MODEL APPLICATION

Year	Model	Beginning Frame No.
2004	KSV700–A1	JKASV700AAB600001 or JKASV6A1□4B500001

□ :This digit in the frame number changes from one machine to another.

Kawasaki
KAWASAKI HEAVY INDUSTRIES, LTD.
Consumer Products & Machinery Company

Part No. 99924-1315-01

Printed in Japan

Kawasaki

KFX 700V FORCE

All Terrain Vehicle Service Manual

Quick Reference Guide

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) Celcius	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)		

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 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 Special Tool Catalog or Manual. Genuine parts provided as spare parts are listed in the Parts Catalog.
- Follow the procedures in this manual carefully. Don't take shortcuts.
- Remember to keep complete records of maintenance and repair with dates and any new parts installed.

How to Use This Manual

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

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

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

⚠ WARNING

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

CAUTION

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

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

NOTE

○ *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

TABLE OF CONTENTS

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:

(1) Dirt

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

(2) Battery Ground

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

(3) Installation, Assembly

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

(4) Tightening Sequence

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

(5) Torque

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

(6) Force

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

(7) Edges

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

(8) High-Flash Point Solvent

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

(9) Gasket, O-Ring

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

Before Servicing

(10)Liquid Gasket, Locking Agent

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

(11)Press

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

(12)Ball Bearing and Needle Bearing

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

(13)Oil Seal and Grease Seal

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

(14)Circlip, Retaining Ring, and Cotter Pin

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

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

(15)Lubrication

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

(16)Direction of Engine Rotation

To rotate the crankshaft manually, make sure to do so in the direction of positive rotation. Positive rotation is counterclockwise as viewed from the left side of the engine. To carry out proper adjustment, it is furthermore necessary to rotate the engine in the direction of positive rotation as well.

(17)Replacement Parts

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

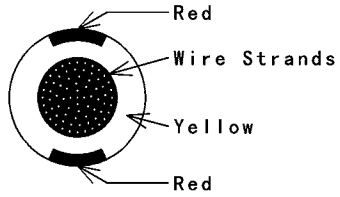
Replacement parts will be damaged or lose their original function once they are removed. Therefore, always replace these parts with new ones every time they are removed. Although the previously mentioned gasket, O-ring, ball bearing, needle bearing, grease seal, oil seal, circlip, and cotter pin have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

(18)Electrical Wires

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

Before Servicing

Two-Color Electrical

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

GB020601W1 C

(19)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	

(20)Specifications

Specification terms are defined as follows:

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

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

Model Identification

KSV700–A1 Left Side View

KSV700–A1 Right Side View

General Specifications

Items		KSV700-A1
Dimensions:		
Overall length		1 985 mm (78.15 in.)
Overall width		1 195 mm (47.05 in.)
Overall height		1 170 mm (46.06 in.)
Wheelbase		1 285 mm (50.60 in.)
Ground clearance:		
Rear final gear case		160 mm (6.30 in.)
Center of frame		245 mm (9.65 in.)
Seat height		850 mm (33.46 in.)
Dry mass		234 kg (516 lb)
Curb mass:	Front	115 kg (254 lb)
	Rear	135 kg (298 lb)
Fuel tank capacity		12 L (3.2 US gal)
Performance:		
Minimum turning radius		3.2 m (10.50 ft)
Engine:		
Type		4-stroke, SOHC, V2-cylinders
Cooling system		Liquid-cooled
Bore and stroke		82.0 × 66.0 mm (3.23 × 2.60 in.)
Displacement		697 mL (42.5 cu in.)
Compression ratio		9.9 : 1
Maximum horsepower		36.3 kW (49.4 PS) @6 500 r/min (rpm), (US) -
Maximum torque		59.2 N·m (6.04 kgf·m, 43.67 ft·lb) @5 000 r/min (rpm)
Carburetion system		Carburetor, Keihin CVKR–D32
Starting system		Electric Starter
Ignition system		Digital DC-CDI
Timing advance		Electronically advanced
Ignition timing		From 5° BTDC @1 100 r/min (rpm) to 28° BTDC @5 000 r/min (rpm)
Spark plug		NGK CR7E
Valve timing:		
Inlet	Open	20° BTDC
	Close	44° ABDC
	Duration	244°
Exhaust:	Open	44° BBDC
	Close	20° ATDC
	Duration	244°
Lubrication system		Forced lubrication (wet sump)
Engine oil:	Type	API SF or SG API SH or SJ with JASO MA class
	Viscosity	SAE 10W-40
	Capacity	2.2 L (2.33 US qt)

General Specifications

Items		KSV700-A1
Drive Train:		
Primary reduction system:		
Type		Belt converter
Reduction ratio		3.122 ~ 0.635
Transmission:		
Type		1-speed and reverse
Gear ratios:		
Forward:		2.416 (29/27 × 27/20 × 20/12)
Reverse		4.285 (16/12 × 20/14 × 27/20 × 20/12)
Final drive system:		
Type		Shaft 2WD
Reduction ratio		4.375 (35/8)
Overall drive ratio:		
Forward:		32.999 ~ 6.711
Reverse		58.527 ~ 11.904
Final gear case oil:	Type	MOBIL Fluid 424 or CITGO TRANSGARD TRACTOR HYDRAULIC FLUID
	Capacity	900 mL (0.95 US qt)
Frame:		
Type		Double cradle, tubular steel
Caster (rake angle)		4.5°
Camber		–0.5°
King pin angle		12.5°
Trail		20 mm (0.79 in.)
Tread:	Front	1 000 mm (39.37 in.)
	Rear	900 mm (35.43 in.)
Front tire:	Type	Tubeless
	Size	AT22 × 7 – 10
Rear tire:	Type	Tubeless
	Size	AT22 × 11 – 10
Suspension:		
Front:	Type	Double A-arms
	Wheel travel	236 mm (9.29 in.)
Rear:	Type	Swingarm
	Wheel travel	200 mm (7.87 in.)
Brake:		
Front		Disc × 2
Rear		Enclosed wet multi-plate
Electrical Equipment:		
Battery		12 V 14 Ah
Headlight:	Type	Semi-sealed beam
	Bulb	12 V 45/45 W × 2

General Specifications

Items		KSV700-A1
Tail/brake light Alternator:		
	Bulb	12 V 5/21 W
Alternator:	Type	Three - phase AC
	Rated output	25 A, 14 V @6 000 r/min (rpm)

Specifications subject to change without notice, and may not apply to every country.
US: United States model.

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

Units of Pressure:

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

Units of Speed:

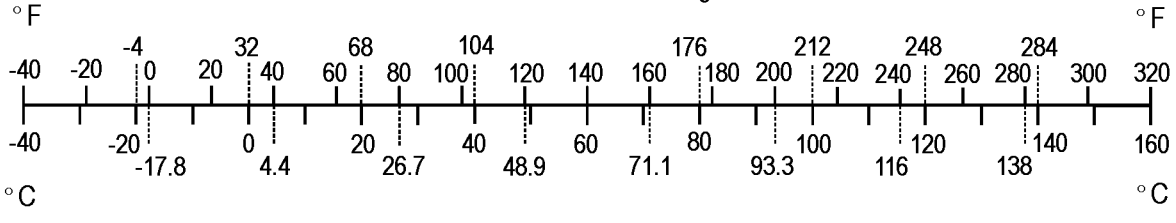
km/h	×	0.6214	=	mph

Units of Power:

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

Units of Temperature:

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



Periodic Maintenance

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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.**

FREQUENCY / OPERATION	First Service	Regular Service				
	After 10 hrs. or 100 km (60 mi.) of use	Every 10 days or 200 km (120 mi.) of use	Every 30 days or 600 km (360 mi.) of use	Every 90 days, 1 700 km (1 100 mi.) or when belt indicator light turns on (100 hrs of use) whichever comes first	Every year of use	See page
ENGINE						
Converter drive belt wear – inspect *				●		2–24
Converter drive belt deflection - inspect *				●		2–25
Air cleaner – inspect *	●	●				2–16
Throttle lever play – inspect	●	●				2–15
Cable adjustment*	●	●				2–28
Idle speed – inspect			●			2–15
Valve clearance – inspect					●	2–22
Fuel system cleanliness – inspect *	●			●		2–16
Engine oil – change *	●			●		2–27
Oil filter – replace *	●			●		2–27
Spark plug – clean and gap	●			●		2–37
Spark arrester – clean					●	2–24
Fuel hoses and connections – inspect				●		2–17
Fuel hose and fuel filter replace	4 years					2–18
Radiator – clean*	●	●				2–19
Radiator hoses, and connections – check*					●	2–19
Coolant – change*	2 years					2–20
Coolant filter of carburetor – clean					●	2–22
CHASSIS						
Joint boots – inspect *	●	●				2–30 2–35 2–36
Rear brake pedal and lever play – inspect *	●	●				2–34
Rear brake plates – change *	every 9 600 km (6 000 mi.)					2–34
Bolts and nuts – tighten	●	●				2–39

2-4 PERIODIC MAINTENANCE

Periodic Maintenance Chart

FREQUENCY / OPERATION	First Service	Regular Service				
	After 10 hrs. or 100 km (60 mi.) of use	Every 10 days or 200 km (120 mi.) of use	Every 30 days or 600 km (360 mi.) of use	Every 90 days, 1 700 km (1 100 mi.) or when belt indicator light turns on (100 hrs of use) whichever comes first	Every year of use	See page
Front brake pad wear – inspect *	●		●			2–30
Brake light switch – inspect *	●		●			2–37
Steering – inspect	●			●		2–36
Tire wear – inspect *			●			2–29
Final gear case oil – change	●				●	2–29
General lubrication *			●			2–37
Front brake fluid level – inspect	●		●			2–31
Front brake fluid – change					●	2–31
Front brake master cylinder piston assembly and dust seal – replace	2 years					2–33
Front brake caliper piston seal and dust seal – replace	2 years					2–34
Front brake hoses and connections– inspect				●		2–30
Front brake hose – replace	4 years					2–30

*: Service more frequently when operated in mud, dust, or other harsh riding conditions, or when carrying heavy loads or pulling a trailer.

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

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:
L: Apply a non-permanent locking agent.
MO: Apply molybdenum disulfide oil solution (mixture of the engine oil and molybdenum disulfide grease in a weight ratio 10:1).
EO: Apply engine oil.
SS: Apply silicone sealant (Kawasaki Bond: 56019-120).
Lh: Left-hand Threads
R: Replacement Parts
S: Follow the specific tightening sequence.

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Fuel System:				
Throttle Limiter Screw	3.7	0.38	33 in·lb	
Throttle Limiter Locknut	3.7	0.38	33 in·lb	
Throttle Case Assembly Screws	3.7	0.38	33 in·lb	
Choke Lever Mounting Screw	3.5	0.36	35 in·lb	
Left Handlebar Switches Assembly Screws	3.5	0.36	35 in·lb	
Air Cleaner Housing Bolts (M5)	5.9	0.60	52 in·lb	L
Air Cleaner Housing Bolts (M6)	8.8	0.90	78 in·lb	
Air Cleaner Element Bracket Screws	4.9	0.60	43 in·lb	
Fuel Tap Plate Screws	0.80	0.080	7 in·lb	
Fuel Tap Cover Screws	1.0	0.10	8 in·lb	
Fuel Pump Bolts	2.0	0.20	17 in·lb	
Cooling System				
Radiator Fan Switch	18	1.8	13	
Water Pump Fitting Bolt	9.8	1.0	87 in·lb	
Water Pump Impeller	7.8	0.80	69 in·lb	
Thermostat Housing Cover Bolts	8.8	0.90	78 in·lb	
Coolant Temperature Warning Light Switch	7.8	0.80	69 in·lb	SS
Radiator Fan Assembly Bolts	8.8	0.90	78 in·lb	
Radiator Mounting Bolts	8.8	0.90	78 in·lb	
Water Pump Cover Bolts	8.8	0.90	78 in·lb	
Coolant Drain Plug	8.8	0.90	78 in·lb	
Engine Top End:				
Water Pipe Bolts	9.8	1.0	87 in·lb	
Rocker Case Bolts 55 mm (2.2 in.)	8.8	0.90	78 in·lb	S
Rocker Case Bolts 130 mm (5.1 in.)	9.8	1.0	87 in·lb	S
Rocker Case Bolts 30 mm (1.2 in.)	9.8	1.0	87 in·lb	
Rocker Case Bolts 25 mm (1.0 in.)	9.8	1.0	87 in·lb	S
Cylinder Head Bolts (M10), First Torque	25	2.5	18	S, MO

