Quick Reference Guide

To use, bend the manual back and match the desired chapter below against the black spot showing at the edge of these pages.



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Supplement — 1985 Model 16

Kawasaki

TECATE

ALL TERRAIN VEHICLE SERVICE MANUAL

All information contained in this manual is based on the latest product information available at the time of publication.

Kawasaki Heavy Industries, Ltd. accepts no liability for any inaccuracies or omissions in this publication, although every possible care has been taken to make it as complete and accurate as possible.

All procedures and specifications subject to change without prior notice, and may not apply to every country.

The right is reserved to make changes at any time without prior notice and without incurring an obligation to make such changes to products manufactured previously. See your Motorcycle dealer for the latest information on product improvements incorporated after this manual was issued.

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Foreword

This Service Manual is designed primarily for use by motorcycle mechanics in a properly equipped shop, although it contains enough detail and basic information to make it useful to the motorcycle user who desires to carry out his own basic maintenance and repair work. Since a certain basic knowledge of mechanics, the proper use of tools, and workshop procedures must be understood in order to carry out maintenance and repair satisfactorily; the adjustments, maintenance, and repair should be carried out only by qualified mechanics whenever the owner has insufficient experience, or has doubts as to his ability to do the work, so that the motorcycle can be operated safely. If proper adjustment can not be obtained by following the procedures in this text, find out the cause and correct as necessary.

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

"NOTE"

○*Explanation on major changes and additions, that are unique to later year units since the publication of the Service Manual, will be added in the end of the text as "Supplements."*

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

To get the longest life out of your Motorcycle:

- Follow the Periodic Maintenance Chart in the Service Manual.
- Be alert for problems and non-scheduled maintenance.
- Use proper tools and genuine Kawasaki Motorcycle parts. Special tools, gauges, and testers that a necessary when servicing Kawasaki motorcycles are introduced by the Special Tool Catalog. Genui 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 installed.

General Information

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Before Servicing

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

Especially note the following:

(1) Dirt

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

(2) Battery Ground

Remove the ground (−) lead from the battery before performing any disassembly operations on the motorcycle. This prevents:

(a) the possibility of accidentally turning the engine over while partially disassembled.
(b) sparks at electrical connections which will occur when they are disconnected.
(c) damage to electrical parts.

(3) Tightening Sequence

Generally, when installing a part with several bolts, nuts, or screws, they should all be started in their holes and tightened to a snug fit. Then tighten them evenly in a cross pattern. 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 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.

(4) Torque

The torque values given in this Service Manual should always be adhered to. Either too little or too much torque may lead to serious damage. Use a good quality, reliable torque wrench.

(5) Force

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

(6) 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.

(7) High Flash-point Solvent

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

(8) 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.

(9) 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).

(10) Press

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

(11) 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.

(12) 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.

(13) Seal Guide

A seal guide is required 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, preferably high temperature grease on the lips to reduce rubber to metal friction.

(14) 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.

(15) Lubrication

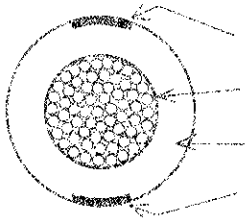
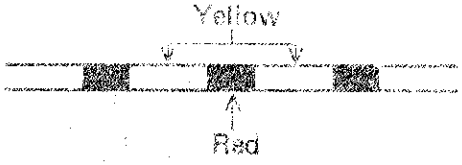
Engine wear is generally at its maximum while the engine is warming up and before all the rubbing surfaces have an adequate lubricative film. During assembly, oil or grease (whichever is more suitable) should be applied to any rubbing surface which has lost its lubricative film. Old grease and dirty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

All the electrical wires are either single-color or two-color and, with only a few exceptions, must be connected to wires of the same color. On any of the two-color wires there is a greater amount of one color and a lesser amount of a second color, so a two-color wire is identified by first the primary color and then the secondary color. For example, a yellow wire with thin red stripes is referred to as a "yellow/red" wire; it would be a "red/yellow" wire if the colors were reversed to make red the main color.

162100

Wire (cross-section)	Name of Wire Color	Picture in Wiring Diagram
	Yellow/red	

(17) 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.

(18) Inspection

When parts have been disassembled, visually inspect these parts for 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	

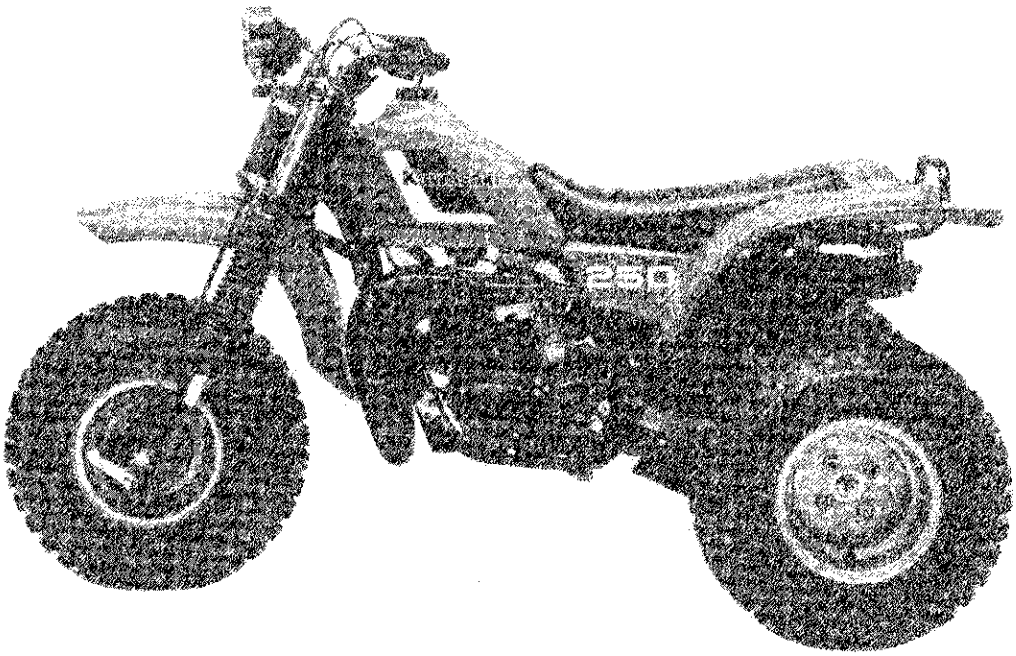
(19) Service Data

Numbers of service data in this text have following meanings:

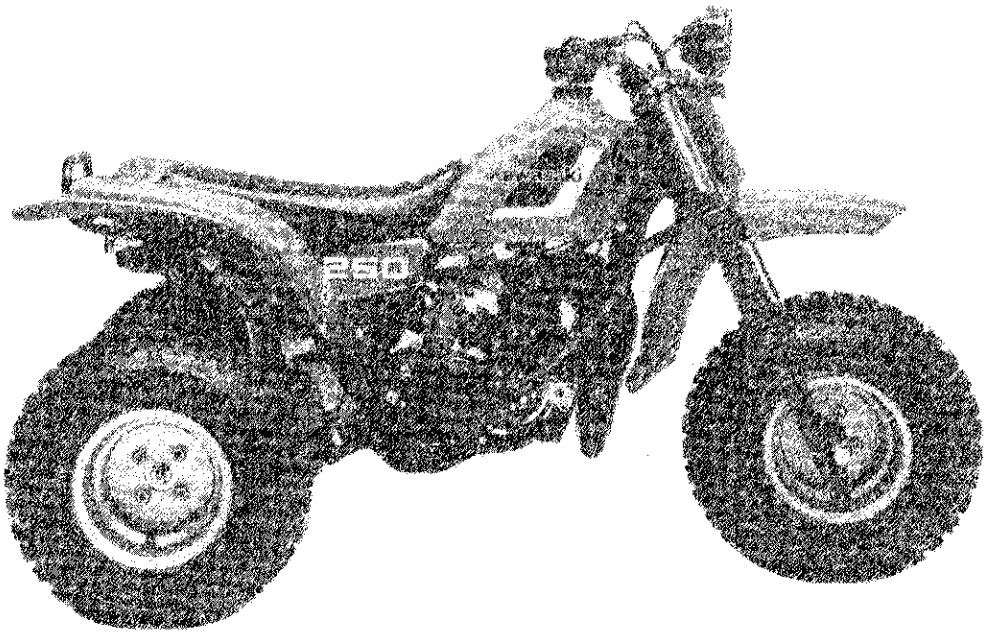
"Standards": Show dimensions or performances which brand-new parts or systems have.

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

KXT250-A1 Left Side Viw:



KXT250-A1 Right Side View:



Specifications

Items			KXT250-A1 Ⓤ	KXT250-A1 Ⓒ
Dimensions:				
Overall length			1,870 mm	*
Overall width			1,115 mm	*
Overall height			1,120 mm	*
Wheelbase			1,280 mm	*
Road clearance			135 mm	*
Seat height			760 mm	*
Dry weight			1,280 N (130 kg)	*
Curb weight:	Front		580 N (59 kg)	*
	Rear		810 N (82 kg)	*
Fuel tank capacity			13.8 L	*
Performance:				
Climbing ability			—	—
Braking distance			—	—
Minimum turning radius			2.1 m	*
Engine:				
Type			2-stroke, single cylinder, ** piston reed valve	*
Cooling system			Liquid-cooled	*
Bore and stroke			70.0 x 64.9 mm	*
Displacement			249 mL	*
Compression ratio			8.3	*
Carburetion system			Carburetor, Mikuni VM32SS	*
Starting system			Primary kick	*
Ignition system			CDI	*
Timing advance			Electronically advanced	*
Ignition timing			17° BTDC @6,000 r/min (rpm)	*
Spark plug			B8ES	BR8ES
Cylinder numbering method			1	*
Firing order			1	*
Port timing:	Inlet	Open	—	—
		Close	—	—
	Scavenging	Open	62° (BBDC)	*
		Close	62° (ABDC)	*
	Exhaust	Open	93° (BBDC)	*
		Close	93° (ABDC)	*
Lubrication system			Petrol mix (20 : 1)	*

Ⓤ : US Model Ⓒ : Canadian Model

* : Indentical to US Model

** : This engine licensed under one or more of Eyvind Boyessen's Patent Nos: 3,905,340, 3,905,341, Re. 30,425, 4,062,331, 4,161,163, 4,202,298 and 4,202,299.

Items	KXT250-A1 Ⓤ	KXT250-A1 Ⓒ
Drive Train:		
Primary reduction system:		
Type	Gear	*
Reduction ratio	3.111 (56/18)	*
Clutch type	Wet multi disc	*
Transmission:		
Type	5-speed, constantmesh return shift	*
Gear ratios: 1st	2.133 (32/15)	*
2nd	1.764 (30/17)	*
3rd	1.388 (25/18)	*
4th	1.100 (22/20)	*
5th	0.928 (26/28)	*
Final drive system:		
Type	chain	*
Reduction ratio	3.230 (42/13)	*
Overall drive ratio	9.333 @Top gear	*
Transmission oil:		
Grade	SE class	*
Viscosity	SAE 10W30 or 10W40	*
Capacity	0.7 L	*
Frame:		
Type	Tubular, single cradle	*
Castor (rake angle)	24°	*
Trail	40 mm	*
Front Tire: Type	Tubeless, Knoby/Trail	*
Size	22 x 11-10	*
Rear Tire: Type	Tubeless, Knoby/Trail	*
Size	22 x 11-10	*
Front suspension:		
Type	Telescopic fork (pneumatic)	*
Wheel travel	220 mm	*
Rear suspension:		
Type	Swing arm (uni-trak)	*
Wheel travel	210 mm	*
Brake type:		
Front	Drum	*
Rear	Single disc	*
Electrical Equipment:		
Headlight: Type	Semi-Sealed beam	*
Bulb	12 V 50 W	*
Tail/brake light	12 V 8 W	*
Alternator: Type	Single-phase AC	*
Rated output	not more than 17 V @10,000 r/min (rpm)	*

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

Torque and Locking Agent

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

Letters used in the "Remarks" column mean:
A : Apply a non-permanent locking agent to the threads.
B : Apply a liquid gasket to the threads or washers.
S : Tighten the fasteners following the sequence specified in this text.
St : Stake the fasteners to prevent loosening.

Engine Parts	Threads Dia. (mm)	Quantity	Torque			Remarks	See Page
			N·m	kg-m	ft-lb		
Engine Mounting:							
Front	8	3	24	2.4	17.5	— — —	13-2
Upper	8	2	24	2.4	17.5	— — —	13-2
Upper	10	1	39	4.0	29	— — —	13-2
Lower	8	1	24	2.4	17.5	— — —	13-2
Top End:							
Cylinder head nut	8	6	25	2.5	18	S	3-3
Spark plug	14	1	27	2.8	20	— — —	14-3
Cylinder nut	10	4	34	3.5	25	— — —	3-3
Right Side:							
Impeller shaft nut	6	1	9.8	1.0	7.0	— — —	4-3
Clutch spring bolt	6	5	8.3	0.85	74 in-lb	S	4-2
Clutch hub nut	20	1	59	6.0	43	— — —	4-2
Shift shaft return spring pin	8	1	—	—	—	A	7-3
Water drain plug	8	1	15	1.5	11	— — —	4-3
Left Side:							
Magneto flywheel bolt	8	1	27	2.8	20	— — —	14-3
Bottom End:							
Engine drain plug	10	1	20	2.0	14.5	— — —	4-2
Internal Parts:							
Change holder bolt	8	1	23	2.3	16.5	— — —	7-2

Chassis Parts	Threads Dia. (mm)	Quantity	Torque			Remarks	See Page
			N-m	kg-m	ft-lb		
Wheels:							
Front axle nut	16	1	69	7	51	— — —	8-2
Rear axle nut	18	2	135	14	100	— — —	9-2
Lug nut	½"	12	49	5.0	36	— — —	8-2
Axle nut	32	2	98	10	72	— — —	9-2
Brakes:							
Bleed valve	8	1	7.8	0.8	69 in-lb	— — —	10-2
Brake hose banjo bolt	10	2	29	3.0	22	— — —	10-2
Caliper mounting bolt	8	2	21	2.1	15	A	10-2
Disc mounting bolt	8	3	34	3.5	25	— — —	9-2
Brake drum mounting bolt	10	4	69	7	51	— — —	10-2
Steering:							
Steering stem head bolt	14	1	44	4.5	33	S	11-2
Suspension:							
Front fork bottom Allen bolt	10	2	23	2.3	16.5	A	11-2
Front fork clamp bolt							
Lower	8	4	21	2.1	15	S	11-2
Upper	8	4	21	2.1	15	S	11-2
Air valve	8	3	12	1.2	8.5	A	11-2
Front fork top bolt	30	2	23	2.3	16.5	S	11-2
Rear shock absorber bolt (upper)	10	1	69	7	51	— — —	11-3
(lower)	12	1	69	7	51	— — —	11-3
Rear shock hose bolt	10	1	18	1.8	13	— — —	11-3
Rear shock hose banjo bolt	10	1	29	3.0	22	B	11-3
Rear shock ring nut	46	2	54	5.5	40	— — —	11-3
Uni-trak arm center bolt	16	1	110	11	80	— — —	11-3
Uni-trak link bolt	14	2	110	11	80	— — —	11-3
Swing arm pivot shaft	14	1	110	11	80	— — —	11-3
Shock bracket bolt	12	2	69	7	51	— — —	11-3
Drive Train:							
Swing arm mount bolt	12	4	74	7.5	54	— — —	9-2
Rear sprocket bolt	10	6	34	3.5	25	— — —	9-2
Foot peg	10	2	34	3.5	26	— — —	13-2
Handlebar clamp bolt	8	4	21	2.1	15	— — —	12-6

The table below, relating tightening torque to thread diameter, list the basic torque for the bolts and nuts used on Kawasaki Motorcycles. However, the actual torque that is necessary may vary amoung bolts and nuts with the same thread diameter. Tightening torque listed in the preceding tables varies to a greater or lesser extent from what is given in the table below. Refer to this table for only the bolts and nuts nor included in the tables on the previous pages. All of the values are for use with dry solvent-cleaned threads.

General Fasteners:

Threads dia. (mm)	Torque		
	N·m	kg·m	ft-lb
5	3.4 – 4.9	0.35 – 0.50	30 – 43 in-lb
6	5.9 – 7.8	0.60 – 0.80	52 – 69 in-lb
8	14 – 19	1.4 – 1.9	10.0 – 13.5
10	25 – 39	2.6 – 3.5	19.0 – 25
12	44 – 61	4.5 – 6.2	33 – 45
14	73 – 98	7.4 – 10.0	54 – 72
16	115 – 155	11.5 – 16.0	83 – 115
18	165 – 225	17.0 – 23	125 – 165
20	225 – 325	23 – 33	165 – 240

Bolts
Nuts
Fasteners

Tightness Inspection

*Check the tightness of the bolts and nuts listed here. Also, check to see that each cotter pin or safety clip is in place and in good condition.

"NOTE"

For the engine fasteners, check the tightness of them when the engine is cold (at room temperature).

*If there are loose fasteners, retorque them to the specified torque following the specified tightening sequence (remarked above). For each fastener, first loosen it by ½ turn, then tighten it.

*If cotter pins or safety clips are damaged, replace them with new ones.

Bolts, Nuts, and Fasteners to be checked

Wheels:
- Front axle nut
- Front axle nut cotter pin
- Rear axle nut
- Rear axle nut cotter pin

Brakes:
- Rear master cylinder mounting bolts
- Caliper mounting bolts
- Brake cam lever bolt
- Brake pedal cotter pin
- Brake rod clevis pin cotter pin

Suspensions:
- Front fork clamp bolts
- Swing arm pivot shaft locknuts
- Rear shock absorber nuts
- Uni-trak nuts

Steering:
- Handlebar clamp bolts
- Stem head bolt

Engine:
- Muffler mounting bolts and nuts
- Muffler connecting clamp bolts
- Engine mounting bolts and nuts
- Engine mounting bracket bolts and nuts
- Shift pedal bolt
- Cylinder head nuts

Others:
- Clutch lever holder bolt
- Front footpeg mounting bolts
- Cooling hose calmps

General Lubrication

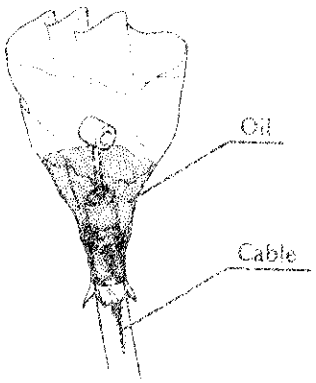
Lubricate the points shown here, with either motor oil or regular grease, in accordance with the Periodic Maintenance Chart or whenever the vehicle has been operated under wet or rainy conditions, and especially after using a high pressure spray washer.

Before lubricating each part, clean off any rusty spots with rust remover and wipe off any grease, oil, dirt, or grime.

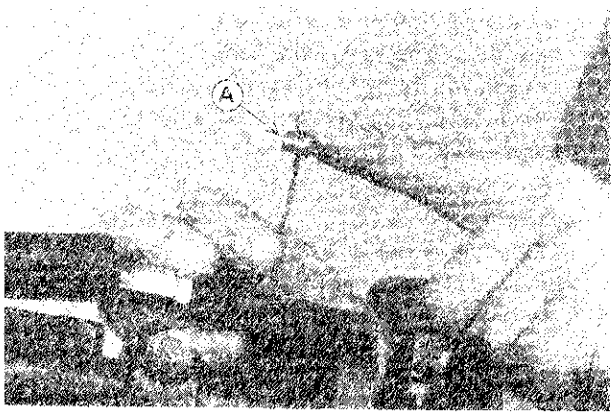
Soak the following Cables in Motor Oil:
- ○Clutch Inner Cable
- ○Throttle Inner Cable
- ○Front Brake Inner Cable

Apply Motor Oil to the following Pivots:
- ○Clutch Lever
- ○Front Brake Lever
- ○Rear Brake Pedal
- ○Rear Brake Lever Joints
- ○Foot Peg
- ○Kick Pedal

Cable Lubrication



Apply Grease to the following Points:
- ○Clutch Inner Cable Upper End
- ○Throttel Inner Cable Upper End
- ○Front Brake Inner Cable Upper End



A. Grease.

Periodic Maintenance Chart

The scheduled maintenance must be done in accordance with this chart to keep the motorcycle in good running condition.

OPERATION \ FREQUENCY	Daily	Every 10 hours	Every 20 hours	Every 30 hours	Every 40 hours	As required	See Page
Clutch – inspect †	●						12-4
Throttle cable – inspect †	●						12-5
Spark plug – clean, gap †		●					14-3
Air cleaner element – clean		●					2-6
Air cleaner element – replace	Every 6 cleanings						2-6
Carburetor – inspect/adjust †						●	2-4
Transmission oil – change*			●				4-5
Piston – clean/check †				●			3-4
Piston ring – replace				●			3-4
Cylinder – inspect †				●			3-4
Piston/cylinder clearance – inspect †				●			3-4
Small end bearing – check †				●			3-4
Main bearings – check †					●		–
Big end bearing – check †				●			7-7
Spark arrester – clean						year	3-13
Coolant – change						●	3-7
Radiator hoses, connections – check †	●						3-8
Brake adjustment – check †	●						10-4
Brake wear – check †				●			10-9,10
Brake fluid level – check †			●				10-5
Brake fluid – change						year	10-5
Drive chain – adjust	●						9-4
Drive chain – lubricate	●						9-5
Drive chain and sprockets – inspect †				●			9-4
Front fork – inspect/clean †			●				–
Front fork oil – change				●			11-9
Nuts, bolts, fasteners – check †	●						1-9
Fuel system – clean			●				2-7
Steering play – check †	●						11-6
Steering stem bearing – grease				●			11-7
General lubrication – perform	●						1-10
Brake camshaft – grease				●			10-10
Uni-trak bearing – grease		●					11-3
Uni-trak link, bearing wear – check †		●					11-4
Uni-trak arm, sleeve wear – check †		●					11-4
Rear shock oil – replace					●		11-12
Swing arm – lubricate			●				11-3
Frame, swing arm – inspect for damage †	●						–
Master cylinder cup and dust seal – replace						2 years	–
Caliper piston seal and dust seal – replace						2 years	10-10
Brake hose – replace						2 years	–

† : Replace, add, adjust, clean, or torque if necessary.
* : Change transmission oil after first day. After that, follow the regular schedule.

"NOTE"

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

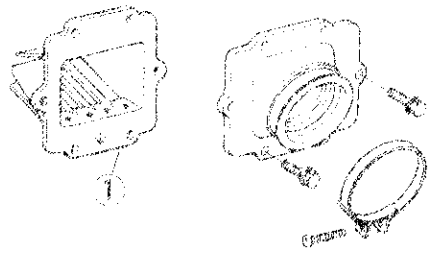
Fuel System

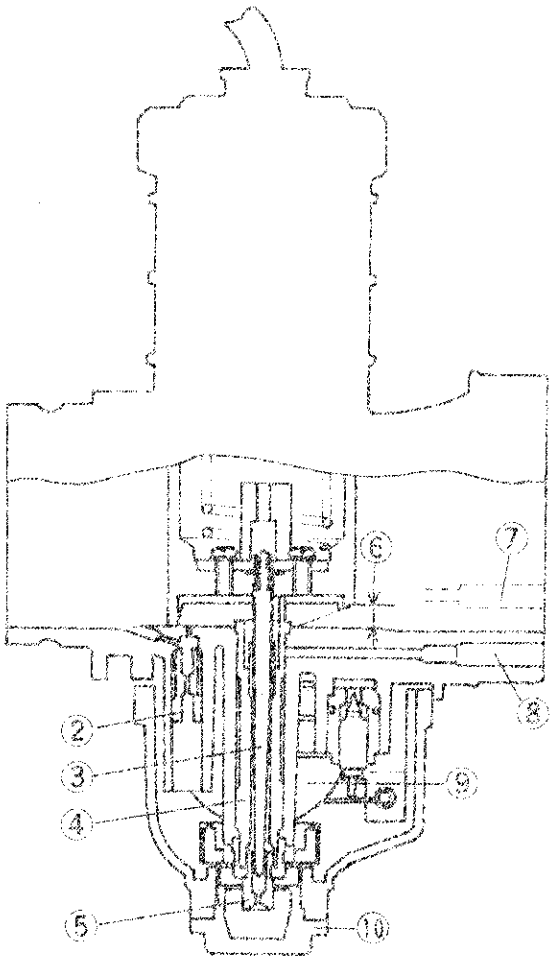
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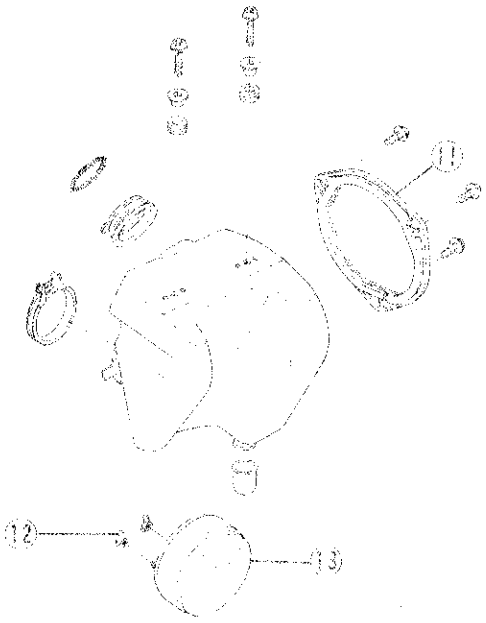
Exploded Views

Carburetor

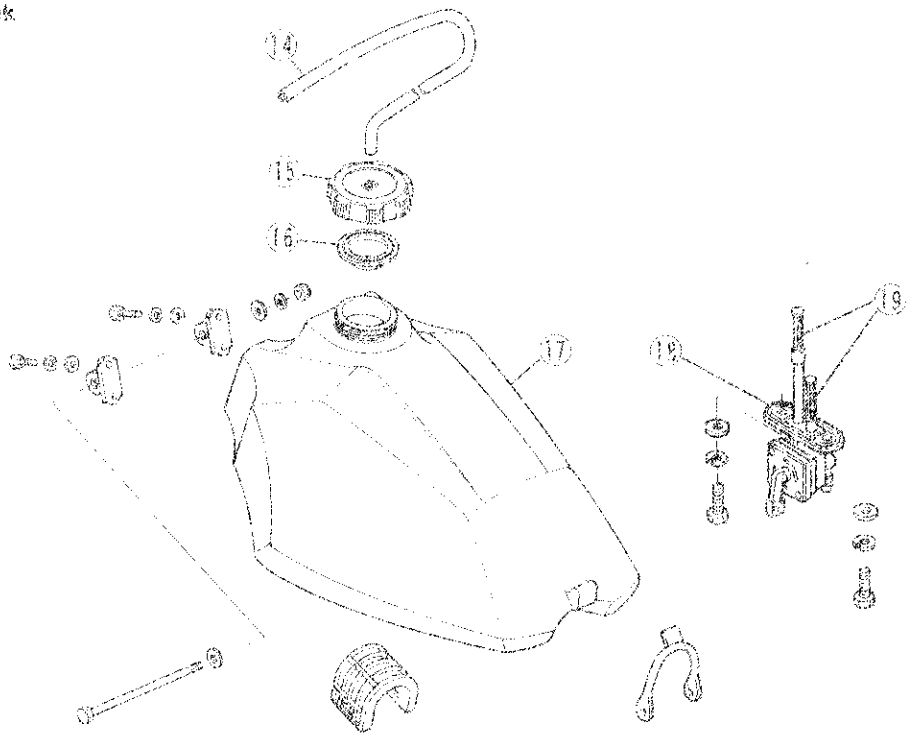




Air Cleaner



Fuel Tank



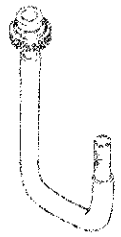
1. Reed Valve
2. Pilot jet
3. Jet Needle
4. Needle Jet
5. Main Jet
6. Cutaway
7. Pilot Air Jet
8. Main Air Jet
9. Float
10. Drain Plug
11. Side Cover
12. Wing Nut
13. Element
14. Vent Tube
15. Tank Cap
16. Gasket
17. Fuel Tank
18. Fuel Tap
19. Fuel Filter

Service Data

Item	Standard	Service Limit	See Page
Carburetor:		— — —	2-2
Make & type	Mikuni VM32SS		
Main jet	230		
Jet needle	6FJ50-4		
	(4th groove from the top)		
Needle jet	Q-6		
Cutaway	2.5		
Pilot jet	45		
Service fuel level	1.0 ±1 mm (Gauge)		
Float height	23.8 ±1 mm		
Air screw	discontinued		
Reed Valve:			
Reed warp	— — —	0.2 mm	2-6
Throttle Grip Play:	2 — 3 mm	— — —	12-5

Special Tool

Fuel Level Gauge: 57001-202



Carburetor

Idling Adjustment:

When the idle speed is too low, the engine may stall, when the idle speed is too high, the fuel consumption becomes excessive, and the resulting lack of engine braking may make the motorcycle difficult to control.

Inspection

*Throughly warm up the engine.
*With the engine idling, turn the handlebar to each side.
*If handlebar movement changes the idle speed; the throttle cables may be improperly adjusted or incorrectly routed, or they may be damaged. Be sure to correct any of these conditions before riding.

WARNING

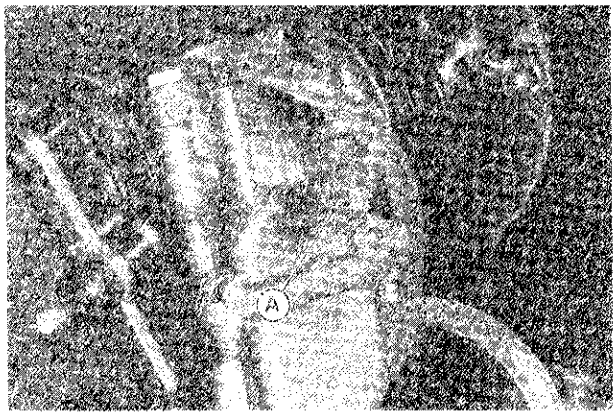
○**Operation with improperly adjusted, incorrectly routed, or the damaged cables could result in an unsafe riding condition.**

*Check that the idle speed is within the specified range.

Idling Adjustment

Idling adjustment is carried out using the idle adjusting screw.

*After thoroughly warming up the engine, turn the idle adjusting screw to obtain the desired idle speed.



A. Idle Adjusting Screw

Maintenance:

Carburetor trouble can be caused by dirt, wear, maladjustment, or improper fuel level in the float chamber.

Mixture Trouble Symptoms

Starting difficulty
Poor running
Overheating
Exhaust smokes excessively
Frequent back firing in the exhaust system during engine braking

The following explanation covers the inspection of the carburetor.

WARNING

○**Gasoline is extremely flammable and can be explosive under certain conditions. Turn the engine stop switch OFF. Do not smoke. Make sure the area is well ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.**
○**Make sure the engine is cold before working. Wipe any fuel off the engine before staring it.**

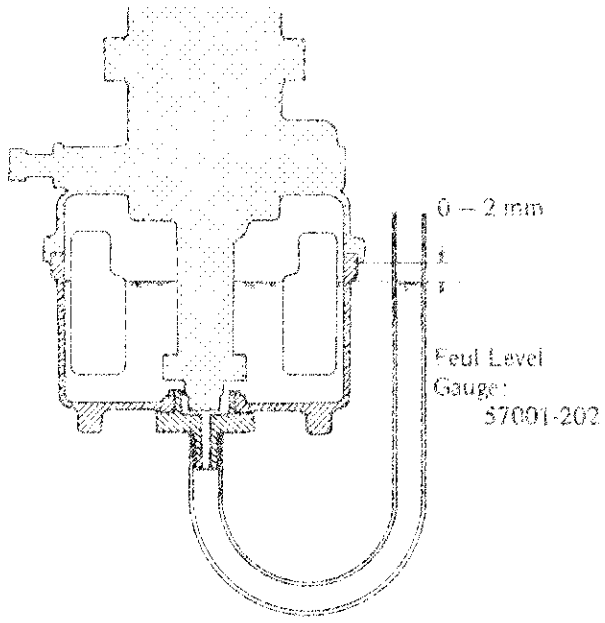
Service Fuel Level Inspection

*Remove the carburetor, and hold it in a true vertical position on a stand.
*Secure an optional fuel tank with a valve to some high place to supply fuel to the carburetor.
*Remove the drain plug from the bottom of the float bowl, and screw a fuel level gauge (special tool) into the plug hole.
*Holding the gauge against the side of the carburetor body so that "0" line is several millimeters higher than the bottom edge of the carburetor body, and open the fuel tap so that fuel will flow into the carburetor.
*Wait until the fuel level in the gauge settles. If the fuel does not appears or overflow, inspect the float and float valve.
*Keeping the gauge vertical, slowly lower it until the "0" line is even with the bottom edge of the carburetor body.

"NOTE"

○*Measure the fuel level keeping the carburetor fully perpendicular to the ground.*

Service Fuel Level Measurement



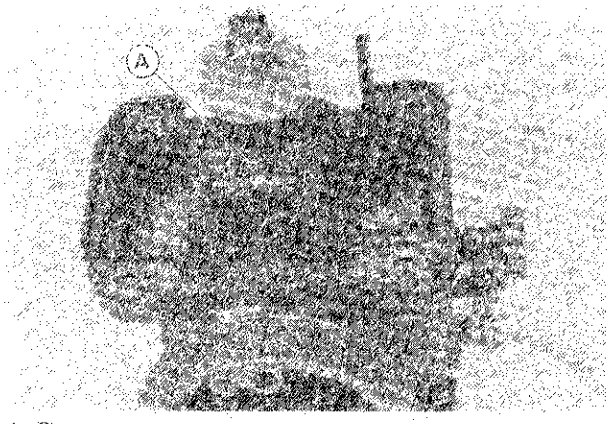
Service Fuel Level Adjustment

*Remove the float from the carburetor.

*Bend the tang on the float a very slight amount to change the float height. Increasing the float height lowers the fuel level, and decreasing the float height raise the fuel level.

*After adjustment, assemble the carburetor, and the service fuel level again.

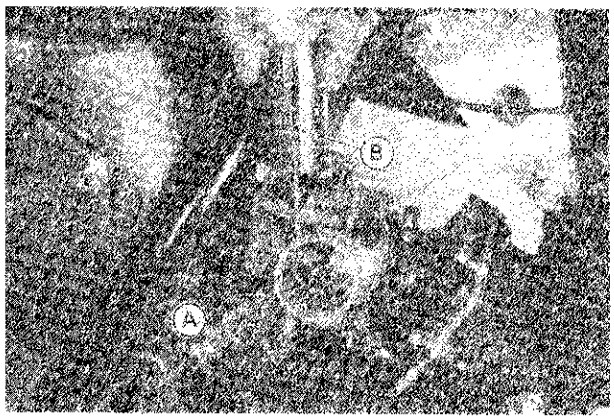
*Readjust the service fuel level if necessary. If the service fuel level cannot be corrected by adjusting the float height within the specified range, the float and/or float valve may be damaged necessitating float and/or valve replacement.



A. Tang

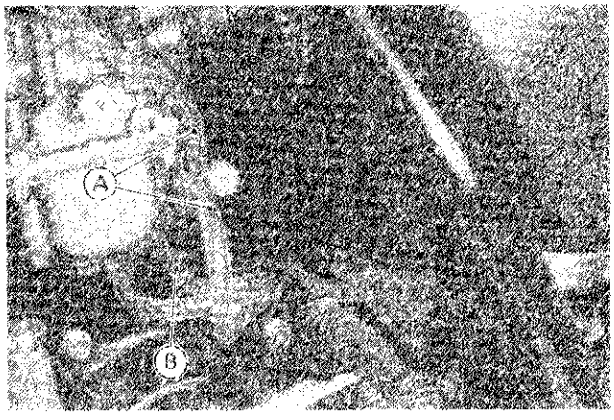
Installation Points

*Being careful not to bend or otherwise damage the jet needle, align the groove on the side of the throttle valve with the guide pin in the carburetor body. Check to see that the throttle valve goes all the way down into the carburetor body, and slides smoothly.



A. Guide Pin B. Groove

*Route and clamp air vent tubes and overflow tube as follows.



A. Air Vent Tube B. Over Flow Tube

CAUTION

○Always keep the tubes free of obstruction, and make sure it does not touch the chain.

Throttle Cable Adjustment

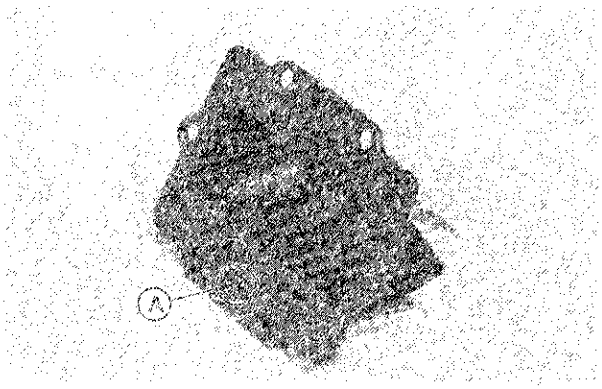
*Adjust the following items:
○Throttle lever play (p. 12-5)
○Idle speed.

Reed Valve

Installation Point

"NOTE"

○*When installing the reed valve on the cylinder, the arrow on the reed valve must point to the downwards as shown.*



A. Arrow

Reed Inspection

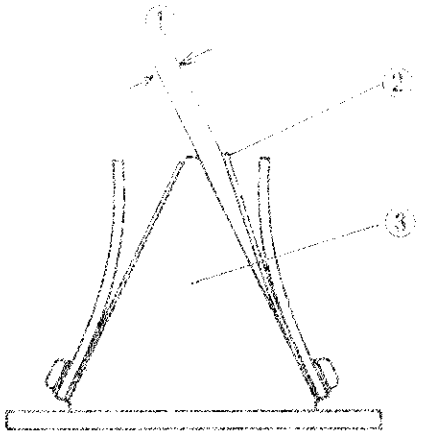
*Check reed warp by measuring the clearance between each reed and the valve holder as shown in the figure.
*If any one of the clearance measurements exceeds the service limit, replace the reed valve assembly with a new one.

Reed Warp

Service Limit	0.2 mm

*Visually inspect the reeds for cracks, folds, or other damage.
*If there is any doubt as to the condition of a reed, replace the reed valve assembly.
*If a reed becomes wavy, replace the reed valve assembly with a new one even if its warp is less than the service limit.

Reed Warp

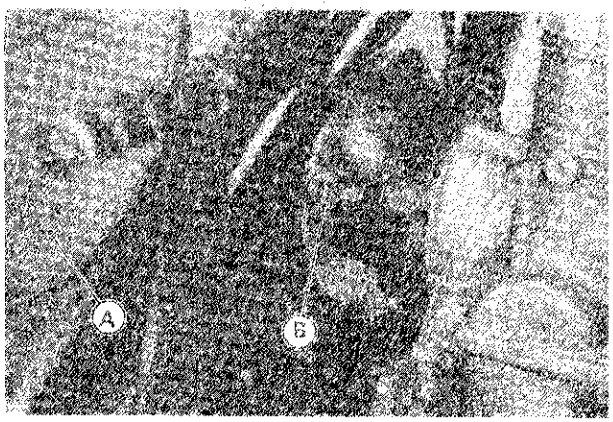


1. Clearance
2. Reed
3. Reed Valve Holder

Air Cleaner

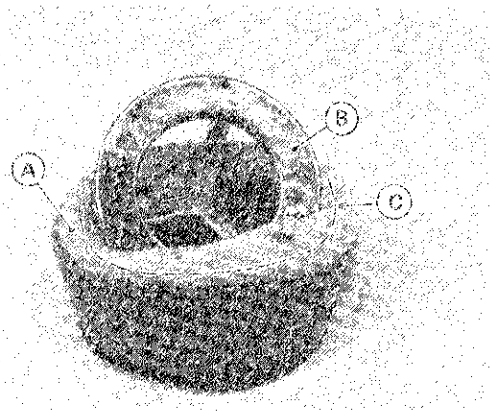
Removal and Cleaning

Inspect the element without fail before and after each racing or practice session, and clean it if necessary.
*Remove the rear fender and cleaner side cover.
*Remove the wing nuts, and pull out the element.



A. Cleaner Side Cover B. Wing Nut

*Stuff rags into the air cleaner outlet so no dirt is allowed to enter the carburetor.
*Separate the sponge filter from the frame.



A. Sponge Filter B. Air Cleaner Frame
C. Grease here.

*Clean the element in a bath of a high flash-point solvent, and squeeze it dry.

WARNING

○**Clean the element in a well-ventilated area, and take care that there are no sparks or flame anywhere near the working area, this includes any appliance with a pilot light. Do not use gasoline or a low flash-point solvent to clean the element. A fire or explosion could result.**

*After cleaning, saturate the element with SE class SAE 30 oil, squeeze out the excess oil, then wrap it in a clean rag and squeeze it as dry as possible. Be careful not to tear the element.
*Inspect the element for damage.

WARNING

○**If dirt or dust is allowed to pass through into the carburetor, the throttle may become stuck, possibly causing an accident.**

CAUTION

○**If dirt gets through into the engine, excessive engine wear and possibly engine damage will occur.**

"NOTE"

○*Replace the element after cleaning it 5 times or if it is damaged.*
○*When installing the element, coat the lip of the element with a thick layer of all purpose grease to assure a complete seal against the air cleaner element base. Also, coat the base where the lip of the element fits (See above figure).*

Fuel System

Accumulation of moisture or sediment in the fuel system will restrict the flow of fuel and cause carburetor and/or fuel tap malfunction.

WARNING

○**Gasoline is extremely flammable and can be explosive under certain conditions. Turn the engine stop switch OFF. Do not smoke. Make sure the area is well ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.**
○**Make sure the engine is cold before working. Wipe any fuel off the engine before starting it.**

Inspection

*Turn the fuel tap lever to the position where the fuel does not flow.
*Remove the drain plug and check to see if water or dirt comes out.
*If any water or dirt comes out, clean the fuel system as follows.
*Tighten the drain plug securely.



A. Drain Plug

Cleaning

*Remove the fuel tank, and remove the fuel tap from the tank.
*Flush out the fuel tank with a high flash-point solvent.
*Wash the fuel filter on the fuel tap clean of dirt with a high flash-point solvent.
*Remove the carburetor, and disassemble it to clean the fuel and air passages.

CAUTION

○**Remove the float before cleaning the carburetor with compressed air, or it will be damaged.**
○**Do not use a strong carburetor cleaning solution which could attack rubber or plastic parts; instead, use a mild cleaning solution safe for these parts.**
○**Do not use wire for cleaning as this could damage the jets.**

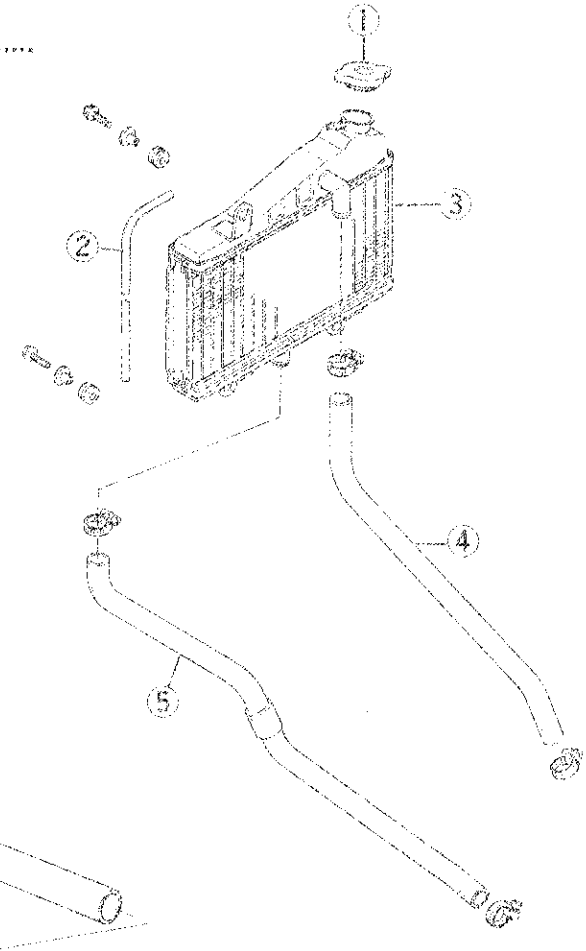
*Wash the disassembled parts, air and fuel passages with a high flash-point solvent. If necessary, use a bath of automotive type carburetor cleaner.
*Blow the jets, air and fuel passages clean with compressed air.

Engine Top End / Radiator

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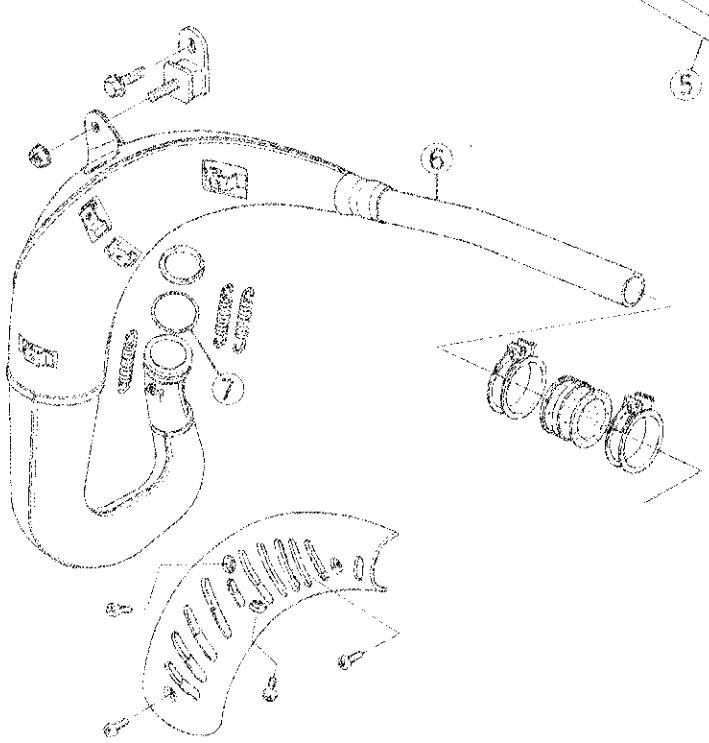
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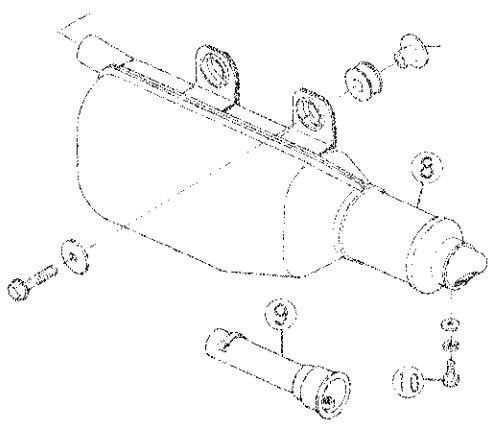
Exploded Views



Radiator

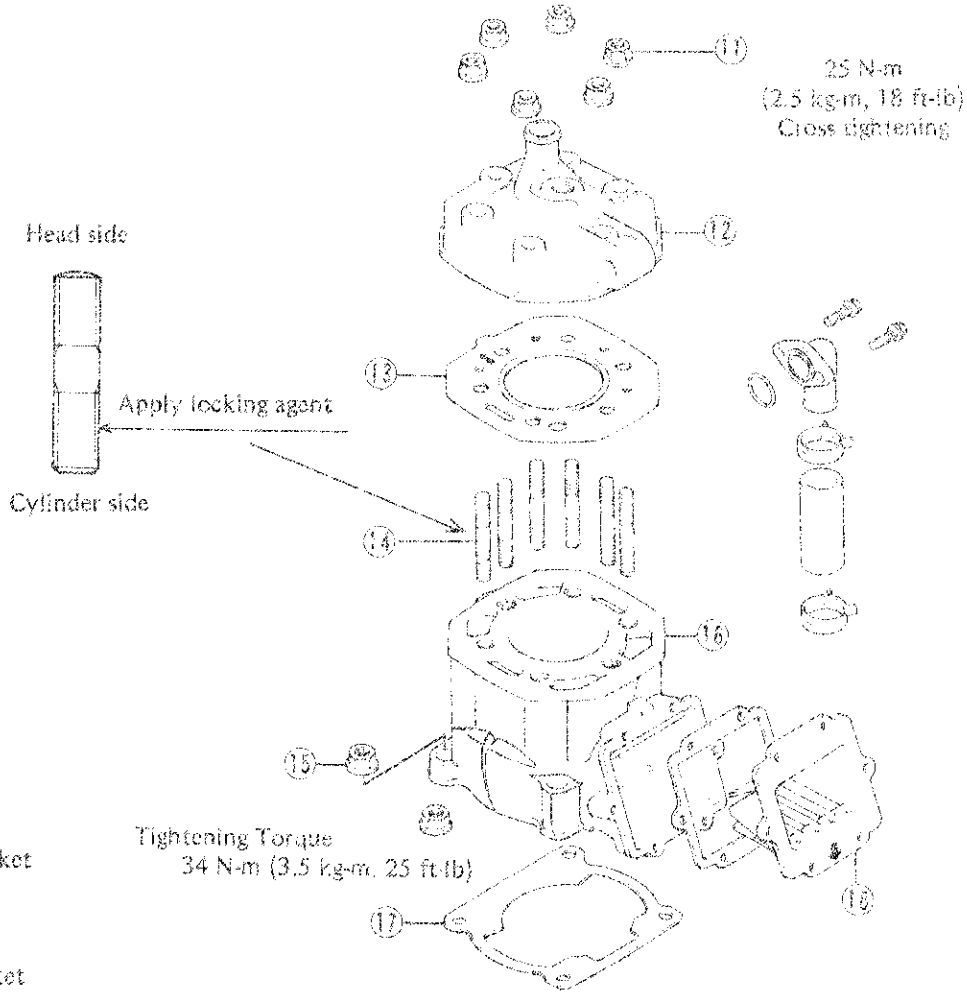
1. Radiator Cap
2. Breather Hose
3. Radiator
4. Upper Hose
5. Lower Hose





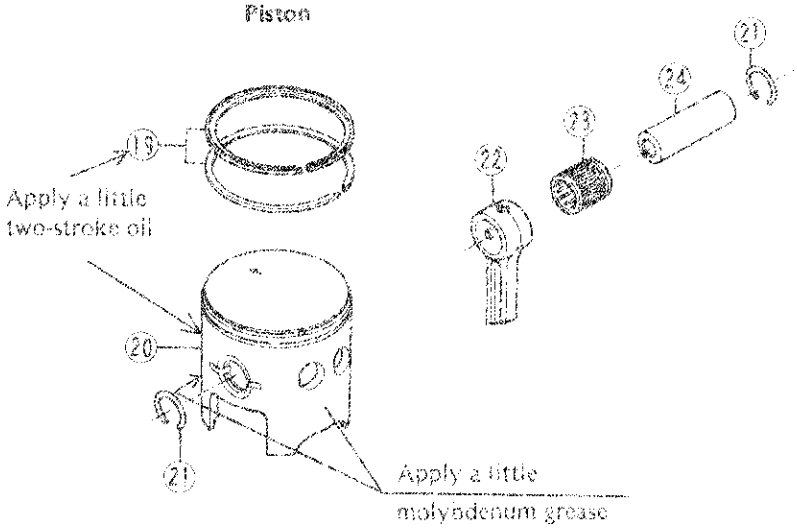
Muffler, Silencer

6. Muffler
7. O-ring
8. Silencer
9. Spark Arrester
10. Arrester Mounting Bolt



11. Cylinder Head Nut
12. Cylinder Head
13. Cylinder Head Gasket
14. Stud Bolt
15. Cylinder Nut
16. Cylinder
17. Cylinder Base Gasket
18. Read Valve
19. Piston Ring
20. Piston
21. Snap Ring
22. Conrod
23. Neelde Bearing
24. Piston Pin

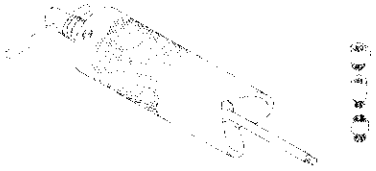
Piston



Item	Standard	Service Limit	See Page
Recommended Coolant:			3-7
Type	Permanent type of anti freeze for aluminum engine and radiator	— — —	
Color	Green		
Mixed ratio	Soft water 57%, coolant 43%		
Freezing point	−30°C (−22°F)		
Total	1.1 L		
Radiator Pressure Valve:			
Opening pressure	93 — 123 kPa (0.95 — 1.25 kg/cm², 13.5 — 17.8 psi)	— — —	3-8
Cylinder Head, Cylinder:			
Cylinder compression	1,079 — 1,275 kPa (11.0 — 13.0 kg/cm², 156 — 185 psi)	824 — 1,275 kPa (8.4 — 13.0 kg/cm², 119 — 185 psi)	3-11
Cylinder head warp	— — —	0.05 mm	3-11
Combustion chamber volume	21.1 — 21.9 mL	— — —	3-11
Cylinder inside diameter	70.015 — 70.030 mm, and less than 0.01 mm difference between any two measurements	77.10 mm, or more than 0.05 mm difference between any two measurements	3-13
Piston:			
Piston/cylinder clearance	0.049 — 0.059 mm	— — —	3-12
Piston diameter	69.961 — 69.976 mm	69.80 mm	3-13
Piston ring end gap			
Top, Second	0.2 — 0.4 mm	0.7 mm	3-13
Piston ring/groove clearance	— — — (Keystone)	— — —	
Piston pin	17.995 — 18.000 mm	17.96 mm	
Piston pin hole	18.000 — 18.006 mm	18.07 mm	
Conrod:			
Small end hole	22.003 — 22.014 mm	22.05 mm	

Special Tool

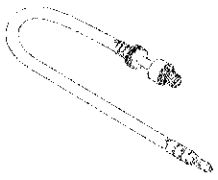
Piston Pin Puller: 57001-910



Compression Gauge: 57001-221



Compression Gauge Adapter: 57001-1159



Piston Ring Pliers: 57001-115



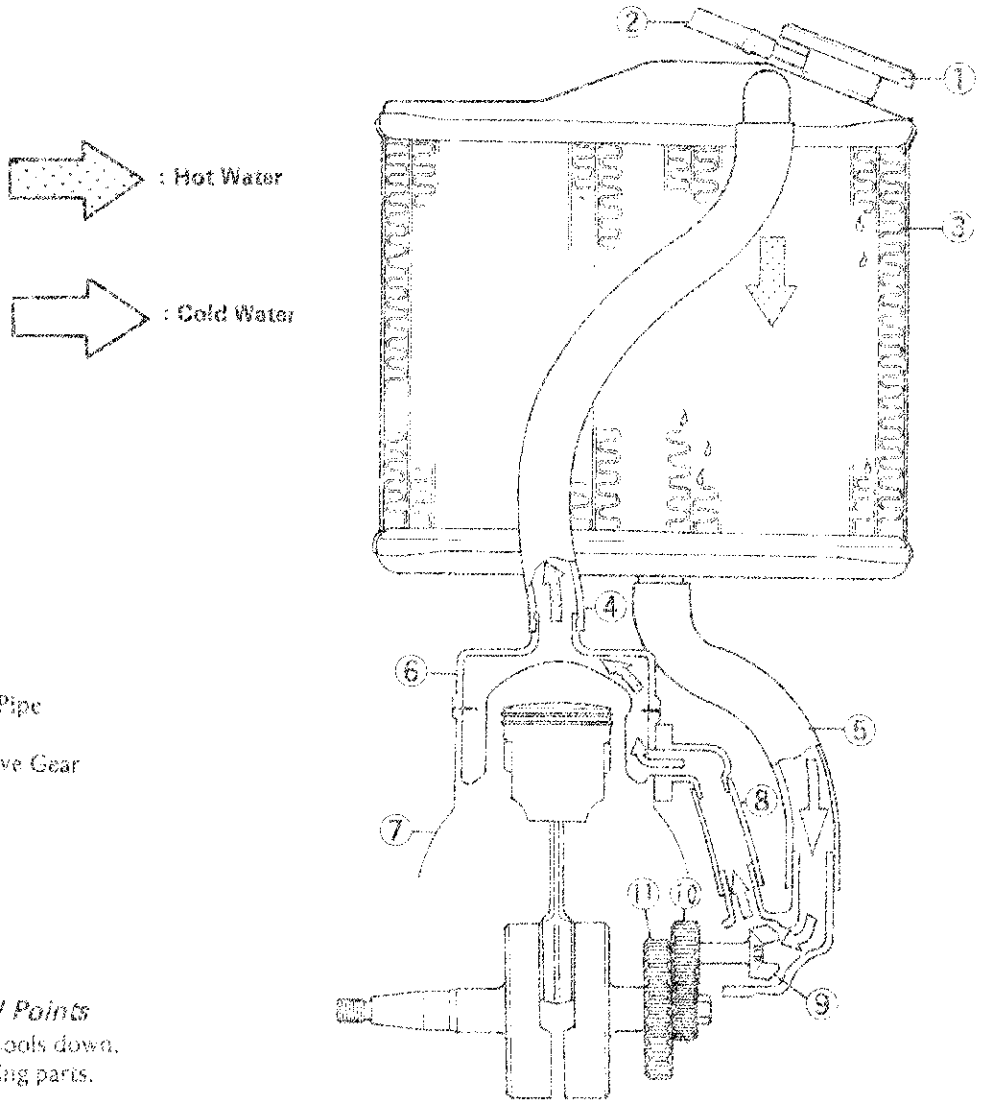
Piston Pin Puller: 57001-910
Adapter A: 57001-912
Adapter B: 57001-913
Adapter C: 57001-914



Cooling System

By circulating in the cooling system, the coolant transfers the heat generated at the engine to the radiator. To protect the cooling system (consisting of the aluminum engine and radiator) from rust and corrosion, the use of corrosion and rust inhibitor chemicals in the water is essential. If coolant containing corrosion and rust inhibitor chemicals is not used, over a period of time, the cooling system accumulates rust and scale in the water jacket and radiator. This will clog up the water passages, and considerably reduce the efficiency of the cooling system.

