Model Identification

ZL600-A1 (US Model) Left Side View:



ZL600-A1 (US Model) Right Side View:



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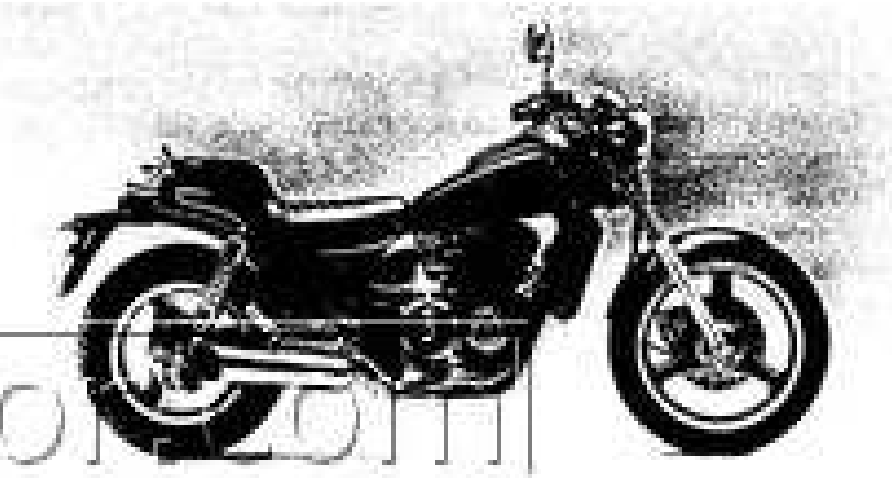


ZL600-A1 (European Model)





ZL600-A1 (European Model)



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General Specifications

Items		ZL600-A1 or ZL500-A1
Dimensions:		
Overall length		2,240 mm, (E)(G) 2,210 mm
Overall width		795 mm, (E)(G) 775 mm
Overall height		1,065 mm, (E)(G) 1,120 mm
Wheelbase		1,550 mm
Road clearance		145 mm
Seat height		720 mm
Dry weight		195 kg, (E)(G) 194 kg, (S) 195 kg
Curb weight:	Front	98 kg
	Rear	113 kg, (E)(G) 112 kg, (S) 113 kg
Fuel tank capacity		12.3 L
Performance:		
Climbing ability		30°
Braking distance		12.5 m from 50 km/h
Minimum turning radius		2.9 m, (E) (S) 3 m
Engine:		
Type		4-stroke, DOHC, 4-cylinder
Cooling system		Liquid-cooled
Bore and stroke		60.0 x 52.4 mm, *55.0 x 52.4 mm
Displacement		592 mL, *497 mL
Compression ratio		11.0
Maximum horsepower		54.4 kW (74 PS) @10,500 r/min (rpm), *52.2 kW (71 PS) @11,500 r/min (rpm), (E) (G) –, (S) 42.7 kW (58 PS) @7,500 r/min (rpm)
Maximum torque		53.9 N·m (5.5 kg-m, 39.8 ft-lb) @8,500 r/min (rpm), *46.1 N·m (4.7 kg-m, 34.0 ft-lb) @10,000 r/min (rpm), (E) (G) –, (S) 54.9 N·m (5.6 kg-m, 40.5 ft-lb) @7,000 r/min (rpm)
Carburetion system		Carburetors, Keihin CVK30 x 4
Starting system		Electric starter
Ignition system		Battery and coil (transistorized)
Timing advance		Electronically advanced
Ignition timing		From 12.5° BTDC @1,050 r/min (rpm) to 40° BTDC @10,000 r/min (rpm), (S) From 7.5° BTDC @1,250 r/min (rpm) to 35° BTDC @10,000 r/min (rpm)
Spark plug	Standard	NGK DR8ES, or ND X27ESR-U, (E) NGK D8EA, or ND X27ES-U
	Option	NGK DR8ES-L, or ND X24ESR-U, (E) NGK D8EA, or ND X24ES-U
Cylinder numbering method		Left to right, 1-2-3-4
Firing order		1-2-4-3
Valve timing:		
Inlet	Open	37° BTDC
	Close	67° ABDC
	Duration	284°
Exhaust	Open	72° BBDC
	Close	32° ATDC
	Duration	284°

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(Continued on next page.)

Items	ZL600-A1, or ZL900-A1
Lubrication system	Forced lubrication (wet sump)
Engine oil:	
Grade	SE or SF class
Viscosity	SAE 10W-40, 10W-50, 20W-40, or 20W-50
Capacity	3.0 L
Drive Train:	
Primary reduction system:	
Type	Chain
Reduction ratio	2.641 (27/23 x 63/28)
Clutch type	Wet multi disc
Tranamission:	
Type	6-speed, constant mesh, return shift
Gear ratios: 1st	2.571 (36/14)
2nd	1.777 (32/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
5th	0.961 (25/26)
6th	0.851 (23/27)
Final drive system:	
Type	Shaft drive
Reduction ratio	2.690 (16/22 x 37/10)
Overall drive ratio	6.054 @Top gear
Final gear case oil:	
Type	API GL-5 Hypoid gear oil SAE 90 (above 5°C) SAE 80 (below 5°C)
Capacity	190 mL
Frame:	
Type	Tubular, double cradle
Caster (rake angle)	29.5°, Ⓓ Ⓒ 29°
Trail	107 mm, Ⓓ Ⓒ 105 mm
Front tire:	
Type	Tubeless
Size	100/90-18 56H
Rear tire:	
Type	Tubeless
Size	150/80-15 70H
Front suspension:	
Type	Telescopic fork (pneumatic)
Wheel travel	145 mm
Rear suspension:	
Type	Swing arm
Wheel travel	108 mm
Brake type:	
Front	Single disc
Rear	Drum

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(Continued on next page.)

Items	ZL600-A1, or ZL500-A1
Electrical Equipment:	
Battery	12 V 12 Ah
Headlight:	
Type	Semi-sealed beam
Bulb	12 V 60/55 W (quartz halogen)
Tail/brake light	12 V 5/21 W x 2, Ⓒ Ⓤ 12 V 8/27 W x 2
Alternator:	
Type	Three-phase AC
Rated output	20 A @10,000 r/min (rpm), 14 V
Voltage regulator:	
Type	Short-circuit

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

* : ZL500 only
Ⓒ : Canadian Model
Ⓒⓐ : California Model
Ⓤ : US Model
Ⓢ : Swiss Model

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Periodic Maintenance Chart

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

OPERATION \ FREQUENCY	Whichever comes first → Every	ODOMETER READING 600 km	5,000 km	10,000 km	15,000 km	20,000 km	25,000 km	30,000 km	See Page
Spark plug – clean and gap			•	•	•	•	•	•	(15-22)
Valve clearance – check*		•		•		•		•	4-5
Air suction valve ⓒ – check*			•	•	•	•	•	•	(4-7)
Air cleaner element – clean		•		•		•		•	2-8
Air cleaner element – replace	5 cleanings					•			2-8
Throttle grip play – check*		•		•		•		•	2-3
Idle speed – check*		•	•	•	•	•	•	•	(2-7)
Carburetor synchronization – check*		•	•	•	•	•	•	•	(2-7)
Fuel sytem – check*				•		•		•	(2-9)
Evaporative emission control system ⓒ – check*		•	•	•	•	•	•	•	(2-18)
Engine oil – change	year	•		•		•		•	(6-5)
Oil filter – replace		•		•		•		•	6-2
Radiator hoses, connections – check*	year	•		•		•		•	(3-11)
Coolant – change	2 years							•	3-3
Final gear case oil level – check*				•		•		•	10-6
Final gear case oil – change		•						•	10-6
Propeller shaft joint – lubricate				•				•	10-16
Fuel hose – replace	4 years								–
Clutch – adjust		•	•	•	•	•	•	•	(5-4)
Brake lining and pad wear – check*			•	•	•	•	•	•	11-3
Brake fluid level – check*	month	•	•	•	•	•	•	•	(11-11)
Brake fluid – change	2 years					•			(11-11)
Brake hose – replace	4 years								(11-13)
Brake master cylinder cup and dust seal – replace	2 years								(11-9)
Caliper piston seal and dust seal – replace	2 years								(11-6)
Brake play – check*		•	•	•	•	•	•	•	11-4
Brake light switch – check*		•	•	•	•	•	•	•	15-14
Brake camshaft – lubricate	2 years					•			11-6
Steering – check*		•	•	•	•	•	•	•	13-3
Steering stem bearing – lubricate	2 years					•			13-5
Front fork oil – change								•	12-5
Tire wear – check*			•	•	•	•	•	•	9-5
Swing arm pivot – lubricate				•				•	12-13
Battery electrolyte level – check*	month	•	•	•	•	•	•	•	(15-10)
General lubrication – perform			•	•	•	•	•	•	16-5
Nut, bolt, and fastener tightness – check*		•		•		•		•	16-6

