Kawasaki

KBL23A/26A
KBL33A/34A/43A/48A
KBH26A/33A/34A/43A/48A

Trimmer/Brushcutter
Service Manual

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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) 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.

EMISSION CONTROL INFORMATION

To protect the environment in which we all live, Kawasaki has incorporated exhaust emission control systems (EM) in compliance with applicable regulations of the United States Environmental Protection Agency and California Air Resources Board.

1. **Exhaust Emission Control System**

   The exhaust emission control system applied to this engine consists of a carburetor and an ignition system having optimum ignition timing characteristics.

   The carburetor has been calibrated to provide lean air/fuel mixture characteristics and optimum fuel economy with a suitable air cleaner and exhaust system.

TAMPERING WITH EMISSION CONTROL SYSTEM PROHIBITED

Federal law and California State law prohibits the following acts or the causing thereof: (1) the removal or rendering inoperative by any person other than for purposes of maintenance, repair, or replacement, of any device or element of design incorporated into any new engine for the purpose of emission control prior to its sale or delivery to the ultimate purchaser or while it is in use, or (2) the use of the engine after such device or element of design has been removed or rendered inoperative by any person.

Among those acts presumed to constitute tampering are the acts listed below:
Do not tamper with the original emission related part:

- Carburetor and internal parts
- Spark plugs
- Magnet or electronic ignition system
- Fuel filter
- Air cleaner elements

Foreword

This manual is designed primarily for use by trained mechanics in a properly equipped shop. However, it contains enough detail and information to make it useful to the owner who desires to perform his own basic maintenance anbd 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 has doubts as to his ability to do the work, all adjustments, maintenance, and repair should be carried out only by qualified mechanics.

This manual covers models: KBL23A, KBH26A, KBL26A, KBH33A, KBL33A, KBH34A, KBL34A, KBH43A, KBL43A, KBH48A and KBL48A. As for safety information, specifications, exploded view, assembly and preparation, operating instructions, and periodic maintenance; this manual does not mention them as you can depend upon their respective owner's manuals and parts catalogues to tell you the details.

In order to perform the work efficiently and to avoid costly mistakes, read the text, thoroughly familiarize yourself with the procedures before stating 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.

To get the longest life out of your equipement.

- Follow the Periodic Maintenance Chart in their respective owner's manuals.
- Be alert for problems and non-scheduled maintenance.
- Use proper tools and genuine Kawasaki engine parts. Genuide 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

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

General Information

Table of Contents

1-2 GENERAL INFORMATION

Before Servicing

Before starting to service the engine, careful read the applicable section to eliminate unnecessary work. Photographs, diagrams, notes, cautions, warnings, and detailed descriptions have been included wherever necessary. Nevertheless, even a detailed account has limitations, a certain amount of basic knowledge is required for successful work.

Especially note the following:

(1) Dirt

Before removal and disassembly, clean the engine. Any dirt entering the engine, carburetor, or other parts will work as an abrasive and shorten the life of the engine. For the same reason, before installing a new part, clean off any dust or metal filings.

(2) Tightening Sequence

Generally, when installing a part with several bolts, nuts, or screws, start them all in their holes and tighten them to a snug fit. Then tighten them evenly, in a staggered sequence. This is to avoid distortion of the part and/or causing gas or oil leakage. Conversely, when loosening the bolts, nuts, or screws, first loosen all of them by about a quarter of a turn and then remove them. Where there is a tightening sequence indication in this Service Manual, the bolts, nuts, or screws must be tightened in the order and method indicated.

(3) 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.

(4) 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 rubber, wooden or plastic-faced mallet. Use an impact driver for screws (particularly for the removal of screws held by a locking agent) in order to avoid damaging the heads.

(5) Edges

Watch for sharp edges, especially during major engine disassembly and assembly. Protect your hands with gloves or a piece of thick cloth when lifting the engine or turning it over.

(6) 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.

(7) Gasket, O-Ring

Do not reuse a gasket or O-ring once it has been in service. The mating surfaces around the gasket should be free of foreign matter and perfectly smooth to avoid oil or compression leaks.

(8) Liquid Gasket, Non-Permanent Locking Agent

Follow manufacturer's directions for cleaning and preparing surfaces where these compounds will be used. Apply sparingly. Excessive amounts may block engine oil passages and cause serious damage. An example of a non-permanent locking agent commonly available in North America is Loctite Lock'n Seal (Blue).

(9) Press

A part installed using a press or driver, such as a journal, should first be coated with oil on its outer or inner circumference so that it will go into place smoothly.

(10) Ball Bearing

When installing a ball bearing, the bearing race which is affected by friction should be pushed by a suitable driver. This prevents severe stress on the balls and races, and prevents races and balls from being dented. Press a ball bearing until it stops at the stop in the hole or on the shaft.

(11) Oil Seal and Grease Seal

Replace any oil or grease seals that were removed with new ones, as removal generally damages seals.

When pressing in a seal which has manufacturer's marks, press it in with the marks facing out. Seals should be pressed into place using a suitable driver, which contacts evenly with the side of seal, until the face of the seal is even with the end of the hole.

(12) Seal Guide

A seal guide is require for certain oil or grease seals during installation to avoid damage to the seal lips. Before a shaft passes through a seal, apply a little oil, preferable high temperature grease on the lips to reduce rubber to metal friction.

(13) Circlip, Retaining Ring

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

(14) Cotter Pin

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

Before Servicing

(15) Lubrication

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

Don't use just any oil or grease. Some oils and greases in particular should be used only in certain applications and may be harmful if used in an application for which they are not intended. This manual makes reference to molybdenum disulfide grease (MoS_2) in the assembly of certain engine and chassis parts. Always check manufacturer recommendations before using such special lubricants.

(16) Replacement Parts

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

(17) 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	

(18) Specifications

Specification terms are defined as follows:

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

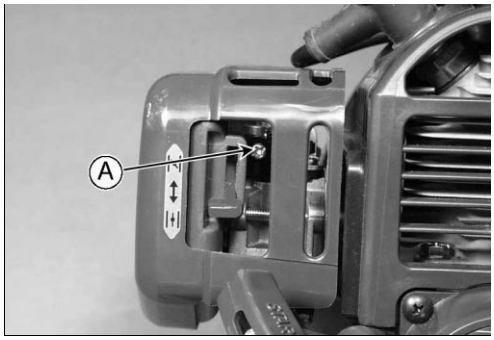
"Service Limits" indicate the usable limits. If the measurement shows excessive wear or deteriorated performance, replace the damaged parts.

Idling Speed

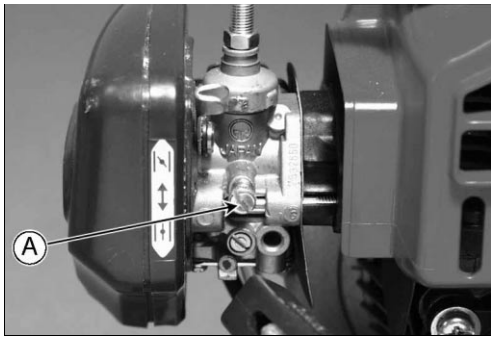
Idling Speed Adjustment

- Start the engine and leave it running at idling speed to warm it up thoroughly.
- If the engine stops while idling, turn the throttle stop screw (A) clockwise until the cutting head or the cutting blade begins to rotate. Then back off one half turn. The cutting head or the cutting blade must not rotate.
- If the cutting head or the cutting blade rotates when the engine is idling, turn the throttle stop screw (A) counterclockwise until the cutting head or the cutting blade stops rotating and then turn the throttle stop screw (A) another one half turn.

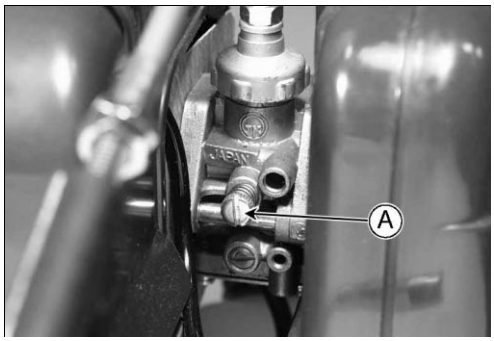
KBL23A/KB□26A/KB□34A



KB□33A



KBH43A/KBH48A



General Specifications

Model		KBL23A	KBH26A	KBL26A
Handle type		Loop handle	Double handles	Loop handle
Engie	Type	Forced air cooled 2-stroke, horizontal shaft gasoline engine		
	Displacement ml (cu. in.)	22.5 1.37	25.4 1.55	25.4 1.55
	Carburetor	Diaphragm type		
	Ignition	Solid state ignition		
	Spark plug	NGK BPMR6A		
	Starter	Recoil starter		
	Clutch mm (in.)	Automatic centrifugal type ϕ54 (2.1)		
Fuel	Mixing ratio	Regular unleaded gasoline 50:1 2-stroke engine oil		
	Tank capacity litre	0.5	0.6	0.6
Drive shaft asembly & gear housing	Cutter Dia. of string mm (in.)	Nylon string ϕ2.4 (0.095)		
	Bearing of shaft	5 plane		
	Rotation	Counterclockwise		
	Lubrication	High quality lithium grease		
	Drive shaft dia. mm (in.)	ϕ6 (0.24)		
	Drive shaft metarial	High tensile steel		
	Reduction ratio	14 : 19		
	Guard	Plastic guard on the pipe assembly		

**"Weight": The unit without cutting attachment and shoulder harness, empty fuel tank.

1-6 GENERAL INFORMATION

General Specifications

Model		KBH33A	KBL33A	KBH34A	KBL34A
Handle type		Double handles	Loop handle	Double handles	Loop handle
Engine	Type	Forced air cooled 2-stroke, horizontal shaft gasoline engine			
	Displacement ml (cu. in.)	33.3 (2.03)	33.3 (2.03)	33.3 (2.03)	33.3 (2.03)
	Carburetor	Diaphragm type			
	Ignition	Solid state ignition			
	Spark plug	NGK BMR6A			
	Starter	Recoil starter			
	Clutch drum dia. mm (in.)	Automatic centrifugal type ϕ78 (3.1)			
Fuel	Mixing ratio	Regular unleaded gaoline 50:1 2-stroke engine oil			
	Tank capacity litre	0.8	0.8	0.8	0.8
Drive shaft ass'y & gear housing	Cutter Dia. of cord mm (in.)	Nylon cord ϕ2.4 (0.095)			
	Bearing of shaft	5 plane			
	Rotation	Counterclockwise			
	Lubrication	High quality lithium grease			
	Drive shaft dia. mm (in.)	ϕ8 (0.31)			
	Drive shaft material	High tensile steel			
	Reduction ratio	17 : 21			
	Guard	Plastic guard on the pipe ass'y			

**"Weight": The unit without cutting attachment and shoulder harness, empty fuel tank.

General Specifications

Model		KBH43A	KBL43A	KBH48A	KBL48A
Handle type		Double handles	Loop handle	Double handles	Loop handle
Engine	Type	Forced air cooled 2-stroke, horizontal shaft gasoline engine			
	Displacement ml (cu. in.)	43.2 (2.64)	43.2 (2.64)	48.6 (2.97)	48.6 (2.97)
	Carburetor	Diaphragm type			
	Ignition	Solid state ignition			
	Spark plug	NGK BMR6A			
	Starter	Recoil starter			
	Clutch drum dia. mm (in.)	Automatic centrifugal type ϕ78 (3.1)			
Fuel	Mixing ratio	Regular unleaded gaoline 50:1 2-stroke engine oil			
	Tank capacity litre	1.0	1.0	1.0	1.0
Drive shaft ass'y & gear housing	Cutter Dia. of cord mm (in.)	Nylon cord ϕ2.4 (0.095)			
	Bearing of shaft	5 plane			
	Rotation	Counterclockwise			
	Lubrication	High quality lithium grease			
	Drive shaft dia. mm (in.)	ϕ8 (0.31)			
	Drive shaft material	High tensile steel			
	Reduction ratio	17 : 21			
	Guard	Plastic guard on the pipe ass'y			

**"Weight": The unit without cutting attachment and shoulder harness, empty fuel tank.

Periodic Maintenance Chart

⚠WARNING

Accidental engine starting can cause injury.
Always remove the spark plug cap before servicing the engine to prevent accidental starting.

	Maintenance	Interval				
		Daily	First 20 hours	Every 20 hours	Every 50 hours	Every 100 hours
	Check and replenish fuel	●				
	Check for fuel leakage	●				
	Check bolts, nuts and screws for looseness and loss	●				
	Check throttle lever operation	●				
	Check engine switch operation	●				
	Check guard assembly condition	●				
	Check hook of shoulder harness condition	●				
	Clean fuel filter			●		
*	Clean air filter element			●		
	Tighten bolts, nuts and screws		●		●	
	Clean spark plug and adjust electrode gap				●	
*	Remove dust and dirt from cylinder fins				●	
	Remove carbon deposits on piston head and inside cylinder				●	
	Remove carbon deposits in the exhaust pipe of muffler				●	
	Check gear case assembly lubrication				●	
	Check drive shaft lubricaion				●	
	Check the sliding portion of crankshaft, connecting rod etc.					●
	Fuel tube	It is recommended to replace every 3 years.				

NOTE

○ *The service intervals indicated are to be used as a guide. "*"Service to be performed more frequently as necessary by operating condition.*

Tightening Torque

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

Letters used in the following “Tightening Torque” table mean.

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

LG: Apply a liquid gasket to the sealing surfaces.

MTGS:Mounting screw(s)

Tightening Torque — KBL23A/KB□26A

Fasteners	Size	Torque			Remarks
		N·m	kg·m	ft·lb	
Air Cleaner Cap MTGS	M5	2.0 - 2.5	0.20 - 0.25	18 - 22 in·lb	
Ignition Coil MTGS	M4	2.0 - 2.5	0.20 - 0.25	18 - 22 in·lb	LA
Recoil Starter MTGS	M4	1.7 - 2.0	0.17 - 0.20	15 - 18 in·lb	LA
Crankcase Connecting Screw	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	LA/LG
Engine Shroud MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	LA
Carburetor/Air Cleaner Case MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	
Insulator MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	LA
Fuel Tank MTGS (Crankcase side)	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	
Fuel Tank MTGS (Recoil Starter side)	M5	2.0 - 2.5	0.20 - 0.25	18 - 22 in·lb	
Muffler MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	LA
Muffler Cover MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	LA
Cylinder MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	LA
Clutch Shoe MTGS	M6	8.0 - 10	0.80 - 1.00	71 - 89 in·lb	LA
Flywheel Nut	M6	8.0 - 10	0.80 - 1.00	71 - 89 in·lb	
Starter Pulley Nut	M8	14 - 16	1.40 - 1.60	10 - 12	
Starter Pulley	M8	10 - 12	1.00 - 1.20	7.2 - 8.7	
Spark Plug	M14	12 - 17	1.20 - 1.70	8.9 - 13	
Gear Case Clamp Screw	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	
Gear Case Alignment Screw	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	
Grease Hole Bolt	M6	4.0 - 5.0	0.40 - 0.50	35 - 44 in·lb	
Clutch Housing Clamp Screw	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	
Clutch Housing MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	
Cutter Blade Mounting Nut	M8	13 - 15	1.30 - 1.50	8.9 - 11	

Tightening Torque — KB□33A

Fasteners	Size	Torque			Remarks
		N·m	kg·m	ft·lb	
Air Cleaner Assy. MTGS	M4	1.7 - 2.0	0.35 - 0.40	15 - 18 in·lb	
Ignition Coil MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	LA
Recoil Starter MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	LA
Crankcase Connecting Screw	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	LA
Head Shroud MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	LA
Carburetor MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	
Insulator MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	LA
Fuel Tank MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	LA
Muffler MTGS	M5	3.9 - 4.4	0.40- 0.45	35 - 39 in·lb	LA
Muffler Cover MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	LA
Cylinder MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	LA
Clutch Shoe MTGS	M8	14 - 16	1.40 - 1.60	10 - 12	LA
Flywheel Nut	M8	14 - 16	1.40 - 1.60	10 - 12	
Starter Pulley Nut	M8	14 - 16	1.40 - 1.60	10 - 12	
Starter Pulley	M8	10 - 12	1.00 - 1.20	89 - 106 in·lb	
Spark Plug	M14	12 - 17	1.20 - 1.70	8.9 - 13 in·lb	
Gear Case Clamp Screw	M6	8.0 - 10	0.80 - 1.00	71 - 89 in·lb	
Gear Case Alignment Screw	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	
Grease Hole Bolt	M6	4.0 - 5.0	0.40 - 0.50	15 - 18 in·lb	
Clutch Housing Alignment Screw	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	
Clutch Housing MTGS	M6	8.0 - 10	0.80 - 1.00	71 - 89 in·lb	
Cutting Tool Guard MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	

Tightening Torque

Tightening Torque — KB□34A

Fasteners	Size	Torque			Remarks
		N·m	kg·m	ft·lb	
Air Cleaner Cap MTGS	M5	2.0 - 2.5	0.20 - 0.25	18 - 22 in·lb	
Ignition Coil MTGS	M4	2.0 - 2.5	0.20 - 0.25	18 - 22 in·lb	
Recoil Starter MTGS	M4	1.7 - 2.0	0.17 - 0.20	15 - 18 in·lb	
Crankcase Connecting Screw	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	LA/LG
Engine Shroud MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	
Carburetor/Air Cleaner Case MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	
Insulator MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	
Fuel Tank MTGS (Crankcase side)	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	
Fuel Tank MTGS (Recoil Starter side)	M5	2.0 - 2.5	0.20 - 0.25	18 - 22 in·lb	
Muffler MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	
Muffler Cover MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	
Cylinder MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	
Clutch Shoe MTGS	M8	14 - 16	1.4 - 1.6	10 - 12	LA
Flywheel Nut	M8	14 - 16	1.4- 1.6	10 - 12	
Starter Pulley Nut	M8	14 - 16	1.40 - 1.60	10 - 12	
Starter Pulley	M8	10 - 12	1.00 - 1.20	7.2 - 8.7	
Spark Plug	M14	12 - 17	1.20 - 1.70	8.9 - 13	
Gear Case Clamp Screw	M6	8 - 10	0.8- 1.0	6.0 - 7.4	
Gear Case Alignment Screw	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	
Grease Hole Bolt	M6	4.0 - 5.0	0.40 - 0.50	35 - 44 in·lb	
Clutch Housing Clamp Screw	M6	8 - 10	0.8- 1.0	6.0 - 7.4	
Clutch Housing MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	
Cutter Blade Mounting Nut	M10	15 - 19	1.5 - 1.9	11 - 14	