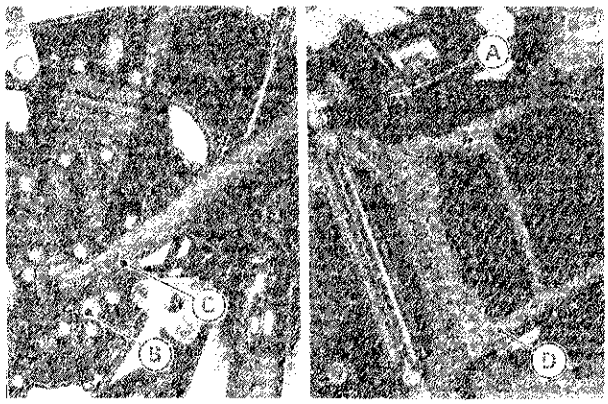
Cooling System



1. Radiator Cap
2. Breather Hose
3. Radiator
4. Upper Hose
5. Lower Hose
6. Cylinder Head
7. Cylinder
8. Joint Hose and Pipe
9. Impeller
10. Water Pump Drive Gear
11. Primary Gear

Radiator Removal Points

- Wait until coolant cools down.
- Remove the following parts.



A. Radiator Cap
B. Drain Plug
C. Lower Hose
D. Radiator Guard

- Remove the radiator taking care not to damage the radiator core.

Coolant

Coolant absobs excessive heat from the engine and transfers it to the air at the radiator. If the coolant level becomes low, the engine overheats and may suffer severe damage. Check the coolant level each day before riding the motorcycle, and replenish coolant if the level is low.

WARNING

○**To avoid burns, do not remove the radiator cap or try to change the coolant when the engine is still hot. Wait until it cools down.**

Coolant Level:

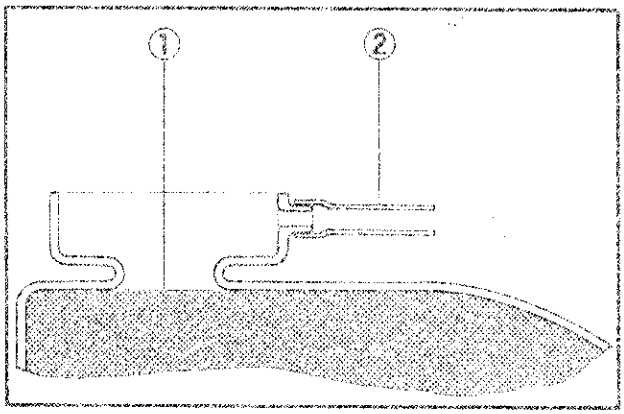
●Situate the motorcycle so that it is perpendicular to the ground.

●Check the coolant level in the radiator. The coolant level should be at the radiator filler neck.

"NOTE"

○*Check the level when the engine is cold (room or atmospheric temperature).*

Radiator filler neck



1. Coolant Level 2. Breather Hose

●If the coolant level is low, add the correct amount of coolant through the radiator cap.

Recommended Coolant

Type:
Permanent type of antifreeze (soft water and ethylene glycol plus corrosion and rust inhibitor chemicals for aluminum engines and radiators)

Water and coolant mixed ratio:
Water 57%, Coolant 43%

Total amount:
1.1 L

Coolant Change:

The coolant should be changed periodically to ensure long engine life.

●Situate the motorcycle so that it is perpendicular to the ground.

●Place a container under the coolant drain plug, and drain the coolant from the radiator and engine by removing the drain plug at the bottom of the water pump cover. Immediately wipe up or wash out any coolant that spills on the frame, engine, or wheel.

●Visually inspect the old coolant. If whitish cotton-like wafts is observed, aluminum parts in the cooling system are corroded. The brownish color of the coolant indiates rusting of iron parts. In these cases, flush the cooling system.

●Check the cooling system for damage, loose joints, or leaks.

●Install the drain plug. Always replace the gasket with new one, if it is damaged.

Tightening Torque

Coolant Drain Plug:	15 N·m (1.5 kg-m, 11 ft-lb)

●Remove the radiator cap.

●Pour the recommended coolant into the radiator and fill the radiator up to the radiator filler neck with coolant, and install the radiator cap.

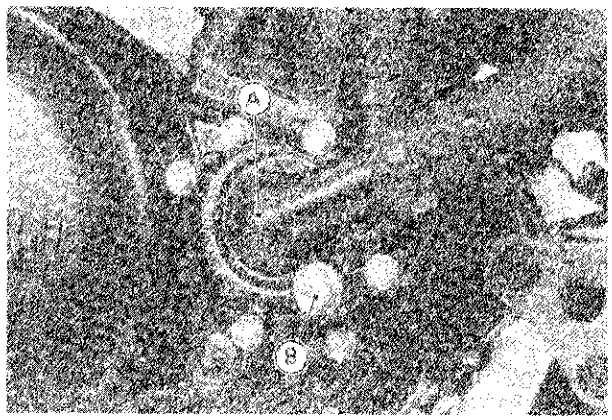
●Check the cooling system for leaks.

●Start the engine, warm up the engine thoroughly, and then stop the engine.

●Check the coolant level after the engine cools down. Add coolant up to the specified level.

WARNING

○**Coolant on tires will make them slippery and can cause an accident and injury.**



A. Water Pump Cover B. Drain Plug

WARNING

○**Use coolant containing corrosion inhibitors made specifically for aluminum engines and radiators in accordance with the instructions of the manufactures. Chemicals are harmful to the human body.**

Soft or distilled water must be used with the inhibitor chemicals and the antifreeze (see below for antifreeze) in the cooling system.

CAUTION

○**If hard water is used in the system, it causes scale accumulation in the water passages, and considerably reduces the efficiency of the cooling system.**

If the lowest ambient temperature encountered falls below the water freezing point in the winter, protect the cooling system against engine and radiator freeze-up, as well as from rust and corrosion. Use a permanent type of antifreeze (soft water and ethylene glycol plus corrosion and rust inhubitor chemicals for aluminum enignes and radiators) in the cooling system. On the mixture ratio of coolant, choose the suitable one referring the relation between freezing point and strength directed on the container.

CAUTION

○**Permanent types of antifreeze on the market have anti-corrosion and anti-rust properties. When it is diluted excessively, it looses its anti-corrosion property. Dilute a permanent type of antifreeze in accordance with the instructions of the marker.**

"NOTE"

○*A permanent type of antifreeze is installed in the cooling system when shipped. It is colored green, includes the 43% of ethylene glycol, and has the freezing point of −30°C (−22°F).*

Coolant Inspection

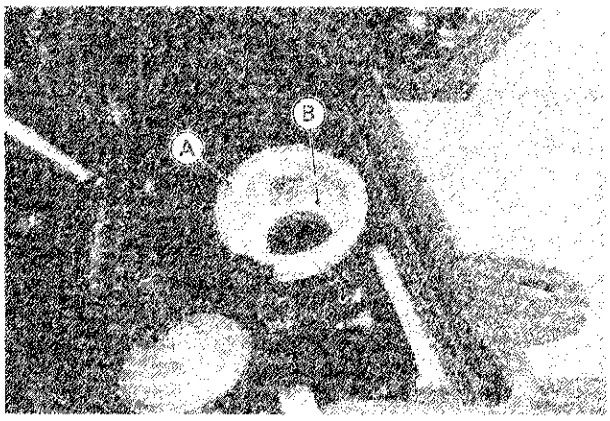
Drain the coolant, and visually inspect the coolant. If small whitish cotton-like clusters are observed, aluminum parts in the cooling system are corroded. The brownish color of the coolant indicates rusting of steel parts. In these cases, flush the cooling system with clean tap water.

Radiator, Radiator Cap, Radiator Hoses

By placing the radiator cap (pressure cap) on the radiator filler neck, the cooling system is pressurized.

Radiator Inspection

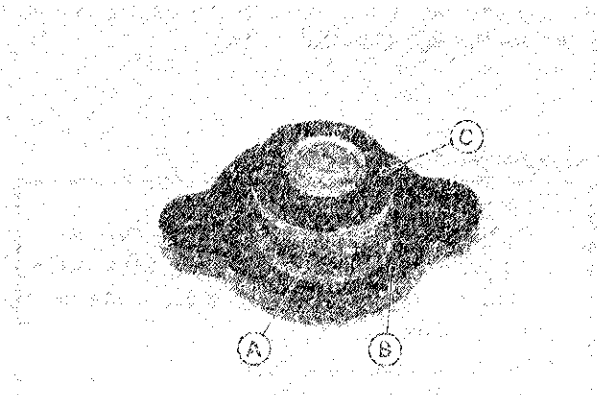
- ●Check the radiator core.
- ✱If there are obstructions to air flow, remove them.
- ✱If the corrugated fins are deformed, carefully straighten them with the thin blade of a screwdriver.
- ✱If the air passage of the radiator core is clogged up more than 20% by unremovable obstructions or unrepairably deformed fins, replace the radiator with a new one.
- ●Check the radiator filler neck for signs of damage. Check the condition of the top and bottom sealing seats in the filler neck. It must be smooth and clean for the radiator cap to function properly.



A. Top Sealing Seat B. Bottom Sealing Seat

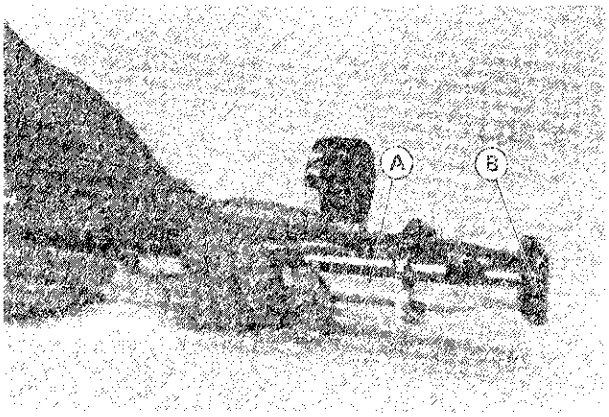
Radiator Cap Inspection

- ●Check the condition of the valve spring, and the top and bottom valve seals of the radiator cap.
- ✱If any one of them shows visible damage, replace the cap.



A. Valve Spring C. Bottom Seal
B. Top Seal

*Install the cap on a cooling system pressure tester. Watching the pressure gauge, pump the pressure tester to build up the pressure. The cap must retain the pressure. (Watch the pressure gauge at least 6 seconds to check that the pressure holds steady.) But the cap must open at the pressure of the rating specified shown in the table and relieve the pressure greater than the specified.



A. Pressure Tester B. Radiator Cap

*Remove the pressure tester, replenish the coolant, and install the radiator cap.
*Run the engine until normal operating temperature is obtained.
*Remove the radiator cap carefully, and recheck for leaks when hot.
*If the pressure drops, check all areas for external leakage. Any trace or source of leakage shows the damaged seal or part.
*If the pressure drops and no external source is found, check for internal leaks. Droplets in the transmission oil indicate internal leakage. Internal water sealing is accomplished by cylinder head gasket and oil seal at the water pump.

Radiator Hose Inspection

*In accordance with the Periodic Maintenance Chart (p. 1-11), visually inspect the hoses for signs of deterioration. Squeeze the hose. A hose should not be hard and brittle, nor should it be soft or swollen.
*Replace any damaged hose.
*Tighten the hose clamps securely.

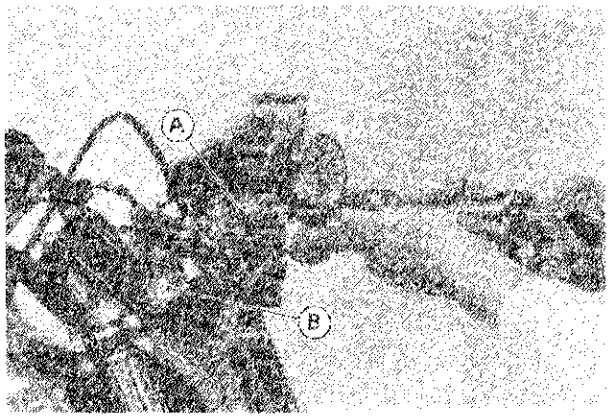
Pressure Testing

Any time the system slowly looses water, the system should be pressure tested.

CAUTION

○During pressure testing operation, do not exceed the pressure for which the system is designed to work. The maximum pressure is 123 kPa (1.25 kg/cm², 17.8 psi).

*Set the motorcycle up on its stand.
*Remove the radiator cap, and install a cooling system pressure tester on the radiator filler neck.
*Build up pressure in the system carefully until the pressure reaches 123 kPa (1.25 kg/cm², 17.8 psi).
*Watch the gauge for at least 6 seconds. If the pressure holds steady, the system is all right.



A. Pressure Tester B. Adapter

Water Pump

See 4. Engine Right Side chapter.

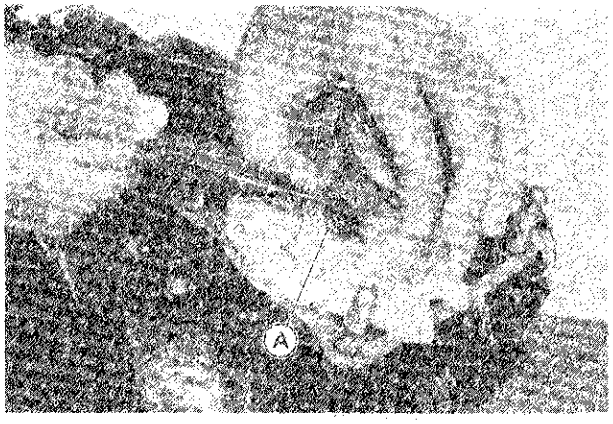
Cylinder Head, Cylinder, Piston

Removal Points

CAUTION

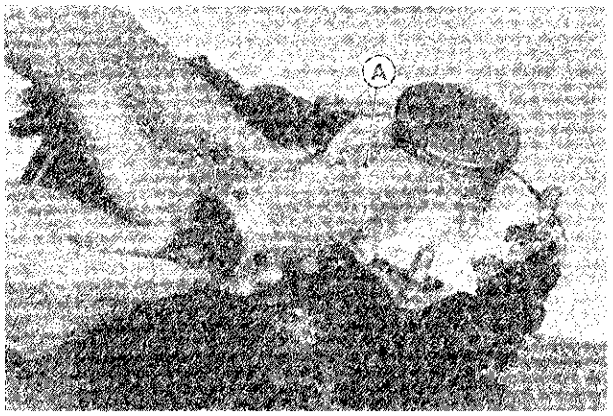
○Do not twist the cylinder as you slide it off the piston. Twisting may cause the piston ring to pop into the intake port. This will cause the cylinder to jam, making removal impossible. If the cylinder does jam, remove the reed valve and press the piston ring back into position.

*Stuff a clean cloth into the crankcase opening around the connecting rod so that no parts will fall into the crankcase.
*Remove one of the piston pin snap rings with needle nose pliers.



A. Snap Ring

*Remove the piston by pushing its piston pin out the side from which the snap ring was removed. Use a piston pin puller (special tool) if necessary.



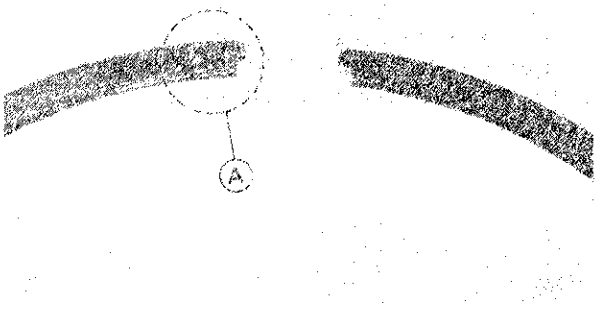
A. Piston Pin Puller: 57001-910

*Install a new piston pin snap ring in place since removal weakens and deforms the ring. After installation, turn the snap ring so that its opening does not coincide with the groove in the side of the piston.

"NOTE"

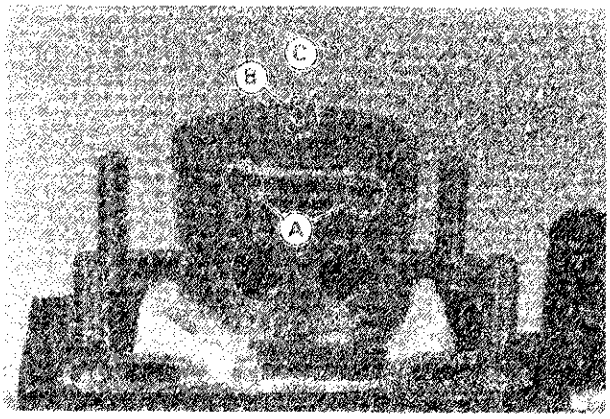
○*If the piston is replaced with a new one, the piston to cylinder clearance must be the specified amount (3-4).*

○*If a piston ring is replaced with a new one, install the ring so that the "N" marked side faces up.*



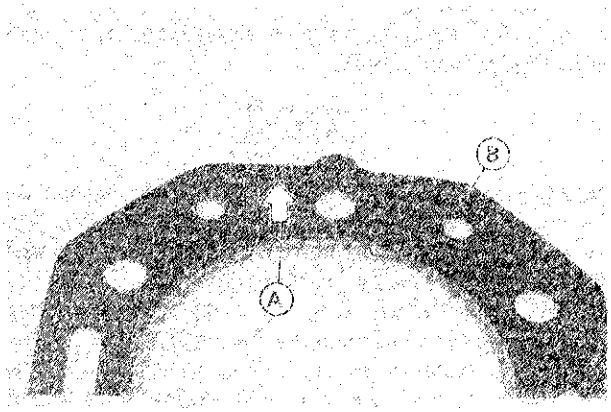
A. "N" Mark

*Check to see that the pin in each piston ring groove is between the ends of the piston rings.



A. Piston Ring Groove Pin C. Front
B. Arrow Mark

*Place the cylinder head gasket and the cylinder head on the cylinder. The arrow on the head gasket must point towards the front.



A. Arrow B. Head Gasket

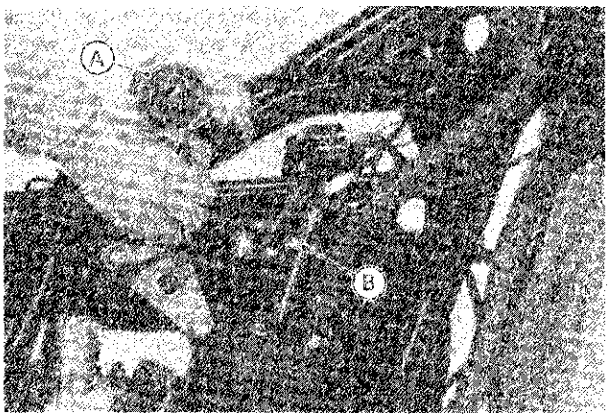
*Cross tighten the cylinder head nuts and cylinder nuts to the specification.

Compression Measurement

*Thoroughly warm up the engine so that engine oil between the piston and cylinder wall will help seal compression as it does during normal running.

*Stop the engine, remove the fuel tank, spark plug and attach compression gauge firmly into the spark plug hole.

*With the throttle fully open, turn the engine over sharply with the kickstarter several times until the compression gauge stops rising; the compression is the highest reading obtainable.



A. Compression Gauge: 57001-221
B. Adapter: 57001-1159

*If cylinder compression is higher than the usable range, check the following:

(1) Carbon build-up on the piston head and cylinder head — clean off any carbon on the piston head and cylinder head.

(2) Cylinder base gasket — use only the proper gasket. The use of a gasket of incorrect thickness will change the compression.

*If cylinder compression is lower than the usable range, check the following:

(1) Gas leakage around the cylinder head — replace the damaged gasket and check the cylinder head for warp.

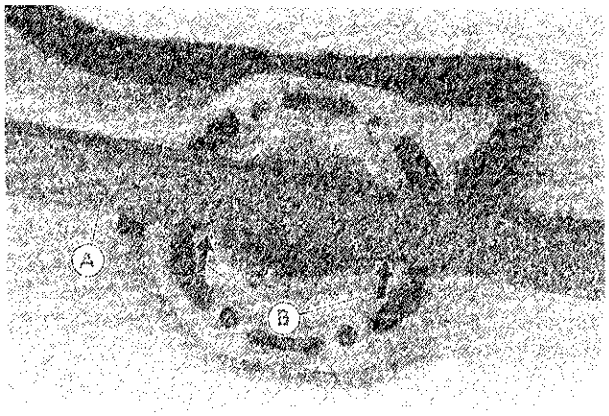
(2) Gas leakage from the crank chamber — check the crankshaft oil seal and reed valve, and check the joint between the crankcase halves.

(3) Piston/cylinder clearance, piston seizure.

(4) Piston ring, piston ring groove wear.

Cylinder Head Warp Inspection

*Measure the warp using the straightedge and thickness gauge.



A. Straightedge B. Thickness Gauge

Combustion Chamber Volume Measurement

"NOTE"

○*Another person will be needed to help expel air bubbles out of the combustion chamber.*

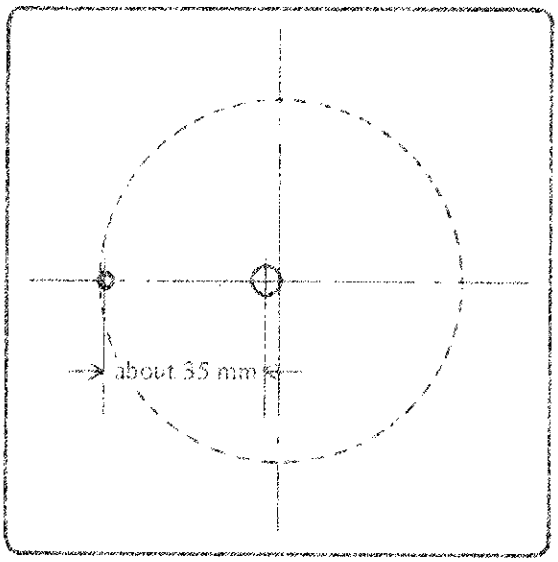
○*Prepare a piece of transparent plastic plate which has a flat surface and two holes about 35 mm apart in its center portion. One hole should be about 6 mm in diameter. The plate must be oil resistant, about 120 mm square, and at least 3 mm thick.*

○*Obtain a burette or syringe which is calibrated at one-cc or smaller graduations. Fill it with light oil such as 2-stroke oil.*

○*The standard spark plug should be installed in the chamber to be measured.*

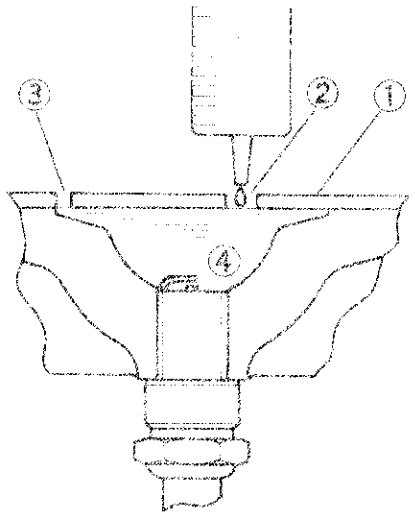
*If the combustion chamber volume is too small, it is possible that the cylinder head was modified for higher compression.

Plastic Measuring Plate



*Clean off any carbon in the combustion chamber.
*Apply a thin coat of grease to the cylinder head mating surface and place the plastic plate over the cylinder head combustion chamber, fitting its small hole near the edge of the combustion chamber.
*Through the large hole, fill the combustion chamber with oil until the chamber is completely but not overly filled. Tilt the cylinder head slightly so that air bubbles come out through the small hole. The oil should just rise to the bottom edge of the holes in the plate. The amount of oil used to fill the chamber is the combustion chamber volume.

Chamber Volume Measurement



1. Plastic Plate 2. Large Hole 3. Small Hole 4. Oil

Piston/Cylinder Clearance

The piston-to-cylinder clearance is measured whenever a piston or cylinder is replaced with a new one, or whenever a cylinder is rebored and and oversize piston is installed. The standard piston-to-cylinder clearance must be adhered to whenever the cylinder is replaced or the cylinder is rebored.

If only a piston is replaced, the clearance may exceed the standard slightly. But it must not be less than the minimum, in order to avoid piston seizure.

The most accurate way to find the piston clearance is by making separate piston and cylinder diameter measurements and then computing the difference between the two values. Measure the piston diameter as just described, and measure the cylinder diameter at the very bottom of the cylinder.

"NOTE"

○*Abnormal wear such as a marked diagonal pattern across the piston skirt may mean a bent connecting rod or crankshaft.*

Piston/Cylinder Seizure Inspection

*Remove the cylinder and piston to check the damage.
*If there is only slight damage, the piston may be smoothed with #400 emery cloth, and any aluminum deposits removed from the cylinder with either #400 emery cloth or light honing.

"NOTE"

○*Whenever the piston or cylinder has been replaced with a new one, the motorcycle must be broken in the same as with a new machine.*

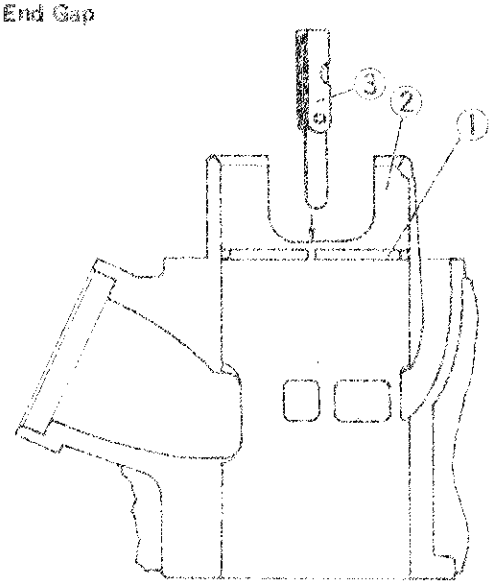
Piston Ring, Piston Ring Groove Inspection

*Visually inspect the piston rings and piston ring grooves.
*If the rings are worn unevenly or damaged, they must be replaced.
*If the piston ring grooves are worn unevenly or damaged, the piston must be replaced and fitted with new rings.

Piston Ring End Gap Inspection

*Place the piston ring inside the cylinder, using the piston to locate the ring squarely in place.
*Set it close to the bottom of the cylinder, where cylinder wear is low.
*Measure the gap between the ends of the ring with a thickness gauge.
*If the gap is wider than the service limit, the ring is overworn and must be replaced.

Ring End Gap



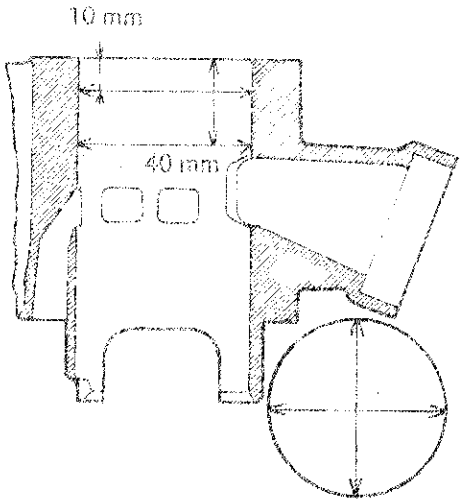
1. Piston Ring 2. Cylinder Block 3. Thickness Gauge

Cylinder, Piston Piston Rings:

Cylinder Wear Inspection

- Inspect the inside of the cylinder for scratches and abnormal wear.
- If the cylinder is damaged or badly worn, replace it with a new one.
- Since there is a difference in cylinder wear in different directions, take a side-to-side and a front-to-back measurement shown in the figure.

Cylinder Diameter Measurement



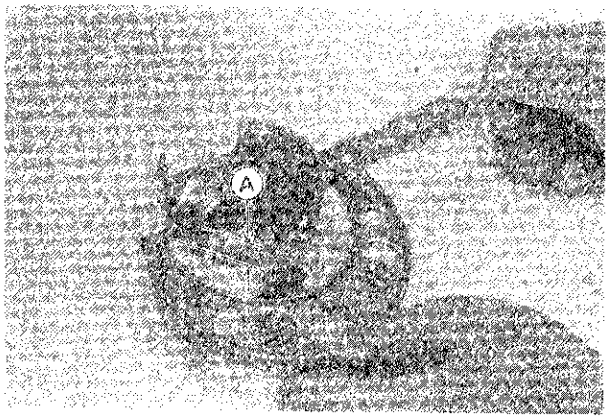
"NOTE"

○*The ELECTRO FUSE cylinder cannot be bored or honed. If altering the cylinder ports, take care that the cylinder wall does not get scratched or otherwise damaged.*

Piston Diameter Measurement

- Measure the outside diameter of the piston 13 mm up from the bottom of the piston at a right angle to the direction of the piston pin.

Piston Diameter Measurement

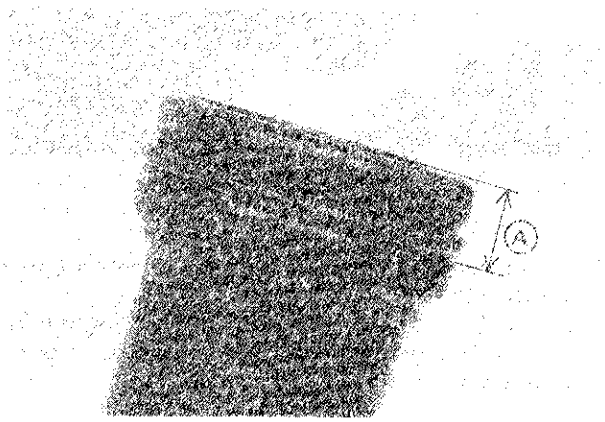


A. 13 mm

Muffler

Installation Point

- Apply the molybdenum disulfide grease around the inlet of the muffler, from the edge to the O-ring.



A. Grease here.

Spark Arrester

This motorcycle is equipped with a spark arrester approved for off-road use by the U.S. Forest Service. It must be properly maintained to ensure its efficiency.

CAUTION

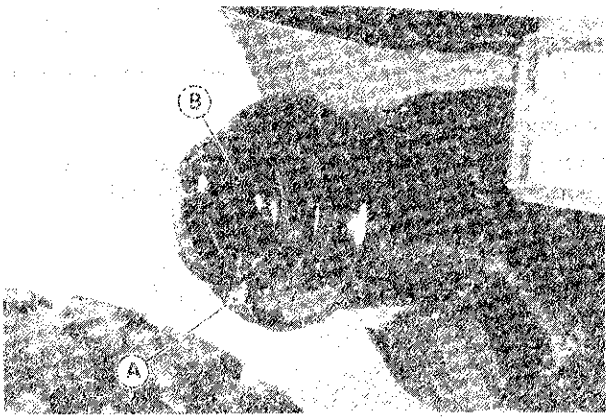
○**The spark arrester must be installed correctly and functioning properly to provide adequate fire protection.**

Cleaning

WARNING

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

- Remove the spark arrester mounting bolt from the silencer.
- Pull the spark arrester out of the silencer.



A. Bolt B. Spark Arrester

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

WARNING

- **Never run the engine with the spark arrester removed near combustible materials. Hot carbon particles may start a fire.**
- **Do not run the engine in a closed area. Exhaust gases contain carbon monoxide, a colorless, odorless, poisonous gas. Breathing exhaust gas leads to carbon monoxide poisoning, asphyxiation, and death.**

- Stop the engine.
- Scrape carbon deposits off the spark arrester and slide it back into the silencer.
- Install the mounting bolt and tighten it securely.

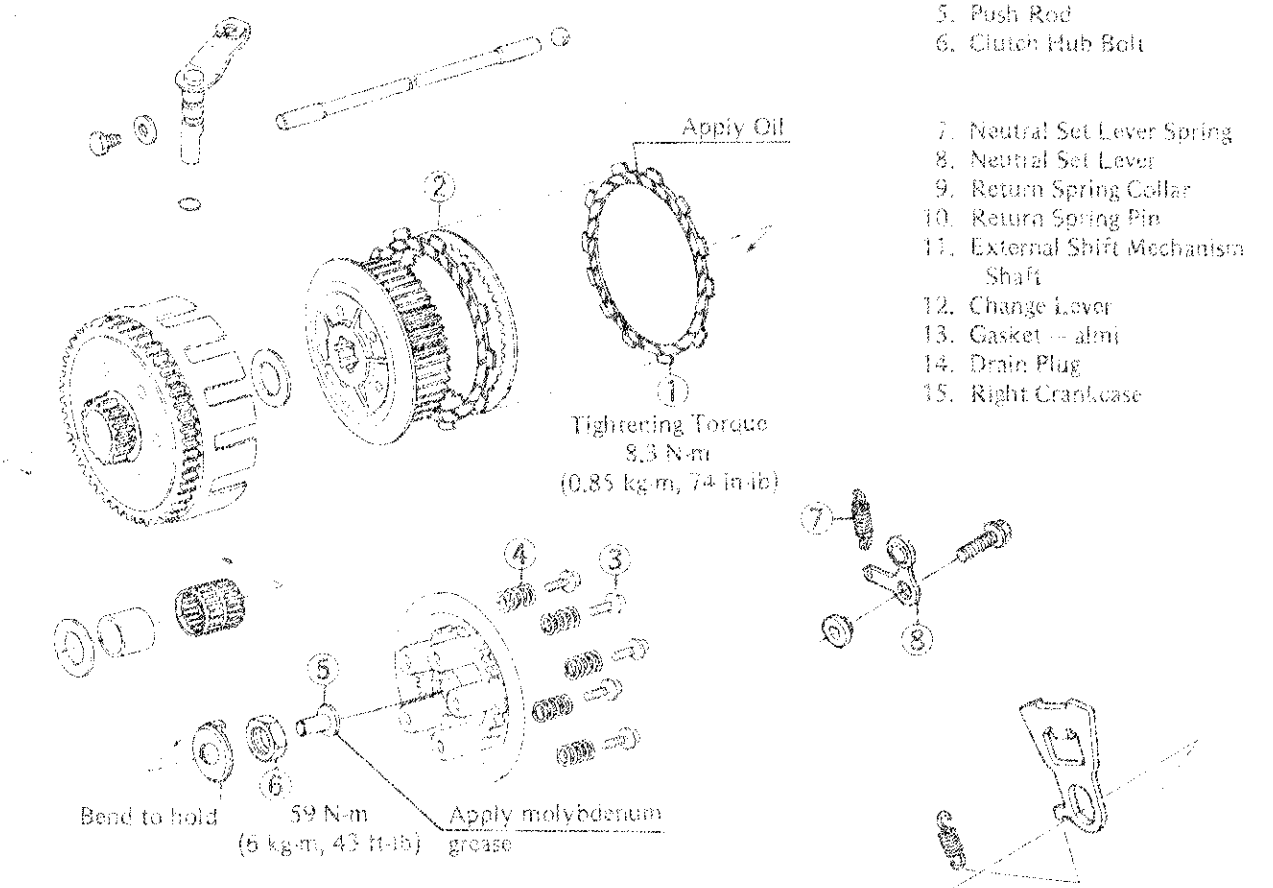
Engine Right Side

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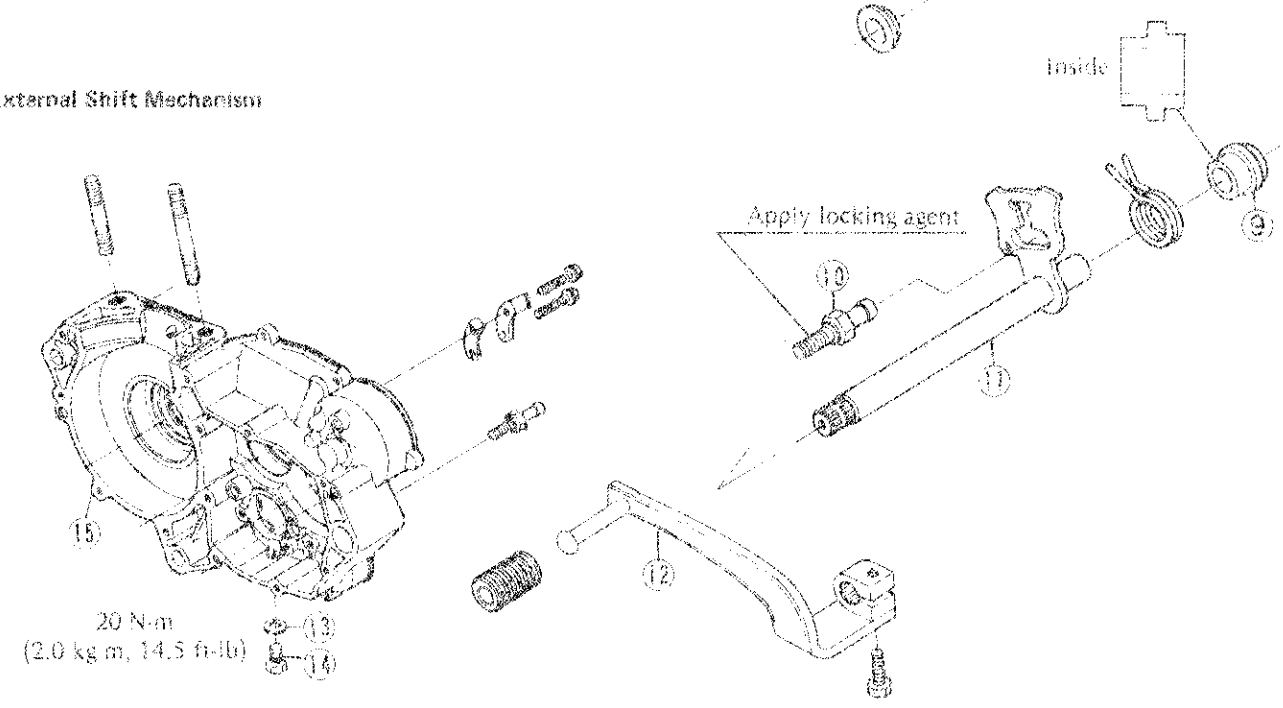
Exploded Views

Clutch

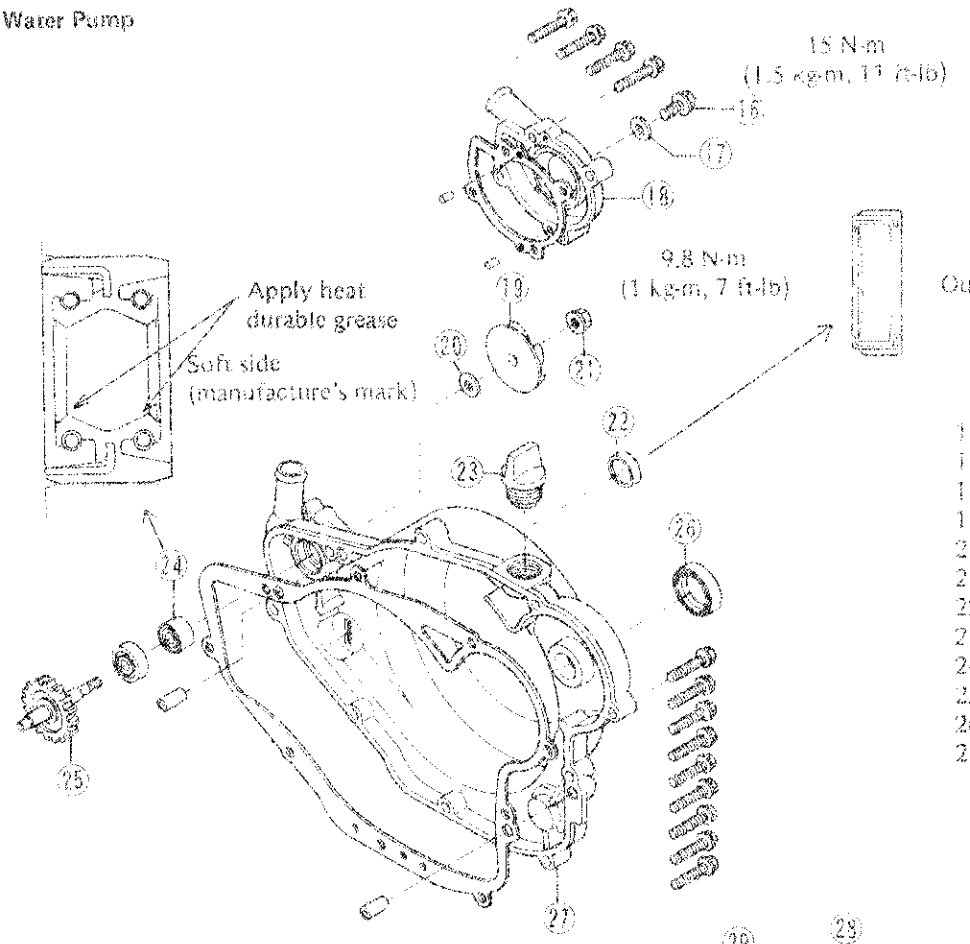


1. Friction Plate
2. Steel Plate
3. Clutch Spring Bolt
4. Clutch Spring
5. Push Rod
6. Clutch Hub Bolt
7. Neutral Set Lever Spring
8. Neutral Set Lever
9. Return Spring Collar
10. Return Spring Pin
11. External Shift Mechanism Shaft
12. Change Lever
13. Gasket – alm
14. Drain Plug
15. Right Crankcase

External Shift Mechanism

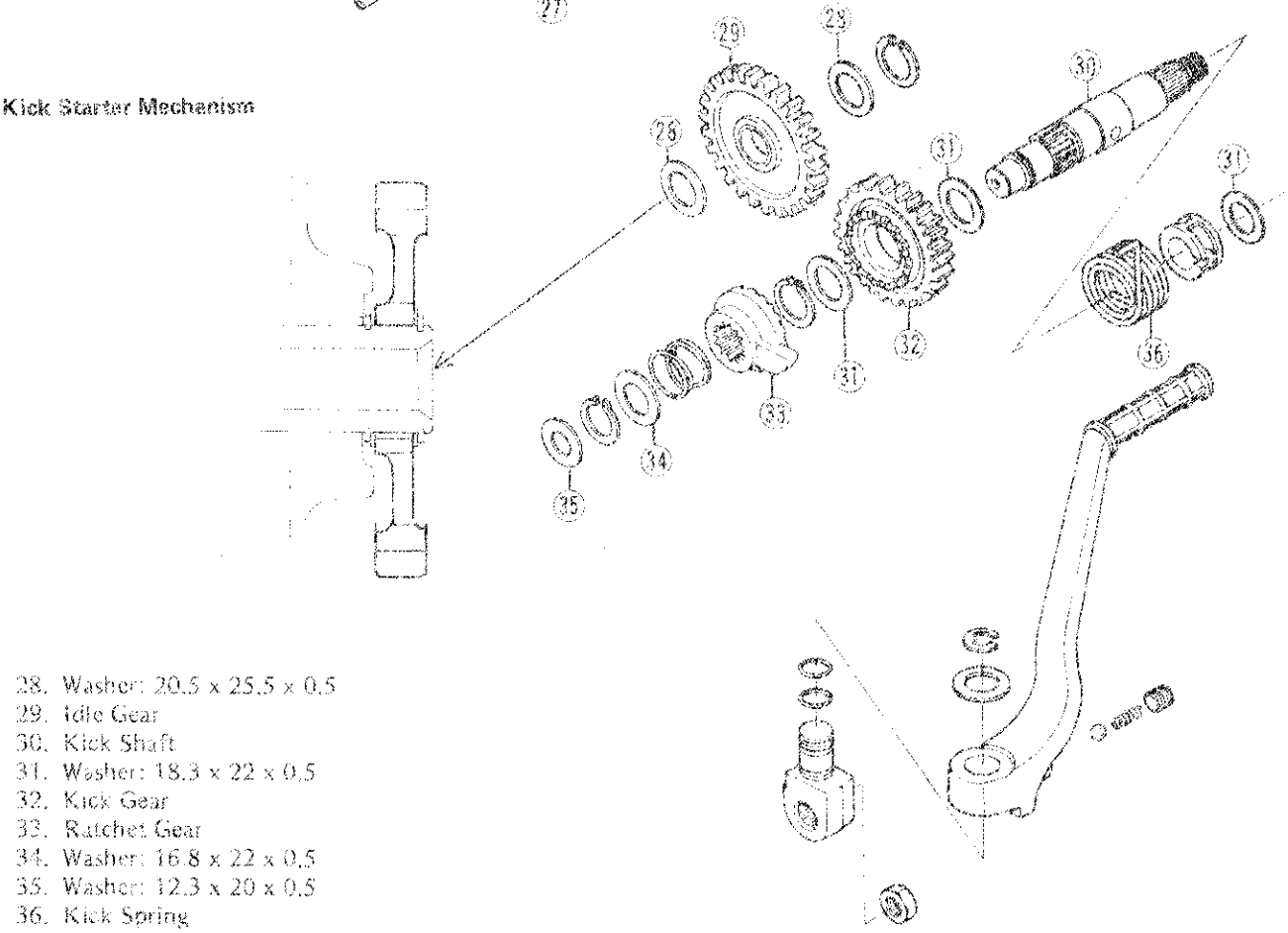


Water Pump



16. Coolant Drain Plug
17. Gasket-Alm
18. Water Pump Cover
19. Impeller
20. Washer
21. Impeller Nut
22. Oil Level Gauge
23. Oil Filler Plug
24. Impeller Shaft Oil Seal
25. Impeller Shaft
26. Oil Seal-Cover
27. Right Engine Cover

Kick Starter Mechanism



28. Washer: 20.5 x 25.5 x 0.5
29. Idle Gear
30. Kick Shaft
31. Washer: 18.3 x 22 x 0.5
32. Kick Gear
33. Ratchet Gear
34. Washer: 16.8 x 22 x 0.5
35. Washer: 12.3 x 20 x 0.5
36. Kick Spring

Service Data

Item	Standard	Service Limit	See Page
Transmission Oil:			
Grade	SE class	— — —	4-5
Viscosity	SAE 10W30 or 10W40		
Capacity	700 mL		
Clutch:			4-7
Friction plate thickness	2.92 – 3.08 mm	2.8 mm	
Clutch plate warp	Friction plate, steel plate	0.3 mm	
	Steel plate	0.3 mm	
Friction plate/clutch housing clearance	0.05 – 0.45 mm	0.6 mm	
Clutch spring free length	33.3 mm	32.3 mm	

Special Tool

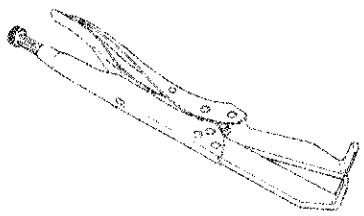
Impeller Shaft Oil Seal Guide: 57001-1161



Shift Shaft Oil Seal Guide: 57001-261



Clutch Holder: 57001-305



Kick Shaft Oil Seal Guide: 57001-263

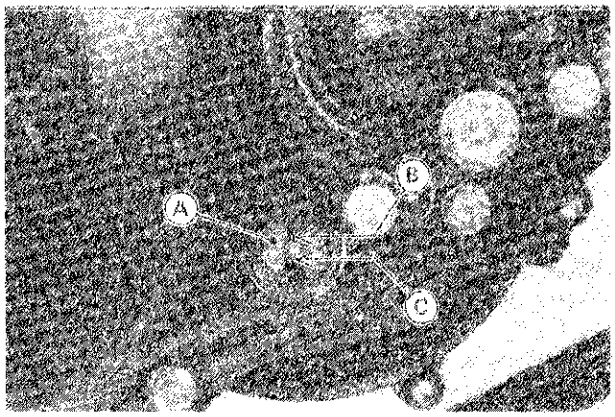


Transmission Oil

Oil Level Inspection

Check the oil level with the oil level gauge on the right engine cover. When checking the oil, position the vehicle so that it is fully perpendicular to the ground.

*Check the oil level through the oil level gauge. The oil level should come up between the upper and lower level.



A. Oil Level Gauge
B. Upper Level
C. Lower Level

*If there is too much oil, remove the excess oil with a syringe or some other suitable device.

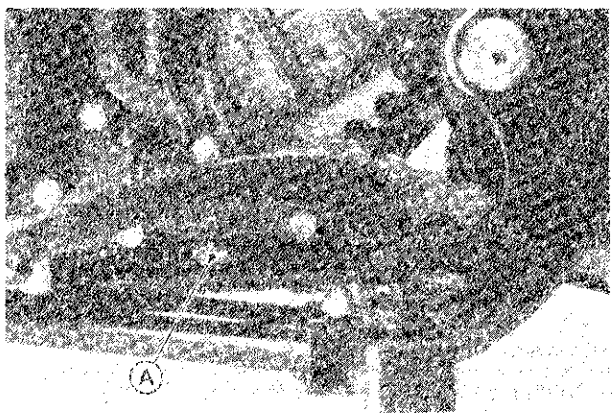
*If there is too little oil, add the correct amount of oil through the oil filler opening. Fill with the same type and make of oil that is already in the transmission.

Oil Change

The transmission oil should be changed periodically to ensure long engine life.

*Warm up the engine thoroughly so that the oil will pick up any sediment and drain easily.

*Stop the engine, and place an oil pan beneath the engine, remove the drain plug.



A. Drain Plug

*Position the vehicle so that it is fully perpendicular to the ground to allow all the oil to drain out.

*Install the drain plug with a new gasket and tighten to the specification.

Tightening Torque

Engine Drain Plug:	20 N·m (2.0 kg-m, 14.5 ft-lb)

*Fill the engine up to the proper level with a motor oil specified in the table.

Transmission Oil

Grade:	SE class
Viscosity:	SAE 10W30 or 10W40
Capacity:	700 mL

*Check the oil level, after kicking the kick pedal 3 or 4 times.

*Install the oil filler plug.

Water Pump

It is necessary to disassembly the water pump, if there is abnormality such as excessive change in coolant level, discoloration of coolant, or milky transmission oil.

Coolant Level

See Engine Top End Chapter on p. 3-7.

Disassembly and Assembly

To disassemble the water pump:

*Drain the coolant (p. 3-7) and transmission oil.

*Remove the water pump cover, and then remove the right engine cover.

*Remove the impeller shaft nut, pull out the impeller shaft, and remove the impeller.

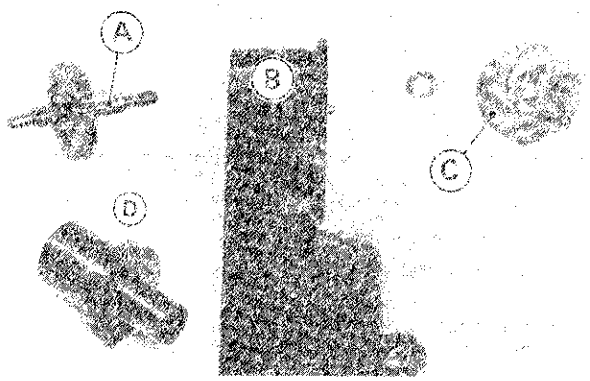
To assemble the water pump:

*Install the impeller shaft through the right engine cover using the impeller shaft oil seal guide (special tool) to protect the impeller shaft oil seal.