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Cylinder Head Bolt (M10), Final Torque	49	5.0	36	S
Cylinder Head Bolts (M6)	9.8	1.0	87 in·lb	
Cylinder Head Jacket Plugs	20	2.0	14	
Valve Adjusting Cap Bolts	8.8	0.90	78 in·lb	
Valve Adjusting Screw Locknuts	12	1.2	104 in·lb	
Rocker Shaft Bolts	8.8	0.90	78 in·lb	
Chain Tensioner Mounting Bolts	8.8	0.90	78 in·lb	
Chain Tensioner Cap Bolt	22	2.2	16	
Intermediate Shaft Sprocket Nut	44	4.5	33	
Intermediate Shaft Chain Guide Bolts	8.8	0.90	78 in·lb	
Intermediate Shaft Chain Tensioner Bolts	8.8	0.90	78 in·lb	
Camshaft Sprocket Bolts	12	1.2	104 in·lb	L
Position Plate Bolts	8.8	0.90	78 in·lb	
Cylinder Bolts 40 mm (1.6 in.)	9.8	1.0	87 in·lb	
Cylinder Bolts 30 mm (1.2 in.)	9.8	1.0	87 in·lb	
Front Cylinder Camshaft Chain Guide Bolt	20	2.0	14	
Rear Cylinder Camshaft Chain Guide Bolt	20	2.0	14	
Exhaust Pipe Cover Bolts	8.8	0.90	78 in·lb	
Muffler Cover Bolts	8.8	0.90	78 in·lb	
Muffler Mounting Bolts	20	2.0	14	
Exhaust Pipe Clamp Bolts	8.8	0.90	78 in·lb	
Converter System:				
Converter Cover Bolts	8.8	0.90	78 in·lb	S
Driven Pulley Nut	93	9.5	69	
Ramp Weight Nuts	6.9	0.70	61 in·lb	
Spider	275	28	203	Lh
Drive Pulley Cover Bolts	13	1.3	113 in·lb	
Drive Pulley Bolt	93	9.5	69	R, Lh
Joint Duct Bolts	8.8	0.90	78 in·lb	
Engine Lubrication System:				
Engine Drain Plug	20	2.0	14	
Oil Filter	18	1.8	13	R
Oil Pressure Switch	15	1.5	11	SS
Oil Pressure Relief Valve	15	1.5	11	L
Oil Pump Bolt	8.8	0.90	78 in·lb	
Oil Pipe Bolts	8.8	0.90	78 in·lb	
Oil Filter Mounting Bolt	25	2.5	18	L (15mm)
Oil Pressure Switch Terminal Bolt	1.5	0.15	13 in·lb	
Chain Guide Bolts	8.8	0.90	78 in·lb	

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Oil Pump Drive Chain Tensioner Bolt	25	2.5	18	
Engine Removal/Installation				
Engine Mounting Bracket Bolts	52	5.3	38	
Engine Mounting Nuts	62	6.3	46	
Crankshaft/Transmission:				
Crankcase Bolts (M8)	20	2.0	14	S, L (1)
Crankcase Bolts (M6)	9.8	1.0	87 in·lb	
Shift Shaft Positioning Bolt	25	2.5	18	
Shift Shaft Spring Bolt	25	2.5	18	L
Shift Shaft Cover Bolts	8.8	0.90	78 in·lb	
Connecting Rod Big End Cap Nuts	34	3.5	25	MO
Engine Drain Plug	20	2.0	14	
Position Plate Mounting Screws	4.9	0.50	43 in·lb	L
Shift Shaft Lever Nut	8.8	0.90	78 in·lb	
Shift Shaft Lever Bolts	14	1.4	10	
Reverse Cable Bracket Mounting Bolts	8.8	0.90	78 in·lb	
Neutral Position Switch	8.8	0.90	78 in·lb	
Reverse Position Switch	15	1.5	11	
Reverse Cable Locknut	12	1.2	104 in·lb	
Cable Holder Mounting Bolts	9.8	1.0	87 in·lb	
Wheels/Tires:				
Tire Rod End Nuts	42	4.3	31	
Tie-Rod Adjusting Locknuts	22	2.2	16	
Wheel Nuts	78	8.0	58	
Front Axle Nuts	52	5.3	38	
Rear Axle Nuts	265	27	195	
Final Drive:				
(Output Bevel Gears)				
Output Driven Bevel Gear Housing Bolts	26	2.7	20	
Output Drive Bevel Gear Cover Bolts	8.8	0.90	78 in·lb	
Bearing Holder	137	14	101	L
Bevel Gear Holder Nut	157	16	116	L
Output Drive Bevel Gear Housing Bolts	26	2.7	20	
Bearing Holder	120	12	89	L
Output Shaft Holder Nut	157	16	116	L
(Final Gear Case)				
Oil Filler Cap	29	3.0	22	
Oil Drain Plug	20	2.0	14	
Final Gear Case Bolts	42	4.3	31	S

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Pinion Gear Bearing Holder	137	14	101	L
Final Gear Case Left Cover Bolts	49	5.0	36	L
Final Gear Case Right Cover Bolts (M8)	24	2.4	17	L,S
Final Gear Case Right Cover Bolts (M10)	49	5.0	36	L,S
Final Gear Case Right Cover Bolts (M12)	94	9.6	69	L,S
Pinion Gear Bearing Holder Nut	157	16	116	L
Brakes:				
Reservoir Cap Screws	1.5	0.15	13 in·lb	
Bleed Valves	7.9	0.80	69 in·lb	
Master Cylinder Clamp Bolts	8.8	0.90	78 in·lb	
Brake Switch Mounting Bolt	1.2	0.12	10 in·lb	
Brake Hose Banjo Bolts	25	2.5	18	
Brake Lever Pivot Bolt	5.9	0.60	52 in·lb	
Brake Lever Pivot Bolt Locknut	5.9	0.60	52 in·lb	
Caliper Mounting Bolts	25	2.5	18	
Disc Mounting Bolts	37	3.8	27	L
Parking Brake Lever Screw	–	–	–	L
Gasket Screws	–	–	–	L
Brake Pedal Bolt	8.8	0.90	78 in·lb	
Suspension:				
Front Shock Absorber Clamp Bolts and Nuts	47	4.8	35	
Front Shock Absorber Mounting Nuts	42	4.3	31	
Rear Shock Absorber Mounting Nuts	62	6.3	46	
Suspension Arm Pivot Bolts	42	4.3	31	
Steering Knuckle Joint Nuts	29	3.0	21	
Swingarm Pivot Right Shaft	152	15.5	112	L
Swingarm Pivot Left Shaft	20	2.0	14	L
Swingarm Pivot Left Nut	152	15.5	112	
Steering:				
Steering Stem Bottom End Nut	40	4.1	30	
Steering Stem Clamp Bolts	25	2.5	18	
Tie-Rod End Nuts	42	4.3	31	
Steering Knuckle Joint Nuts	29	3.0	22	
Tie-Rod Adjusting Locknuts	22	2.2	16	
Handlebar Lower Holder Nuts	37	3.8	27	L
Handlebar Holder Bolts	29	3.0	22	S
Master Cylinder Clamp Bolts	8.8	0.90	78 in·lb	
Frame:				
Engine Mounting Bracket Bolts	52	5.3	38	

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Engine Mounting Nut	62	6.3	46	
Footrest Mounting Bolts	44	4.5	33	
Electrical System:				
Alternator Cover Bolts	8.8	0.90	78 in·lb	
Alternator Rotor Bolts	127	13	94	
Alternator Stator Bolts	13	1.3	113 in·lb	
Alternator Cover Plugs	18	1.8	13	
Spark Plug	13	1.3	113 in·lb	
Crankshaft Sensor Mounting Bolts	5.9	0.60	52 in·lb	
Starter Motor Mounting Bolts	8.8	0.90	78 in·lb	
Starter Motor Terminal Nut	4.9	0.50	43 in·lb	
Starter Motor Terminal Locknut	6.9	0.70	61 in·lb	
Starter Motor Bolts	4.9	0.50	43 in·lb	
Starter Motor Clutch Bolts	34	3.5	25	L
Reverse Position Switch	15	1.5	11	
Neutral Position Switch	15	1.5	11	
Oil Pressure Switch	15	1.5	11	SS
Oil Pressure Switch Terminal Bolt	1.5	0.15	13 in·lb	
Radiator Fan Switch	18	1.8	13	
Coolant Temperature Warning Light Switch	6.9	0.70	61 in·lb	SS

Torque and Locking Agent

The tables 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	Mark of bolt head	Torque		
		N·m	kgf·m	ft·lb
5	4T	2.2 ~ 2.6	0.22 ~ 0.27	19 ~ 23 in·lb
6	9T	12 ~ 15	1.2 ~ 1.5	104 ~ 130 in·lb
6	7T	7.8 ~ 9.8	0.80 ~ 1.0	69 ~ 87 in·lb
6	4T	3.9 ~ 4.9	0.40 ~ 0.50	35 ~ 43 in·lb
8	7T	18 ~ 22	1.8 ~ 2.2	13 ~ 16
8	4T	10 ~ 14	1.0 ~ 1.4	87 ~ 122 in·lb
10	7T	39 ~ 44	4.0 ~ 4.5	29 ~ 33
10	4T	20 ~ 24	2.0 ~ 2.4	14 ~ 17

Basic Torque for General Fasteners of Frame Parts

Threads dia. mm	Torque		
	N·m	kgf·m	ft·lb
5	3.4 ~ 4.9	0.35 ~ 0.50	30 ~ 43 in·lb
6	5.9 ~ 7.8	0.60 ~ 0.80	52 ~ 69 in·lb
8	14 ~ 19	1.4 ~ 1.9	10.0 ~ 14
10	25 ~ 34	2.6 ~ 3.5	19.0 ~ 25
12	44 ~ 61	4.5 ~ 6.2	33 ~ 45
14	73 ~ 98	7.4 ~ 10	54 ~ 72
16	115 ~ 155	11.5 ~ 16	83 ~ 155
18	165 ~ 225	17 ~ 23	125 ~ 165
20	225 ~ 325	23 ~ 33	165 ~ 240

Specifications

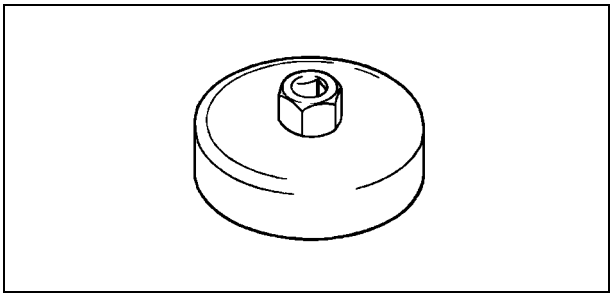
Item	Standard	Service Limit
Fuel System:		
Throttle lever free play	2 ~ 3 mm (0.08 ~ 0.12 in.)	– – –
Air cleaner element oil	High-quality foam air filter oil	– – –
Engine Top End:		
Valve clearance:		
Exhaust	0.20 ~ 0.25 mm (0.0079 ~ 0.0098 in.)	– – –
Inlet	0.10 ~ 0.15 mm (0.0039 ~ 0.0059 in.)	– – –
Converter System:		
Belt height (Parallel portion)	1.16 ~ 3.48 mm (0.0457 ~ 0.1370 in.)	0.64 mm (0.0251 in.)
Belt deflection	22 ~ 27 mm (0.87 ~ 1.06 in.)	– – –
Engine Lubrication System:		
Engine oil:		
Type	API SF or SG	– – –
	API SH or SJ with JASO MA class	– – –
Viscosity	SAE10W-40	– – –
Capacity	1.7 L (1.80 US qt)	– – –
	(When filter is not removed)	
	1.9 L (2.01 US qt)	– – –
	(When filter is removed)	
	2.2 L (2.33 US qt)	– – –
	(When engine is completely dry)	
Wheels/Tires		
Tire tread depth:		
Front	– – –	3 mm (0.12 in.)
Rear	– – –	3 mm (0.12 in.)
Standard tire:		
Front	AT 22 X 7-10	– – –
	CARLISLE, HOLE SHOT XC	– – –
Rear	AT 22 x 11-10	– – –
	CARLISLE, HOLE SHOT XCT	– – –
Final Drive:		
Final Gear Case:		
Gear Case Oil:		
Type	MOBIL Fluid 424 or CITGO	– – –
	TRANSGARD TRACTOR HYDRAULIC FLUID	
Oil level	Filler opening bottom	– – –
Capacity	900 mL (0.95 US qt)	– – –

Specifications

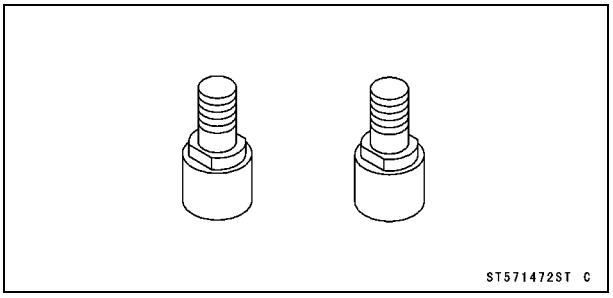
Item	Standard	Service Limit
Brakes:		
Front Brake Fluid:		
Type	DOT 3 or DOT 4	– – –
Front Disc Brake:		
Pad lining thickness	4 mm (0.16 in.)	1 mm (0.04 in.)
Rear Brake Lever, Pedal and Cables:		
Rear brake lever free play	1 ~ 2 mm (0.04 ~ 0.08 in.)	– – –
Brake pedal free play	15 ~ 25 mm (0.6 ~ 1.0 in.)	– – –
Electrical System:		
Spark plug gap	0.7 ~ 0.8 mm (0.028 ~ 0.031 in.)	– – –
Rear brake light switch timing	On after 10 mm (0.4 in.) of pedal travel	– – –

