MODEL APPLICATION

Year	Model	Beginning Frame No.
1996	VN800-B1	JKBVNCB1□TA030001, VN800A-030001, or VN800B-000001 (Germany)
1997	VN800-B2	JKBVNCB1□VA050001, VN800A-050001, or VN800B-005001 (Germany)
1998	VN800-B3	JKBVNCB1□WA063001, JKBVNCB1□WB500005, VN800A-063001, or VN800B-008001 (Germany)
1999	VN800-B4	JKBVNCB1□XA075001, JKBVNCB1□XB502701, or JKBVN800ABA075001
2000	VN800-B5	JKBVN800ABA083001, JKBVNCB1□YA083001, or JKBVNCB1□YB506101
2001	VN800-B6	JKBVNCB1□IA089001, JKBVNCB1□IB509801, JKBVNCB1□IB089001, or JKBVN800ABA089001
2002	VN800-B7	JKBVNCB1□2A095001, JKBVNCB1□2B095001, or JKBVN800ABA095001,

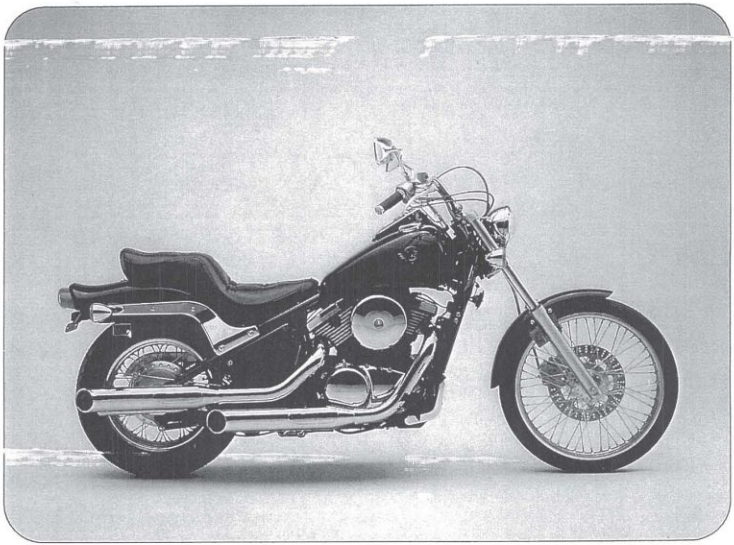
□ : This digit in the frame number changes from one machine to another.

Kawasaki

Part No. 99924-1199-56

Kawasaki

VULCAN 800
VN800



95-04

Motorcycle
Service Manual

Quick Reference Guide

Kawasaki

VULCAN 800
VN800

Motorcycle
Service Manual

LIST OF ABBREVIATIONS

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

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 Motorcycle parts. Special tools, gauges, and testers that are necessary when servicing Kawasaki motorcycles 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 divited 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

Before Servicing

Before starting to perform an inspection service or carry out a disassembly and reassembly operation on a motorcycle, 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 motorcycle. Any dirt entering the engine will shorten the life of the motorcycle. 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 motorcycle. 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.

(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.

Before Servicing

(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 motorcycle 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

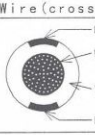
When there is a replacement instruction, replace these parts with new ones every time they are removed.

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.

Two-Color Electrical

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

Before Servicing

(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.

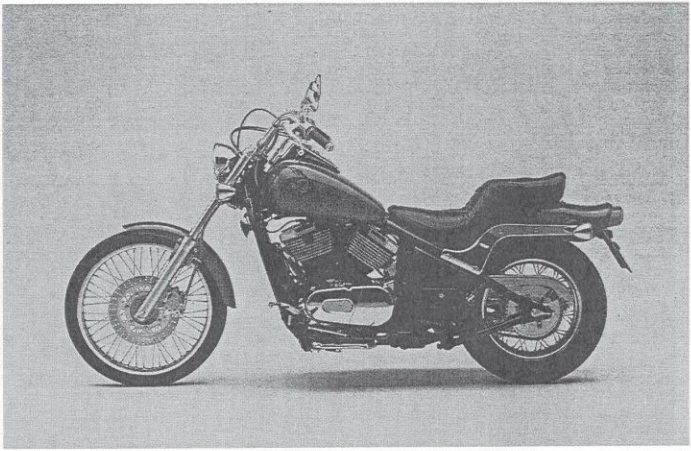
Model Identification

VN800-A1 (US and Canada Models) Left Side View:

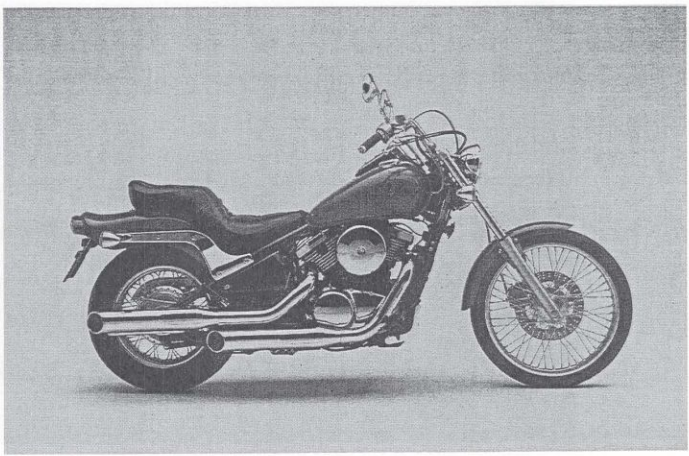
VN800-A1 (US and Canada Models) Right Side View:

Model Identification

VN800-A1 (Europe Model) Left Side View:



VN800-A1 (Europe Model) Right Side View:



General Specifications

Items		VN800-A1, A2, A3, A4, A5
Dimensions:		
Overall length		2 370 mm, (CN)(US) 2 360 mm
Overall width		825 mm
Overall height		1 170 mm
Wheelbase		1 625 mm
Road clearance		160 mm
Seat height		710 mm
Dry mass		225 kg, (CA) 225.5 kg
Curb mass:	Front	107 kg
	Rear	137 kg, (CA) 137.5 kg
Fuel tank capacity		15.0 L
Performance:		
Minimum turning radius		2.9 m
Engine:		
Type		4-stroke, SOHC, V 2-cylinder
Cooling system		Liquid-cooled
Bore and stroke		88.0 x 66.2 mm
Displacement		805 mL
Compression ratio		9.5
Maximum horsepower		40.5 kW (55 PS) @7 000 r/min (rpm), (CN) 44.1 kW (60 PS) @7 500 r/min (rpm), (ST) 24.2 kW (33 PS) @3 000 r/min(rpm), (FR) 39.3 kW (53 PS) @7 000 r/min (rpm) (UTAC's norm), (US) ---
Maximum torque		64 N-m (6.5 kg-m, 47.0 ft-lb) @3 300 r/min(rpm), (CN) 64.7 N-m (6.6 kg-m, 47.7 ft-lb) @3 500 r/min (rpm), (ST) 55 N-m (5.6 kg-m, 40.5 ft-lb) @3 000 r/min (rpm), (FR)(UK)(US) ---
Carburetion system		Carburetor, Keihin CVK 36
Starting system		Electric starter
Ignition system		Battery and coil (transistorized)
Timing advance		Electronically advanced(digital igniter)
Ignition timing		From 5.0° BTDC @1 000 r/min (rpm) to 37.5° BTDC @6 750 r/min (rpm)
Spark plug		NGK CR7E or ND U22ESR-N
Cylinder numbering method		Front to rear, 1-2
Firing order		1-2
Valve timing:		
Inlet	Open	22° BTDC, A2 ~ 19° BTC
	Close	78° ABDC, 71° ABDC
	Duration	280°, 270°
Exhaust	Open	72° BBDC, A2 ~ 69° BBDC
	Close	28° ATDC, 31° ATDC
	Duration	280°, 280°