*Mount the washer, impeller and nut, and then tighten to the specification.

Tightening Torque

Impeller Nut:	10 N·m (1.0 kg-m, 7.2 ft-lbs)



A. Impeller Shaft
B. Right Engine Cover
C. Impeller
D. Impeller Shaft Oil Seal Guide: 57001-1161

*Install the right engine cover and water pump cover.
*Fill the engine with oil and check the oil level (p. 4-5).
*Fill the radiator with coolant and check the coolant level (p. 3-7).

"NOTE"

If the impeller shaft oil seal is removed, it should be replaced with a new one. Install the oil seal so that the soft side faces in.

Inspection

Check the impeller for damage and cracks. If necessary, replace the impeller with a new one. Check bearing and impeller shaft gear for signs of damage. If necessary, replace them with new ones.

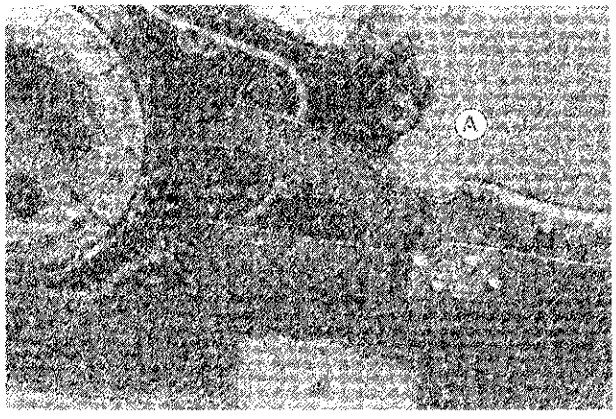
Clutch

Clutch Cable Adjustment and Removal

See Controls and Instruments Chapter on p. 12-4.

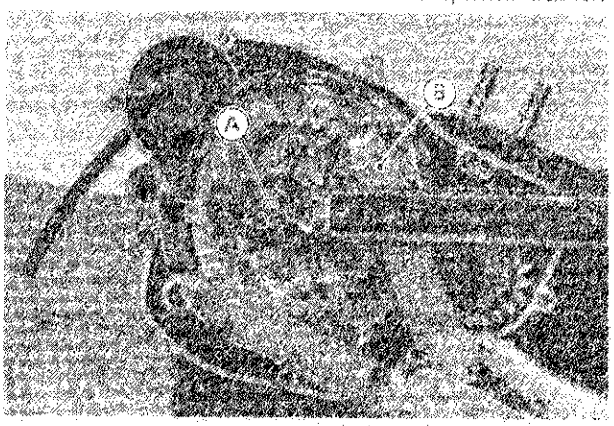
Removal and Installation Point

*Use the clutch holder (special tool) to hold the primary gear for removal or installation.



A. Clutch Holder: 57001-305

*Change the clutch holder position to the clutch hub, and remove the clutch hub nut and splend washer.



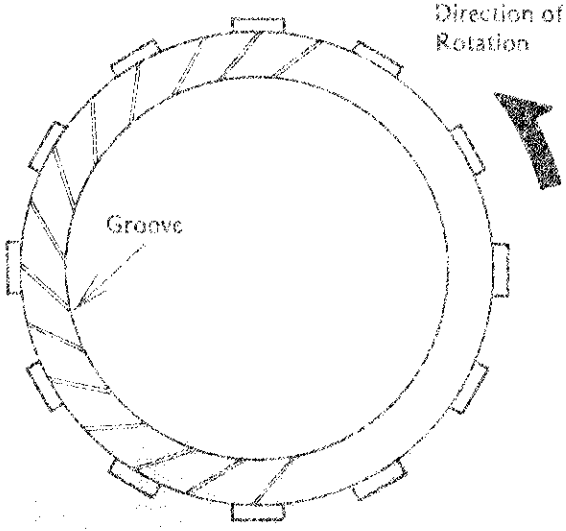
A. Clutch Hub Nut B. Clutch Holder: 57001-305

"NOTE"

When replacing any clutch plate, apply transmission oil to the new clutch plate surfaces.

*Install the friction plates so that the grooves in the plates run forward the center in the direction of the clutch housing rotation (counterclockwise viewed from the right side of the engine).

Friction Plate Installation



*Tighten the clutch spring bolts to the specification. Cross-tighten them evenly by hand rather than using a compressed air tool to prevent uneven spring pressure.

Tightening Torque

Clutch Hub Bolt:	59 N-m (6 kg-m, 43 ft-lb)
Clutch Spring Bolt:	8.3 N-m (0.85 kg-m, 74 in-lb)

Friction Plate Wear, Damage Inspection

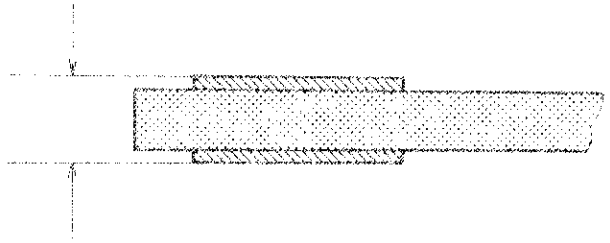
*Visually inspect the friction plates to see whether or not they show any signs of seizure, overheating, or uneven wear.

*If any paites show signs of damage, replace the friction plates and steel plates as a set.

Friction Plate Thickness

Standard:	2.92 – 3.08 mm
Service Limit:	2.8 mm

Friction Plate Measurement



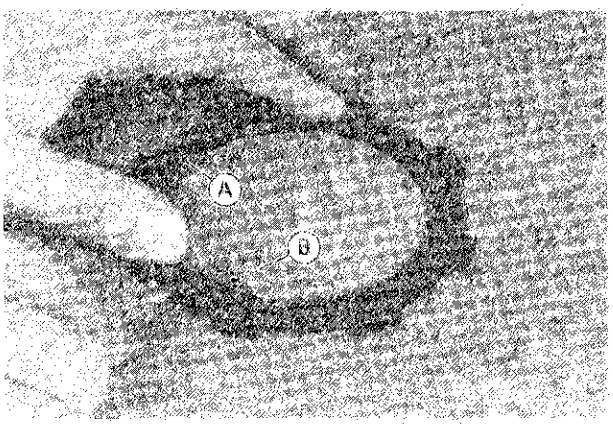
Friction and Steel Plate Warp Inspection

*Place each friction plate and steel plate on a surface plate, and measure the gap between the surface plate and each friction plate and steel plate. This gap is the amount of friction and steel plate warp.

*If any plate warped over the service limit, replace it with new one.

Clutch Plate Warp

Service Limit:	0.3 mm

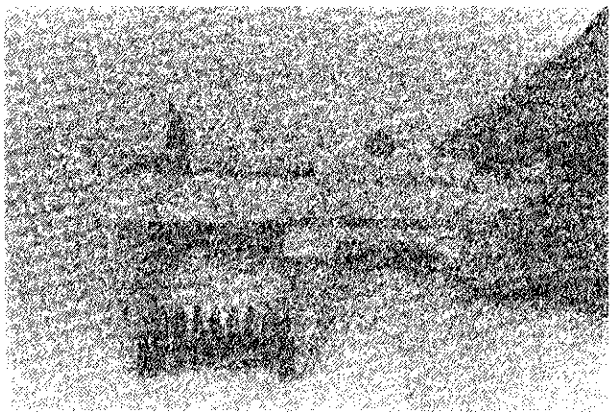


A. Friction Plate B. Thickness Gauge

Clutch Spring Free Lenght Measurement

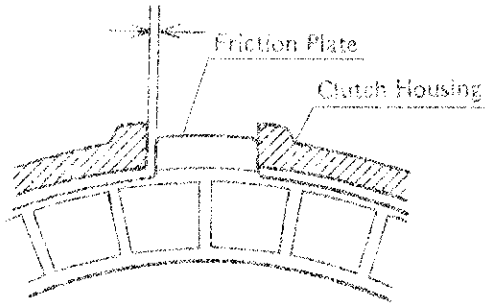
Clutch Spring Free Length

Standard:	33.3 mm
Service Limit:	32.3 mm



Friction Plate/Clutch Housing Clearance

Friction Plate/Clutch Housing Clearance



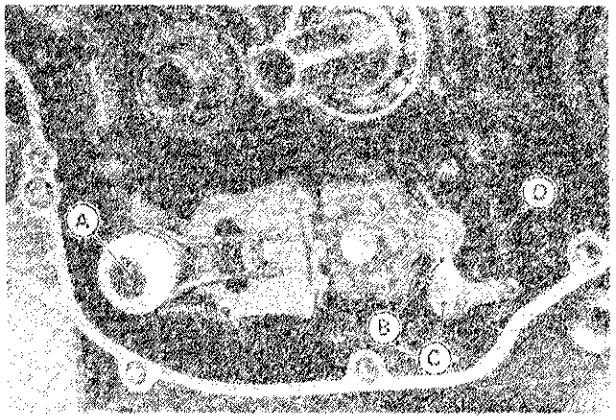
Friction Plate/Clutch Housing Clearance

Standard:	0.05 – 0.45 mm
Service Limit:	0.6 mm

External Shift Mechanism

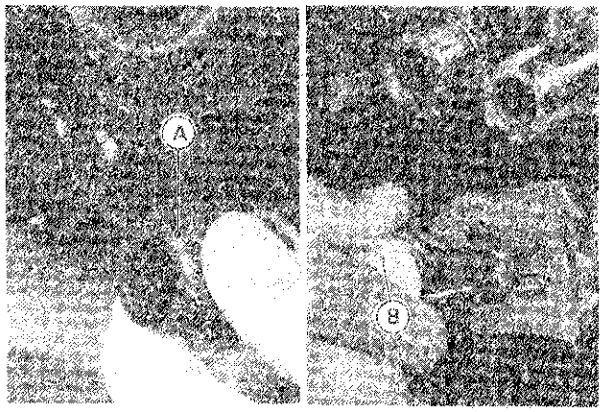
Shift Mechanism Installation

*Install the neutral set lever, and put the spring back into place.



A. External Shift Mechanism Shaft C. Bolt
B. Neutral Set Lever D. Spring

●Using the shift shaft oil seal guide (special tool) on the crankcase shift shaft oil seal, insert the external shift mechanism shaft through the crankcase.

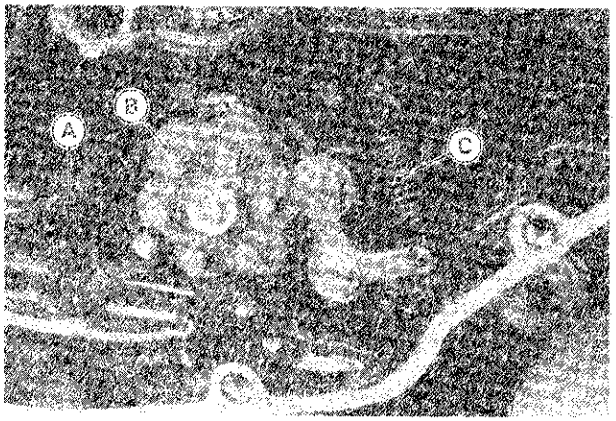


A. Shift Shaft Oil Seal Guide: 57001-261
B. External Shift Mechanism Shaft

Shift Mechanism Inspection

Inspect the drum holder, and gear set lever spring. Replace any broken or otherwise damaged parts.

Check to see if the return spring pin is loose or not. If it is loose, remove it and apply a locking agent to the threads. Then screw and tighten it securely.



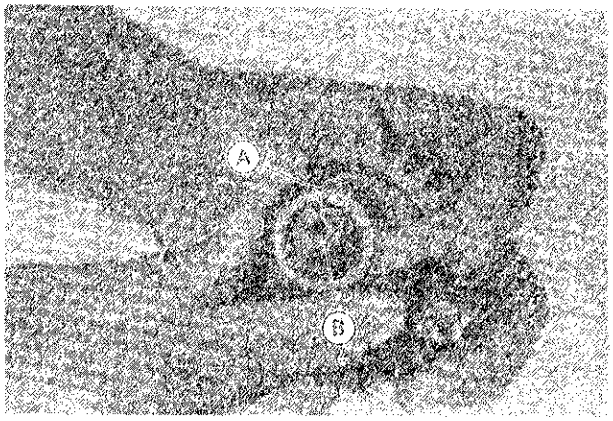
A. Return Spring Pin C. Neutral Set Lever Spring
B. Drum Holder

Kickstarter

Assembly Point

"NOTE"

○*When installing the ratchet on the kick shaft, align the ratchet gear punch mark with the punch mark on the kick shaft.*



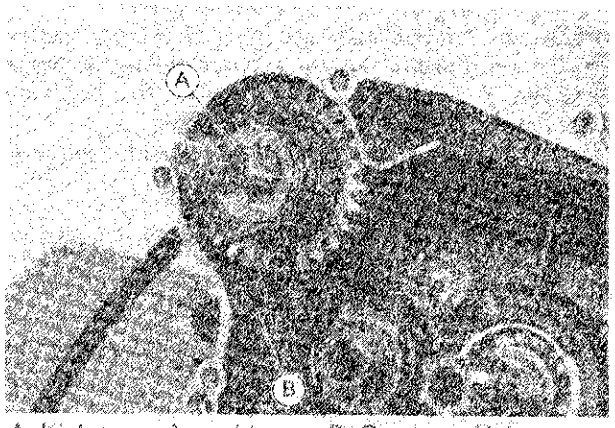
A. Punch Mark (Ratchet) B. Punch Mark (Kick Shaft)

CAUTION

○**Misalignment of the ratchet gear changes the kick spring preload. If the kick spring preload is too light, partial mesh of the kick gear and the ratchet gear could cause kick mechanism noise. If the kick spring preload is too heavy, the kick spring could weaken or break.**

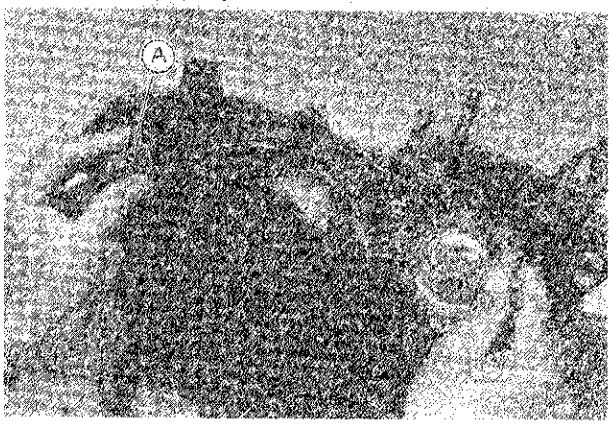
Installation Points

●Install the kickstarter assembly with the thrust washer, and turn the kick shaft all the way clockwise.



A. Kickstarter Assembly B. Crankcase Hole

●Stick the gasket in position with a thin layer of grease, and mount the right engine cover using the kick shaft oil seal guide (special tool) to protect the cover oil seal. Install the mounting bolts.



A. Kick Shaft Oil Seal Guide: 57001-263

Engine Left Side

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Engine Sprocket

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Engine Removal, Installation

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Engine Removal

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Installation Points 6-3

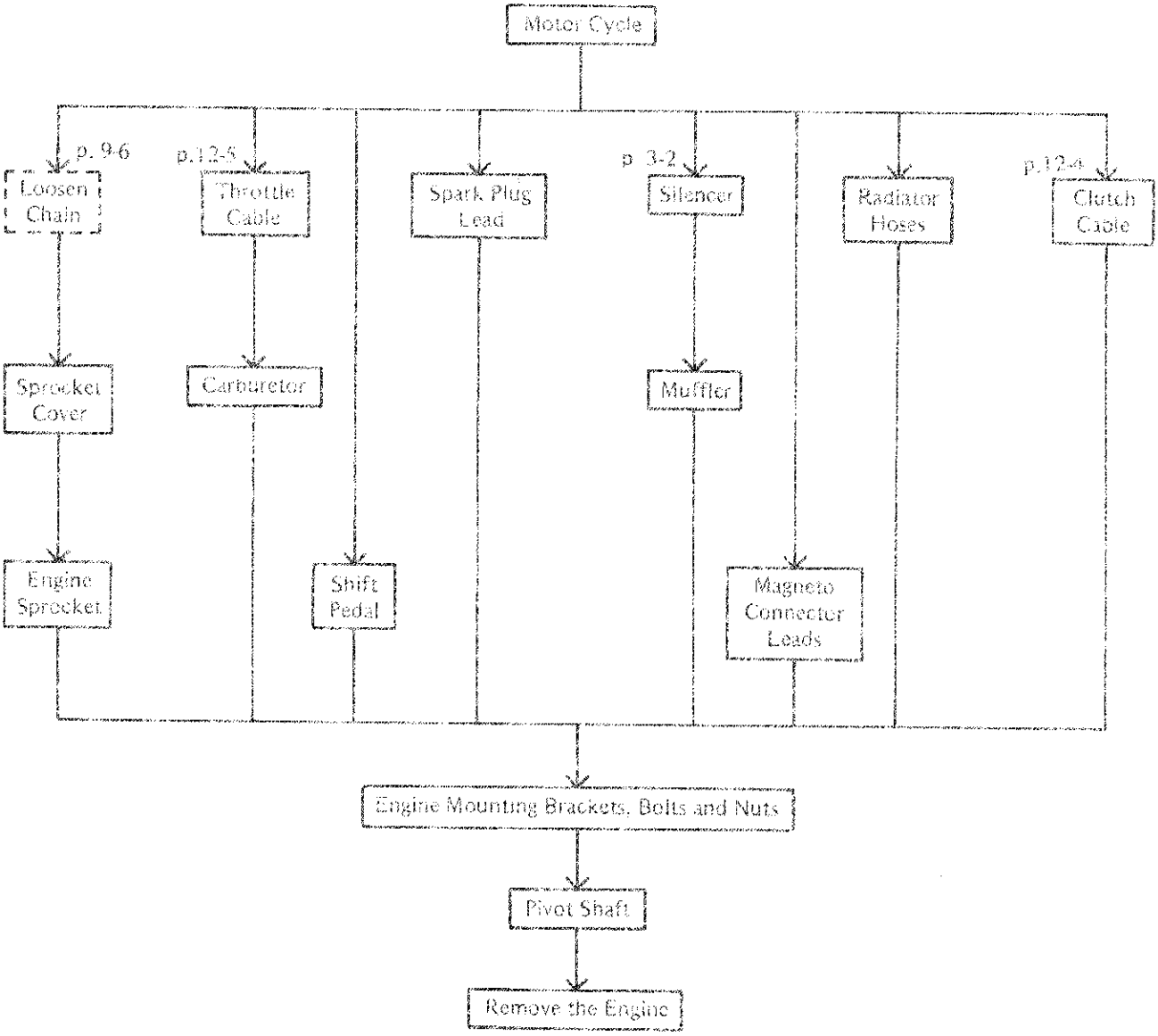
Flow Chart (Engine Disassembly) 6-4

Engine Removal

Removal Points

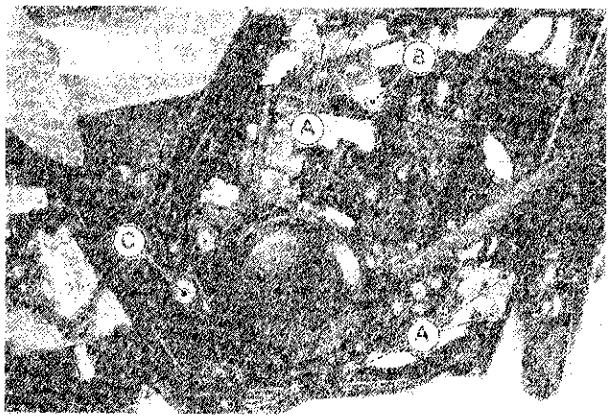
- For later installation convenience, note and record how and where cables, wirings, and hoses are routed. They should not be allowed sharp bend, kinking nor twisting.
- Drain the transmission oil (p. 4-5) and coolant (p. 3-7).
- Remove the parts and free the cables or wirings as follows.
- Turn the fuel tap OFF and pull off the fuel hose.
- Take off the fuel tank.

○The following chart is intended to be aids to proper removal. Select the component you wish to remove and follow the arrows to that point on the chart.



Installation Points

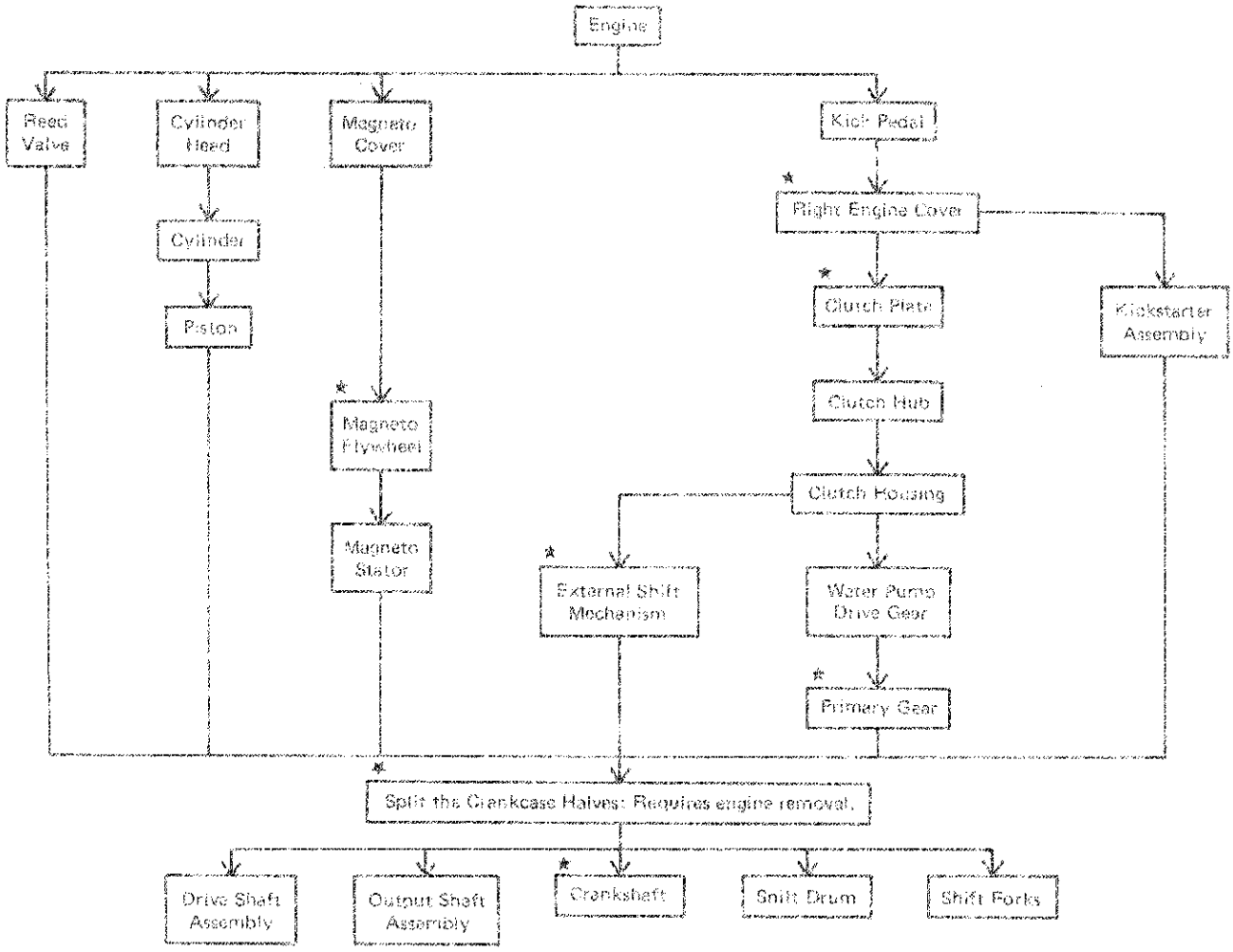
* Tighten the following parts.
  - Engine mounting bolts and pivot shaft. (See right figure).
  - Oil drain plug with a new gasket . . . . . (p.4-5).
  - Coolant drain plug with a new gasket . . . . . (p.3-7).
* Fill the engine with transmission oil . . . . . (p. 4-5).
* Fill the cooling system with coolant . . . . . (p. 3-7).
* Adjust the following parts.
  - Throttle control cable . . . . . (p.12-5).
  - Drain chain . . . . . (p.9-4).
  - Clutch cable . . . . . (p.12-4).
  - Carburetor (idling) . . . . . (p.2-4).
  - Front brake . . . . . (p.10-4).



A. Engine Mounting Bolt 8 mm
   24 N-m (2.4 kg-m, 17 ft-lb)
B. Engine Mounting Bolt 10 mm
   39 N-m (4.0 kg-m, 29 ft-lb)
C. Pivot Shaft
   110 N-m (11 kg-m, 80 ft-lb)

Flow Chart (Engine Disassemble)

○This chart is designed to aid in determining proper removal sequence. Select the component you wish to remove and follow the arrows to that point on the chart.



"NOTE"

1. *Action that has been already done in the engine removal procedure is omitted. Action that is not necessarily required for engine disassembly off the motorcycle is also omitted.*
2. *Action with a mark (★) requires special tool(s) for removal, installation, disassembly or assembly.*

Precautions

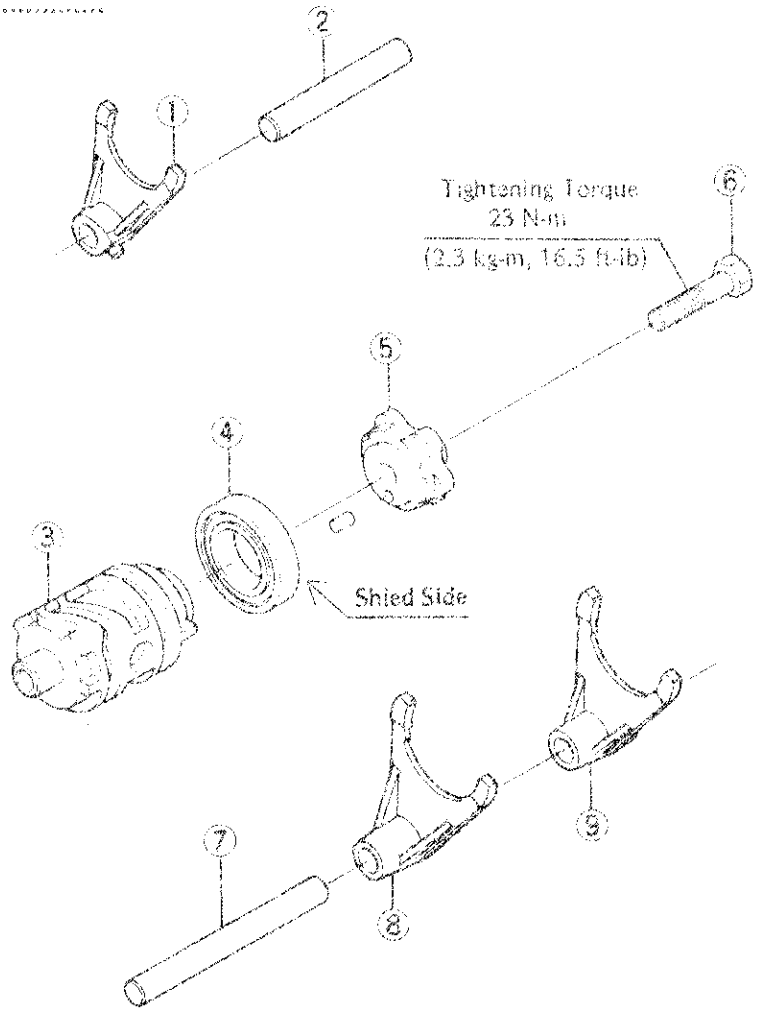
●Turn the crankshaft always in the direction of normal rotation; which is clockwise, viewed from the right side.
●An arrow mark is placed on some parts. The arrow shows either the orientation or the direction of rotation of a part.
○If the arrow mark shows orientation, install the part so that the arrow points the front of the motorcycle when it is installed.
○If the arrow mark shows direction of rotation, install the part so that the arrow mark coincides with the rotational direction.
●Install the gaskets in the correct position and direction so that they perfectly match with the mating surfaces where they are to be installed.
●Before assembling parts, wear an eye protector, and blow the oil passages in the parts clean with compressed air.

Engine Bottom End / Transmission

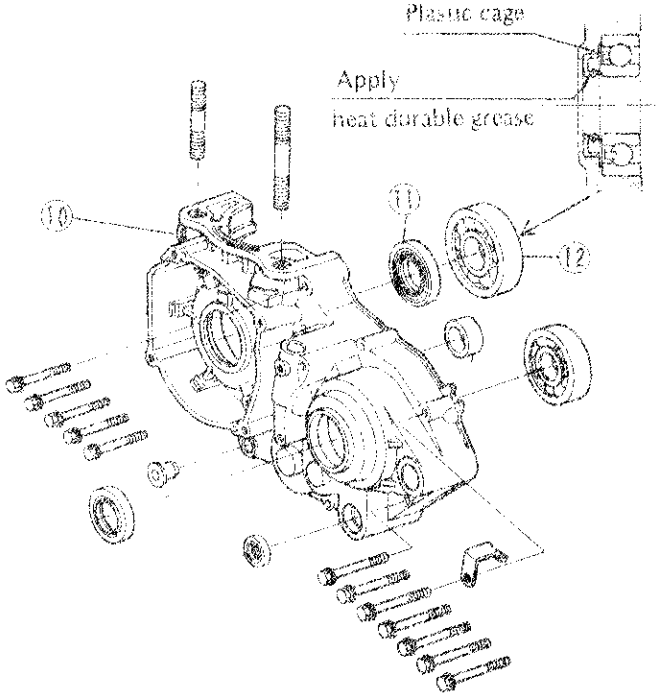
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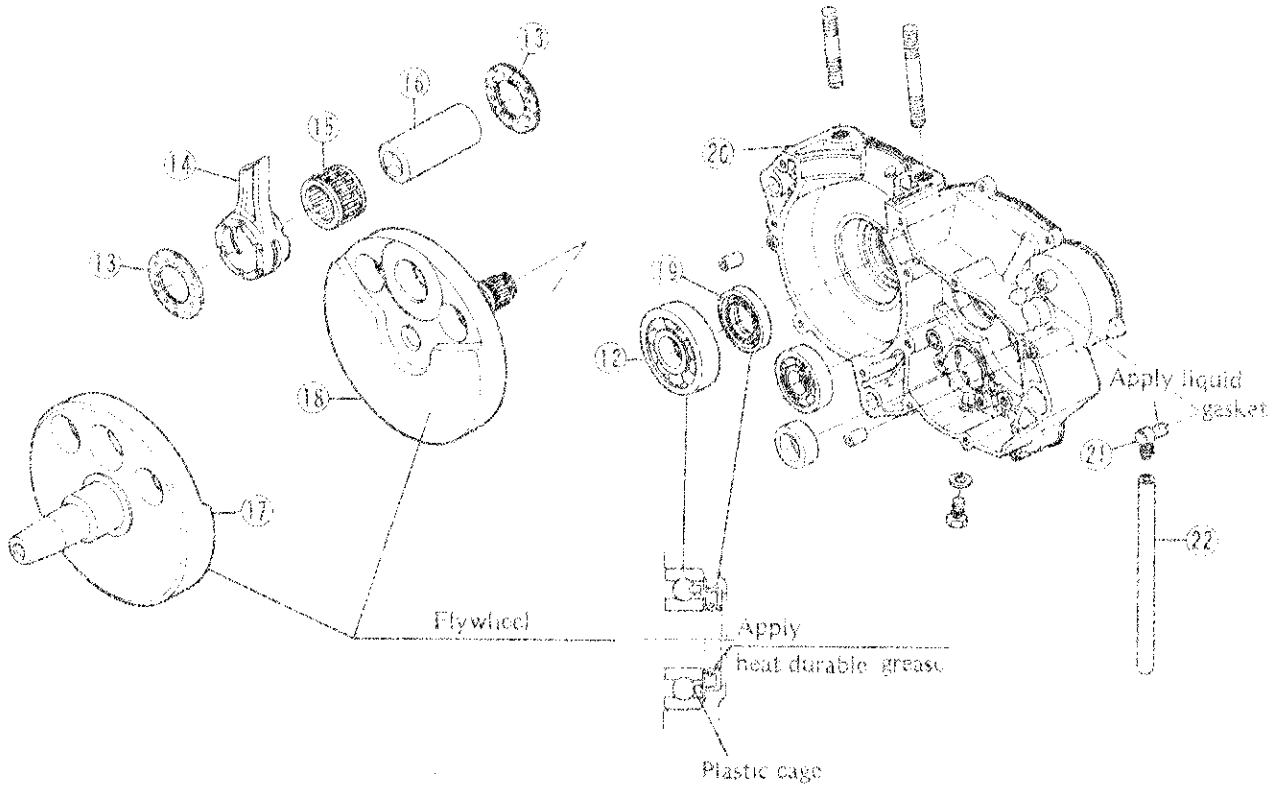
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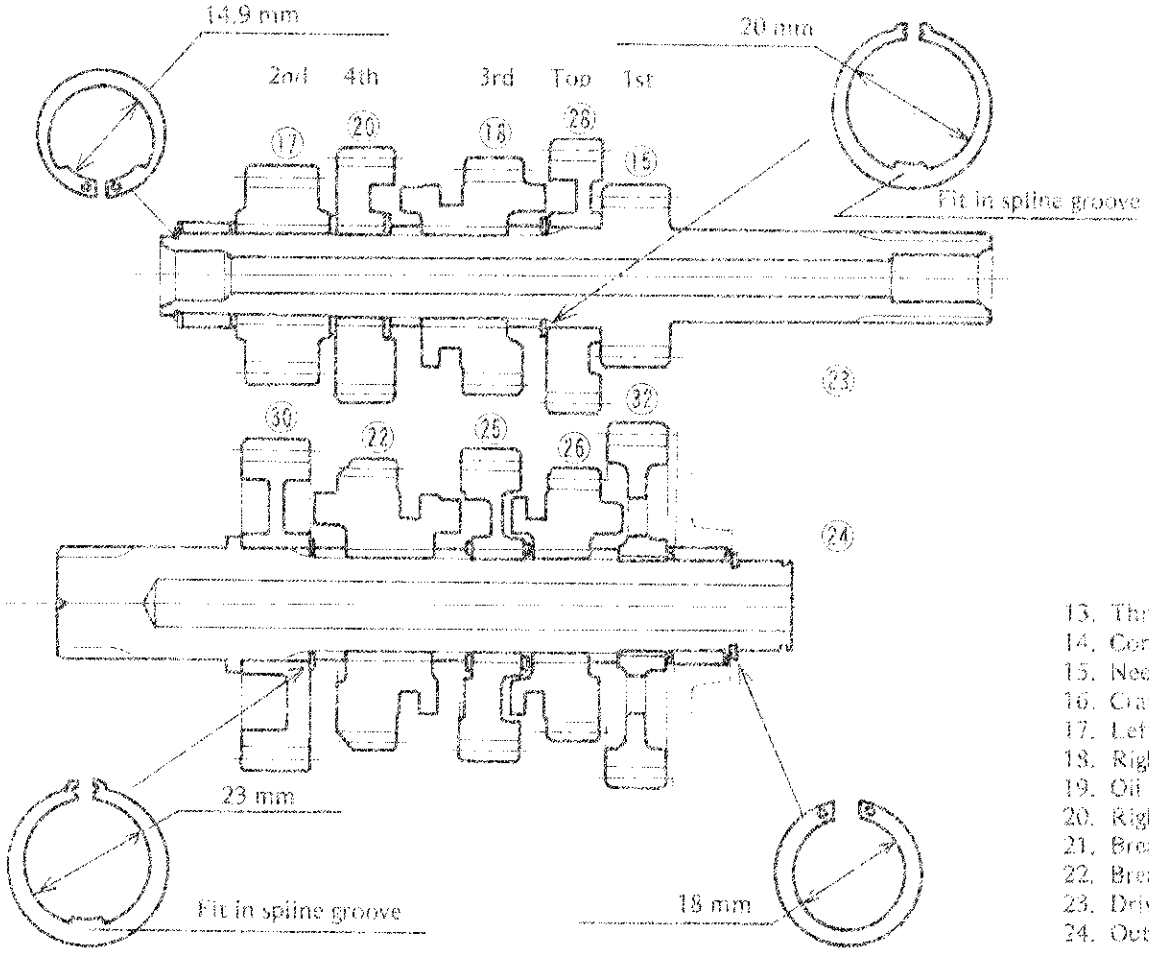
Exploded Views



1. Drive Shaft 3rd Gear Shift Fork
2. Shift Rod Short
3. Shift Drum
4. Single Shielded Bearing
5. Change Drum Holder
6. Change Drum Holder Bolt
7. Shift Rod-long
8. Output Shaft 4th Gear Shift Fork
9. Output Shaft 5th Gear Shift Fork
10. Left Crankcase
11. Oil Seal
12. Crankshaft Ball Bearing







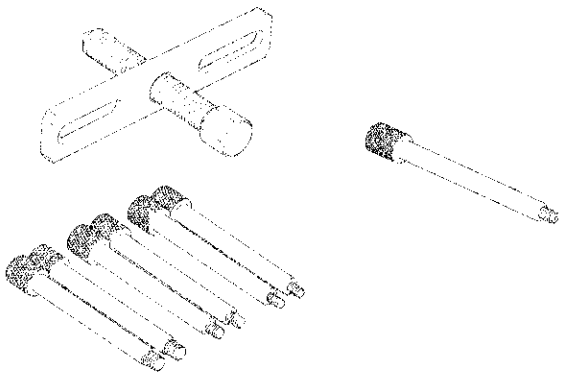
13. Thrust Washer
14. Connecting Rod
15. Needle Bearing
16. Crank Pin
17. Left Crankshaft
18. Right Crankshaft
19. Oil Seal
20. Right Crankcase
21. Breather
22. Breather Tube
23. Drive Shaft
24. Output Shaft

Service Data

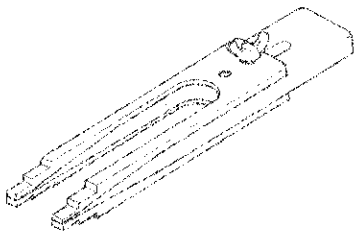
Item	Standard	Service Limit	See Page
Transmission:			
Shift fork finger thickness	4.4 – 4.5 mm	4.2 mm	7-6
Gear shift fork groove width	4.55 – 4.65 mm	4.75 mm	7-6
Shift fork guide pin diameter	5.990 – 6.005 mm	5.95 mm	7-7
Shift drum groove width	6.05 – 6.20 mm	6.25 mm	7-7
Crankshaft:			
Connecting rod big end radial clearance	0.037 – 0.049 mm	0.10 mm	7-7
Connecting rod side clearance	0.45 – 0.55 mm	0.70 mm	7-7
Crankshaft runout	0.03 mm	0.10 mm	7-7

Special Tool

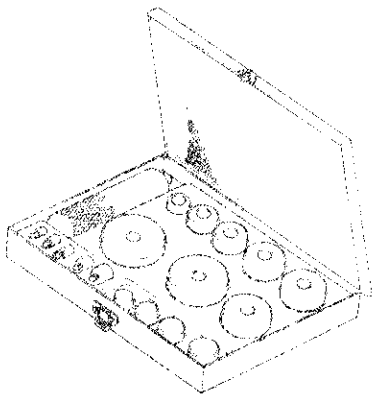
Crankcase Splitting Tool: 57001-1098, 156



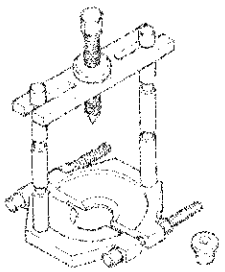
Crankshaft Installing Jig: 57001-1174



Bearing Driver Set: 57001-1129



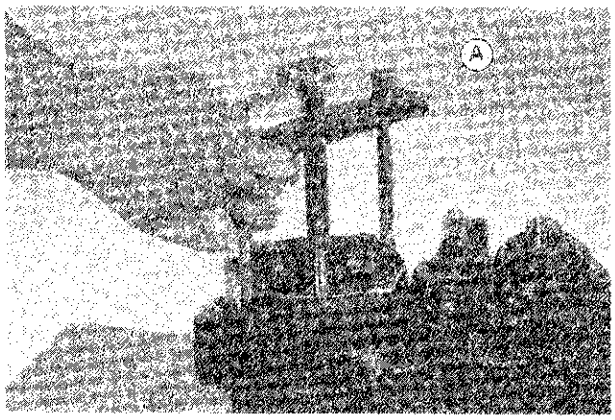
Bearing Puller: 57001-135



Crankcase Splitting

Crankcase Disassembly Point

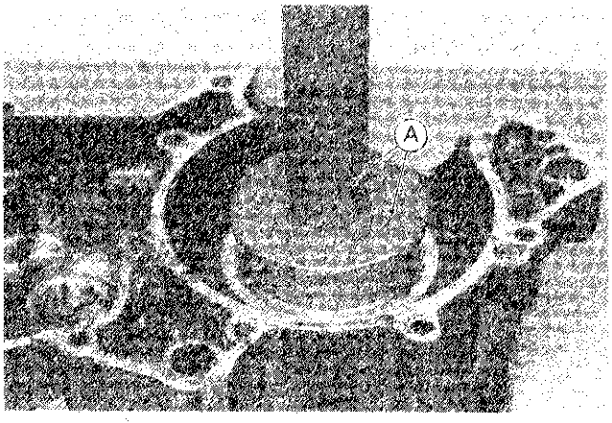
- Install the crankcase splitting tool (special tool) on the left side of the crankcase. Be certain to screw the bolts in all the way.
- Tighten the bolt on the crankcase splitting tool to split the crankcase



A. Crankcase Splitting Tool: 57001-1098, 156

Crankcase Assembly Point

- Clean out the crankcase, and clean off any grime on the transmission and crankshaft parts with a high flash-point solvent.
- Any oil seal that is removed is damaged and must be replaced with a new one. Press in the new oil seal using a press and suitable adapters so that the face of the seal is level with the surface of the crankcase.
- Apply a little amount of heat durable grease to the inner lip of the oil seal.
- Install the ball bearings using a press and the bearing driver set (special tool). Install the needle bearing using a press and the driver set (sepcial tool).



A. Bearing Driver Set: 57001-1129

- Shift the transmission to neutral before reassembling the cases.
- Clean off and wipe dry the mating surfaces of the crankcase halves, and apply liquid gasket to the mating surface of the left crankcase half.

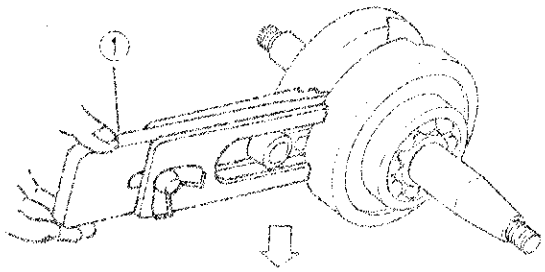
Crankshaft Installation Point

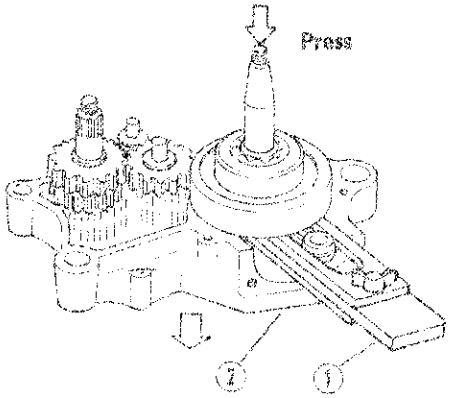
- Fit the crankshaft assy into the right crankcase using a crankshaft installing jig inserted between the flywheels opposite the connecting rod big end.

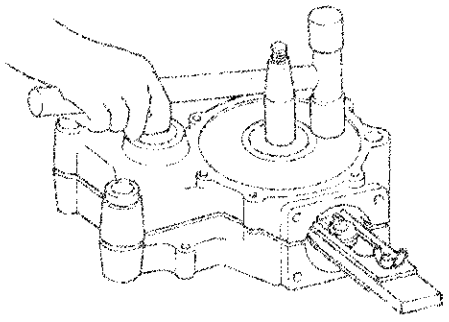
"NOTE"

○*Constantly check the alignment of the two halves, and the position of the transmission shafts.*

This tool is easily adjustable to fit in any gap between the flywheels. Install the crankshaft as follows.



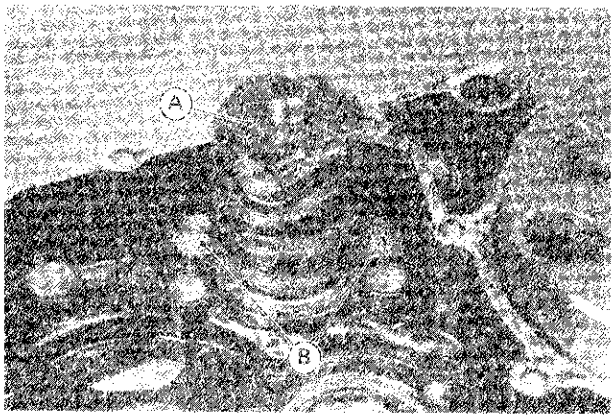




1. Crankshaft Installing Jig: 57001-1174
2. Right Crankcase

Transmission Assembly

*Apply a little engine oil to the shift drum assembly. Insert the shift drum assembly into the crankcase, install the flat washers and mounting bolts, and tighten the bolts securely.

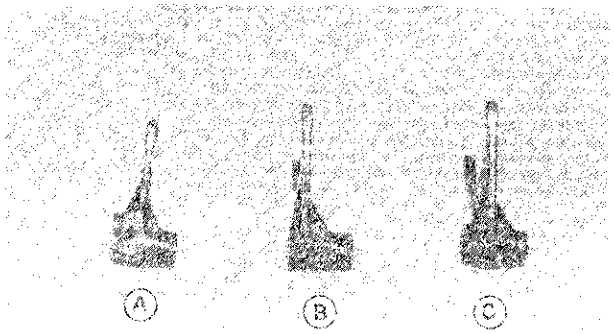


A. Shift Drum B. Bolt

*Mesh output shaft gears with those on the drive shaft as shown in the figure (p. 7-3).
*Simultaneously fit shift forks and both assemblies into the right crankcase half.

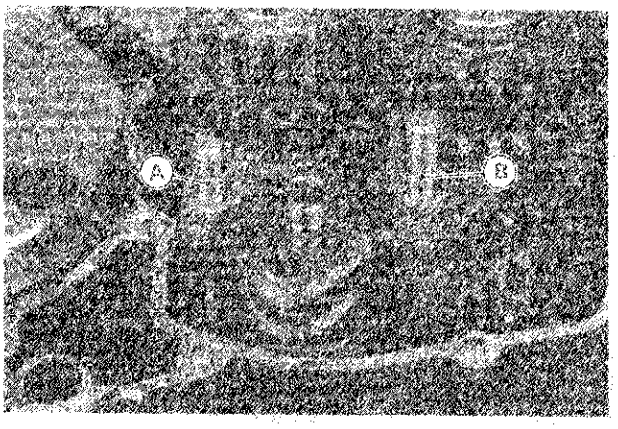
Identification of the shift forks

Drive shaft 3rd gear shift fork:	fingers are shorter than those of other two shift forks
Output shaft 4th gear shift fork:	guide pin goes to left side of the fingers
Output shaft 5th gear shift fork:	guide pin goes to center



A. Drive Shaft 3rd Gear Shift Fork
B. Output Shaft 4th Gear Shift Fork
C. Output Shaft 5th Gear Shift Fork

*Fit each shift fork guide pin into a shift drum groove.
*Insert the shift rods into the shift forks.



A. Short Rod B. Long Rod

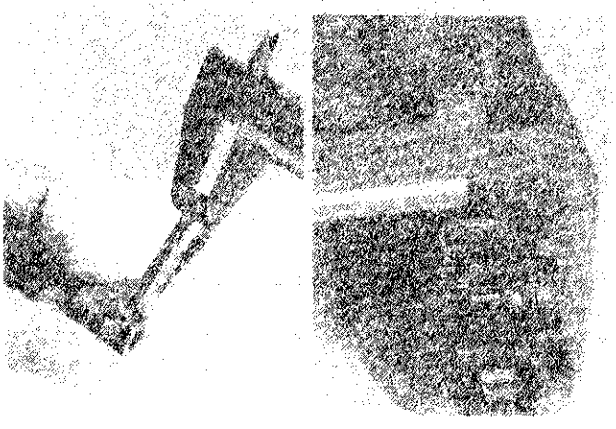
Transmission Maintenance

Transmission or shift mechanism damage, causing the transmission to misshift, overshift, and/or jump out of gear, brings about more damage to the transmission and also overrev damage to the engine itself.

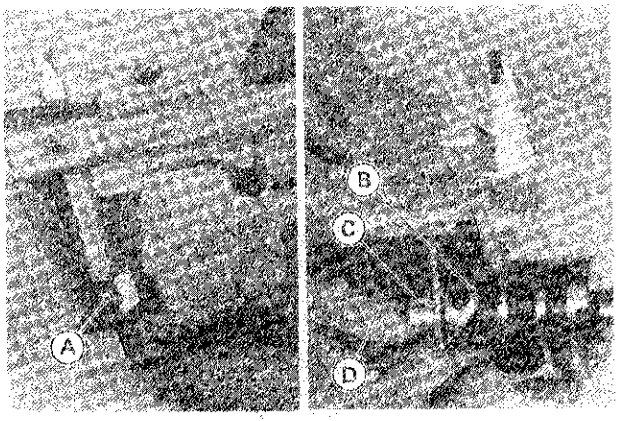
Shift Drum, Shift Fork, Shift Rod Inspection

*Visually inspect the shift rods and shift forks.
*If they are badly worn or if they show stepped wear, replace them.
*Replace any fork if the ear shows burn.
*Replace any fork that is bent. A bent fork could cause difficulty in shifting or allow the transmission to jump out of gear when under power.

Shift Fork, Gear Groove Wear Measurement



Shift Fork Guide Pin/Shift Drum Groove Wear Measurement



A. Guide Pin
B. Shift Drum
C. Bearing
D. Face

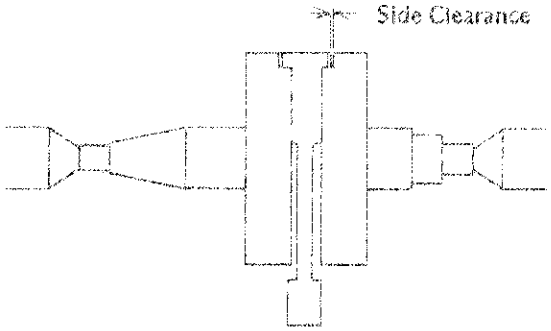
Big End Seizure

In case of serious seizure with damaged flywheels, the crankshaft must be replaced. In case of less serious damage, disassemble the crankshaft and replace the crankpin, needle bearing, side washers, and connecting rod.

Connecting Rod Side Clearance

- Measure the side clearance of the connecting rod with a thickness gauge.
- ★If the clearance exceeds the service limit, replace the crankshaft.

Side Clearance

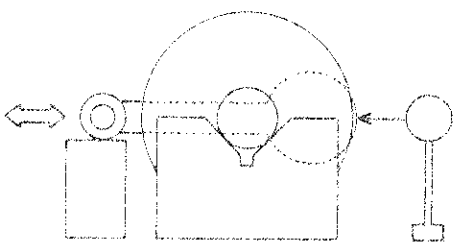


Crankshaft Maintenance

Connecting Rod Big End Radial Clearance

- Set the crankshaft in a flywheel alignment jig or on V blocks, and place a dial gauge against the big end of the connecting rod.
- Push the connecting rod first towards the gauge and then in the opposite direction. The difference between the two gauge readings is the radial clearance.
- ★If the radial clearance exceeds the service limit, the crankshaft should be either replaced or disassembled and the crankpin, needle bearing, and connecting rod big end examined for wear.

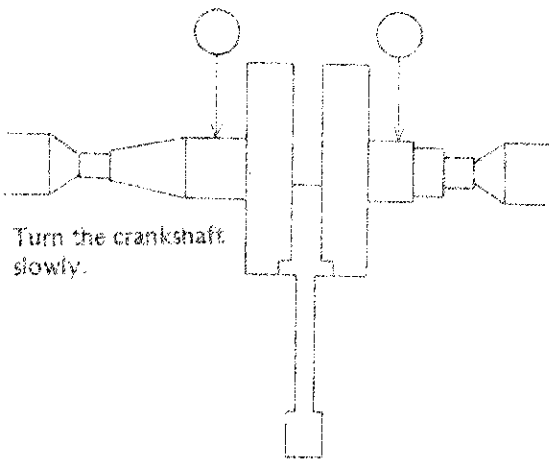
Radial Clearance



Crankshaft Runout

- Set the crankshaft in a flywheel alignment jig or on V blocks, and place a dial gauge against the points indicated.
- Turn the crankshaft slowly. The maximum difference in gauge readings is the crankshaft runout.

Crankshaft Runout



Crankshaft Alignment

★If the runout at either point exceeds the service limit, align the flywheels so that the runout falls within the service limit.

★In the case of horizontal misalignment, which is the most common, strike the projecting rim of the flywheel with a plastic, soft lead, or brass hammer as indicated in the figure.

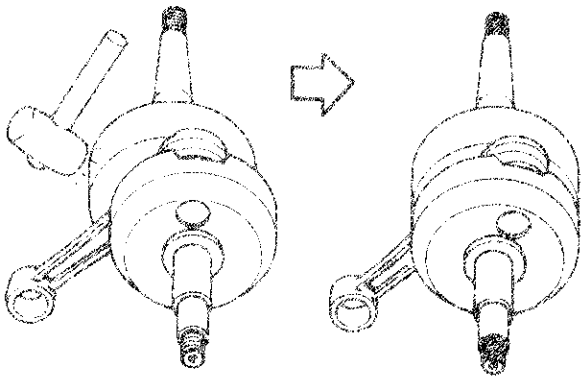
★Recheck the runout with a dial gauge, repeating the process until the runout falls within the service limit. Vertical misalignment is corrected either by driving a wedge in between the flywheels or by squeezing the flywheel rims in a vise, depending on the nature of the misalignment. In both cases of horizontal and vertical misalignment, correct the horizontal misalignment first.