Special Tools

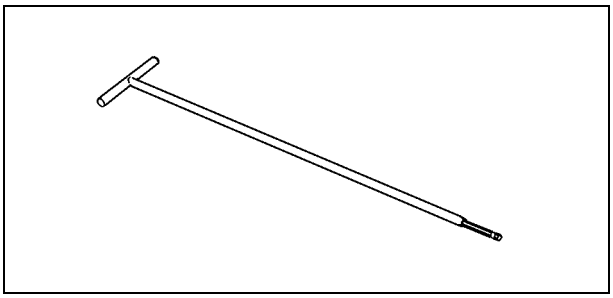
Oil Filter Wrench :
57001–1249



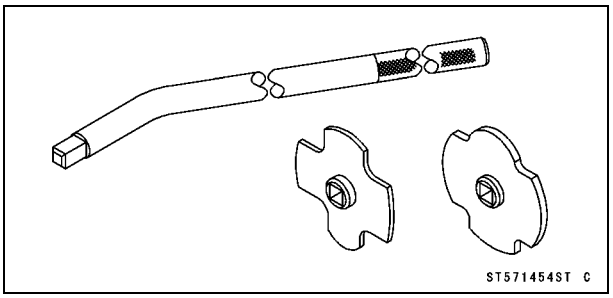
Pulley Holder Attachment :
57001–1472



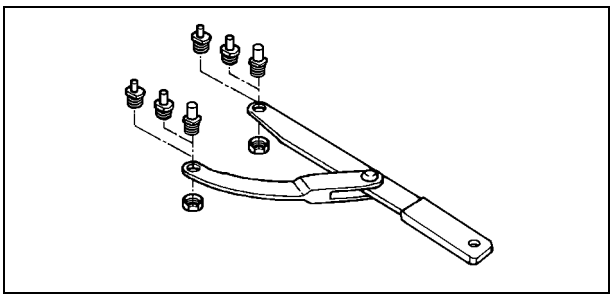
Carburetor Drain Plug Wrench, Hex 3 :
57001–1269



Filler Cap Driver:
57001–1454



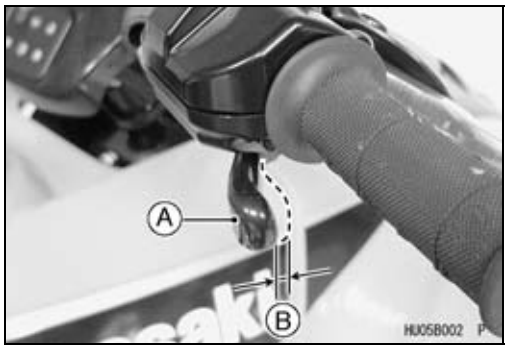
Flywheel & Pulley Holder :
57001–1343



Periodic Maintenance Procedures

Fuel System

Throttle Lever Free Play Inspection



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

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

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

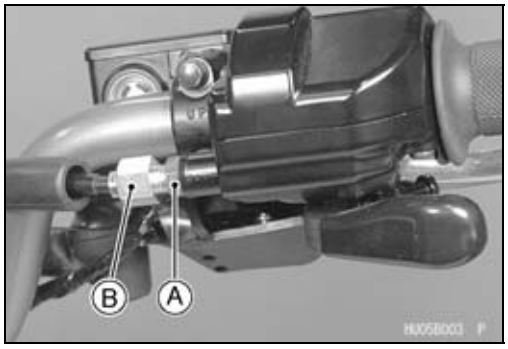
★If the idle speed increases, check the throttle lever free play and the cable routing.

- Stop the engine and check the throttle lever free play [B].

★If the free play is not within the specified range, adjust the cable.

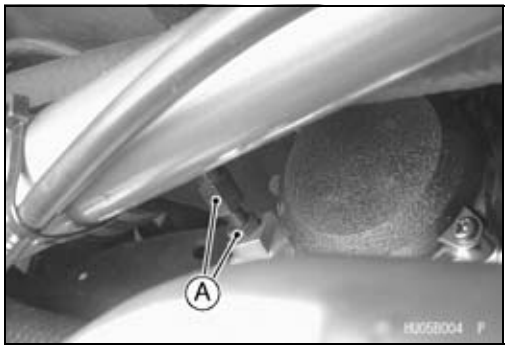
Throttle Lever Free Play
Standard: 2 ~ 3 mm (0.08 ~ 0.12 in.)

Throttle Lever Free Play Adjustment



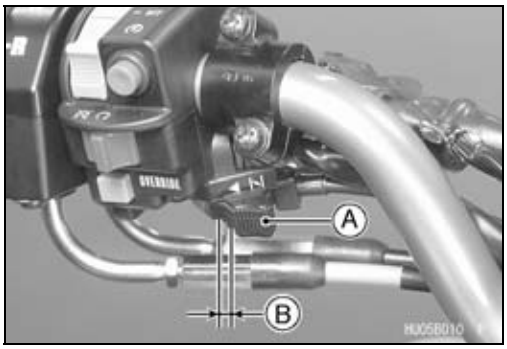
- Slide the rubber cover off the adjuster at the throttle case.
- Loosen the locknut [A] and turn the throttle cable upper adjuster [B] until the cable has proper amount of play.
- Tighten the locknut and reinstall the rubber cover.

★If the free play cannot be adjusted by using the upper cable adjuster, remove the air cleaner cover and then use the cable adjusting nuts [A] at the lower end of the throttle cable and make the necessary free play.



Periodic Maintenance Procedures

Choke Lever Free Play Check

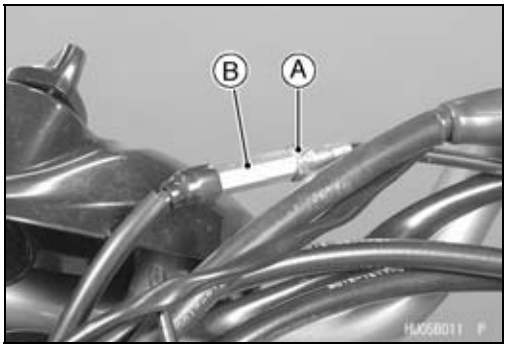


- Check if the choke lever [A] returns properly and if the inner cable slides smoothly.
- Make sure that the choke lever returns to its released position all the way.
- To determine the amount of choke cable play at the lever, pull the choke lever to the left until feeling the operation of the lever tough; the amount of choke lever is equivalent to that of cable play.
- The proper amount of play ranges about 3 mm (0.12 in.) at the choke lever.

★If the free play is not within the specified range, adjust the cable.

Choke Lever Free Play [B]
Standard: about 3 mm (0.12 in.)

Choke Lever Free Play Adjustment



- Loosen the locknut [A] of the choke cable.
- Turn the adjuster [B] until the cable has proper amount of play.
- Tighten the locknut securely.

Idle Speed Inspection

- Start the engine and warm it up thoroughly.
- With the engine idling, turn the handlebar to both sides to check for any changes in the idle speed.

★If handlebar movement changes the idle speed, the throttle cable may be improperly adjusted incorrectly routed, or damaged. Be sure to correct any of these conditions before riding.

⚠ WARNING

Operation with improperly adjusted, incorrectly routed, or damaged cables could result in an unsafe riding condition.

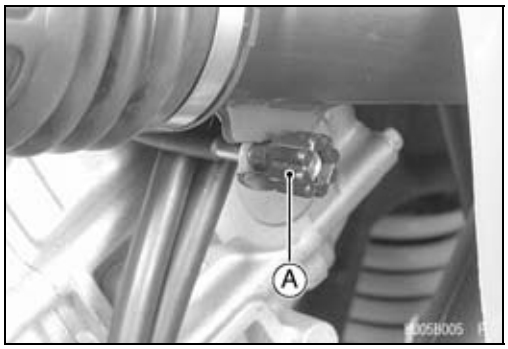
- Check idle speed with a suitable tachometer.

★If the idle speed is out of the specified range, adjust it.

Idle Speed
Standard: 1,100 ± 50 r/min (rpm)

Periodic Maintenance Procedures

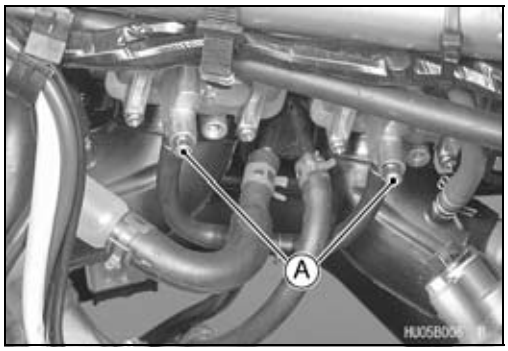
Idle Speed Adjustment



- Start the engine and warm it up thoroughly.
- Turn the idle adjusting screw [A] until the idle speed is correct.

○ Open and close the throttle a few times to make sure that the idle speed is within the specified range.

Fuel System Cleanliness Inspection



⚠ WARNING

Gasoline is extremely flammable and can be explosive under certain conditions. 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.

- Turn the fuel tap to the OFF position.
- Place the suitable container under the drain plugs [A].
- Turn out the carburetor drain plug a few turns and drain the fuel system.

Special Tool - Carburetor Drain Plug Wrench, Hex 3: 57001–1269

- Check to see if water or dirt comes out.
- Tighten the drain plug.

★If any water or dirt appears during the above inspection, clean the fuel system (carburetor, fuel tank, fuel hose).

Air Cleaner Element Cleaning and Inspection

NOTE

○ *In dusty areas, the element should be cleaned more frequently than the recommended interval.*

○ *After riding through rain or muddy terrains, the element should be cleaned immediately.*

○ *Also, if there is a break in the element material or any other damage to the element, replace the element with a new one.*

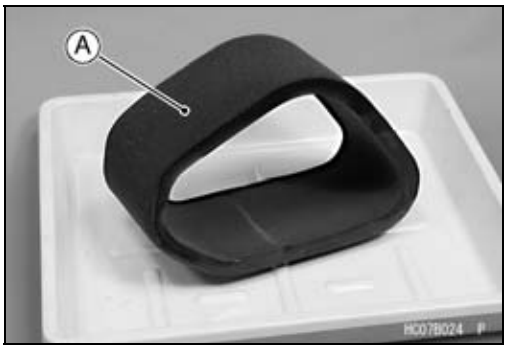
⚠ WARNING

Clean the element in a well-ventilated area, and take care that there are no sparks or flame anywhere near the working area; this includes any appliance with a pilot light. Because of the danger of highly flammable liquids, do not use gasoline or a low-flash point solvent to clean the foam element.

- Remove the air cleaner element (see Fuel System chapter).

Periodic Maintenance Procedures

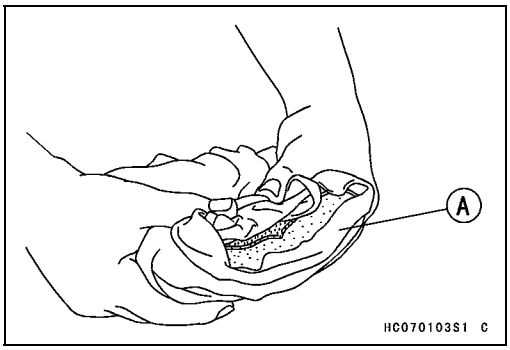
- Clean the element [A] in a bath of high-flash point solvent.



- Squeeze it dry in a clean towel [A]. Do not wring the element or blow it dry; the element can be damaged.
- Inspect the element for damage.

★If it is torn, punctured, or hardened, replace it.

- After cleaning, saturate the element with a high-quality foam-air-filter oil, squeeze out the excess oil, then wrap it in a clean rag and squeeze it as dry as possible. Be careful not to tear the element.



Air Cleaner Draining

- If any water or oil accumulates in the tube, drain it by taking off the tube plug [A]. After draining, be sure to install the tube plug and clamp firmly.

Fuel Hoses and Connections Inspection

- Remove the air cleaner cover (see Frame chapter)
- Turn the fuel tap to the OFF position.
- Check the fuel hoses [A].

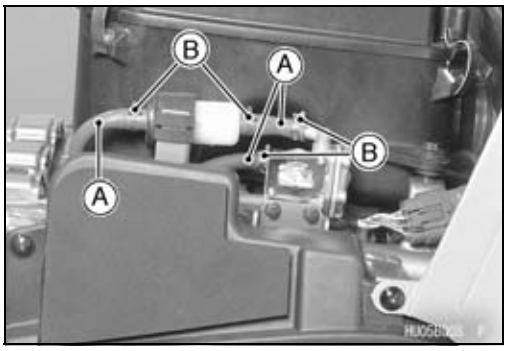
★If the fuel hose is frayed, cranked, or bulged, replace the fuel hose.

- Check that the hose is securely connected and clamps [B] are tightened.

★If the fuel hose has been sharply bent or kinked, replace the fuel hose.

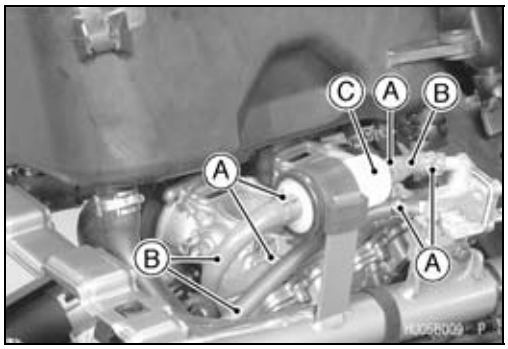
★If the clamps are loosened or damaged, replace the clamps.

- When installing the fuel hose, route the hose according to Cable, Wire, and Hose Routing section in Appendix chapter.
- When installing the fuel hose, avoid sharp bending, kinking, flattening or twisting, and route the fuel hose with a minimum of bending so that the fuel flow will not be obstructed.