Tightening Torque — KB□43A/KB□48A

Fasteners	Size	Torque			Remarks
		N·m	kg·m	ft·lb	
Air Cleaner Cap MTGS	M4	1.7 - 2.0	0.17 - 0.20	15 - 18 in·lb	
Air Cleaner Case MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	
Ignition Coil MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	
Recoil Starter MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	LA
Crankcase Connecting Screw	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	LA/LG
Engine Shroud MTGS	M4	1.7 - 2.0	0.17 - 0.20	15 - 18 in·lb	LA
Fuel Tank MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	LA
Insulator MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	
Muffler MTGS	M6	7.0 - 8.0	0.70 - 0.80	62 - 71 in·lb	
Muffler Cover MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	
Cylinder MTGS	M6	7.0 - 9.0	0.70 - 0.90	62 - 80 in·lb	
Clutch Shoe MTGS	M8	14 - 16	1.40 - 1.60	10 - 12	LA
Flywheel Nut	M10	25 - 30	2.50 - 3.00	18 - 22	
Starter Pulley Nut	M8	14 - 16	1.40 - 1.60	10 - 12	
Starter Pulley	M8	10 - 12	1.00 - 1.20	89 - 106 in·lb	
Spark Plug	M14	12 - 17	1.20 - 1.70	8.9 - 13	
Gear Case Clamp Screw	M6	8.0 - 10.0	0.80 - 1.00	71 - 89 in·lb	
Gear Case Alignment Screw	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	
Grease Hole Bolt	M6	4.0 - 5.0	0.40 - 0.50	35 - 44 in·lb	
Clutch Housing Alignment Screw	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	
Clutch Housing Clamp Screw	M6	8.0 - 10	0.80 - 1.00	71 - 89 in·lb	
Clutch Housing MTGS	M6	8.0 - 10	0.80 - 1.00	71 - 89 in·lb	
Cutting Tool Guard MTGS	M5	3.5 - 4.0	0.35 - 0.40	31 - 35 in·lb	

Clearance Table

Clearance Table

Unit: mm (in)

	Service Limit						Remarks
	KBL23A	KB□26A	KB□33A	KB□34A	KB□43A	KB□48A	
Cylinder bore	32.1 (1.263)	34.1 (1.342)	32.8 (1.291)	37.1 (1.461)	41.6 (1.638)	44.1 (1.736)	Replace if over
Piston-to-cylinder clearance	0.15	0.15	0.15	0.15	0.15	0.15	Replace if over
Piston ring-to-groove clearance	0.17	0.17	0.17	0.17	0.17	0.17	Replace if over
Piston ring end-gap	0.7	0.7	0.7	0.7	0.7	0.7	Replace if over
Piston-to-piston pin clearance	0.1	0.1	0.1	0.1	0.1	0.1	Replace if over
Connecting rod big-end axail play	0.5	0.5	0.5	0.5	0.5	0.5	Replace if over
Connecting rod big-end radial play	0.15	0.15	0.15	0.15	0.15	0.15	Replace if over
Piston pin-to-needle bearing radial play	0.15	0.15	0.15	0.15	0.15	0.15	Replace if over
Ball bearing axial play	0.5	0.5	0.5	0.5	0.5	0.5	Replace if over
Crankshaft axial play*	0.05 ~ 0.295	0.05 ~ 0.295	0.05 ~ 0.295	0.05 ~ 0.295	0.05 ~ 0.295	0.05 ~ 0.295	Adjust if over

* does not include that of ball bearings.

Setting Table

Setting Table

	Standard Setting					
	KBL23A	KB□26A	KB□33A	KB□34A	KB□43A	KB□48A
The engine speed at which the clutch engages	about 4000 rpm at 4.0 N·m (0.4 kg·m), of drag torque		about 3800 rpm at 4.0 N·m (0.4 kg·m) of drag torque		about 3500 rpm at 4.0 N·m (0.4 kg·m) of drag torque	
Max. engine speed (rpm)	Different depending on matching machine					
Idling speed (rpm)	3000 ± 200 rpm					
Ignition coil air-gap	0.3 to 0.5 mm (0.011 to 0.019 in.)		0.4 to 0.5mm (0.015 to 0.019 in.)	0.3 to 0.5 mm (0.011 to 0.019 in.)		
ignition timing	25° B.T.D.C. @7000 rpm					
Gear ratio	14:19		17:21			
Jet needle clip location	–		2/3	-	2/3	
Main adjust screw turning out	–		1 1/2 ± 1/2	-	1 1/2 ± 1/2	
Gear case grease capacity (full case)	about 8 to 10 grams		about 13 to 17 grams			

Power Train

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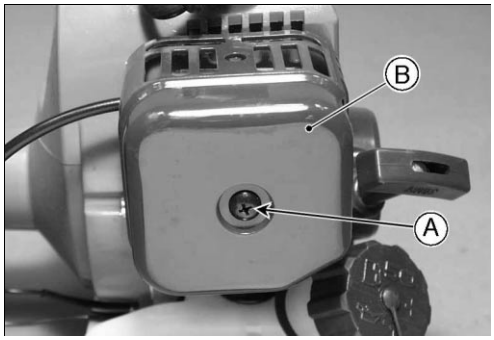
2-2 POWER TRAIN

Complete Engine

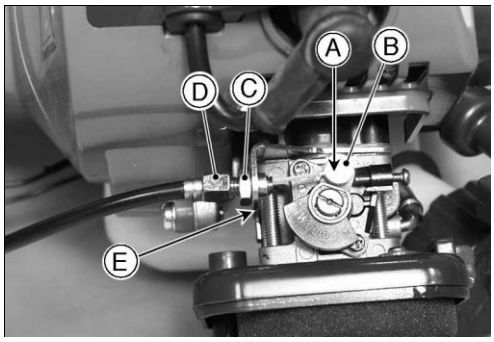
Complete Engine Removal — KBL23A/KB□26A/KB□34A

The power train has been designed to have friction enough between the clutch housing and the guard tube so that it can keep the guard tube from turning and coming off. Thus it is almost impossible to remove not only the ball bearings but the clutch drum.

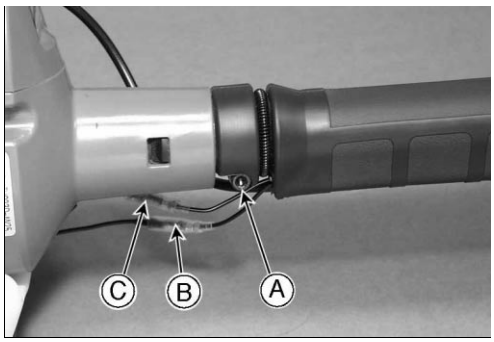
- Unscrew the mounting screw (A) to remove the carburetor cover (B).



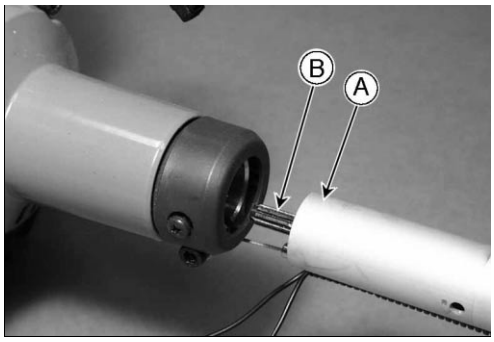
- Remove the cable-end nipple (A) out of the throttle valve terminal (B).
- Release the cable adjuster locknut (C) to remove the cable adjuster (D) out of the bracket (E).



- Release the guard tube clamp screw (A) and the lead wire connectors (B, C).



- Pull the complete engine out of the guard tube (A) and withdraw the drive shaft (B).

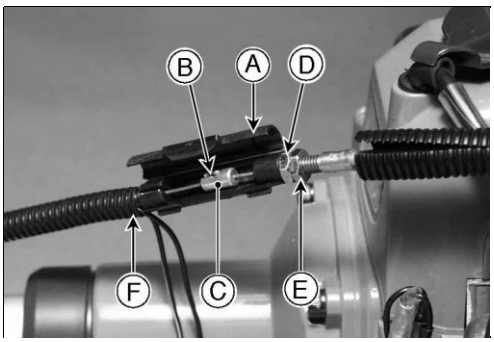


Complete Engine

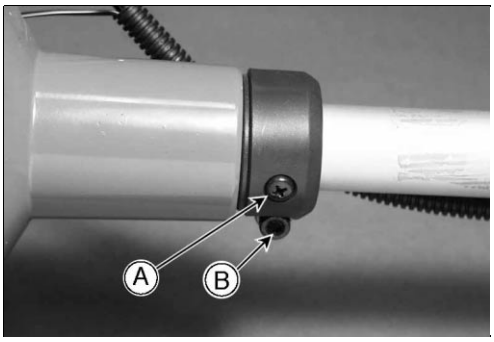
Complete Engine Removal — KB□33A/KB□34A/KB□43A/KB□48A

It is very hard to remove the combination damper out of the clutch housing (in order for friction to make the engine kept from turning relatively to the guard tube), being almost impossible to remove also the clutch drum.

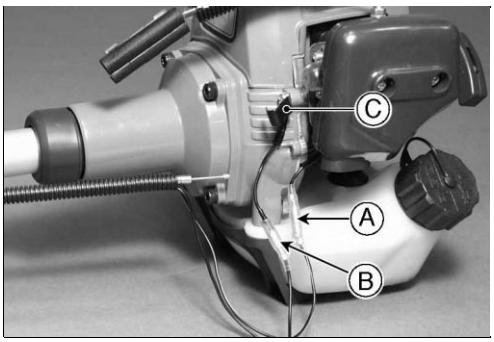
- Snap the joint case (A) open.
- Detouch the cable-end nipple (B) out of the cable-end stub (C).
- Release the locknut (D) to remove the mid-adjuster (E) out of the joint case (A) together with the throttle cable (F).



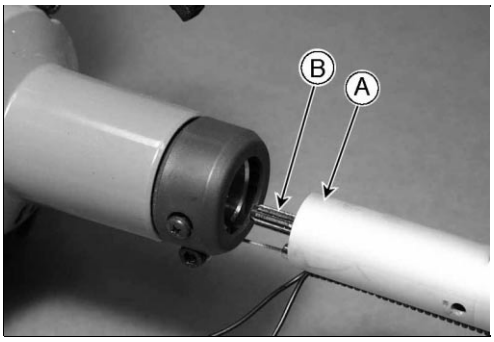
- Remove the set screw (A) keeping the engine from turning.
- Release the guard tube clamp screw (B) just enough to withdraw the complete engine out of the guard tube.



- Unfasten the stop switch lead-connectors (A, B), and untie the clamp(C).



- Pull the complete engine out of the guard tube (A).
- Withdraw the drive shaft (B) from the guard tube (A).



2-4 POWER TRAIN

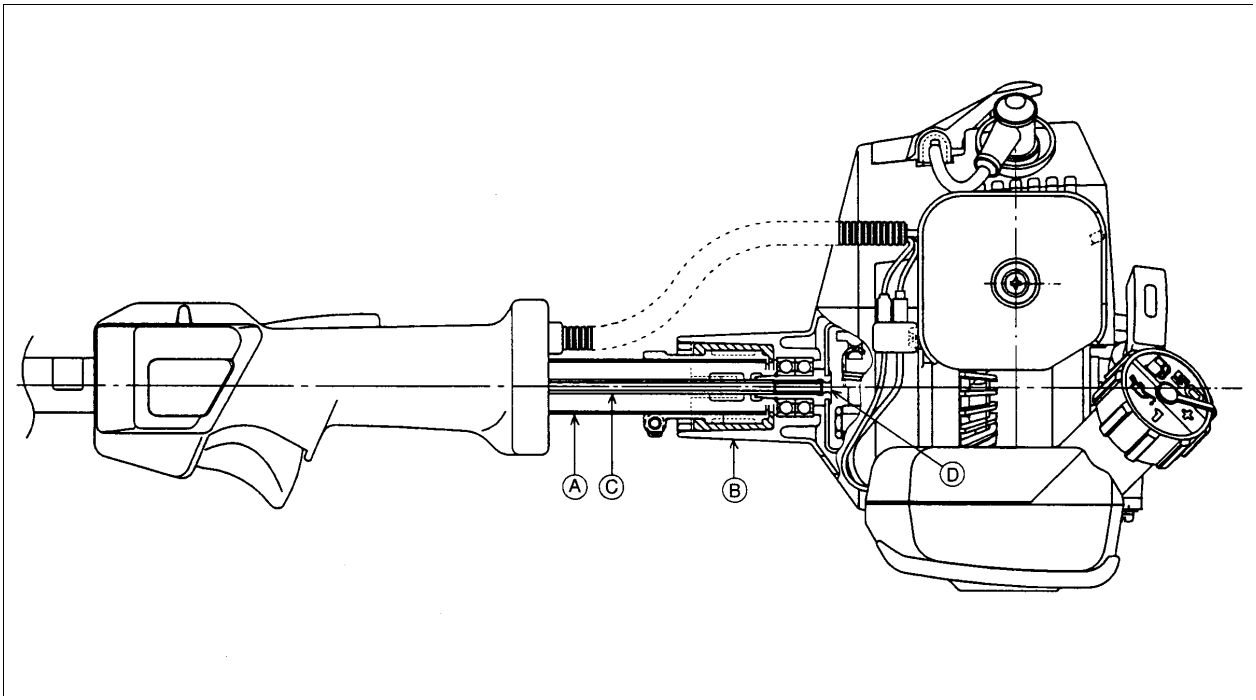
Complete Engine

Complete Engine Installation — KBL23A/KB□26A

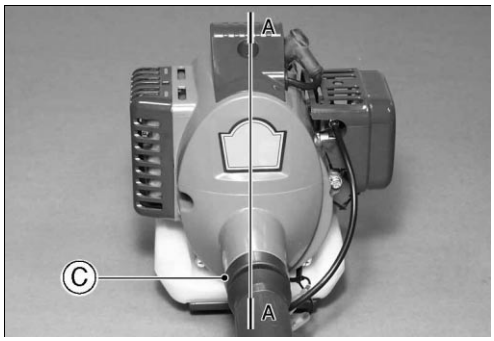
● Installation is the reverse of removal:
Note the following points:

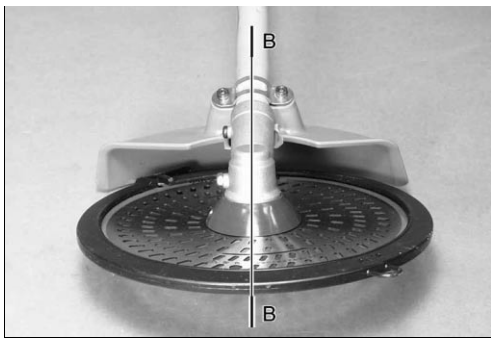
○ Have the end of the guard tube (A) coming home to the bottom of the clutch housing (B).

○ Have the spline-end of the drive shaft (C) meshing with that of the clutch drum's stub (D).



○ Tighten the clamp screw (C) to bring imaginary planes (A-A and B-B) into line (See Tightening Torque Table).





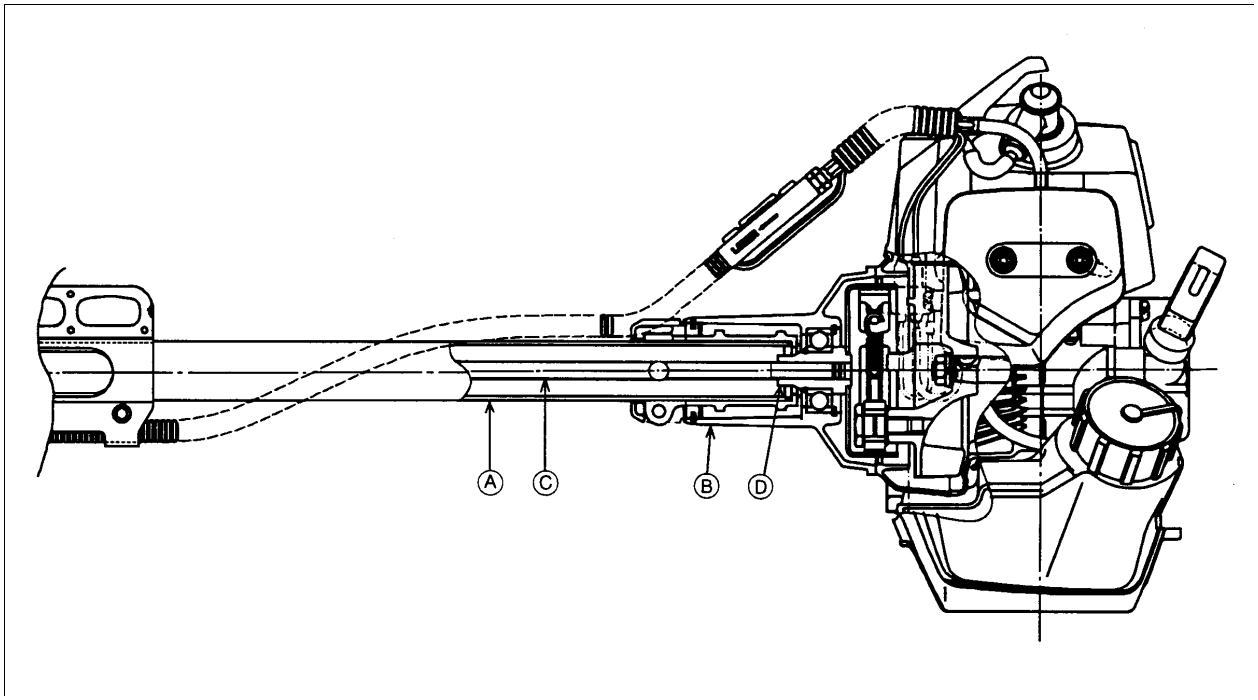
Complete Engine

Complete Engine Installation — KB□33A/KB□34A/KB□43A/KB□48A

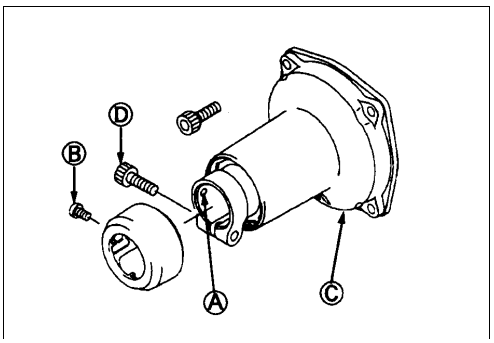
● Installation is the reverse of removal.
Note the following points:

○ Have the end of the guard tube (A) coming home to the bottom of the clutch housing (B).

○ Have the spline-end of the drive shaft (C) meshing with that of the clutch drum's stub (D).