General Specifications

Items		VN800-A1, A2	VN800-A3,A4,A5
Lubrication system		Forced lubrication (wet sump)	—
Engine oil:			
Grade		SE, SF or SG class	—
Viscosity		SAE10W-40, 10W-50, 20W-40, or 20W-50	—
Capacity		3.2 L	—
Drive Train:			
Primary reduction system:			
Type		Gear	—
Reduction ratio		2.184 (83/38)	—
Clutch type		Wet multi disc	—
Transmission:			
Type		5-speed, constant mesh, return shift	—
Gear ratios:	1st	2.250 (36/16)	2.533 (38/15)
	2nd	1.600 (32/20)	1.650 (33/20)
	3rd	1.230 (32/26)	1.230 (32/26)
	4th	1.000 (29/29)	1.000 (29/29)
	5th	0.857 (24/28)	0.857 (24/28)
Final drive system:			
Type		Chain drive	—
Reduction ratio		2.875 (46/16)	2.470 (42/17)
Overall drive ratio		5.382 @Top gear	4.625 @ Top gear
Frame:			
Type		Tubular, double cradle	—
Caster (rake angle)		34°	—
Trail		149 mm	—
Front tire:	Type	Tube	—
	Size	80/90-21 48H	—
Rear tire:	Type	Tube	—
	Size	140/90-16 71H	—
Front suspension:	Type	Telescopic fork	—
	Wheel travel	150 mm	—
Rear suspension:	Type	Swingarm (uni-trak)	—
	Wheel travel	100 mm	—
Brake Type:	Front	Single disc	—
	Rear	Drum	—
Electrical Equipment:			
Battery		12 V 12 Ah	—
Headlight:	Type	Semi-sealed beam	—
	Bulb	12 V 60/55 W (quartz-halogen)	—
Tail/brake light		12 V 5/21 W × 2, (CN) (US) 12 V 8/27 W × 2	—
Alternator:	Type	Three-phase AC	—
	Rated output	23.5 A/14 V @8 000 r/min (rpm)	—

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

(CA): California Model
(CN): Canada Model
(FR): France Model
(ST): Switzerland Model
(UK): U.K. Model
(US): U.S. Model

Periodic Maintenance Chart

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

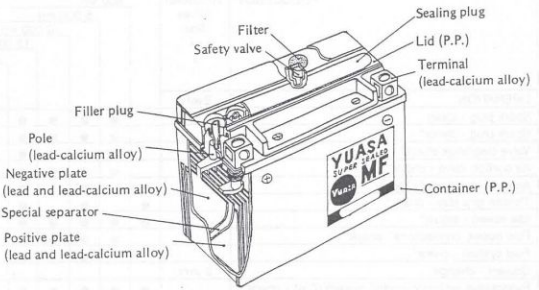
FREQUENCY	Whichever comes first → ↓	† ODOMETER READING						
		800 km	5 000 km	10 000 km	15 000 km	20 000 km	25 000 km	30 000 km
OPERATION	Every							
Spark plug - clean			●	●	●	●	●	●
Spark plug - check*			●	●	●	●	●	●
Valve clearance check*				●		●		●
Air suction valve - check*			●	●	●	●	●	●
Air cleaner element - clean		●		●		●		●
Throttle grip play - check*		●		●		●		●
Idle speed - adjust*		●	●	●	●	●	●	●
Fuel hoses, connections - check*			●	●	●	●	●	●
Fuel system - check*				●		●		●
Coolant - change	2 yers							●
Evaporative emission control system (Cal) - check*		●	●	●	●	●	●	●
Engine oil - change	year	●	●	●	●	●	●	●
Oil filter - replace		●		●		●		●
Oil screen - clean		●		●		●		●
Radiator hoses, connections - check *	year	●		●		●		●
Fuel hose - replace	4 years							
Clutch - adjust		●	●	●	●	●	●	●
Drive chain wear - check *			●	●	●	●	●	●
Drive chain - lubricate	300 mm							
Drive chain slack - check*	800 km							
Brake lining or pad wear - check*			●	●	●	●	●	●
Brake fluid level - check*	month	●	●	●	●	●	●	●
Brake fluid - change	2 years					●		
Brake hoses, connections - check*			●	●	●	●	●	●
Brake hose - replace	4 year							
Brake master cylinder cup and dust seal - replace	2 years							
Caliper piston seal and dust seal - replace	2 years							
Brake play - check*		●	●	●	●	●	●	●
Brake light switch - check*		●	●	●	●	●	●	●
Brake camshaft - lubricate	2 years							
Brake cable - replace*	2 years							
Steering - check		●	●	●	●	●	●	●
Steering stem bearing - lubricate	2 years					●		
Front fork oil - change								●
Tire wear - check*			●	●	●	●	●	●
Spoke tightness and rim runout - check*		●	●	●	●	●	●	●
Swingarm pivot, uni-trak linkage - lubricate				●		●		●
General lubrication - perform			●	●	●	●	●	●
Nuts, bolts, and fastener tightness - check*		●		●		●		●

† : For higher odometer readings, repeat at the frequency interval established here.
* : Replace, add, adjust, clean, or torque if necessary.
(Cal) : California Model only

Technical Information - Sealed Battery

A sealed battery is installed in this model. The battery is a sealed type, and so cannot be performed the electrolyte level check and topping-up.

(I) Construction



(II) Main Features

1) Maintenance free..... It is not necessary to check the electrolyte level and top-up the electrolyte.
2) No electrolyte leakage..... As the electrolyte is retained firmly in the special separators, there is no free electrolyte in the battery.
3) Instant activation system..... It can be used instantly after filling only the electrolyte without initial charge.
4) One-push motion electrolyte filling..... It is possible to fill the electrolyte by easy one-push motion.
5) Safety construction ..... If the battery internal pressure rises abnormally high, the safety valve opens to release the gas inside the battery to restore the normal pressure and prevent the battery from rupturing. After restoring the normal pressure, the safety valve closes and the battery is sealed again. Moreover, a ceramic filter is disposed on top of the safety valve under the lid to remove risk of ignition or explosion caused by fire from outside.
6) Compact and high performance..... No presence of free electrolyte allows the battery made lower in height, thus resulting in enhanced volume efficiency. Moreover, gas being absorbed inside the battery eliminates the need for a gas exhaust tube.
7) Strong charge/discharge characteristics .... It can amply withstand deep charge/discharge cycles.

(III) Principle of Sealing Structure

A lead-acid battery operates under the following chemical reaction:

(+)				(−)	Discharge	(+)				(−)
PbO_2	+	$2H_2SO_4$	+	Pb	⇄	$PbSO_4$	+	$2H_2O$	+	$PbSO_4$
(Lead peroxide) Positive active material		(Sulfuric acid) Electrolyte		(Spongy lead) Negative active material	Charge	(Lead sulfate) Positive active material		(water) Electrolyte		(Lead sulfate) Negative active material

Normally in an ordinary lead-acid battery when it comes to an end of a charge, where the lead sulfate being a discharge product returns to lead peroxide and spongy lead, the charge current flowing thereafter is used exclusively to decompose electrolytically water from the electrolyte, thus resulting in generation of hydrogen gas from the negative plate and oxygen gas from the positive plate. The gases so generated are released out of the battery, causing the amount of electrolyte decreased to require occasional water replenishment.

A maintenance free battery, however, is so designed that, when it is overcharged, even if the positive plate is fully charged, the negative plate remains not fully turned to spongy lead. Therefore, even when the positive plate is overcharged generating oxygen gas, the negative plate is no fully charged, hence generating no hydrogen gas.

Moreover, the oxygen gas generated from the positive plate immediately reacts with the charged active material on the negative plate, and returns to water, with the ultimate result of no water loss.