Periodic Maintenance Procedures

Fuel Hose and Fuel Filter Replacement

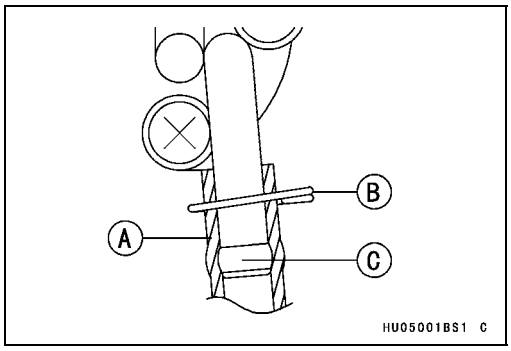


⚠ WARNING

Gasoline is extremely flammable and can be explosive under certain conditions. 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.

- Remove the air cleaner cover (see Frame chapter).
- Turn the fuel tap to the OFF position.
- Remove:
  Clamps [A]
  Clamp (Fuel Tank Side)
  Fuel Hoses [B]
  Fuel Filter [C]
- Replace the fuel hoses and fuel filter with a new one.
- When installing the fuel hose, route the hose according to Cable, Wire, and Hose Routing section in Appendix chapter.
- When installing the fuel hose, avoid sharp bending, kinking, flattening or twisting, and route the fuel hose with a minimum of bending so that the fuel flow will not be obstructed.

- Fit the fuel hose [A] onto the pipe fully and install the clamps [B] beyond the raised rib [C].



Periodic Maintenance Procedures

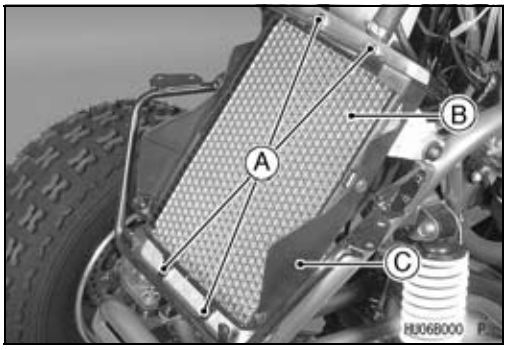
Cooling System

Radiator Cleaning

CAUTION

Clean the radiator screen and the radiator in accordance with the Periodic Maintenance Chart. In dusty areas, they should be cleaned more frequently than the recommended interval. After riding through muddy terrains, the radiator screen and the radiator should be cleaned immediately.

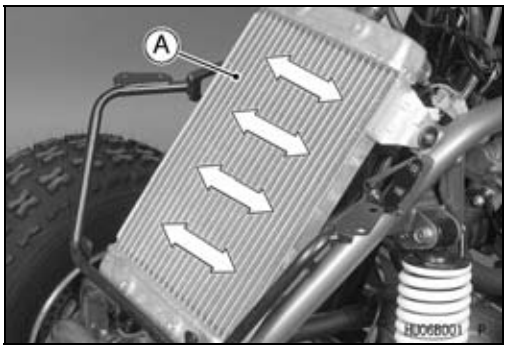
- Remove:
  Radiator Cover (see Frame chapter)
  Radiator Screen Mounting Screws [A]
  Radiator Screen [B] (With the Shroud [C])
- Clean the radiator screen in a bath of tap water, and then dry it with compressed air or by shaking it.



- Clean the radiator.

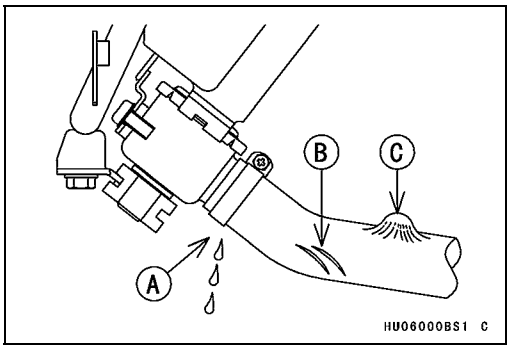
CAUTION

When cleaning the radiator with steam cleaner, be careful of the following to prevent radiator damage.
Keep the steam gun away more than 0.5 m (20 in.) from the radiator core [A].
Hold the steam gun perpendicular to the core surface.
Run the steam gun following the core fin direction.



Radiator Hose and Connection Inspection

- The high pressure inside the radiator hose can cause coolant to leak [A] or the hose to burst if the line is not properly maintained. Visually inspect the hoses for signs of deterioration. Squeeze the hoses. A hose should not be hard and brittle, nor should it be soft or swollen.
- ★Replace the hose if any fraying, cracks [B] or bulges [C] are noticed.
- Check that the hoses are securely connected and clamps are tightened correctly.



Periodic Maintenance Procedures

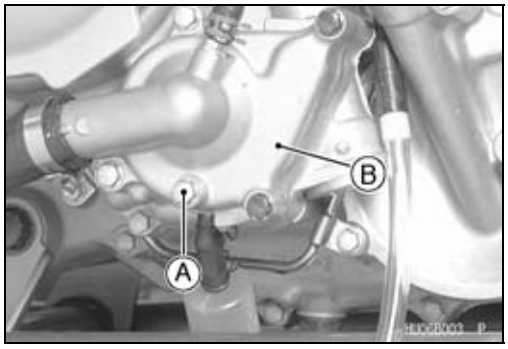
Coolant Change

⚠ WARNING

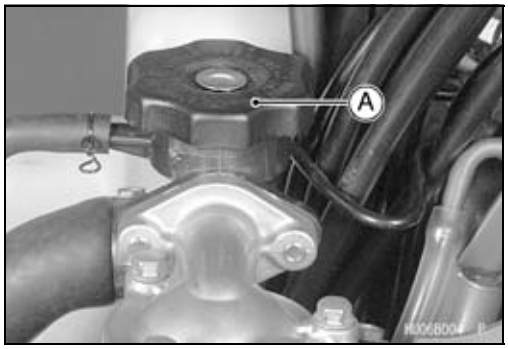
To avoid burns, do not remove the radiator cap or try to change the coolant when the engine is still hot. Wait until it cools down.
Coolant on tires will make them slippery and can cause an accident and injury. Immediately wash away any coolant that spills on the frame, engine, or wheels.
Since coolant is harmful to the human body, do not use for drinking.

- Remove:
  Front Fender (see Frame chapter)
  Reserve Tank Cap
- Place the container under the reserve tank.
- Pull off the cooling hose [A], and drain the coolant.

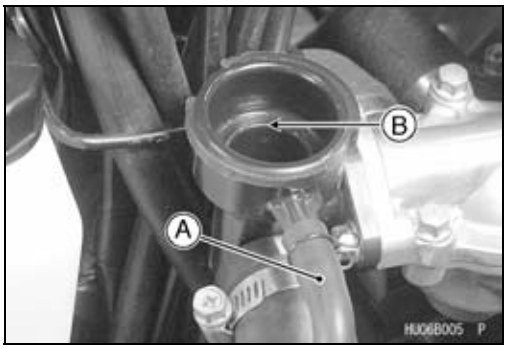
- Place a container under the drain plug [A] at the bottom of the water pump [B], then remove the drain plug.



- Remove the radiator cap [A] in two steps. First turn the cap counterclockwise to the first step. Then push and turn it further in the same direction and remove the cap.
- The coolant will drain from the radiator and engine.



Periodic Maintenance Procedures



- Install the cooling hose [A].
- Tighten the drain plug.

Torque - Coolant Drain Plug: 8.8 N·m (0.90 kgf·m, 78 in·lb)

- Support the vehicle on a stand or the jack so that the front wheels are off the ground. This makes air bleeding easier.
- Fill the radiator up to the radiator filler neck [B] with coolant.

NOTE

- *Pour in the coolant slowly so that the air in the engine and radiator can escape.*

- Fill the reserve tank up to the full level line with coolant, and install the reserve tank cap.

CAUTION

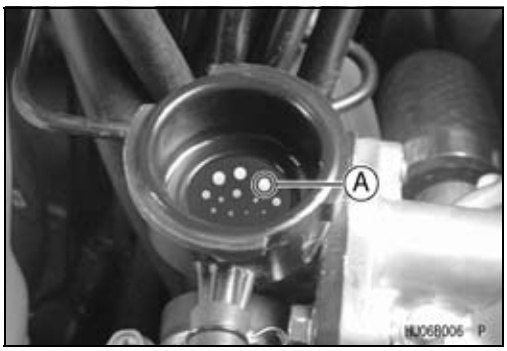
Soft or distilled water must be used with antifreeze (see Specifications in this chapter) in the cooling system.
If hard water is used in the system, it causes scale accumulation in the water passages, considerably reducing the efficiency of the cooling system.

Water and Coolant Mixture Ratio (when shipping)

Soft Water:	**50%**
Coolant:	**50%**
Freezing Point:	**–35°C (–31°F)**
Total Amount:	**2.5 L (2.64 US qt)**

NOTE

- *Choose a suitable mixture ratio by referring to the coolant manufacturer's directions.*



- Bleed the air from the cooling system as follows.
- Start the engine with the radiator cap removed and run it until no more air bubbles [A] can be seen in the coolant.
- Tap the radiator hoses to force any air bubbles caught inside.
- Stop the engine and add coolant up to the radiator filler neck.
- Install the radiator cap.
- Start the engine, warm it up thoroughly until the radiator fan turns on and then stop the engine.
- Check the coolant level in the reserve tank after the engine cools down.
- ★If the coolant level is lower than the low level line, add coolant to the full level line.

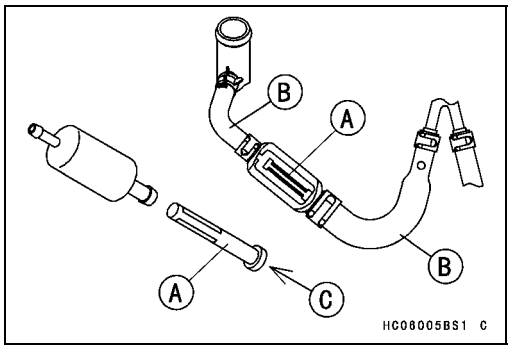
CAUTION

Do not add more coolant above the full level line.

Periodic Maintenance Procedures

Coolant Filter Cleaning

- Drain the coolant (see Coolant change).
- Remove the filter [A] from the cooling hoses [B] of carburetor system.
- Blow [C] off dirt and sediment on the filter with compressed air.



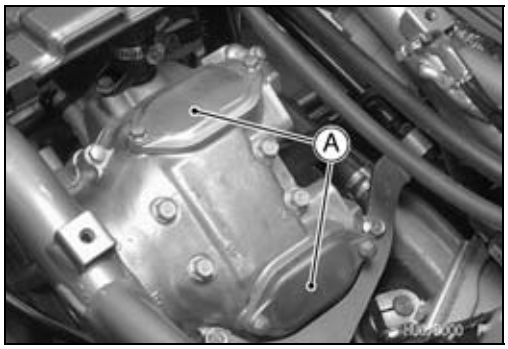
Engine Top End

Valve Clearance Inspection

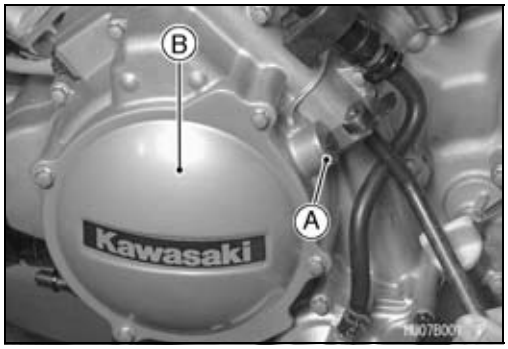
NOTE

○ *Check the valve clearance only when the engine is cold (at room temperature).*

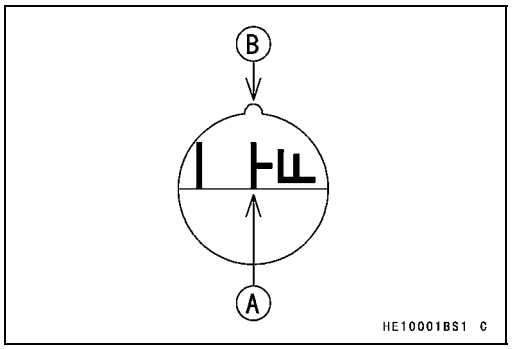
- Remove:
  Air Cleaner Cover (see Frame chapter)
  Air Cleaner Housing (see Fuel System chapter)
  Front Fender (see Frame chapter)
  Valve Adjusting Caps [A]



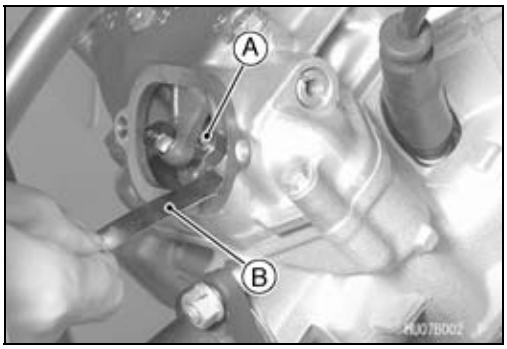
- Remove the timing inspection plug [A].
  Special Tool - Filler Cap Driver: 57001–1454
- Remove the alternator bolt cover [B].