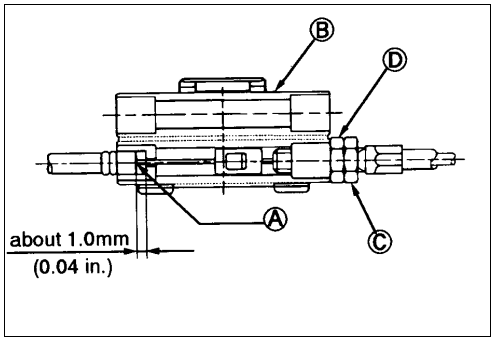
○ Align the hole (A) of the clutch housing (C) with that of the guard tube to tighten the alignment screw (B) and then tighten the clamp screw (D) to the specified torque.



Complete Engine

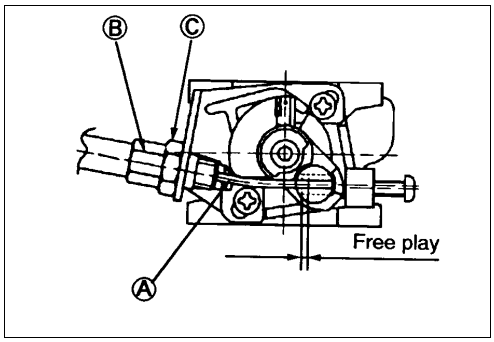
Throttle Cable Free Play Adjustment — KB□33A/KB□43A/KB□48A

- After the throttle cable (A) was connected in the coupler (B), place the throttle lever at its idle position to adjust the nut (C) in order that the end (A) of the throttle outer cable can come to the position specified in the figure with the cable-related level.
- Lock the adjusting nut (C) by turning the locking nut (D).



Throttle Cable Free Play Adjustment — KBL23A/KB□26A/KB□34A

- After the throttle cable (A) was connected to the carburetor, place the throttle lever at its idle position to adjust free play of the throttle cable (A) to about 1 mm (0.04 in.) long by turning the adjuster (B) with the loop handle installed in place.
- Tighten the locknut (C) to keep the adjuster (B) from loosening.

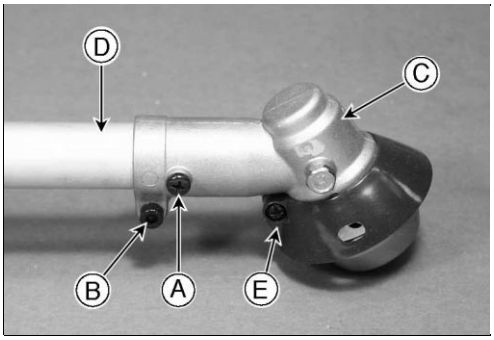


Gear Case

Removal

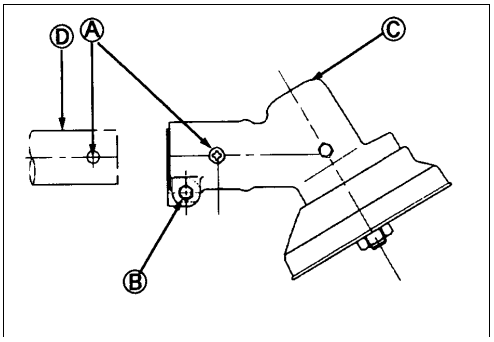
- Remove the alignment screw (A) keeping the complete gear case from turning.
- Release the clamp screw (B) all the way.
- Pull the complete gear case (C) out of the guard tube (D).
- Release its clamp screw to remove the gear case cover (E).

KBL23A/KB□26A



Installation

- Installation is the reverse of removal.
- Align a hole (A) of the gear case (C) with that of the drive tube (D) to tighten the alignment screw (A) and then tighten the clamp screw (B) to the specified torque.



Gear Case

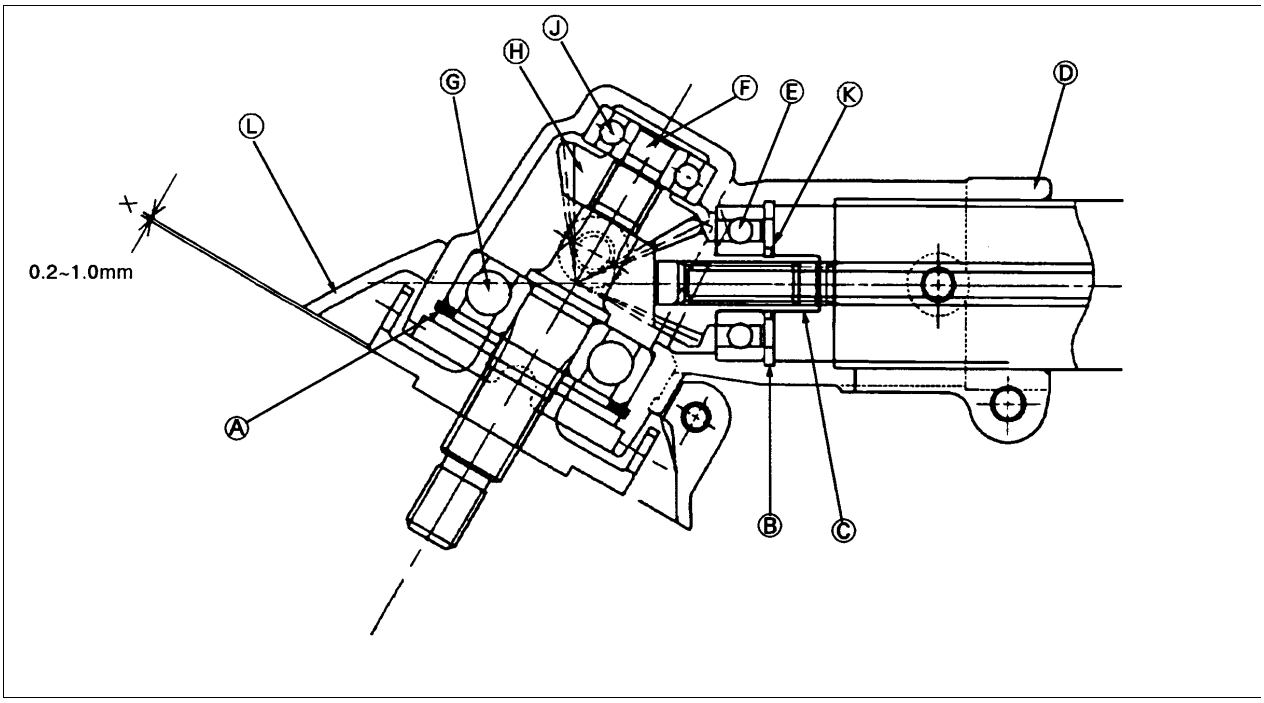
Disassembly — KBL23A/KB□26A

- Remove the circlips (A, B) out of their respective grooves.
- ○ Heat the complete gear case to about 110°C to 140°C (230°F to 280°F) on a heating plate to make bearing removal easy.

⚠WARNING

Be careful with the hot gear case and relative parts. They may be hot enough to burn you severely.

- Pull the drive pinion (C) off the gear case (D) together with the ball bearing (E) and then pull the cutting tool shaft (F) off the case (D) together with the ball bearing (G) and the bevel gear (H).
- Remove the circlip (K) to press the drive pinion (C) out of the ball bearing (E).
- Hit the gear case against a wooden block to get the ball bearing (J) falling out of the gear case (D).
- Remove the circlip (K) out of the pinion (C) to separate the ball bearing (E) from the drive pinion (C).



Gear Case

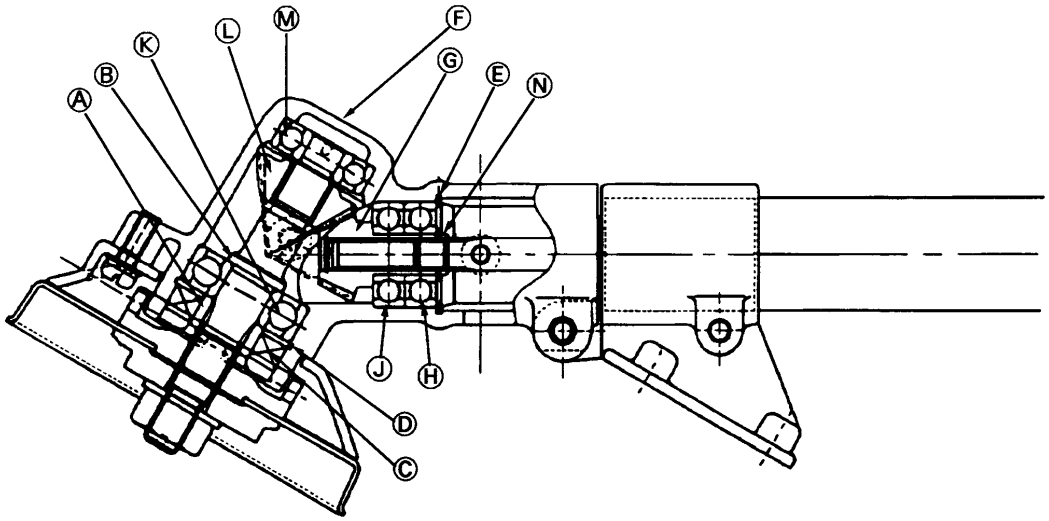
Disassembly — KB□33A/KB□34A/KB□43A/KB□48A

- Remove the circlips (A) out of the cutting tool shaft (B).
- Pry out the oil seal (C).
- Remove the circlips (D, E) out of respective grooves.
- ○ Heat the complete gear case to about 110°C to 140°C (230°F to 280°F) on a heating plate to make bearing removal easy.

⚠WARNING

Be careful with the hot gear case and relative parts. They may be hot enough to burn you severely.

- Pull the drive pinion (G) off the gear case (F) together with the ball bearings (H, J) and then pull the cutting tool shaft (B) off the gear case (F) together with the ball bearing (K) and the bevel gear (L).
- Hit the gear case against a wooden block to get the ball bearing (M) falling out of the gear case (F).
- Remove the circlip (N) out of the pinion (G) to separate the ball bearings (H, J) from the pinion (G).

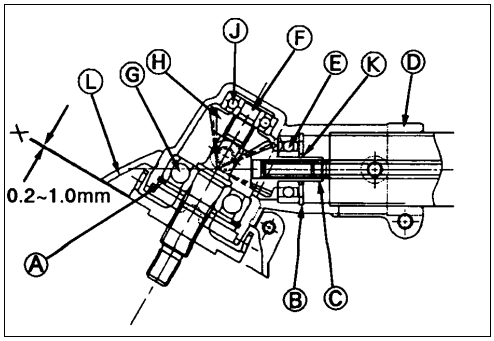


Gear Case

Reassembly — KBL23A/KB□26A

- Reassembly is the reverse of disassembly.
- Adjusting clearance (X) as specified, install the cover (L) on the gear case (D).

Specified Clearance
0.2 to 1.0 mm (0.008 to 0.04 in.)



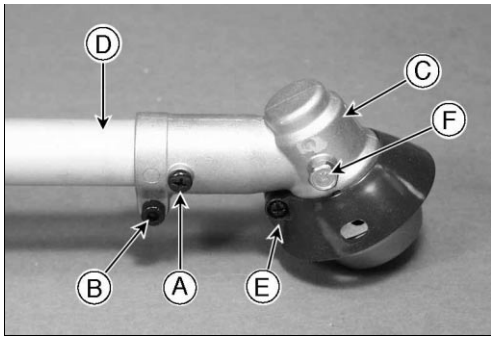
Gear Case Lubrication

Use a heavy duty grease for lubrication of the bevel bearing. The grease level should be checked after first 50 hours of operation and added as necessary. Thereafter check every 20 hours of operation. To do this, release to remove the filler plug (F) on the side of the gear case (C). If no grease can be seen inside the gear case, squeeze grease into the gear case. Do not squeeze grease more than 10g at a time.

CAUTION

The gear case must not be completely filled with grease, i,e, heat during normal operation would cause grease to be forced out of the gear case.

KBL23A/KB□26A



Cutting Blade

Cutting Blade Installation

This steel cutting blade mounting nut (D) is left-handed thread.

⚠WARNING

Be careful not to injure your hands with the steel cutter blade.

- Turn the brushcutter upside down on the ground with its cutting tool shaft (E) upward.
- Put the holder (A), the steel cutting blade (B), and the holder (C) over the cutting tool shaft (E).
- Take care that the steel cutting blade (B) is centered by putting it correctly on the socket and spigot joint.
- Put the steel cutting blade (B) with its arrow side marked upward, on the upper holder (C), and center the lower holder (G) on the cutting blade (B).
- Make sure the steel cutting blade (B) is correctly centered with the socket and the spigot joint between upper and lower holders (C, G).
- Aligning the hole of the holder (C) with the hole (F) on the gear case, insert a wrench provided into the gear case through both holes to keep the shaft from turning.
- Tighten down the nut (D) to the specified torque by turning it counterclockwise.

Specified Torque

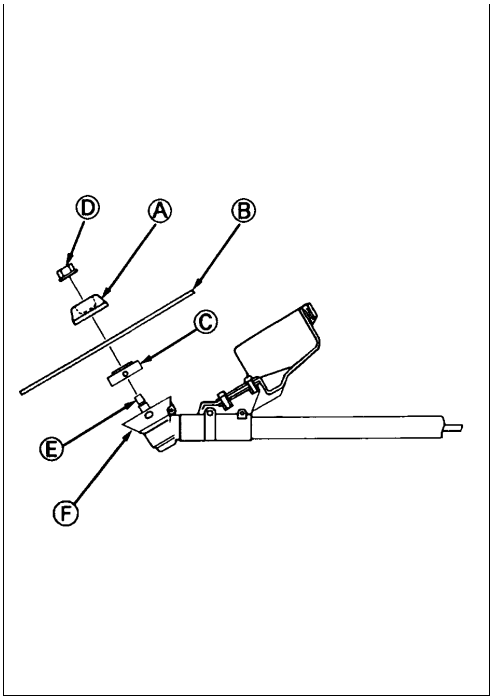
KBL23A/KB□26A

13-15 N·m (1.3 - 1.5 kg·m)

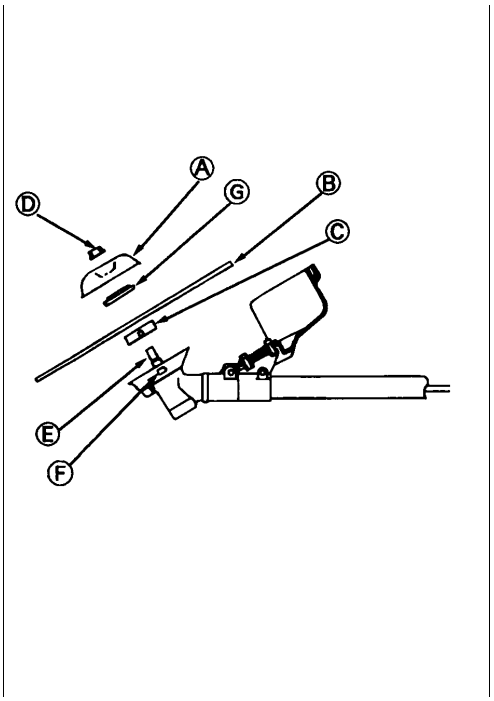
KB□33A/KB□34A/KB□43A/KB□48A

15-19 N·m (1.5 - 1.9 kg·m)

KBL23A/KB□26A



KB□33A/KB□34A/KB□43A/KB□48A

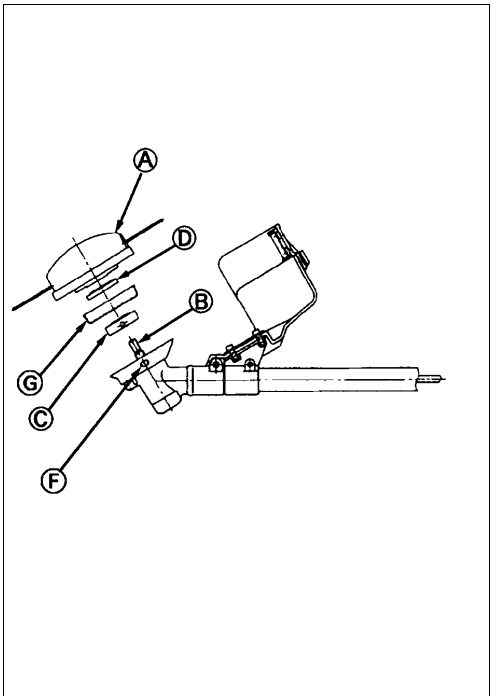


Cutting Head

Cutting Head Installation

The nylon-cord cutter head (A) has a left-handed mounting thread.

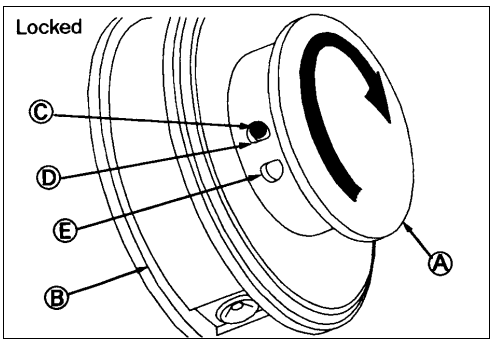
- Turn the brushcutter upside down on the ground with its cutting tool shaft (B) upward.
- Aligning the hole of the holder (C) with the hole (F) on the gear box; insert a wrench provided, into the gear case to keep the cutting tool shaft (B) from turning.
- ○ Take care that the cover (G) is centered by putting it onto socket and spigot at between the holder (C) and the holder (D).
- Tighten the nylon-cord cutter head (A) by turning itself counterclockwise with both hands as much as possible.

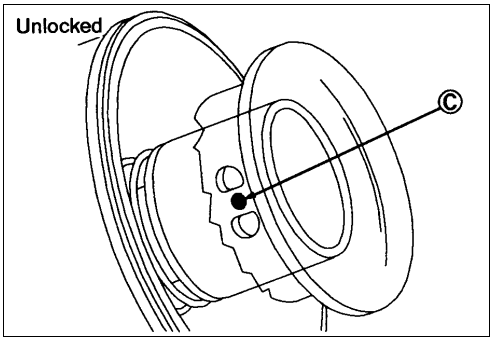


Cutting Head except Australian Model

Disassembly

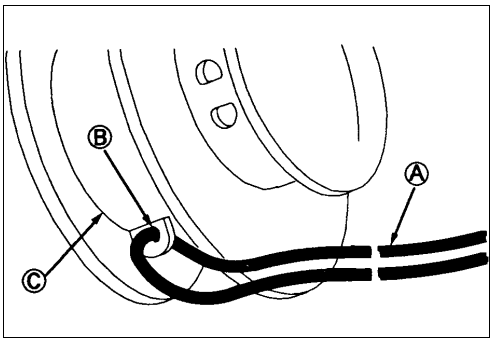
- Do not push the spool (A) in. Hold the drum (B) firmly and turn the spool (A) clockwise to take up slack, then twist with a hard snap until plastic peg (C) is between the holdes (D&E).
- Pull the spool (A) out of the drum (B).