• : For higher odometer readings, repeat at the frequency interval established here.
* : Replace, add, adjust, clean, or torque if necessary.
ⓒ : California vehicle only
US only
(page-ref) : Refer to page in the Base Manual

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2

Fuel System

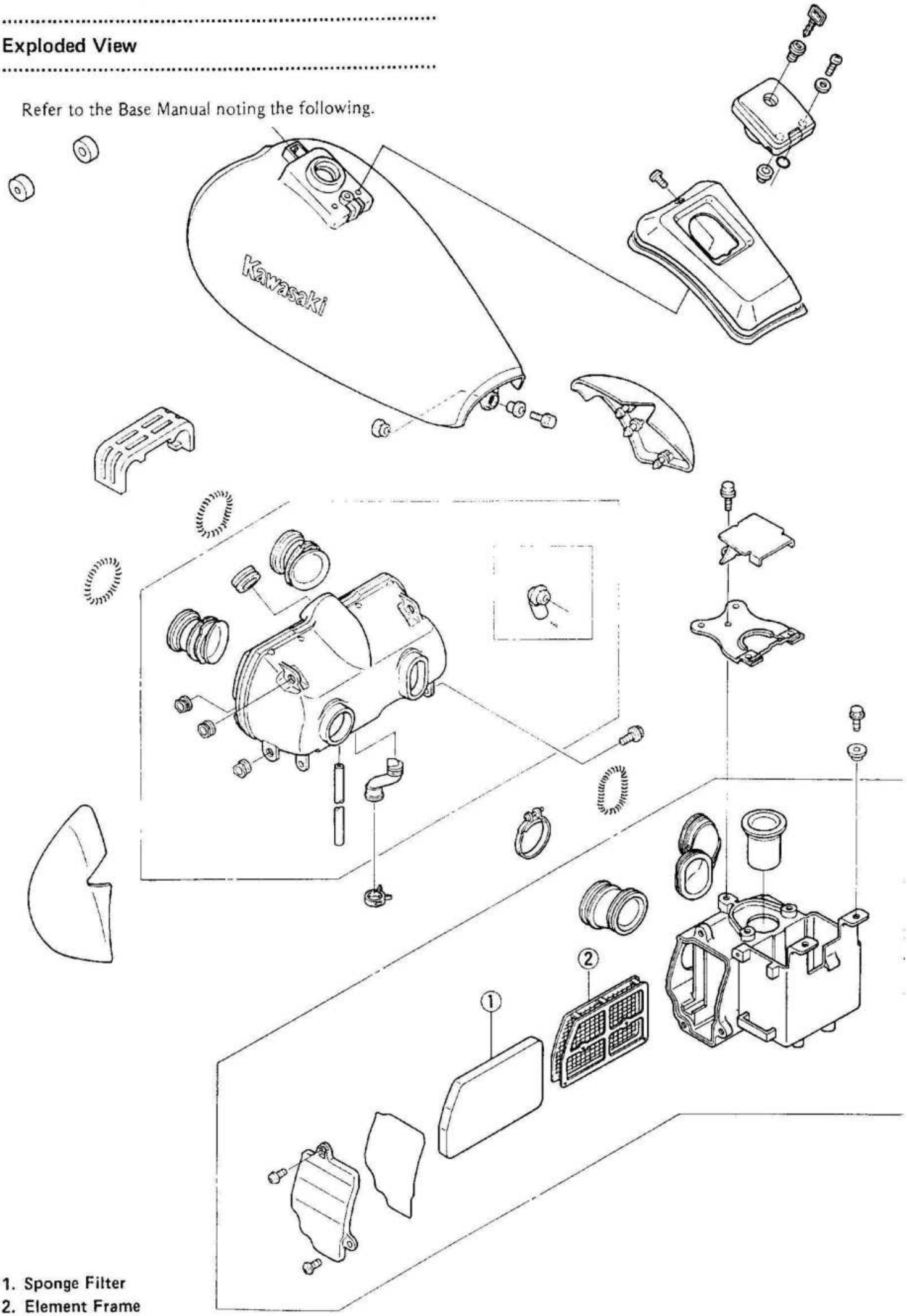
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* : Refer to Base Manual

Exploded View

Refer to the Base Manual noting the following.



1. Sponge Filter
2. Element Frame

Specifications

Refer to the Base Manual noting the following.

Carburetor Specifications for ZL600

Make/Type	KEIHIN CVK30
Main Jet	90, (Ca) 92
Main Air Jet	#100
Needle Jet	#6
Jet Needle	N27Z, (U) (Ca) N27X
Pilot Jet	#35
Pilot Air Jet	#160
Pilot Screw (turns out)	2, (U) —
Starter Jet	#52, (Ca) 48
Service Fuel Level	0.5 ±1 mm above the bottom edge of carburetor body
Float Height	17.0 ±2 mm
Optional Main Jets	#85, 88, 92, 95
	(Ca) #88, 90, 95, 98

(Ca) : California Model
(U) : U.S. Model

Carburetor Specifications for ZL500

Make/Type	KEIHIN CVK30
Main Jet	#90
Main Air Jet	#100
Needle Jet	#6
Jet Needle	N53E
Pilot Jet	#35
Pilot Air Jet	#140
Pilot Screw (turns out)	2
Starter Jet	#52
Service Fuel Level	0.5 ±1 mm above the bottom edge of carburetor body
Float Height	17.0 ±2 mm
Optional Main Jets	#85, 88, 92, 95

Idle Speed

Standard:	**1,050 ±50 r/min (rpm)**
(Ca)	**1,250 ±50 r/min (rpm)**
ZL500	**1,200 ±50 r/min (rpm)**

Air Cleaner Element Oil

Grade:	**SE or SF class**
Viscosity:	**SAE 30**

Throttle Grip and Cables

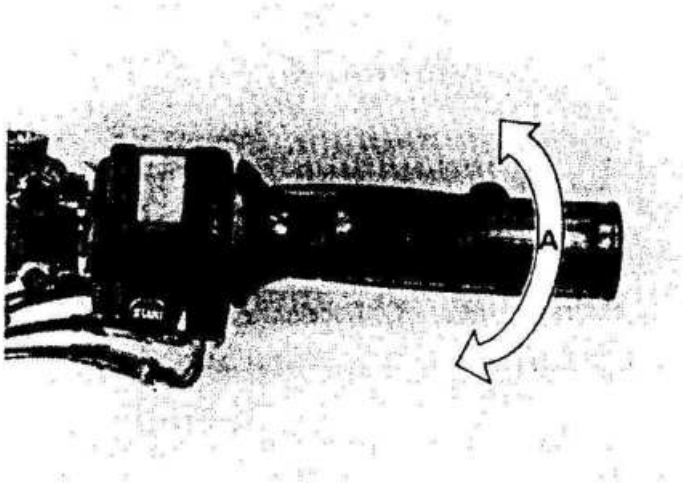
If the throttle grip has excessive free play due to cable stretch or misadjustment, there will be a delay in throttle response. Also, the throttle valves may not open fully at full throttle.

On the other hand, if the throttle grip has no play, the throttle will be hard to control, and the idle speed will be erratic. Check the throttle grip play periodically in accordance with the Periodic Maintenance Chart, and adjust the play if necessary.

Throttle Grip Play Inspection

- Check that there is **2 – 3 mm** throttle grip free play by lightly turning the throttle grip back and forth.

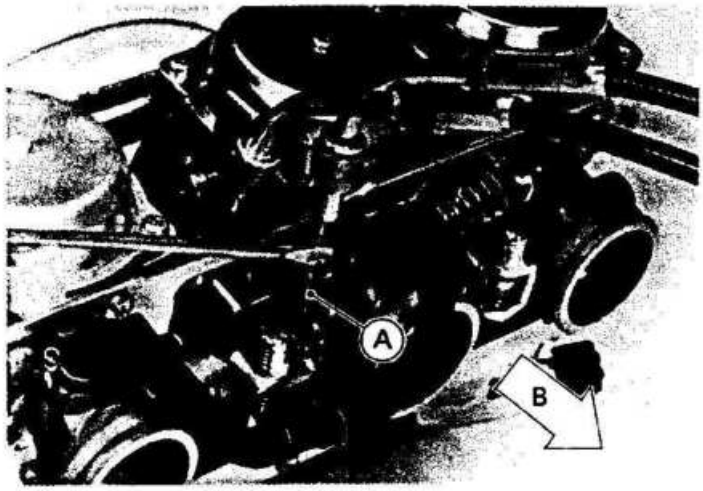
Throttle Grip Free Play
2 – 3 mm



A. Throttle Grip Free Play

- With the throttle grip closed, check that the decelerator inner cable is tight by touching it at the lower end with a thin-bladed screwdriver.