- Turn the crankshaft **counterclockwise** with a wrench on the alternator rotor bolt until “T-F” mark [A] on the alternator rotor aligns with the notch [B] as shown: the end of the compression stroke in the front cylinder head.



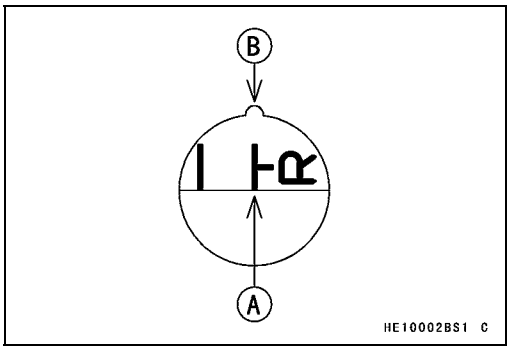
Periodic Maintenance Procedures



- Measure the clearance for all four valves, one at a time between the end of the valve stem and the adjusting screw [A] with the thickness gauge [B].

Valve Clearance (when cold)
Exhaust: 0.20 ~ 0.25 mm (0.0079 ~ 0.0098 in.)
Inlet: 0.10 ~ 0.15 mm (0.0039 ~ 0.0059 in.)

★If the valve clearance is not correct, adjust it (see Valve Clearance Adjustment).

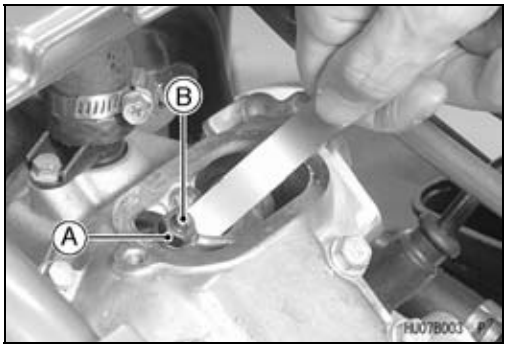


- Then, turn the crankshaft **counterclockwise** with a wrench on the alternator rotor bolt until "T-R" mark [A] on the alternator rotor aligns with the notch [B] as shown: the end of the compression stroke in the rear cylinder head.
- Measure the clearance for all four valves, one at a time between the end of the valve stem and the adjusting screw with the thickness gauge.

Valve Clearance (when cold)
Exhaust: 0.20 ~ 0.25 mm (0.0079 ~ 0.0098 in.)
Inlet: 0.10 ~ 0.15 mm (0.0039 ~ 0.0059 in.)

★If the valve clearance is not correct, adjust it (see Valve Clearance Adjustment).

Valve Clearance Adjustment



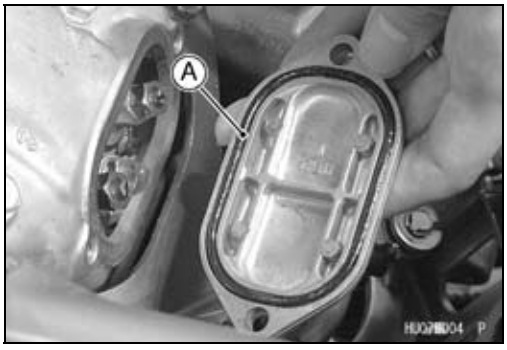
- Remove the valve adjusting caps.
- Loosen the locknut [A] and turn the adjusting screw [B] until the clearance is correct.
- Hold the adjusting screw from turning and tighten the locknut to the specified torque.

Torque - Valve Adjusting Screw Locknuts: 12 N·m (1.2 kgf·m, 104 in·lb)

- Recheck the clearance.

★If the clearance is incorrect, repeat the adjustment procedure.

★If the clearance is correct, perform the adjustment procedure on the other valve.



- Apply grease to the O-rings [A].

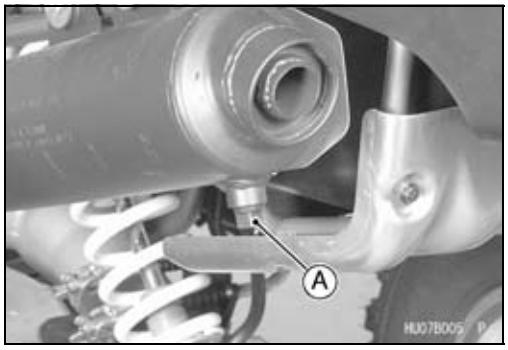
Torque - Valve Adjusting Cap Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)

Periodic Maintenance Procedures

Spark Arrester Cleaning

⚠ WARNING

To avoid burns, wear gloves while cleaning the spark arrester. Since the engine must be run during this procedure, the muffler will become hot.



- Remove the drain plug [A] on the muffler.
- In an open area away from combustible materials, start the engine with the transmission in neutral.
- Raise and lower engine speed while tapping on the muffler with a rubber mallet until carbon particles are purged from the muffler.

⚠ WARNING

Do not run the engine in a closed area. Exhaust gases contain carbon monoxide; a colorless, odorless, poisonous gas. Breathing exhaust gas leads to carbon monoxide poisoning, asphyxiation, and death.

- Stop the engine.
- Install the drain plug.

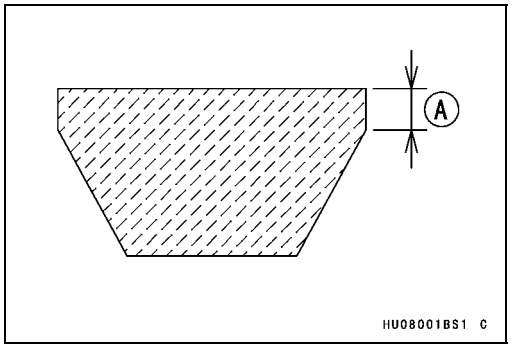
Converter System

Drive Belt Inspection

Inspection of the drive belt is required at least every 90 days of vehicle use (average 12 mile/day) not to exceed 1,700 km (1,100 mile) or belt indicator light turn on (100 hours of use) counted by the hour meter. More frequent inspection is necessary if the vehicle is subjected to hard usage.

⚠ WARNING

Neglect, abuse, or failure to maintain the transmission can result in a severely worn or damaged drive belt locking up the transmission and wheels. This can cause the operator to lose control and have an accident resulting in injury or death.



- Remove the torque converter cover (see Converter System chapter).
- Measure the height [A] of the belt paralle portion at several locations.

★If any measurements exceed the service limit, replace the belt.

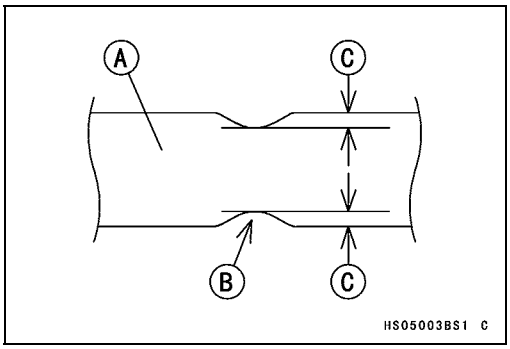
Belt Height (Paralle Portion)

Standard: 1.16 ~ 3.48 mm (0.0457 ~ 0.1370 in.)

Service Limit: 0.64 mm (0.0251 in.)

Periodic Maintenance Procedures

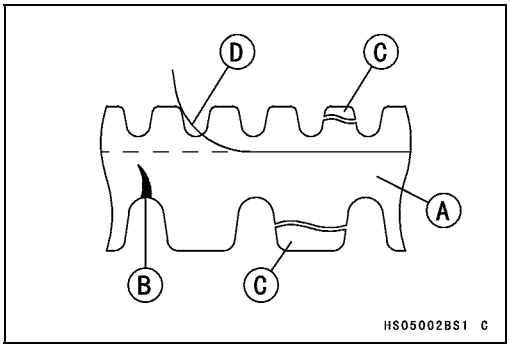
● Check the belt [A] for abnormal wear [B].
○ Measure the width [C] of the belt at abnormal wear point.
★ If any measurements exceed 0.5 mm (0.02 in.), replace the belt.



● Check the belt for cracks, breaks, or peeling.
★ If necessary, replace the belt with a new one.
Belt [A]
Crack [B]
Broken [C]
Peeling [D]

NOTE

○ *Whenever the belt is replaced, inspect the drive and the driven pulleys.*



Drive Belt Deflection Inspection

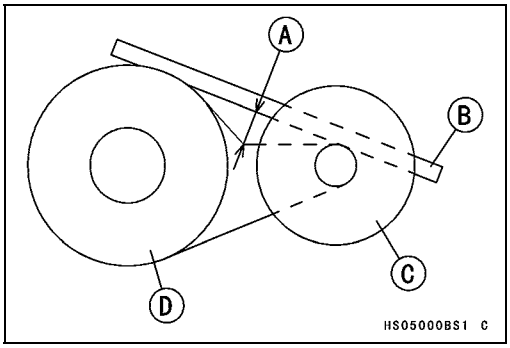
● Remove the torque converter cover (see Converter System chapter).
● Put the transmission in neutral and rotate the driven pulley by hand to make sure the belt is shifted all the way to the top of the driven pulley.

● Measure the belt deflection [A] as shown:
○ Place a straightedge [B] on top of the belt between the drive pulley [C] and the driven pulley [D].
○ Use a ruler to push the belt away from the straightedge. Push hard, but with no more force than 59 N (6 kgf, 13 lb).

Belt Deflection

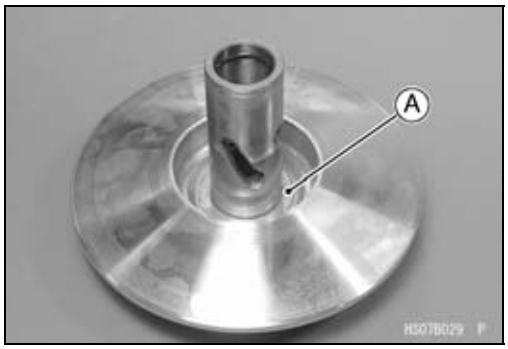
Standard: 22 ~ 27 mm (0.87 ~ 1.06 in.)

★ If the belt deflection is not within the specified range, first measure the height of the belt pralle portion (see Drive Belt Inspection). Adjust the deflection by adding or removing spacers on the fixed sheave.
● When adjusting the deflection, less is better than more. Less deflection will maintain better performance for more time as the belt width decreases by normal wear, which causes the deflection to increase with usage.



Periodic Maintenance Procedures

Drive Belt Deflection Adjustment



- Disassemble the driven pulley (see Converter System chapter).

★If the belt deflection is more than 27 mm (1.06 in.), remove the spacers to decrease it.

○The rule-of-thumb is: 0.1 mm (0.004 in.) change in spacer thickness equals about 1.3 mm (0.051 in.) change in belt deflection.

★If the belt deflection is less than 22 mm (0.87 in.), add the spacers [A] to increase it.

○The rule-of-thumb is: 0.1 mm (0.004 in.) change in spacer thickness equals about 1.6 mm (0.063 in.) change in belt deflection.

Spacers

Part No.	Thickness
92026-1569	0.6 mm (0.024 in.)
92026-1617	0.8 mm (0.032 in.)
92026-1565	1.0 mm (0.039 in.)
92026-1570	1.4 mm (0.055 in.)

- Assemble the driven pulley (see Converter System chapter).
- With the transmission in neutral, rotate the driven pulley to allow the belt to return to the top of the sheaves before measuring the belt deflection.
- Measure the belt deflection again and repeat the above procedures until it is within the standard range.
- Using the flywheel & pulley holder and adapter, tighten the driven pulley nut.

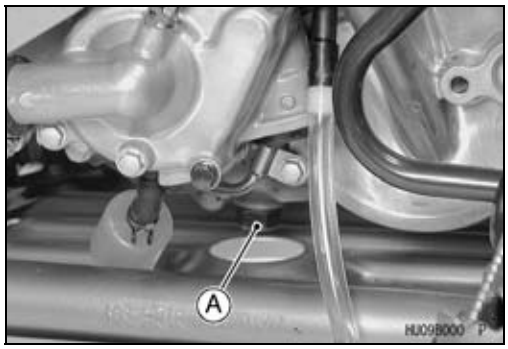
Special Tools - Flywheel & Pulley Holder: 57001–1343
Pulley Holder Attachment: 57001–1472

Torque - Driven Pulley Nut: 93 N·m (9.5 kgf·m, 69 ft·lb)

Periodic Maintenance Procedures

Engine Lubrication System

Engine Oil Change



- Support the vehicle so that it is level side to side and front to back after warming up the engine.
- Remove the engine drain plug [A] to drain the oil.

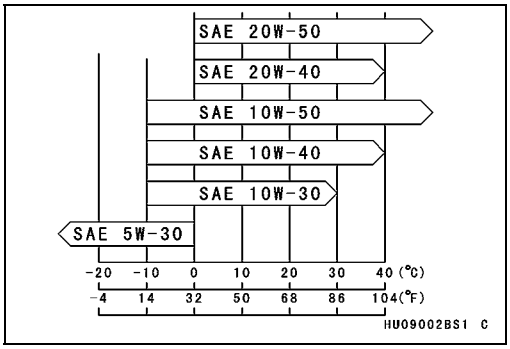
○ The oil in the filter can be drained by removing the filter (see Oil Filter Change).

★Replace the drain plug gasket with a new one.