Technical Information - Sealed Battery

Pb Negative active material (charged state)	+	1/2 O_2 Oxygen generated from positive plate	→	(PbO) Negative active material		
(PbO)	+	H_2SO_4 Electrolyte	→	$PbSO_4$ Negative active material (charged state)	+	H_2O Water

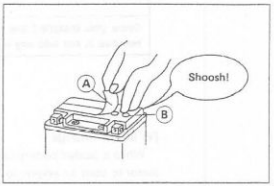
Thus, the negative plate is made as not to get fully charged. Even if the overcharge continues, the oxygen gas generated inside the battery is absorbed by the negative plate, a process called oxygen cycle, which keeps water loss theoretically at nil, and allows the battery to be sealed.

(IV) Filling the Battery with Electrolyte

CAUTION

Do not remove the aluminum seal sheet sealing the filler ports until just before use.
Be sure to use the dedicated electrolyte container for correct electrolyte volume.

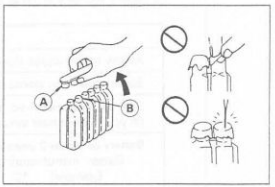
- Check to see that there is no peeling, tears or holes in the sealing sheet.
- Place the battery on a level surface.
- Remove the sealing sheet [A].
- ○ When removing, check to hear an air-sucking sound "Shoosh!" from filler ports [B].



NOTE

○ *A battery whose sealing sheet has any peeling, tears, holes, or from which the air-sucking sound was not heard requires a refreshing charge (initial charge).*

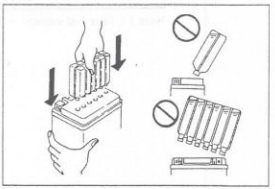
- Take the electrolyte container out of the vinyl bag.
- Detach the strip of caps [A] from the container.



NOTE

○ *Do not discard the strip of caps because it is used as the battery plugs later.*
○ *Do not peel back or pierce the sealed areas [B].*

- Place the electrolyte container upside down with the six sealed areas in line with the six battery filler ports.
- Push the container down strongly enough to break the seals. Now the electrolyte should start to flow into the battery.

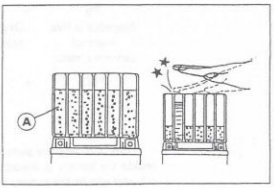


NOTE

○ *Do not tilt the container as the electrolyte flow may be interrupted.*

Technical Information - Sealed Battery

● Make sure air bubbles [A] are coming up from all six filler ports.
○ Leave the container this way for 5 minutes or longer.

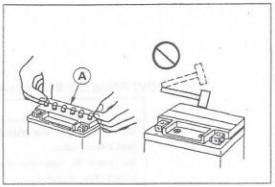


NOTE

○ *If no air bubbles are coming up from a filler port, tap the bottom of the bottle two or three times. Never remove the container from the battery.*

CAUTION
Fill until the container is completely emptied.

● Be certain that all the electrolyte has flowed out.
● Tap the bottom the same way as above if there is any electrolyte left in the container.
● Now pull the container gently out of the battery.
● Let the battery sit for **20** minutes. During this time, the electrolyte permeates the special separators and the gas generated by chemical reaction is released.
● Fit the strip of caps [A] tightly into the filler ports until the strip is at the same level as the top of the battery.



NOTE

○ *Do not hammer. Press down evenly with both hands.*

CAUTION
Once you installed the strip of caps after filling the battery, never remove it, nor add any water or electrolyte.

(V) Initial Change

While a sealed battery can be used after only filling with electrolyte, a battery may not be able to sufficiently move a starter motor to start an engine in the cases shown in the table below, where an initial change is required before use. However, if a battery shows a terminal voltage of higher than 12.6 V after 10 minutes of filling (Note 1), no initial change is necessary.

Condition requiring initial charge	Charging method
At low temperatures (lower than 0°C)	1.4 A x 2 ~ 3 hours
Battery has been stored in high temperature and humidity.	1.4 A x 15 ~ 20 hours
Seal has been removed, or broken – peeling, tear or hole. (If you did not hear the air-sucking sound "Shoosh!" as you removed the seal.)	
Battery as old as 2 years or more after manufacture. Battery manufacturing date is printed on battery top. Example) 12 (Day) 10 (Month) 93 (Year) T1 (Mfg. location)	

Note 1 : Terminal voltage – To measure battery terminal voltage, use a digital voltmeter.

Technical Information - Sealed Battery

(VI) Precautions

1) No need of topping-up
   No topping-up is necessary in this battery until it ends its life under normal use. Forcibly prying off the sealing plug to add water is very dangerous. Never do that.
2) Refreshing charge
   If an engine will not start, a horn sounds weak, or lamps are dim, it indicates the battery has been discharged. Give refresh charge for 5 to 10 hours with charge current shown in the specification (see the Electrical System chapter). When a fast charge is inevitably required, do it following precisely the maximum charge current and time conditions indicated on the battery.

CAUTION

This battery is designed to sustain no unusual deterioration if refresh-charged according to the method specified above. However, the battery's performance may be reduced noticeably if charged under conditions other than given above. Never remove the sealing plug during refresh charge.
If by chance an excessive amount of gas is generated due to overcharging, the safety valve operates to keep the battery safe.

3) When you do not use the motorcycle for months
   Give a refresh charge before you store the motorcycle and store it with the negative lead removed. Give a refresh charge once a month during storage.
4) Battery life
   If the battery will not start the engine even after several refresh charges, the battery has exceeded its useful life. Replace it. (Provided, however, the vehicle's starting system has no problem.)

⚠WARNING

Keep the battery away from sparks and open flames during charging, since the battery gives off an explosive gas mixture of hydrogen and oxygen. When using a battery charger, connect the battery to the charger before turning on the charger. This procedure prevents sparks at the battery terminals which could ignite any battery gases.
No fire should be drawn near the battery, or no terminals should have the tightening loosened.
The electrolyte contains sulfuric acid. Be careful not to have it touch your skin or eyes. If touched, wash it off with liberal amount of water. Get medical attention if severe.

(VII) Interchangeability with Ordinary Battery

A sealed battery can fully display its performance only when combined with a proper vehicle electric system. Therefore, replace a sealed battery only on a motorcycle which was originally equipped with a sealed battery.

Be careful, if a sealed battery is installed on a motorcycle which had an ordinary battery as original equipment, the sealed battery's life will be shortened.

Torque and Locking Agent

The following tables list the tightening torque for the major fasteners 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 to the threads.
O: Apply an oil to the threads, seated surface, or washer.
S: Tighten the fasteners following the specified sequence.
SS: Apply silicone sealant.

Fastener	Torque			Remarks
	N·m	kg·m	ft·lb	
Fuel System:				
Carburetor damper plate mounting bolts	11	1.1	95 in·lb	
Air cleaner element cover mounting nut	11	1.1	95 in·lb	
Air cleaner housing mounting bolts	11	1.1	95 in·lb	
Cooling System				
Water pump impeller nut	11	1.1	95 in·lb	
Water hose fitting bolts	11	1.1	95 in·lb	
Radiator fan switch	18	1.8	13.0	SS
Water temperature sensor	7.8	0.80	69 in·lb	SS
Coolant drain plug	11	1.1	95 in·lb	
Engine Top End:				
Cylinder head cover bolts	12	1.2	104 in·lb	
Cylinder head nuts: 10 mm	39	4.0	29	S
8 mm	25	2.5	18.0	S
Cylinder head bolts	12	1.2	104 in·lb	S
Cylinder nuts	25	2.5	18.0	
Camshaft cap bolts	25	2.5	18.0	
Camshaft sprocket bolts	49	5.0	36	L
Camshaft chain tensioner cap bolts	20	2.0	14.5	
Camshaft chain guide bolts	11	1.1	95 in·lb	L
Intake manifold bolts	12	1.2	104 in·lb	
Cylinder head cover damper plate bolts	12	1.2	104 in·lb	L, S
Clutch:				
Clutch hub nut	132	13.5	98	O
Clutch spring bolts	8.8	0.90	78 in·lb	
Right engine cover bolts	12	1.2	104 in·lb	L (1)
Engine Lubrication System:				
Engine drain plug	20	2.0	14.5	
Oil pump mounting bolts	11	1.1	95 in·lb	L
Oil pump drive chain guide bolt	12	1.2	104 in·lb	L
Oil filter	18	1.8	13.0	
Oil filter plate mounting bolts	7.8	0.80	69 in·lb	
Oil screen plug	20	2.0	14.5	
Oil pressure relief valve	15	1.5	11.0	L
Oil pressure switch	15	1.5	11.0	SS
Oil pressure switch adapter	20	2.0	14.5	
Oil pipe mounting bolts (crankcase inside)	11	1.1	95 in·lb	L
Oil pipe mounting bolts (crankcase outside)	5.4	0.55	48 in·lb	L
Oil passage cover screw (crankcase inside)	5.4	0.55	48 in·lb	L