(In the photo, the carburetors have been removed for clarity)

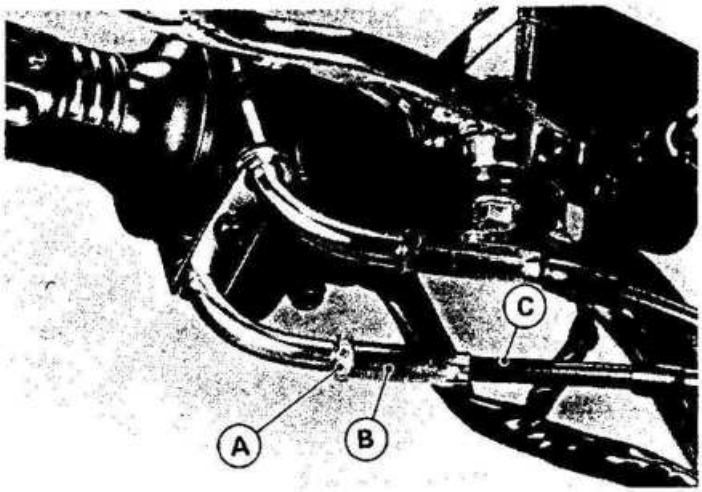


A. Decelerator Inner Cable B. Front

★If the throttle grip free play is incorrect or the decelerator inner cable is loose with the throttle closed, adjust the throttle cables.

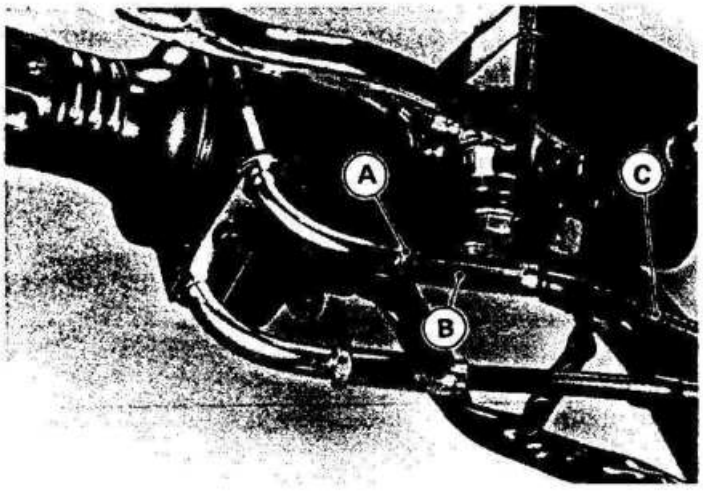
Throttle Cable Adjustment

- Loosen the locknuts, and screw both throttle cable adjusting nuts in fully at the upper end of the throttle cables so as to give the throttle grip plenty of play.
- With the throttle grip completely closed, turn out the decelerator cable adjuster nut until the inner cable just becomes tight.
- Tighten the locknut.



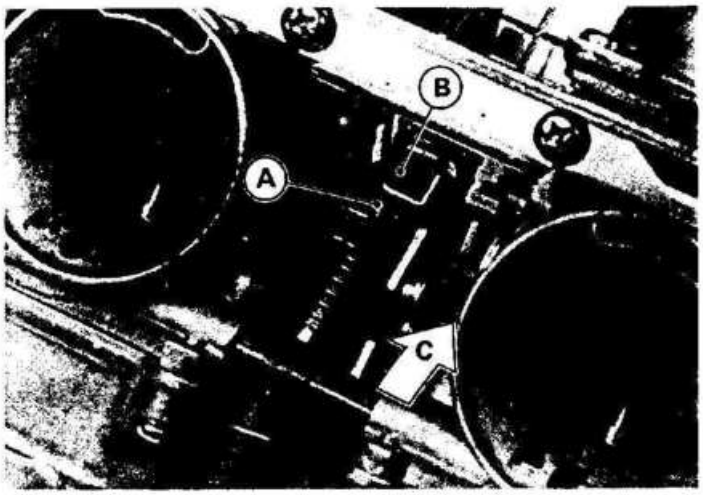
A. Locknut C. Decelerator Cable
B. Adjuster Nut

- Turn the accelerator cable adjuster nut until the correct throttle grip free play is obtained.
- Tighten the locknut.



A. Locknut C. Accelerator Cable
B. Adjuster Nut

- Check that the throttle linkage lever stops against the idle adjusting screw with the throttle grip closed.



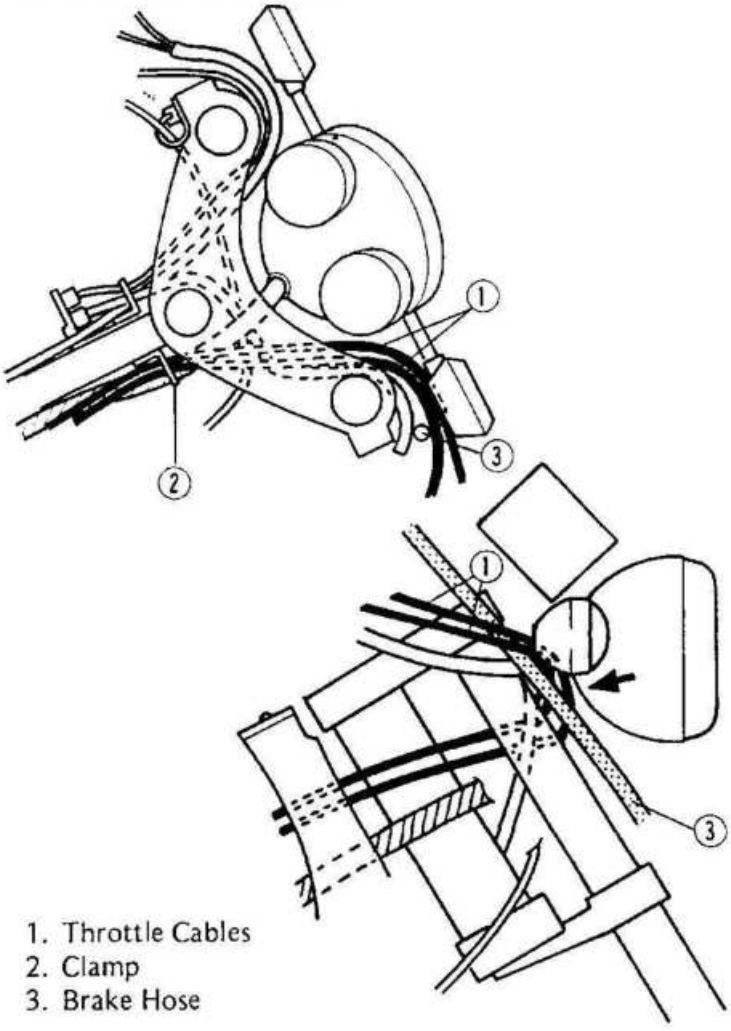
A. Idle Adjusting Screw C. Front
B. Lever

- Start the engine.
- Turn the handlebar from side to side while idling the engine.

★If idle speed varies, the throttle cable may be poorly routed or it may be damaged.

- Correct any problem before operating the motorcycle.
- Run the throttle cables in front of the brake hose.