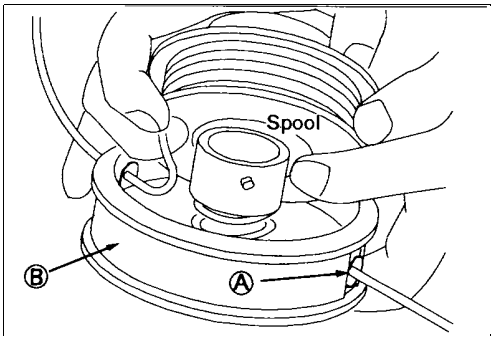
Reassembly

- Use one line, 6 m (20 ft.) long.
- Thread end of the line (A) through the hole (B) on the spool (C) and pull through until the line (A) is the same length on both sides of the hole (B).
- Wind both ends of the line (A) counterclockwise at same time.



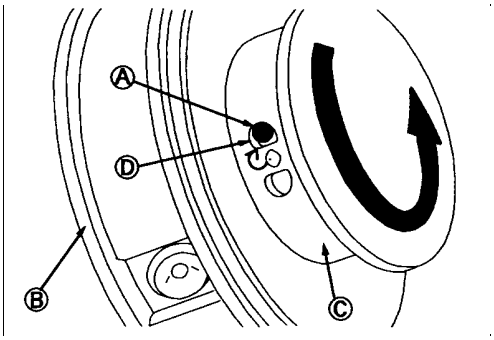
CAUTION
Wind tightly and evenly from side to side and do not twist the line (ignore the ridge).

- Feed ends of the line out through the eyelets (A) on the drum (B).



CAUTION
Keep line as tight as possible and do not let it slip under the spool into the drum.

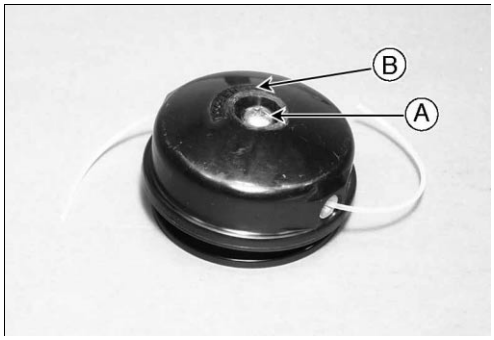
- Align the peg (A) on the drum with the slots in the spool and push the spool into the drum.
- Hold the drum (B) firmly, twist the spool (C) sharply in direction shown, until the peg (A) goes into the hole (D) with a click and locks the spool (C) to the drum (B).
- Cut the lines to about 100 mm (4 in.) long.



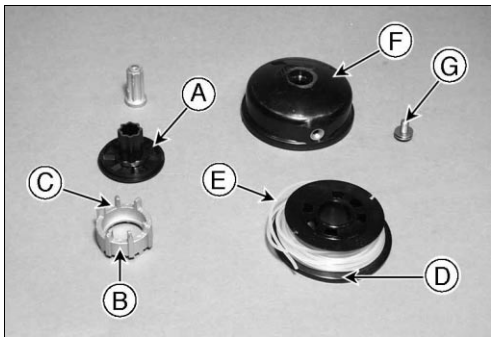
Cutting Head — Australian Model

Disassembly

● Turn the set screw (A) in accordance with the arrow (B) marked at the bottom of the head.



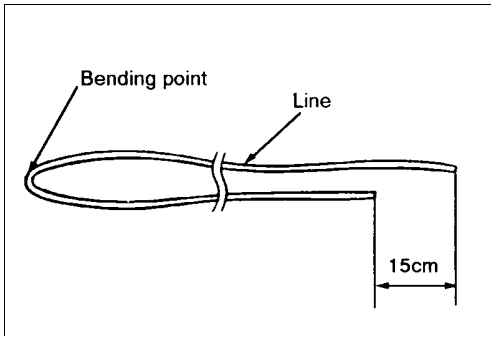
● Remove the set screw to disassemble the cutting head as shown.
A. Retainer
B. Slider
C. Return Spring
D. Spool
E. Line
F. Case
G. Set Screw



Reassembly

● Use one line, 6 m (20 ft.) long.

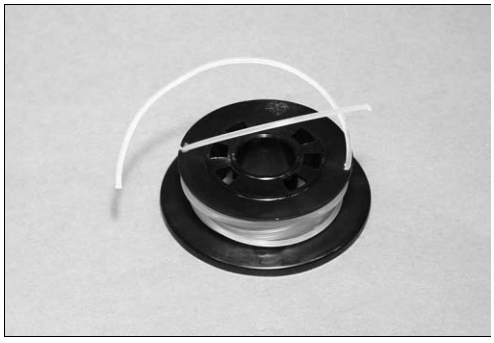
● Turn down the line in two in order that one side is about 150 mm (5.90 in.) longer than the other side.



● Hitch the line to the hook on the spool at its turned point. Wind both ends of the line on the spool at the same time

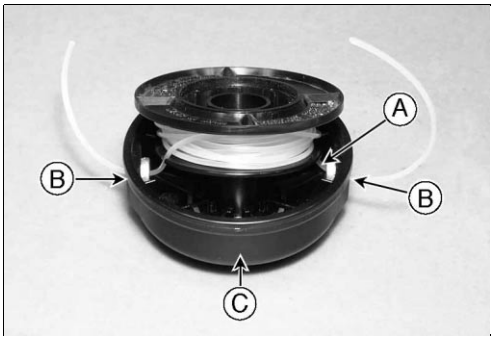
CAUTION
Wind tightly and evenly from side to side and do not twist the line (ignore the ridge).

● After the line was wound, have both sides of the line caught in the notches in order to pull both ends of the line out of the notches about 150 to 200 mm (5.90 to 7.87 in.) long.

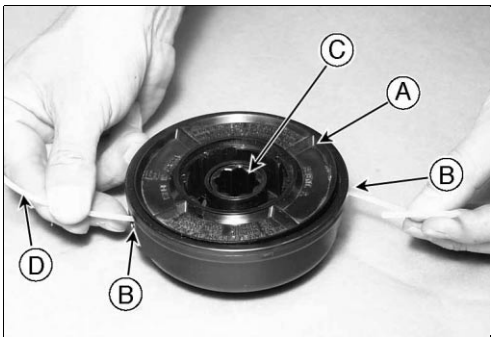


Cutting Head — Australian Model

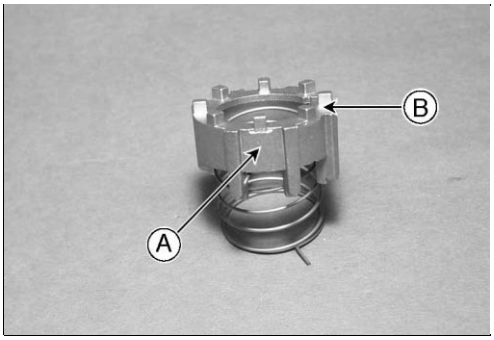
- Feed ends of the line (A) through eyelets (B) on the case (C).



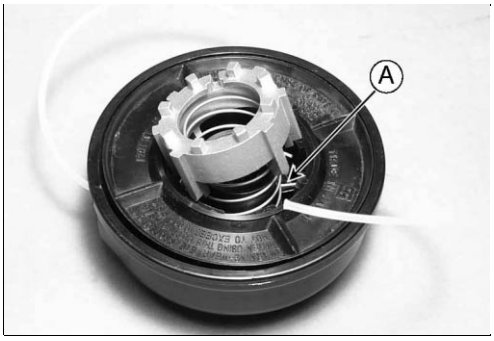
- Align the notches of the spool (A) with the eyelets (B) of the case to insert the spool onto the case core (C).
- Pull both ends of the line (D) to complete the spool installation.



- Set the latch of the return spring into the notch (A) of the slider (B) as shown.



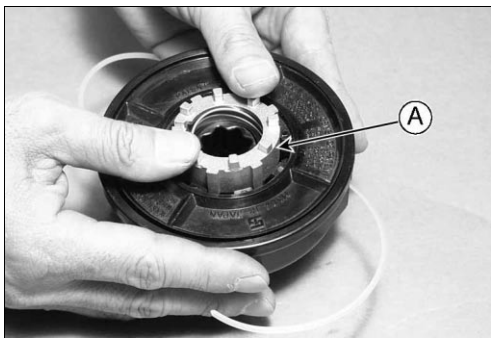
- Insert another latch of the return spring into the notch of the spool marked with △ (A) to such a depth as to enable to turn the slider.



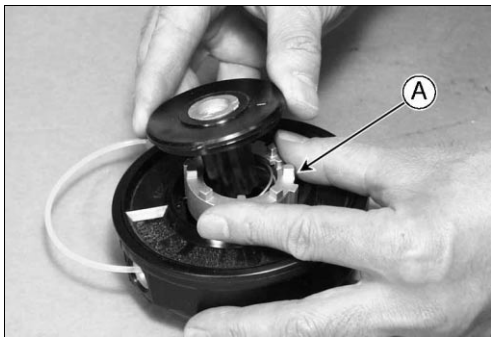
- Holding the slider (A) to align the latch of the return spring with △ marked on the spool, push the slider (A) into the case.
- Twist it within about 30 degrees of angle to get both top and bottom latches of the return spring settled in.

Cutting Head — Australian Model

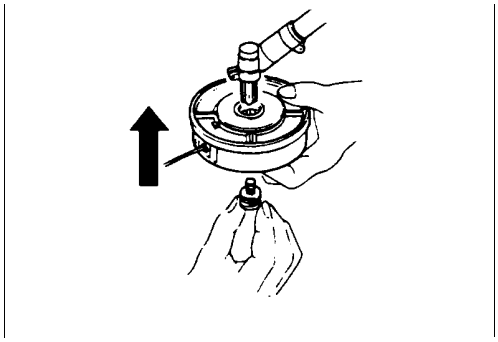
- After the slider (A) was pushed onto the case core, take the slider (A) in and out to check that it can move free.



- While pushing this slider onto the case, insert the retainer (A) into the case.

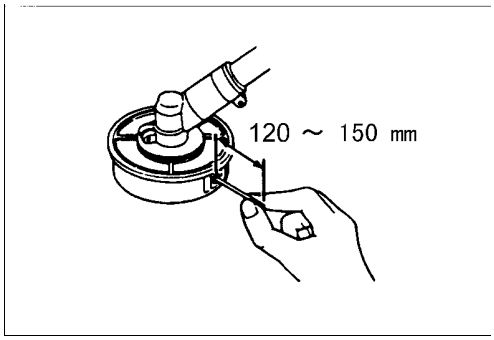


- While holding the retainer, press the case which has been set onto the cutting tool shaft attached to the equipment.



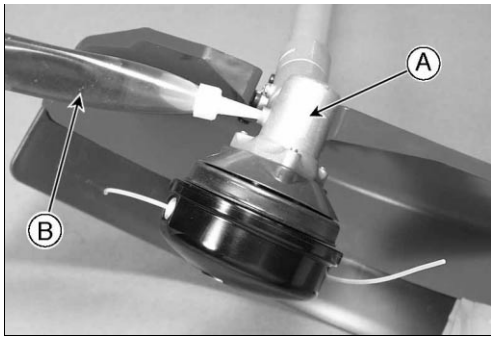
Operation Check

- After the mowing head was assembled, check if the mowing head operates correctly:
  - Tap the ground 2 or 3 times with the mowing head, if the mowing head clicks.
  - Pull both ends of the line out of the mowing head, if both ends of the line can be pulled out of the mowing head.
- Pull both ends of the line out of the mowing head to remove slack and then cut them 120 to 150 mm (4.72 to 5.90 in.) long.



Gear Case Service

- Use high quality gear lubricant grease.
- Check grease level every 50 hours of operation. If no grease can be seen on the inside of the filler plug, fill the gear case (A) with grease, until grease comes out of the pinion gear shaft. About 8 to 10 grams (full case) of grease for KBL23A/KB□26A and 13 to 17 grams (full case) of grease for KB□33A/KB□34A/KB□43A/KB□48A are necessary.
  B. Grease Tube



Cutting Head — Australian Model

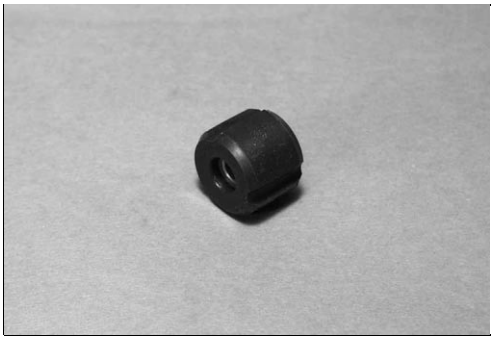
Drive Shaft Service

The drive shaft is supported in 5 bearing-pushes inside the guard tube. It is impossible to replace the bearing-bushes, i. e. the complete guard tube has to be replaced in case of bearing damage.

- Inspect film of lubricant every 50 hours of operation. If film of lubricant on the drive shaft is broken in places, coat the areas concerned with grease.

CAUTION
Do not apply too much grease to the drive shaft. **Never pump grease into the guard tube.**

Bearing-Bush before Assembly



ENGINE

Table of Contents

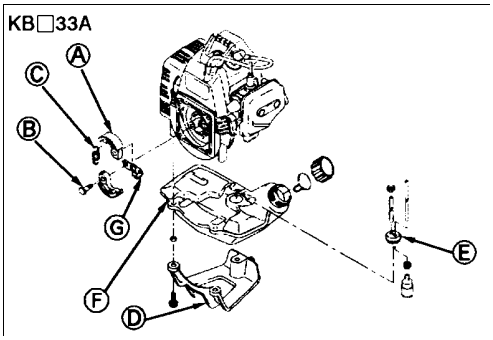
3-2 ENGINE

Clutch and Fuel Tank

Removal

- Keeping the clutch shoes (A) from turning by using a pair of pliers, release the clutch pins (B) by turning counterclockwise to remove the clutch shoes (A) and the clutch assembly.
  - Take care not to scratch the clutch shoes (A).
  - Do not remove the clutch spring (C) if not needed.
- Remove the stand (D).
- Remove the tank grommet (E) out of the fuel tank (F).
- Loosen the fuel tube clamps to remove the fuel tank (F) together.

KB□33A



Installation

- Installation is the reverse of removal.

NOTE

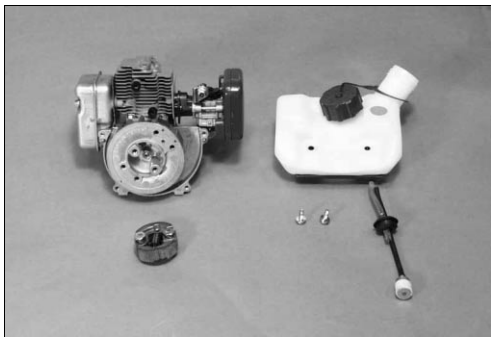
  - *Apply a bit of 2–stroke engine oil to the grommet in order to make the insertion easy.*

- Fix the fuel filter to the delivery side opaque tube and clamp it.
- Install the tank grommet to the fuel tank so that the transparent tube comes toward the fuel tank center.
- Put the opaque tube into the fuel tank together with the fuel filter and fit the tank grommet into its hole in order that the raised letters on the tank grommet can look toward outside.
- Apply locking agent to screw threads of the clutch pins (B).
- Apply a bit of heat resisting grease to the clutch-pin holes.
- Put the clutch shoes (A) and the plate (G) on the flywheel with raised letter(s) such as R54 for KB□26A, R78 for KB□43A/KB□48A, and R for KB□33A/KB□34A toward you to install them by tightening the clutch pins (B) to the specified torque.

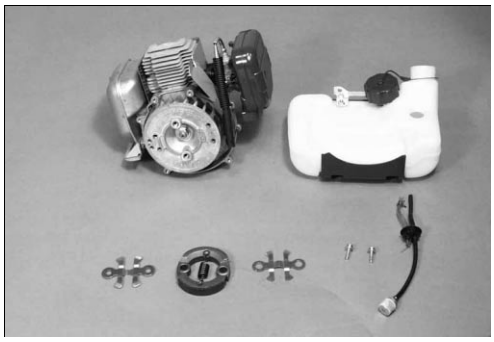
Specified Clutch Pin Tightening Torque
[KBL23A/KB□26A]
8 ∼ 10 N·m (0.8 ∼ 1.0 kg·m)
[KB□33A/KB□34A/KB□43A/KB□48A]
14 ∼ 16 N·m (1.4 ∼ 1.6 kg·m)

- Install the clutch spring (C) to the clutch shoes (A) before installing the clutch shoes (A) on the flywheel if the clutch spring is removed.

KBL23A/KB□26A



KB□43A/KB□48A



Air Cleaner, carburetor, and Muffler

Removal

- Unscrew the shroud mounting screw to remove the shroud.
- Unscrew the air cleaner mounting screws (A) to remove the air cleaner assembly (B).
- Unscrew the two carburetor mounting-screws (C) to remove the carburetor together with the gaskets (D, F) and the insulator (E).

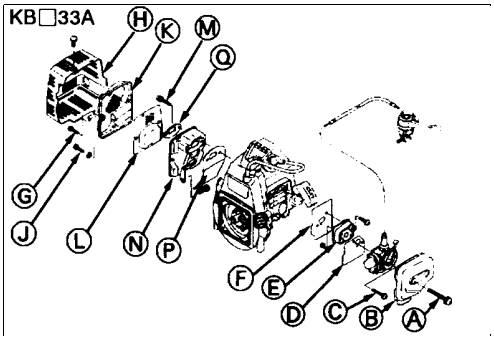
NOTE

○ *Do not remove the carburetor if not needed.*

- Unscrew the muffler cover mounting-screws (G) to remove the muffler cover (H).
- Unscrew the four muffler mounting-screws (J) to remove the muffler body (K) and the baffle plate (L).
- Unscrew the two flange bolts (M) to remove the muffler body-complete (N) together with the gasket (P) and the flange (Q).

NOTE

○ *In ordinary circumstances, there is no need to remove the muffler body complete (N) out of the cylinder.*



KBL23A/KB□26A

KB□43A/KB□48A

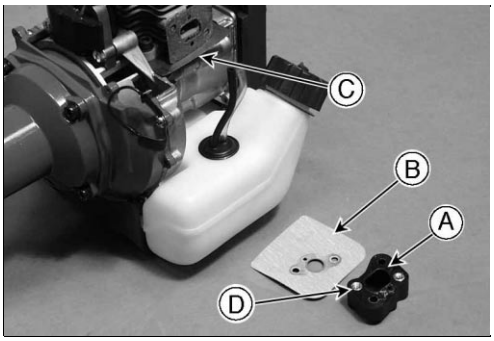
Installation

- Installation is the reverse of removal.
- Use new gaskets.

- If the insulator (A) is removed, fit the screw to round seat and nuts (D) to the hexagonal seats in the insulator (A), and put the insulator gasket (B) onto screw ends as shown, then install the insulator on the cylinder (C) with the screws.