Torque and Locking Agent

Engine Removal/Installation:					
Engine mounting nuts		44	4.5	33	
Engine mounting bracket bolts		23	2.3	16.5	
Down tube mounting bolts		44	4.5	33	
Crankshaft/Transmission:					
Crankcase bolts:	10 mm	39	4.0	29	S
	6 mm	11	1.1	95 in·lb	
Connecting rod big end cap nuts		46	4.7	34	
Primary gear bolt		157	16.0	115	O
Balancer gear bolt		69	7.0	51	L
Starter clutch gear bolt		69	7.0	51	L
Starter clutch bolts		34	3.5	25	L
Output shaft bearing stopper bolts		12	1.2	104 in·lb	
Balancer shaft bearing stopper bolts		11	1.1	95 in·lb	
Shift drum bearing stopper bolts		11	1.1	95 in·lb	
Transmission cover bolts		11	1.1	95 in·lb	
External shift mechanism cover bolts		11	1.1	95 in·lb	
Shift shaft return spring pin		29	3.0	22	L
Shift drum position lever bolt		11	1.1	95 in·lb	
Neutral switch		15	1.5	11.0	
Shift pedal pivot bolt		29	3.0	22	
Shift pedal pivot nut		29	3.0	22	
Shift drum cam mounting screw		–	–	–	L
Shift lever camp bolt		12	1.2	104 in·lb	
Wheels/Tires:					
Front axle clamp bolt		34	3.5	25	
Front axle nut		88	9.0	65	
Rear axle nut		98	10.0	72	
Spoke nipples		4.0	0.41	36 in·lb	
Final Drive:					
Engine sprocket nut		127	13.0	94	O
Rear sprocket nuts		74	7.5	54	
Rear sprocket stud bolts		–	–	–	L
Brakes:					
Torque link nuts		34	3.5	25	
Caliper mounting bolts		34	35.	25	
Disk mounting bolts		23	2.3	16.5	
Brake hose banjo bolts		25	2.5	18.0	
Bleed valve		7.8	0.80	69 in·lb	
Brake pedal bolt		23	2.3	16.5	
Master cylinder clamp bolts		11	1.1	95 in·lb	
Brake lever pivot bolt		1.0	0.10	9 in·lb	
Brake lever pivot nut		5.9	0.60	52 in·lb	
Reservoir cap screw		1.5	0.15	13 in·lb	
Front brake light switch screws		1.2	0.12	10 in·lb	
Suspension:					
Front fork clamp bolts:	upper	20	2.0	14.5	
	lower	34	3.5	25	
Front fork bottom Allen bolts		20	2.0	14.5	L
Rear shock absorber nuts		59	6.0	43	
Swingarm pivot shaft nut		98	10.0	72	

Torque and Locking Agent

Rocker arm pivot shaft nut	98	10.0	72	
Tie-rod nuts	59	6.0	43	
Steering:				
Handlebar clamp bolts	34	3.5	25	
Handlebar holder mounting nuts	34	3.5	25	
Handlebar weight mounting screws	–	–	–	L
Steering stem head bolt	44	4.5	33	
Steering stem nut	4.9	0.50	43 in·lb	
Frame:				
Rear frame mounting bolts	44	4.5	33	
Side stand pivot bolt	44	4.5	33	
Helmet hook mounting screw	–	–	–	L
Electrical System:				
Alternator cover bolts	12	1.2	104 in·lb	L (1)
Timing inspection cover screw	4.9	0.50	43 in·lb	
Alternator rotor bolt	157	16.0	115	O
Stator coil bolts	13	1.3	113 in·lb	
Pickup coil bolts	2.9	0.30	26 in·lb	
Alternator lead clamp bolts	7.8	0.80	69 in·lb	
Spark plugs	18	1.8	13.0	
Starter motor mounting bolts	11	1.1	95 in·lb	
Starter motor through bolts	4.9	0.50	43 in·lb	
Starter motor terminal nut	11	1.1	95 in·lb	
Starter motor cable nuts	4.9	0.50	43 in·lb	
Side stand switch mounting bolts	3.9	0.40	35 in·lb	L

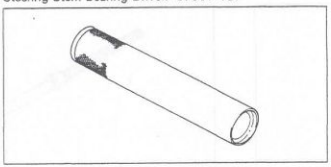
The table, reading tightening torque to thread diameter, lists the basic torque for the bolts and nuts. Use this table for only the bolts and nuts which do not require a specific torque value. All of the values are for use with dry solvent-cleaned threads.

Basic Torque for General Fasteners of Frame Parts

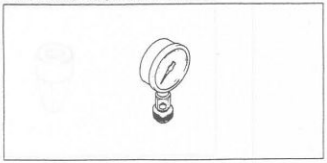
Threads dia.	Torque		
mm	N·m	kg·m	ft·lb
5	3.4 ~ 4.9	0.35 ~ 0.50	30 ~ 43 in·lb
6	5.9 ~ 7.8	0.60 ~ 0.80	52 ~ 69 in·lb
8	14 ~ 19	1.4 ~ 1.9	10.0 ~ 13.5
10	25 ~ 34	2.6 ~ 3.5	19 ~ 25
12	44 ~ 61	4.5 ~ 6.2	33 ~ 45
14	73 ~ 98	7.4 ~ 10.0	54 ~ 72
16	115 ~ 155	11.5 ~ 16.0	83 ~ 115
18	165 ~ 225	17 ~ 23	125 ~ 165
20	225 ~ 325	23 ~ 33	165 ~ 240

Special Tools and Sealant

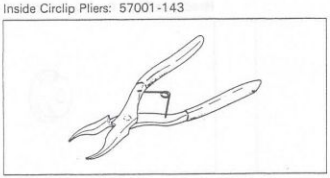
Steering Stem Bearing Driver: 57001-137



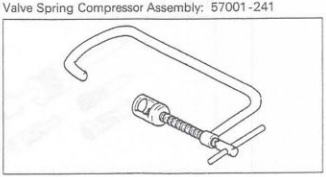
Compression Gauge: 57001-221



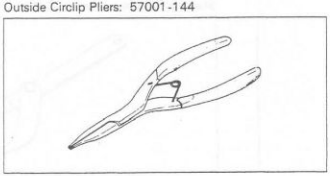
Inside Circlip Pliers: 57001-143



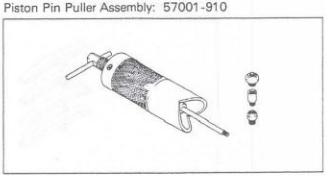
Valve Spring Compressor Assembly: 57001-241



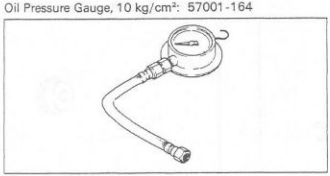
Outside Circlip Pliers: 57001-144



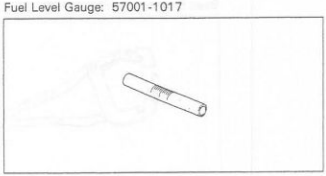
Piston Pin Puller Assembly: 57001-910



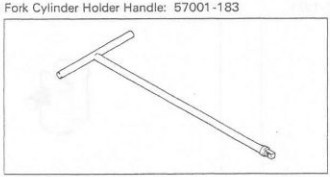
Oil Pressure Gauge, 10 kg/cm²: 57001-164