Throttle Cable Installation



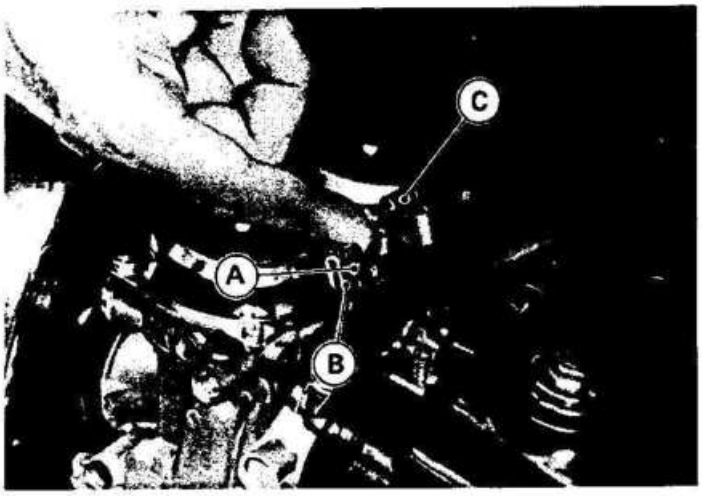
1. Throttle Cables
2. Clamp
3. Brake Hose

WARNING

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

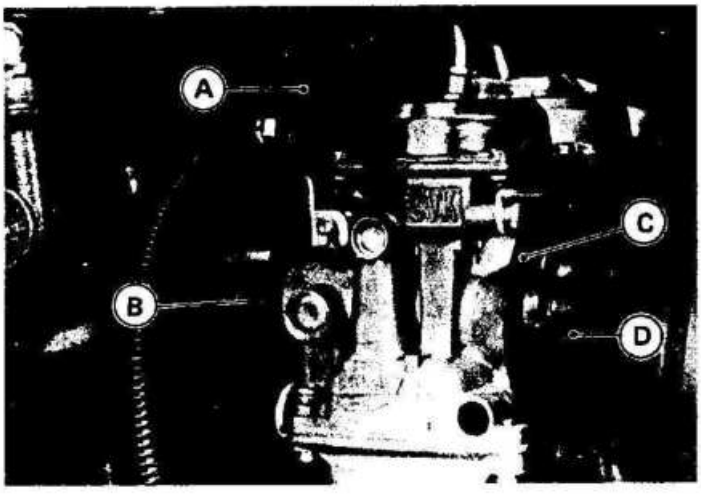
Carburetor Assembly Removal

- Remove the following parts.
  Seat (see Frame chapter)
  Fuel Tank (see Fuel Tank Removal)
  Vacuum Switch Air Hoses
  Vacuum Hoses
- Loosen the upper throttle cable adjuster locknuts, and turn in the adjusters.
- Take out the two screws holding the right switch case halves together and remove the throttle cable upper ends.
- Loosen the choke cable adjuster locknuts, and turn in the adjuster.
- Slip the tip of the choke inner cable out of the lever, and pull the cable out.



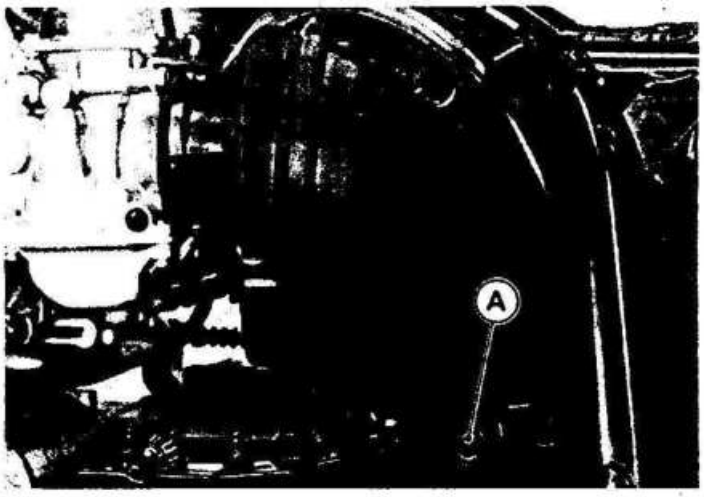
A. Tip
B. Lever
C. Choke Outer Cable

- Loosen the carburetor holder clamp screws (only rear side screws).
- Slip the spring bands off the surge tank ducts.



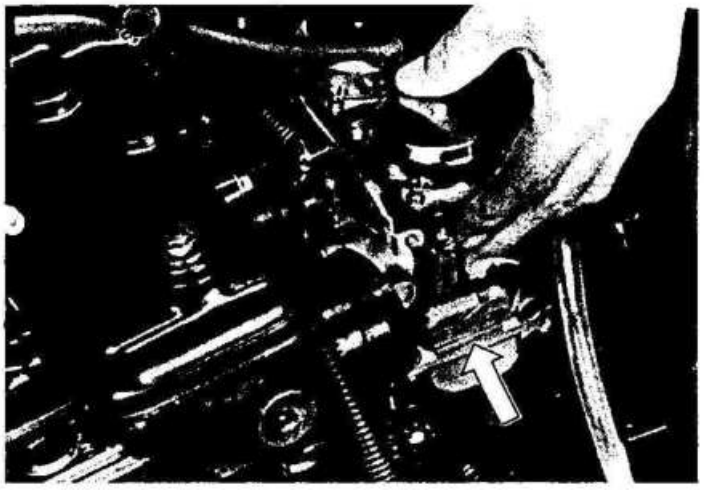
A. Vaccum Hose
B. Clamp
C. Spring Band
D. Duct

- Remove the surge tank mounting bolts.



A. Surge Tank Mounting Bolts

- Pull the surge tank to the rear. This makes carburetor assembly removal and installation much easier.
- Pull the carburetor assembly out of the carburetor holders, and then slide it out toward the right.



- Slip the tips of the throttle inner cables out of the pulley to complete carburetor assembly removal.

WARNING

○Gasoline is extremely flammable and can be explosive under certain conditions. Turn the ignition switch OFF. Do not smoke. Make sure the area is well ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

- After removing the carburetors, stuff pieces of lint-free, clean cloth into the carburetor holders and the intake ducts to keep dirt out of the engine and air cleaner.

WARNING

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

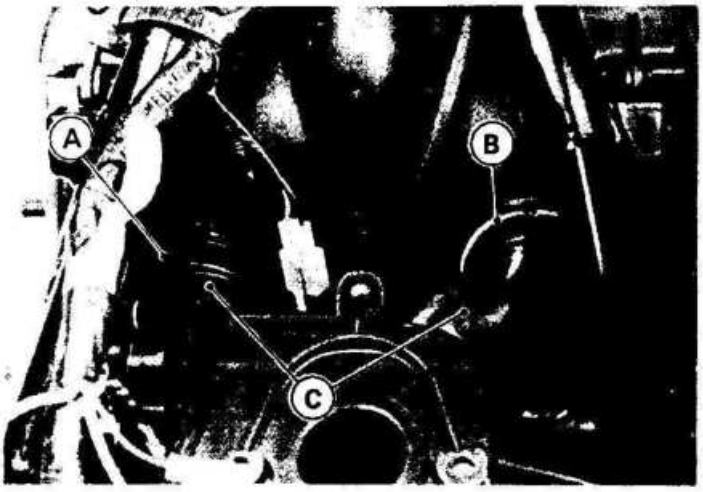
CAUTION

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

Surge Tank

Surge Tank Removal

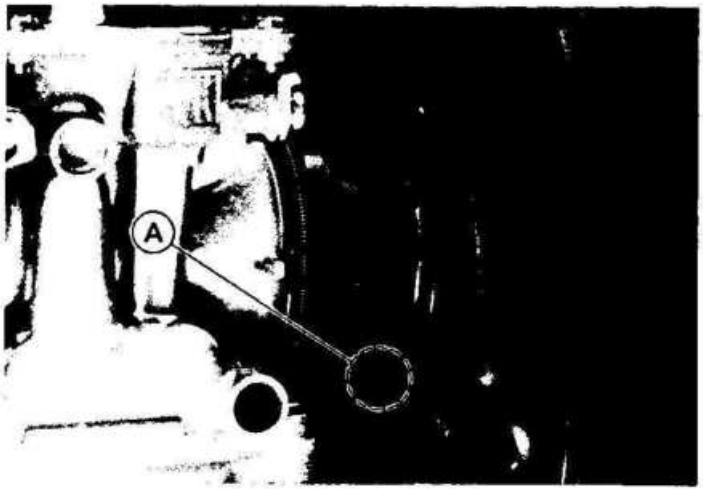
- Remove the carburetor assembly (see Carburetor Assembly Removal).
- After removing the side covers, take off the surge tank side covers.
- Pull off the oil breathing tube at the bottom of the tank.
- Slip the spring band off the air cleaner housing and loosen the air cleaner housing clamp screw.
- Pull the ducts out of the surge tank.
- Remove the surge tank.



A. Clamp
B. Spring Band
C. Ducts

Surge Tank Installation Note

- When installing the surge tank duct, fit the notch in the duct onto the projection on the surge tank.