○ Each pulse hole must align.

KB□43A/KB□48A

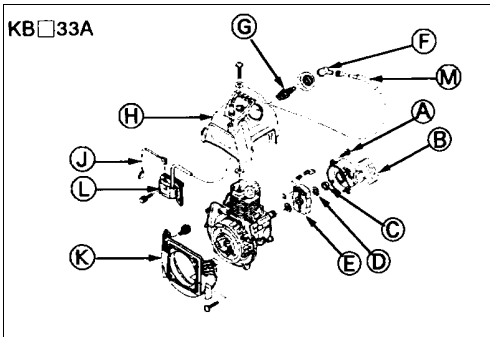


Recoil Starter, Shroud, Fan Housing, and Ignition Coil

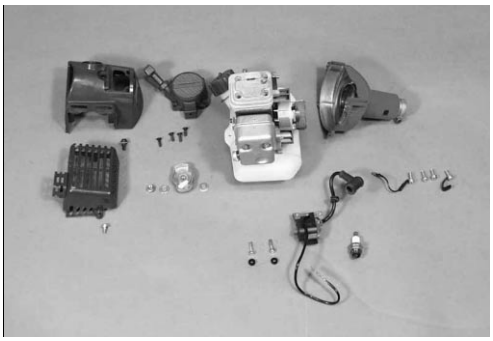
Removal

- Remove the four mounting screws (A) to remove the recoil starter (B).
- Release the starting pulley locknut (C) counterclockwise to remove it together with the washer (D).
- Remove the starting pulley (E) by turning itself counterclockwise.
- Remove the spark plug cup (F) out of the spark plug (G).
- Remove the plug cup (F) out of the high tension cord (M).
- Remove the shroud (H).
- Disconnect the ignition lead wire (J).
- Remove the fan housing (K).
- Remove the ignition coil (L).

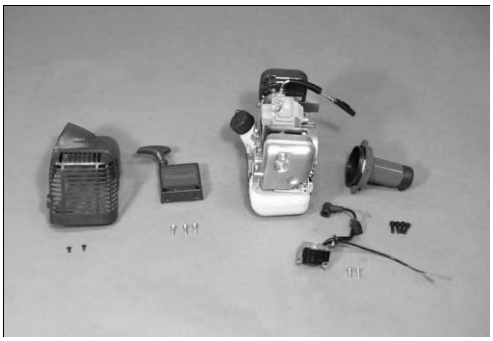
KB□33A



KBL23A/KB□26A



KB□43A/KB□48A



Installation

- Installation is the reverse of removal.
- Adjust the ignition coil air gap to the specified value.

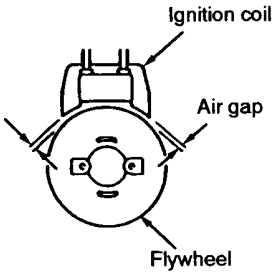
Ignition Coil Air Gap Specified

[KBL23A/KB□26A/KB□34A/KB□43A/KB□48A]

0.3 to 0.5 mm (0.011 to 0.019 in.)

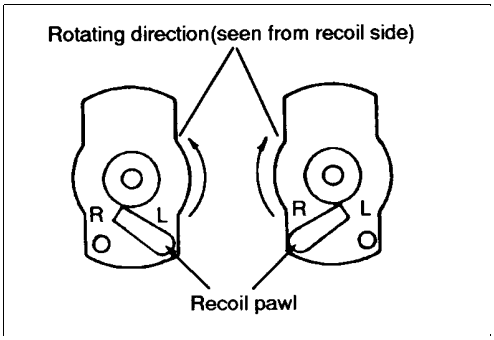
[KB□33A]

0.4 to 0.5 mm (0.015 to 0.019 in.)



Recoil Starter, Shroud, Fan Housing, and Ignition Coil

- Install the starting pulley to the crankshaft by turning clockwise.
- The recoil pawl must be fitted on the pulley as shown.



Ignition Coil Inspection

The ignition coil has been integrated with an igniter being solid-state.

- Use the Kawasaki hand tester (P/N 57001–1394); resistance value may vary with individual meters.
- Set the Kawasaki hand tester to the specified range.
- Connect the test leads to the points shown and read the resistance.

★If the resistance is not as specified, replace the ignition coil.

★If the meter reads as specified, the ignition coil windings probably good. However if the ignition system still does not perform as it should after all other components have been checked, replace the ignition coil with one know to be good.

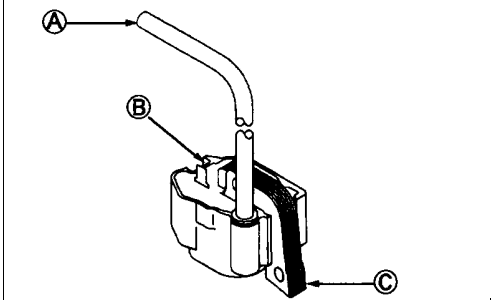
Ignition Coil Specified Resistance

	Resistance Between	
	[B] and [C]	[A] and [C]
	Primary Winding	Secondary Winding
KBL23A/KB□26A	0.8 Ω to 1.2 Ω (Rx1 Ω)	9 kΩ to 15 kΩ (Rx1 kΩ)
KB□33A	0.3 Ω to 0.7 Ω (Rx1 Ω)	9.3 kΩ to 15.6 kΩ (Rx1 kΩ)
KB□34A	0.4 Ω to 0.6 Ω (Rx1 Ω)	8 kΩ to 13 kΩ (Rx1 kΩ)
KBH43A/KBH48A	0.7 Ω to 1.2 Ω (Rx1 Ω)	9.4 kΩ to 15.6 kΩ (Rx1 kΩ)

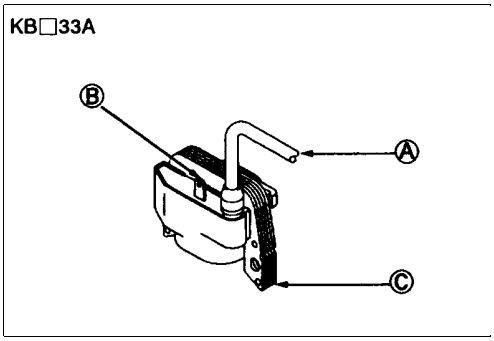
NOTE

- *It is unable to inspect the igniter whether it is good or bad with the Kawasaki hand tester since it was integrated with the ignition coil.*
- *Whenever you have doubt as to function of the igniter to operate, try replacing the ignition coil with one known to be good.*

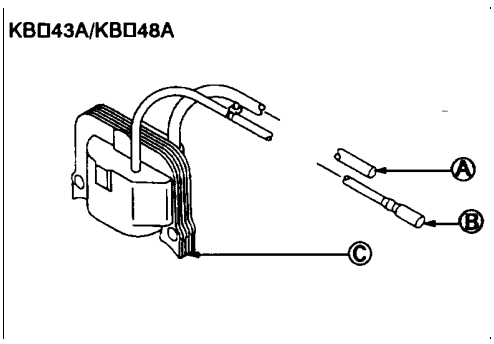
KBL23A/KB□26A/KB□34A



KB□33A



KB□43A/KB□48A

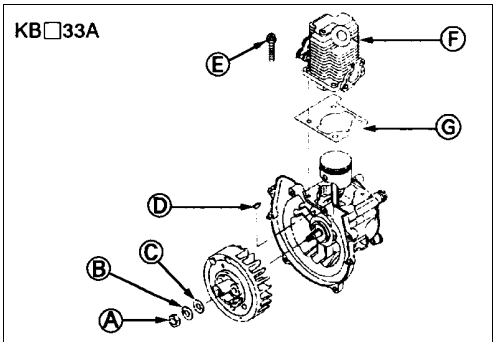


Flywheel and Cylinder

Removal

- Release the flywheel nut (A) counterclockwise to remove it together with the spring washer (B) and the plain washer (C).

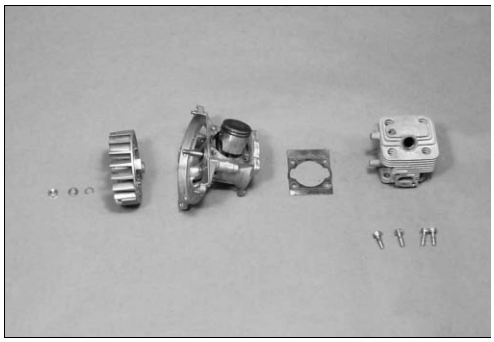
KB□33A



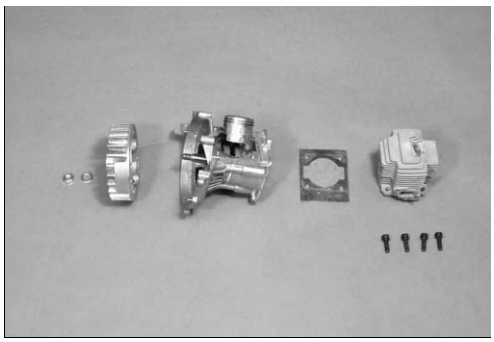
- Release the flywheel (H) out of the crankshaft by using a puller (I) as shown.
- Remove the key (D) from the crankshaft.
- Unscrew the flange bolts (E) to remove the cylinder (F) and the cylinder gasket (G) from the crankcase.
- Scrape the carbon deposits inside the cylinder with a suitable tool.

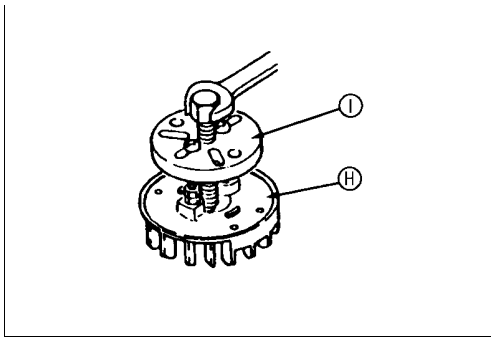
○ Use a scraper that are mode of a material that will not cause damage.

KBL23A/KB□26A



KB□43A/KB□48A

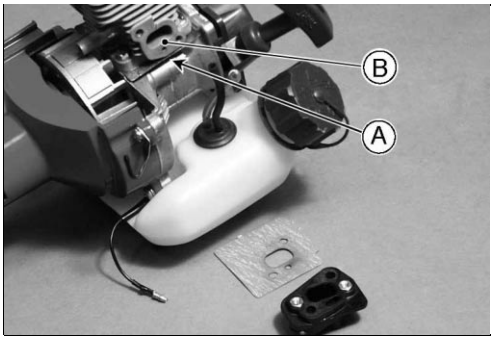




Flywheel and Cylinder

● Check to see if the pulse hole (A) under the inlet port (B) is clogged.
★If clogged, clean.

KBL23A/KB□26A

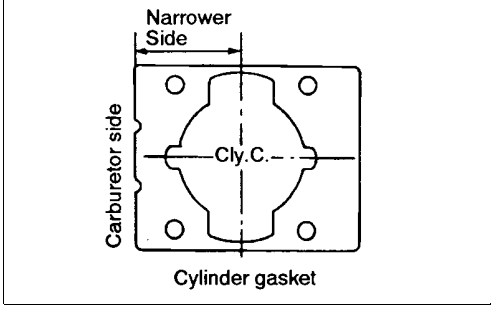


Installation

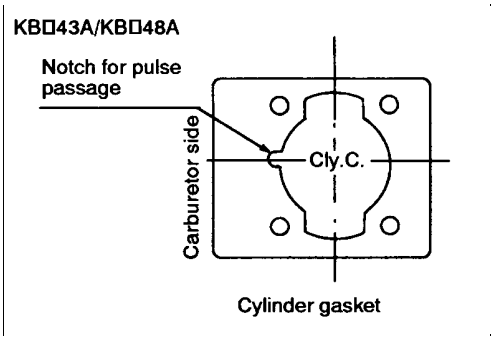
The cylinder gasket has the notches allowing crankcase pulses to pass through. The cylinder gasket should be properly set according the following.

● Installation is the reverse of removal.
● Use a new gasket.
● Set the cylinder gasket with its direction as shown.

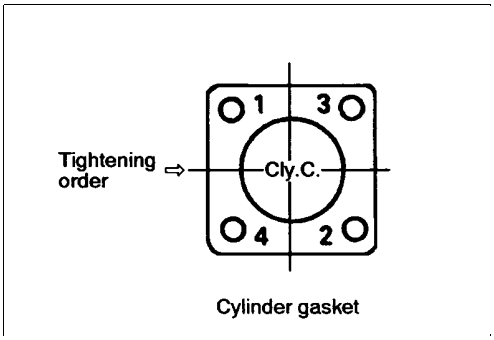
KB□33A



KB□43A/KB□48A



● Evenly tighten the cylinder to the crankcase with tightening torque and order specified (see Tightening Torque).



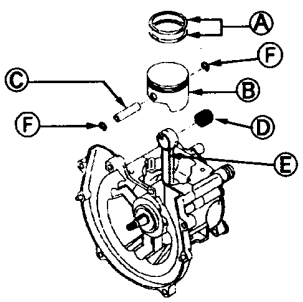
Piston and Piston Ring

Removal

CAUTION
Do not reuse snap rings as removal weakens and deforms them. They could fall out and score the cylinder wall.

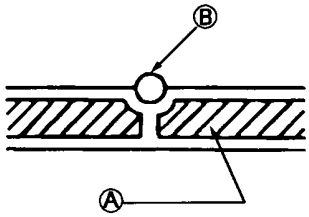
- Remove snap rings (F) out of the piston (B).
- Pull the piston pin (C) off the piston (B) to remove the piston (B) and the needle bearing (D) out of small-end of the connecting rod (E).
- Remove piston rings (A) out of the piston (B).

KB□33A



Installation

- Installation is the reverse of removal.
- Position the piston rings (A) in order that the radii at the ring gap can meet at the piston ring stopper pin (B) in the piston groove when the rings are compressed.



- Fit the needle bearing into small end of the connecting rod to install the piston to small end of the connecting rod, with the mark (A) on piston crown pointing to specified side, with the piston pin.

KB□33A

- "Arrow" on piston crown should point to flywheel side.

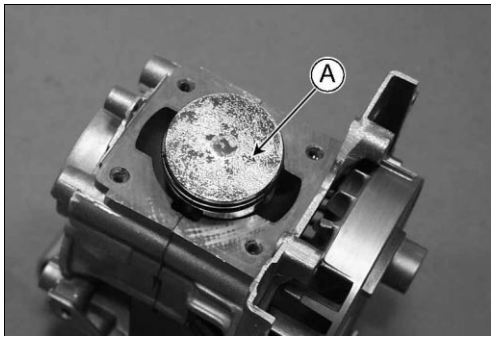
KBH43A

- "E" on piston crown should face muffler side.

KBL23A/KB□26A/KB□34A/KBH48A

- "H" on piston crown should face muffler side.

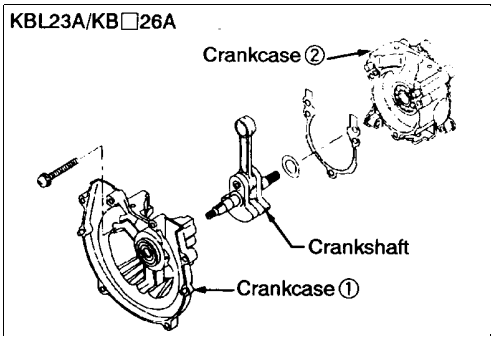
KB□33A



Crankcase and Crankshaft — KBL23A/KB□26A/KB□34A/KB□43A/KB□48A

Removal

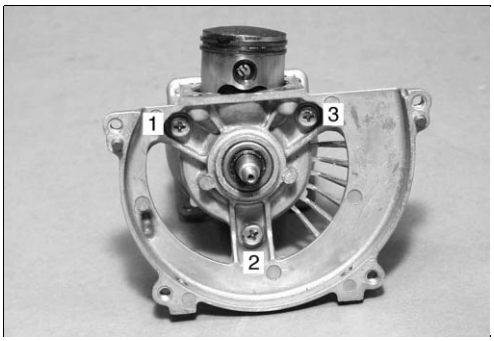
- Unscrew the tightening screws to split the crankcase (2) from the crankcase (1).
  - Lightly tap the crankcase with a plastic hammer to split it.
  - Take care not to damage the oil seals.
  - Take care not to lose the adjusting shims. (0 to 3 pieces).



Installation

The crankshaft, the connecting rod, and the needle bearing are inseparable. This means that the crankshaft must always be replaced as a complete unit in the event of damage to any one of these parts when fitting a replacement always install new ball bearings. The complete crankcase must be replaced if either half is damaged.

- Installation is the reverse of removal.
  - Apply fine oil to both ball bearings.
  - Apply heat resisting grease between oil seal lips.
- If the original crankcase if reused, remove liquid must be cleaned thoroughly to ensure a perfect seal.
- Sparingly apply liquid gasket on the sealing surface of the starter half of the crankcase.



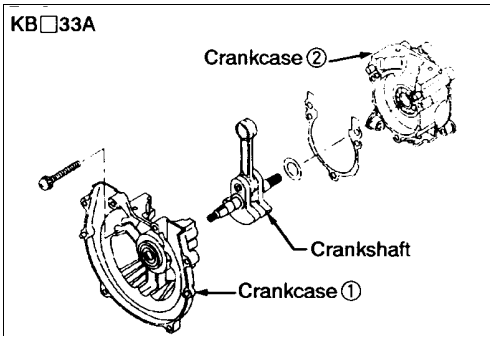
CAUTION
Excessive amounts may block something inside and cause serious damage.

- Put the flywheel half of the crankcase onto the starter half of the crankcase so that the dowel pins can be fit into their holes of the flywheel half of the crankcase and tighten the bolts to the specified torque evenly in the order shown (see Tightening Torque).

Crankcase and Crankshaft — KB□33A/KB□34A

Removal

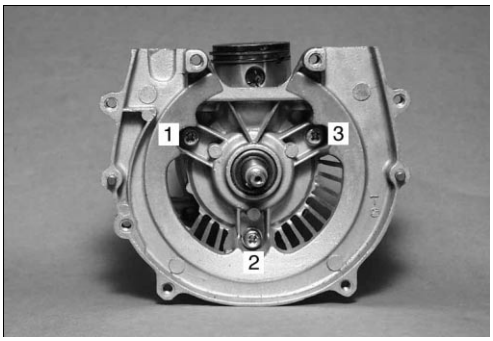
- Unscrew the tightening screws to split the crankcase (2) from the crankcase (1).
- ○ Lightly tap the crankcase with a plastic hammer to split it.
- ○ Take care not to damage the oil seals.
- ○ Take care not to lose the adjusting shims (0 to 3 pieces).