★If flywheel misalignment cannot be corrected by the above method, replace the crankpin or the crankshaft itself.

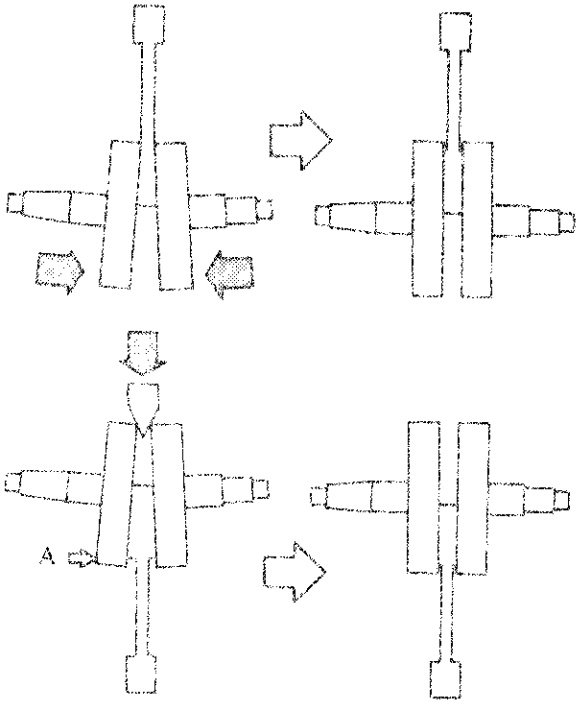
CAUTION

○**Don't hammer the flywheel at part "A".**

Horizontal Misalignment



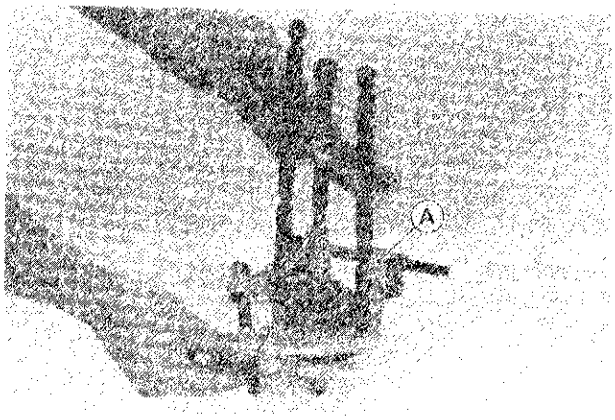
Vertical Misalignment



Crankshaft Disassembly

Crankshaft Disassembly Point

★Remove the bearing on the crankshaft with the bearing puller (special tool).



A. Bearing Puller: 57001-135

★If it should be necessary to disassemble the crankshaft, use a press to remove the crankpin.

Crankshaft Assembly Point

★Since assembly of the crankshaft demand exacting tolerances, the disassembly and reassembly of the crankshaft can only be done by a shop having the necessary tools and equipment. The following information give the tolerance that are necessary for a properly equipped shop to reassemble the crankshaft.

★Cold-fitting tolerance between crank pin and flywheels: 0.1 – 0.119 mm.

★Select a crankpin, needle bearing, and connecting rod such that the radial clearance will be 0.037 – 0.049 mm (p. 7-7).

○These parts should be replaced as a unit.

★Press with a thickness gauge inserted between the connecting rod and one of the flywheels so that the side clearance will be 0.45 – 0.55 mm (p. 7-7).

★Supporting both ends of the crankshaft, check the crankshaft runout using a dial gauge. The flywheels must be aligned so that the runout is under 0.03 mm total indicated reading (p. 7-7).

Wheel and Tires

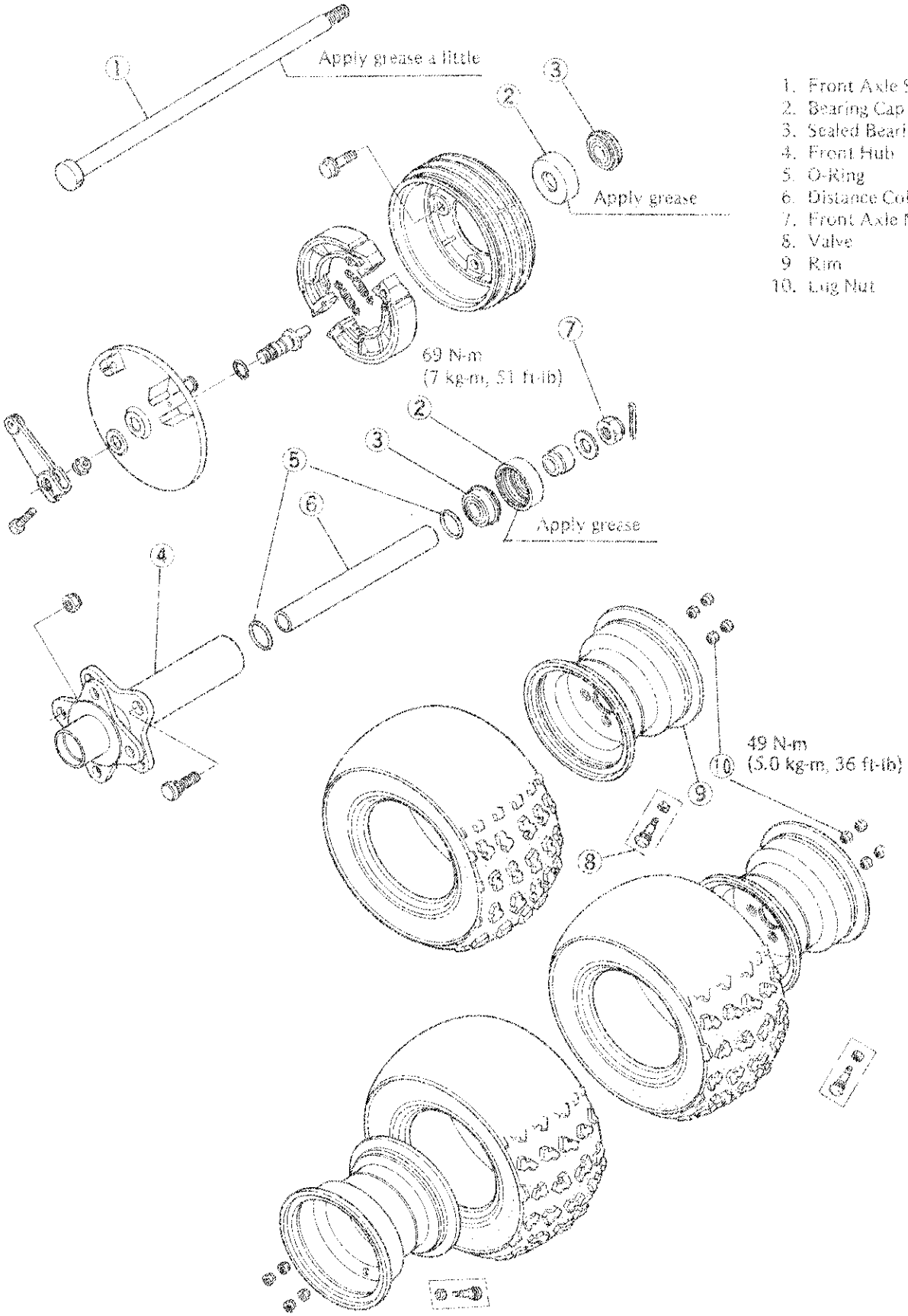
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Exploded Views



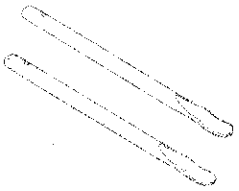
1. Front Axle Shaft
2. Bearing Cap
3. Sealed Bearing
4. Front Hub
5. O-Ring
6. Distance Collar
7. Front Axle Nut
8. Valve
9. Rim
10. Lug Nut

Service Data

Item		Standard	Service Limit	See page
Wheels:				
Tire payload		1180 N (120 kg, 270 lb)	— — —	
Tires:				
Make &type:	Front	DUNLOP KNOBY/TRAIL Tubeless	— — —	
	Rear	DUNLOP KNOBY/TRAIL Tubeless	— — —	
Cold tire pressure:	Front	41 kPa (0.42 kg/cm², 6 psi)	— — —	8-5
	Rear	27 kPa (0.28 kg/cm², 4 psi)	— — —	
Tire size:	Front	22 × 11 – 10 KT461	— — —	
	Rear	22 × 11 – 10 KT460	— — —	

Special Tool

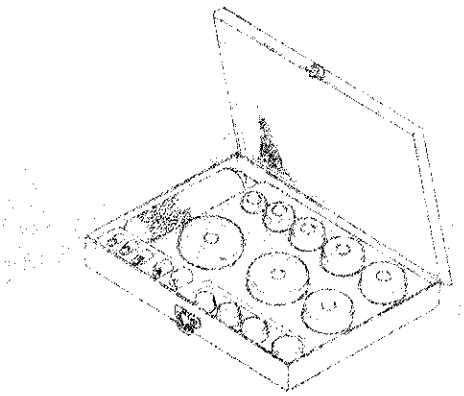
Tire Irons: 57001-1073



Air pressure Gauge: 52005-1003



Bearing Drive Set: 57001-1129
(57001-1132, 1136, 1146)



Patch Kit-Tubeless: T96000-010

Tires (Tubeless)

CAUTION

○Damage to the rim flanges and tire beads spoil the air-tightness of tubeless tires and rims. When handling tubeless tires and rims, be careful not to damage the air-sealing surfaces.

WARNING

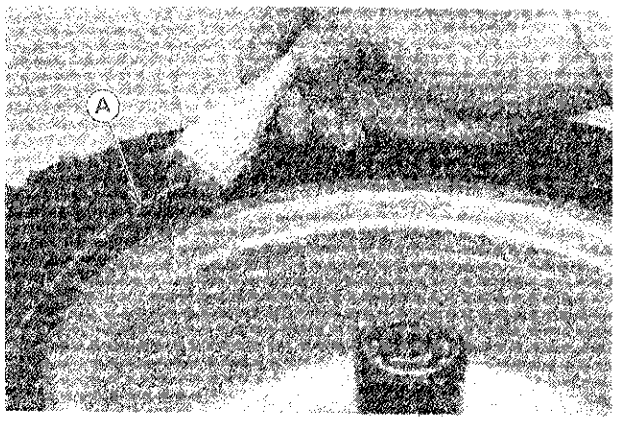
○To ensure safe handling and stability, use only wheels, valves, and tires recommended.

Tire Removal

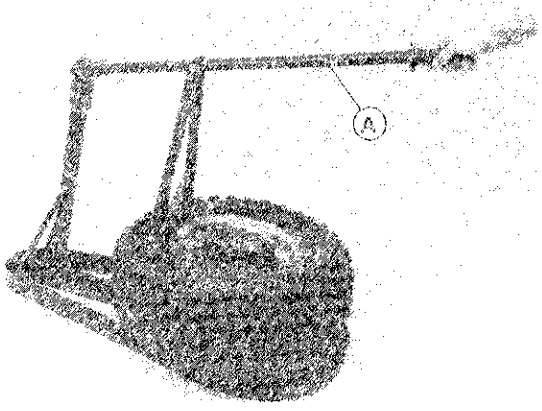
- To maintain wheel balance, mark the valve stem position on the tire with chalk so that the tire will be reinstalled in the same position.
- Unscrew the valve core to deflate the tire.
- Lubricate the tire beads and rim flanges on both sides with a soap and water solution, or rubber lubricant. This helps the tire beads slip off the rim flanges.

CAUTION

○Never lubricate with mineral oil (engine oil) or gasoline because they will cause deterioration of the tire.

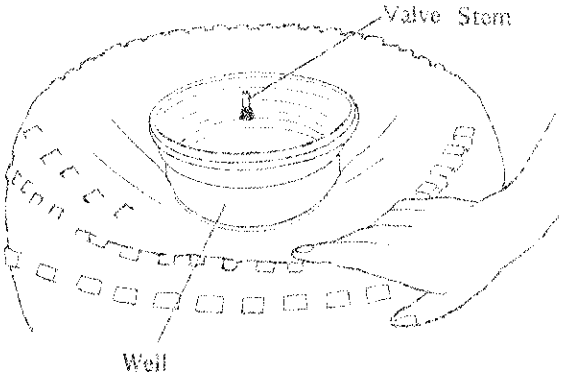


A. Apply Lubricant

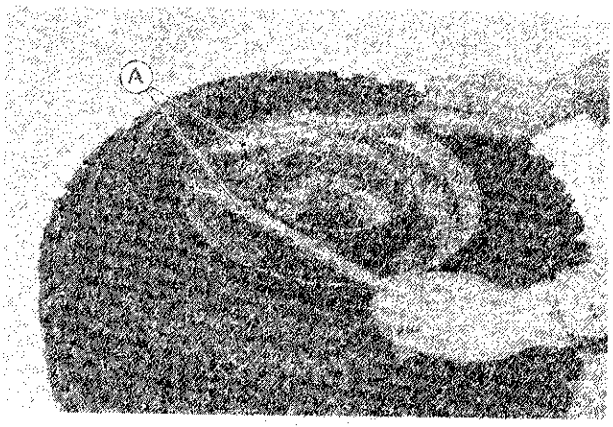


A. Tire Tool

- Brake the tire beads away from both sides of the rim with a tire tool.
- Kneel on the side of the tire opposite the valve stem, forcing the tire bead into the center well of the rim.



- Lubricate two tire irons with soap and water or rubber lube, and begin prying the first bead off the rim near the valve stem.
- Work around the rim with the tire irons a little at a time, while continuing to hold the bead opposite the irons in the center well of the rim.

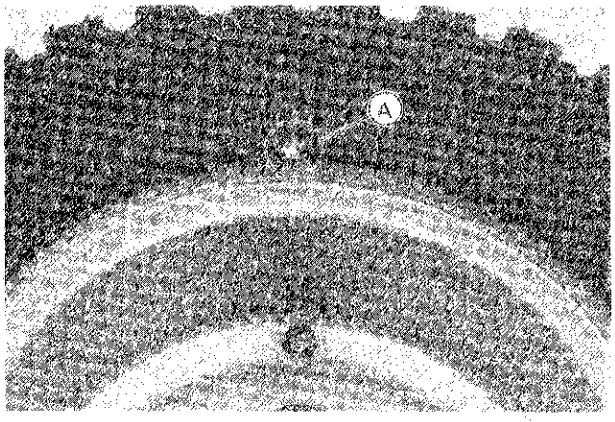


A. Tire Irons: 57001-1073

- Lift the second bead up into the center well and use the same procedure as in removing the first bead.

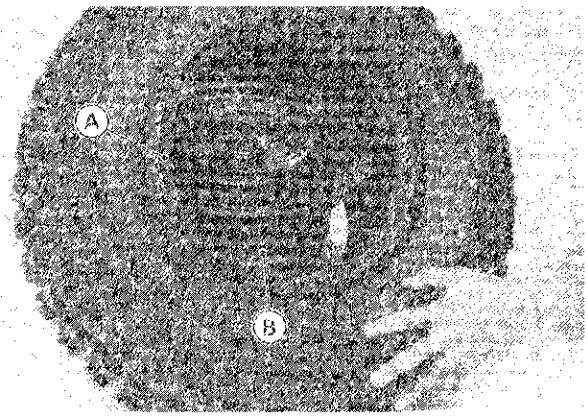
Tire Installation Points

- Inspect the rim (see Wheel Inspection).
- Check the tire for wear damage (see Tire Inspection).
- Lubricate the tire beads, rim flanges, and the tire irons with a soap and water solution or a rubber lube.
- Position the tire on the rim so that the valve is at the tire balance mark (the chalk mark made during removal, or the yellow paint mark on a new tire).



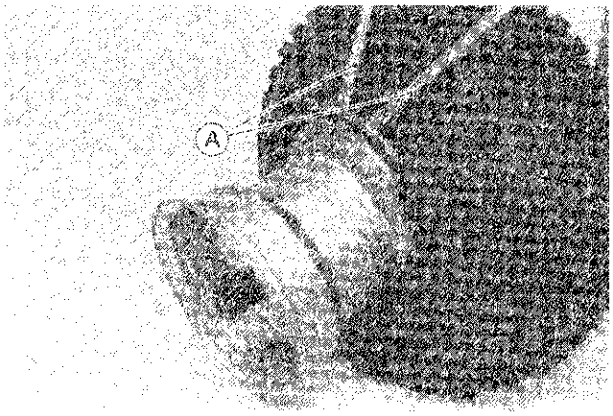
A. Balance Mark

*By hand, slide as much of the first bead as possible over the rim flange, starting at the side opposite the valve stem.
○As the bead goes onto the rim, force the bead into the center well of the rim to ease installation.



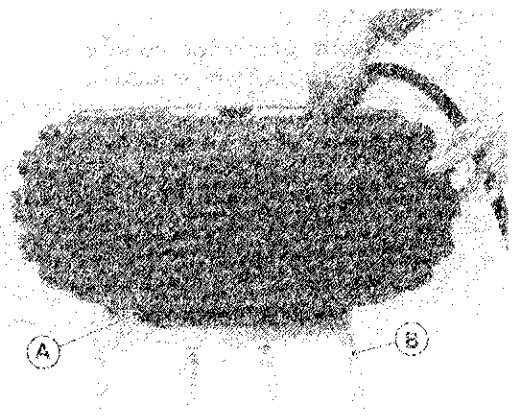
A. Tire Bead B. Well

*Use the tire irons to install the rest of the bead.



A. Tire Iron: 57001-1073

*Use the same procedure to install the second bead.
*Lubricate the tire beads again, center the tire on the rim.
*Support the wheel rim on the suitable stand to prevent slipping off of the tire.



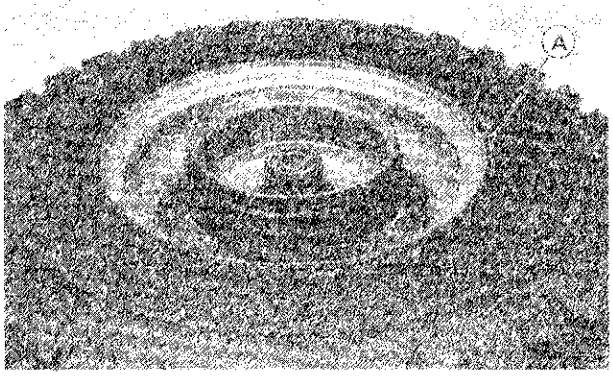
A. Rim B. Suitable Stand

*Inflate the tire until the tire beads seat on the rim.

WARNING

○**Do not inflate the tire to more than 69 kPa (0.7 kg/cm², 10 psi). Overinflation can cause the tire to explode, causing personal injury.**

*Check to see that the rim lines on both sides of the tire are parallel with the rim flanges.



A. Rim Line

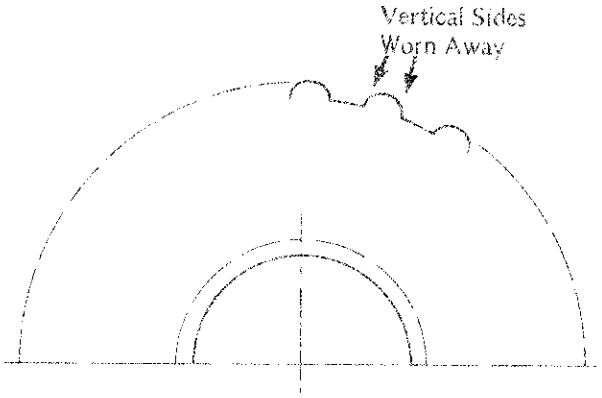
*If the rim lines and the rim flanges are not parallel, deflate the tire, lubricate the sealing surfaces again, and reinflate the tire.
*After the beads are properly seated, check for air leaks.
○Inflate the tire to 35 kPa (5 psi). Apply a soap and water solution around the tire bead and check for bubbles.
*Deflate the tire completely.
*Inflate the tire to the specified pressure.

Tire Inflation Pressure

Front:	41 kPa (0.42 kg/cm², 6 psi)
Rear:	27 kPa (0.28 kg/cm², 4 psi)

Tire Inspection

- Examine the tire for damage and wear.
- If the tire is cut or cracked, replace it.
- Lumps or high spots on the tread or sidewalls indicate internal damage requiring tire replacement.
- Remove any foreign objects from the tread. After removal, check for leaks with a soap and water solution.
- Check the shape of the tread knobs. If no vertical side is left on the drive side of the knobs, replace the tire.



Tire Patching

- Disassemble the tire from the rim (see Tire Removal).
- Follow the instructions provided in the repair kit.

Tubeless Tire Repair Kit

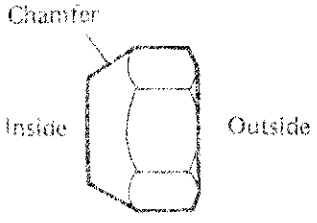
Part Number	T96000-010

- Assemble the tire and rim (see Tire Installation).

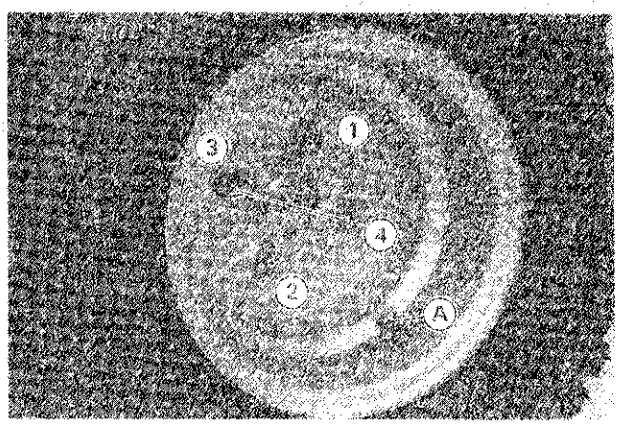
Wheels (Rims)

Installation Points

- Coat the axle with a thin layer of grease to ease future removal.
- Install the lug nuts so that the chamfer side faces in.



- Position the wheel so that the valve stem is toward the outside of the vehicle, or away from the front brake drum.
- Tighten the lug nuts in a criss-cross pattern to the specification.



A. Valve Stem B. Lug Nut

Lug Nut Torque

49 N-m (5.0 kg-m, 36 ft-lb)

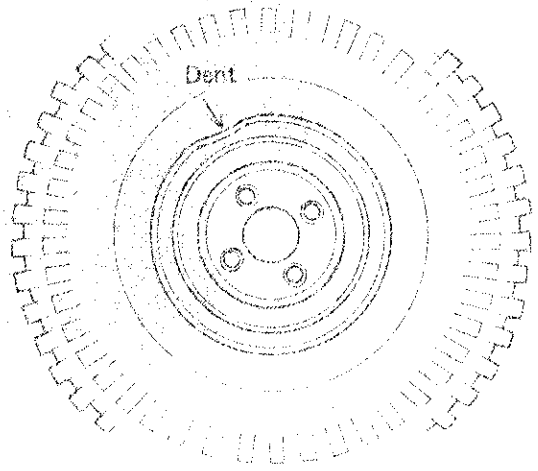
- Tighten the axle nut to the specification.

Axle Nut Torque

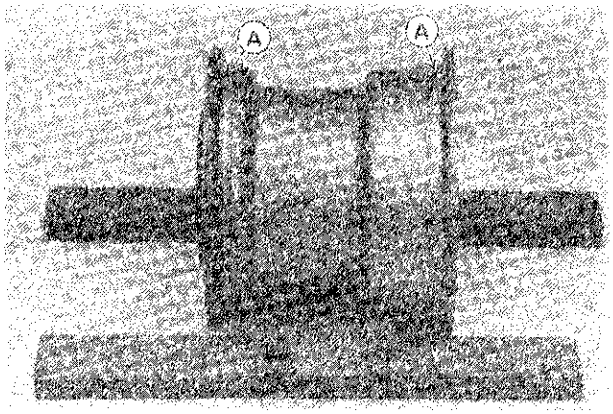
Front:	69 N-m (7 kg-m, 51 ft-lb)
Rear:	135 N-m (14 kg-m, 100 ft-lb)

Wheel Inspection

- Examine both sides of the rim for dents. If the rim is dented, replace it.



- If the tire is removed, inspect the air sealing surfaces of the rim for scratches or nicks. Smooth the sealing surfaces with fine emery cloth if necessary.



A. Sealing Surface

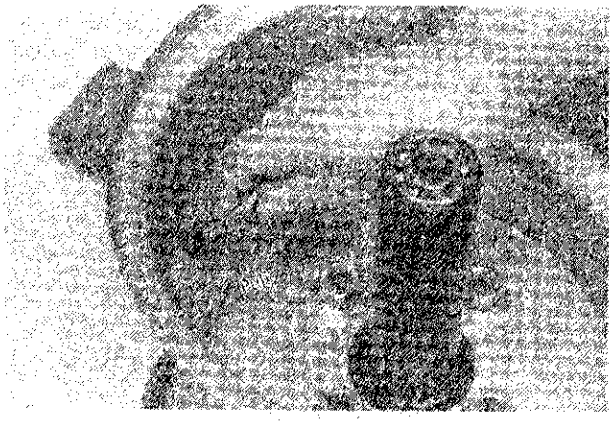
Wheel Replacement

*Remove the wheel.

*Disassemble the tire from the rim (see Tire Removal).

*Install a new valve stem in the new rim.

○Remove the valve cap, lubricate the stem with a soap and water solution or a rubber lubricant, and pull the stem through the rim from the inside out until it snaps into place.

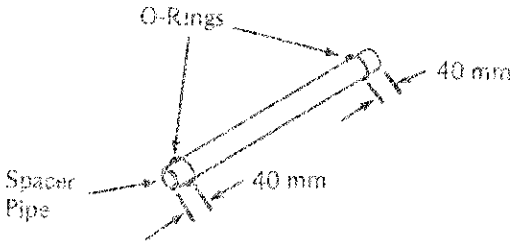


CAUTION

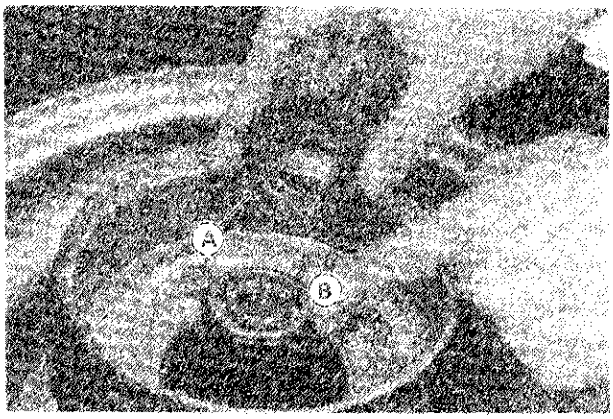
○**Do not use engine oil or gasoline to lubricate the stem because they will deteriorate the rubber.**

Front Hub Installation Points

*Position an O-ring 40 mm from each end of the spacer pipe.



*Apply a small amount of grease to the sealing lips of the bearing cap.



A. Bearing Cap B. Grease

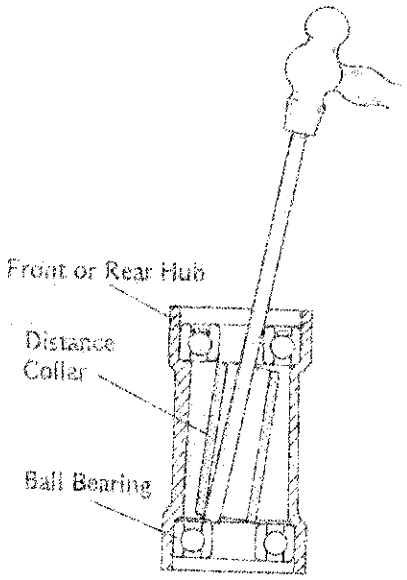
Wheel Bearings

Removal Point

*Remove the bearing as shown in the figure.

*Tap the distance collar to remove the remaining bearing.

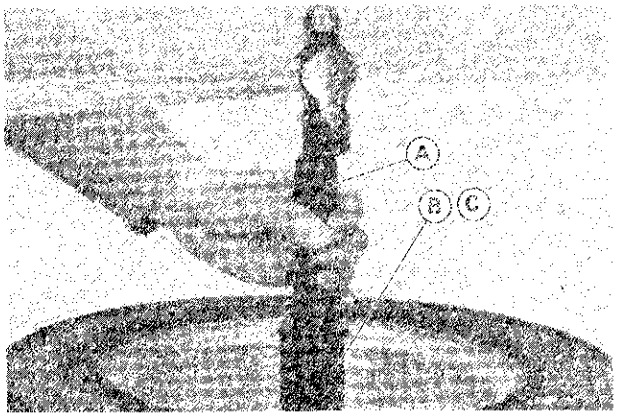
Removing Wheel Bearings



Installation Points

If front wheel bearing are to be removed, do not separate the front wheel from the hub. This will simplify bearing removal.

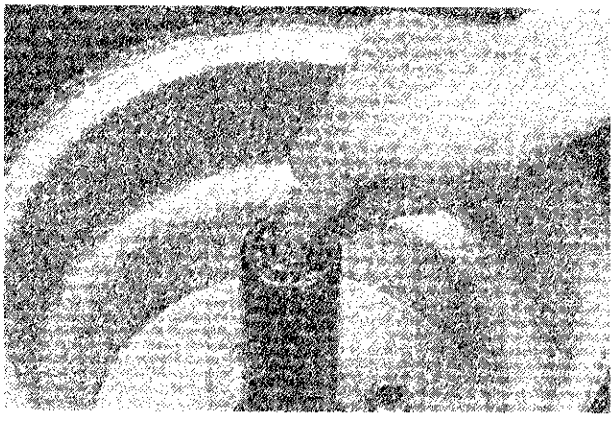
- Before installing the wheel bearings, blow any dirt or foreign particles out of the hub with compressed air.
- Pack each bearing with wheel bearing grease.
- Press either bearing into the hub. Use the bearing driver (special tool) which does not contact the bearing inner race.
- Press the rear wheel bearing (brake disc side) into the hub until it stops at the bottom of the hole.



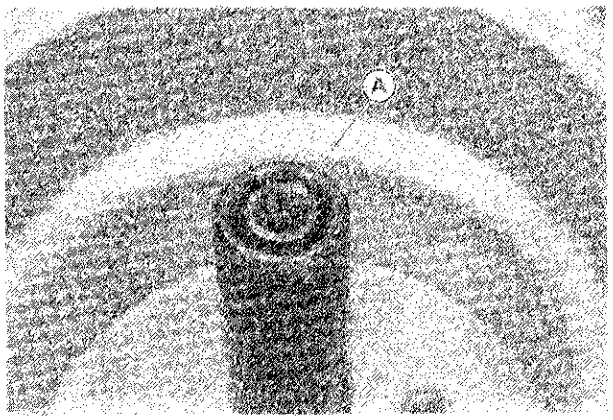
A. Bearing Driver: 57001-1129
B. Front Hub: 57001-1132, 1136, 1146
C. Rear Hub: 57001-1132, 1141, 1148

Front Hub Bearing Inspection

- Turn each bearing back and forth while checking for roughness or binding. If roughness or binding is found, replace the bearing.



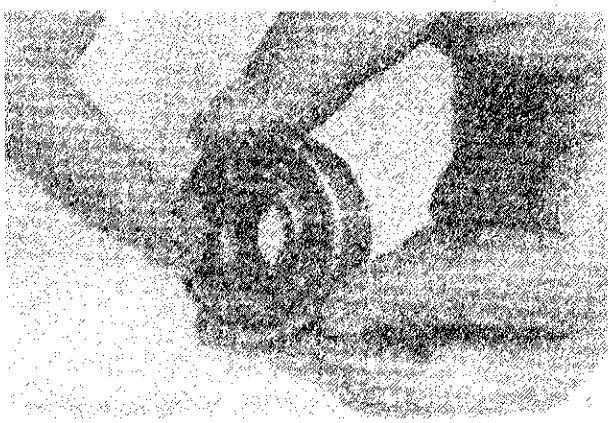
- Examine the bearing seal for tears or leakage. If the seal is torn or is leaking, replace the bearing.



A. Bearing Seal

Rear Hub Bearing Lubrication, Inspection

- Remove the bearings.
- Wipe the oil grease out of the hub before bearing installation.
- Wash the bearings with a high flash-point solvent, and dry them (do not spin it while it is dry).
- Inspect the bearings for damage, replace any damaged bearing.
- Pack the bearings with good quality bearing grease. Turn the bearing around by hand a few times to make sure the grease is distributed uniformly inside the bearing.

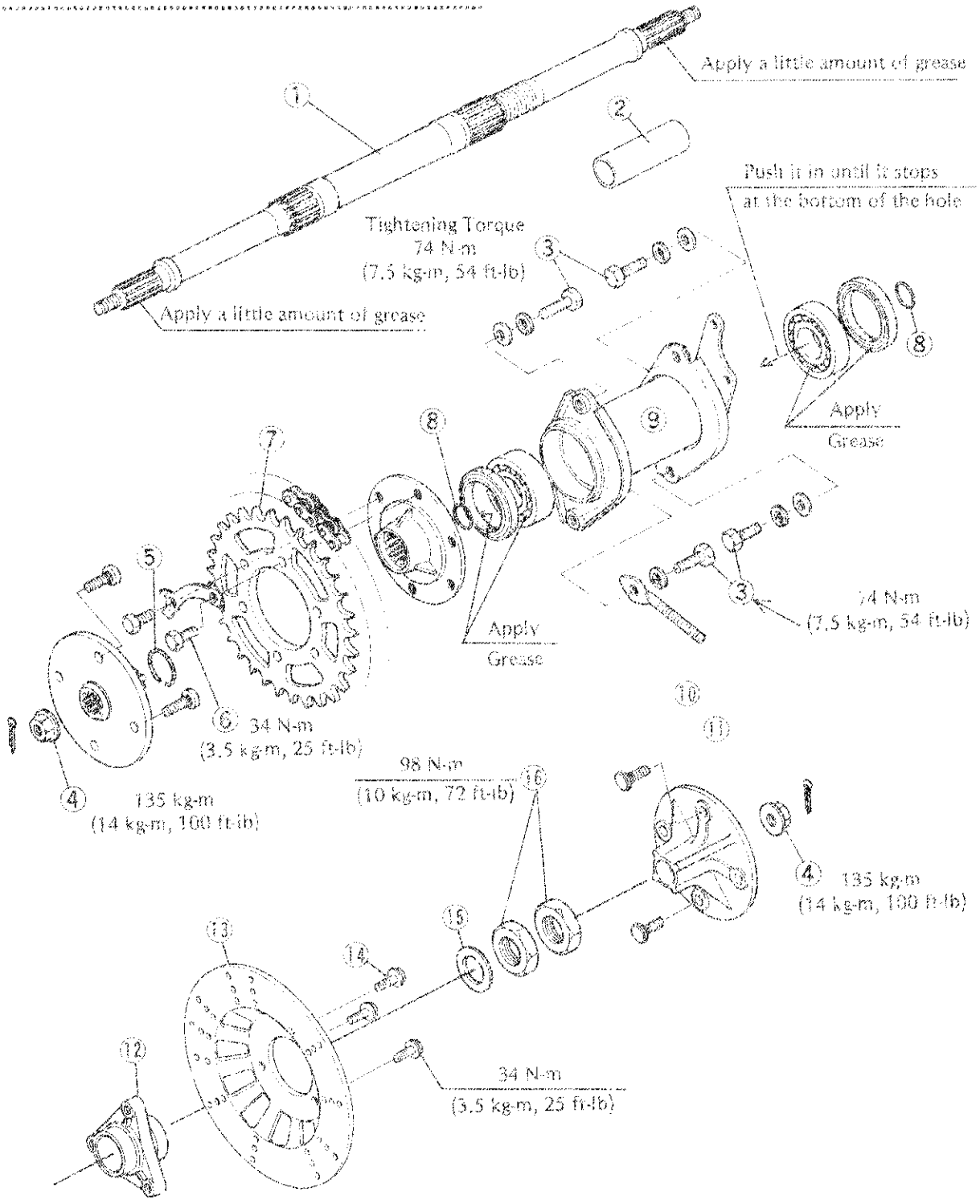


Final Drive

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Exploded Views



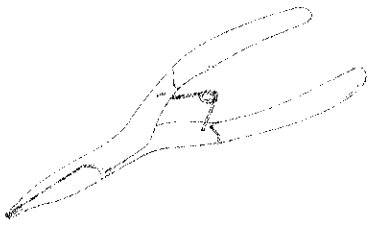
1. Rear Axle Shaft
2. Distance Collar
3. Swing Arm Mount Bolt
4. Rear Axle Nut
5. Ring
6. Rear Sprocket Bolt
7. Rear Sprocket
8. O-ring
9. Rear Hub
10. Chain Adjusting Nut
11. Lock Nut
12. Disc Holder
13. Brake Disc
14. Disc Mounting Bolt
15. Plane Washer
16. Axle Nut

Service Data

Item		Standard	Service Limit	See Page
Drive Chain:				
Make and Type		Enuma, Endless EK520SH-0 90L	— — —	
Chain Slack Usable Range:	normal	25 — 35 mm		9-4
	muddy condition	30 — 40 mm		
20-Link Length		317 — 317.7 mm	324 mm	9-4
Chain Guid Wear		— — —	— — —	9-5

Special Tool

Circlip Pliers: 57001-144



Drive Chain

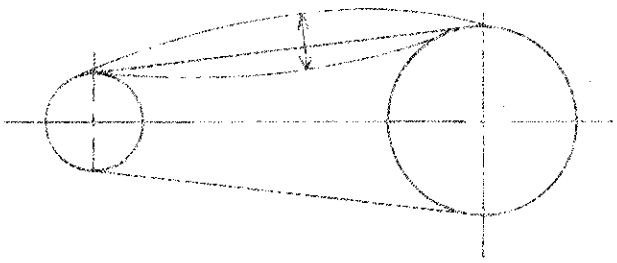
WARNING

○A chain that breaks or jumps off the sprockets could snag on the engine sprocket or lock the rear wheel, severely damaging the motorcycle and causing it to go out of control.

Slack Inspection

●If the drive chain appears dry, lubricate it.
●Rotate the rear wheel to find the position where the chain is tightest, and measure the vertical movement midway between the sprockets.

Drive Chain Slack



*If the drive chain slack is out of the usable range, adjust it so that the chain slack will be within the usable range.

Drive Chain Slack

Usable Range : 25 — 35 mm

"NOTE"

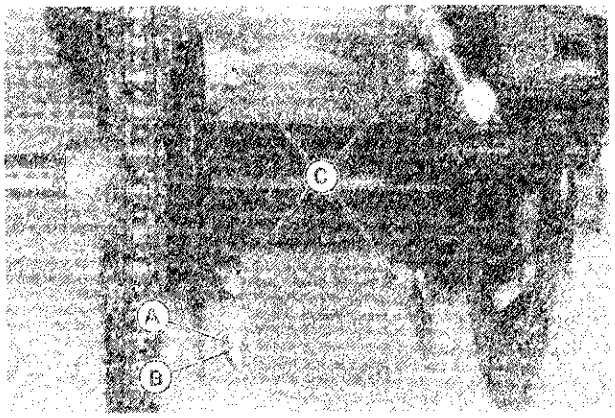
○*In wet and muddy conditions, mud sticks to the chain and sprockets resulting in an overly tight chain, and the chain may break. To prevent this, adjust the chain to the following specification.*

Drive Chain Slack—wet, muddy condition

Usable Range : 30 — 40 mm

Slack Adjustment

●Loosen swing arm mount bolts (4 on both sides).
●Loosen the chain adjuster locknut.



A. Adjusting Nut
B. Locknut
C. Swing Arm Mount Bolt

●Turn chain adjusting nut until the drive chain has the correct amount of slack.
●Tighten chain adjuster locknut.
●Tighten swing arm mount bolts to the specification.
●Rotate the wheel, measure the chain slack again at the tightest position, and readjust if necessary.

Tightening Torque

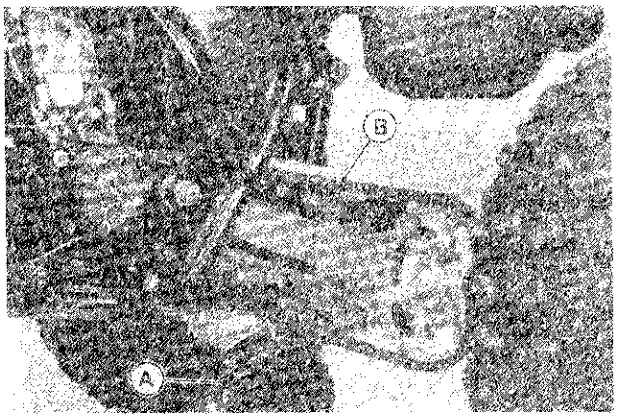
Swing Arm Mount Bolt : 74 N·m (7.5 kg-m, 54 ft-lb)

WARNING

○If swing arm mount bolts are not securely tightened, an unsafe riding condition may result.

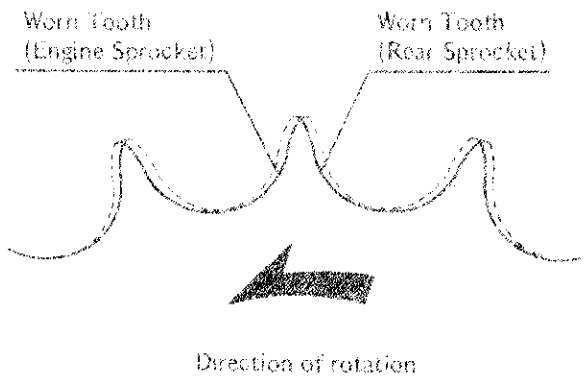
Wear Inspection

●Rotate the rear wheel to inspect the drive chain for damaged rollers, and loose pins and links.
●Also inspect the sprockets for unevenly or excessively worn teeth, and damaged teeth.
*If there is any irregularity, replace the drive chain and both sprockets.
●If the chain appears dry, lubricate it.
●Stretch the chain taut either by hanging a 10 kg weight on the chain.
●Measure the length of 20 links on the straight part of the chain from pin center of the 1st pin to pin center of the 21st pin. Since the chain may wear unevenly, take measurements at several places.
*If any measurements exceeds the service limit, replace the chain. Also, replace the engine and rear sprockets when the drive chain is replaced.

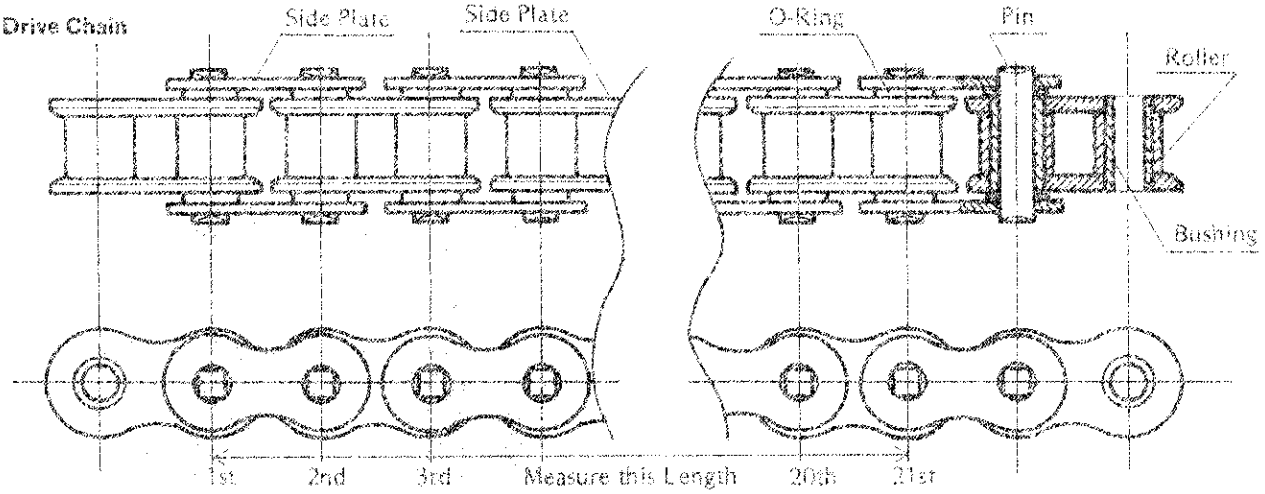


A. Weight B. Measure

Sprocket Wear (exaggerated for illustration)

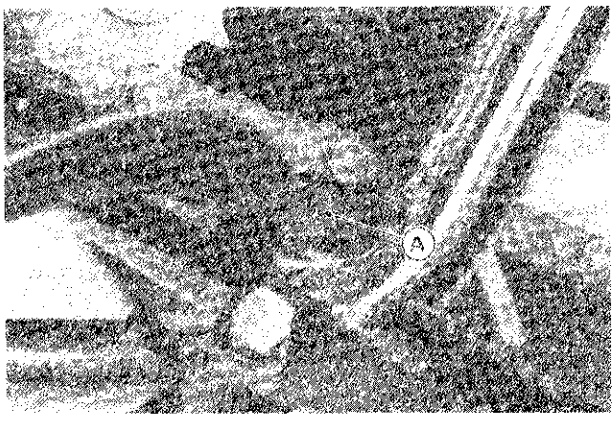


Drive Chain



Chain Guide Wear

Visually inspect the drive chain guide rubber. If the rubber protrusion is worn down halfway or more, or damaged, replace it.



A. Chain Guide Rubber

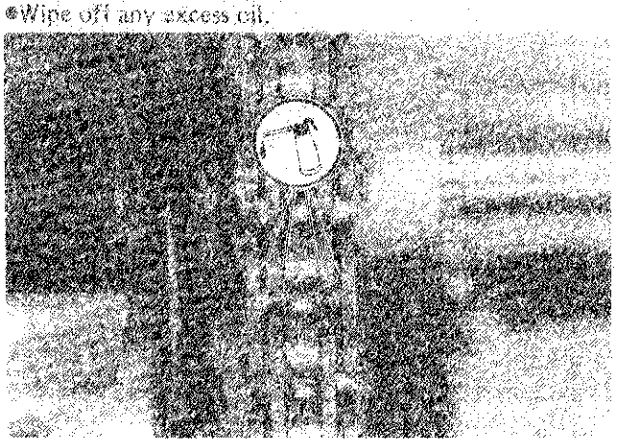
WARNING

For safety, use only the standard chain.

Lubrication

The chain should be lubricated with a lubricant which will both prevent the exterior from rusting and also absorb shock and reduce friction in the interior of the chain. An effective, good quality lubricant specially formulated for chains is best for regular chain lubrication. If a special lubricant is not available, a heavy oil such as SAE 90 is preferred to a lighter oil because it will stay on the chain longer and provide better lubrication.

- If the chain appears especially dirty, it should be cleaned before lubrication.
- Apply oil to the sides of the rollers so that oil will penetrate to the rollers and bushings. Apply the oil to the O-rings so that the O-rings will be coated with oil.
- Wipe off any excess oil.



Drive Chain Removal

- Remove the chain guard.
- Loosen lug nuts of the left rear wheel.
- Support the bottom of the vehicle with jack stand and remove the left rear wheel.
- Remove the lower mounting bolt of the Uni-Trak link.
- Loosen swing arm mount bolts (4).
- Back out the chain adjusting nut and kick the rear shaft until the chain is too loose.
- Remove the engine sprocket.
- Remove the pivot shaft nut and pull out the pivot shaft.
- Remove the chain.

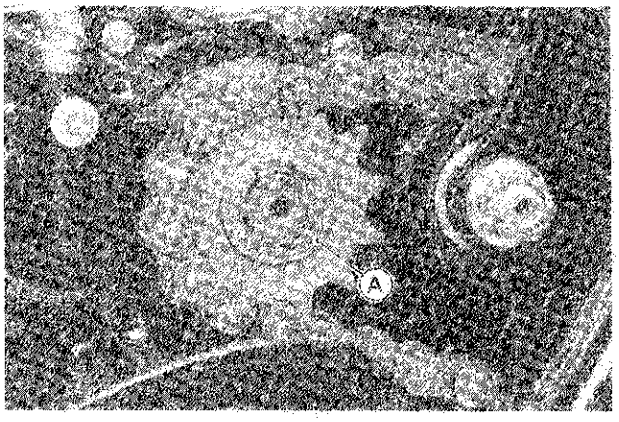
WARNING

○The chain must not be cut for installation, as this may result in subsequent chain failure and loss of control.

Engine Sprocket

Sprocket Removal Point

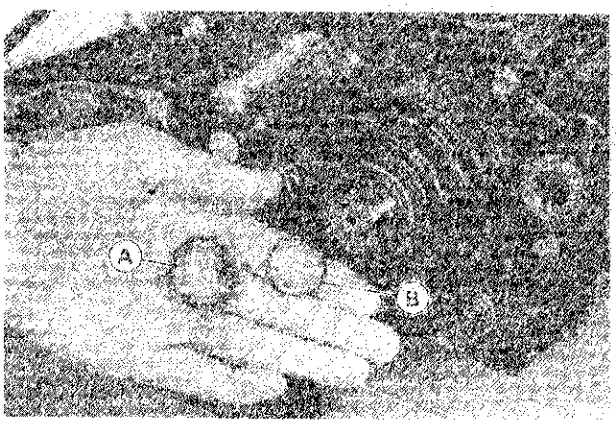
- Loosen swing arm mount bolts (4).
- Back out the chain adjusting nut and kick the rear shaft until the chain is too loose.
- Remove the engine sprocket cover.
- Remove the circlip, and pull off the engine and drive chain.



A. Circlip B. Shoulder

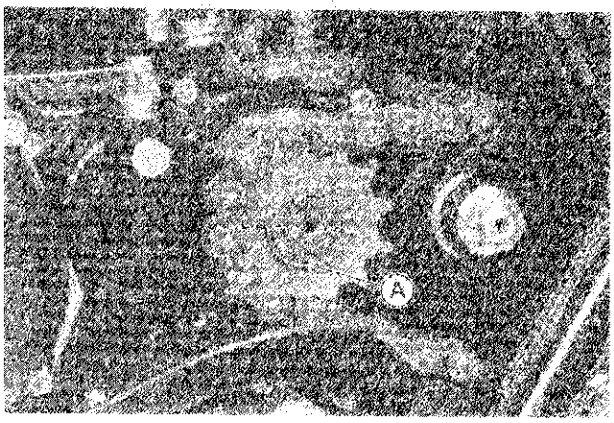
Sprocket Installation Points

- Be sure to install the O-ring and sleeve on the output shaft.



A. Sleeve B. O-ring

- Install the sprocket so that the shoulder faces out.



A. Sprocket Shoulder

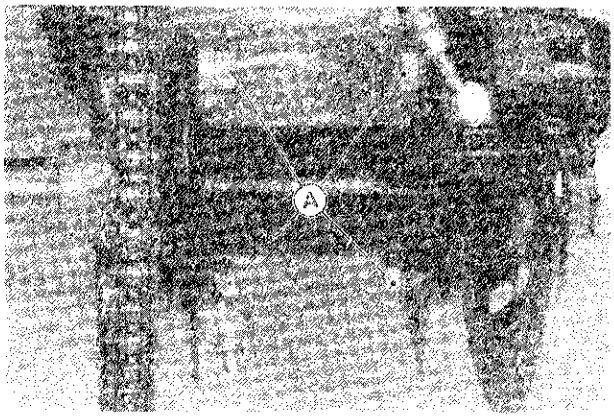
Rear Axle and Bearing

Rear Axle Removal

- Remove rear wheels.
- Remove axle nuts **16**.
- Pull out the rear axle.

Rear Axle Assy Removal

- Remove rear wheels.
- Remove the chain (remarked above).
- Take out the swing arm mount bolts and lift the axle assembly from the vehicle.



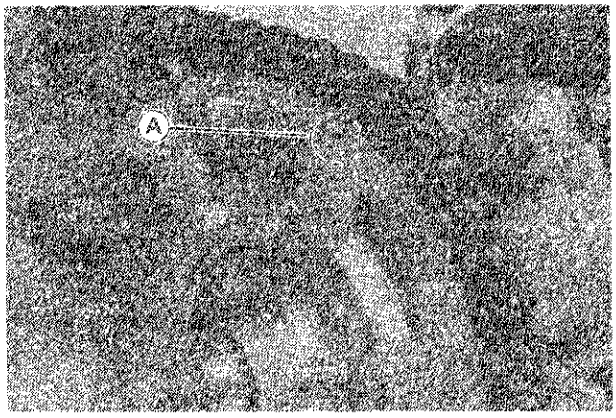
A. Swing Arm Mount Bolts

Installation Point of Rear Sprocket

- Install the rear sprocket facing the tooth number marking outward, and tighten bolts to the specification.
- Bend the tap portions of the double washers over the bolts.

Tightening Torque

Rear Sprocket Bolt: 34 N-m (3.5 kg-m, 25 ft-lb)



A. Tooth Number Marking

WARNING

By installing the sprocket this way, the chamfered hole side of the rear sprocket facing toward the flange. If not, the sprocket will not seat on the flange evenly, causing the drive chain to be thrown off by excessive sprocket runout during operation. This can result in rear wheel lockup and loss of control.

Wheel Bearing Removal

See the WHEELS and TIRES chapter.

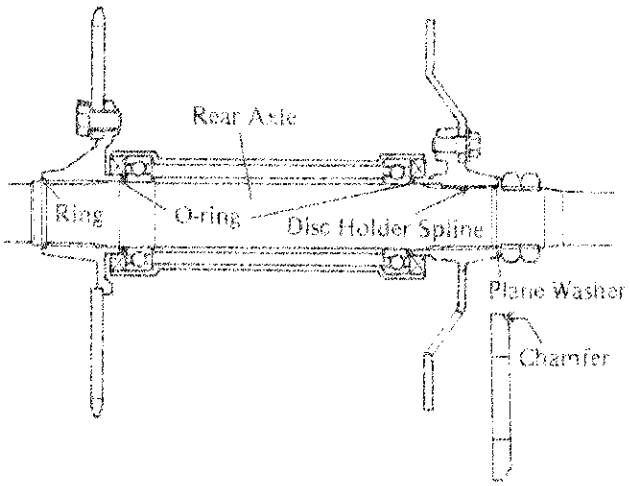
WARNING

Be careful not to fall the rear axle on your foot when removing or installing the shaft assy.
(to prevent injury of feet and toes.)