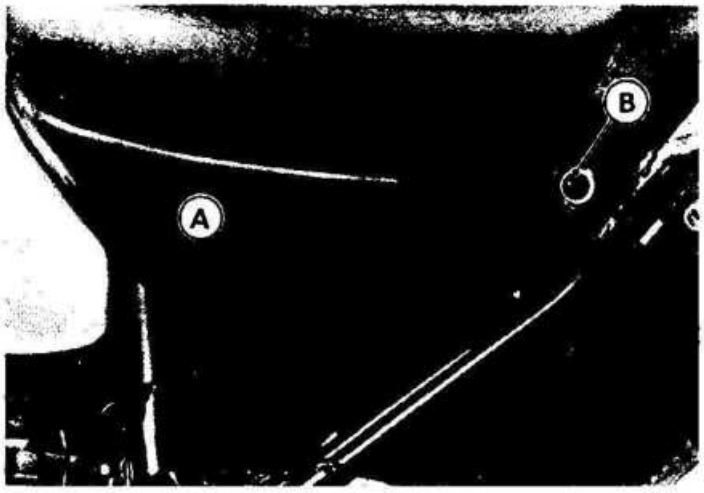


A. Notch

Air Cleaner

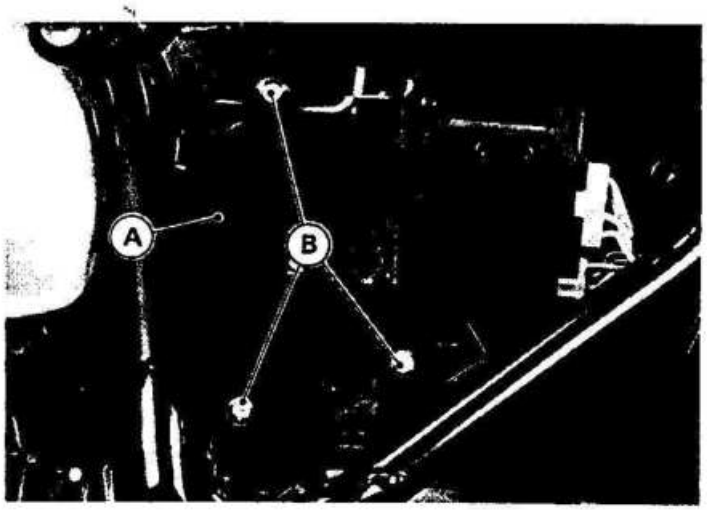
Air Cleaner Element Removal

- Remove the left side cover.



A. Left Side Cover B. Screw

- Remove the air cleaner side cover by taking out the mounting screws.



A. Side Cover B. Mounting Screws

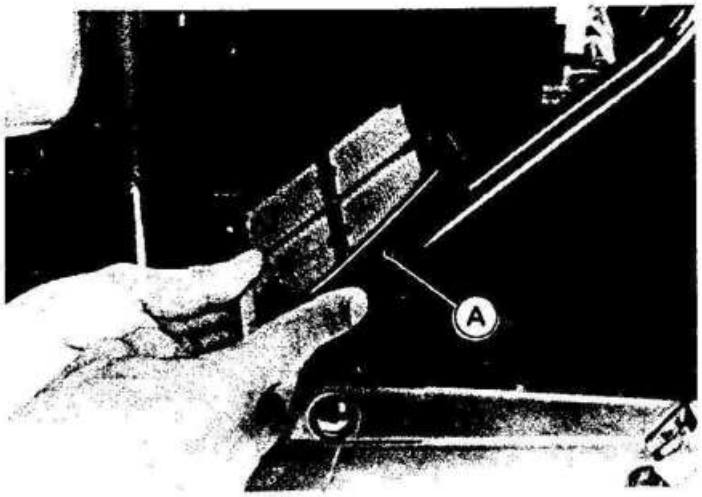
- Pull out the cleaner element.
- Push a clean, lint-free towel into the air cleaner housing to keep dirt or other foreign material from entering.

CAUTION

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

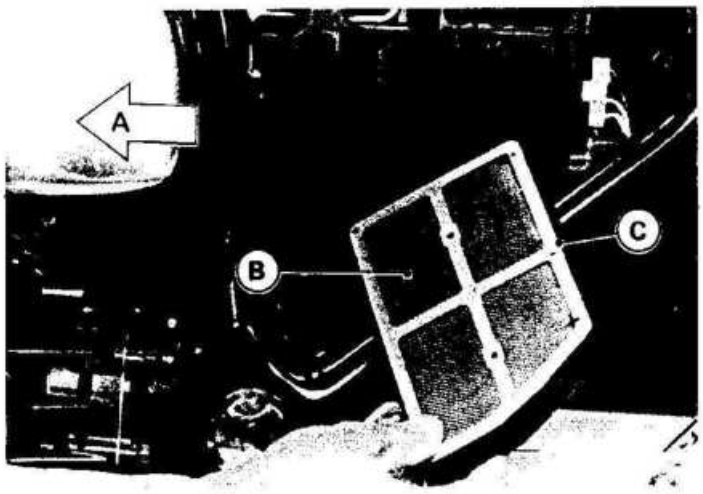
Air Cleaner Element Installation

○When installing the element, coat the element lip with a layer of all purpose grease to assure a complete seal against the cleaner case.

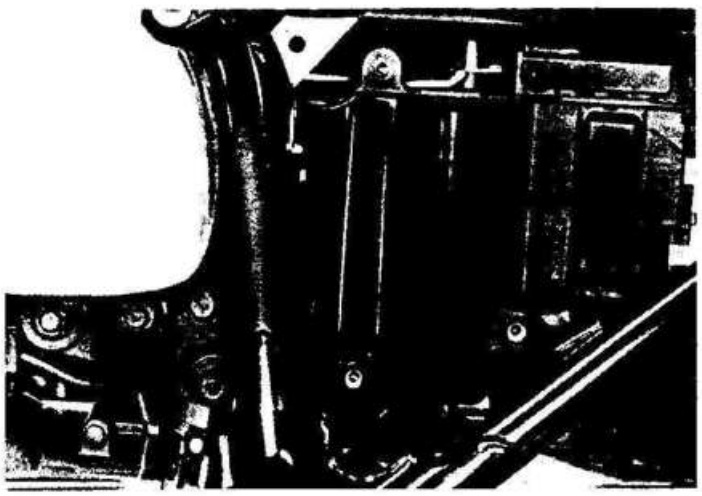


A. Apply grease.

- Set the element into the frame so that the element sponge meets with the wire netting of the frame.
- Install the element assembly so that the wire netting faces forward.

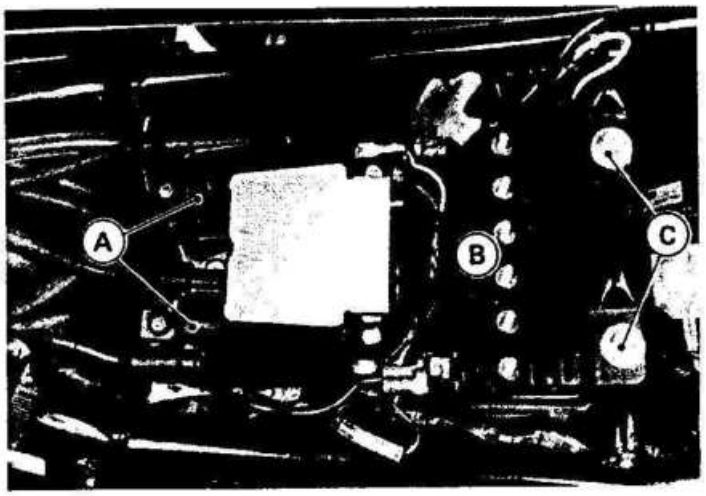


A. Front
B. Wire Netting
C. Frame



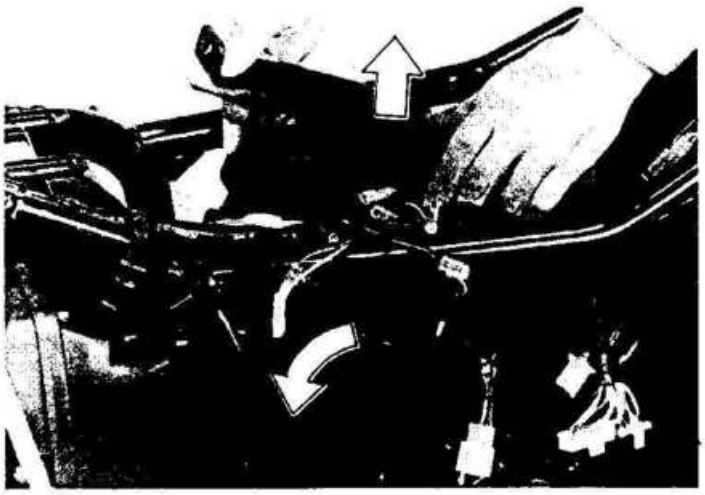
Air Cleaner Housing Removal

- Remove the following parts.
  - Seat (see Frame chapter)
  - Right and Left Side Covers
  - Battery
  - Ignition Coils (see Electrical System chapter)
  - Junction Box
  - Regulator/Rectifier Connector (at the bottom of the housing)
  - Starter Relay and Turn Signal Relay
  - Air Cleaner Ducts (2)
  - Case Mounting Bolts