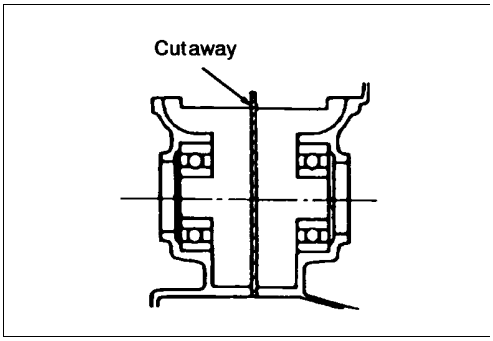


Installation

The crankshaft, the connecting rod, and the needle bearing are inseparable. This means that the crankshaft must always be replaced as a complete unit in the vent of damage to any one of these parts when fitting a replacement always install new ball bearings. The complete crankcase must be replaced if either half is damaged.

- Installation is the reverse of removal.
- ○ Apply fine oil to both ball bearings.
- ○ Apply heat resisting grease between oil seal lips.
- If the original crankcase is reused, remove the gasket stuck and clean the sealing surfaces;
  They must be cleaned thoroughly to ensure a perfect seal.
- Put the new gasket on the sealing surface of the crankcase so that the dwel pins are in position or fit them in the new gasket and tighten the bolts to the specified torque evenly in the order shown. (See Tightening Torque).
- Carefully cutaway any crankcase gasket that is proud of the cylinder flange surface.





Crankcase and Crankshaft — KBL23A/KB□26A/KB□33A/KB□34A

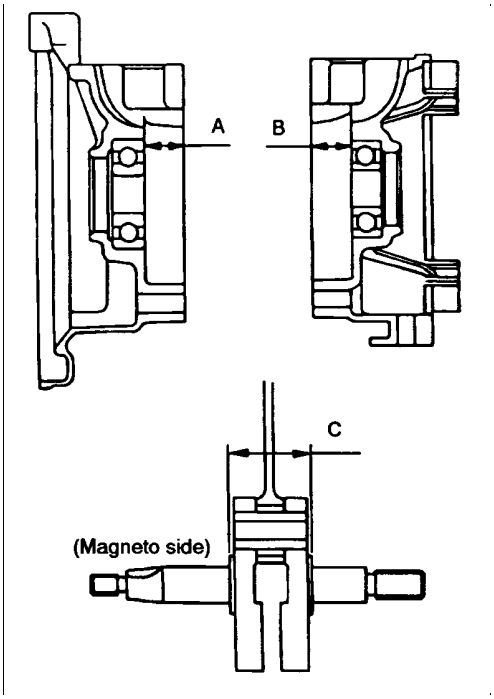
Whenever any one of the crankshaft, the crankcase, and the ball bearing is replace; select the crankshaft shim(s) to adjust crankshaft axial play according to crankshaft shim selection.

Crankshaft Shim Selection

Measure dimension of A, B, and C shown in the figure and calculate crankshaft clearance (dimension D) by the following equation.

Important: Measure dimension of A and B at the outer race not to allow ball bearing axial play to affect the shim selection.

D = A + B - C



KBL23A/KB□26A

Shim thickness mm (in).	Shim Part No.	
0.2 (0.007)	(1)	92025-2125
0.4 (0.015)	(2)	92025-2126
0.6 (0.023)	(3)	92025-2127

Clearance (dimension D) mm	Shim
0.05 ~ 0.27	without shim
0.28 ~ 0.47	(1)
0.48 ~ 0.67	(2)
0.68 ~ 0.79	(3)

KB□33A

Shim thickness mm (in).	Shim Part No.	
0.1 (0.003)	(1)	92025-2103
0.2 (0.007)	(2)	92025-2104
0.4 (0.015)	(3)	92025-2105
0.6 (0.023)	(4)	92025-2106

Clearance (demension D) mm	Shim
-0.11 ~ +0.03	(1) + (2)
0.04 ~ 0.13	(3)
0.14 ~ 0.23	(1) + (3)
0.24 ~ 0.33	(2) + (3)
0.34 ~ 0.43	(1) + (4)
0.44 ~ 0.53	(3) + (3)
0.54 ~ 0.63	(1) + (2) + (4)

KB□34A

Shim thickness mm (in).	Shim Part No.	
0.2 (0.007)	(1)	92025-2104
0.4 (0.015)	(2)	92025-2105
0.6 (0.023)	(3)	92025-2106

Clearance (dimension D) mm	Shim
0.05 ~ 0.27	without shim
0.28 ~ 0.47	(1)
0.48 ~ 0.67	(2)
0.68 ~ 0.79	(3)

Crankcase and Crankshaft — KB□43A/KB□48A

Whenever any one of the crankshaft, the crankcase, and the ball bearing is replaced; select the crankshaft shim(s) to adjust crankshaft axial play according to crankshaft shim selection.

Crankshaft Shim Selection

Measure dimension of A, B, and C shown in the figure and calculate crankshaft clearance (dimension D) by the following equation.

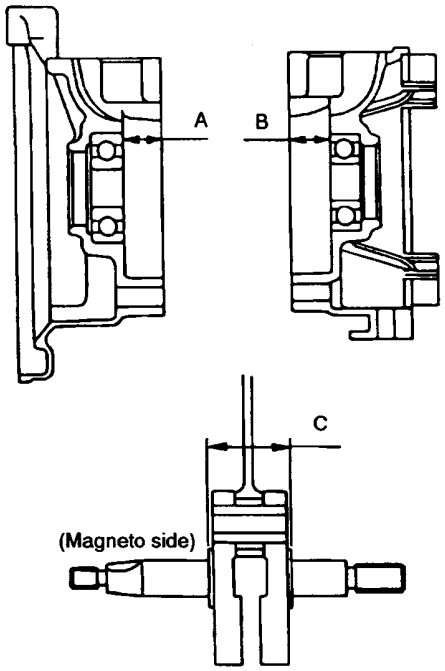
Important: Measure dimension of A and B at the outer race not to allow ball bearing axial play to affect the shim selection.

D = A + B - C

KB□43A/KB□48A

Shim thickness mm (in).	Shim Part No.	
0.2 (0.007)	(1)	92025-2135
0.4 (0.015)	(2)	92025-2136
0.6 (0.023)	(3)	92025-2137

Clearance (dimension D) mm	Shim
0.05 ~ 0.27	without shim
0.28 ~ 0.47	(1)
0.48 ~ 0.67	(2)
0.68 ~ 0.79	(3)



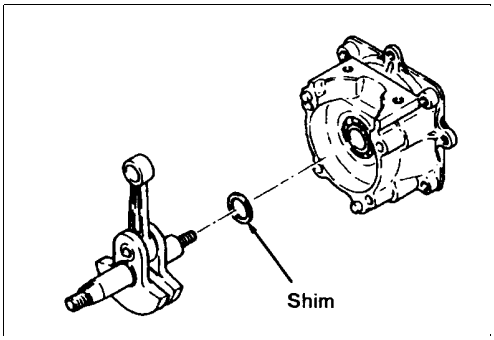
Crankcase and Crankshaft

Crankshaft Shim Installation

● Install shim(s) selected onto the crankshaft as shown and assemble the crankcase.

Crankshaft Axial Play
Standard: 0.05 ~ 0.295 mm (0.002 ~ 0.011 in.)*

* does not include that of ball bearings.



TROUBLESHOOTING

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4-2 TROUBLESHOOTING

Engine Troubleshooting

Hard Starting

Symptom	Cause		Remedy
Pulling recoil starter handle would not cause sufficient compression	Poor compression	•Wear in piston •Wear in piston ring •Stick of piston ring •Wear or deformation of clinder boce. •Poor tightening of cylinder and spark plug	•Replace •Replace •Clean ring groove and replace piston ring •Replace cylinder and piston ring as a set •Tighten
After choking and making several starting attempts, it is found, on removing spark plug, that electrodes are still dry.	Insufficient fuel	•No fuel in fuel tank •Clogging of dust or entry of air in fuel pipe •Clogged fuel tank cap air vent •Foul fuel filter in fuel tank •Poor opening and closing of choke valve •Air entering at gasket fitted to carburetor flange •Clogged carburetor needle jet or main jet	•Replenish •Clean •Clean •Clean •Correct •Tighten or replace gasket •Clean
After choking and making several starting attempts, it is on removing spark plug, that electrodes are excessively wet.	Excess fuel	•Faulty choking (In summer, or when engine is warm, full choking gives too rich mixture) •Overflow of fuel from carburetor •Clogged air cleaner	•Remove spark plug, with engine switch OFF, exhaust excess fuel by pulling starter rope •Check carburetor and exhaust excess fuel from cylinder •Clean aircleaner and exhaust excess fuel from cylinder
On removing spark plug, moisture condensed on spark plug electrodes.	Faulty fuel	•Mixture of water into fuel •Deterioration in fuel because of poor long-term storage •Use of fuel other than designated	•Change fuel •Change fuel •Change fuel
Make spark check. No spark but spark appears on spark plug replaced.	Faulty spark plug	•Electrodes are burned and damaged to cause too wide gap •Much carbon bridging electrodes gap •Small foreign matter being caught between electrodes •Faulty insulation of electroes	•Correct gap or replace •Clean or replace •Clean •Clean or replace spark plug
No spark in any spark plug, but spark appears when the end of high tension cord is touched to engine block.	Faulty plug cap	•Faulty contacting at spark plug cap	•Remove plug cap and connect terminal again

Engine Troubleshooting

Symptom		Cause		Remedy
No spark or very week spark at the end of high tension cord				
	Spark appears when stop switch wire is disconnected at connector.	Faulty stop switch	•Stop switch lead wire is jammed •Short circuit in stop switch	•Correct •Replace
	No spark appeas even when stop switch wire is disconnected at connector.	Slow recoil starter revolution	•Recoil starter revolution is lower than that igniter begins to work.	•Pull recoil starter rope more rapidly
	Spark appears when ignition coil is replaced with new one.	Faulty ignition coil	•Wiring of coil coming short-circuited or disconnected •Stop lead wire is jammed	•Replace •Correct or replace
	Spark appears when flywheel is replaced with new one.	Faulty flywheel	•Flywheel damagnetized	•Replace

Engine Malfunction at Low Speed

Symptom	Cause		Remedy
When throttle value is opened garadually, revolution speed drops at some position or engine stops	•Faulty carburetor •Faulty fuel filter •Air enters at carburetor flange	•Clogging in carburetor inside •Foul fuel filter •Faulty carburetor gasket •Incomplete fitting of carburetor	•Disassemble and clean •Clean or replace •Replace •Tighten
When spark test of spark plug is made with recoil starter rope pulled, spark appears very week.	•Faulty ignition system	•Faulty insulation of spark plug •Foul electrodes •Faulty magneto (flywheel, ignition coil and related parts)	•Replace •Clean •Replace

Engine Malfunction at High Speed

Symptom	Cause		Remedy
Same as "Engine Malfunction at Low Speed" mentioned above	•Faulty carburetor •Faulty fuel filter •Faulty ignition system	•Same as "Engine Malfunction at Low Speed"	•Same as "Engine Malfunction at Low
Loaded operation causes revolution fluctuation with big frequency	•Clogged fuel tank cap air vent •Dust clogging in or entry of air into fuel pipe or carburetor		•Clean •Clean

4-4 TROUBLESHOOTING

Engine Troubleshooting

Insufficient Power

Symptom	Cause		Remedy
Same as "Hard Starting"	•Poor compression •Insufficient fuel •Excess fuel •Faulty fuel •Faulty magneto •Faulty igniter	•Same as "Hard Starting"	•Same as "Hard Starting"
Engine overheated	•Clogged air cleaner •Carbon deposit inside combustion chamber •Inappropriate mixing ratio (too little oil) •Broken cooling fan blade •Dirt or dust attached to cooling fins of cylinder •Grass of dirt attached to cooling air passage and flywheel blade		•Clean •Clean •Change fuel •Replace •Clean •Clean
Thick smoke issues from exhaust port.	Excess fuel	•Same as "Hard Starting"	•Same as "Hard Starting"
	Faulty exhaust system	•Carbon deposit narrows exhaust passage and muffler •Excessive oil mixed	•Clean •Change fuel
Engine knocking	•Interior fuel		•Change fuel

Abnormal Engine Noises

Symptom	Cause	Remedy
Piston Slapping	•Cylinder and piston ring wear •Wear and/or deformation in piston •Carbon deposit inside combustion chamger •Wear in piston pin and connecting rod small end bearing •Wear in piston and piston pin	•Replace •Replace •Clean •Replace •Replace
Connecting rod noise	•Wear in large and small end bearings	•Replace

Hunting

Symptom	Cause	Remedy
Hunting	•Foul air cleaner •Dust clogging in or air entry into fuel pipe •Clogged fuel tank cap air vent •Clogged carburetor	•Clean •Clean •Clean •Clean

Fuel Leakage from Carburetor

Symptom	Cause	Remedy
Fuel leak from carburetor	•Foreign matter attached to needle valve and/or valve seat •Correction or wear in needle valve and/or valve seat •Poor tightening of diaphragm gasket	•Clean •Clean •Replace needle valve assembly •Tighten or replace

Excessive Fuel Consumption

Symptom	Cause		Remedy
Same as "Hard Starting"	•Poor compression	•Same as "Hard Starting"	•Same as "Hard Starting"
Sufficient compression but excessive fuel consumption.	•Too rich fuel mixture •Inferior fuel •Foul air cleaner •Too high idling speed •Choke valve not fully open		•Adjust •Replace •Clean •Adjust •Adjust

Engine Troubleshooting

Engine Stops during Operation

Symptom	Cause		Remedy
Difficulty in cranking, or seizure	Overheat	•Excessively lean fuel mixture (too little fuel)	•Adjust carburetor
		•Inferior lubricating oil mixed	•Change fuel
		•Excessive carbon deposit in conbustion chamber	•Clean
		•Dust accumulation on cooling fins of cylinder	•Clean
Cranking is easy	Faulty electrical system	•Faulty spark plug	•Clean or replace
		•Faulty magneto	•Check and repair
		•Loseness in connections	•Check and repair
	Faulty fuel system	•Clogged fuel line	•Clean
		•Foul air cleaner	•Clean or replace
		•Fuel in tank used up	•Replenish
	Faulty carburetor	•Dust clogging in fuel passage	•Clean

SUPPLEMENT

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5-2 SUPPLEMENT

Rotary Valve, Diaphragm Type Carburetor — KBL23A/KB□26A/KB□34A

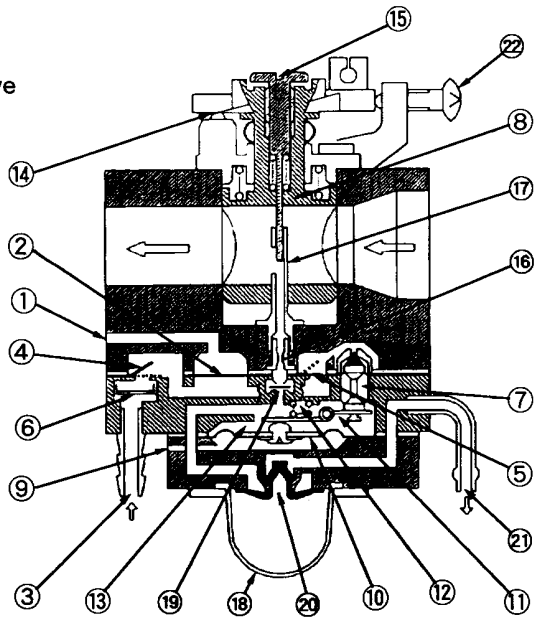
Priming Pump System

When starting the engine, by pushing the priming pump (18), air is pushed out toward the overflow pipe (21) from the priming pump check valve (20), which causes negative pressure inside the metering chamber (13) and the needle valve (7) opens.

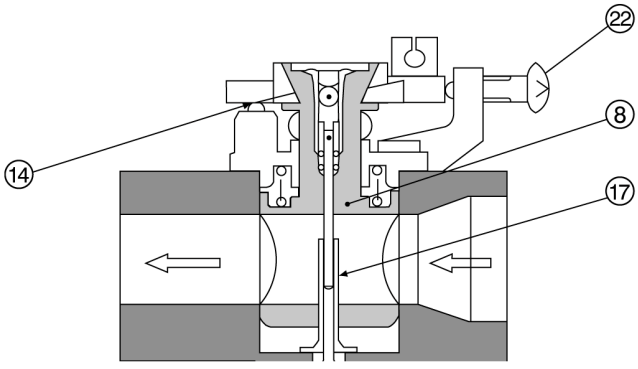
Then fuel from the fuel tanks is sucked into the metering chamber through the inlet cheek valve (4) and then into the priming pump. And excessive fuel is discharged from the overflow pipe. This operation is called “Priming operation at starting”.

Non emission type

1. Engine Pulse Passage
2. Fuel Pump Diaphragm
3. Fuel Inlet
4. Inlet Check Valve
5. Outlet Check Valve
6. Inlet Screen
7. Needle Valve
8. Throttle Valve
9. Air Vent
10. Main Diaphragm
11. Control Lever
12. Valve Spring
13. Metering Chamber
14. Lead Cam
15. Idle Needle Pin
16. Main Jet
17. Main Nozzle
18. Priming Pump
19. Main Check Valve
20. Priming Pump Check Valve
21. Overflow Pipe
22. Idle Adjust Screw



emission type



Rotary Valve, Diaphragm Type Carburetor — KBL23A/KB□26A/KB□34A

Fuel Pump System

After starting the engine, part of pressure change inside the crankcase caused by engine revolution is transmitted to the pump diaphragm (2) through the engine pulse passage(1), which deforms the pump diaphragm and it starts reciprocating motion. Namely, fuel is sucked from the tank into the carburetor under pressure by volume change due to the pump diaphragm's reciprocating motion and the inlet (4) and the outlet check valves (5) function.

Metering Chamber System

The main diaphragm (10) forming the metering chamber senses inside fuel pressure change of the metering chamber (13), which occurs in accordance with the engine revolution change, as vertical motion. And it works to keep a uniform pressure (equivalent to the fuel surface of a float type carburetor) inside the metering chamber by opening and closing the needle valve (7).

Fuel in the metering chamber is drawn by negative pressure in the venturi, blown out from the main nozzle (17), mixed with air passed through the venturi and sucked into the engine. When the engine stops, negative pressure in the venturi becomes zero; the control lever (11) is pushed up with the valve spring (12); and the needle valve (7) closes. Then fuel flow stops and overflow is prevented.