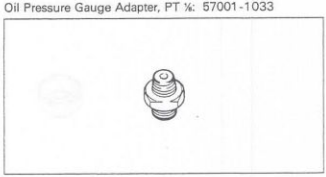
Fuel Level Gauge: 57001-1017



Fork Cylinder Holder Handle: 57001-183

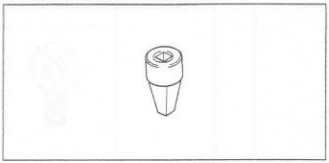


Oil Pressure Gauge Adapter, PT ⅛: 57001-1033

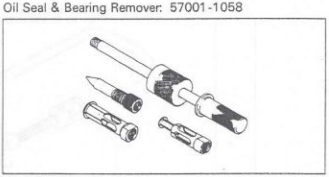


Special Tools and Sealant

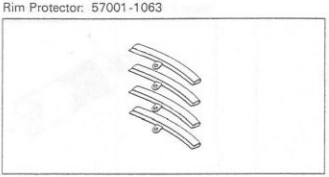
Fork Cylinder Holder Adapter: 57001-1057



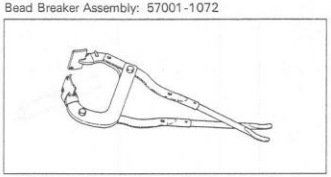
Oil Seal & Bearing Remover: 57001-1058



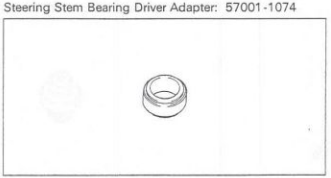
Rim Protector: 57001-1063



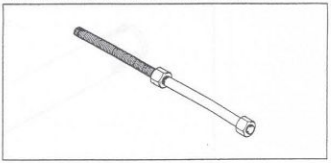
Bead Breaker Assembly: 57001-1072



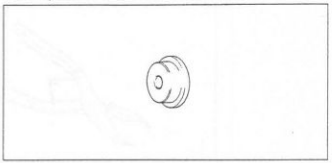
Steering Stem Bearing Driver Adapter: 57001-1074



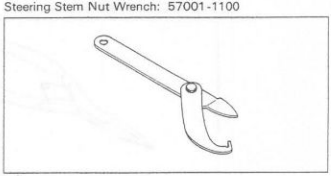
Head Pipe Outer Race Press Shaft: 57001-1075



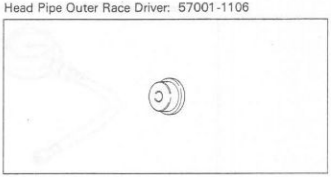
Head Pipe Outer Race Driver: 57001-1076



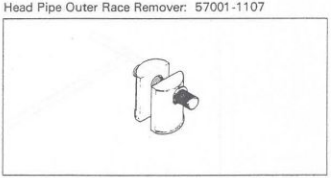
Steering Stem Nut Wrench: 57001-1100



Head Pipe Outer Race Driver: 57001-1106

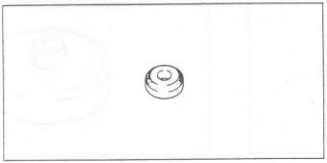


Head Pipe Outer Race Remover: 57001-1107

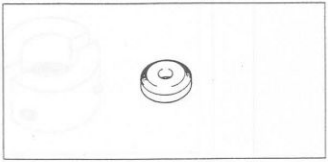


Special Tools and Sealant

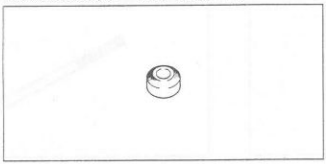
Valve Seat Cutter, 45° – Φ32: 57001-1115



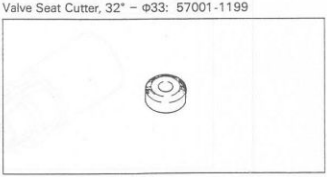
Valve Seat Cutter, 45° – Φ30: 57001-1187



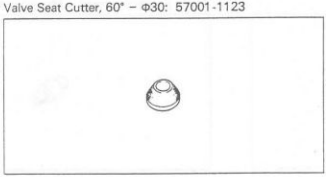
Valve Seat Cutter, 32° – Φ28: 57001-1119



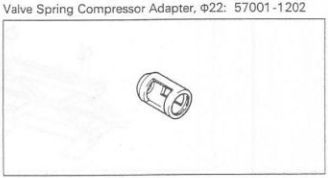
Valve Seat Cutter, 32° – Φ33: 57001-1199



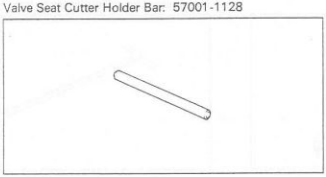
Valve Seat Cutter, 60° – Φ30: 57001-1123



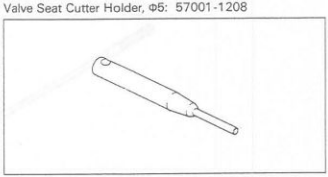
Valve Spring Compressor Adapter, Φ22: 57001-1202



Valve Seat Cutter Holder Bar: 57001-1128

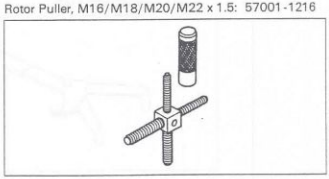


Valve Seat Cutter Holder, Φ5: 57001-1208



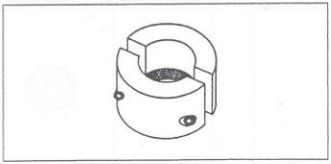
Bearing Driver Set: 57001-1129

Rotor Puller, M16/M18/M20/M22 x 1.5: 57001-1216

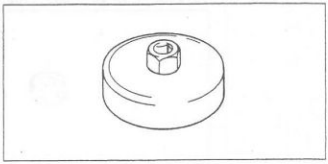


Special Tools and Sealant

Fork Outer Tube Weight: 57001-1218



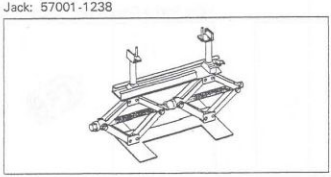
Oil Filter Wrench: 57001-1249



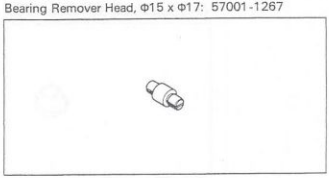
Front Fork Oil Seal Driver: 57001-1219

Bearing Remover Shaft: 57001-1265

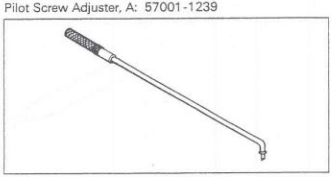
Jack: 57001-1238



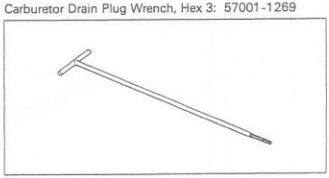
Bearing Remover Head, Φ15 x Φ17: 57001-1267



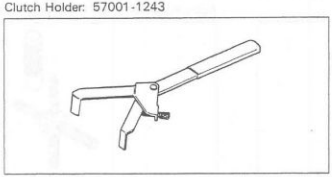
Pilot Screw Adjuster, A: 57001-1239



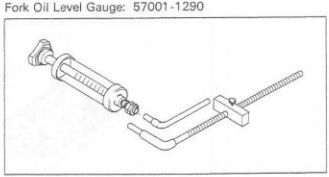
Carburetor Drain Plug Wrench, Hex 3: 57001-1269