A. Ignition Coils
B. Battery
C. Case Mounting Bolts

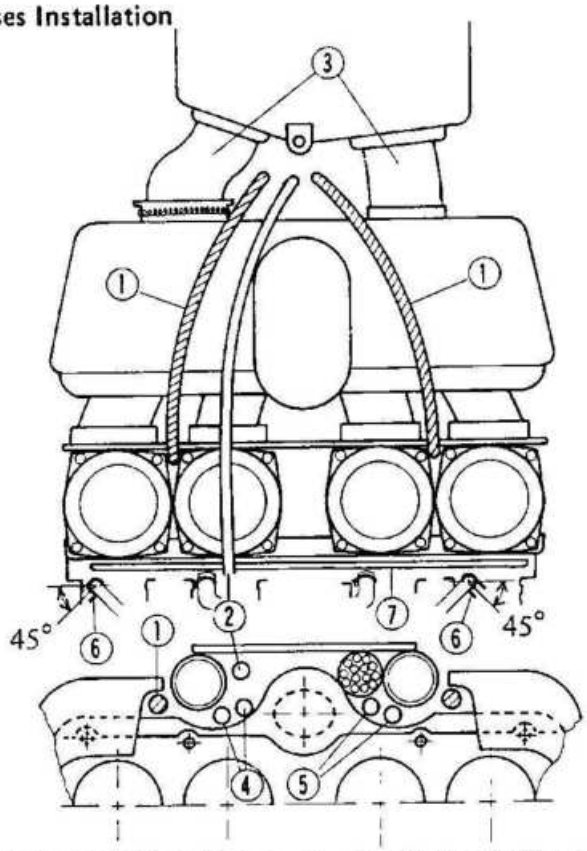
- Push the front end of the housing down and lift the rear until it can be pulled up and out of the frame.



Air Cleaner Housing Installation

- After installing the housing, run the carburetor vent hoses, the reservoir tank hose which is connected to the radiator, and the fuel tank breather hose between the air cleaner ducts.
- Secure the vacuum hoses with the clamps so that the clamp hands points a 45° angle outside with the choke rod. This prevents clamp contact with the choke lever.

Hoses Installation



1. Carburetor Vent Hoses
2. Reservoir Tank Hose
3. Air Cleaner Ducts
4. #3, #4 Spark Plug Leads
5. #1, #2 Spark Plug Leads
6. Vacuum Hose Clamps
7. Choke Lever

Air Cleaner Element Inspection and Cleaning

A clogged air cleaner restricts the engine's air intake, increasing fuel consumption, reducing engine power, and causing spark plug fouling.

NOTE

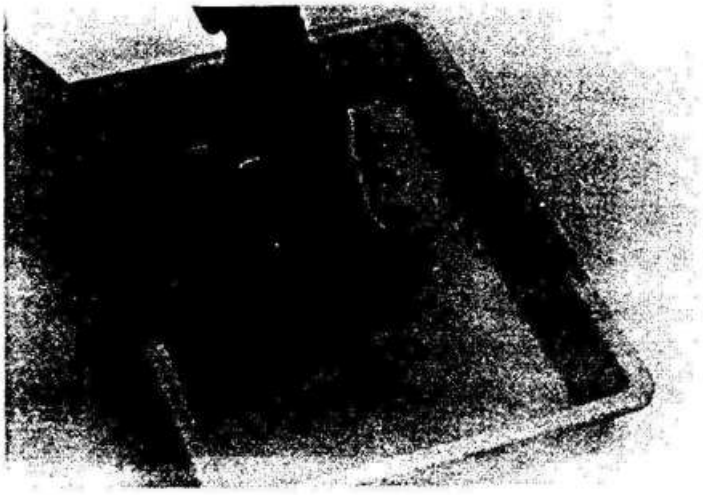
○*In dusty areas, the element should be cleaned more frequently than the recommended interval.*
○*After riding through rain or on muddy roads, the element should be cleaned immediately.*

•Separate the element from the frame and inspect the element parts for damage.
★If any part is damaged, the damaged part must be replaced or it will allow dirt into the carburetor.
•Clean the element in a bath of high flash-point solvent, and then dry it with compressed air or by shaking it.

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 sponge filter with SE class SAE 30 oil, squeeze out the excess, then wrap it in a clean rag and squeeze it dry as possible. Be careful not to tear the sponge filter.



A. Sponge Filter

•Repleated cleaning opens the pores of the foam in the element. Replace the element according to the Periodic Maintenance Chart (see General Information chapter).

Fuel Tank

Fuel Tank Removal

•Remove the seat (see Seat Removal in Frame chapter).
•Remove the mounting bolt from the rear end of the tank.



A. Bolt

•Turn the fuel tap to the ON position to stop the fuel flow.
•Pull the hoses off the tank and tap.
○For California vehicles, the breather and fuel return hoses must be disconnected from the tank fittings before tank removal. Plug the fuel return fitting. This prevents gasoline from flowing into the canister.

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.**

CAUTION

○**If gasoline, solvent, water or any other liquid enters the canister, the canister's vapor absorbing capacity is greatly reduced. If the canister does become contaminated, replace it with a new one.**

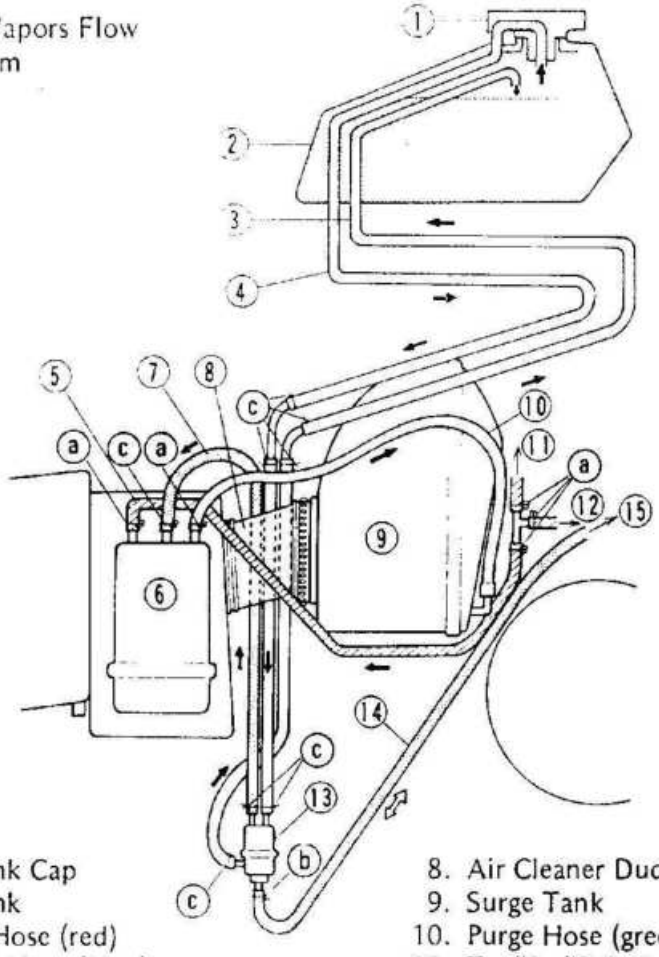
●Tilt the tank out the rear of the frame.
●Drain the fuel tank.
○Arrange a suitable container under the fuel tank.
○Turn the fuel tap PRI to drain the fuel into the container.

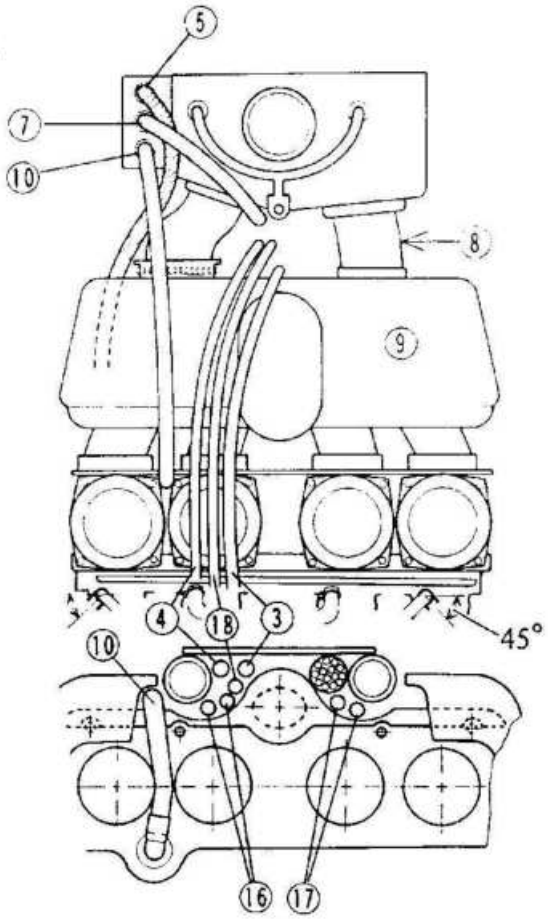
Evaporative Emission Control System (US California Vehicle only)

Refer to the Base Manual, noting the following.
●Route and connect the hoses according to the system diagram shown.
●Be sure to install the correct clamps onto the positions shown.