5-4 SUPPLEMENT

Rotary Valve, Diaphragm Type Carburetor — KBL23A/KB□26A/KB□34A

Disassembly

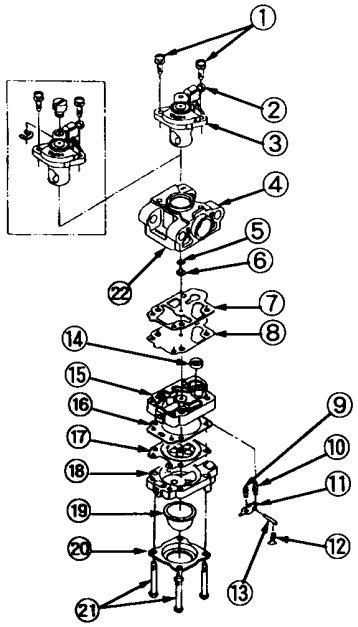
Before disassembling, clean the carburetor with cleaning oil so that no dirt enters the carburetor.

- Remove 2 throttle-collar screws (1) to remove the throttle valve assembly (3) from the carburetor body (4).

CAUTION
Do not disassemble the throttle valve assembly (3).

- Remove 4 pump-cover screws (21) with the priming pump (19) side upward.
- Remove the priming pump cover (20), the priming pump (19), the air purge body (18), the main diaphragm (18), the gasket (16), the pump body (15), the pump diaphragm (8), and the pump gasket (7) in that order.
- Remove the main jet (6) and the O-ring (5) from the carburetor body (4).

CAUTION
Do not remove the main nozzle (22) as it is press fitted. **If much dirt is found inside the carburetor, especially on the inlet screen, clean the fuel tank inside and replace the fuel filter.**



Reassembly

Before reassembly, clean removed parts and the body with suitable detergent and use compressed air to dry.

- Reassembly is the reverse of removal.

Rotary Valve, Diaphragm Type Carburetor — KBL23A/KB□26A/KB□34A

Inspection and Adjustment

- Clean the carburetor with cleaning oil and apply air.
- Check to see that no dirt or corrosion is found in the main jet.

★If dirt is found, clean and apply air.

★If corrosion is found, replace the main jet with new one.

CAUTION
When replacing the main jet, be sure to replace with a jet with the same number.

- As to the gaskets, check to see if no deformation or damage is found.

★If deformation or damage is found, replace them with new ones.

- Check the pump diaphragm to see if no damage or hardening is found. Check the inlet check valve and the outlet check valve in particular and make sure that they are flat and not bent.

★If they are bent, replace them with no ones.

- Check the main diaphragm to see if there is any peeling, damage or the aluminum plate bent.

★If they are bent, replace with new one.

After cleaning the pump body, check to see that the control lever functions well and that no dirt is found on the inlet screen.

CAUTION
To prevent deformation or sticking of the main check valve, never apply high pressure air to the valve.

- Check to see that there is no deformation or damage on the check valve.

★If any, replace it with new one.

- Check to see that no hole, damage or abnormal hardening is present on the priming pump.

★If present, replace it with new one.

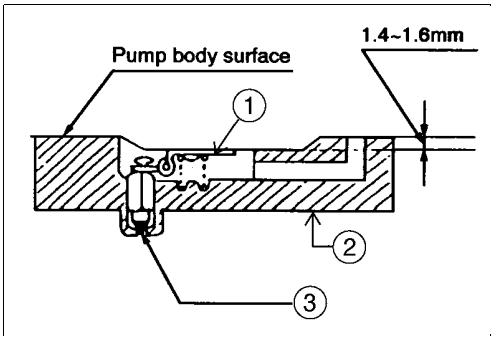
- Push the tip end of the control lever lightly and make sure that the lever moves smoothly.

★If the needle valve which opens and closes with movement of the control lever (1), has got some damage on its tip end or wear due to its long use, applying air to the tip end of the needle valve (3) will not be solution for overflow.

In this case, replace the pump body assembly with new one.

- Adjust the control lever (1) so as to be at the same level as the bottom of the metering chamber as shown.

★If correction is necessary, ben the lever lightly to be on the same surface of the metering chamber bottom, or adjust the lever to be from 1.4 mm (0.055 in.) to 1.6 mm (0.062 in.) with surface of the pump body as standard.



- To check function of the main check valve, stick vinyl pipe end to the main check valve and breathe in and out from the other end.

★If the valve opens when breathing in and closes when breathing out, the valve functions well.

- If any problems are found, soak the valve in gasoline for about 10 minutes and repeat breathing in and out several times.

★If no improvement shows, replace the pump body (2) with new one.

5-6 SUPPLEMENT

Rotary Valve, Diaphragm Type Carburetor — KBL23A/KB□26A/KB□34A

Idle Needle Pin Adjustment

- Start the engine and move the throttle lever to its fully-closed position. Raise the engine speed just before the cutting tool begins turning by turning the idle adjust screw clockwise.
- Adjust the idle needle pin where the engine speed rises highest by turning it clockwise or counter clockwise. When the engine speed rises and the cutting tool begins turning, lower the engine speed by turning the idle adjust screw counterclockwise and readjust the idle needle pin where the engine speed rises highest right before the cutting tool begins turning by turning the pin clockwise or counterclockwise.
- When the idle needle pin position is fixed, turn the idle needle pin 1/4 to 1/2 turn more and stop turning.
- And then adjust the idle adjust screw to the specified speed. See “Setting Table”.

Rotary Valve, Diaphragm Type Carburetor Troubleshooting — KBL23A/KB□26A/KB□34A

Symptom	Cause	Remedy
Engine hard to start	•Idle needle pin maladustement	•Adjust
	•Idle adjust screw maladjustment	•Adjust
	•Foul fuel filter in fuel tank	•Clean
	•Clogging in fuel passage	•Clean
	•Air leakage in fuel passage	•Repair
	•Improper fuel	•Change
	•Inferior check valve	•Replace
	•Clogged air cleaner element	•Clean or replace
	•Damaged carburetor control (metering) lever	•Repair
	•Malfunction of carburetor control (metering) lever	•Repair
	•Inferior main diaphragm gasket	•Replace
	•Poor tightening of main diaphragm cover screw	•Tighten
	•Damaged main diaphragm	•Replace
	•Adherence of inlet needle valve	•Replace
	•Inlet needle valve wear	•Replace
	•Inlet needle valve sticking	•Repair
Overflow, fuel leakage	•Poor tightening of fuel pump cover screw	•Tighten
	•Damaged carburetor control (metering) lever	•Repair
	•Too high carburetor control (metering) lever	•Adjust
	•Malfunction of carburetor control (metering) lever	•Repair
	•Deformed carburetor control (metering) level spring	•Replace
	•Inferior main diaphragm gasket	•Replace
	•Poor tightening of main diaphragm cover screw	•Tighten
	•Damaged main diaphragm	•Replace
	•Inlet needle valve wear	•Replace
	•Inlet needle valve sticking	•Repair
Priming is hard to suck fuel	•Clogged fuel tank cap air vent	•Clean
	•Foul fuel filter in fuel tank	•Clean
	•Clogged fuel line	•Clean
	•Air leakage in fuel line	•Repair
	•Damaged priming pump	•Replace
	•Inferior priming pump check valve	•Replace
	•Malfunction of carburetor control (metering) lever	•Repair
	•Inferior main diaphragm gasket	•Replace
	Poor Tightening of main diaphragm cover screw	•Tighten
	•Damaged main diaphragm	•Replace
	•Adherence of inlet needle valve	•Replace
Engine would not idle	•Idle needle pin maladjustment	•Adjust
	•Idle adjust screw maladjustment	•Adjust
	Foul fuel filter in fuel tank	•Clean
	Air leakage in fuel line	•Repair
	•Interior manifold O-ring	•Replace
	•Poor tightening of carburetor	•Tighten

5-8 SUPPLEMENT

Rotary Valve, Diaphragm Type Carburetor Troubleshooting — KBL23A/KB□26A/KB□34A

Symptom	Cause	Remedy
Idling is too slow	•Idle needle pin maladjustment	•Adjust
	•Clogged air cleaner element	•Clean or replace
	•Damaged carburetor control (metering) lever	•Replace
	•Carburetor control (metering) lever is too high	•Adjust
	•Malfunction of carburetor control (metering) lever	•Replace
	•Inlet needle valve wear	•Replace
	•Forein matter sicking	•Clean
Idling is unstable	•Idle needle pin maladjustment	•Adjust
	•Idle adjust screw maladjustment	•Adjust
	•Clogged fuel tank cap air vent	•Clean
	•Foul fuel tank fuel filter	•Clean
	•Clogged fuel line	•Clean
	•Air leakage in fuel line	•Repair
	•Improper fuel	•Change
	•Inferior check valve (foreign matter)	•Replace
	•Inferior manifold O-ring	•Replace
	•Poor tightening of carburetor	•Tighten
	•Malfunction of carburetor control (metering) lever	•Replace
	•Poor installation of carburetor control lever	•Correct
	•Damaged main diaphragm	•Replace
	•Adherence of inlet needle valve	•Replace
	•Foreign matter sticking	•Clean
Idling does not continue	•Idling needle pin maladjustment	•Adjust
	•Idling adjust screw maladjustment	•Adjust
	•Foul fuel tank filter	•Clean
	•Clogged fuel line	•Clean
	•Air leakage in fuel line	•Repair
	•Inferior check valve (foreign matter)	•Replace
	•Too high carburetor control (metering) lever	•Adjust
	•Malfuncion of carburetor control (metering) lever	•Replace
	•Deformation of carburetor control (metering) lever	•Replace
	•Poor installation of carburetor control lever spring	•Correct
	•Inlet needle valve wear	•Replace
	•Foreign matter sicking of inlet needle	•Clean

Rotary Valve, Diaphragm Type Carburetor Troubleshooting — KBL23A/KB□26A/KB□34A

Symptom	Cause	Remedy
Engine does not accelerate	•Idle needle pin maladjustment	•Adjust
	•Clogged fuel tank cap air vent	•Clean
	•Foul fuel tank filter	•Clean
	•Clogged fuel line	•Clean
	•Air leakage in fuel line	•Repair
	•Pulse leakage from fuel pump	•Repair
	•Clogged pulse passage	•Clean
	•Poor tigtening of pump cover screw	•Tighten
	•Inferior of pump diaphragm	•Replace
	•Inferior of check valve	•Repair
	•Inferior of manifold O-ring	•Replace
	•Poor tigtening of carburetor	•Tighten
	•Damaged carburetor control (metering) lever	•Replace
	•Too low carburetor control (meterian) lever	•Adjust
	•Malfunction of carburetor control (metering) lever	•Replace
	•Poor installation of carburetor control (metering) lever	•Correct
	•Damaged carburetor control (metering) lever button	•Replace
	•Poor tightening of diaphragm cover	•Tighten
	•Damaged diaphragm	•Replace
	•Adherence of inlet needle valve	•Replace
Engine stops when decelrating	•Idle needle pin maladjustment	•Adjust
	•Interior pump diaphragm	•Replace
	•Too high carburetor control (metering) lever	•Adjust
	•Malfunction of carburetor control (metering) lever	•Replace
	•Inlet needle valve wear	•Replace
	•Foreign matter stticking of inlet needle	•Clean
Engine does not accelerate quick	•Idle needle pin maladjustment	•Adjust
	•Clogged air cleaner element	•Clean
Malfunction at high speed	•Clogged fuel tank cap air vent	•Clean
	•Four fuel tank filter	•Clean
	•Clogged fuel line	•Clean
	•Air leakage in fuel line	•Repair
	•Improper fuel	•Change
	•Pulse leakage from pulse pump	•Repair
	•Poor tightening of pump cover screw	•Tighten
	•Inferior of pump diaphragm	•Replace
	•Inferior of check valve	•Replace
	•Clogged air cleaner element	•Clean
	•Inferior of manifold O-ring	•Replace
	•Poor tightening of carburetor screw	•Tighten
	•Damaged carburetor control (metering) lever	•Replace
	•Malfunction of carburetor control (metering) lever	•Replace
	•Deformation of carburetor control (metering) lever	•Replace
	•Poor installation of control lever spring	•Correct
	•Damaged main diaphragm button	•Replace
	•Inferior of main diaphragm gasket	•Replace
	•Poor tightening of main diaphragm cover	•Tighten
	•Damaged main diaphragm	•Replace
	•Inlet needle valve wear	•Replace
	•Foreign matter sticking of inlet needle	•Clean

5-10 SUPPLEMENT

Piston Valve, Diaphragm Type Carburetor — KB□33A/KB□43A/KB□48A

Disassembly

Before disassembling, clean the carburetor with cleaning oil so that no dirt enters the carburetor.

- Unscrew to remove the plate (38) and the priming pump (37).
- Remove the pump cover (35), the gasket (34), the pump plate (33), the pump diaphragm (30), and the gaskets (29, 31, 32).

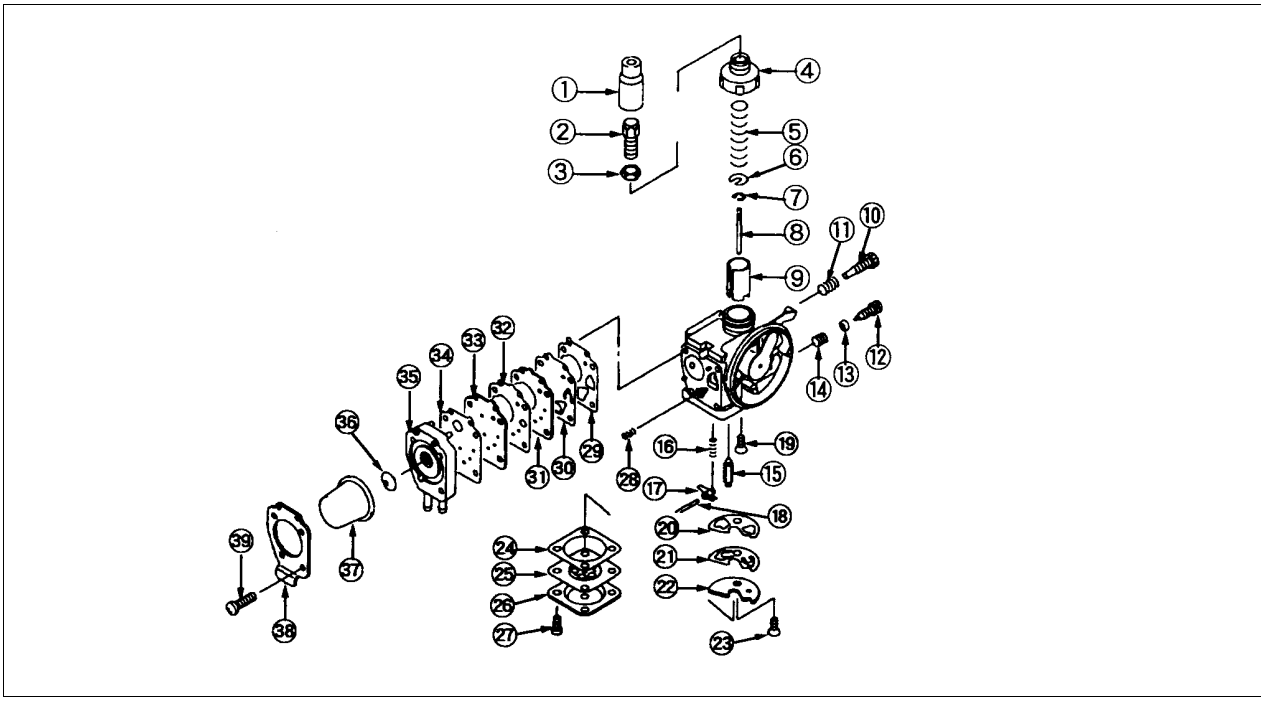
○ Check to see if the gaskets (29, 31, 32, 34) and the pump diaphragm (30) are not damaged, and confirm outflow of air from the other side of the passage.

- Unscrew to remove the control lever (17), the control lever pin (18), the control lever spring (16), and the needle valve (15).
- Unscrew to remove the plate (22), the check valve (21), and the gasket (20).
- Remove the cap (1) and pull up the throttle wire to take out the throttle valve (9).
- Remove the throttle wire from the throttle valve (9) to remove the spring (5), the retainer (6), and the jet needle (8).

CAUTION
Do not remove the needle clip (7) if adjusting is not necessary.

- Remove the throttle stop screw (10) and the main adjust screw (12) together with the springs (11, 14) from the carburetor body and check to see if tip of each screw is not damaged and free from foreign material.

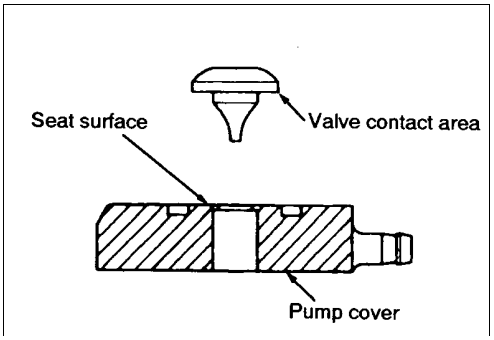
★ If abnormal condition is found on the throttle stop screw (10) or main adjust screw (12), replace with new ones.



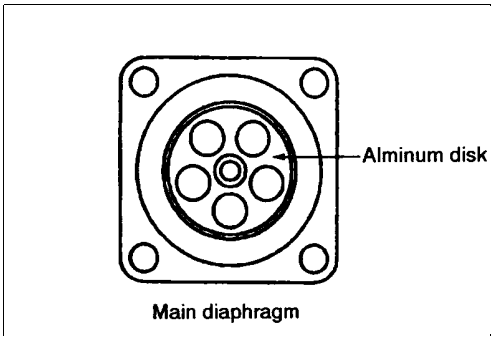
Piston Valve, Diaphragm Type Carburetor — KB□33A/KB□43A/KB□48A

CAUTION

Do not remove the check valve installed into the priming pump cover normary. If it is removed because of clogging with dust and so on, take care not to damage seat surface to the check valve and contact area of the valve. When removing the check valve, do not sue tip of a screw driver, a metal, and the like.



- Unscrew to remove the diaphragm cover, the main diaphragm, and the gasket.
- ○ Check to see if the main diaphragm is not ripped or does not come off and the aluminum disk of the diaphragm is not deformed.
- ★ If the diaphragm or the gasket is damaged, replace with new one.



Reassembly

Before assembly, clean removed parts and the body with suitable detergent and use compressed air to dry.

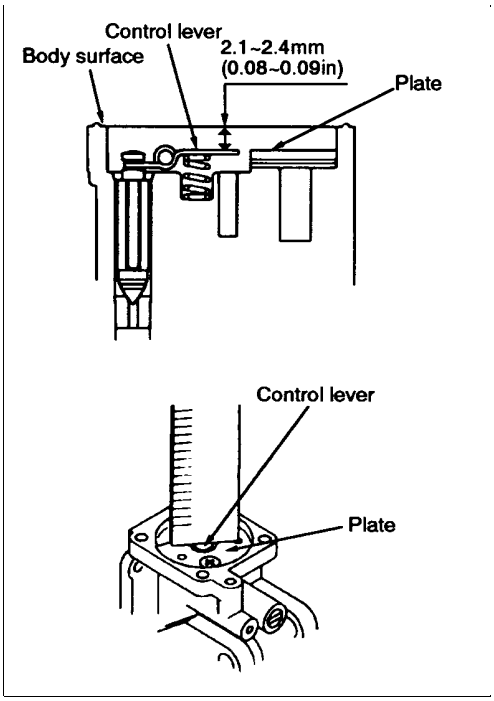
- Reassembly is the reverse of disassembly.