- Tighten:

Torque - Engine Drain Plug : 20 N·m (2.0 kgf·m, 14 ft·lb)

- Pour in the specified type and amount of oil.



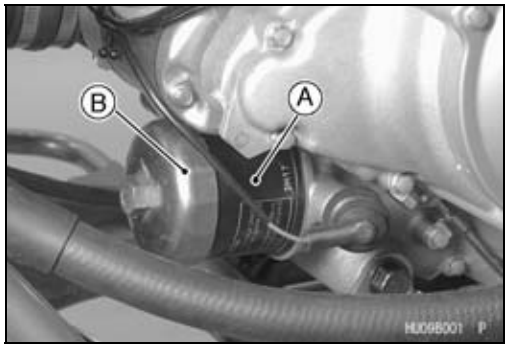
Engine Oil

Type:	**API SF or SG**
	API SH or SJ with JASO MA class
Viscosity:	**SAE 10W-40**
Amount:	**1.7 L (1.80 US qt)**
	(When filter is not removed)
	1.9 L (2.01 US qt)
	(When filter is removed)
	2.2 L (2.33 US qt)
	(When engine is completely dry)

NOTE

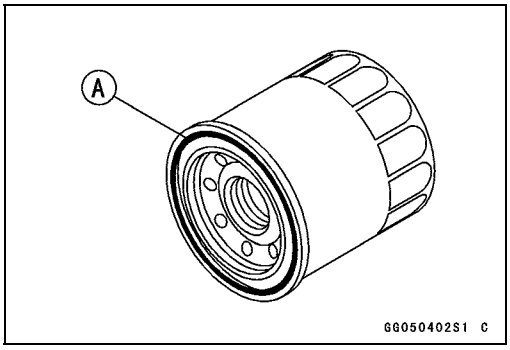
○ *Although 10W-40 engine oil is the recommended oil for most conditions, the oil viscosity may need to be changed to accommodate atmospheric conditions in your riding area.*

Oil Filter Change



- Drain the engine oil.
- Remove the oil filter [A] with the oil filter wrench [B].

Special Tool - Oil Filter Wrench : 57001–1249



- Replace the filter with a new one.
- When installing the oil filter, be careful of the following.

○ Apply oil to the gasket [A] before installation.

○ Tighten the filter with the oil filter wrench.

Special Tool - Oil Filter Wrench: 57001–1249

Torque - Oil Filter : 18 N·m (1.8 kgf·m, 13 ft·lb)

○ Pour in the specified type and amount of oil.

Periodic Maintenance Procedures

Crankshaft/Transmission

Shift Control Grip Free Play Inspection

- Measure the distance the shift control grip moves with the push button depressed.
- Check the shift control cable free play of both directions.

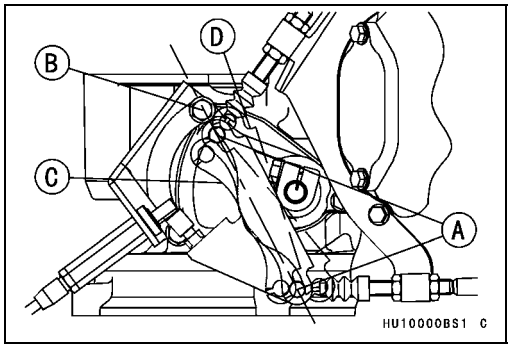
★If the free play is not within the specified range, adjust the cable.

Shift Control Cable Grip Free play [A]
Standard: 0 ~ 2 mm (0 ~ 0.08 in.)

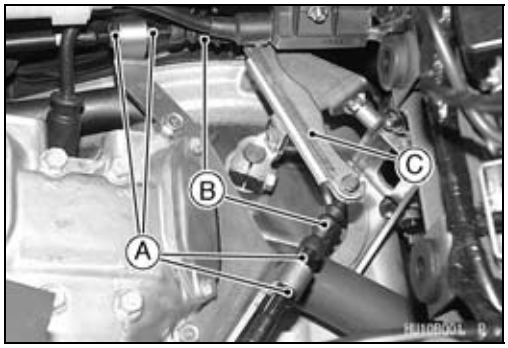
Shift Control Grip Free Play Adjustment

- Remove the battery with the battery case (see Electrical System).
- Make sure that the shift control grip is in neutral position.
- Make sure that the gear change lever is in neutral position.

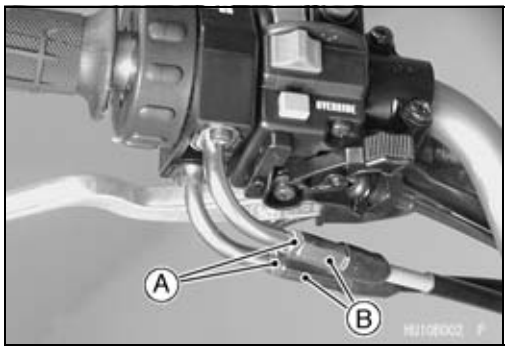
○Neutral position is the shift cable lower ends [A] and reverse lock cable bracket bolt [B] aligned state.
Drive Position [C]
Reverse Position [D]



- Turn the adjusting nuts [A] at shift control cable lower end make the inner cables [B] tight with no free play.
- Turn the shift control grip from “N” to “D” and to “R” respectively and make sure the change lever [C] works correctly.
- Tighten the all adjusting nuts securely.



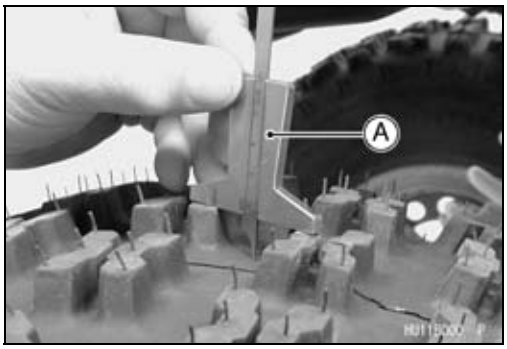
- Slide back the rubber covers.
- Loosen the locknuts [A] and turn the shift cable upper adjusters [B] to obtain the specified free play.
- Tighten the locknuts securely and re install the rubber covers.



Periodic Maintenance Procedures

Wheels/Tires

Tire Inspection



- Examine the tire for damage and wear.

★If the tire is cut or cracked, replace it.

○Lumps or high spots on the tread or sidewalls indicate internal damage requiring tire replacement.

○Remove any foreign objects from the tread. After removal, check for leaks with a soap and water solution.

- Measure the tread depth at the center of the tread with a depth gauge [A]. Since the tire may wear unevenly, take measurements at several places.

★If any measurements are less than the service limit, replace the tire.

Tire Tread Depth

Service Limit:

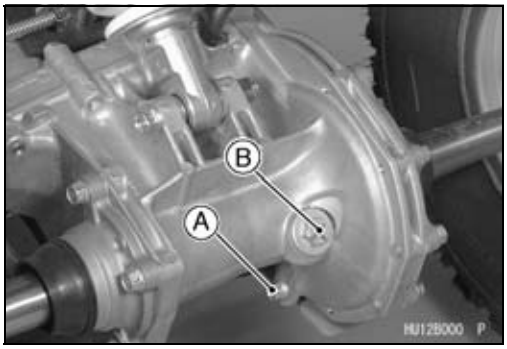
Front:	**3 mm (0.12 in.)**
Rear:	**3 mm (0.12 in.)**

Standard Tire

Front:	**AT 22 x 7 - 10 CARLISLE, HOLE SHOT XC**
Rear:	**AT 22 x 11 - 10 CARLISLE, HOLE SHOT XCT**

Final Drive

Final Gear Case Oil Change



- Warm up the oil by running the vehicle so that the oil will pick up any sediment and drain easily. Then stop the vehicle.
- Park the vehicle so that it is level, both side-to-side and front-to-rear.
- Place an oil pan beneath the rear final gear case and remove the drain plug [A].

⚠ WARNING

When draining or filling the final gear case, be careful that no oil gets on the tire or rim because oil will deteriorate the tire. Clean off any oil that inadvertently gets on them with a high-flash point solvent.

- After the oil has completely drained out, install the drain plug with a new aluminum gasket.

Torque - Oil Drain Plug: 20 N·m (2.0 kgf·m, 14 ft·lb)

- Fill the final gear case up to the bottom of filler opening with the oil specified below.

Final Gear Case Oil

Type:	**MOBIL Fluid 424 or CITGO TRANSGARD TRACTOR HYDRAULIC FLUID**
Capacity:	**900 mL (0.95 US qt)**

- Be sure the O-ring is in place.

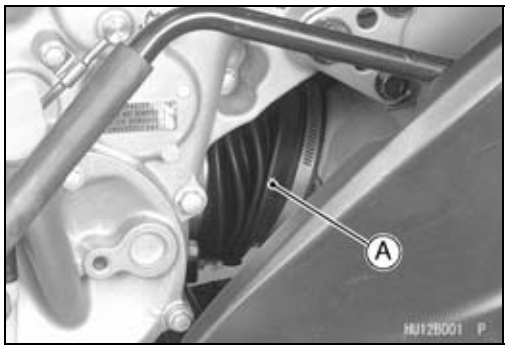
Torque - Oil Filler Cap [B]: 29 N·m (3.0 kgf·m, 22 ft·lb)

Periodic Maintenance Procedures

Propeller Shaft Joint Boot Inspection

- Visually inspect the rear propeller shaft joint boot [A] in accordance with the Periodic Maintenance Chart or if the shaft is noisy during operation.

★If the joint boot is torn, worn, or deteriorated, replace the joint boot and check the propeller shaft (see Final Drive chapter).



Brakes

Front Brake Pad Wear Inspection

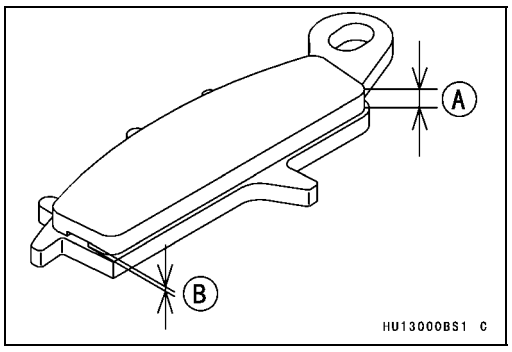
- Check the lining thickness [A] of the pads in each caliper.

★If the lining thickness of either pad is less than the service limit [B], replace both pads in the caliper as a set.

Pad Lining Thickness

Standard: 4 mm (0.16 in.)

Service Limit: 1 mm (0.04 in.)



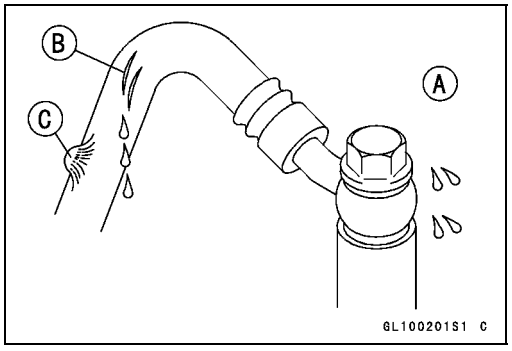
Front Brake Hoses and Connections Inspection

- Inspect the brake hose and fittings for deterioration, cracks and signs of leakage.

○ The high pressure inside the brake line can cause fluid to leak [A] or the hose to burst if the line is not properly maintained. Bend and twist the rubber hose while examining it.

★Replace the hose if any cracks [B] or bulges [C] are noticed.

- Tighten any loose fittings.



Front Brake Hose Replacement

- Pump the brake fluid out of the line as explained in the Brake Fluid Change.
- Remove the banjo bolts at both ends of the brake hose, and pull the hose off the vehicle.
- Immediately wipe up any brake fluid that spills.

CAUTION

Brake fluid quickly ruins painted surfaces; any spilled fluid should be completely washed away immediately.

- Use a new flat washer for each side of the hose fittings.
- Install the new brake hose in its place (see Appendix chapter), and tighten the banjo bolts.

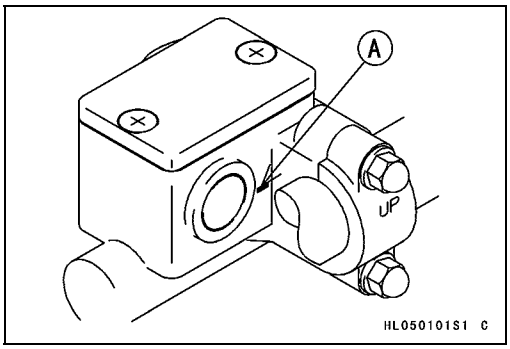
Torque - Brake Hose Banjo Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)

Periodic Maintenance Procedures

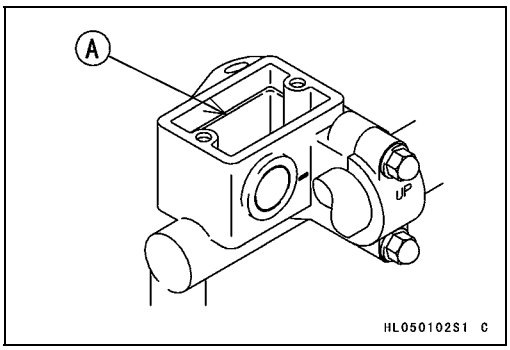
Brake Fluid Level Inspection

- Position the reservoir horizontal, and check that the fluid level in the reservoir is higher than the lower level line [A].