Clutch Holder: 57001-1243

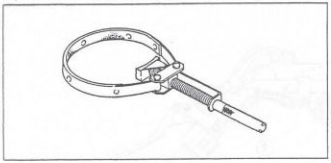


Fork Oil Level Gauge: 57001-1290

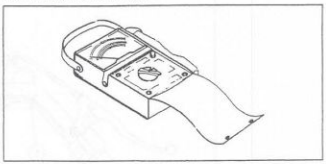


Special Tools and Sealant

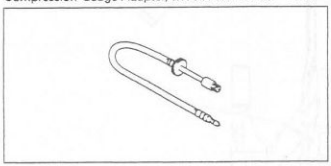
Flywheel Holder: 57001-1313



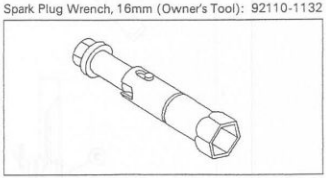
Hand Tester: 57001-1394



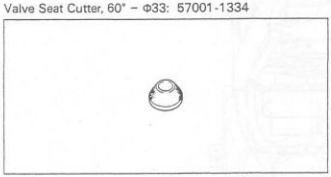
Compression Gauge Adapter, M10 X 1.0: 57001-1317



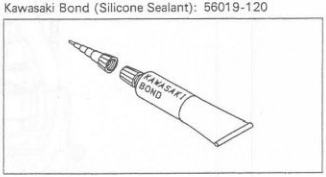
Spark Plug Wrench, 16mm (Owner's Tool): 92110-1132



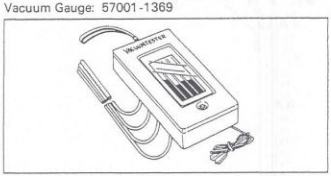
Valve Seat Cutter, 60° – Φ33: 57001-1334



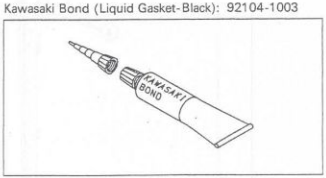
Kawasaki Bond (Silicone Sealant): 56019-120



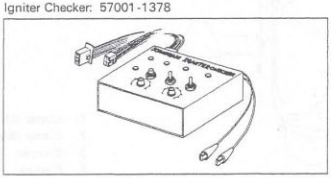
Vacuum Gauge: 57001-1369



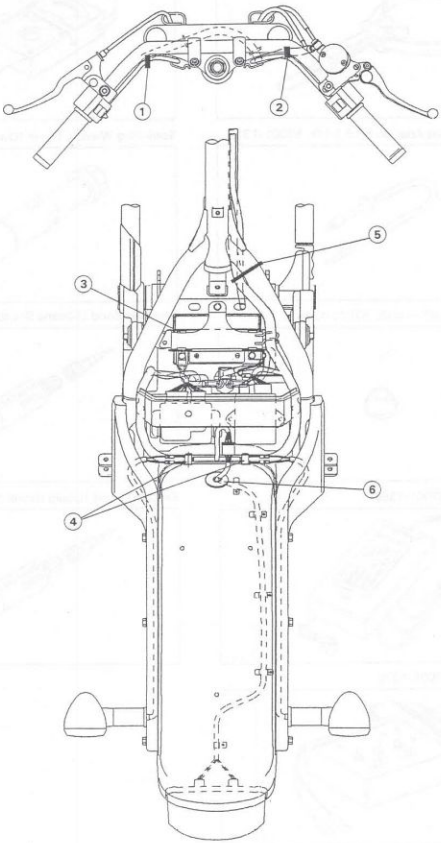
Kawasaki Bond (Liquid Gasket-Black): 92104-1003



Igniter Checker: 57001-1378

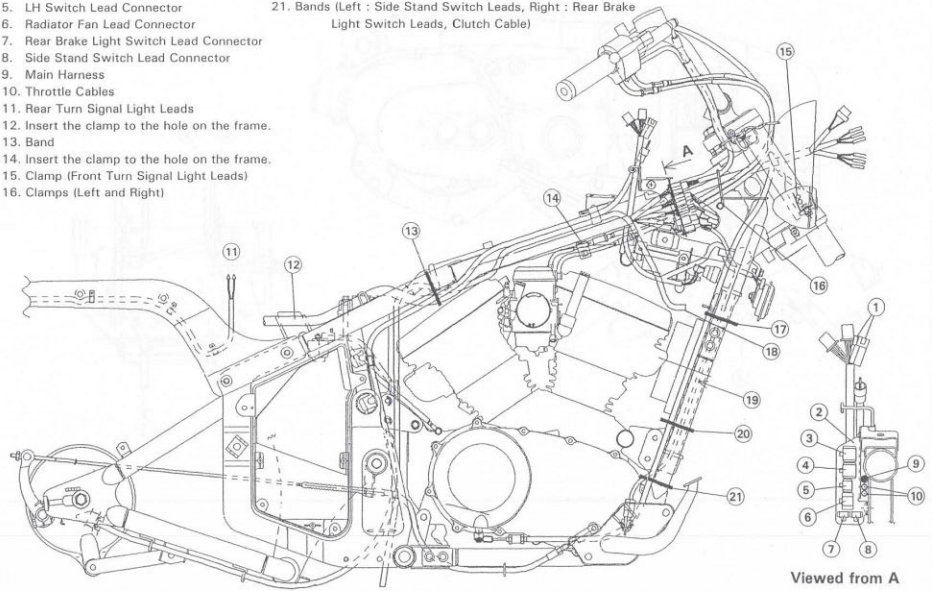


Cable, Wire, and Hose Routing



1. Clamp (LH Switch Leads)
2. Clamp (Brake Hose)
3. Damper
4. Clamps
5. Band
6. Grommet

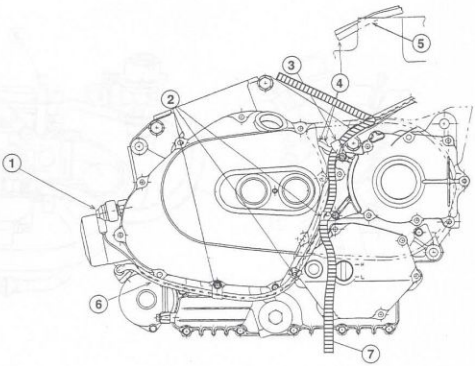
1. Rectifiers
2. Bracket
3. LH Switch Lead Connector
4. RH Switch Lead Connector
5. LH Switch Lead Connector
6. Radiator Fan Lead Connector
7. Rear Brake Light Switch Lead Connector
8. Side Stand Switch Lead Connector
9. Main Harness
10. Throttle Cables
11. Rear Turn Signal Light Leads
12. Insert the clamp to the hole on the frame.
13. Band
14. Insert the clamp to the hole on the frame.
15. Clamp (Front Turn Signal Light Leads)
16. Clamps (Left and Right)
17. Bands (Left : Side Stand Switch Leads, Radiator Fan Leads, Right : Rear Brake Light Switch Leads)
18. Fuel Tank Drain Hose
19. Run the Leads between the frame and the radiator (Left and Right).
20. Band (Right : Rear Brake Light Switch Leads, Clutch Cable)
21. Bands (Left : Side Stand Switch Leads, Right : Rear Brake Light Switch Leads, Clutch Cable)