Rear Axle Installation Points

- Be sure the ring and O-rings stay in position as shown in the figure.
- Install the plane washer so that its chamfer side faces out.
- Turn the rear axle shaft to put into the spline of the disc holder.

Rear Axle Installation



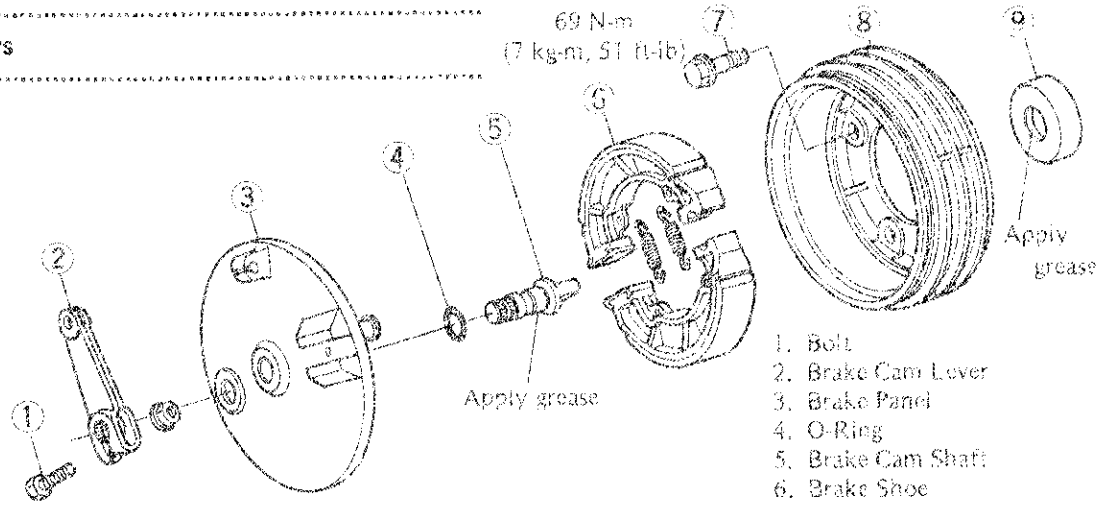
Brakes

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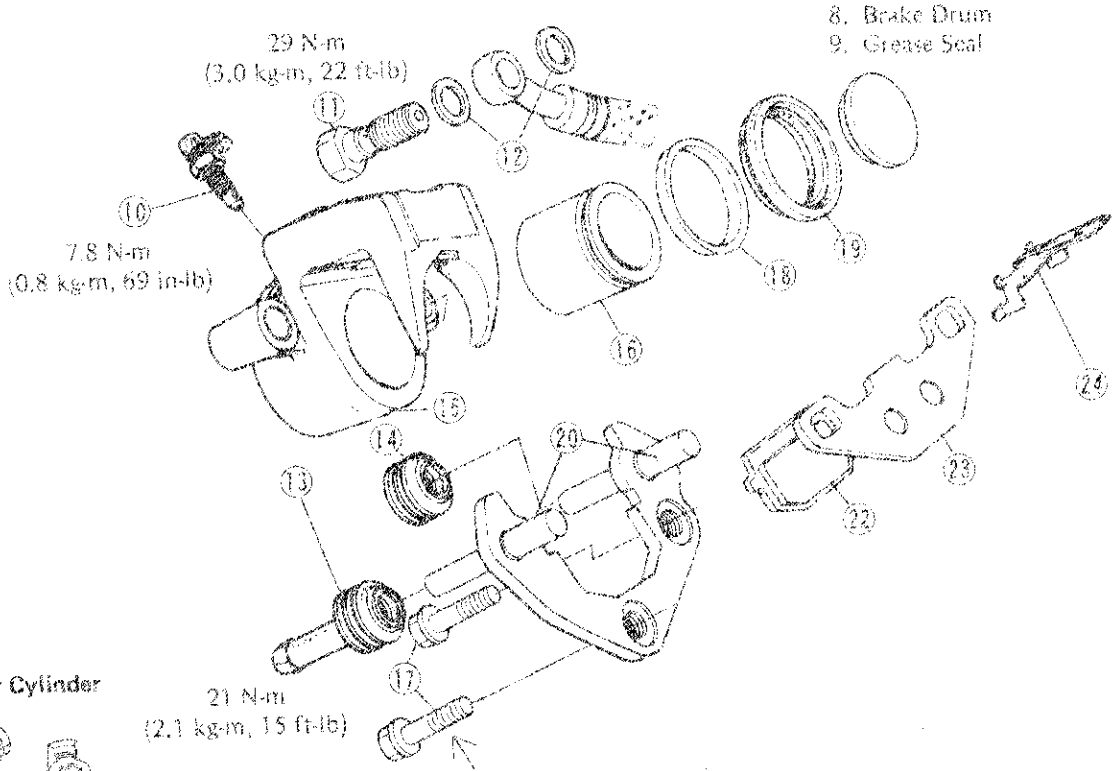
Exploded Views

Front Brake

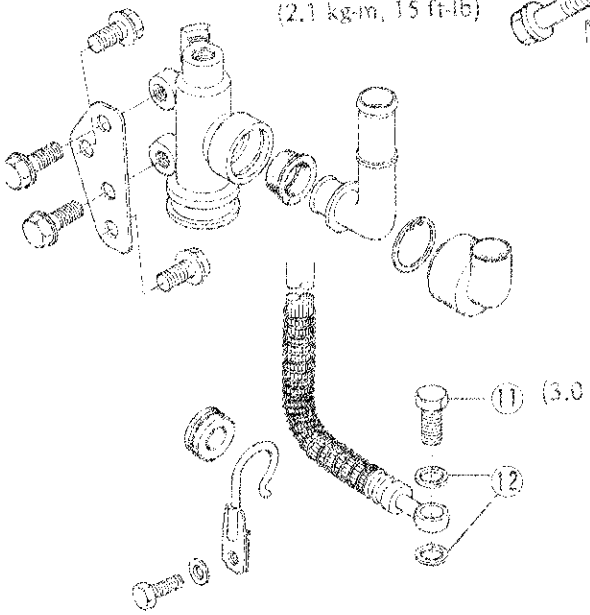


1. Bolt
2. Brake Cam Lever
3. Brake Panel
4. O-Ring
5. Brake Cam Shaft
6. Brake Shoe
7. Brake Drum Mounting Bolt
8. Brake Drum
9. Grease Seal

Rear Brake



Rear Master Cylinder



10. Bleed Valve
11. Banjo Bolt
12. Flat Washer
13. Dust Cover
14. Dust Cover
15. Caliper
16. Caliper Piston
17. Caliper Mounting Bolt
18. Fluid Seal
19. Dust Seal
20. Caliper Holder Shaft
21. Caliper
22. Pad
23. Pad
24. Anti Rattle Spring

●When installing the caliper mounting bolts, replace them with new ones, or apply a non permanent locking agent to the threads.

Service Data

Item	Standard	Service Limit	See Page
Front Brake:			
Brake lever play	4 – 5 mm	– – –	10-4
Drum brake cam lever angle	80°		10-4
Drum inside diameter	140.00 – 140.16 mm	140.75 mm	10-9
Shoe lining thickness	3.85 – 3.90 mm	2 mm	– – –
Rear Brake:			
Brake fluid grade	D.O.T.3	– – –	10-5
Brake pedal position, play	20 – 30 mm	– – –	10-4
Pad lining thickness	3.7 mm	1 mm	10-10
Disc thickness	3.8 – 4.1 mm	3.5 mm	– – –
Disc runout	0.2 mm	0.3 mm	10-10

Recommended Disc Brake Fluid

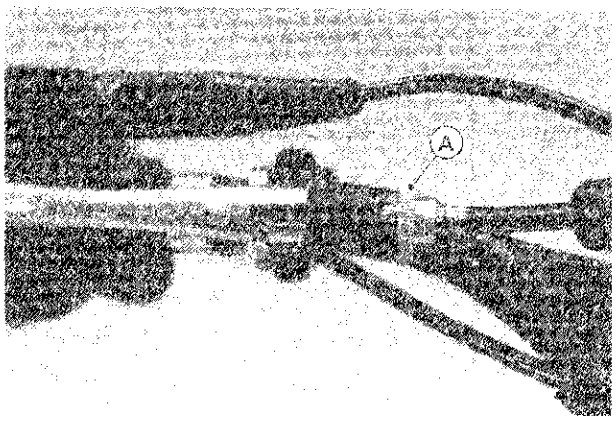
Type:	D.O.T.3
Brand:	Atlas Extra Heavy Duty Shell Super Heavy Duty Texaco Super Heavy Duty Castrol Girling-Universal Castrol GT (LMA) Castrol Disc Brake Fluid

Brake Adjustment

Front Brake Play Adjustment

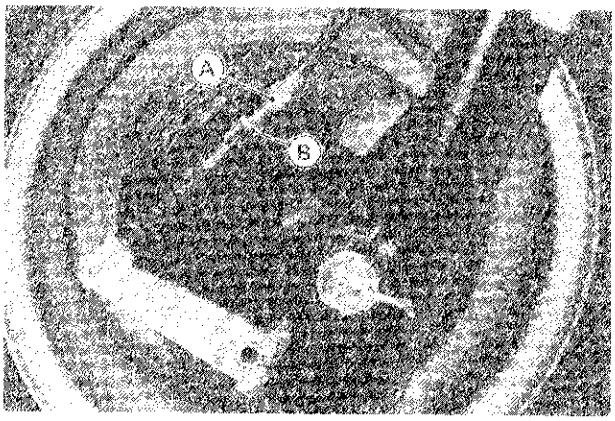
*Slide the front brake lever dust cover out of place.

*Turn the adjuster fully in and stop it where you feel a click.



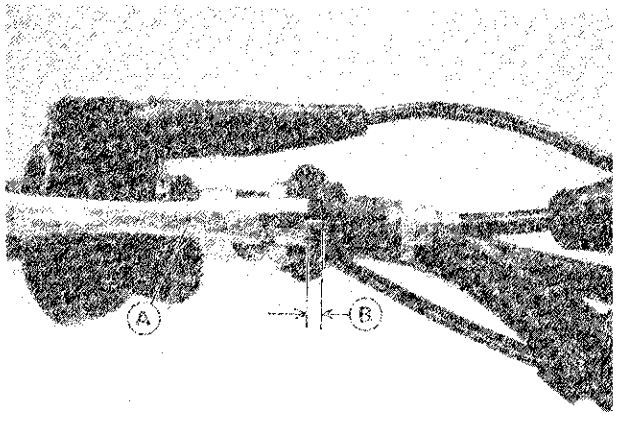
A. Adjuster

*Slide up the dust cover, and loosen the locknut at the lower end of the brake cable.



A. Adjuster B. Locknut

*Turn the adjuster on the lower end of the front brake cable so that the brake lever has 4 – 5 mm of play, and tighten the locknut.



A. Front Brake Lever B. 4 – 5 mm

*If sufficient adjustment cannot be made with the adjuster, complete the adjustment with the adjuster at the brake lever.

*Check for brake drag.

*Check braking effectiveness.

*Slide the dust covers back into place.

"NOTE"

○*For minor corrections, use the adjuster at the front brake lever.*

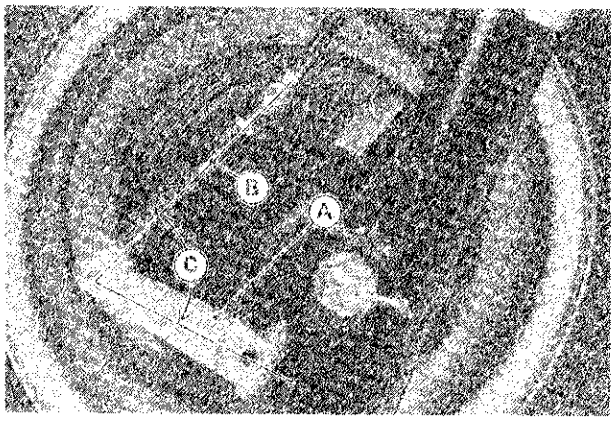
○*If the brake lever adjustment cannot be made with the adjuster at the brake lever or at the brake panel, move the front brake cam lever to a new position on the brake camshaft.*

WARNING

○**Check brake drum for excessive wear before moving front brake cam lever (p. 10-2).**

Front Brake Cam Lever Adjustment

*When the brake is fully applied, the brake cam lever should come to an 80° angle with the brake cable. If it does not, remove the cam lever, and then remount it at a new position on the shaft to obtain the proper angle. Adjust the front brake.



A. Cam Lever C. 80°
B. Brake Cable

WARNING

○**Since a cam lever angle greater than 90° reduces braking effectiveness, this adjustment should not be neglected. Whenever the cam lever angle is adjusted, also check for drag and brake lever operation. In case of doubt as to braking effectiveness, disassemble and inspect all internal brake parts. Worn parts could cause the brake to lock or fail, possibly causing a crash.**

Brake Pedal Position Adjustment

Disc and disc pad wear are automatically compensated for and have no effect on the brake pedal action. There are no parts that require adjustment on the rear brake except brake pedal position.

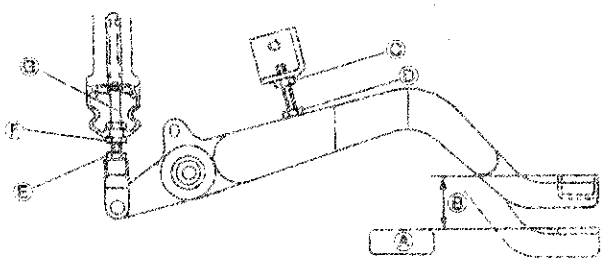
When the brake pedal is in the return position, it should be **0 – 10 mm (0 – 0.4 in)** higher than the top of the footpeg. Adjust the brake pedal position as follows.

- Loosen the stopper locknut and turn in the stopper to keep the pedal free from it.
- Loosen the locknut on the master cylinder push rod and turn in or out the push rod with the upper nut to achieve correct pedal position.

"NOTE"

It may be necessary to light jam the upper nut and locknut together to turn the push rod.

- When brake pedal position is correct, tighten the locknut and upper nut in their original positions.
- Turn out the stopper until it touches the brake pedal lever and then tighten the locknut.



A. Footpeg
B. 0 – 10 mm (0 – 0.4 in.)
C. Stopper Locknut
D. Stopper
E. Locknut
F. Upper Nut
G. Master Cylinder Push Rod

WARNING

Always maintain correct brake adjustment. If adjustment is incorrect, the brake could drag and overheat. This could damage the brake assembly and possibly lock the wheel resulting in loss of control.

Brake Fluid – Rear Brake

WARNING

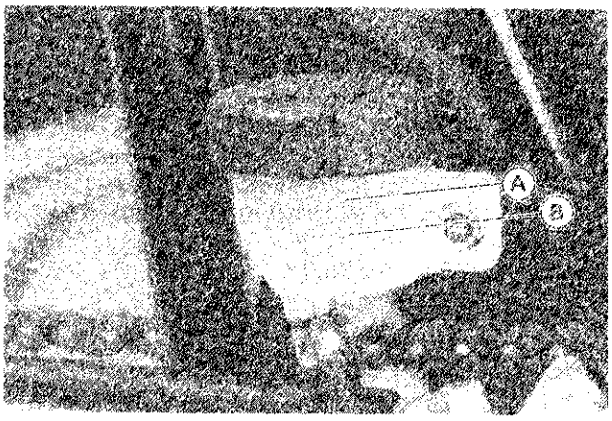
If the brake pedal feels mushy when it is applied, there might be air in the brake lines or the brake may be defective. Since it is dangerous to operate the motorcycle under such conditions, have the brake checked immediately.

Fluid Requirement

Recommended fluids are given in the table (p. 10-2). If none of the recommended brake fluids are available, use extra heavy-duty brake fluid only from a container marked D.O.T.3.

Fluid Level Inspection

- Check the brake fluid level in the reservoir. Hold the reservoir horizontal when checking brake fluid level.
- The fluid level should be between the upper and lower level lines. If the fluid level is lower than the lower level line, check the brake line for leakage, then fill the reservoir to the upper level line with the same type and brand of fluid that already is in the reservoir.
- Install the reservoir cap.



A. Upper level line B. Lower level line

CAUTION

Do not spill brake fluid onto any painted surface.
Do not use fluid from a container that has been left open or that has been unsealed for a long time.
Check for fluid leakage around the fittings.
Check for brake hose damage.

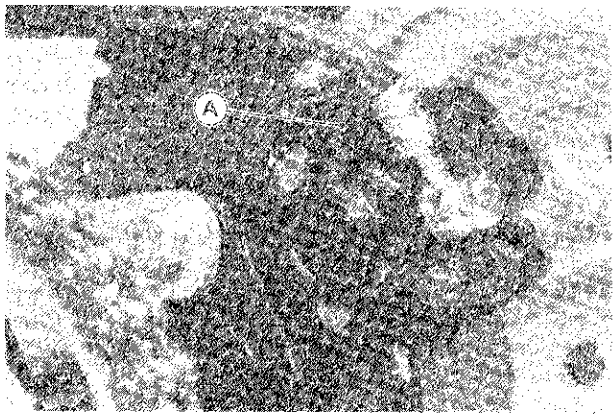
WARNING

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

Changing the Brake Fluid

The brake fluid should be changed in accordance with the Periodic Maintenance Chart (p. 1-11) and whenever it becomes contaminated with dirt or water.

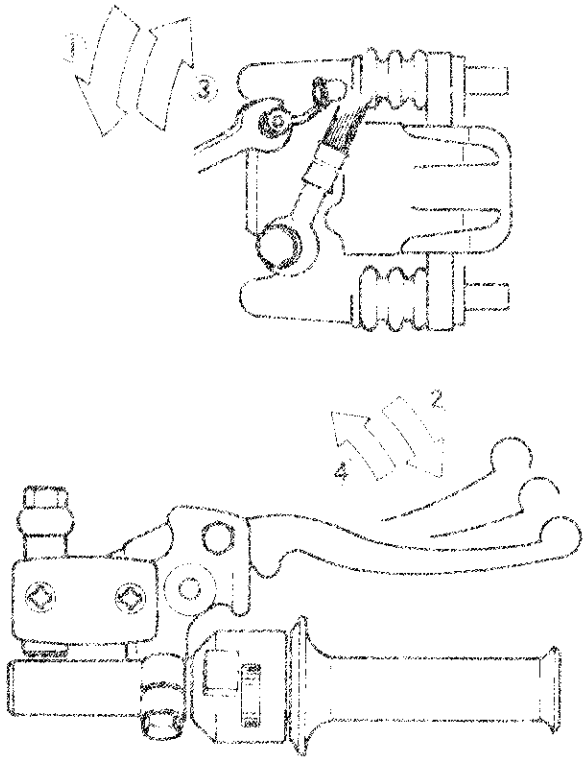
- Attach a clear plastic hose to the bleed valve on the caliper, and run the other end of the hose into a container.
- Open the bleed valve (counterclockwise to open), and pump the brake lever until all the fluid is drained from the line.



A. Bleed Valve

*Close the bleed valve, and fill the reservoir with fresh brake fluid.
*Open the bleed valve, apply the brake by the brake lever, close the valve with the brake held applied, and then quickly release the lever. Repeat this operation until the brake line is filled and fluid starts coming out of the plastic hose. Replenish the fluid in the reservoir as often as necessary to keep it from running completely out.
*Bleed the air from the lines.

Filling Up the Brake Line



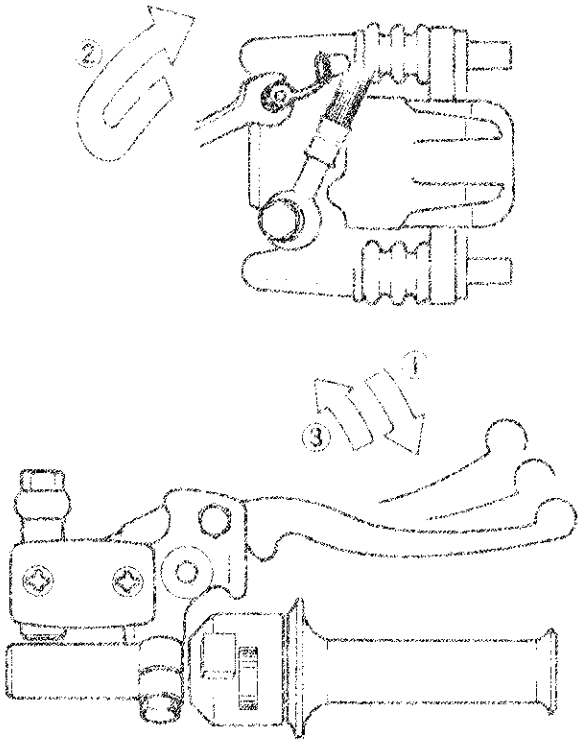
1. Open the bleed valve.
2. Apply the brake, keeping the brake applied.
3. Close the bleed valve.
4. Then quickly release the brake.

Bleeding the Brake Fluid

Bleed the air from the brake whenever brake lever action feels soft or spongy, after the brake fluid is changed, or whenever a brake line fitting has been loosened for any reason.

*Remove the reservoir cap, and check that there is plenty of fluid in the reservoir. The fluid level must be checked several times during the bleeding operation and replenished as necessary. If the fluid in the reservoir runs completely out any time during bleeding, the bleeding operation must be done over again from the beginning since air will have entered the line.
*With the reservoir cap off, slowly pump the brake lever several times until no air bubbles can be seen riding up through the fluid from the holes at the bottom of the reservoir. This bleeds the air from the master cylinder end of the line.
*Install the reservoir cap, and connect a clear plastic hose to the bleed valve at the caliper, running the other end of the hose into a container. Pump the brake lever a few times until it becomes hard and then, holding the lever squeezed, quickly open (turn counterclockwise) and close the bleed valve. Then release the lever. Repeat this operation until no more air can be seen coming out into the plastic hose. Check the fluid level in the reservoir every so often, replenishing it as necessary.
*After air bleeding is finished, tighten the bleed valve to 8 N·m (0.8 kg·m, 69 in·lbs) of torque, and install the rubber cap.
*Check the brake fluid level.

Bleeding the Brake Line



1. Hold the brake applied.
2. Quickly open and close the valve.
3. Release the brake.

Front Brake Disassembly

Front Brake Lever and Cable

See Controls and Instruments Chapter on p. 12-5.

Front Brake Disassembly Point

WARNING

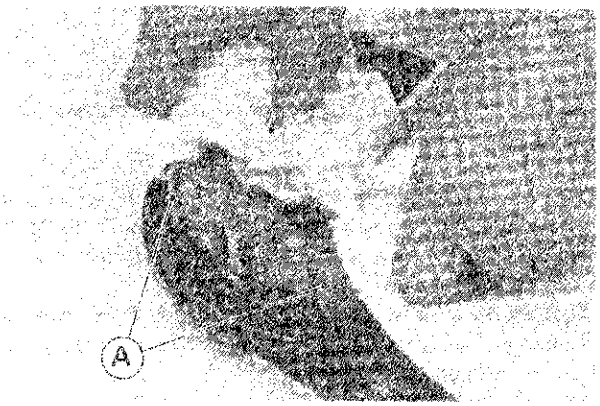
○Brake linings contain asbestos fiber. Inhalation of asbestos may cause serious scarring of the lungs and may promote other internal injury and illness, including cancer. Observe the following precautions when handling brake linings.

○Never blow brake lining dust with compressed air.

○If any components are to be cleaned, wash with detergent, then immediately discard the cleaning solution and wash your hands.

○Do not grind any brake lining material unless a ventilation hood is available and properly used.

✱Using a clean cloth around the linings to prevent grease or oil from getting on them, remove the brake shoes by pulling up on the center of the linings.



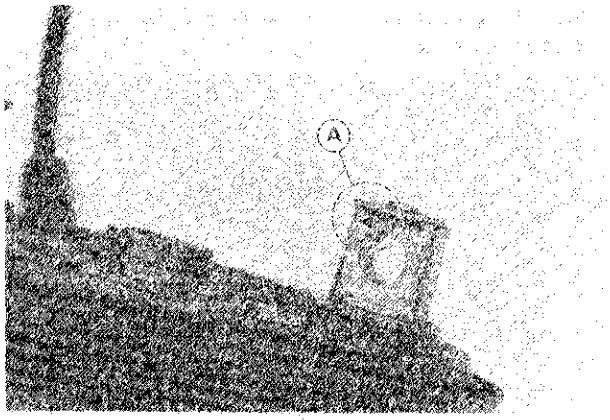
A. Brake Shoes

✱Make the position of the cam lever **2** so that it can be installed later in the same position.

Front Brake Assembly Point

✱Clean the old grease from the camshaft, and regrease using regular cup grease. Apply grease to the center of the shaft and to the cam surfaces. Do not overgrease.

✱The camshaft of the rear brake must be installed so that the triangular mark on the cam surface points to the center of the panel.

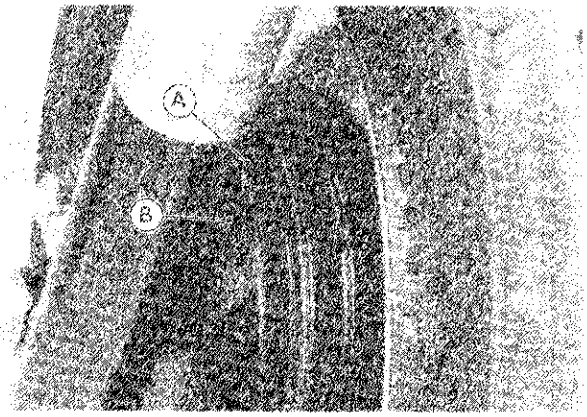


A. Triangular Mark

WARNING

○Improper installation will cause ineffective braking.

✱Be certain that the front brake stopper fits into the brake panel slot.

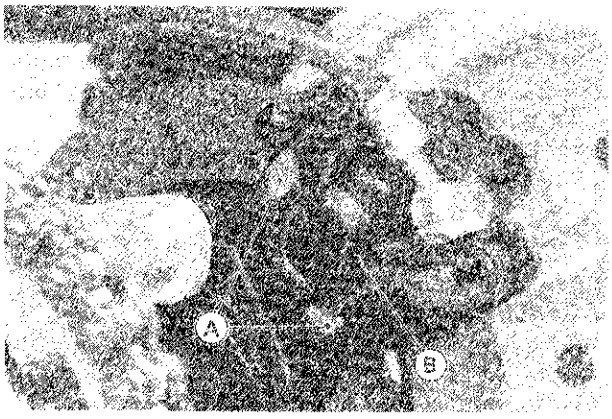


A. Brake Panel B. Stopper

Rear Brake Disassembly

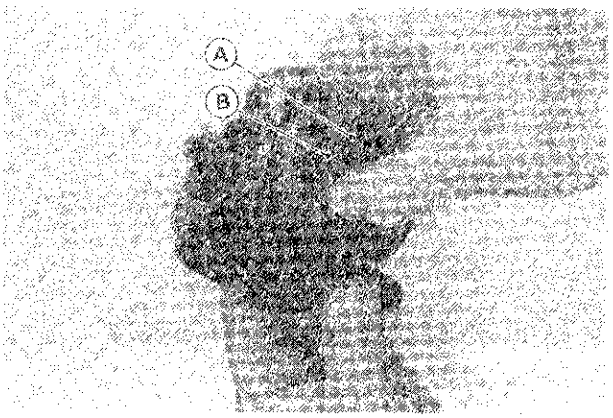
Removal Points of Pads

✱Remove caliper mounting bolts (2) and lift the caliper off the disc.



A. Caliper Mounting Bolts B. Caliper

*Push the caliper piston in by hand as far as it will go and remove pads.



A. Pad B. Pad

Inspection After Installation

*Check the front brake for weak braking power and brake drag.

WARNING

○**Do not attempt to drive the motorcycle until a full brake lever is obtained by pumping the brake lever or pedal until the pads are against the disc. The brake will not function on the first application of the lever if this is not done.**

Removal Points of Calipers

*If the caliper is to be disassembled after caliper removal and if compressed air is not available, remove the piston using the following two steps before disconnecting the brake hose from the caliper.
*Remove the pads.
*Pump the brake lever to remove the caliper piston.
*Immediately wipe up any brake fluid that spills.

Installation Points of Calipers

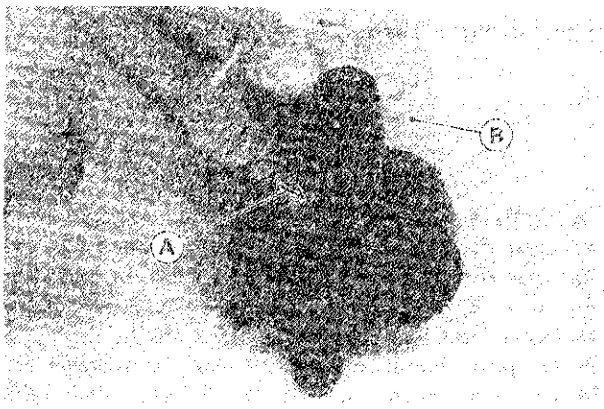
*Discard the used flat washers, and install a new washer on each side of the brake hose fittings.
*Connect the brake hose to the caliper putting a new flat washer on each side of the brake hose fitting.
*Check the fluid level in the master cylinder, and bleed the brake line (p. 10-6).
*Check the brake for weak braking power, brake drag, and fluid leakage.

Disassembly Points of Calipers

*Using compressed air, remove the piston.
*Cover the caliper opening with a clean, heavy cloth.
*Remove the piston by lightly applying compressed air to where the brake line fits into the caliper.

WARNING

○**To avoid serious injury, never place your fingers or palm inside the caliper opening. If you apply compressed air into the caliper, the piston may crush your hand or fingers.**



A. Compressed Air B. Heavy Cloth

Assembly Points of Calipers

*Clean the caliper parts with brake fluid or alchol (See CAUTION – p. 10-5).
*Fit a new fluid seal in place inside the cylinder.

"NOTE"

○*Whenever the fluid seal is removed, it should be replaced with a new one.*

*Apply brake fluid to the outside of the piston and the fluid seal, and push the piston into the cylinder by hand. Take care that neither the cylinder nor the piston skirt get scratched.
*Install the dust seal around the piston. Check that the dust seal is properly fitted into the grooves in the piston and caliper.
*Apply a thin coat of PBC (Poly Butyl Cuprysil) grease to the caliper holder shafts and the holder holes. (PBC grease is a special high temperature, water-resistant grease).

"NOTE"

○*Replace the dust covers and rubber friction boots if they were damaged.*

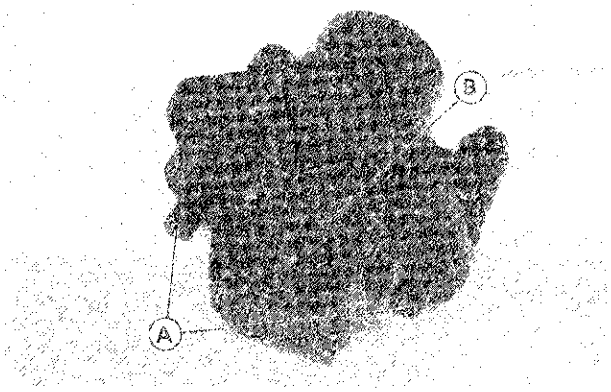
*Install the caliper holder into the caliper holes.

"NOTE"

○*The bosses of the caliper holder threaded holes for the caliper mounting bolts must face the piston side.*

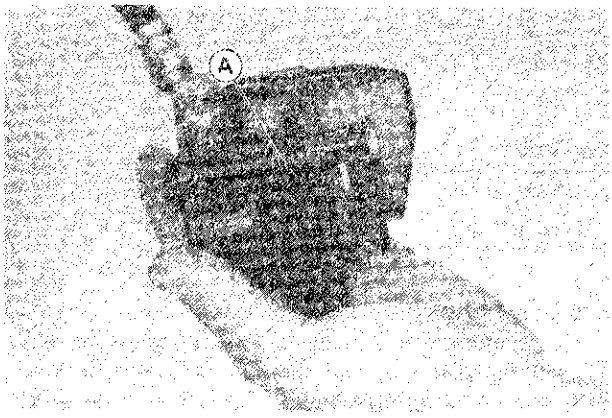
WARNING

○Do not ride the motorcycle until the pads are seated against the disc. Pump the brake lever several times until a full, firm lever "feel" is obtained. The brake will not function on the first application of the lever if this is not done.



A. Caliper Holder Shaft B. Anti-rattle Spring

*Check to see if the ends of the dust covers are seated in the grooves on the caliper shafts.



A. Dust Cover

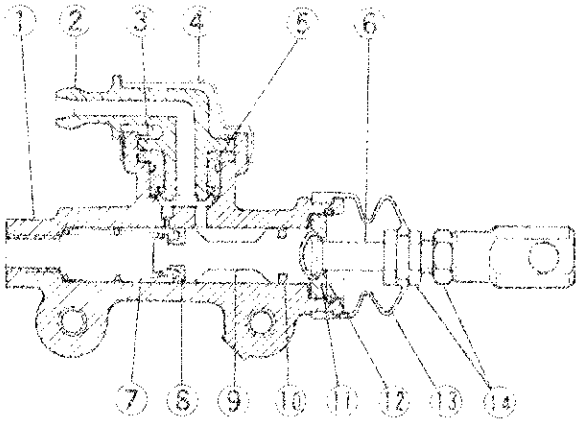
Installation Points of Rear Master Cylinder

*Use a new flat washer on each side of the brake hose fitting. Tighten the banjo bolt to the specification.
*Bleed the brake line after master cylinder installation (p. 10-6).
*Check the rear brake for weak power, brake drag, and fluid leakage.

Disassembly Points of Rear Master Cylinder

*Slide the push rod dust cover **13** out of its place.
*Remove the retainer **12** with a thin screwdriver, and pull out the piston stop **11**, push rod **6**, and piston **9**. Do not remove the primary cup **8**, and O-ring **10** from the piston since removal will damage them.

Rear Master Cylinder



1. Master Cylinder Body
2. Connector
3. Circlip
4. Rubber Boot
5. Grommet
6. Push Rod
7. Spring
8. Primary Cup
9. Piston
10. O-Ring
11. Piston Stop
12. Retainer
13. Dust Cover
14. Locknut

CAUTION

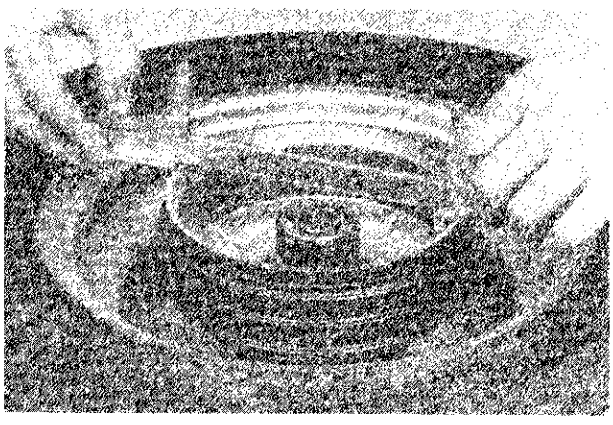
○Do not remove the primary cup and O-ring from the piston since removal will damage them.

Assembly Points of Rear Master Cylinder

*Before assembly, clean all parts including the master cylinder with brake fluid or alcohol (See CAUTION p. 10-5). Apply brake fluid to the parts removed and to the inner wall of the cylinder.
*Check to see that the piston return spring pushes back the piston to its rest position when the spring is compressed.

Brake Maintenance

Front Brake Drum Wear

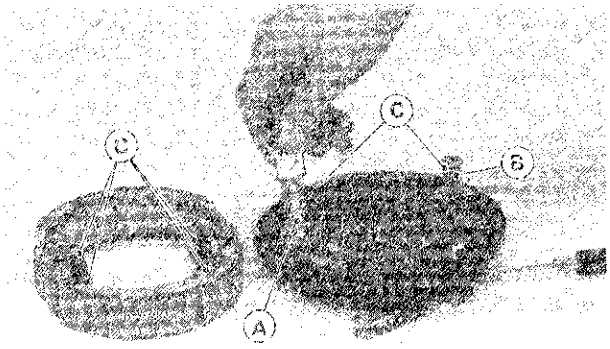


Brake Drum Inside Diameter

Standard:	140.00 – 140.16 mm
Service Limit:	140.75 mm

Brake Panel Lubrication

- Disassemble the front drum brake.
- Using a high flash-point solvent clean the old grease off the brake camshaft, camshaft hole, and other pivot points.
- Replace the drum brake parts if they show wear or damage.
- Apply grease to the brake pivot points (brake shoe anchor pin, spring ends, and cam surface of the camshaft) and fill the camshaft groove with grease.



A. Brake Camshaft
B. Anchor Pin
C. Grease



A. Grease Seal: apply grease

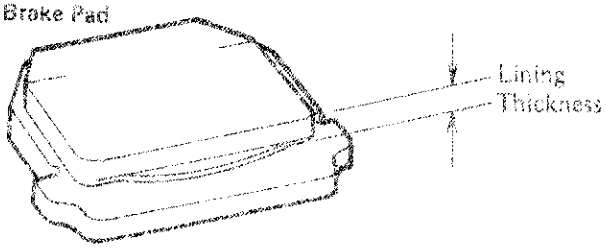
"NOTE"

○Do not get any grease on the brake shoe linings, and wipe off any excess grease so that it will not get on the linings or drum after brake assembly.

- Assemble the front drum brake.
- Adjust the brake play.

Rear Caliper Pad Wear

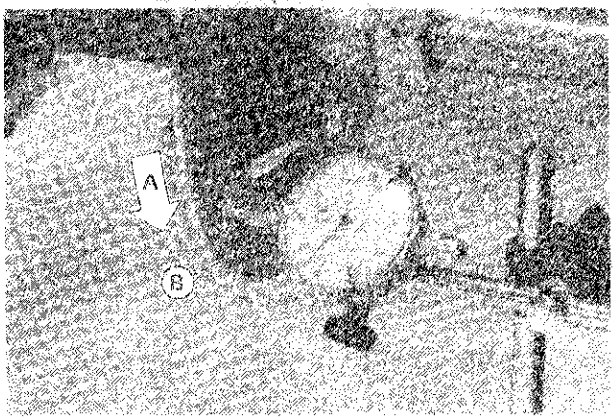
Brake Pad



Disc Brake Pad Lining Thickness

Standard:	3.7 mm
Service Limit:	1 mm

Rear Disc Runout Inspection



A. Turn
B. Brake Disc

Disc Runout

Standard:	0.2 mm
Service Limit:	0.3 mm

Disc Cleaning

Poor braking can also be caused by oil on the disc.

- Oil on the disc must be cleaned off with trichloroethylene or a high flash-point. Do not use one which will leave an oily residue.

Caliper Part Inspection

- Replace the fluid seal under any of the following conditions:
  - ○fluid leakage around the pad
  - ○brake overheat
  - ○a large difference of pad wear between left and right
  - ○the seal is stuck to the piston

"NOTE"

○If the fluid seal **18** *is replaced, replace the dust seal* **19** *as well. Also, replace all seals every other time the pads are changed.*

- Check the dust seal **19**.
- If they are cracked, worn, swollen, or otherwise damaged, replace them.

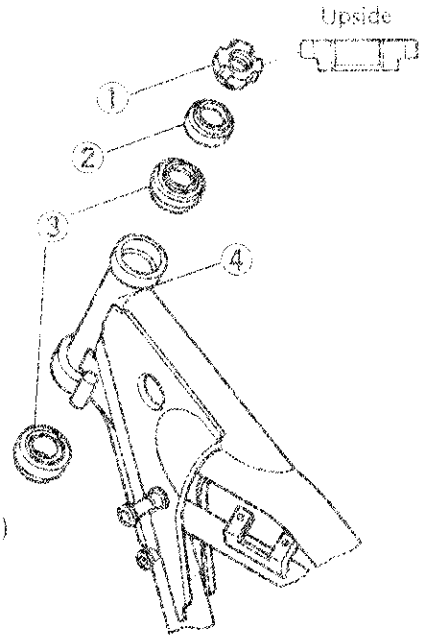
Suspension

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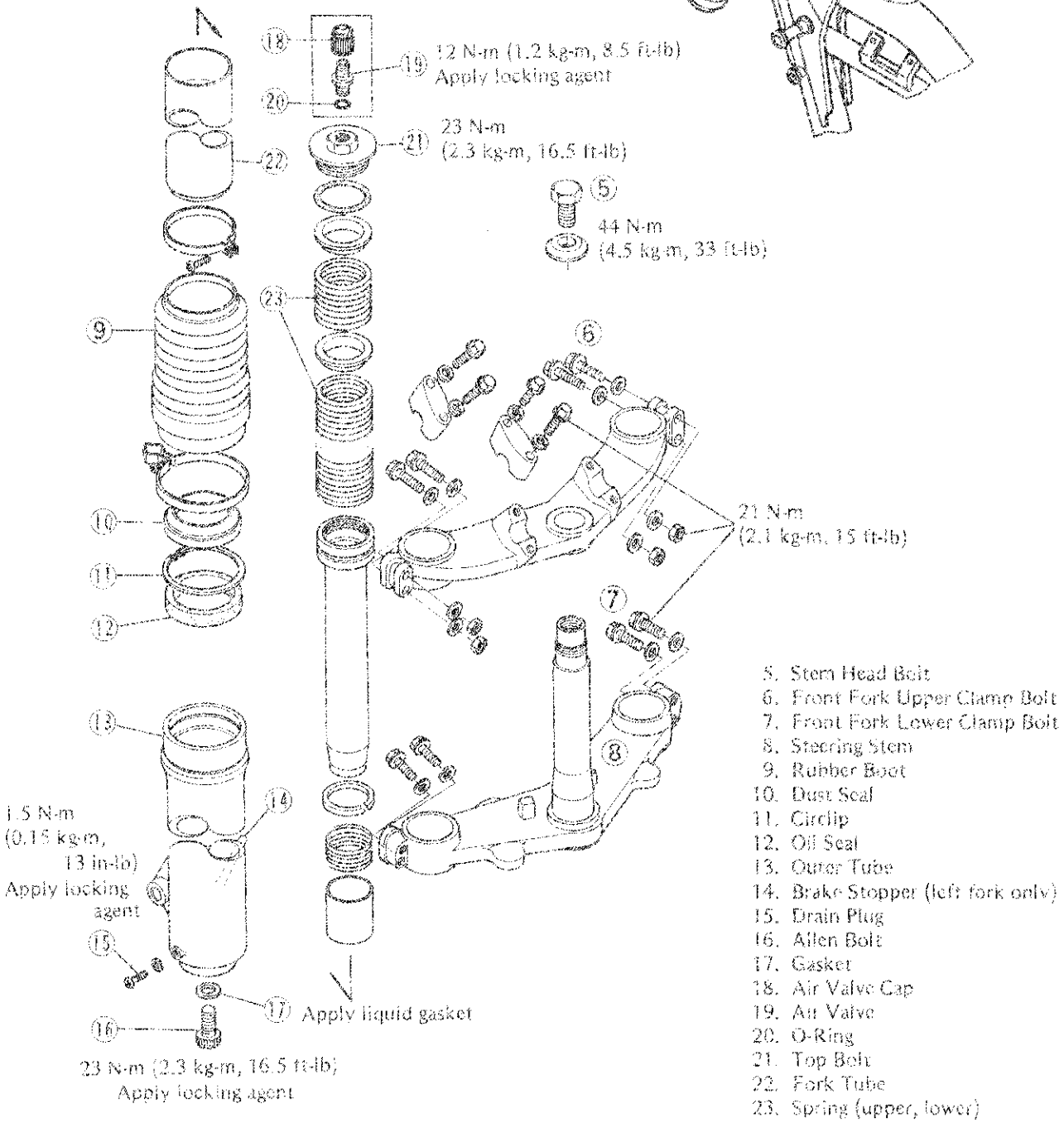
Exploded Views

Steering



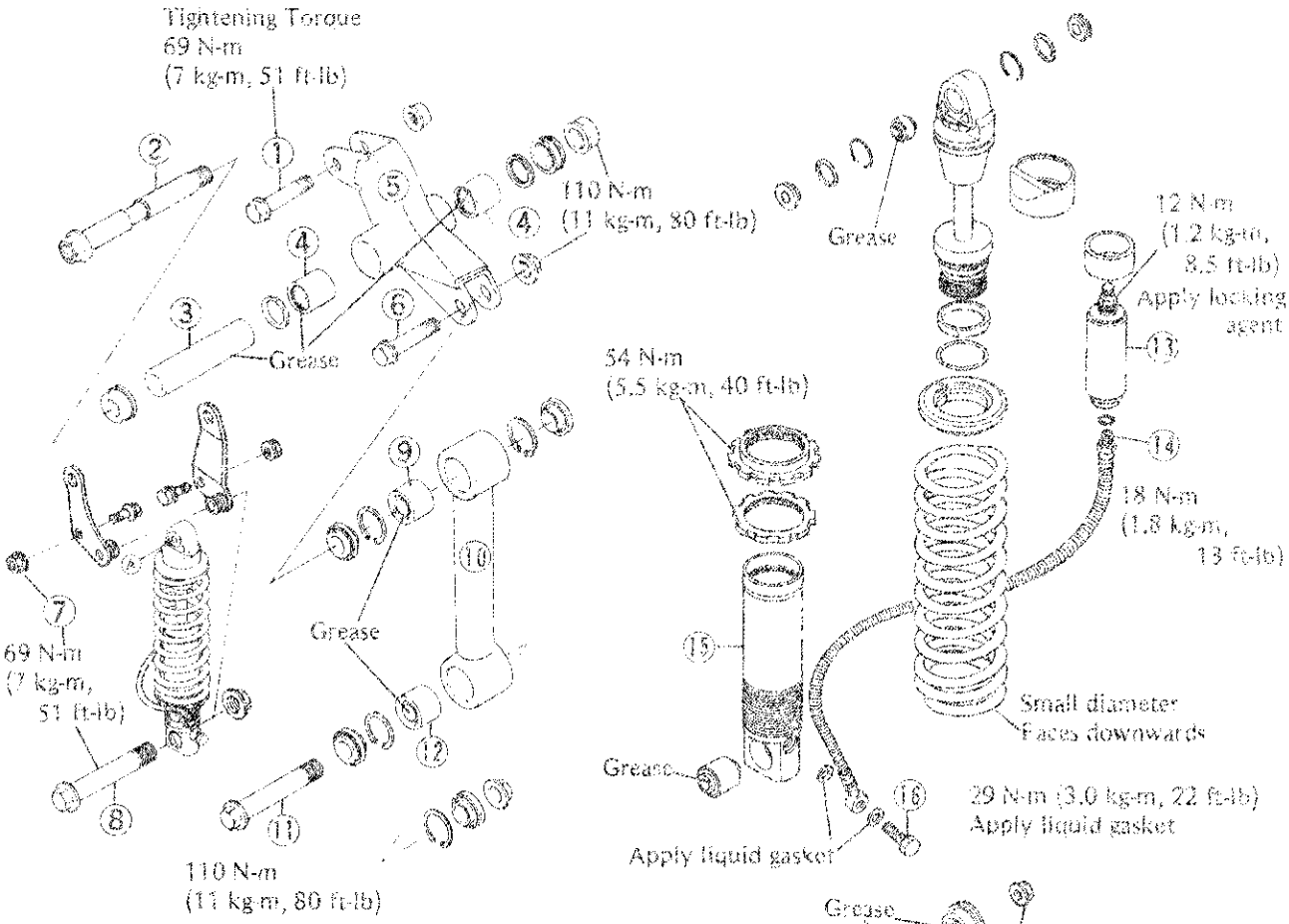
1. Stem Locknut
2. Cap
3. Steering Bearing (upper, lower)
4. Head Pipe

Front Fork

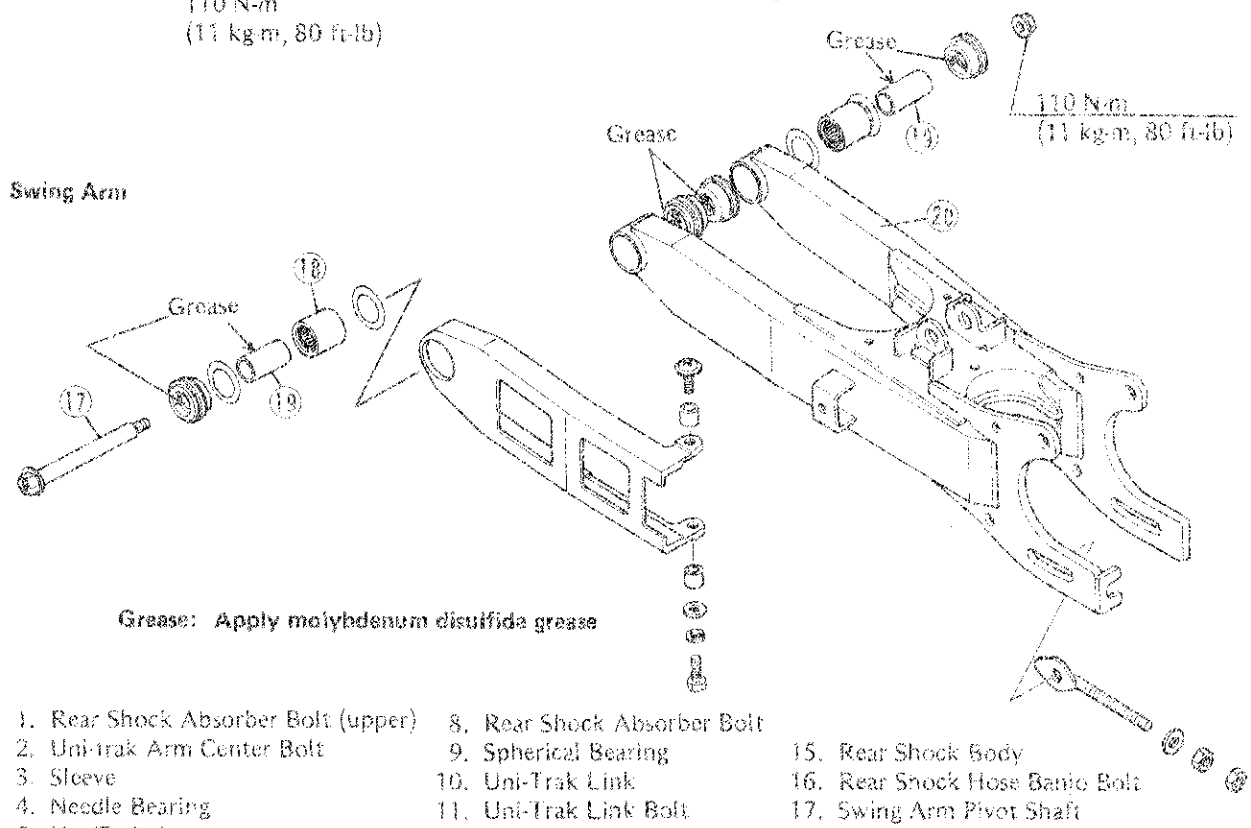


5. Stem Head Bolt
6. Front Fork Upper Clamp Bolt
7. Front Fork Lower Clamp Bolt
8. Steering Stem
9. Rubber Boot
10. Dust Seal
11. Circlip
12. Oil Seal
13. Outer Tube
14. Brake Stopper (left fork only)
15. Drain Plug
16. Allen Bolt
17. Gasket
18. Air Valve Cap
19. Air Valve
20. O-Ring
21. Top Bolt
22. Fork Tube
23. Spring (upper, lower)

Shock Absorber Disassembly



Swing Arm

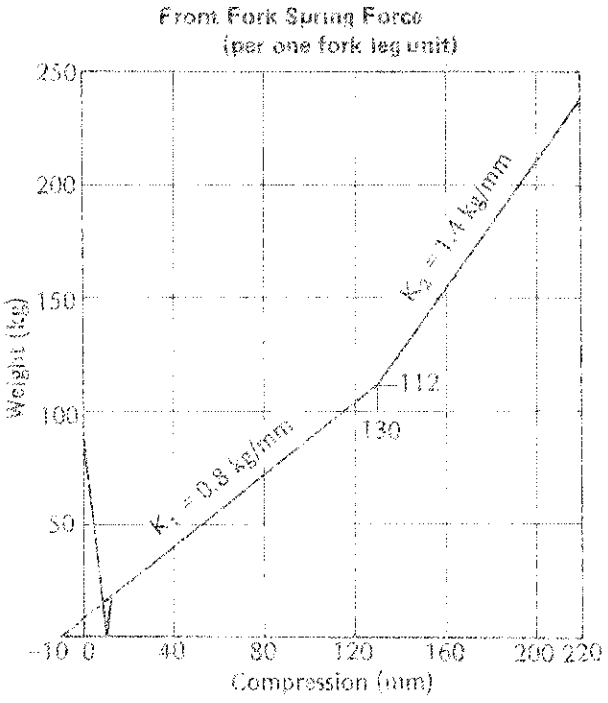


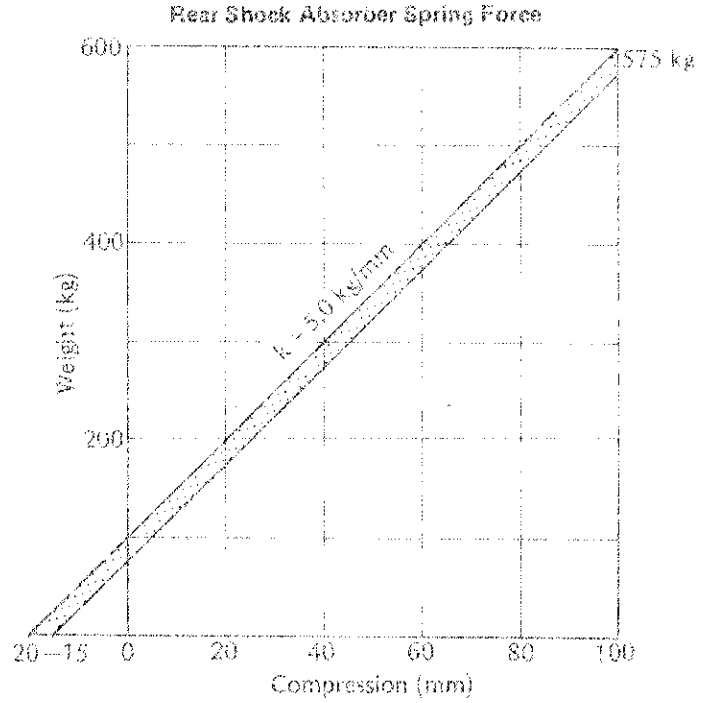
Grease: Apply molybdenum disulfide grease

1. Rear Shock Absorber Bolt (upper)
2. Uni-trak Arm Center Bolt
3. Sleeve
4. Needle Bearing
5. Uni-Trak Arm
6. Uni-Trak Link Bolt
7. Shock Bracket Bolt
8. Rear Shock Absorber Bolt
9. Spherical Bearing
10. Uni-Trak Link
11. Uni-Trak Link Bolt
12. Spherical Bearing
13. Reservoir Tank
14. Rear Shock Hose Bolt
15. Rear Shock Body
16. Rear Shock Hose Banjo Bolt
17. Swing Arm Pivot Shaft
18. Needle Bearing
19. Sleeve
20. Swing Arm

Service Data

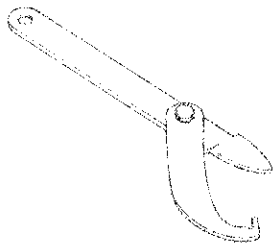
Item		Standard	Service Limit	See Page
Front Fork:				
Air pressure		Atmospheric pressure	— — —	11-8
Fork oil		KAYABA G10		11-9
	Viscosity	SAE 10 W		
	Amount per side	225 mL	(when changing oil)	
		259 – 267 mL	(completely dry)	
	Oil level	180 mm		
Rear Shock Absorber				
Air pressure		980 kPa (10 kg/cm², 142 psi)		11-13
	Usable range	980 – 1,470 kPa		
		(10 – 15 kg/cm², 142 – 213 psi)		
Oil		KYB K-2-C (or SAE 5 W)		
Oil amount				11-12
	Reservoir tank	67 mL	— — —	
	Rear shock body	155 mL	— — —	
Spring Preload		735 N (75 kg, 166 lb)	— — —	11-11
Tie-Rod:				
Spherical bearing wear		— — —	0.7 mm	11-13
Rocker Arm:				
Sleeve outside diameter		23.979 – 24.000 mm	23.95 mm	11-13
Swing Arm:				
Sleeve outside diameter		19.967 – 20.000 mm	19.95 mm	11-13





Special Tool

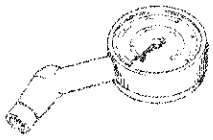
Stem Nut Wrench: 57001-1100



Stem Bearing Remover: 57001-1107



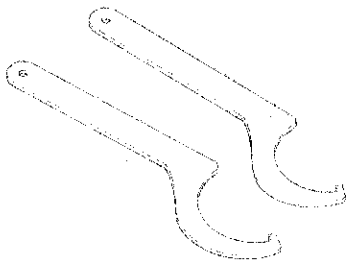
Air Pressure Gauge: 52005-1003



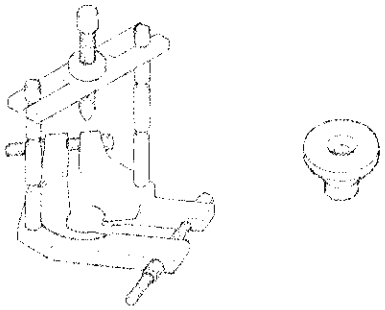
Oil Seal Driver: 57001-1091



Hook Wrench: 57001-1101



Bearing Puller: 57001-158
Adapter: 57001-317

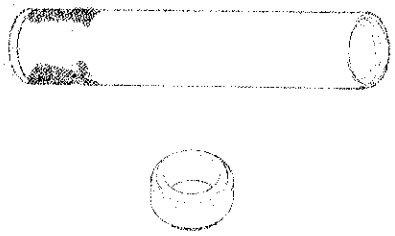


Driver Press Shaft: 57001-1075
Bearing Driver: 57001-1146
Bearing Driver: 57001-1147

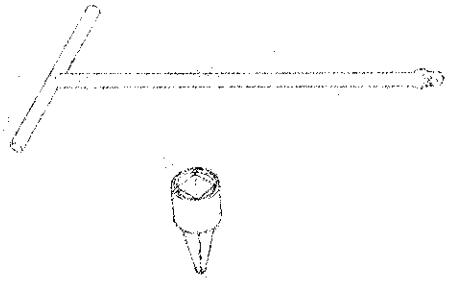




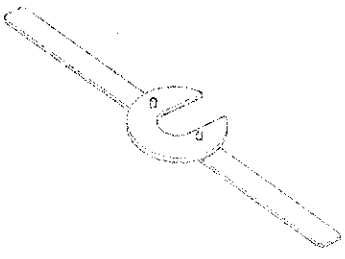
Stem Bearing Driver: 57001-137
Adapter: 57001-1074



Handle: 57001-183
Adapter: 57001-1011



Ring Nut Wrench: 57001-1177

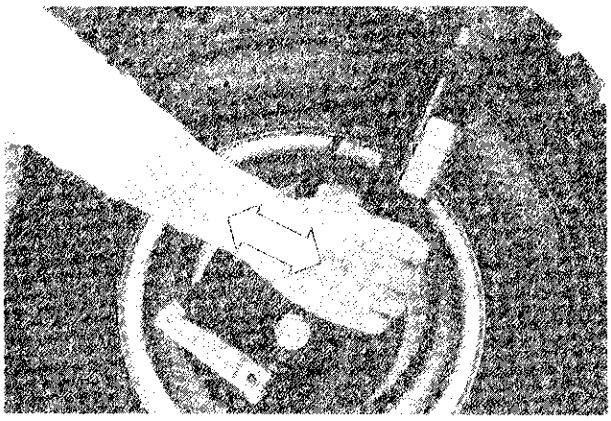


Steering

For safety, the steering should always be kept adjusted so that the handlebar will turn freely but not have excessive play.