Evaporative Emission Control System

➡ Fuel Vapors Flow
⇨ Vacuum





1. Fuel Tank Cap
2. Fuel Tank
3. Return Hose (red)
4. Breather Hose (blue)
5. Carburetor Vent Hose (yellow)
6. Canister
7. Breather Hose (blue)
8. Air Cleaner Ducts
9. Surge Tank
10. Purge Hose (green)
11. To #1, #2 Carburetors
12. To #3, #4 Carburetors
13. Separator : return pump
14. Vacuum Pulse Hose (white)
15. To #3 Carburetor Holder
16. #3, #4 Spark Plug Leads
17. #1, #2 Spark Plug Leads
18. Coolant Reservoir Tank Hose

a. φ11.5 Clamps
b. φ9 Clamps
c. φ10 Clamps

Cooling System

3

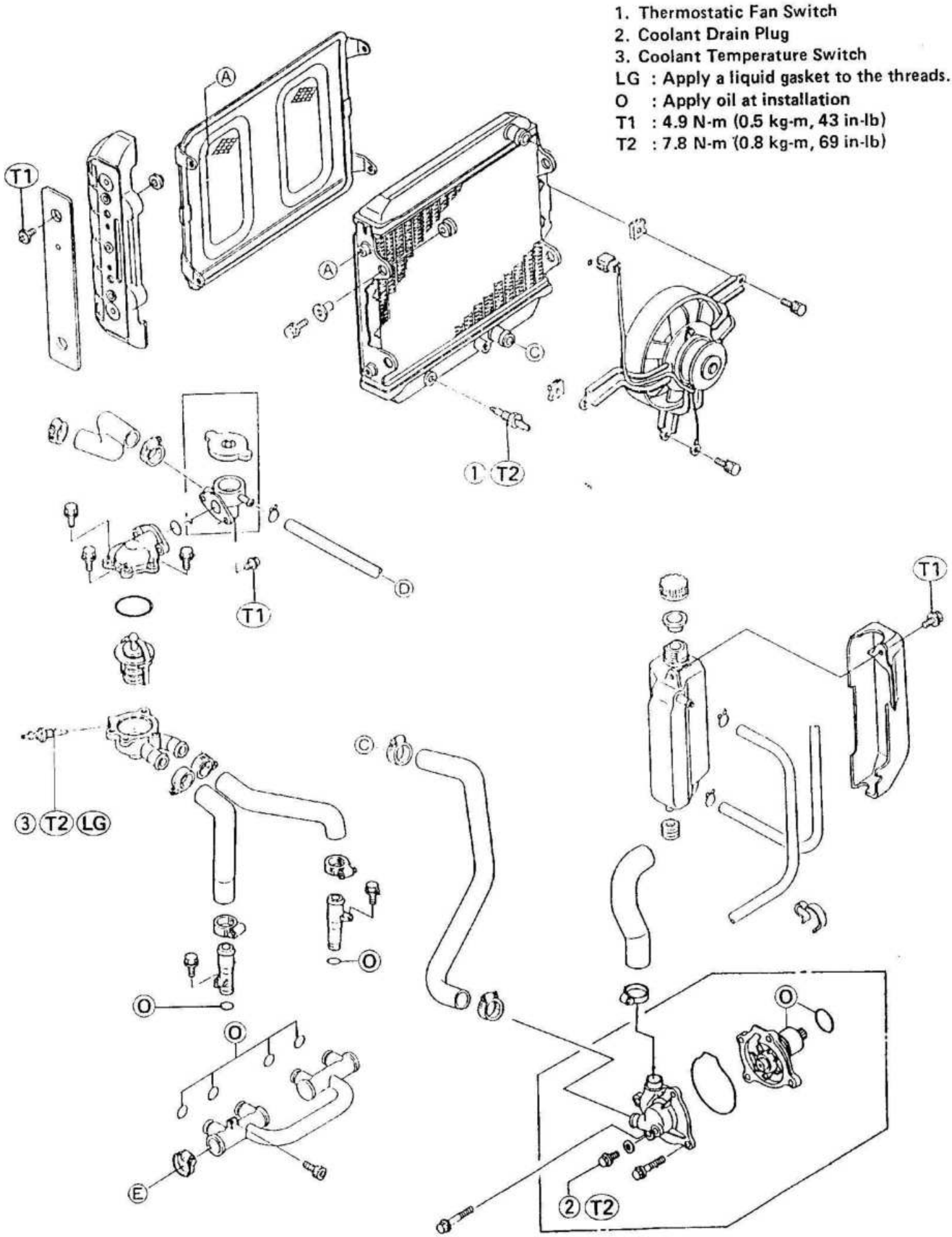
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* : Refer to Base Manual

Exploded View

Refer to p. 3-2 in the Base Manual, noting the following. A coolant temperature switch has been mounted in the thermostat housing in place of the water temperature sensor.



Specifications

Refer to p. 3-3, noting the following.

Radiator Cap Relief Pressure

73.5 –103 kPa (0.75 –1.05 kg/cm², 11 –15 psi)

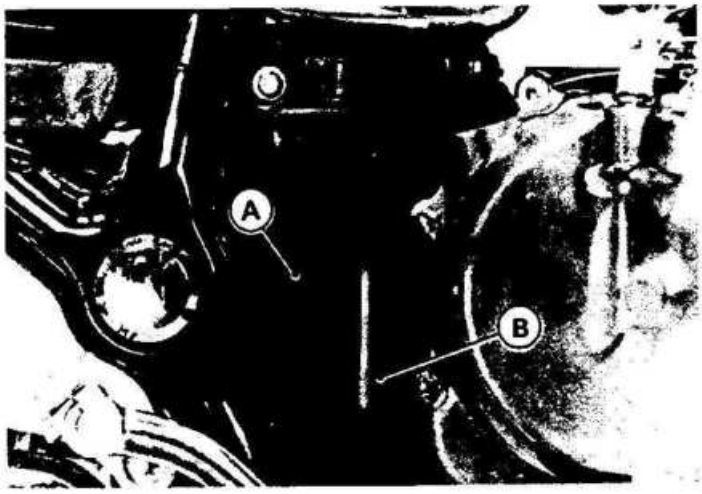
Coolant

Coolant Level Inspection

- Situate the motorcycle so that it is perpendicular to the ground.
- Check the level through the coolant level gauge on the reservoir tank. The coolant level should be between the FULL and LOW marks.

NOTE

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



A. "FULL" Mark B. "LOW" Mark

★If the amount of coolant is insufficient, add coolant through the filler opening to the FULL mark.

CAUTION

○**For refilling, add the specified mixture of coolant and soft water. Adding water alone dilutes the coolant and degrades its anticorrosion properties. The diluted coolant can attack the aluminum engine parts. In an emergency, soft water can be added. But the diluted coolant must be returned to the correct mixture ratio within a few days.**

○**If coolant must be added often, or the reservoir tank has run completely dry; there is probably leakage in the cooling system. Check the system for leaks (see Visual Leak Inspection, and Cooling System Pressure Testing in the Base Manual).**

Coolant Draining

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

CAUTION

○**To avoid burns, do not remove the radiator cap or try to change the coolant when the engine is still hot. Wait accordance with the instructions of the manufacturers (see Coolant Filling).**

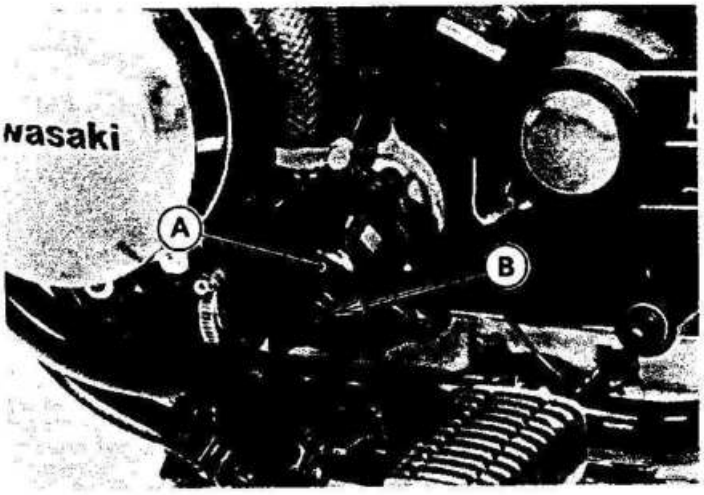
WARNING

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

○**Coolant on tires will make them slippery and can cause an accident and injury. Immediately wipe up or wash away any coolant that spills on the frame, engine or other painted parts.**