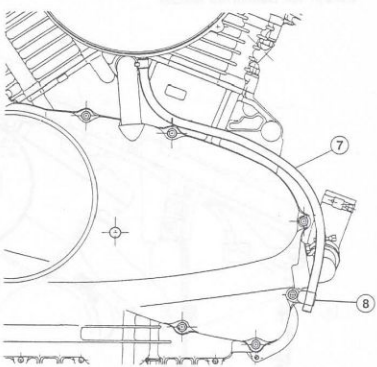


Cable, Wire, and Hose Routing

1. Fuel Tank Drain Hose
2. Clamp
3. Tighten the lead to the crankcase.
4. Starter Motor Lead
5. Alternator Leads
6. Ignition Switch
7. Choke Knob
8. Insert the clamp to the hole on the frame.
9. Clamp

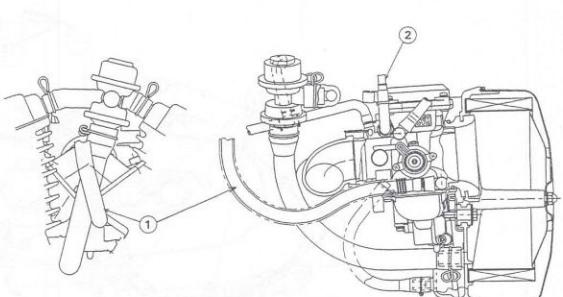
Cable, Wire, and Hose Routing



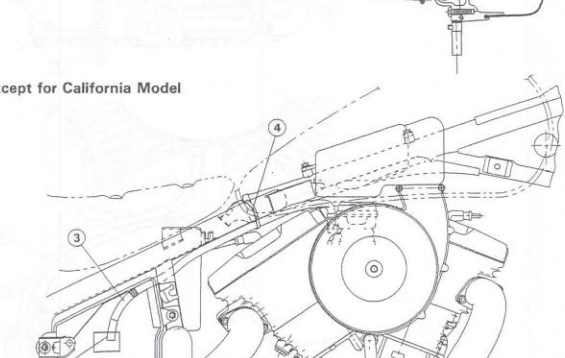


1. Direct the oil pressure switch lead to the downward. (Apply grease to the terminal.)
2. Clamps
3. Clamp
4. Alternator Leads, Pickup Coil Leads
5. Run the leads inside the drive chain cover.
6. Starter Motor Lead
7. Air Cleaner Drain Hose
8. Clamp

Cable, Wire, and Hose Routing



Except for California Model



1. Fuel Hose
2. Direct the choke cable to the upward.
   (Do not run the choke cable below the manifold.)
3. Hose (Green)
4. Do not overtighten the band.
5. Insert the hose end to the bracket.

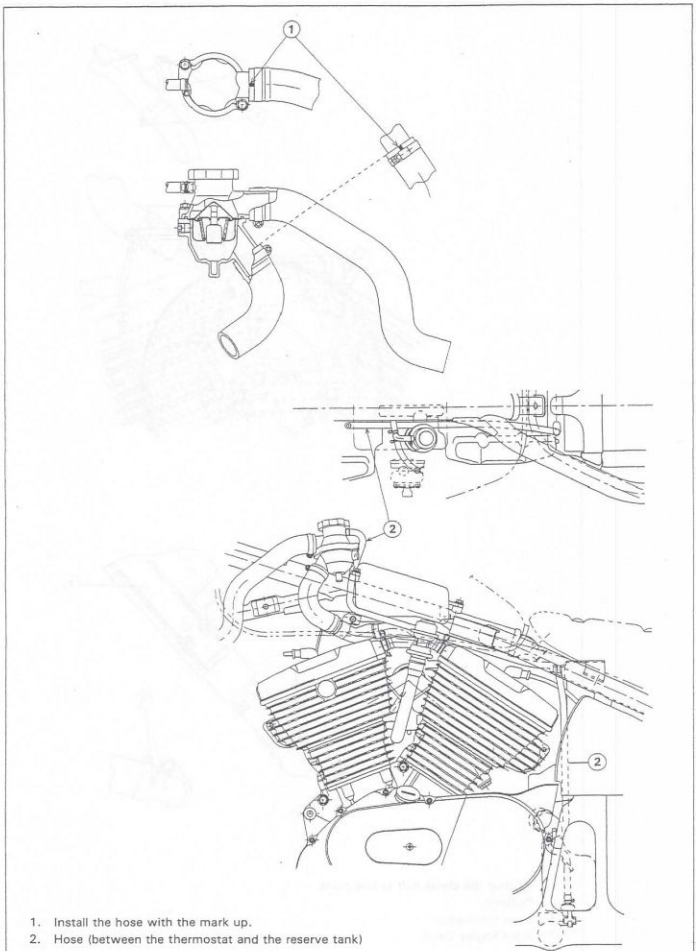
Cable, Wire, and Hose Routing

California Model

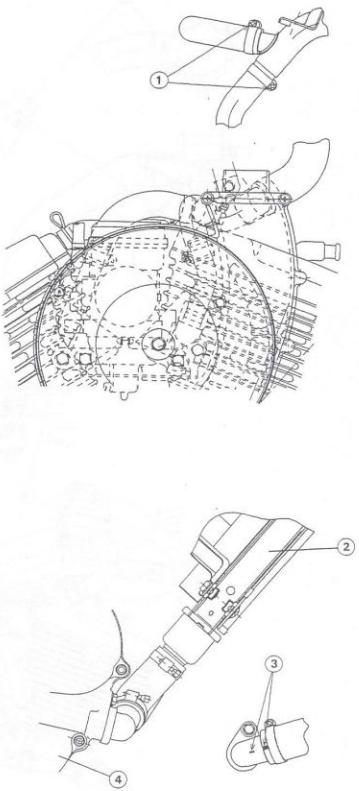
California Model

1. Hose (Green)
2. Clamp
3. Hose (Yellow)
4. Clamp
5. Canister
6. Holder
7. Hose (Blue)
8. Hose (Blue)
9. Band
10. Separator
11. Clamp
12. Hose (White)
13. Hose (Red)
14. Clamp
15. Air Cleaner Housing
16. Grommet