Inspection

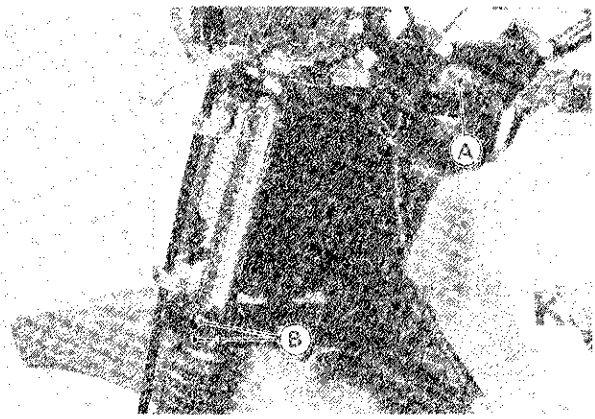
To check the steering adjustment, first place a stand or block under the engine so that the front wheel is raised off the ground. Push the handlebar lightly to either side; if it continues moving under its own momentum, the steering is not too tight. Squatting in front of the motorcycle, grasp the lower ends of the front fork at the axle, and push and pull the bottom end of the front fork back and forth; if play is felt, the steering is too loose.



Adjustment

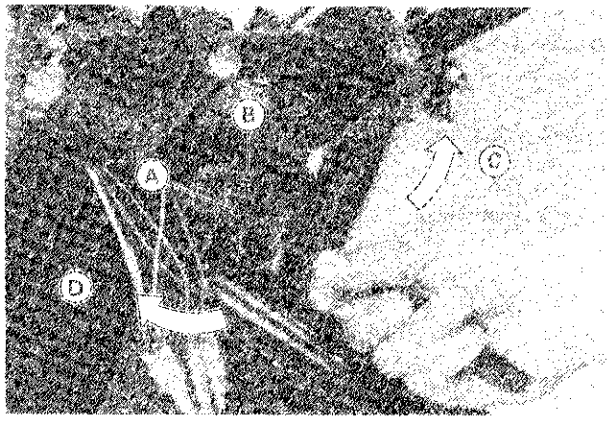
If the steering needs adjusting:

- Remove the fuel tank.
- Place a stand under the frame to raise the front wheel off the ground.
- Loosen the steering stem head bolt.
- Loosen the four front fork lower clamp bolts.



A. Stem Head Bolt B. Front Fork Lower Clamp Bolts.

- Turn the steering stem locknut with the stem nut wrench (special tool) to obtain the proper adjustment.



A. Stem Nut Wrench: 57001-1100
B. Lower Stem Locknut
C. Loosen the stem locknut when the steering is too tight.
D. Tighten the stem locknut when the steering has play.

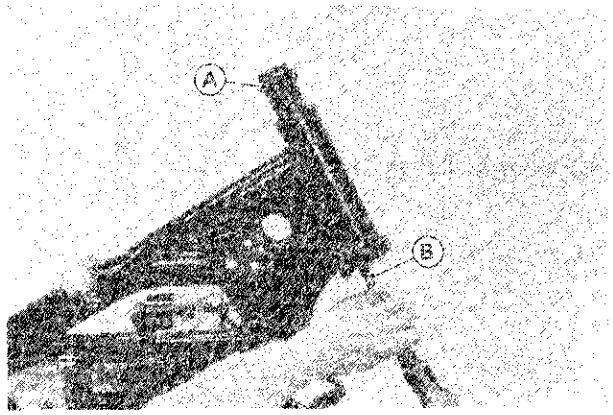
- Before re-checking the steering, tighten the following fasteners in this order.
  - Stem lock nut
  - Stem head bolt → tighten to the specified torque.
  - Front fork lower clamp bolts → tighten to the specified torque.

Tightening Torque

Stem head bolt:	44 N-m (4.5 kg-m, 32.5 ft-lb)
Front fork lower clamp bolts:	20 N-m (2.0 kg-m, 14.5 ft-lb)

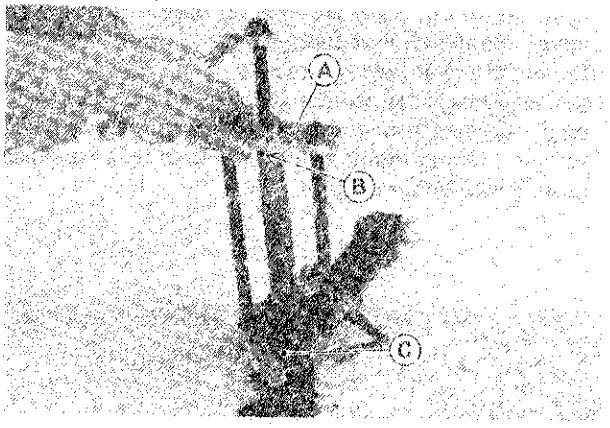
Removal Points of Stem Bearing

- Remove the following parts.
  - Fuel tank
  - Front wheel
  - Radiator
  - Front fork legs
  - Headlight unit
  - Handlebars, holders
  - Stem head bolt
  - Steering stem head
- To remove the upper outer races pressed into the head pipe, install stem bearing remover (special tool) as shown below, and hammer the stem bearing remover to drive it out.



A. Stem Bearing Remover: 57001-1107
B. Suitable Bar

●Remove the lower inner race, which is pressed onto the steering stem, with the bearing puller and adapter (special tools).



A. Lower Inner Race
B. Bearing Puller: 57001-158
C. Adapter: 57001-317

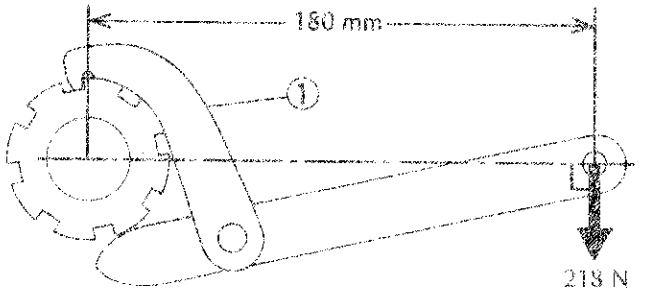
Installation Points of Steering Stem

●Lubricate the steering stem bearings with grease.
●If a new steering bearing is installed, or if the removed bearing is reinstalled, seat the bearing perfectly in place according to the following 4 steps:
○Tighten the stem locknut to 39 N-m (4.0 kg-m, 29 ft-lb).

"NOTE"

○Tightening the stem locknut to 39 N-m (4.0 kg-m, 29 ft-lb) of torque is only to seat the bearing. After seating the bearing, loosen the locknut and handtighten the locknut.
○To torque the locknut with steering stem nut wrench 57001-1100, hook the wrench on the stem locknut, and pull the wrench at the hole by 218 N (22.2 kg) force in the direction as shown.

Torquing Stem Locknut



1. Stem nut wrench: 57001-1100

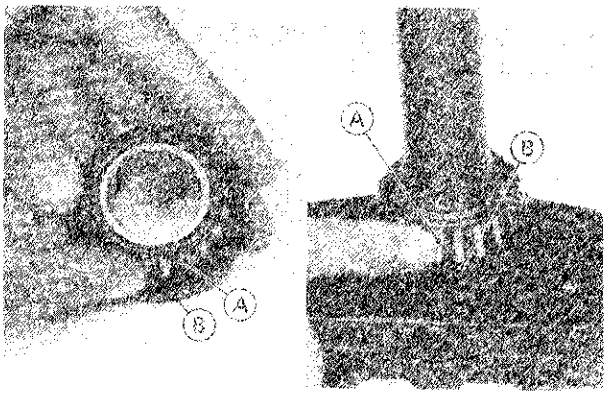
○Check that there is no play and the steering stem turns smoothly without rattle. If not, the steering stem bearing may be damaged.
○Again back out the steering stem locknut a fraction of turn until it turns lightly.
○Turn the steering stem locknut lightly clockwise until it just becomes hard to turn. Do not overtighten, or the steering will be too tight.

Adjustment after Installation

●Check and adjust the following items:
Steering
Headlight aim (See the chapter 14)

Steering Bearing Lubrication

Whenever the steering stem is disassembled, the steering stem bearings should be relubricated.
●Wipe all the old grease off the races and rollers, if necessary, wash them in a high flash-point solvent.
●Replace the bearing parts if they show wear or damage.
●Apply grease liberally to the upper and lower races, and pack the cone bearings with grease. Turn the bearing around by hand a few times to make sure the grease is distributed uniformly inside the bearing.



A. Grease
B. Grease Seal

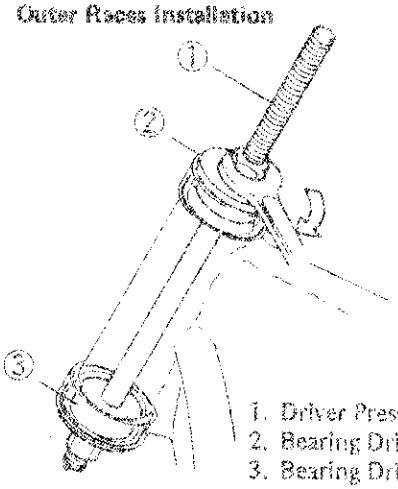
Grease Seal Deterioration, Damage

●Inspect the grease seal for any signs of deterioration or damage, and replace if necessary.
●Replace the grease seal with a new one whenever it has been removed. The grease seal comes off whenever the lower bearing inner race is removed.

Stem Bearing Installation

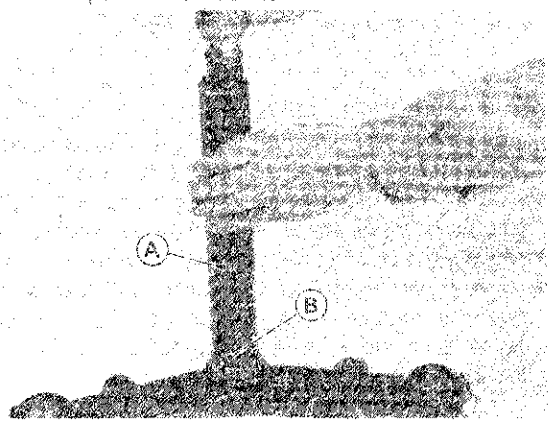
●Apply grease to the outer races, and then drive them into the head pipe using a bearing driver and driver press shaft (special tool). Be sure to press them in until they stop at the stepped portion in the head pipe.

Outer Races Installation



1. Driver Press Shaft (57001-1075)
2. Bearing Driver (57001-1146)
3. Bearing Driver (57001-1147)

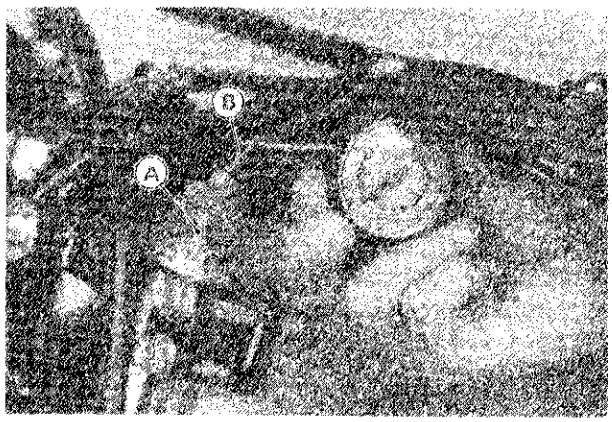
*Apply grease to the tapered roller bearing, and drive it onto the steering stem using stem bearing driver 57001-137 and adapter 57001-1074.



A. Stem Bearing Driver: 57001-137
B. Adapter: 57001-1074

WARNING

○Only air or nitrogen gas can be used. Never inject oxygen or any kind of explosive gas.
○Do not incinerate the front fork.
○Do not remove the springs and rely on compressed air only. Correct springs must be used in this suspension system. Use without springs can lead to a condition causing accident and injury.



A. Air Valve B. Pressure Gauge

Front Fork

The condition of the front fork is very important for steering stability, and front fork performance is dependent on front fork oil viscosity, quantity, quality, front fork air pressure.

Alteration of the stiffness or softness of the shock absorption can be achieved by using fork oil of a different viscosity or changing the fork air pressure. When altering the shock absorption by changing the fork air pressure carry out the following steps:

Air Pressure Adjustment

*Park the vehicle on level ground.
○The standard air pressure is **atmospheric pressure.**
*Remove the air valve cap and push the air valve to open.
*Reinstall the air valve cap.

*Under special conditions, however, adjust the shock absorption to suit your preference as follows.

CAUTION

○**Inject air little by little so that air pressure does not rise rapidly. Air pressure exceeding 245 kPa (2.5 kg/cm², 36 psi) may damage the oil seal.**

Fork Oil Level

*With the front wheel on the ground and the front brake fully applied, push down on the handlebar a few times to expel the air in the fork oil.
*Release the front fork air pressure.
*Remove the top plug and main spring in the fork leg.
*With the fork fully compressed, insert a tape measure or thin rod in the fork inner tube, and measure the distance from the top end of the fork inner tube to the oil.
★If the oil is above or below the specified level, remove or add oil and recheck the oil level.

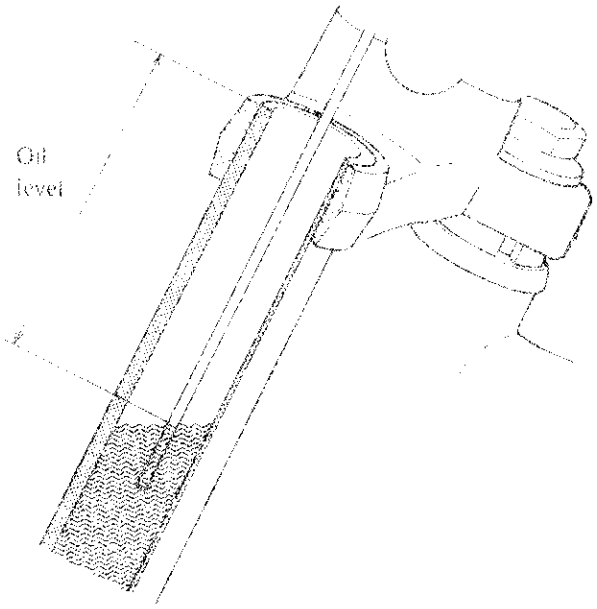
CAUTION

○**The operation of air front fork is especially dependant upon correct oil level. Higher level than specified may cause oil leakage and seal breakage. So be sure to maintain the specified level.**

Fornt Fork Oil Level

180 ±2 mm below from the top end of the inner tube

Fork Oil Level Measurement



Front Fork Oil

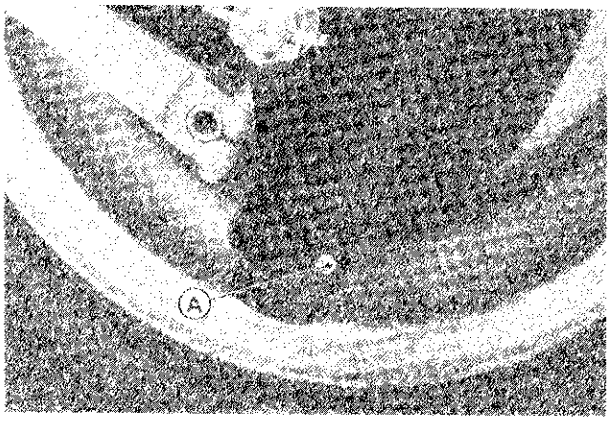
Rating:	KAYABA G10
Viscosity:	SAE 10W
Amount per side	
when changing oil:	225 mL
After disassembly and completely dry:	259 – 267 mL

Tightening Torque

Drain Plug:	1.5 N-m (0.15 kg-m, 13 in-lb)
Apply Locking Agent	

Oil Change

- Release the front fork air pressure before draining out the fork oil.
- Remove the drain plug to drain the oil.
- To pump out the oil, with the front wheel on the ground and the front brake fully applied, push down on the handlebar a few times.



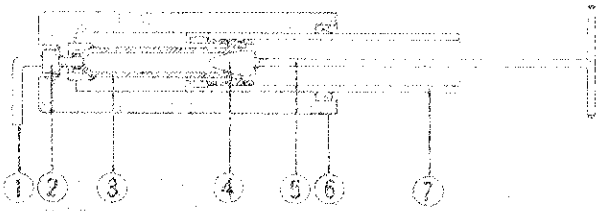
A. Drain Plug

- Wash the drain plug threads clean of oil, and blow them dry.
- Apply a non-permanent locking agent to threads, and install the drain plug gasket.
- Tighten the drain plug to the specified torque.
- Remove the top plug and main spring in the fork leg, and fill the fork leg with the specified amount of oil.
- Check the oil level in the fork leg.
- Change the fork oil in the other fork leg in the same manner.

Fork Disassembly

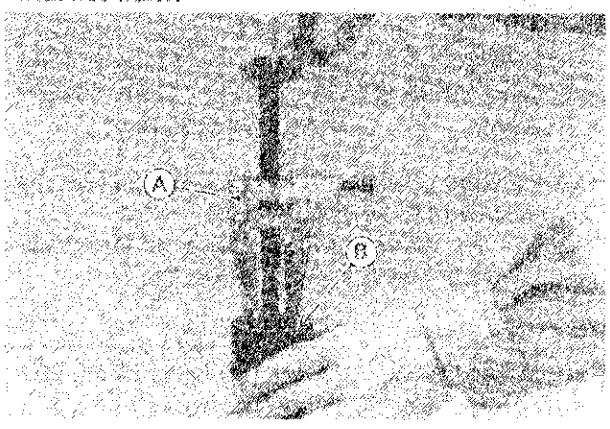
- Before removing the front fork from the frame, release the air and loosen the fork top bolts.
- Remove the following parts.
  - ○front brake
  - ○front wheel
  - ○fork tube
  - ○rubber boot
  - ○top bolt, spring guides, upper spring, lower spring
  - ○drain screw – pump out the oil into a container.
- Push the inner tube all the way in, and remove the Allen bolt on the bottom of the outer tube using the cylinder holder handle and adapter (special tools).

Removing Bottom Allen Bolt



1. Wrench
2. Bolt
3. Cylinder
4. Adapter: 57001-1011
5. Handle: 57001-183
6. Outer tube
7. Inner tube

- Remove the circlip and dust seal.
- Pull out the oil seal using a suitable tool. It may be necessary to heat the outer tube around the oil seal with hot water.



A. Oil Seal Puller B. Oil Seal

Fork Assembly

*Apply a non-permanent locking agent to the drain screw and install the screw.

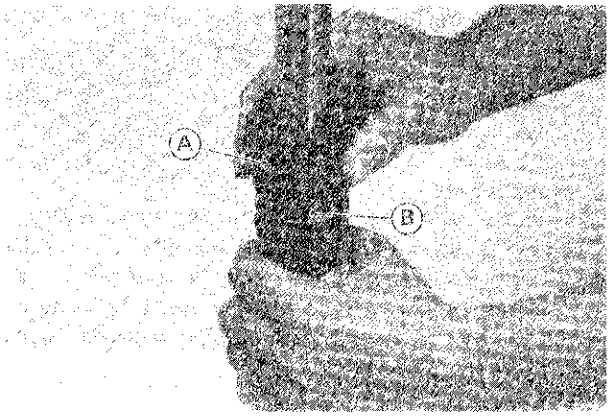
*Apply liquid gasket on both sides of gasket .

*Apply a non-permanent locking agent to the Allen bolt , and install them with the cylinder holder handle and adapter (special tool).

Allen Bolt Tightening Torque

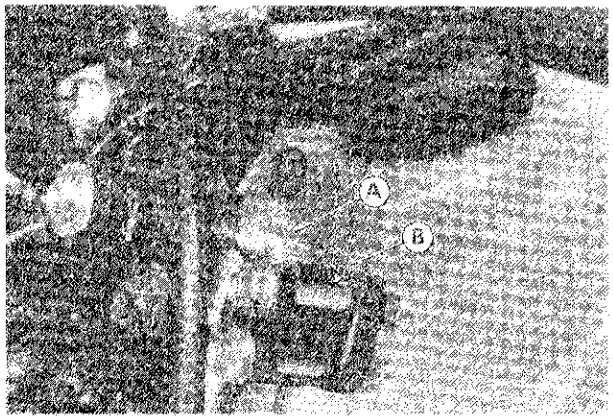
23 N·m (2.3 kg-m, 16.5 ft-lb)

*Replace the oil seal with a new one, apply oil to the out side, and install it with the oil seal driver (special tool).



A. Oil Seal Driver: 57001-1091 B. Oil Seal

*Install the fork tube on the frame so that the bottom of the fork top bolt aligns with the upper surface of the steering stem head.



A. Top Bolt B. Steering Stem Head

*After installing the fork tube on the motorcycle, tighten the top bolt to the specification.

*Apply a non-permanent locking agent to the air valve, and tighten the valve to the specification.

Tightening Torque

Fork Top Bolt:	23 N·m (2.3 kg-m, 16.5 ft-lb)
Air Valve:	12 N·m (1.2 kg-m, 8.5 ft-lb) apply locking agent

Uni-Trak

The rear suspension system of this motorcycle is UNI-TRAK. It consists of a rear shock absorber, uni-trak arm, and link.

The rear shock absorbers can be adjusted by changing the air pressure and the spring preload.

It is necessary to remove the rear shock absorber for spring replacement.

Damper Adjustment:

The damper adjuster on the rear shock absorber has 4 positions so that the damping force can be adjusted for different road and loading conditions.

If the damper setting feels too soft or too stiff, adjust it in accordance with the following table:

Damping Force

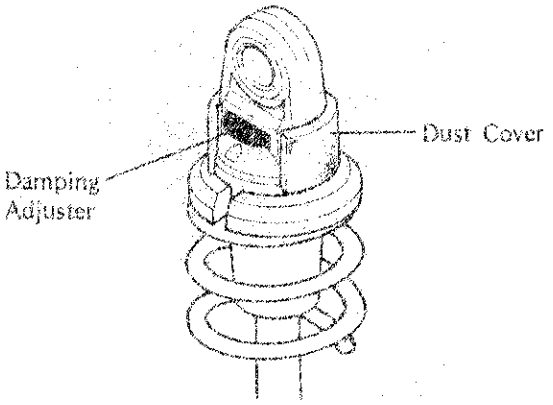
Position	1, 2, 3, 4
Damping Force	→ Stronger
Standard	2

Adjustment

*Remove the rear fender.

*Slide the dust cover out of the top of the shock absorber.

*Turn the damper adjuster to the desired number until you feel a click.



Rear Shock Removal

*Remove the seat and rear fender.

*Loosen the upper and lower mounting nuts of shock absorber. Do not remove them yet.

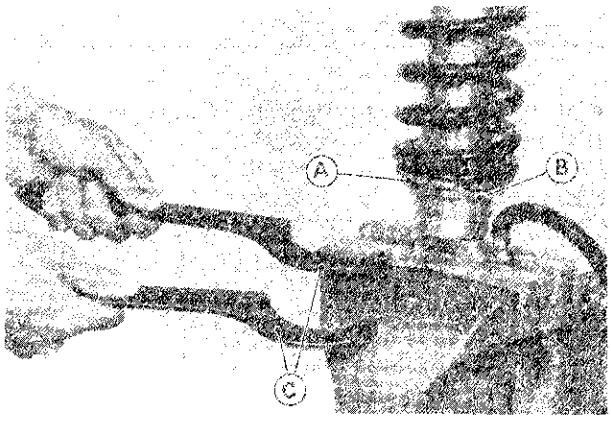
*Place a sturdy block or support under the frame so that the rear wheel is raised off the ground.

*Remove the rubber band holding the gas reservoir to the frame.

*Remove the mounting bolts and nuts, and take the rear shock absorber downwards.

Spring Preload Adjustment

- Remove the rear shock absorber from the frame.
- Clean the threaded portion on the bottom of the rear shock absorber.
- Hold the bottom of the rear shock absorber with a vise. Be careful not to damage the hose.
- Using the hook wrenches (special tools), loosen the locknut and turn the adjusting nut as required. Hold the upper mounting bracket so that it does not turn during adjustment. Turning the adjusting nut up makes the spring preload stronger.

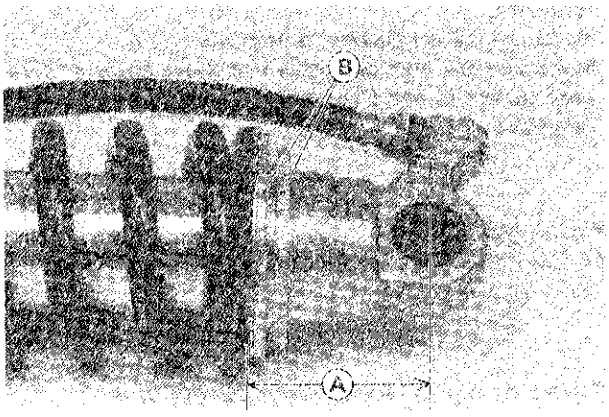


A. Adjusting Nut
B. Locknut
C. Hook Wrench: 57001-1101

- Set the adjusting nut to the specification.
- Tighten the locknut to **54 N-m** of torque.
- After adjustment, move the spring up and down to make sure that the spring is compressed a certain amount.

Spring Preload Setting

Standard Adjusting Nut Position:	80 mm
Nut Adjustable Range:	68 – 85 mm
(Initial Srping Preload):	735 N (75 kg, 166 lb)
(Preload Change/ a turn of the nut):	74 N/a turn (7.5 kg, 17 lb)



A. Adjusting Nut Position.
B. Tightening Torque: 54 N-m (5.5 kg-m, 40 ft-lb)

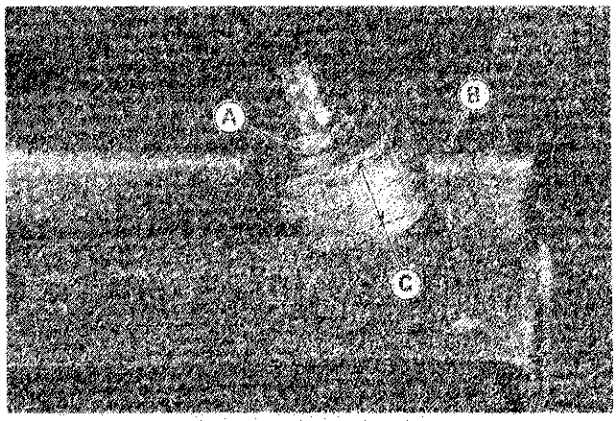
Rear Shock Disassembly

- Remove the rear shock absorber from the frame.
- Remove the air valve cap and release the nitrogen gas completely from the gas reservoir.

WARNING

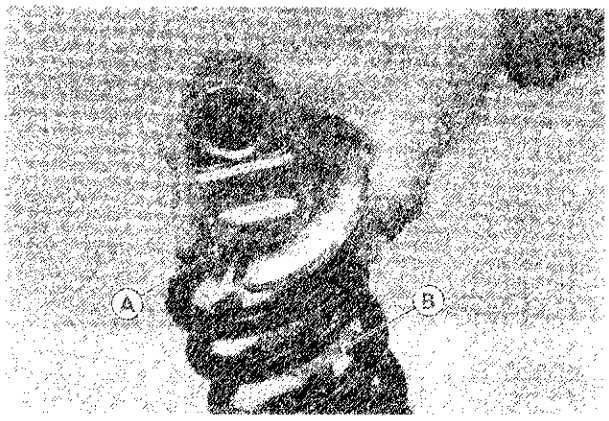
Since the high pressure gas is dangerous, do not point the air valve to your face or body.

- Hold the lower part (within about 15 mm) of the gas reservoir with a vice, and remove the bolt from the reservoir. Use the rubber or aluminum plate not to damage the gas reservoir.



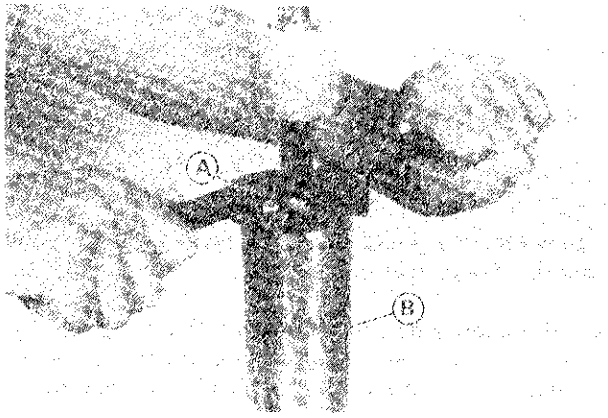
A. Bolt
B. Aluminum Plates
C. 15 mm

- Empty out the oil in the gas reservoir and rear shock body.
- Loosen the locknut and adjusting nut all the way down using the hook wrenches (remarked above).
- Slide down the rubber bumper.
- Remove the clip, and pull off the spring.



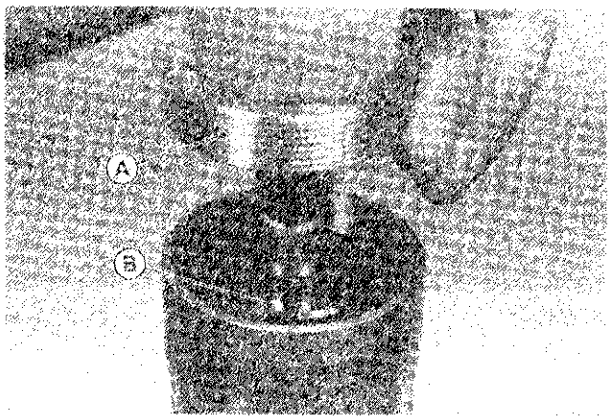
A. Clip
B. Rubber Bumper

- Hold the bottom of the rear shock with a vice again. Remove another bolt and free the hose from the rear shock.
- Loosen the ring nut with the ring nut wrench (special tool).



A. Ring Nut Wrench: 57001-1177
B. Rear Shock Absorber

*Slide up the push rod and ring nut, push down the bearing on the push rod, and remove the circlip.



A. Ring Nut B. Bearing

*Pull out the push rod assembly. This unit should not be disassembled further.

"NOTE"

○*If necessary, remove the valve so you can push the piston from the top of the reservoir.*

*Fill the reservoir and rear shock body with specified oil.

Rear Shock Absorber Oil

Oil	:	KYB K-2C (or SAE 5W)
Amount		
Reservoir	:	67 mL
Rear shock body	:	155 mL

*Connect the hose to the reservoir. Torque both ends to the specification.

Tightening Torque

Rear shock hose bolt
: 18 N·m (1.8 kg·m, 13 ft·lb)
Rear shock hose banjo bolt
: 29 N·m (3.0 kg·m, 22 ft·lb)

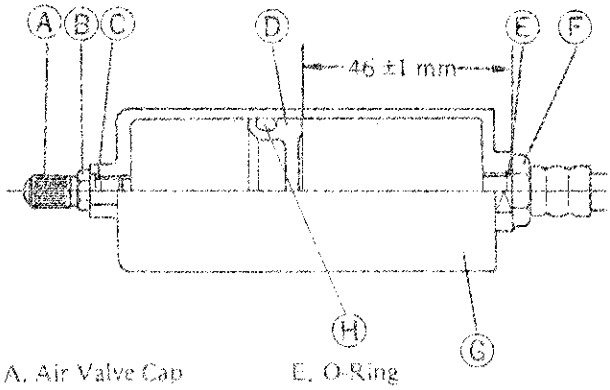
*Inject nitrogen gas through the valve on the gas reservoir to the specification.

Gas Pressure of Reservoir

Factory standard
: 980 kPa (10 kg/cm², 142 psi)
Adjustable gas range
: 980 – 1,470 kPa
(10 – 15 kg/cm², 142 – 213 psi)

Rear Shock Assembly and Oil Change

*Check the O-ring for damage and replace it if necessary.
*Set the free piston in the reservoir so it is **46 ±1 mm** from the end of the reservoir.



A. Air Valve Cap
B. Air Valve
C. O-Ring
D. Free Piston
E. O-Ring
F. Hose Bolt
G. Reservoir
H. O-Ring

WARNING

○**Pressurize the gas reservoir with nitrogen gas only. Do not use air or other gases, since they may cause premature wear, rust, fire hazard or substandard performance.**
○**Never exceed the maximum pressure.**
○**Make sure the hose and other rear shock absorber components are in good condition before pressurizing the reservoir.**

*Install the spring and retainer clip.
*Adjust spring preload and reinstall the rear shock absorber.

Swing Arm and Rocker Arm Sleeve Wear

*If it shows visible damage, replace the sleeve and needle bearing as a set.

Swing Arm & Rocker Arm Needle Bearing Wear

*The rollers in the needle bearings wear so little that the wear is difficult to measure. Instead, inspect the needle bearings for abrasions, color change, or other damage.

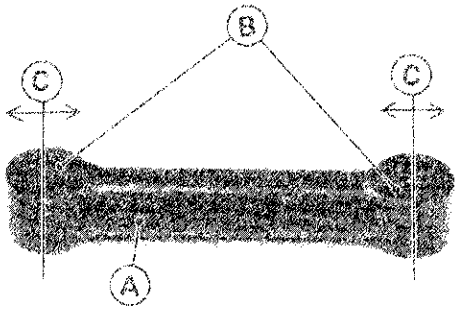
*If there is any doubt as to its condition of either needle bearing, replace the bearing and sleeve as a set.

Tie-Rod Spherical Bearing Wear

*If the spherical bearing is overworn, replace the tie-rod component.

Spherical Bearing Wear

Service Limit:	0.7 mm



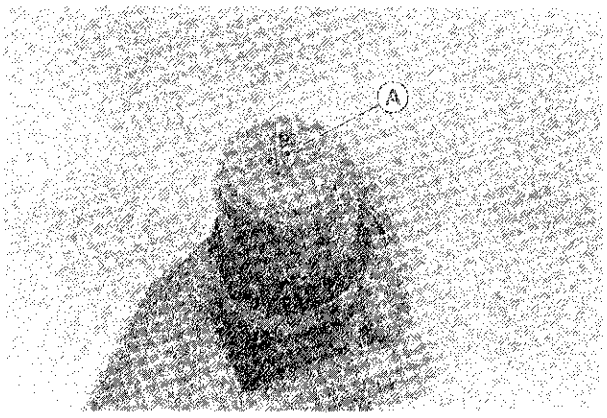
A. Tie-rod B. Spherical Bearing C. Wear

Scrapping

WARNING

○Since the rear shock absorber contains nitrogen gas, do not incinerate the rear shock absorber.

○Before a rear shock absorber is scrapped, release the nitrogen gas completely. Do not point the air valve to your face or body then.



A. Air Valve

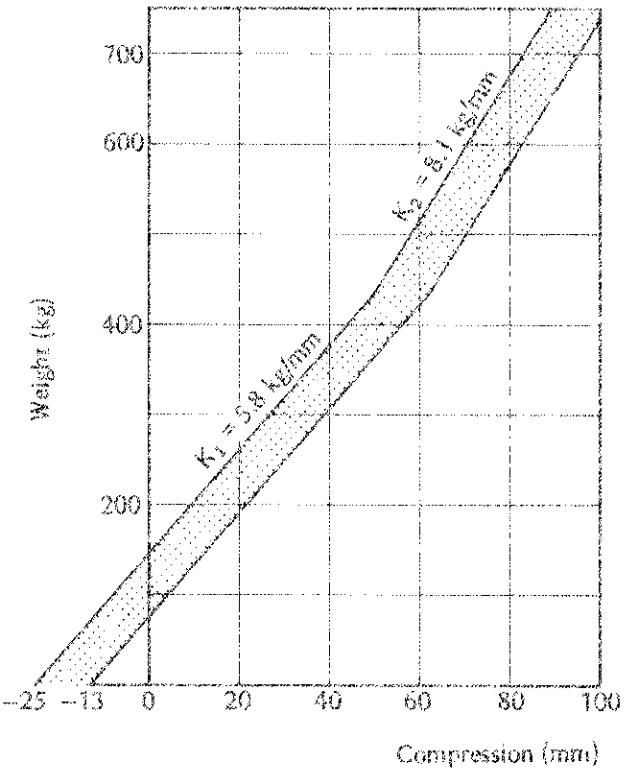
Option Spring Setting (P/N 92091-1736A)

*Install the spring so that the small diameter end faces downwards.

Option Spring Setting

Standard Adjusting	
Nut Position:	60 mm
Nut Adjustable Range:	50 – 72 mm
Initial Spring Preload:	735 N (75 kg, 166 lb)
Preload Change/ a turn of the nut:	85.5 N (8.7 kg, 19.2 lb)

Rear Shock Absorber Spring Force

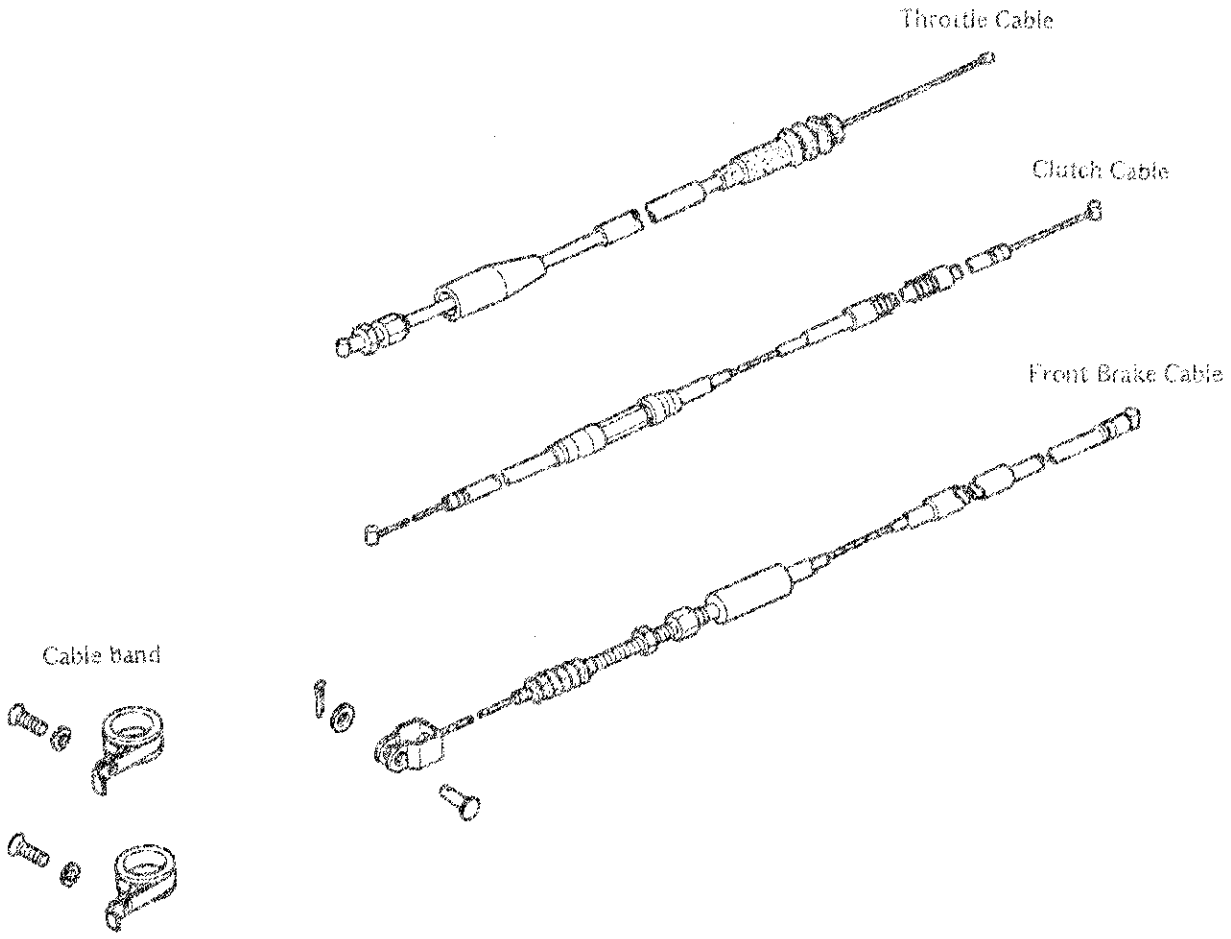


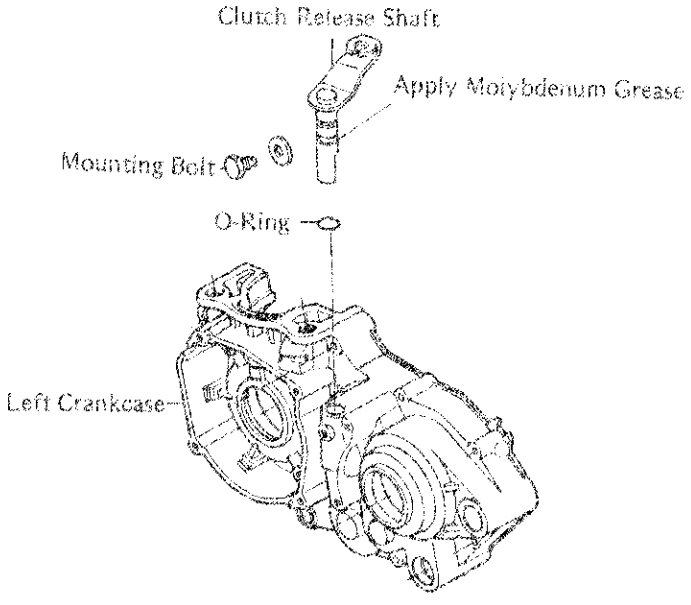
Controls and Instruments

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Handlebar
Installation 12-6

Exploded Views





Specifications

Clutch Lever Free Play

2 – 3 mm

Throttle Lever Free Play

2 – 3 mm

Front Brake Lever Free Play

4 – 5 mm

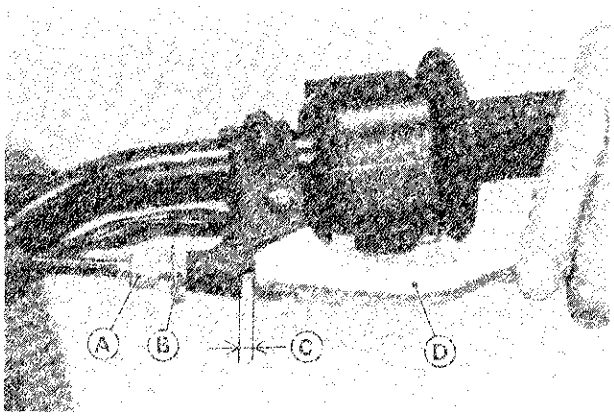
Clutch

Clutch Adjustment

Proper clutch lever play between the clutch lever and the clutch lever holder is 2 – 3 mm. The play increases with the cable stretch and the friction plate wear, necessitating adjustment.

When there is too much lever play, first try adjusting the cable at the clutch lever.

- Slide the clutch lever dust cover out of place.
- Loosen the knurled locknut, turn the adjuster to obtain the proper amount of lever play, and tighten the locknut.

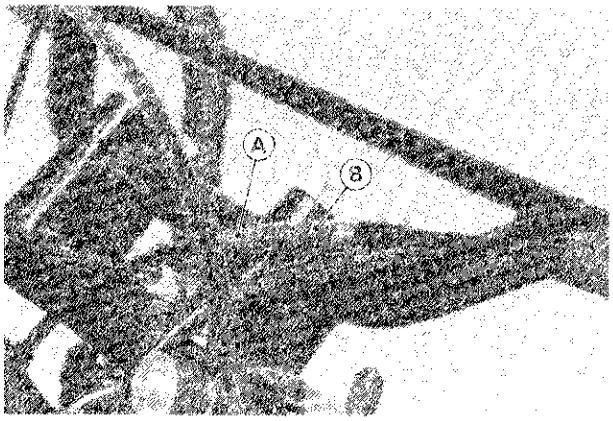


A. Adjuster
B. Knurled Locknut
C. 2 – 3 mm
D. Clutch Lever

- Slide back the clutch lever dust cover.

If the adjuster at the clutch lever has reached its limit, adjust the cable with the adjusting bolt on the middle of the clutch cable.

- Loosen the locknut on the middle of the clutch cable.



A. Locknut
B. Adjusting Bolt (middle)

- Turn the adjusting bolt so that the clutch lever will have 2 – 3 mm of play.

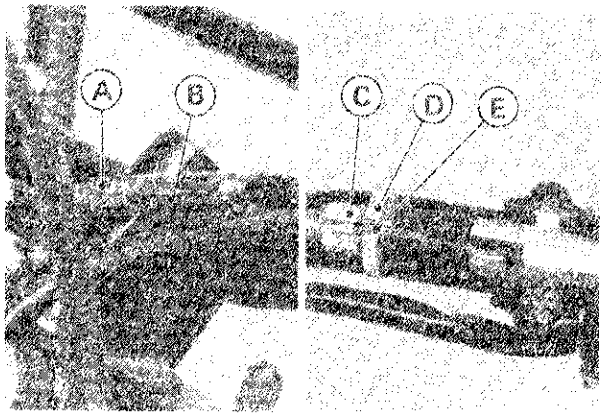
WARNING

Be sure that the outer cable end at the clutch lever is fully seated in the adjuster at the clutch lever, or it could slip into the place later, creating enough cable play to prevent clutch disengagement.

- Tighten all the locknut, and slide back the clutch lever dust cover.
- After the adjustment is made, start the engine and check that the clutch does not slip and that it releases properly.

Clutch Cable Removal

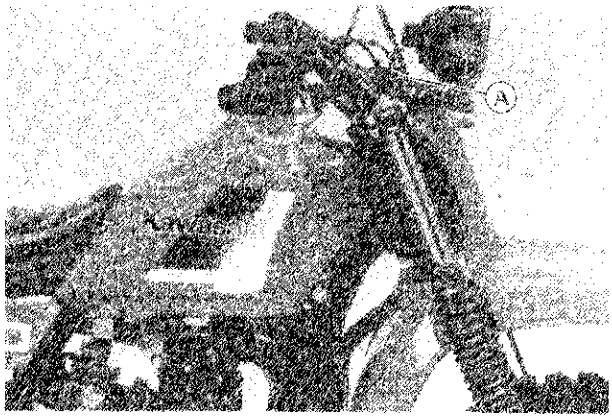
- Slide the clutch lever dust cover out of place.
- Loosen the knurled locknut and screw the adjuster in.
- Loosen the locknut on the middle of the clutch cable.
- Turn the adjusting bolt so that the clutch lever will have plenty of play.
- Line up the slots in the clutch lever, knurled locknut and adjuster, and then free the cable from the lever.



A. Locknut
B. Adjusting Bolt
C. Adjuster
D. Knurled Locknut
E. Slot

Clutch Cable Installation

- Route the cable as follows.



A. Clutch Cable

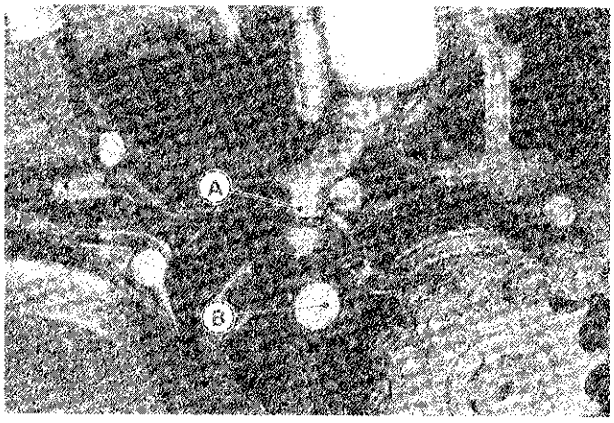
Clutch Release Removal/Installation

Removal

●Remove the clutch release shaft mounting bolt, pull the release shaft out of the left crankcase.

Installation

●Apply molybdenum disulfide grease to the lower portion of the shaft and O-ring. Fit the clutch release shaft into place, and tighten the mounting bolt.

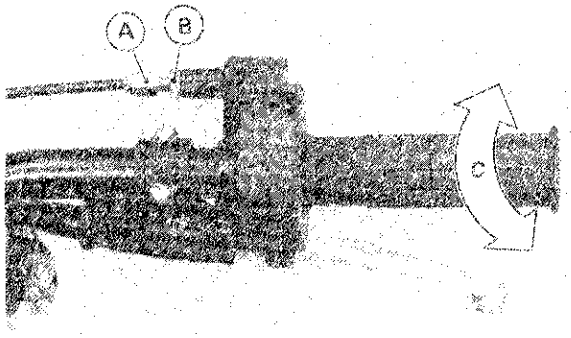


A. Clutch Release Shaft B. Mounting Bolt

Throttle Cable

Adjustment

●Check that the throttle grip has 2 – 3 mm of play and turns smoothly.