Metering Chamber Adjustment

- Push tip of the control lever lightly to check smooth movement of the control lever.
- After installation, check control lever height proper height is as shown; but if the lever and the plate are on much the same surface lever height shows no problem in use. Use ruler as a simple method to check control lever height as shown. If necessary, adjust by bending the control lever slightly.

CAUTION

Excessively bending the lever to the body (down side as shown) results in faulty acceleration and the engine stops during operation. Bending the lever to the opposite side (up side as shown) results in excessive fuel consumption and impossibility in starting due to overflow.



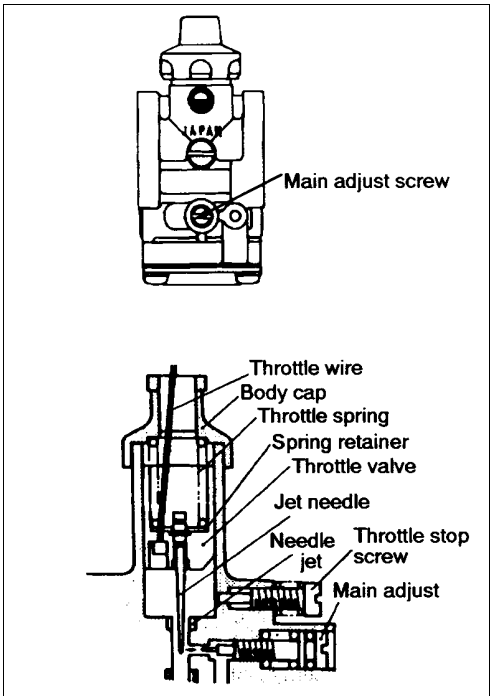
5-12 SUPPLEMENT

Piston Valve, Diaphragm Type Carburetor — KB□33A/KB□43A/KB□48A

Main Adjust Screw Adjustment

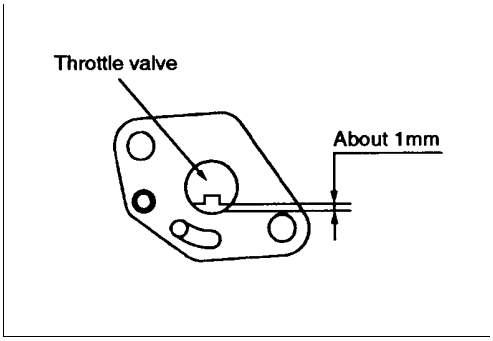
- Turn the main adjust screw slowly clockwise until it stops at full closure and then turn it out 1–1/8 turns for KB□33A or 1–1/2 +- 1/2 turns for KBH43A and KBH48A.

CAUTION
Turn the screw slowly because overturning (tightening) causes deformation of tip of the screw and screw seat on the body and results in malfunction of the carburetor.



Lowest Throttle Valve Adjustment

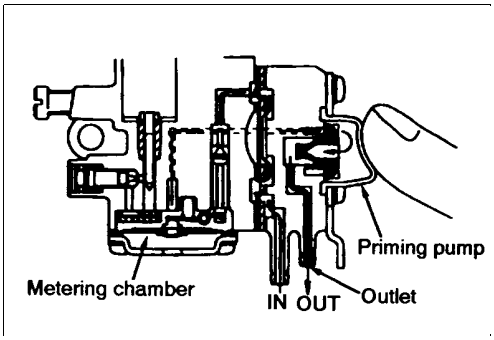
- Adjust the lowest position of the throttle valve by turning the screw so that opening of the throttle valve may reach about 1 mm (0.04 in.).



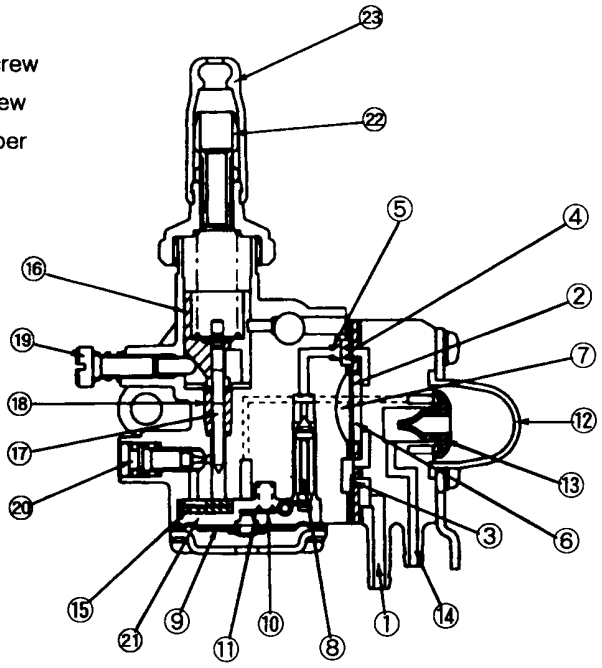
Piston Valve, Diaphragm Type Carburetor — KB□33A/KB□43A/KB□48A

Priming Pump System

When starting the engine, by pushing the priming pump (12), several times by hand pressure in metering chamber lowers and the main diaphragm (9), the needle valve (8) is opened and fuel flows into metering chamber (21). Overflow from the chamber flows back into the fuel tank through the fuel outlet (14). Pushing should be stopped as soon as overflow appears out of the fuel outlet (14). During operation of the priming pump (12), the main check valve (15) is closed by negative pressure to check air suction from the needle jet (18) into the metering chamber (21).



1. Fuel Inlet
2. Pump Diaphragm
3. Suction Check Valve
4. Delivery Check Valve
5. Check Valve Spring
6. Pump Chamber
7. Pulse Chamber
8. Needle Valve
9. Main Diaphragm
10. Control Lever
11. Control Lever Spring
12. Priming Pump
13. Priming Pump Check valve
14. Fuel Outlet
15. Main Check Valve
16. Throttle Valve
17. Jet Needle
18. Needle Jet
19. Throttle Stop Screw
20. Main Adjust Screw
21. Metering Chamber
22. Cable Adjuster
23. Rubber Cap

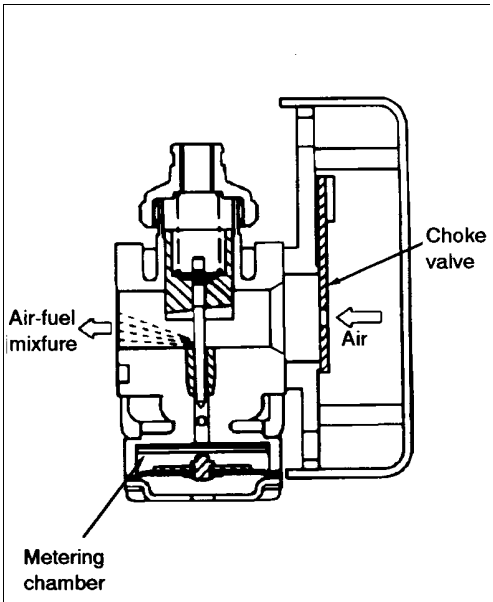


Piston Valve, Diaphragm Type Carburetor — KB□33A/KB□43A/KB□48A

Choke System

Use the choke lever to fully close the choke valve, open the throttle lever half, turn the engine switch to “ON”, and pull the recoil starter rapidly until the engine fires.

At this time, intake negative pressure increases by choking, more fuel flows from the needle jet and rich (nanely, containing extra fuel) air-fuel mixture suitable for starting the engine is sucked into the engine cylinder. After the engine starts, open the choke valve gradually to full open position. In tense heat or when the engine is warm, open the choke valve half or fully.

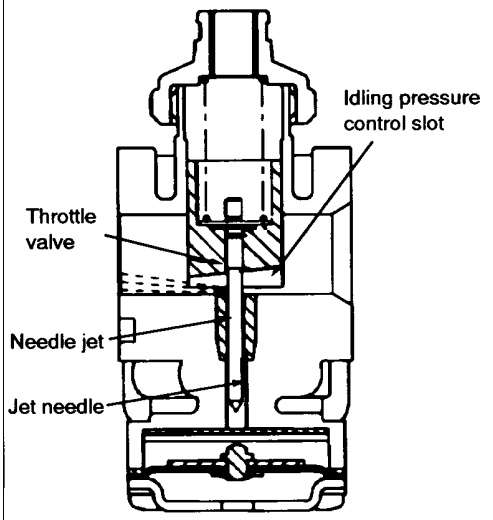


Idling System

At this time, throttle valve position is at the lowest in the carburetor and opening of the valve becomes minimum.

The minimum opening of the throttle valve is decided by adjusting the throttle stop screw, and fuel flow rate is controlled by clearance between the needle jet and the jet needle.

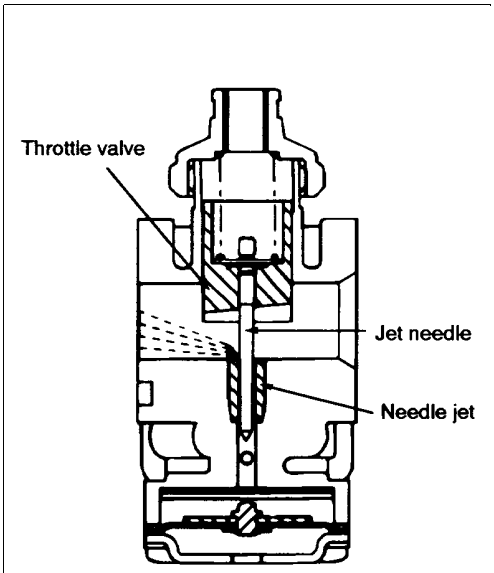
The slot on bottom surface of the throttle valve regulates the negative pressure on the needle jet to give fuel flow appropriate for idling.



Piston Valve, Diaphragm Type Carburetor — KB□33A/KB□43A/KB□48A

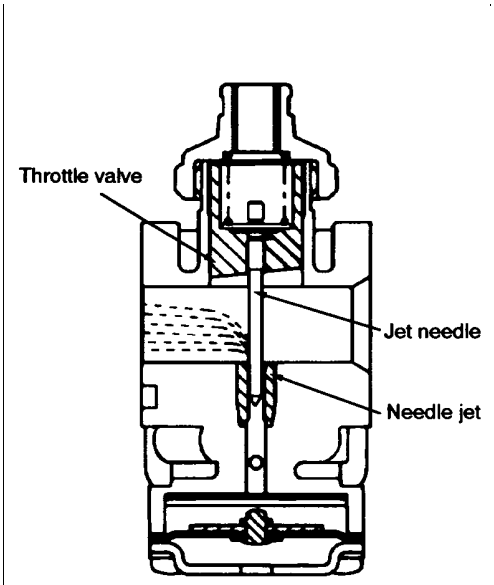
Fuel and Air Flow between Idling and Full Throttle

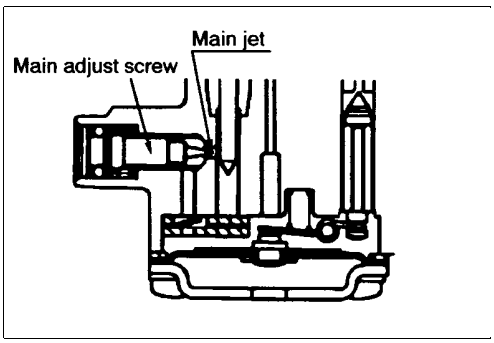
When increasing the throttle valve opening, clearance between the needle jet and the jet needle increases gradually and fuel flow rate from the jet and the jet needle increases gradually and fuel flow rate from the jet also increases. Fuel flow rate is controlled by the clearance. By this movement of the throttle valve, at the same time, intake air amount passing through the carburetor also increases, and air-fuel mixture to meet requirement of the engine from idling to high speed running can be supplied.



Fuel and Air Flow at Full Throttle

At this time, the throttle valve is positioned at the highest in the carburetor and opening of the valve becomes maximum (full). Fuel flow rate is controlled largely by the main jet and opening of the jet is adjusted by the main adjust screw.





Piston Valve, Diaphragm Type Carburetor Troubleshooting — KB□33A/KB□43A/KB□48A

	Condition	Probable cause	Remedy
Hard starting	•No fuel drain into the return pipe in spite of several priming operation.	•Clogging in fuel tube at inlet side.	•Remove and clean the tube.
		•Broken tube at inlet side	•Replace the tube.
		•Air leakage from joint portion of fuel tube at inlet side.	•Fit fuel tube to the joint. If not good, replace the tube.
		•Adhesion of dust to check valve of priming pump.	•Disassemble and clean parts.
		•Broken check valve of priming pump or damaged seat surface of pump cover.	•Replace the check valve or the pump cover.
		•Air leakage from fitting area of priming pump.	•Retighten screws to priming pump plate.
		•Broken priming pump.	•Replace the pump.
		•Air leakage from main check valve.	•Disassemble and clean the check valve. If not good, replace the main check valve and the plate.
		•Loose main diaphragm cover.	•Retighten screws to the diaphragm cover.
		•Broken main diaphragm.	•Replace the main diaphragm.
		•Broken main diaphragm gasket.	•Replace the gasket.
	•Fuel drains into the return pipe by priming operation, but engine does not start.	•Choke valve not closed.	•Close choke valve.
		•Air entering engine through the fitting portion of carburetor.	•Retighten the fitting bolts of the carburetor.
		•Main adjust screw not adjusted properly.	•Adjust the screw properly.
		•Clogged needle jet.	•Disassemble and clean.
		•Overflow of fuel from needle jet to the venturi of carburetor.	•Disassemble and clean needle valve portion, and adjust the control lever height properly. If not good, replace the needle valve.
	•After starting, engine revolution does not continue.	•Choke valve closed after starting.	•Open choke valve after starting.
		•Clogged pulse passage.	•Disassemble and clean the pulse passage.
		•Improper height of control lever.	•Adjust the control lever height properly.

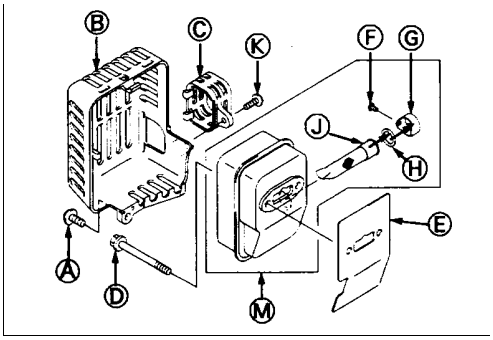
Piston Valve, Diaphragm Type Carburetor Troubleshooting — KB□33A/KB□43A/KB□48A

	Condition	Probable cause	Remedy
Engine malfunction at low speed	•Unstable idling and the running does not not continue.	•Air entering engine through the fitting portion of carburetor. •Too low idling speed (rpm). •Clogged main check valve. •Clogged needle jet. •Improper position of clip to jet needle. •Worn jet needle or needle jet. •Improper height of control lever.	•Retighten the fitting bolts of the carburetor. •Adjust the idling speed with throttle stop screw. •Disassemble and clean the check valve portion. •Disassemble and clean. •Insert the clip to the proper position (2nd stage) of jet needle. •Change the clip to upper position of jet needle. If not good, replace the jet needle and the carburetor body. •Adjust the control lever height properly
	•Engine does not accelerate in spite of opening throttle valve.	•Clogging in fuel tube at inlet side. •Fuel passage or pulse passage of fuel pump is clogged. •Main adjust screw not adjusted properly. •Clogged needle jet. •Clogged main check valve. •Improper height of control lever. •Improper position of clip to jet needle.	•Remove and clean the tube. •Disassemble and clean the fuel pump. •Adjust the screw properly. •Disassemble and clean. •Disassemble and clean the check valve portion. •Adjust the control lever height properly. •Insert the clip to the proper position (2nd stage) of jet needle.
•Unstable revolution at high speed		•Clogged air filter. •Dust clogging in or air entering fuel tube. •Air entering engine through the fitting portion of carburetor. •Fuel passage or pulse passage of fuel pump is clogged. •Main adjust screw not adjusted properly. •Clogged needle jet. •Clogged main check valve. •Improper height of control lever.	•Clean the filter. •Remove and clean or replace the tube. •Retighten the fitting bolts of the carburetor, or replace the fitting gasket. •Disassemble and clean the fuel pump. •Adjust the screw properly. •Disassemble and clean. •Disassemble and clean the check valve portion. •Adjust the control lever height properly.
•When throttle valve is returned to idling position, engine stops.		•Air entering engine through the fitting portion of carburetor. •Too low idling revolution. •Clogged main check valve. •Clogged needle jet. •Improper position of clip to jet needle. •Worn jet needle or needle jet •Improper height of control lever.	•Retighten the fitting bolts or replace the fitting gasket. •Adjust the opening of throttle valve at idling with throttle stop screw. •Disassemble and clean the check valve portion. •Disassemble and clean. •Insert the clip to the proper position (2nd stage) of jet needle. •Change the clip to upper position of jet needle. If not good, replace the jet needle and the carburetor body. •Adjust the control lever height properly.

Spark Arrester — KBL23A/KB□26A/KB□34A for US only

KBL23A/KB□26A/KB□34A for US only are equipped with a muffler in which a spark arrester is installed.

Clean the net of the spark arrester every 50 hours of operation according to the following manner.



Removal

⚠WARNING

Do not attempt to service a hot exhaust muffler or severe burns could result. Always allow the exhaust muffler to cool prior to service.

- Unscrew a muffler cover mounting screw (A) to remove the plastic muffler cover (B) together with a guard (C).

CAUTION

Do not remove the guard (C) unless it is necessary as a tapping screw (K) has gnawed at the plastic muffler cover (B).

- Unscrew the muffler mounting screws (D) to remove the muffler assembly (M) out of the engine together with a gasket (E).
- Unscrew a tapping screw (F) to pull the cap (G) out of the exhaust outlet together with the gasket (H).
- Draw the net (J) of the arrester out of the muffler assembly (M) through the exhaust outlet.

Installation

- Installation is the reverse of removal.

CAUTION

Do not reuse the gaskets (E and H) and the tapping screw (F).

Cleaning

⚠WARNING

Do not use gasoline or low flash-point solvents for cleaning purposes. A fire or explosion could result.

- Clean the net (J) of the arrester by soaking it in a high flash-point solvent and dry with compressed air.
- If the net (J) of the arrester is still clogged after soaking, gently clean it with a fine wire blush in the solvent and dry with compressed air.
- Reinstall the net (J) of the arrester.