★If the fluid level is lower than the lower level line, check for fluid leakage of the brake line, and add the fluid as follows:



○ Remove the reservoir cap, and fill the reservoir to the upper level line [A] in the reservoir with the same type and brand of the fluid that is already in the reservoir. And then install the reservoir cap.



⚠ WARNING

Change the fluid in the brake line completely if the fluid must be refilled but the type and brand of the fluid that is already in the reservoir are unidentified.

- Tighten:

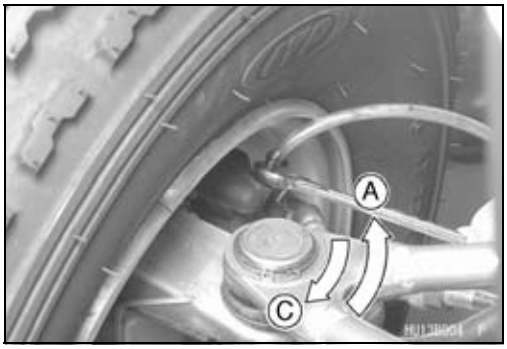
Torque - Reservoir Cap Screws : 1.5 N·m (0.15 kgf·m, 13 in·lb)

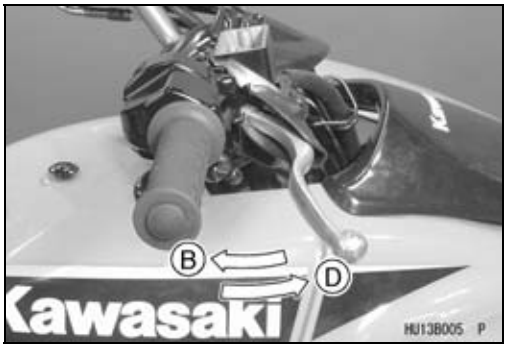
Brake Fluid Change

- Remove the reservoir cap and the rubber cap on the bleed valve.
- Attach a clear plastic hose to the bleed valve on the caliper, and run the other end of the hose into a container.
- Fill the reservoir with new brake fluid.
- Change the brake fluid as follows:

○ Open the bleed valve [A].
○ Apply the brake lever and hold it [B].
○ Close the bleed valve [C].
○ Release the brake lever [D].

- Check the fluid level in the reservoir often, replenishing it as necessary.





NOTE

○ *If the fluid in the reservoir runs completely out any time during fluid changing, air will enter the line, and the system must be bled.*

Periodic Maintenance Procedures

- Repeat this operation until fresh brake fluid comes out into the plastic hose or the color of the fluid changes.

⚠ WARNING

Do not mix two brands of fluid. Change the brake fluid in the brake line completely if the brake fluid must be refilled but the type and brand of the brake fluid that is already in the reservoir are not known.

- Tighten:

Torque - Bleed Valves: 7.9 N·m (0.80 kgf·m, 69 in·lb)

- Apply the brake lever forcefully for a few seconds, and check for fluid leakage around the fittings.

★If necessary, bleed the air from the brake line (see Brake Line Air Bleeding).

⚠ WARNING

If the brake lever has a soft or "spongy feeling" when it is applied, there might be air in the brake line or the brake may be defective. Since it is dangerous to operate the vehicle under such conditions, bleed the air from the brake line immediately.

Brake Line Air Bleeding

- Bleed the air whenever brake parts are replaced or reassembled.
- Remove the reservoir cap and fill the reservoir with new brake fluid.
- Slowly pump the brake lever several times until no air bubbles can be seen rising up through the fluid from the hose at the bottom of the reservoir. This bleeds the air from the master cylinder and the brake line.

NOTE

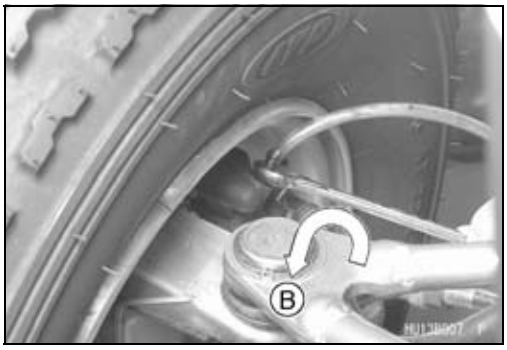
○ *Tap the brake hose lightly going from the caliper to the reservoir side and bleed the air off at the reservoir.*

Periodic Maintenance Procedures

- Attach a clear plastic hose to the bleed valve on the caliper, and run the other end of the hose into a container.
- Bleed the brake line and the caliper as follows:
  - Hold the brake lever applied [A].
  - Quickly open and close the valve [B].
  - Release the brake lever [C].
- The fluid level must be checked several times during the bleeding operation and replenished as necessary.

NOTE

- *If the fluid in the reservoir runs completely out any time during bleeding, the bleeding operation must be done over again from the beginning since air will have entered the line.*
- *If the brake lever action still feels soft or "spongy", tap the brake hose from bottom to top and air will rise up to the top part of the hose. Slowly pump the brake lever in the same manner as above.*



- Tighten:

Torque - Bleed Valves : 7.9 N·m (0.80 kgf·m, 69 in·lb)

- Apply the brake lever forcefully for a few seconds, and check for fluid leakage around the fittings.

Master Cylinder Inspection (Visual Inspection)

- Disassemble the master cylinder (see Brakes chapter).
- Check that there are no scratches, rust or pitting on the inner wall of the master cylinder [A] and on the outside of the piston [B].

★If the master cylinder or piston shows any damage, replace them.

- Inspect the primary [C] and secondary [D] cups.

★If a cup is worn, damaged, softened (rotted), or swollen, the piston assembly should be replaced to renew the cups.

★If fluid leakage is noted at the brake lever, the piston assembly should be replaced to renew the cups.

- Check the dust cover [E] for damage.

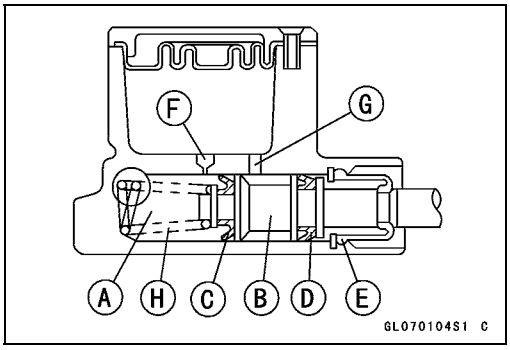
★If it is damaged, replace it.

- Check that the relief [F] and supply [G] ports are not plugged.

★If the relief port becomes plugged, the brake pads will drag on the disc. Blow the ports clean with compressed air.

- Check the piston return spring [H] for any damage.

★If the spring is damaged, replace it.



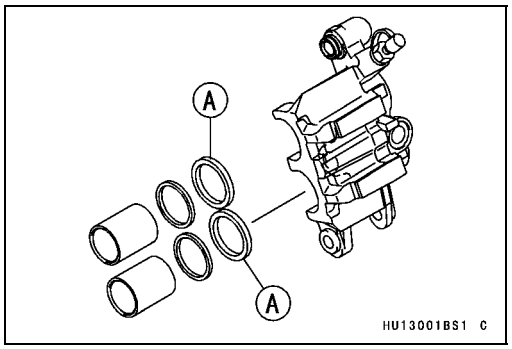
Periodic Maintenance Procedures

Caliper Fluid Seal Replacement

The fluid seals [A] around the piston maintain the proper pad/disc clearance. If the seals are not satisfactory, pad wear will increase, and constant pad drag on the disc will raise brake and brake fluid temperature.

- Disassemble the brake caliper (see Brakes chapter).
- Replace the fluid seals under any of the following conditions: (a) fluid leakage around the pad; (b) brakes overheat; (c) there is a large difference in inner and outer pad wear; (d) the seal is stuck to the piston.

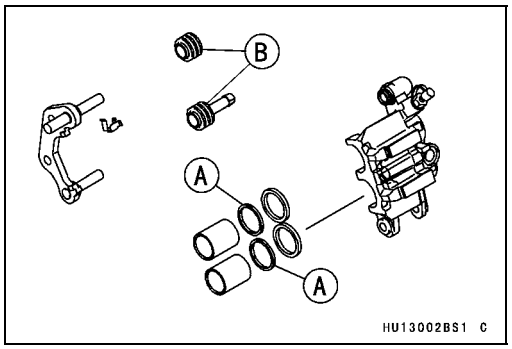
★If the fluid seal is replaced, replace the dust seal as well. Also, replace all seals every other time the pads are changed.



Caliper Dust Seal and Friction Boot Replacement

- Disassemble the brake caliper (see Brakes chapter).
- Check that the dust seals [A] and friction boots [B] are not cracked, worn swollen, or otherwise damaged.

★If they show any damage, replace them.



Rear Brake Plates Replacement

- Disassemble the internal wet brake (see Brakes chapter).
- Replace the steel pressure plates, steel plates and friction plates in accordance with the specified interval.

Rear Brake Lever Free Play Inspection

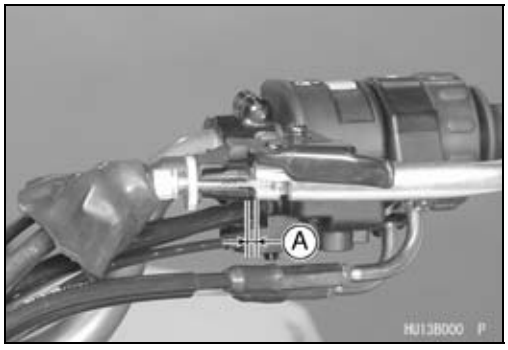
- Check the rear brake lever free play [A].

○ Pull the rear brake lever lightly until the brake is applied.

★If the play is incorrect, adjust it.

Rear Brake Lever Free Play

Standard: 1 ~ 2 mm (0.04 ~ 0.08 in.)



Rear Brake Pedal Free Play Inspection

- Check the brake pedal free play [A].

○ Depress the brake pedal lightly by hand until the brake is applied.

★If the free play is incorrect, adjust it.

Brake Pedal Free Play

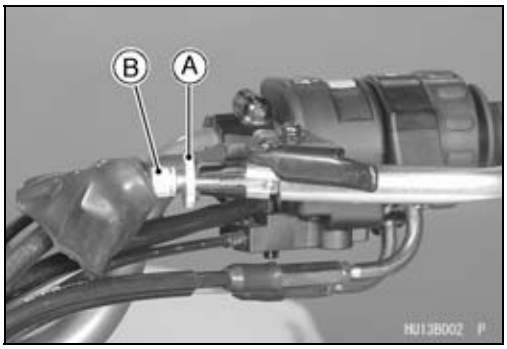
Standard: 15 ~ 25 mm (0.6 ~ 1.0 in.)

Periodic Maintenance Procedures

Rear Brake Lever and Pedal Free Play Adjustment

NOTE

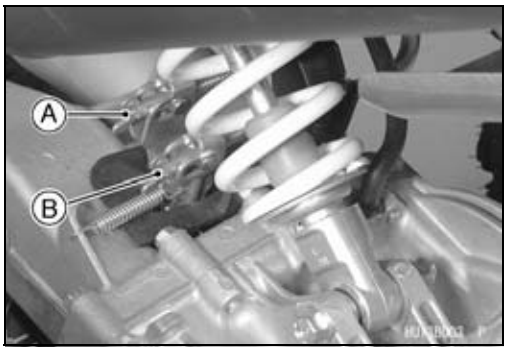
○ *Since the rear brake lever and pedal free play adjustments affect each other, make them at the same time.*



Rear Brake Lever:

- Loosen the knurled locknut [A] and turn the adjuster [B] at the rear brake lever in as far as it will go.
- Tighten the locknut.

- Turn the brake lever adjuster [A] at the rear end of the brake cable until the rear brake lever has the correct amount of play.



Brake Pedal:

- Turn the brake pedal adjuster [B] at the rear end of the brake cable until the brake pedal has the correct amount of play.

- Operate the pedal a few times to see that it returns to its rest position immediately upon release.
- Rotate the rear wheels to check for brake drag.
- Check braking effectiveness.

★If there is any doubt as to the conditions of the brake, check the brake parts for wear or damage.

Suspension

Knuckle Joint Inspection

- Visually inspect the boot [A] of knuckle joint.

★If damage, wear or deterioration is found, replace the knuckle joint.

Periodic Maintenance Procedures

Steering

Steering Inspection

- Turn the handlebar left and right, and check the steering action.

★If the steering action is not smooth, or if the steering binds or catches before the stop, lubricate the steering stem bearing.

NOTE

○ *The cables and wires will have some effect on the steering action which must be taken into account.*

- Check the steering action again.

★If steering stem bearing lubrication does not remedy the problem, inspect the steering stem for straightness, steering stem clamps, and tie-rod bearings.

★If you feel looseness, or if the steering rattles as it turns, check the tightness of the steering bolts and nuts.

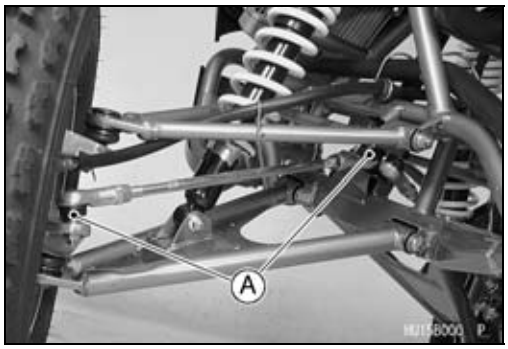
- Tighten loose bolts and nuts to the specified torque (see Steering chapter), and check the steering action again.