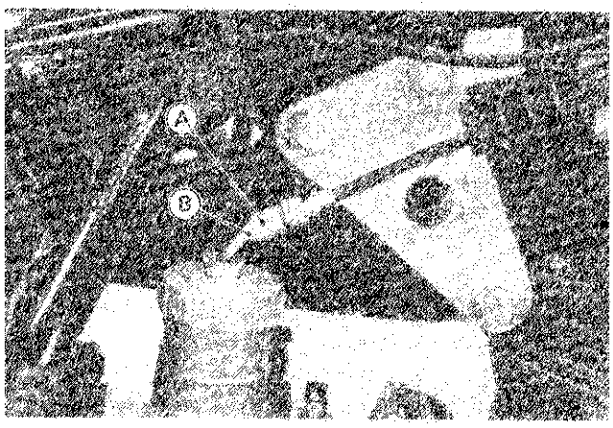


A. Adjuster C. 2 – 3 mm
B. Locknut

●If the play is incorrect, loosen the locknut in the upper end of the throttle cable, and turn the adjuster to obtain the correct amount of play. Tighten the locknut.

"NOTE"

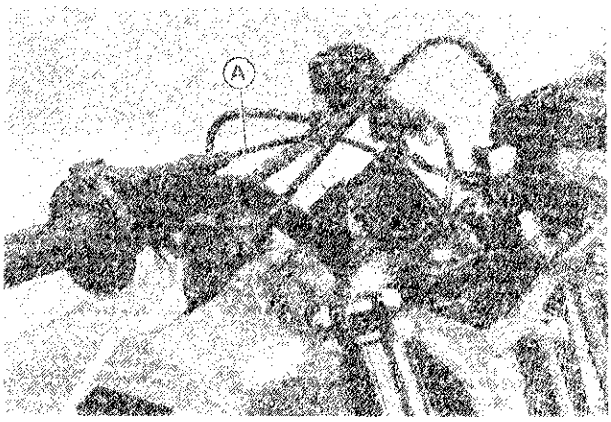
If the throttle grip play cannot be adjusted with the adjusting nut at the grip, use the cable adjuster at the carburetor. After completion of the adjustment, do not forget to securely tighten the locknut.



A. Adjuster B. Locknut

Installation

●Route the cable as follows.

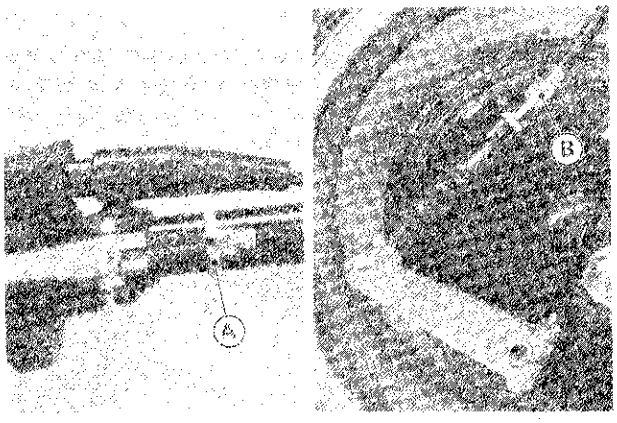


A. Throttle Cable

Brake Cable

Brake Cable Removal

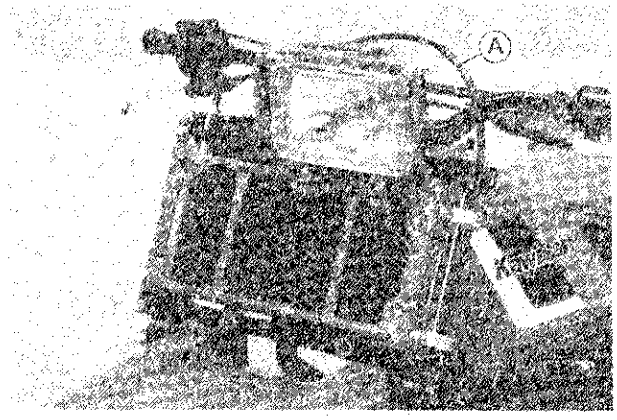
●Screw both adjusters in to give a plenty of play.
●Line up the slots in the brake lever and adjuster.
●Free the cable from the lever.



A. Adjuster – lever B. Adjuster –lower end

Brake Cable Installation

*Route the cable as follows.



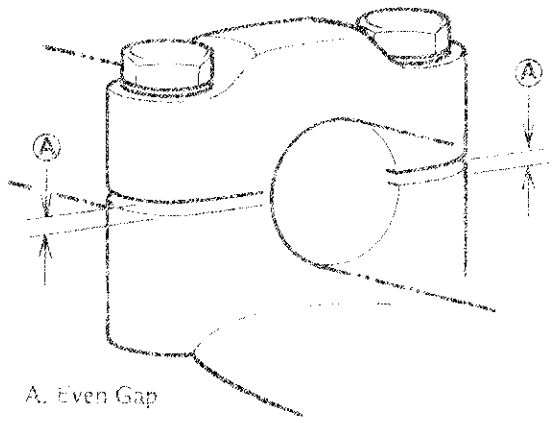
A. Brake Cable

Handlebar

Installation

*Mount the handlebar clamps so that the front and rear gaps will be equal.

Handlebar Clamp Installation



A. Even Gap

*Tighten the handlebar clamp bolt to the specification.

Tightening Torque

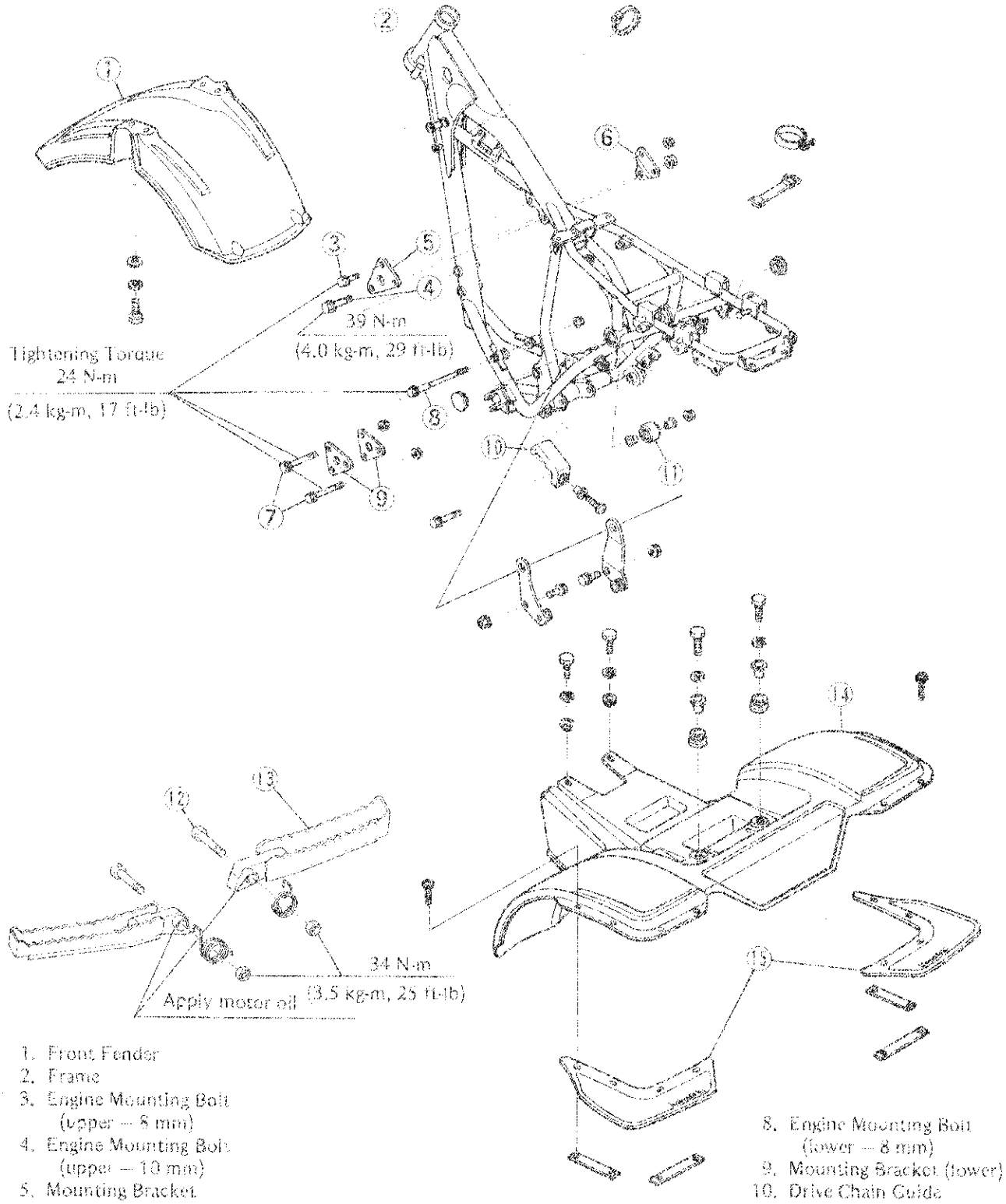
21 N·m (2.1 kg-m, 15 ft-lb)

Frame

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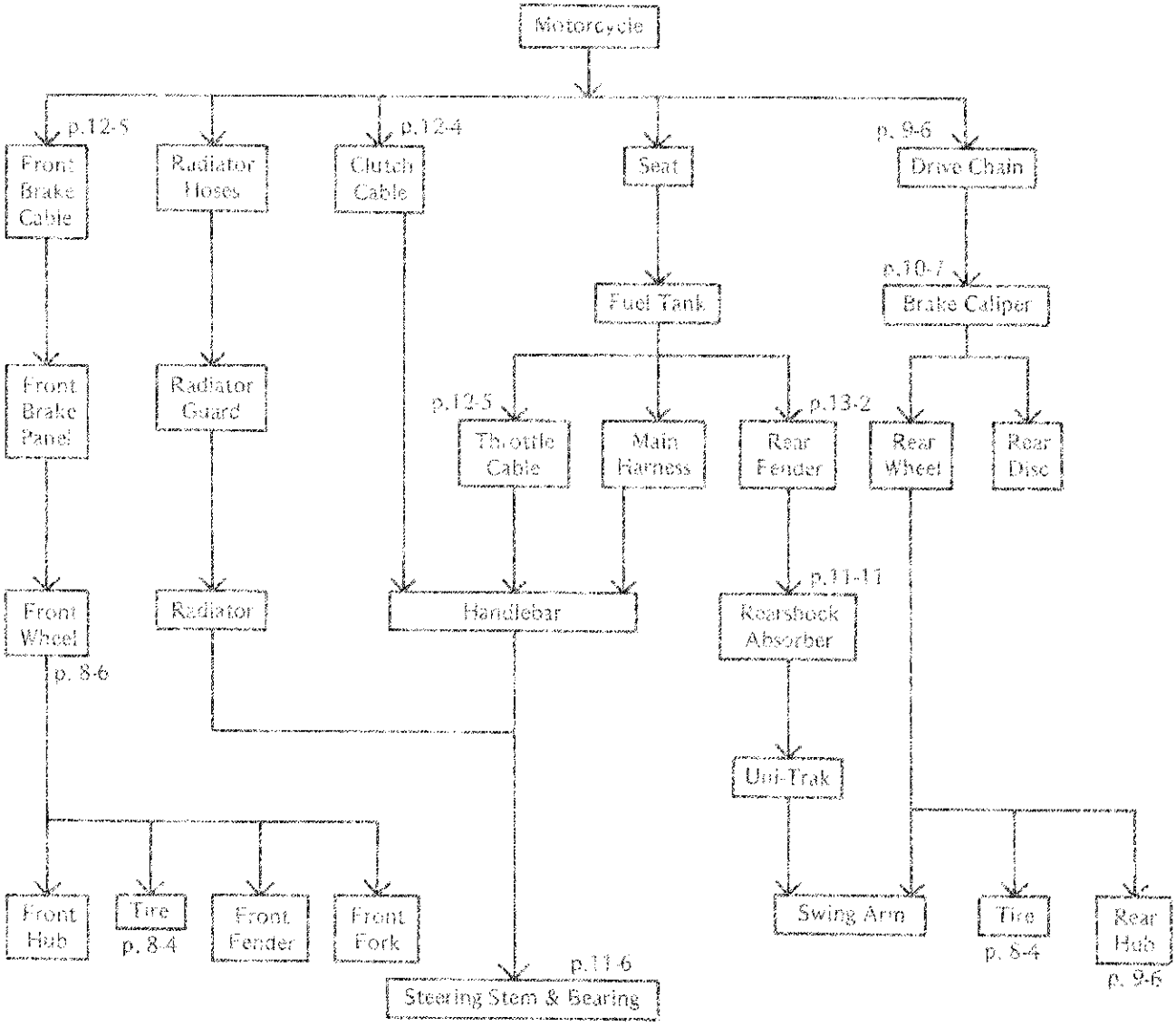
Exploded Views

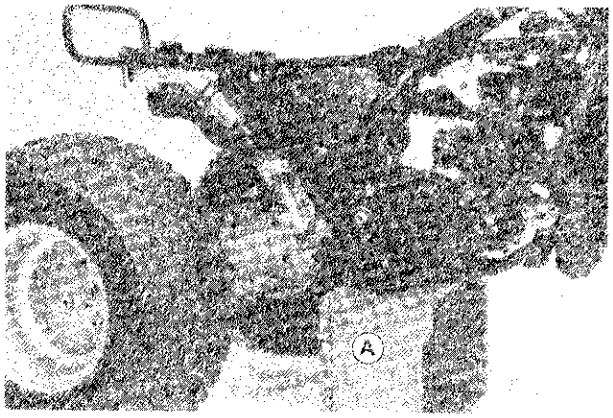


1. Front Fender
2. Frame
3. Engine Mounting Bolt (upper – 8 mm)
4. Engine Mounting Bolt (upper – 10 mm)
5. Mounting Bracket (left, upper)
6. Mounting Bracket (right, upper)
7. Engine Mounting Bolt (Lower – 8 mm)
8. Engine Mounting Bolt (lower – 8 mm)
9. Mounting Bracket (lower)
10. Drive Chain Guide
11. Chain Guide Roller
12. Foot Peg Mounting Bolt
13. Foot Peg
14. Rear Fender
15. Flap

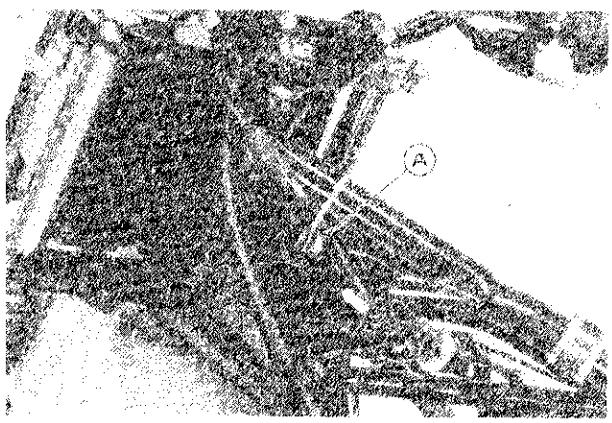
Disassembly Flow Chart — Chassis

○This chart is designed to aid in determining proper removal sequence. Select the component you wish to remove and follow the arrows to that point on the chart.
●Set the motorcycle up on a stand or jack so that it is stable during removal and installation operation.
●For later installation convenience, note and record how and where cables, wirings, and hoses are routed. They should not be allowed sharp bend, kinking, nor twisting.





A. Stand



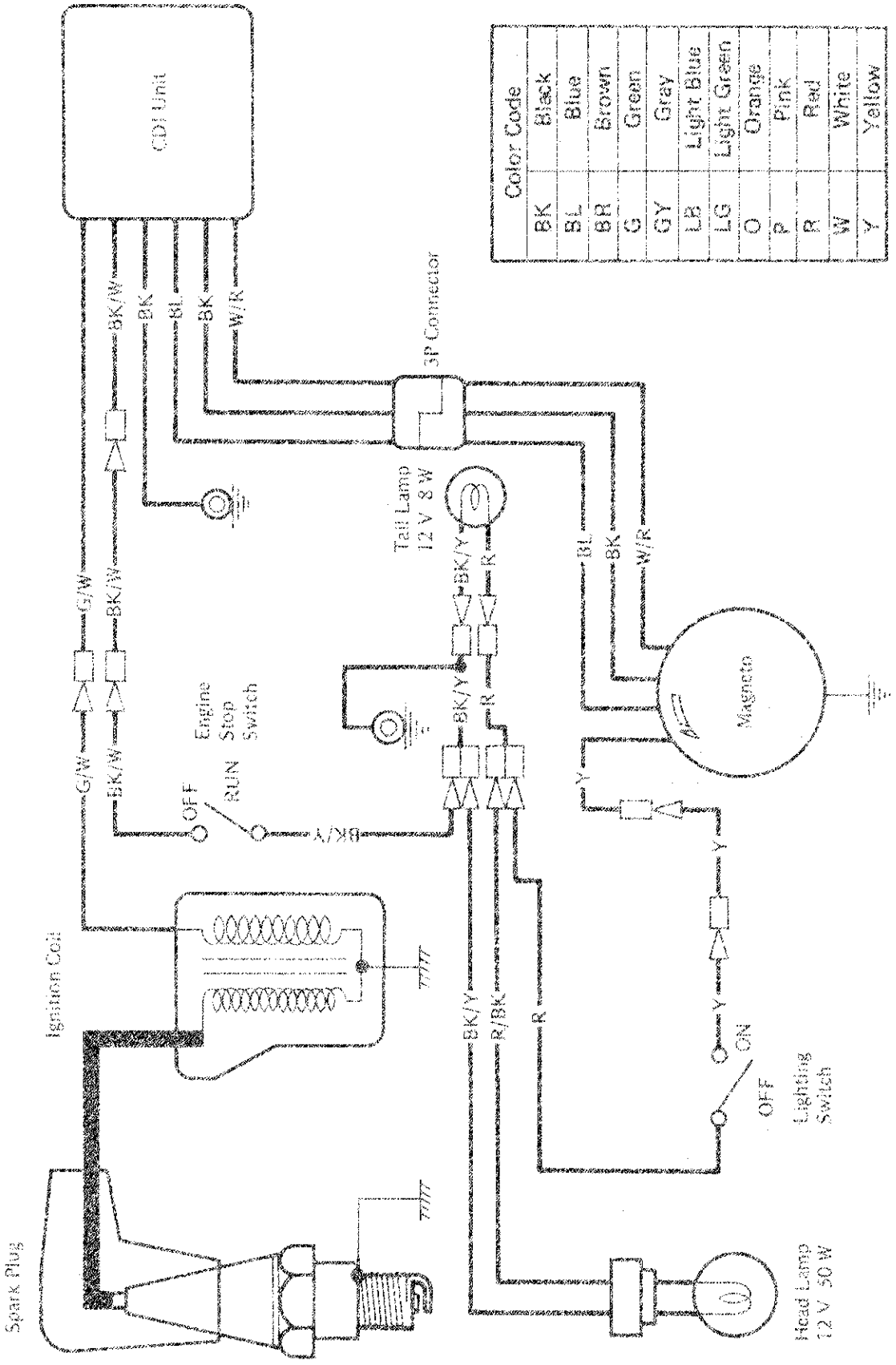
A. Main Harness

Electrical System

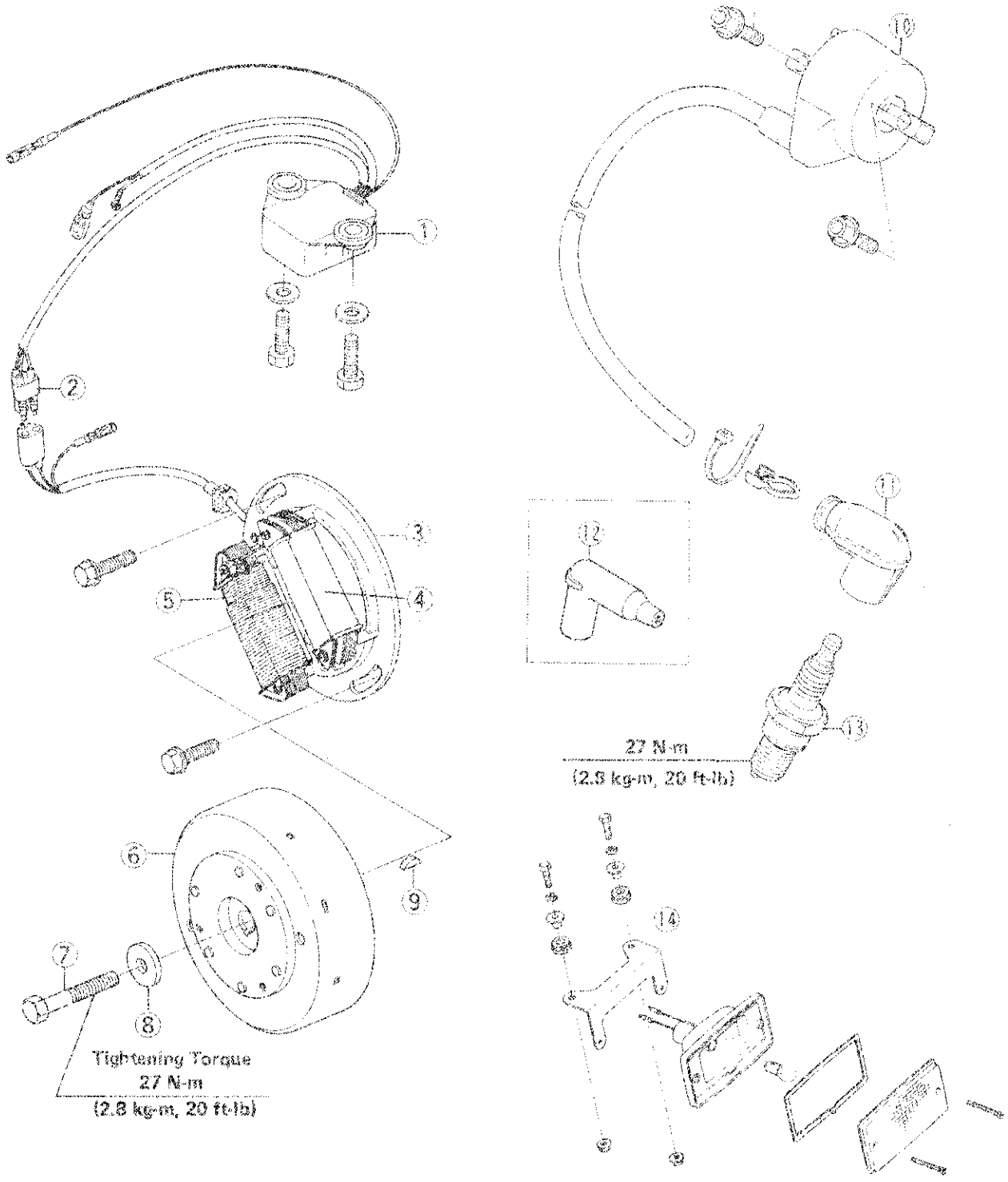
Table of Contents

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CDI Unit Inspection 14-12

Wiring Diagram



Exploded Views



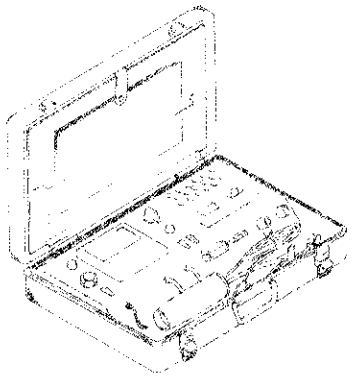
1. CDI Unit
2. 3-pin Connector
3. Stator
4. Charging Coil
5. Lighting Coil
6. Fly Wheel Magneto
7. Fly Wheel Bolt
8. Flat Washer
9. Woodruff Key
10. Ignition Coil
11. Spark Plug Cap: US
12. Spark Plug Cap: Canada
13. Spark Plug
14. Tail Light Unit

Service Data

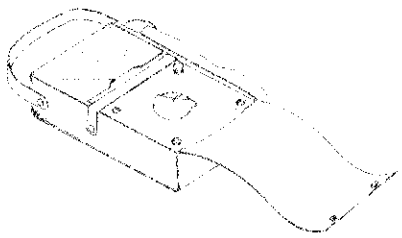
Item	Standard	See Page
AC Lighting Voltage:	10.2 V @2,500 r/min (rpm) not more than 17 V @10,000 r/min (rpm)	14-8
Stator Lighting Coil Resistance:	Y-BK: 0.47 – 0.71 Ω	14-8
Spark Plug:		
Plug gap	0.7 – 0.8 mm	14-8
Plug type	Ⓘ NGK B8ES, Ⓒ NGK BR8ES	
Ignition Timing:	17° @6,000 r/min (rpm)	14-9
Piston Position at Timing Mark:	Distance from TDC: 1.79 mm	14-10
Ignition Coil:		
Arcing distance	7 mm or more (3-needle method)	14-11
Primary winding resistance	0.8 – 1.2 Ω	14-12
Secondary winding resistance	5.6 – 8.4 kΩ	
Stator Charging Coil Resistance:	BK–BL 170 – 250 Ω BK–W/R 185 – 280 Ω BL–W/R 20 – 30 Ω	14-12
CDI Unit Resistance:	– – –	14-12

Special Tool

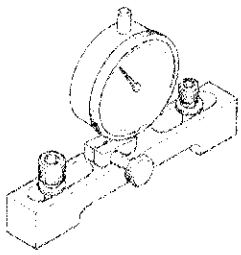
Electro Tester: 57001-980



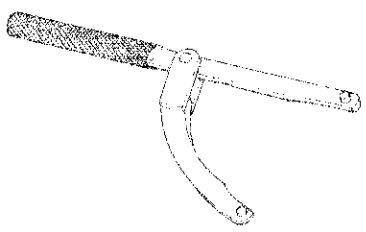
Hand Tester: 57001-983



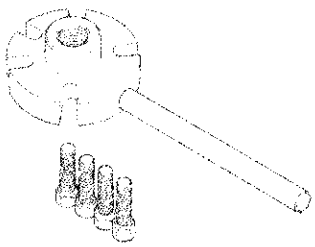
TDC Finder B: 57001-160



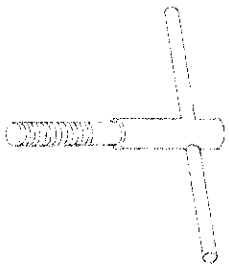
Magneto Flywheel Holder: 57001-306



Flywheel Puller: 57001-259



Flywheel Puller: 57001-1016

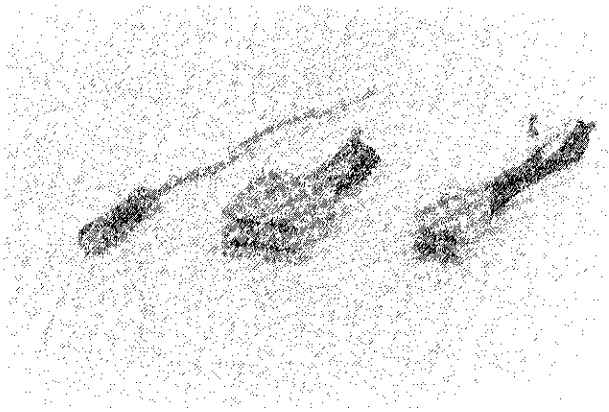


Precautions

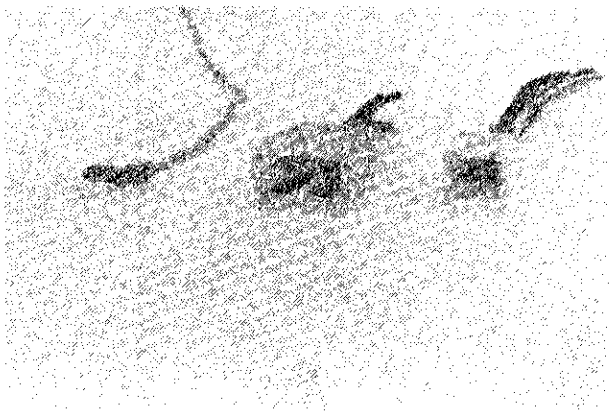
There are numbers of important precautions that are musts when servicing electrical systems. Though cautions that apply to the indications are listed below, failure to observe these rules can result in serious system damage. Learn and observe all the rules below.

- ○ The electrical parts should never be struck sharply, as with a hammer, or allowed to fall on a hard surface. Such a shock to the parts can damage them.
- ○ Troubles may involve one or in some cases all items. Never replace a defective part without determining what CAUSED the failure. If the failure was brought on by some other item or items, they too must be repaired or replaced, or the new replacement will soon fail again.
- ○ Make sure all connectors in the circuit are clean and tight, and examine wires for signs of burning, fraying, etc. Poor wires and bad connections will affect electrical system operation.
- ○ Electrical Connectors

Female Connectors



Male Connectors



- ○ Color Codes:

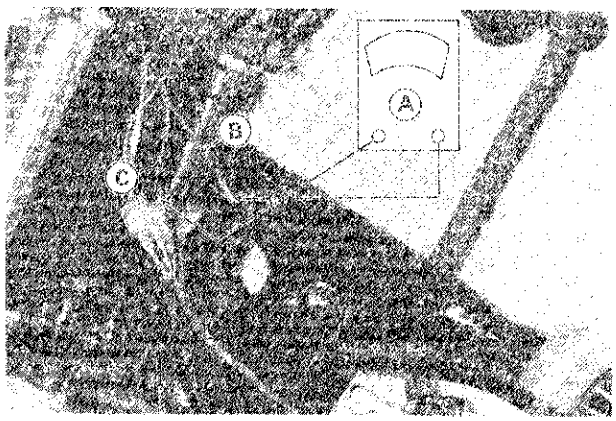
BK	Black
BL	Blue
BR	Brown
CH	Chocolate
DG	Dark green
G	Green
GY	Gray
LB	Light blue
LG	Light green
O	Orange
P	Pink
R	Red
W	White
Y	Yellow

- ○ Measure coil and winding resistance when the part is cold (at room temperature).

Engine Stop Switch

Inspection

- ✱Remove the fuel tank.
- ●Disconnect following two connectors and connect a meter as shown.
- ★If the meter does not read as specified, the switch is defective. Replace it.



A. Multimeter
B. BK/W
C. BK/Y

Engine Stop Switch Continuity

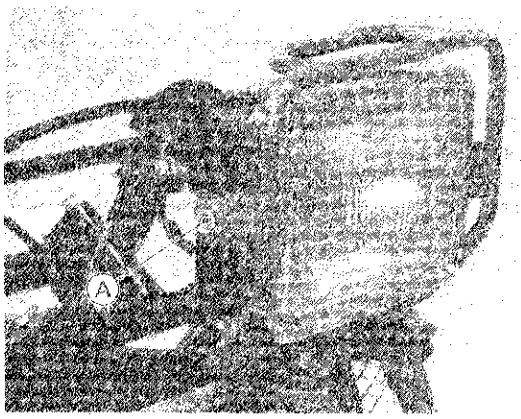
Switch Position	Meter Reading
RUN	∞ Ω
OFF	0 Ω

Lighting System

Headlight Adjustment

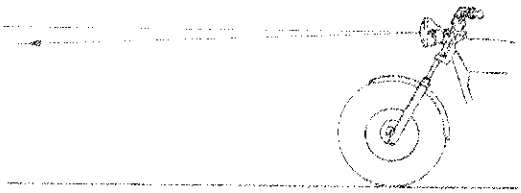
*Adjust the headlight so that it points slightly below horizontal.

*Loosen the headlight mounting nuts, and adjust the headlight vertically.



A. Headlight Mounting Nuts

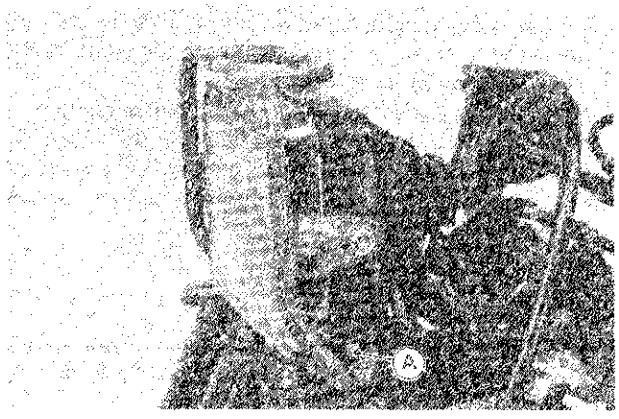
Vertical Adjustment



Headlight Bulb Replacement

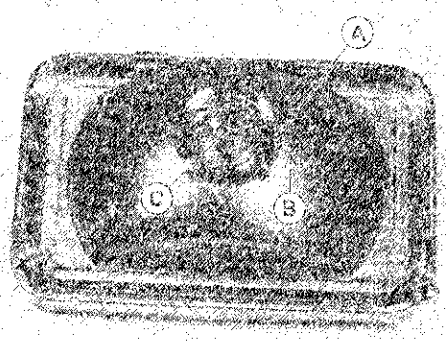
*Disconnect the headlight connector.

*Loosen the lower headlight screws and drop out the headlight housing.



A. Lower Headlight Screws

*Push and open the spring clips to remove the bulb.



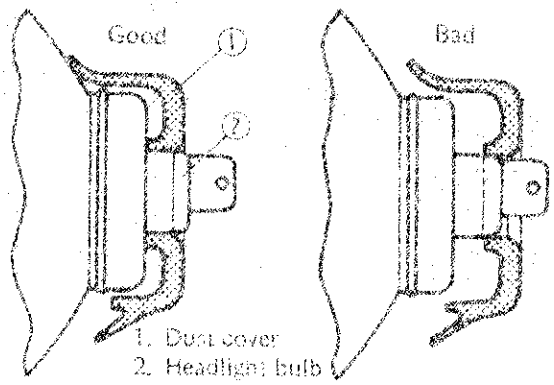
A. Spring Clip B. Push C. Bulb

Headlight Bulb Installation

*Install the dust cover of headlight as shown.

*Check the headlight aiming after installation.

Dust Cover Installation



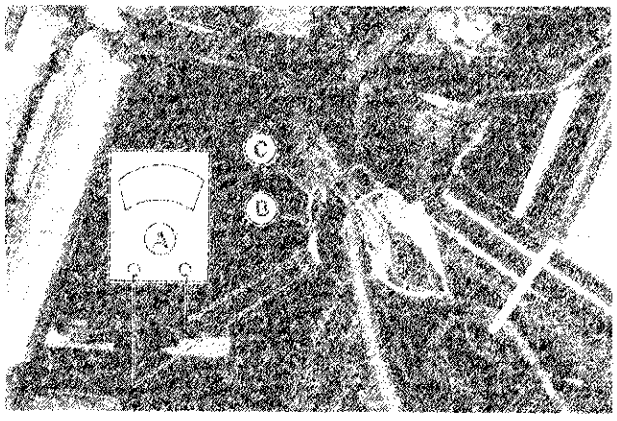
1. Dust cover
2. Headlight bulb

Headlight Circuit Inspection

If the headlight does not light, check to see if the bulb has burned out. If the bulb is good, check the lighting switch.

*Remove the fuel tank.

*Disconnect following two connectors and connect a meter as shown in the figure.



A. Meter (× 1 Ω) C. Y Lead
B. R Lead

Head Light Switch Continuity

Switch Position	Meter Reading (x1 Ω)
ON	0 Ω
OFF	∞ Ω

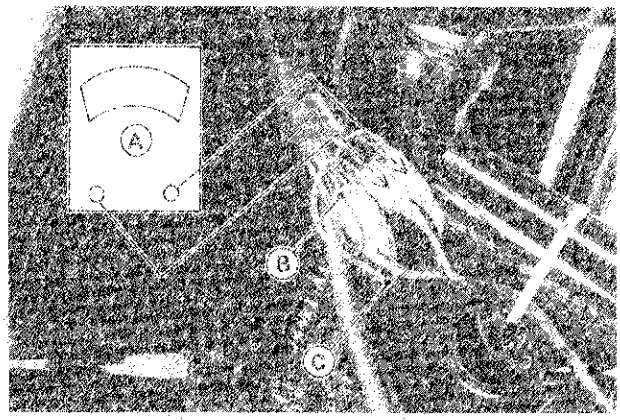
AC Lighting Voltage Measurement

The condition of the lighting coil of magneto is determind by measuring the voltage of the AC output.

"NOTE"

oPerform test with headlight connected.

*Connect a voltmeter as shown in the figure.



A. AC Voltmeter (25 V AC)
B. BK/Y Lead
C. R/BK Lead

*Turn on the lighting switch to ON position and start the engine.
*See that the headlight and tail light are all lit.
*Measure the lighting voltage at 4,000 rpm. The voltage should show the value in the table.
*If the reading is much lower than specified, check the magneto.

AC Lighting Voltage

Meter	Reading
AC25V	10.2 V @2,500 rpm not more than 17 V @10,000 rpm

Magneto Inspection

*Remove the tank and disconnect the 3 P connector and the connector (Y lead) from the magneto.
*Connect an ohmmeter to measure the lighting coil resistance.
*If there is more resistance than shown in the table, the coil has an open lead, and must be replaced. Much less than this resistance means the coil is shorted, and must be replaced.
*If the coil has normal resistance, but the operational inspection showed the magneto to be defective: then the flywheel magnets have probably weakened, and the flywheel must be replaced.

Lighting Coil Resistance

Connection		Reading
Meter (x 1Ω)	Y	0.47 – 0.71 Ω
	BK	

Ignition System

This model has a Capacitor Discharge Ignition (CDI) system.

Since the CDI system has no mechanical parts such as a cam or contact breakers, there are no parts to wear out and no periodic maintenance is required. So, unless there is circuit failure or the magneto stator plate is incorrectly installed during engine assembly, **there is never any need to readjut the timing.** However, if there is any doubt as to correct timing, inspect as follows.

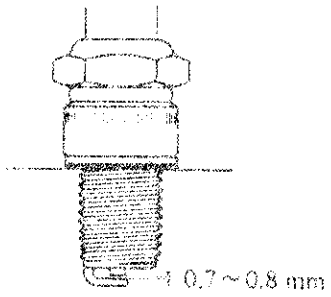
Spark Plug Cleaning and Gapping

*Remove the spark plug.
*Clean the spark plug preferably in a sand-blasting device, and then clean off any abrasive particles. The solvent and a wire brush or other suitable tool.
*If the spark plug electrodes are corroded or damaged, or if the insulator is cracked, replace the plug. Use the standard plug or its equivalent.
*Measure the gap with a wire-type thickness gague.
*If the gap is incorrect carefully bend the outer electrode, with a suitable tool to obtain the correct gap.
*Tighten the spark plug in the cylinder head to specified torque.

Spark Plug

Plug	:	Ⓒ NGK B8ES, Ⓒ BR8ES
Gap	:	0.7 – 0.8 mm
Tightening Torque	:	27 N-m (2.8 kg-m, 20 ft-lb)

Spark Plug



Ignition Timing Test (dynamic)

●Connect a strobe light in the manner prescribed by the manufacturer in order to check the ignition timing under operating conditions.

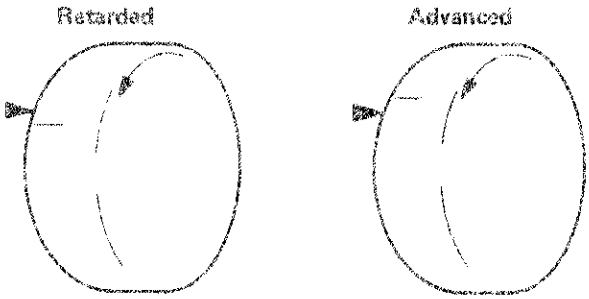
WARNING

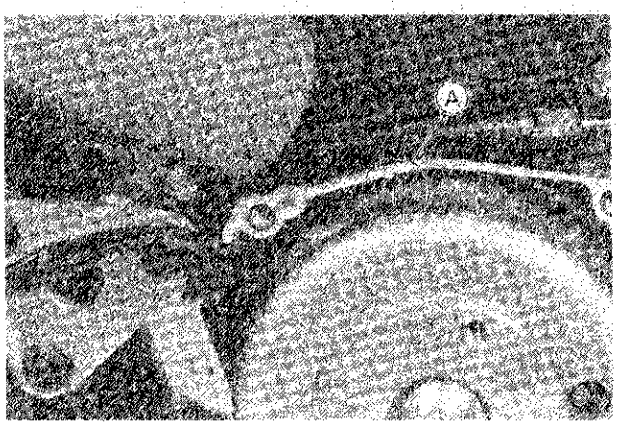
○**Make sure that no tools, clothes, or leads ever touch the spinning flywheel. Touching the flywheel of a running engine could cause an injury.**

●Start the engine, run the engine at 6,000 rpm, and direct the light at the timing marks on the flywheel and crankcase. The marks should align at 6,000 rpm.
●If they do not, check the timing marks, using TDC finder (See next item).

Dynamic Ignition Timing

1. Plug Fires Late
2. Plug Fires Early

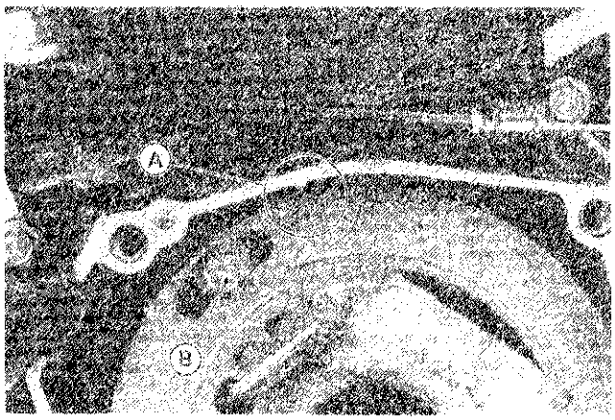




A. Timing Marks

Ignition Timing Adjustment

●Remove the magneto cover.
●Remove the magneto (See p. 14-10).
●Check to see if the mark on the magneto stator is aligned with the mark on the crankcase.



A. Marks B. Screw

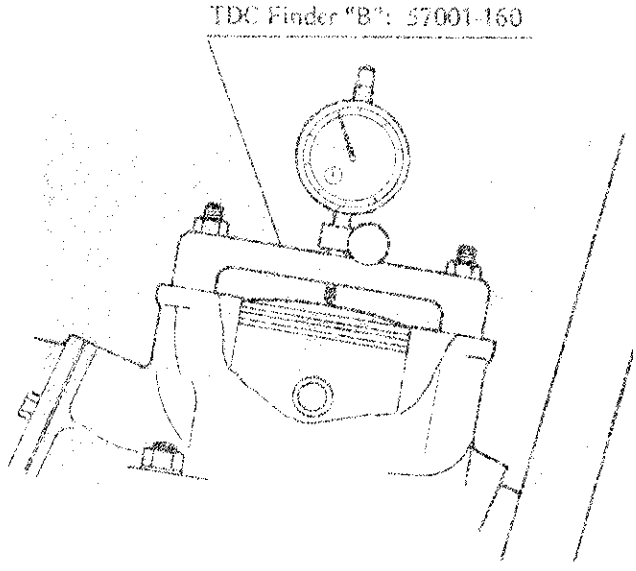
●If the marks are not aligned, loosen the two magneto stator bolts and move the magneto stator to align the mark.

Verification of Timing Marks

The accuracy of the timing marks can be checked with a dial gauge and TDC finder (special tool).

●Drain the coolant.
●Remove the following parts
○Fuel tank
○Muffler
○Cylinder Head
○Magneto Cover
●Turn the crankshaft until the position of the piston is close to the top.
●Using TDC finder "B" (special tool), mount a dial gauge on the finder, turn the crankshaft to set the piston at exact TDC (top dead center), and set the dial to zero.

TDC Finder "B": 57001-160



*Turn the flywheel clockwise until the dial gauge read about 2 mm and then counterclockwise until the dial gauge reads specified value as shown in the table.

Piston Position at Timing Mark

Distance from TDC : 1.79 mm

*The timing mark on the flywheel should align with the timing projection on the magneto cover at this point.

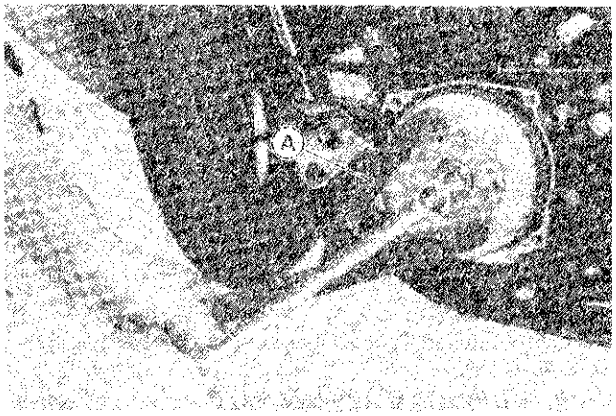
*If it does not, set the piston at the specified position BTDC (before top dead center) and make a new timing mark on the flywheel just under the projection.
*Check the ignition timing.

"NOTE"

○*When inspecting ignition timing after verifying the timing marks with a dial gauge, use your new timing mark.*

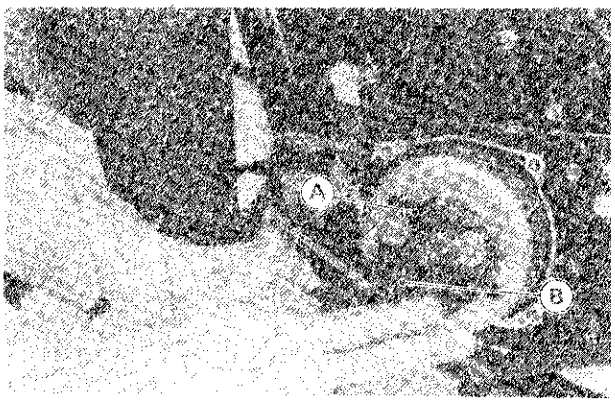
Magneto Removal

*Using the magneto flywheel holder (special tool) to hold the flywheel steady, loosen the flywheel bolt a few turns. Do not take out the bolt and washer yet.



A. Magneto Flywheel Holder: 57001-306

*Insert the suitable bolts (M6 x P1.0 x L25 – 30 mm) until the clearance between the flywheel and the bolt head becomes about 5 mm (0.2 in).
*Using the magneto flywheel pullers (special tools), pull out the flywheel.
*Remove the bolt and flat washer.



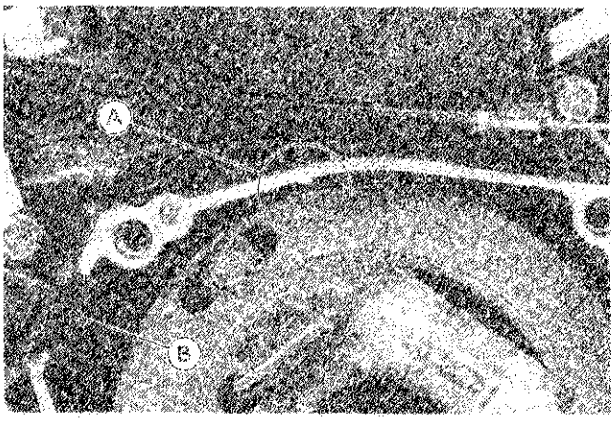
A. Flywheel Puller: 57001-259
B. Flywheel Puller: 57001-1016

CAUTION

○**If the flywheel is difficult to remove and a hammer is used to tap the flywheel puller, be careful not to strike the flywheel itself. Striking the flywheel can cause the magnets to lose their magnetism.**

Magneto Installation

*Install the magneto stator so that the mark on the magneto stator aligns with the mark on the crankcase. Fit the rubber fitting into the crankcase.

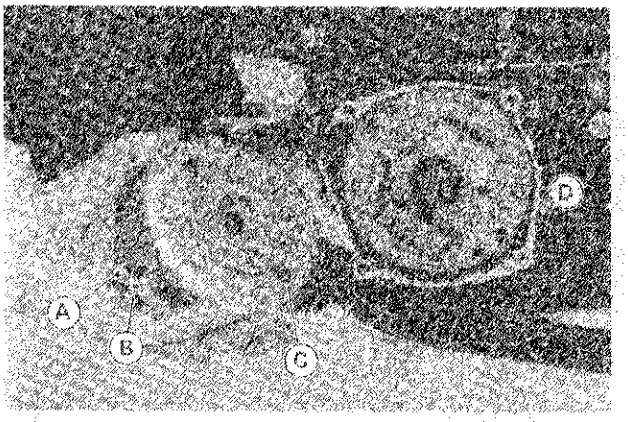


A. Marks B. Rubber Fitting

*Fit the woodruff key on the left side of the crankshaft.
*Fit the magneto flywheel and insert the flat washer and bolt. Using the flywheel holder (special tool) to keep the crankshaft steady, tighten the flywheel bolt to the specification.

Flywheel Bolt Tightening Torque

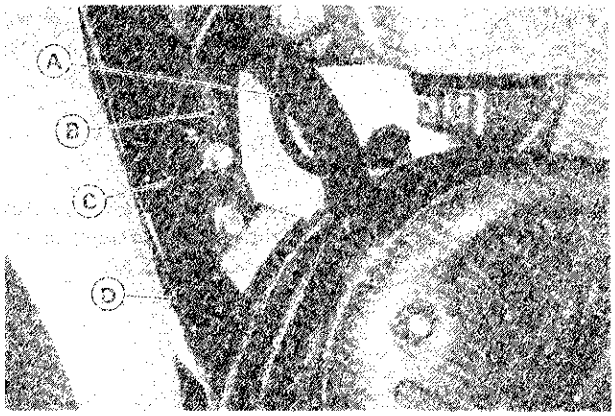
27 N·m (2.8 kg-m, 20 ft-lb)



A. Bolt
B. Flat Washer
C. Magneto Flywheel
D. Woodruff Key

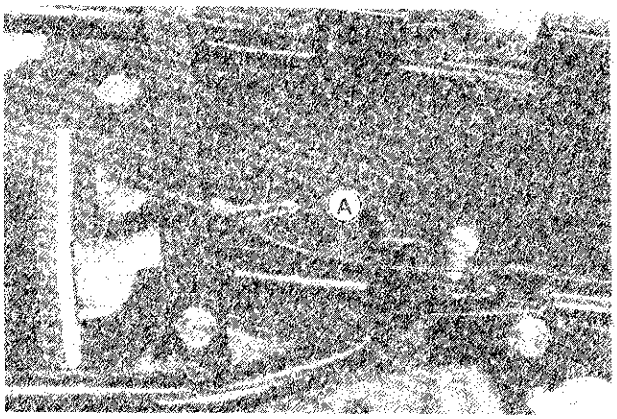
Harness Installation

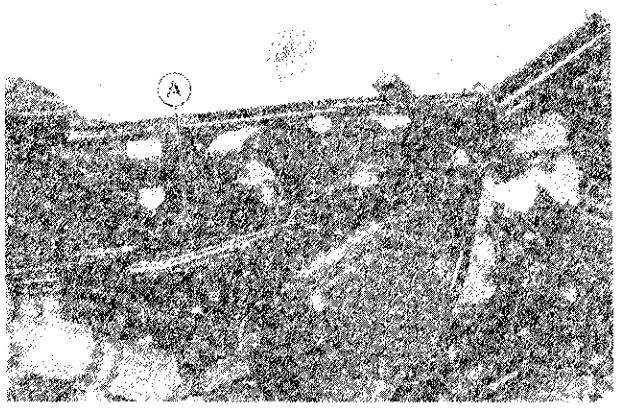
*Feed the spark plug lead, magneto lead, and head light lead so that they do not directly touch the muffler.



A. Spark Plug Lead
B. Breather Hose
C. Magneto Output Lead
D. Clutch Cable

*Route the main harness as follows.





A. Main Harness

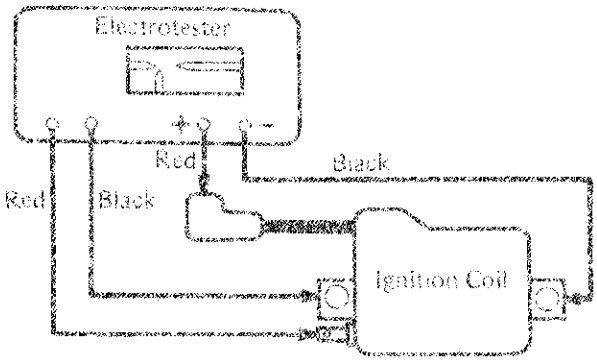
Ignition Coil Inspection

The most accurate test for determining the condition of the ignition coil is made by measuring arcing distance with the Kawasaki Electrotester. Since a tester other than the Kawasaki Electrotester may produce a different arcing distance, the Kawasaki Electrotester is recommended for reliable results.

*Remove the ignition coil.

*Connect the ignition coil to the Kawasaki Electrotester as shown in the figure.

Ignition Coil Test



*Turn on the tester switches.

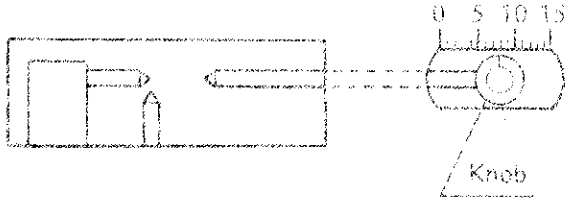
WARNING

To avoid extremely high voltage shocks, do not touch the coil or leads.

*Gradually slide the arcing distance adjusting knob from left to right (small distance to large distance) carefully checking the arcing.

*Stop moving the knob at the point where the arcing begins to fluctuate, and note the knob position in mm. The reading should be 7 mm.

Arcing Distance Measurement



*If the distance reading is less than the specified value, the ignition coil or spark plug cap is defective.

*To determine which part is defective, measure the arcing distance again with the spark plug cap removed from the ignition coil.

*If the arcing distance is subnormal as before, the trouble is with the ignition coil itself. If the arcing distance is now normal, the trouble is with the spark plug cap.

"NOTE"

If an Electrotester is not available, the coil can be checked for a broken or badly shorted winding with an ohmmeter. However, an ohmmeter cannot detect layer shorts and shorts resulting from insulation breakdown under high voltage.

Ignition Coil Resistance Measurement

*Remove the fuel tank.

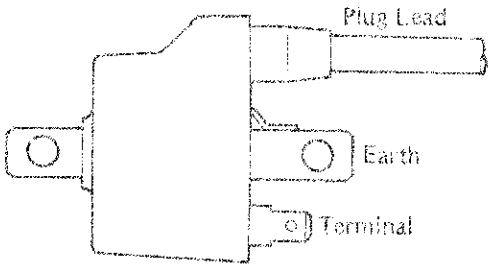
*Disconnect the green/white ignition coil lead, pull the spark plug cap off the spark plug. For measurement of secondary winding resistance, remove the spark plug cap from the spark plug lead.