Cable, Wire, and Hose Routing



1. Install the hose with the mark up.
2. Hose (between the thermostat and the reserve tank)



1. Position the clamp bolt at this point.
2. Radiator
3. Align the marks.
4. Right Engine Cover

Fuel System

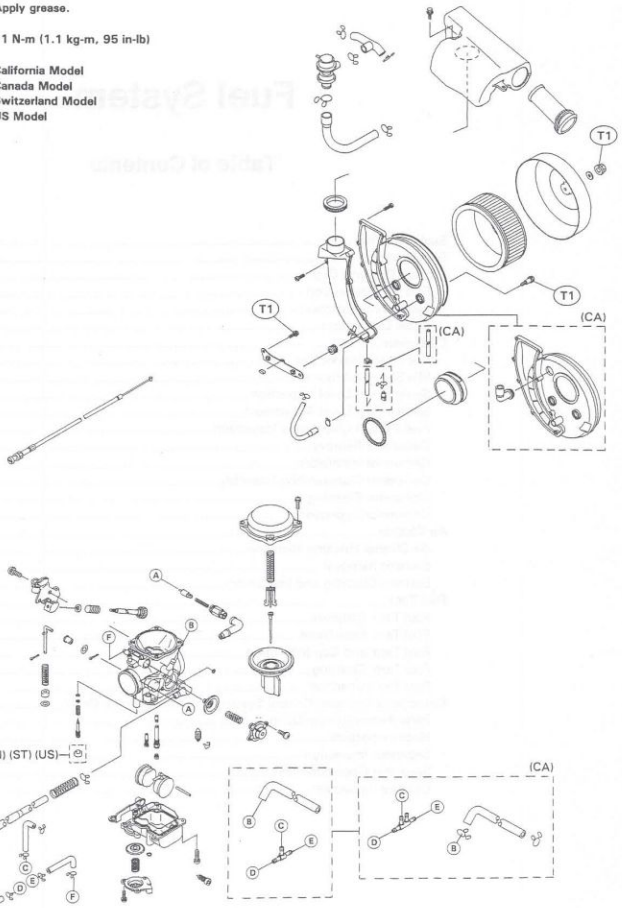
Table of Contents

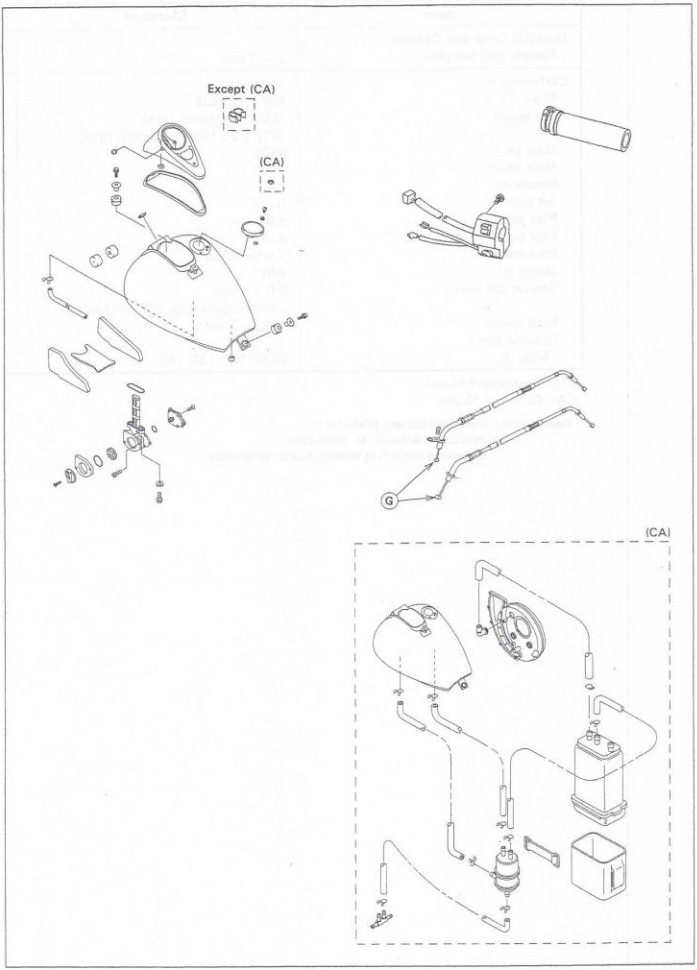
Exploded View

G : Apply grease.

T1 : 11 N-m (1.1 kg-m, 95 in-lb)

CA: California Model
CN: Canada Model
ST: Switzerland Model
US: US Model




Except (CA)
(CA)
G
(CA)

Specifications

Item	Standard	Service Limit
Throttle Grip and Cables:		
Throttle grip free play	2 ~ 3 mm	– – –
Carburetor:		
Make, Type	Keihin, CVK36	– – –
Idle speed	1000 ± 50 r/min (rpm),	– – –
	(ST), (CA) 1300 ±50 r/min (rpm)	– – –
Main jet	#135	– – –
Main air jet	#100	– – –
Needle jet	#6	– – –
Jet needle	N2PE	– – –
Pilot jet	#48	– – –
Pilot air jet	#70	– – –
Pilot screw	1 ¾ turns out	– – –
Starter jet	#70	– – –
Service fuel level	2.0 ± 1 mm above upper edge of float chamber	– – –
Float height	16.5 ± 2 mm	– – –
Optional parts:		
Main jet	#130, 132, 138, 140	– – –

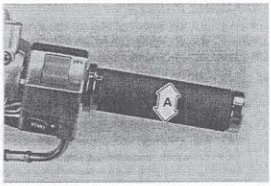
(ST): Switzerland Model
(CA): California Model

Special Tool – Fuel Level Gauge: 57001-1017
Pilot Screw Adjuster, A: 57001-1239
Carburetor Drain Plug Wrench, Hex 3: 57001-1269

Throttle Grip and Cables

Free Play Inspection

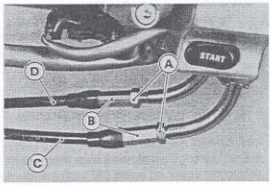
- Check that the throttle grip moves smoothly from full open to close, and the throttle closes quickly and completely in all steering positions by the return spring.
- ★If the throttle grip does not return properly, check the throttle cable routing, grip free play, and cable damage. Then lubricate the throttle cable.
- Run the engine at the idle speed, and turn the handlebar all the way to the right and left to ensure that the idle speed does not change.
- ★If the idle speed increase, check the throttle cable free play and the cable routing.
- Check the throttle grip free play [A].
- ★If the free play is incorrect, adjust the throttle cable.

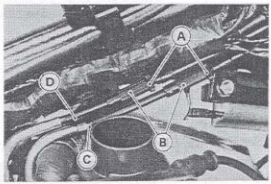


Throttle Grip Free Play
Standard: 2 ~ 3 mm

Free Play Adjustment

- Loosen the locknuts [A].
- Screw the adjusters [B] in completely so as to give the throttle grip plenty of play.
- Turn out the decelerator cable [C] adjuster until there is no play when the throttle grip is completely closed.
- Tighten the locknut.
- Turn the accelerator cable [D] adjuster until the proper amount of throttle grip free play is obtained.
- Tighten the locknut.
- ★If the proper amount of free play cannot be obtained by using the adjusters, use the adjusters middle of the throttle cables.
- First give the throttle grip plenty of play by turning the adjusters at the grip in fully.
- Remove the fuel tank (see Fuel Tank Removal).
- Loosen the locknuts [A].
- Turn the adjusters [B] fully at the middle of the throttle cables so as to give the throttle grip plenty of play.
- With the throttle grip completely closed, turn the decelerator cable [C] adjuster until the inner cable just becomes tight.
- Tighten the locknut.
- Turn the accelerator cable [D] adjuster until the correct throttle grip free play is obtain.
- Tighten the locknut.





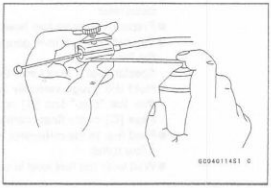
⚠WARNING

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

Cable Lubrication

Whenever the cable is removed, lubricate the throttle cable as follows:

- Apply a thin coating of grease to the cable lower ends.
- Lubricate the cable with a penetrating rust inhibitor.



Carburetor

Idle Speed Inspection

- Start the engine and warm it up thoroughly.
- With the engine idling, turn the handlebar to both sides.

★If handlebar movement changes the idle speed, the throttle cables may be improperly adjusted or incorrectly routed, or damaged. Be sure to correct any of these conditions before riding (see Cable Routing section in General Information chapter).

⚠WARNING

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

- Check idle speed.

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

Idle Speed

Standard: **1,000 ± 50 r/min (rpm)**
(Switzerland, U.S. Models)
1,300 ± 50 r/min (rpm)

Idle Speed Adjustment

- Start the engine and warm it up thoroughly.
- Turn the 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. Readjust if necessary.

Service Fuel Level Inspection

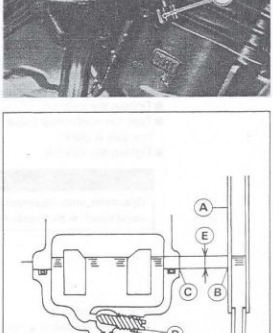
⚠WARNING

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.

- Situate the motorcycle so that it is perpendicular to the ground.
- Remove the fuel tank and air cleaner (see Fuel Tank Removal, Air Cleaner Housing Removal).
- Prepare an auxiliary fuel tank and connect the fuel hose to the carburetor.
- Prepare a suitable fuel hose.
- Connect the fuel level gauge [A] to the carburetor float chamber with the fuel hose.

Special Tool – Fuel Level Gauge: 57001-1017

- Hold the gauge vertically against the side of the carburetor body so that the "zero" line [B] is several millimeters higher than the upper edge [C] of the float chamber.
- Feed fuel to the carburetor, then turn the carburetor drain plug [D] out a few turns.
- Wait until the fuel level in the gauge settles.



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