★If the steering action does not change by tightening the bolts and nuts, inspect the steering stem clamps, steering stem bearings, tie-rod bearings, and steering knuckle joints.

Tie Rod End Inspection

- Visually inspect the grease seal [A] of tie rod end.

★If damage, wear or deterioration is found, replace the tie rod end.



Periodic Maintenance Procedures

Electrical System

Spark Plug Cleaning / Inspection

- Remove the spark plug (see Electrical System chapter).
- Clean the spark plug, preferably in a sandblasting device, and then clean off any abrasive particles. The plug may also be cleaned using a wire brush or other suitable tool.

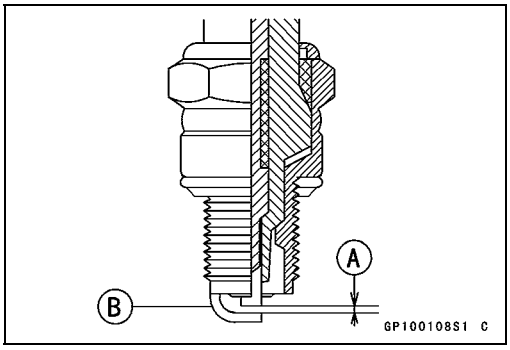
★If the spark plug electrodes are corroded or damaged, or if the insulator is cracked, replace the plug. Use the standard spark plug or its equivalent.

Spark Plug Gap Inspection

- Measure the gap [A] with a wire-type thickness gauge.

★If the gap is incorrect, carefully bend the side electrode [B] with a suitable tool to obtain the correct gap.

Spark Plug Gap
0.7 ~ 0.8 mm (0.028 ~ 0.031 in.)

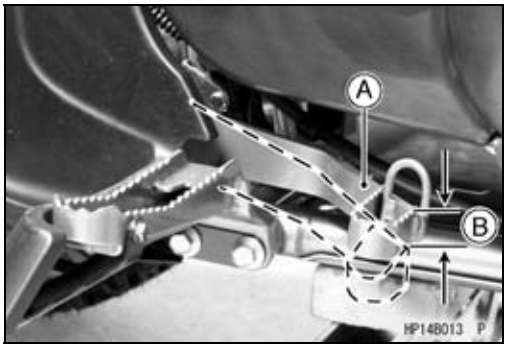


Brake Light Switch Inspection

- Turn on the ignition switch.
- Check the operation of the rear brake light switch by depressing the brake pedal [A].

★If it does not as specified, adjust the brake light timing.

Brake Light Timing
Standard: On after about 10 mm (0.4 in.) of pedal travel [B]

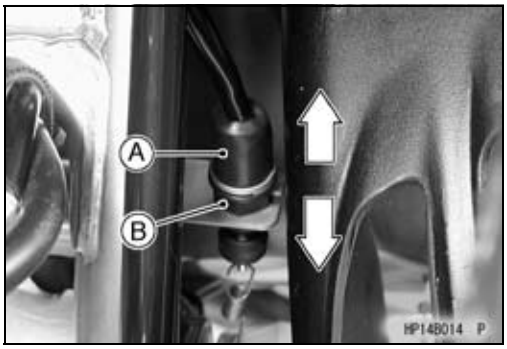


Brake Light Timing Adjustment

- Remove the foot guard (see Frame chapter).
- Adjust the brake light switch [A] up or down. To change the switch position, turn the adjusting nut [B].

CAUTION

To avoid damaging the electrical connections inside the switch, be sure that the switch body does not turn during adjustment.



General Lubrication

Lubrication

- Before lubricating each part, clean off any rusty spots with rust remover and wipe off any grease, oil, dirt, or grime.
- Lubricate the points listed below with indicated lubricant.

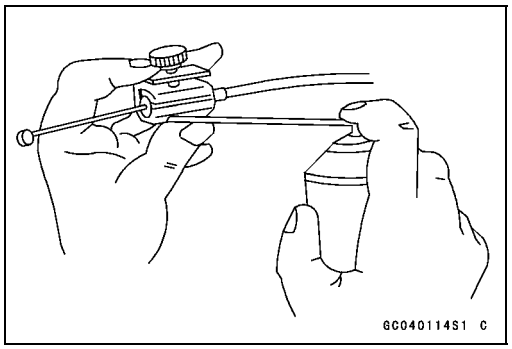
NOTE

○ *Whenever the vehicle has been operated under wet or rainy conditions, or especially after using a high-pressure spray water, perform the general lubrication.*

Periodic Maintenance Procedures

Cables: Lubricate with Cable Lubricant

Brake Cables
Throttle Cable
Choke Cable
Shift Control Cables

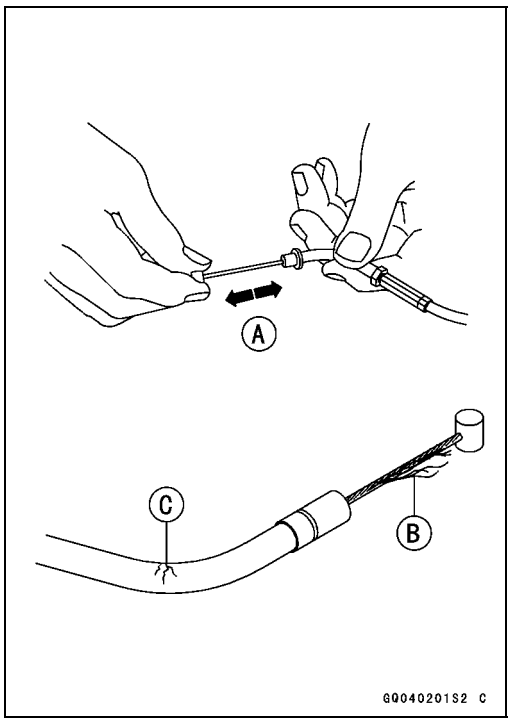


- Lubricate the cables by seeping the oil between the cable and housing.

○ The cable may be lubricated by using a pressure cable lubber with an aerosol cable lubricant.

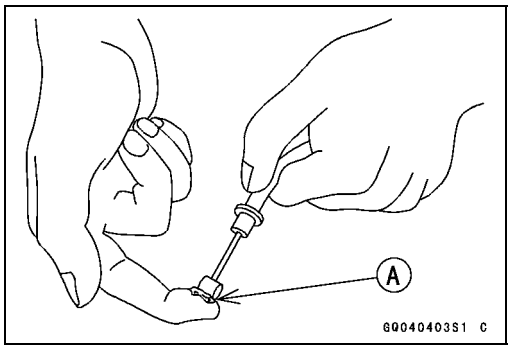
- With the cable disconnected at the both ends, the cable should move freely [A] within the cable housing.

★If cable movement is not free after lubricating, if the cable is frayed [B], or if the cable housing is kinked [C], replace the cable.



Points: Lubricate with Grease.

Throttle Inner Cable Ends [A]
Choke Cable Lower End
Brake Cable Ends
Shift Control Cable Upper Ends



Slide Points: Lubricate with Grease.

Brake Lever
Brake Pedal Pivot Shaft
Throttle Lever Shaft

Periodic Maintenance Procedures

Bolts and Nuts Tightening

Tightness Inspection

- Check the tightness of the bolts and nuts listed here in accordance with the Periodic Maintenance Chart. Also, check to see that each cotter pin is in place and in good condition.

★If there are loose fasteners, retorque them to the specified torque following the specified tightening sequence. Refer to the appropriate chapter for torque specifications. If torque specifications are not listed in the appropriate chapter, see the Basic Torque Table (see Torque and Locking Agent). For each fastener, first loosen it by 1/2 turn, then tighten it.

★If cotter pins are damaged, replace them with new ones.

Bolts, Nuts, and Fasteners to be checked

Wheels:
Front Axle Nuts and Cotter Pins
Rear Axle Nuts and Cotter Pins
Wheel Nuts

Brakes:
Front Brake Master Cylinder Clamp Bolts
Brake Lever Pivot Bolt
Brake Lever Pivot Nut
Front Brake Caliper Mounting Bolts
Brake Pedal Cotter Pin

Steering/Suspension:
Handlebar Clamp Bolts
Stem Clamp Bolts
Stem Bearing Housing Bolts
Tie-Rod End Nuts and Cotter Pins
Tie-Rod Adjusting Sleeve Locknuts
Shock Absorber Mounting Bolts and Nuts
Suspension Arm Pivot Bolts

Engine:
Engine Mounting Bolts
Engine Mounting Bracket Bolts
Exhaust Pipe Holder Nuts
Muffler Mounting Bolts
Muffler Clamp Bolt

Others:
Footrest Mounting Bolts
Throttle Mounting Bolts

Fuel System

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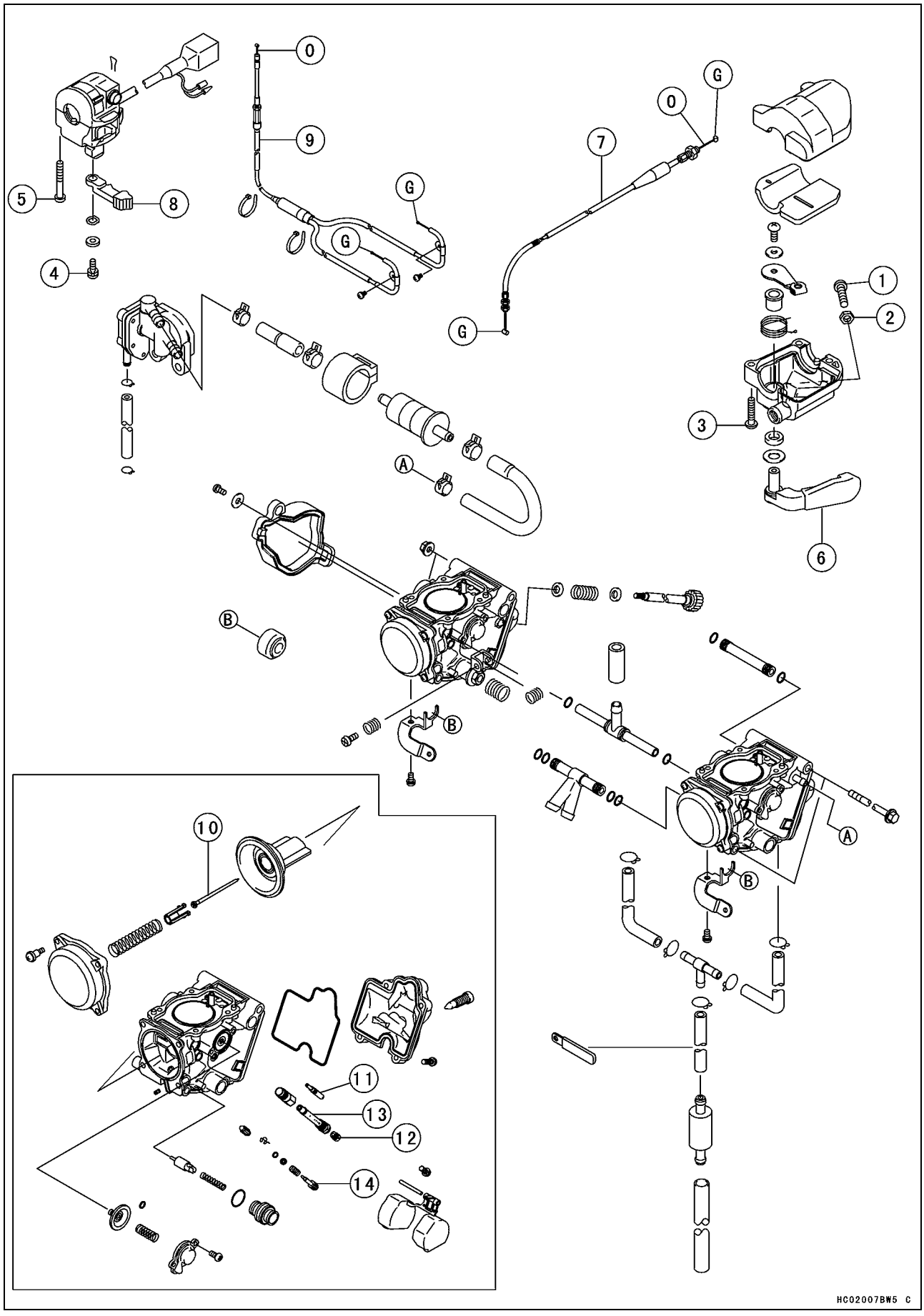
Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Throttle Limiter Screw	3.7	0.38	33 in·lb	
2	Throttle Limiter Locknut	3.7	0.38	33 in·lb	
3	Throttle Case Assembly Screws	3.7	0.38	33 in·lb	
4	Choke Lever Mounting Screw	3.5	0.36	31 in·lb	
5	Left Handlebar Switches Assembly Screws	3.5	0.36	31 in·lb	

6. Throttle Lever
7. Throttle Cable
8. Choke Lever
9. Choke Cable
10. Jet Needle
11. Pilot Jet
12. Main Jet
13. Needle Jet
14. Pilot Screw

O: Apply engine oil.
G: Apply grease.