*Connect the Kawasaki hand tester (or small portable type of multimeter) as shown in the table. "Zero" the meter before using it

Ignition Coil Resistance

Meter	Connection	Reading
x 1 Ω	Terminal – earth	0.8 – 1.2 Ω (primary)
x 1 kΩ	Plug lead – earth	5.6 – 8.4 kΩ (secondary)

Measuring Ignition Coil Resistance



Magneto Stator Coil Inspection

If the spark is weak or absent after the spark plug and ignition coil are found to be all functioning properly, and if the wiring is all in good condition and properly connected, the cause may be a short or open in the stator coil.

*Disconnect the 3-pin magneto connector under the fuel tank.

*Use an ohmmeter, and measure the resistance between the leads shown in the Table.

*If however, the coil checks out good, the cause is probably a loss of magnetism in the flywheel. Replace the flywheel and the stator as a unit.

Stator Charging Coil Resistance

Meter	Connection	Reading
x 10 kΩ	BK – BL	170 – 250 Ω
	BK – W/R	185 – 280 Ω
	BL – W/R	20 – 30 Ω

CDI Unit Inspection

If a Kawasaki Electrotester is not available, the unit can be tested with a multimeter (small radio repair type). Set the meter to the highest resistance range available (x kΩ), and connect the meter leads as shown in the table. If the readings correspond to the table, the CDI unit is good. "Zero" the meter before using it.

CAUTION

○**Use only a small portable type of multimeter for this test. If a megger or a meter with a large-capacity battery is used, the CDI unit may be damaged.**

"NOTE"

○*(∞*) in the table indicates small deflection and return of needle. Before checking the connections, short-circuit G/W and BK/W leads to discharge any residual voltage in the capacitor.*

○*Check resistance at room temperature.*

CDI Unit Resistance

Range x 1 kΩ		Meter Positive (+) Lead Connection				
		BL	BK x 2	W/R	BK/W	G/W
Meter Negative (–) Lead connection	BL		∞	∞	∞	∞
	BK x 2	3.1 kΩ		1 MΩ	2.9 kΩ	∞*
	W/R	∞	∞		2.9 kΩ	∞*
	BK/W	∞	∞	1 MΩ		∞*
	G/W	∞	∞	∞*	∞*	

Appendix

Table of Contents

Troubleshooting Guide 15-2
Unit Conversion Table. 15-4

Troubleshooting Guide

Engine Doesn't Start or Starting Difficulty:

Engine won't turn over
- Cylinder, piston seizure
- Connecting rod small end seizure
- Connecting rod big end seizure
- Transmission gear or bearing seizure
- Kick return spring broken
- Kick gear not engaging

Compression low
- Cylinder worn
- Piston ring worn, weak, broken, or sticking
- Piston ring groove and ring clearance excessive
- Cylinder head not sufficiently tightened down
- Cylinder warped
- Cylinder head gasket damaged
- Crankshaft oil seal leak

No spark or spark weak
- Spark plug faulty
- Spark plug cap poorly connected or shorted
- Ignition coil faulty
- Wiring open or shorted
- Magneto faulty (layer short)

No fuel flow
- No fuel in fuel tank
- Fuel hose clogged
- Fuel tap clogged
- Float valve clogged
- Pilot jet clogged

Flooded
- Fuel level too high
- Float valve worn or stuck open

Poor Running at Low Speed:

Spark weak
- Spark plug faulty
- Ignition coil faulty
- Spark plug cap, high tension cord short
- Spark plug gap excessive

Mixture too rich or too lean
- Pilot jet or air passage clogged
- Idle adjusting screw maladjusted
- Starter plunger stuck open
- Fuel level too high or too low
- Air cleaner clogged
- Intake manifold loose
- Tank cap air vent obstructed

Compression low
- Cylinder worn
- Piston ring worn, weak, broken, or sticking
- Piston ring groove and ring clearance excessive
- Cylinder head not sufficiently tightened down
- Cylinder head warped
- Cylinder head gasket damaged
- Crankshaft oil seal leak

Other
- Ignition timing incorrect
- Transmission oil viscosity too high

Poor Running or No Power at High Speed:

Mixture too rich or too lean
- Air cleaner clogged
- Intake manifold loose
- Main jet clogged or wrong size
- Jet needle or needle jet worn
- Starter plunger stuck open
- Tank cap air vent obstructed
- Fuel level too high or too low

Compression low
- Cylinder worn
- Piston ring worn, weak, broken, or sticking
- Piston ring groove and ring clearance excessive
- Cylinder head not sufficiently tightened down
- Cylinder head warped
- Cylinder head gasket damaged
- Crankshaft oil seal leak

Misfiring
- Spark plug faulty
- Spark plug cap poorly connected or shorted
- Ignition coil faulty
- High tension lead faulty

Knocking
- Ignition timing advanced
- Fuel poor quality
- Carbon built up in combustion chamber

Other
- Ignition timing incorrect
- Brakes dragging
- Overheating
- Clutch slipping
- Throttle valve does not fully open
- Transmission oil quantity excessive
- Transmission oil viscosity too high

Overheating:

- Ignition timing retarded
- Carbon built up in combustion chamber
- Brakes dragging
- Clutch slipping
- Intake manifold loose or damaged
- Main jet clogged
- Fuel level too low
- Coolant level too low
- Coolant deteriorated
- Radiator clogged
- Radiator cap faulty
- Water pump not rotating
- Water pump impeller damaged

Clutch Not Operating Smoothly:

Clutch slipping
- No clutch lever play
- Friction plates worn
- Clutch springs weak
- Clutch inner cable not sliding smoothly

Clutch doesn't disengage properly
- Clutch lever play excessive
- Clutch plates warped or damaged
- Clutch springs not evenly tightened
- Transmission oil deteriorated or of too high viscosity
- Clutch inner cable not sliding smoothly

Shift Operation Not Smooth:

Doesn't go into gear or shift pedal doesn't return
- Clutch not disengaging
- Shift return spring weak or broken
- Shift return spring pin loose
- Gear set lever spring broken
- Shift shaft gear broken
- Shift fork bent or seized
- Shift drum damaged

Jumps out of gear
- Shift fork worn
- Drive shaft, output shaft, or gear splines worn
- Gear groove worn
- Shift drum groove worn
- Shift fork guide pin worn

Poor Handling or Stability:

Handlebar hard to turn
- Steering stem nut too tight
- Tire pressure too low
- Steering stem lubrication insufficient

Handlebar vibrates or shakes
- Swing arm bent
- Front fork bent
- Frame bent
- Wheel alignment incorrect
- Pivot shaft warped
- Right/left front fork oil level uneven

Shock absorption too stiff
- Front fork oil quantity excessive
- Front fork oil viscosity too high
- Front fork air pressure too high
- Tire air pressure too high

Shock absorption too soft
- Oil quantity in sufficient
- Oil viscosity too low
- Fork spring weak
- Suspension oil leak

Brakes Don't Hold:
- Air in the brake line
- Pad or disc worn
- Brake fluid leak
- Disc warped
- Contaminated pads
- Brake fluid deteriorated
- Primary cup or secondary cup defective
- Master cylinder scratched inside
- Brake maladjustment
- Linings or drum worn
- Brakes overheated
- Water in brakes
- Brake cam worn
- Oil in drum

Abnormal Drive Train Noise

Clutch noise
- Clutch rubber damper deteriorated
- Clutch housing/friction plate clearance excessive
- Clutch housing gear/primary gear backlash excessive
- Metal chip jammed in clutch housing gear teeth

Transmission noise
- Crankcase bearing worn
- Transmission gear worn or chipped
- Metal chip jammed in gear teeth
- Transmission oil insufficient or too thin
- Kick ratchet gear not properly disengaging from kick gear

Drive chain noise
- Chain worn
- Rear and/or engine sprocket(s) worn
- Chain lubrication insufficient

Abnormal Frame Noise

Front fork noise
- Oil insufficient or too thin
- Spring weak or broken

Rear shock absorber noise
- Shock absorber damaged

Disc brake noise
- Pad installed incorrectly
- Pad surface glazed
- Disc carped
- Caliper damaged
- Cylinder damaged

Drum Brake noise
- Brake lining overworn or worn unevenly
- Drum worn unevenly or scored
- Brake spring weak or broken
- Foreign matter in hub
- Brake not properly adjusted

Other noise
- Bracket, nut, bolt, etc. not properly mounted or tightened

Unit Conversion Table

Prefixes for Units:

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

Units of Mass:

kg	x	2.205	=	lb
g	x	0.03527	=	oz

Units of Volume.

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

Units of Force:

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

Units of Length:

km	x	0.6214	=	mile
m	x	3.281	=	ft
mm	xx	0.03937	=	in

Units of Torque.

N-m	x	0.1020	=	kg-m
N-m	x	0.7376	=	ft-lb
N-m	x	8.851	=	in-lb
kg-m	x	9.807	=	N-m
kg-m	x	7.233	=	ft-lb
kg-m	x	86.80	=	in-lb

Units of Pressure:

kPa	x	0.01020	=	kg/cm^2
kPa	x	0.1450	=	psi
kPa	x	0.7501	=	cm Hg
kg/cm^2	x	98.07	=	kPa
kg/cm^2	x	14.22	=	psi
cm Hg	x	1.333	=	kPa

Units of Speed:

km/h	x	0.6214	=	mph

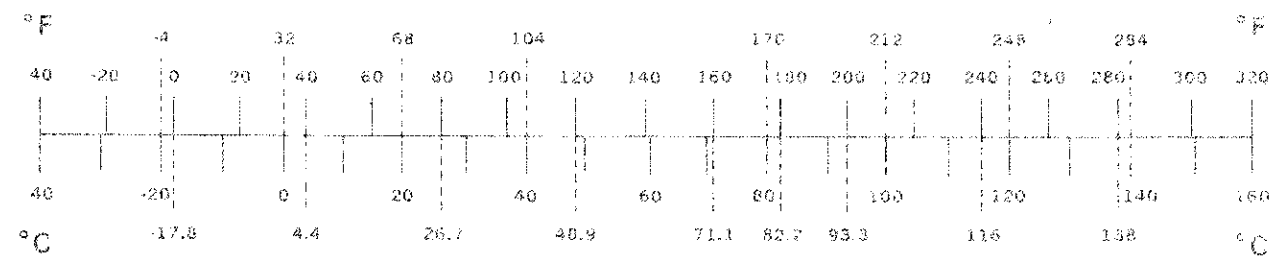
Units of Power:

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

Units of Temperature:

$$\frac{9\,(°C + 40)}{5} - 40 = °F$$

$$\frac{5\,(°F + 40)}{9} - 40 = °C$$



Supplement – 1985 Model

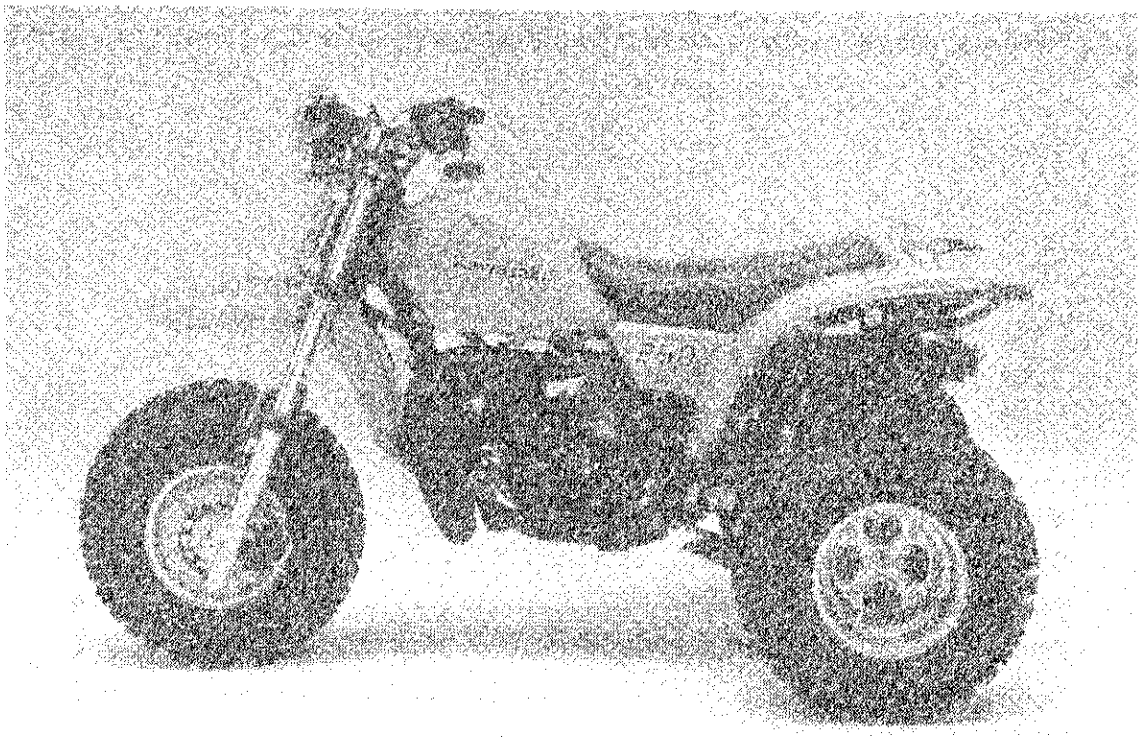
This supplement is designed to be used in conjunction with the front part of this Manual. The maintenance and repair procedures described in this Supplement are only those that are unique to later year units since the first publication of the Manual. Complete and proper servicing of later year units therefore requires mechanics to read both this Supplement and the front part of the Service Manual.

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Model Identification

KXT250-A2 Left Side View :



KXT250-A2 Right Side View :



Specifications

Refer to P.P. 1-5, 1-6 for other specifications not specifically mentioned here.

Items	KXT250-A2
Dimensions:	
Overall length	1,855 mm
Overall width	1,125 mm
Overall height	1,170 mm
Wheelbase	1,285 mm
Road clearance	135 mm
Seat height	810 mm
Dry weight	1,225 N (125 kg)
Curb weight: Front	559 N (57 kg)
Rear	775 N (79 kg)
Frame:	
Trail	48 mm
Brake type:	
Front	Single disc
Rear	Single disc

Service Data

See each chapter for other service data not specifically mentioned here.

Item	Standard (Service limit)	See Page
Clutch:		
Friction plate thickness	3.12 – 3.28 mm (3.0 mm)	4- 7
Clutch spring free length	32.6 mm (31.7 mm)	4- 7
Drive chain:		
Make and Type	Enuma, Joint Endless EK520 SH-0	16-9
Front and Rear Brakes:		10- 3
Pad lining thickness	4.5 mm (1 mm)	
Disc thickness	3.8 – 4.1 mm (3.5 mm)	
Front Fork:		11- 9
Oil amount per side	258 – 266 mL (when completely dry)	
	220 mL (when changing oil)	
Oil level	181 – 183 mm	
Rear Shock Absorber:		16-11
Damper adjuster position	Shock absorber body: No. 2	
	Reservoir tank : No. 2	
Oil amount		
Shock body	91 mL	
Reservoir tank	188 mL	
Electrical System:		
Ignition timing	19° @ 6,000 r/min (rpm)	14- 9
Piston position at timing mark	Distance from TDC : 2.23 mm	14-10

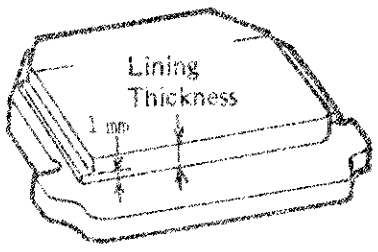
Carburetor Specifications

Make/Type	:	VM34SS
Main Jet	:	260
Main Air Jet	:	(ϕ2.5)
Needle Jet	:	Q-6
Jet Needle	:	6FL51-4
Jet Needle Clip Position	:	4th groove from the top
Pilot Jet	:	40
Pilot Air Jet	:	1.6
Throttle valve cutaway	:	3.0
Starter Jet	:	100
Service Fuel Level	:	5 ±1 mm
Float Height	:	25.7 ±2 mm

Carburetor Option Parts

Main Jet	:	280, 270, 250, 240
Needle Jet	:	R-0, Q-8, Q-4, Q-2
Pilot Jet	:	30, 35, 45, 50

Brake Pad



Periodic Maintenance Chart

The scheduled maintenance must be done in accordance with this chart to keep the motorcycle in good running condition.

FREQUENCY / OPERATION	Daily	Every 10 hours	Every 20 hours	Every 30 hours	Every 40 hours	As required	See Page
Clutch – inspect †	●						12-4
Throttle cable – inspect †	●						12-5
Spark plug – clean, gap †		●					14-8
Air cleaner element – clean		●					2-6
Air cleaner element – replace	Every 5 cleanings						2-6
Carburetor – inspect/adjust †						●	2-4
Transmission oil – change*			●				4-5
Piston – clean/check †				●			3-4
Piston ring – replace				●			3-4
Cylinder – inspect †				●			3-4
Piston/cylinder clearance – inspect †				●			3-4
Small end bearing – check †				●			3-4
Main bearings – check †					●		–
Big end bearing – check †				●			3-7
Spark arrester – clean						year	3-13
Coolant – change						●	3-7
Radiator hoses, connections – check †	●						3-9
Brake adjustment – check †	●						10-4
Brake wear – check †				●			16-4
Brake fluid level – check †			●				16-10
Brake fluid – change						year	10-5
Drive chain – adjust	●						9-4
Drive chain – lubricate	●						9-5
Drive chain and sprockets – inspect †				●			9-4
Front fork – inspect/clean †			●				–
Front fork oil – change				●			16-4
Nuts, bolts, fasteners – check †	●						1-9
Fuel system – clean			●				2-7
Steering play – check †	●						11-6
Steering stem bearing – grease				●			11-7
General lubrication – perform	●						1-10
Uni-trak bearing – grease		●					16-14
Uni-trak link, bearing wear – check †		●					11-4
Uni-trak arm, sleeve wear – check †		●					11-4
Rear shock oil – replace					●		16-13
Swing arm – lubricate			●				11-3
Frame, swing arm – inspect for damage †	●						–
Master cylinder cup and dust seal – replace						2 years	–
Caliper piston seal and dust seal – replace						2 years	16-10
Brake hose – replace						2 years	–

† : Replace, add, adjust, clean, or torque if necessary.
* : Change transmission oil after first day. After that, follow the regular schedule.

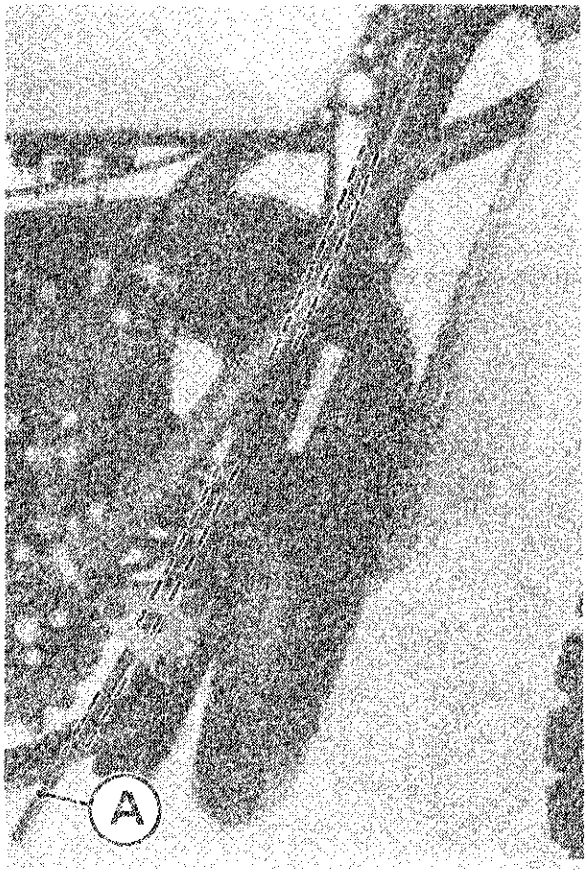
NOTE

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

Cooling System

Reservoir Tank Installation

*Run the reservoir tank hose as shown.



A. Reservoir Tank Hose

Clutch

Clutch Installation

*The following parts are similar to the old parts, however, have no interchangeability.

Do not mix the new type parts with the old ones.

○Clutch push rod (1 mm longer than the old type)

○Clutch release

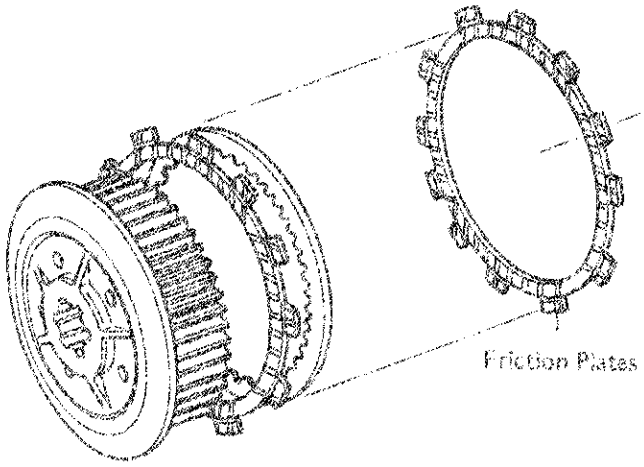
○Clutch springs

Friction Plates Installation

The groove pattern on the friction plate is modified for smooth clutch engagement.

Plate installation is free of its rotation direction.

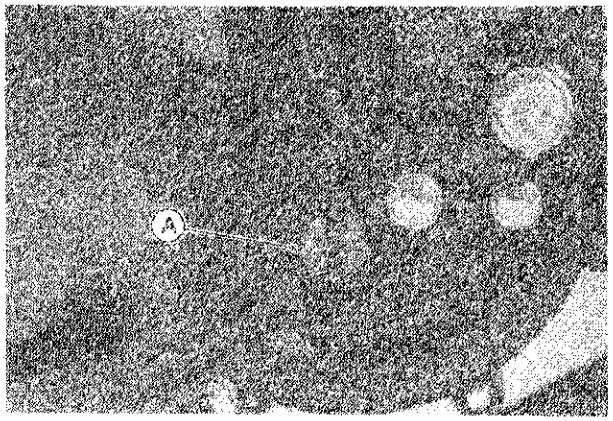
Clutch Plates



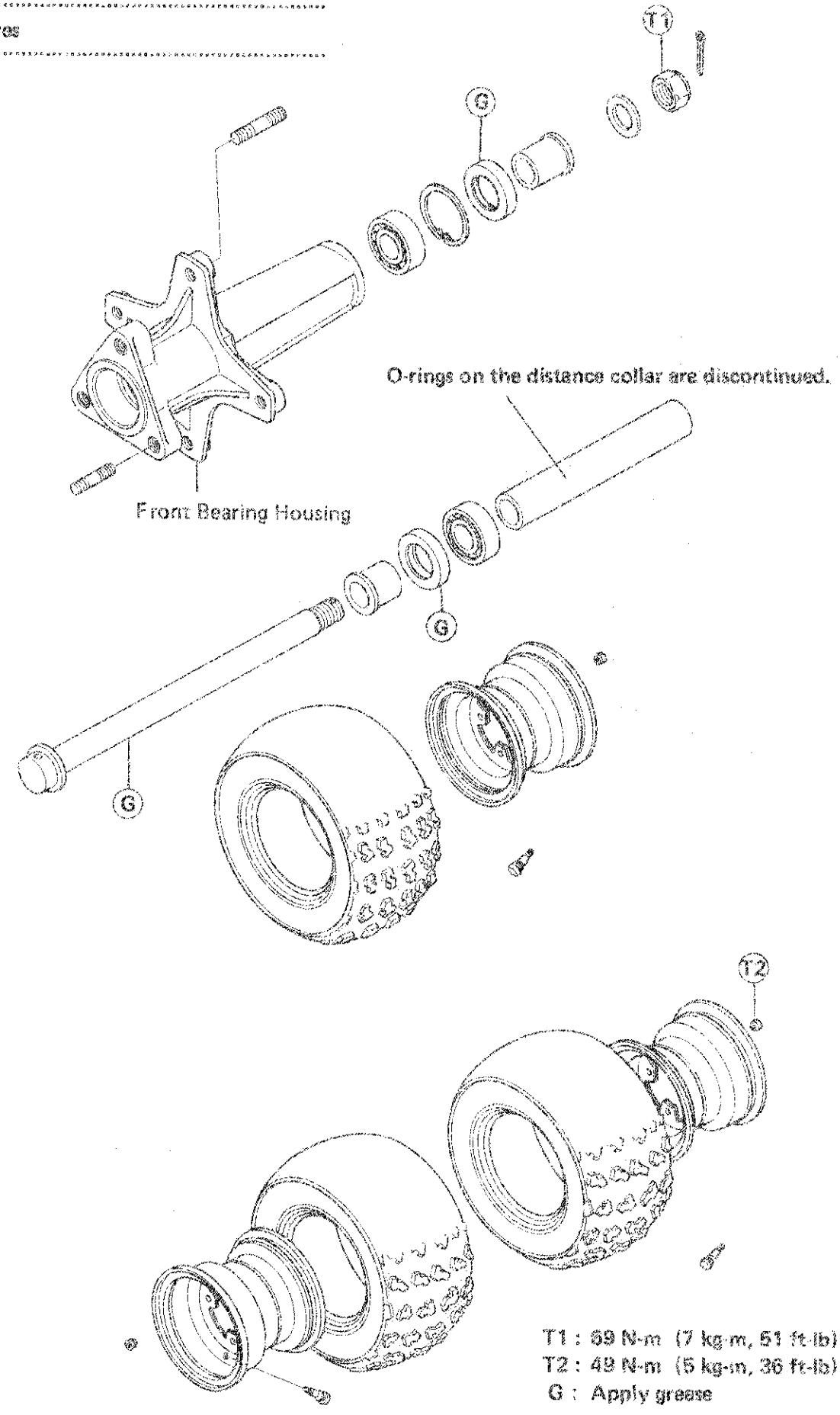
Transmission Oil

Oil Level Inspection

○The oil level should be in the middle of the gauge.



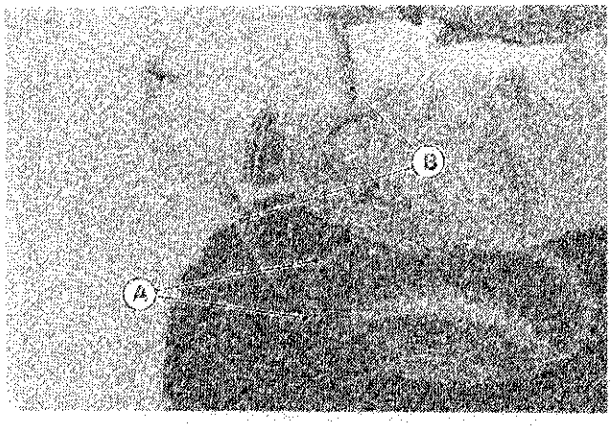
A. Oil Level Gauge


T1
G
O-rings on the distance collar are discontinued.
Front Bearing Housing
G
G
T2
T1 : 69 N·m (7 kg·m, 51 ft·lb)
T2 : 49 N·m (5 kg·m, 36 ft·lb)
G : Apply grease

Tire Removal

Refer to P. 8 – 4, noting the following.

- When separating the rim from the tire bead with the tire irons, use a suitable rim protectors around the valve stem to prevent the aluminium rim damage.

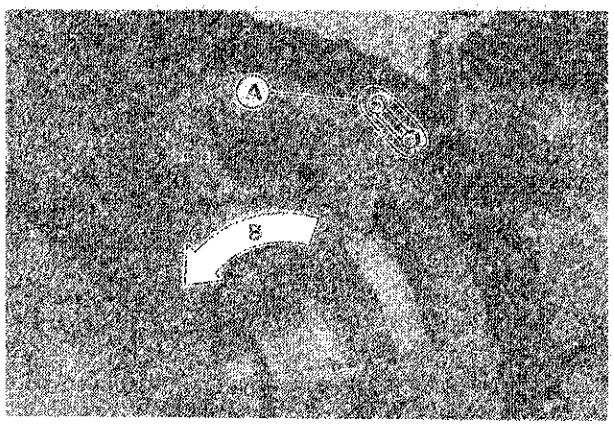


A. Rim Protectors : Split rubber hoses
B. Tire Irons : 57001-1073

Final Drive

Drive Chain Removal

- Remove the clip from the drive chain master link using pliers, and remove the master link.



A. Master Link Clip B. Direction of Chain Rotation

- Free the drive chain from the sprockets, being careful that the chain does not get dirty from contact with the ground.

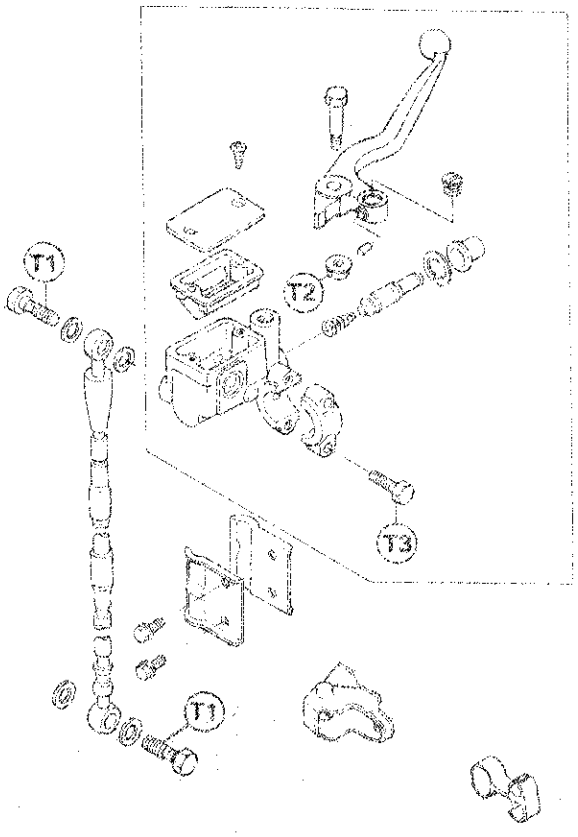
Installation Note

- Install the master link clip, being careful of the direction as shown in the figure.
- Adjust the drive chain.

WARNING

Incorrect installation of the master link clip can allow it to catch on an adjacent part. If the clip dislodges, the chain could come apart, and this could result in rear wheel lockup and loss of control.

Front Brake



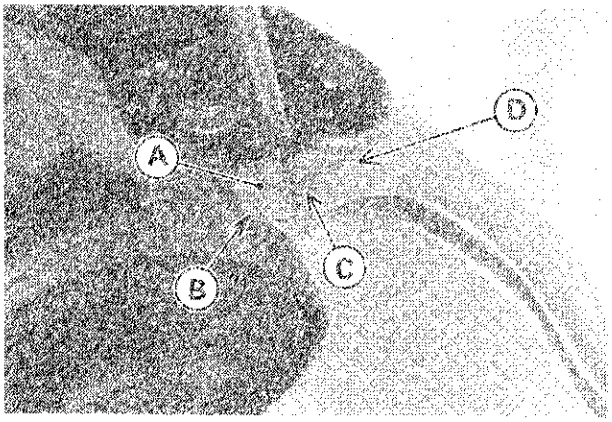
T1 : 29 N-m (3.0 kg-m, 22 ft-lb)
T2 : 5.9 N-m (0.6 kg-m, 52 in-lb)
T3 : 8.8 N-m (0.9 kg-m, 78 in-lb)

Front Brake Lever Play

○The brake lever play adjuster has **2 positions**: one punch mark and two punch marks.

●Turn the adjuster to suit you until the punch mark is aligned with the line mark and you feel a click.

○The standard setting position is the **one punch mark.**



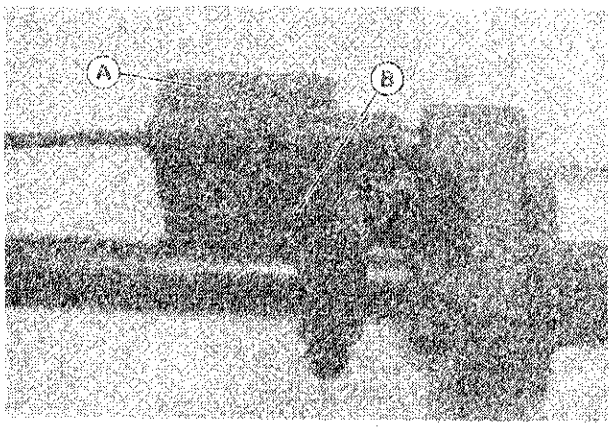
A. Adjuster
B. Two Punch Marks
C. One Punch Mark
D. Line Mark

WARNING

○If the brake lever feels mushy when it is applied, there might be air in the brake lines or the brake may be defective. Since it is dangerous to operate the motorcycle under such conditions, check the brake immediately.

Brake Fluid Level Inspection

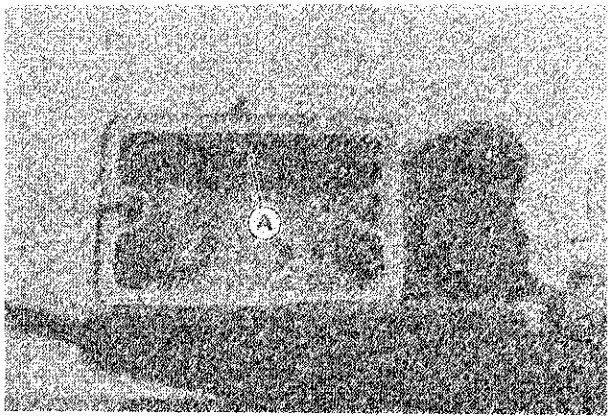
●Holding the reservoir horizontal, check that the brake fluid level in the reservoir is higher than the lower level.



A. Reservoir
B. Lower Level

★If the fluid level is below the lower level, check the fluid leakage of the brake line, and add the brake fluid as follows.

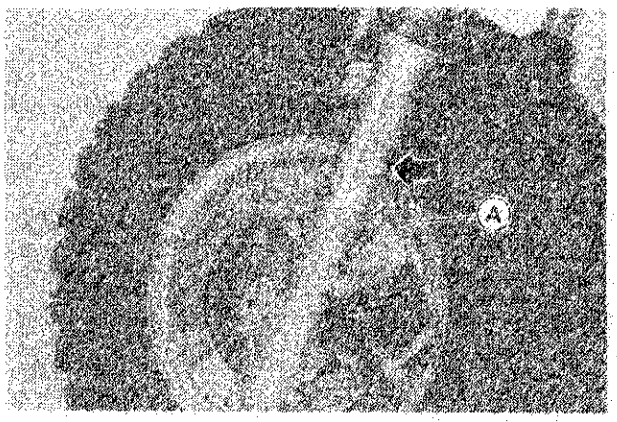
○Remove the reservoir cap, and fill the reservoir to the level line in the reservoir with the same type and brand of brake fluid that already is in the reservoir. And then install the reservoir cap.



A. Level Line

Front Brake Hose Installation

●Run the brake hose as shown.



A. Brake Hose

Front Master Cylinder Disassembly

●Drain the brake fluid.

●Remove the banjo bolt to disconnect the upper brake hose from the master cylinder.

●Remove the clamp bolts, and take off the master cylinder. Immediately wipe up any brake fluid that spills.

●Remove the locknut and pivot bolt, and remove the brake lever.

●Remove the screws, take off the master cylinder cap and diaphragm, and empty out the brake fluid.

●Slide the dust seal out of its place.

●Remove the stopper with a circlip pliers.

●Remove the piston with the secondary cup, primary cup and spring by lightly applying a compressed air as shown.

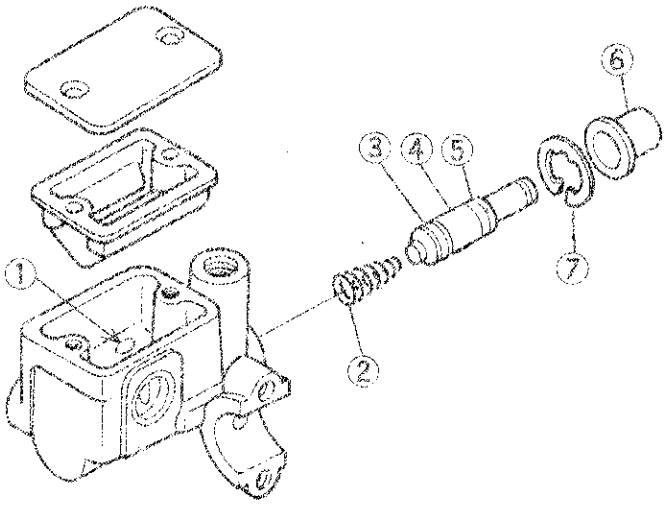
WARNING

○To avoid serious injury, never place your fingers or palm in front of the opening. If you apply compressed air into the master cylinder, the piston may crush your hand or fingers.

CAUTION

○Do not remove the primary cup and secondary cup from the piston since removal will damage them.

Front Master Cylinder



1. Apply Air
2. Spring
3. Primary Cup
4. Piston
5. Secondary Cup
6. Dust Seal
7. Stopper

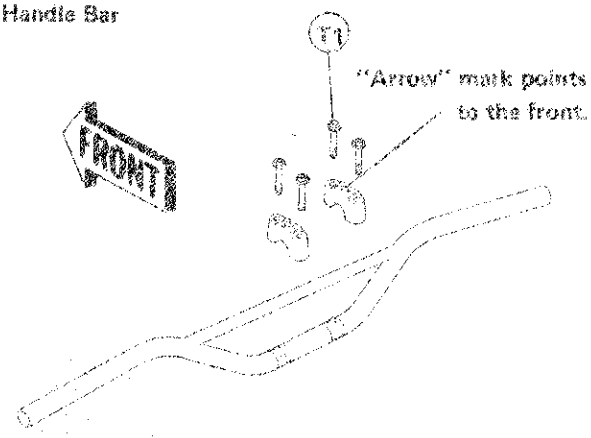
Handlebar

Installation

*Install the handlebar clamps so that the arrow on the clamp points to the front.

*Tighten the front clamp bolts first, and then the rear clamp bolts. There will be a gap at the rear part of the clamp after tightening.

Handle Bar



T1 : 21 N·m (2.1 kg-m, 15 ft-lb)

Suspension

Damper Adjustment

See P. 11 — 10 noting that the gas reservoir has a damping adjuster.

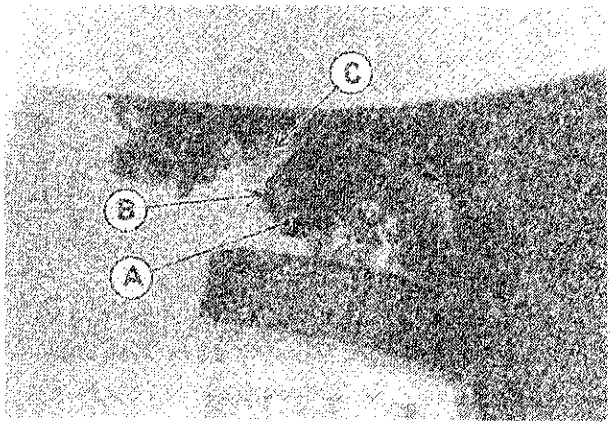
Gas Reservoir

*To adjust the shock damping, hand turn the damper adjuster on the gas reservoir until you feel a click.

*If the damper setting feels too soft or too stiff, adjust it in accordance with the following table:

Damping Force

Position	1	2	3	4
Damping Force	——→ Larger			



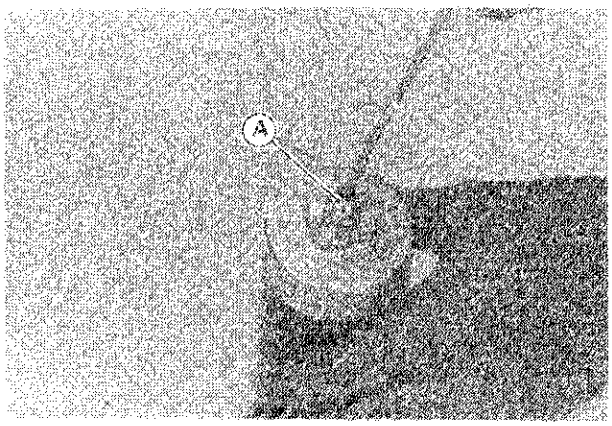
A. Damper Adjuster B. Position Number
C. Align the number with the mark.

NOTE

○The recommended setting position is the 2 position.

Gas Reservoir Disassembly

- Remove the rear shock absorber from the frame.
- Remove the air valve cap.
- Release the nitrogen gas completely by pushing the valve to open.

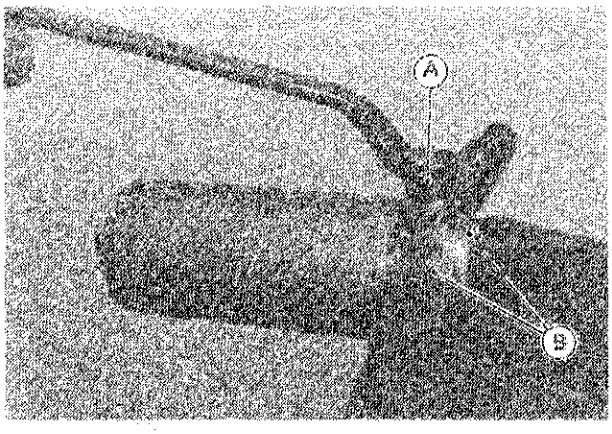


A. Air Valve

WARNING

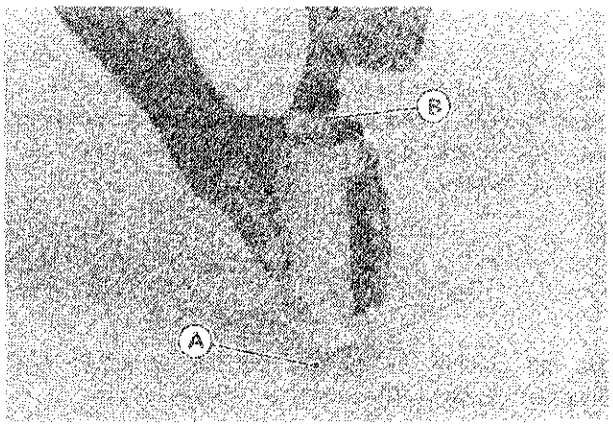
Since the high pressure gas is dangerous, do not point the air valve toward your face or body.

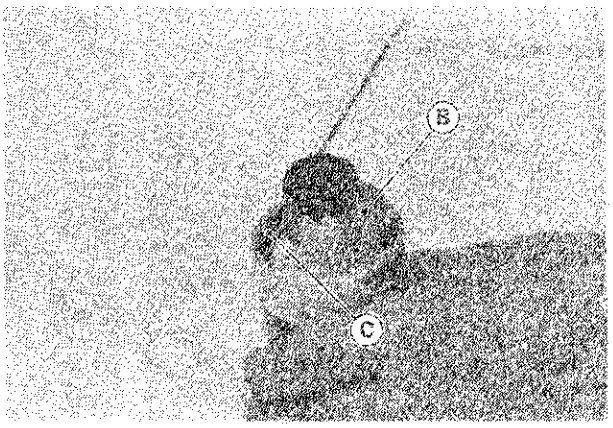
- Remove the banjo bolt from the reservoir joint.



A. Banjo Bolt B. Suitable Collar onto both sides

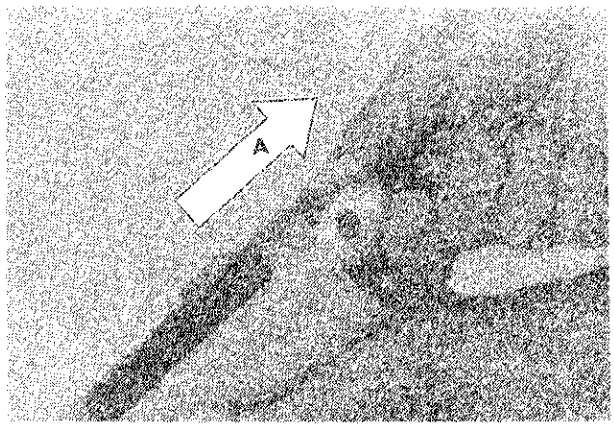
- Insert a suitable collar onto the gas valve to prevent valve damaging.
- Drive the reservoir joint into the reservoir with hand pressure to remove the circlip.





A. Suitable Collar C. Circlip
B. Reservoir Joint

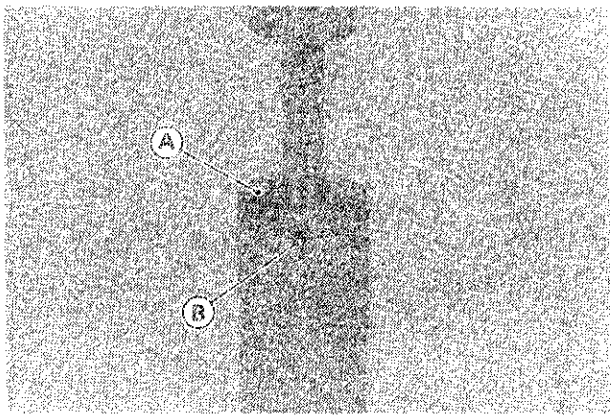
- While pushing the air valve to open, pull out the reservoir joint from the reservoir.
- Empty out the oil in the reservoir.

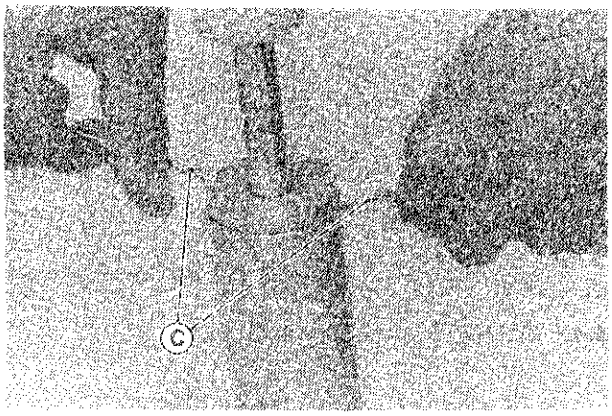


A. Pull out the joint

Rear Shock Absorber Body Disassembly

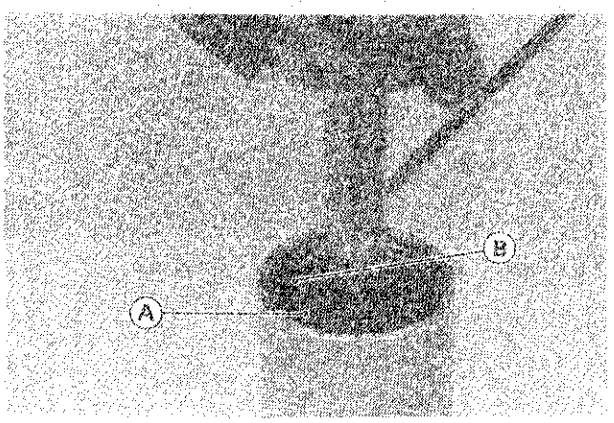
- Empty out the oil in the rear shock absorber body.
- Hold the bottom of the cylinder with a vise again.
- With two suitable bars pry at the gap to remove the lid.





A. Lid
B. Pry Points
C. Suitable Bars

●Lift off the push rod, lightly tap around the seal with a suitable rod or mallet, and push the seal assembly about 20 mm down. Then remove the circlips.



A. Seal Assembly
B. Circlips (2)

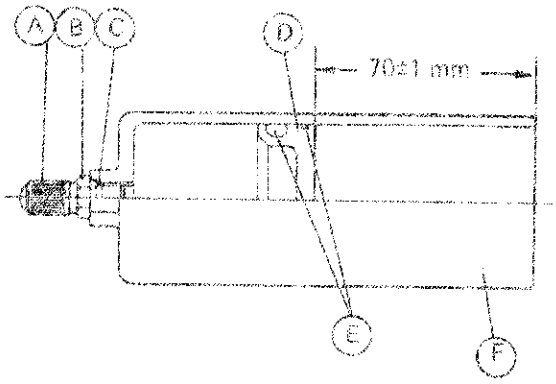
●Lightly move the push rod back and forth, and pull out the push rod assembly.

Rear Shock Assembly and Oil Changing Note

○Refer to P. 11-12, noting the following.

●Set the free piston in the reservoir so that it is 70 ± 1 mm from the end of the reservoir.

Reservoir Piston Position



A. Air Valve Cap
B. Air Valve
C. O-ring
D. Free Piston
E. O-Ring
F. Reservoir

●Fill the reservoir and rear shock body with the specified oil.

Rear Shock Absorber Oil

Oil	:	SAE 5W
Amount		
Reservoir	:	188 mL
Rear shock body	:	91 mL

●Apply grease to the O-rings of the reservoir and the shock absorber cylinder when assembling.

CAUTION

○Ensure that no air remains in the system.

●Install the lid into the rear shock body by lightly tapping it evenly with a plastic mallet.

Standard Spring Preload Adjustment
(P/N : 92081 – 1856)

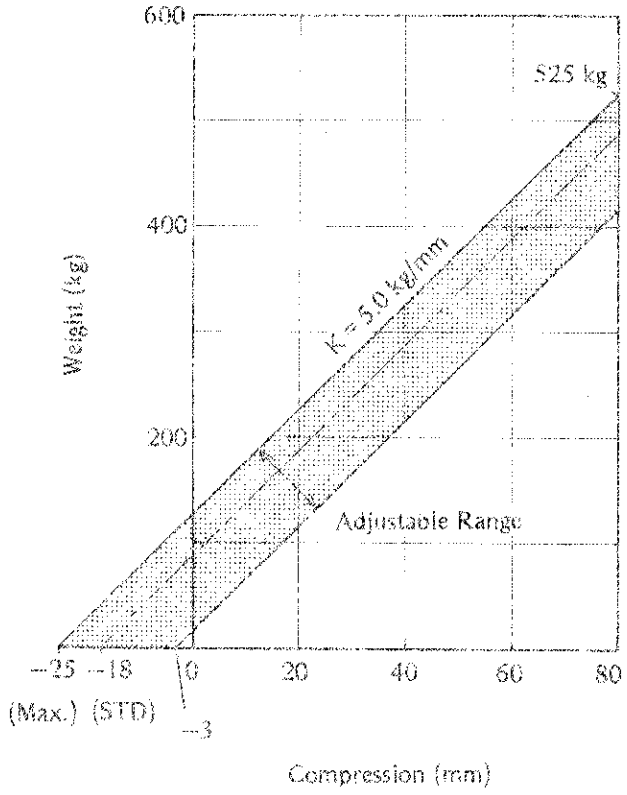
○Refer to P.P. 11-4 and 11-11, noting the following.

●Install the spring so that the small diameter end faces downward.

Spring Preload Setting

Standard Adjusting Nut Position : 108 mm
Nut Adjustable Range : 93 – 115 mm
Initial Spring Preload : 882 N (90 kg, 199 lb)
Preload change/a turn of the nut :
74 N (7.5 kg, 17 lb)

Rear Shock Absorber Spring Force

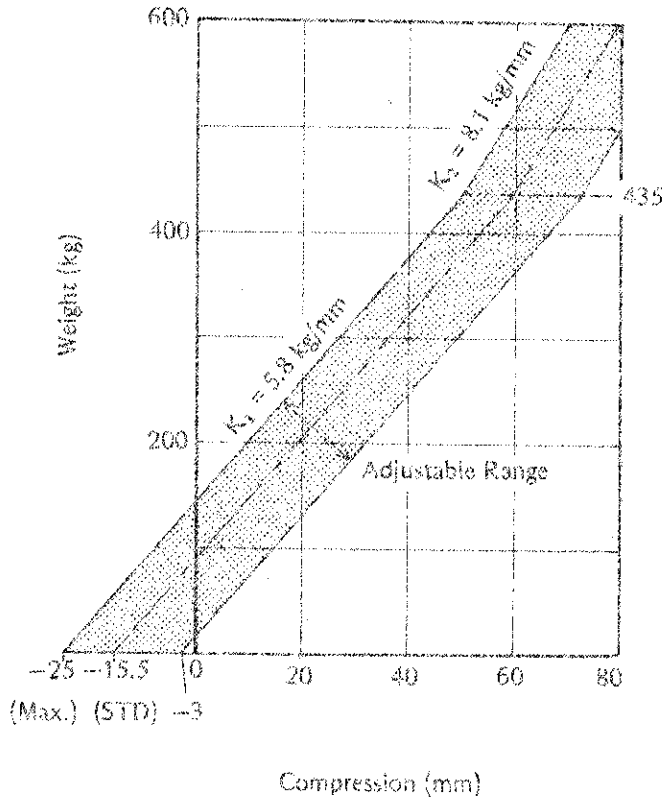


Option Spring Preload Adjustment (P/N 92081 – 1857)

Option Spring Setting

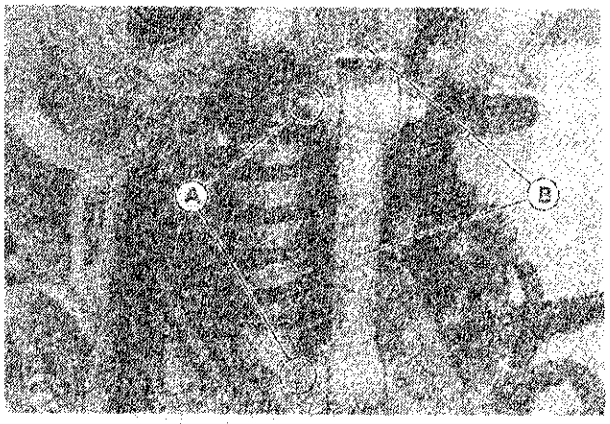
Standard Adjusting Nut Position : 105.5 mm
Nut Adjustable Range : 93 – 115 mm
Initial Spring Preload : 882 N (90 kg, 199 lb)
Preload Change/a turn of the nut:
85.5 N (8.7 kg, 19.2 lb)

Rear Shock Absorber Spring Force



Uni-trak Bearing Lubrication

*According to the Periodic Maintenance Chart in p. 16-6, lubricate the Uni-trak bearings through the grease fittings with a grease gun. It is normal for a small amount of grease to seep out of around the bearing.



A. Grease Fittings B. Uni-trak Link

Wiring Diagram

