder:**  
**57001-1217**





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