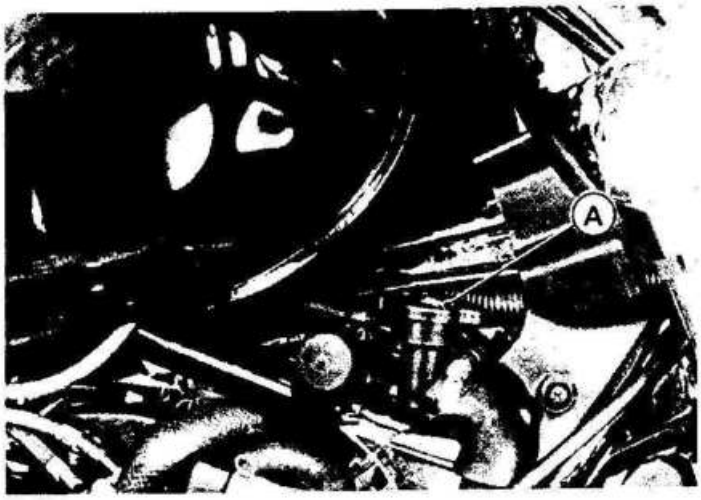
○**Since coolant is harmful to the human body, do not use for drinking.**

- Set the motorcycle up on its side stand.
- Place a container under the water pump.
- While relieving possible cooling system pressure, drain the coolant from the engine by removing the drain plug at the side of the water pump.



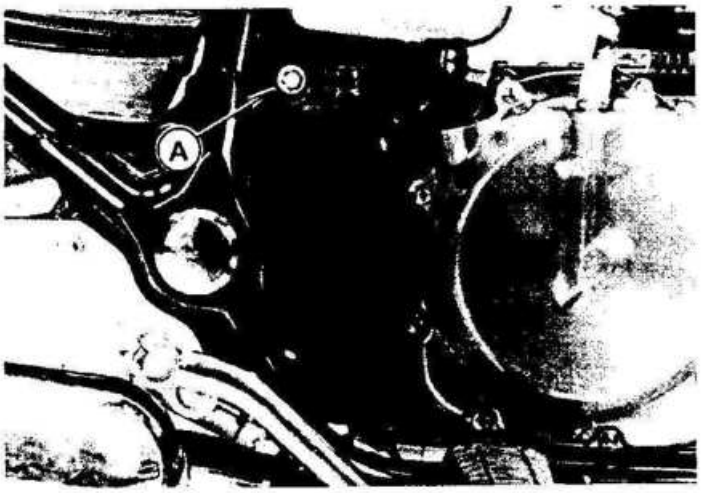
A. Water Pump B. Drain Plug

- Remove the fuel tank mounting bolt and move back the tank a little rearward for the radiator cap to fully appear. Take care that the fuel hoses do not slip out of place.
- Remove the radiator cap in two steps. First turn the cap counterclockwise, then push down and remove the cap.



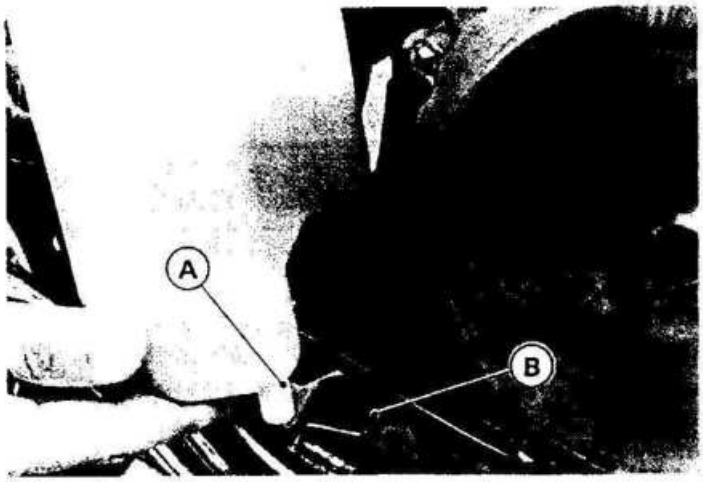
A. Radiator Cap

•Unscrew the tank mounting bolt to remove the tank and cover.



A. Mounting Bolt

•Raise up the reservoir tank to remove it from the stay with the hoses attached. Pull off the air vent hose from the clamp.



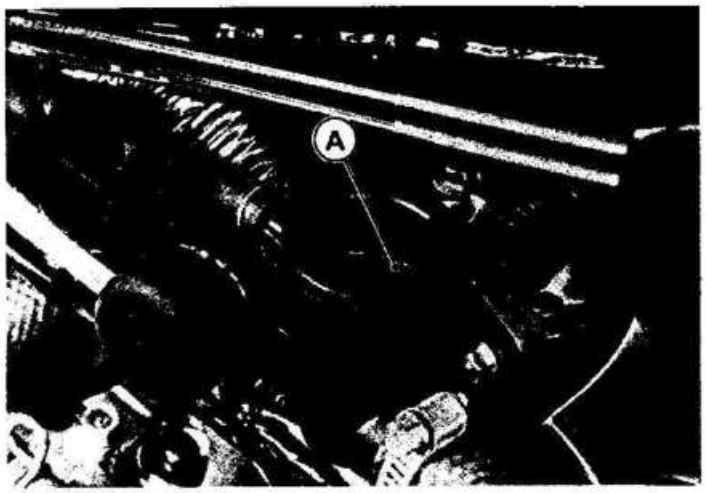
A. Stopper B. Stay

•Turn over the tank and pour the coolant from the air vent hose into a suitable container.
•Inspect the old coolant for color and smell.



Coolant Filling

•Install the drain plug. Always replace the gasket with a new one, if it is damaged.
•Tighten the drain plug to the specified torque (see Exploded View).
•Fill the radiator up to the radiator filler neck with coolant, and install the cap turning it clockwise about ¼ turn.



A. Filler Neck

•Check the cooling system for leaks.

NOTE

○*Pour in the coolant slowly so that it can expel the air from the engine and radiator.*
○*The radiator cap must be installed in two steps. First turn the cap clockwise to the first stop. Then push down on it and the rest of the way.*

●Fill the reservoir tank up to the FULL mark with coolant, and install the cap.

CAUTION

○Soft or distilled water must be used with the antifreeze (see below for antifreeze) in the cooling system.
○If hard water is used in the system, it causes scales accumulation in the water passages, and considerably reduces the efficiency of the cooling system.

NOTE

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

Original Coolant

Type	:	Permanent type antifreeze for aluminum engine and radiator
Color	:	green
Mixed ratio	:	soft water 57%, coolant 43%
Freezing point	:	−30°C (−22°F)
Total amount	:	2.0 L (up to "FULL" mark)

●Start the engine and warm it up by running it for 10 – 20 seconds at idle speed, and then stop it.
●Remove the radiator cap and refill the radiator up to the bottom of the filler neck with coolant, if the coolant level has gone down.
●Check the coolant level in the reservoir tank. Add coolant up to the Full mark if the level has gone down.
●Inspect the drain plug and the radiator cap for leaks.

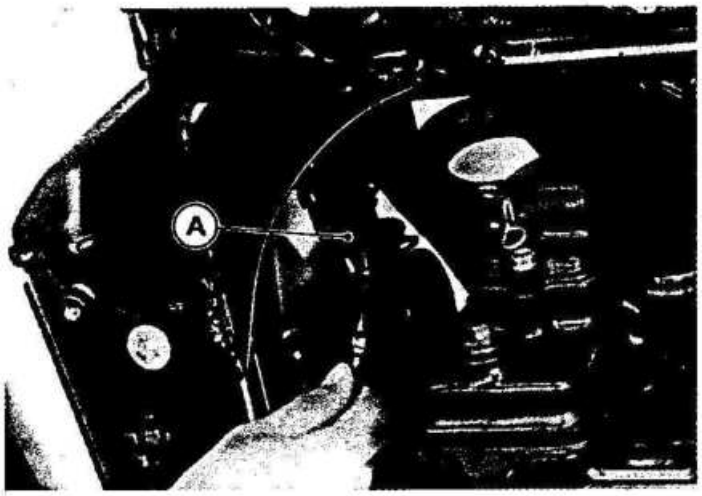
Radiator, Radiator Fan

Radiator, Radiator Fan Removal

●Drain the coolant.
●Disconnect the fan motor connector before removal of the radiator or radiator fan.

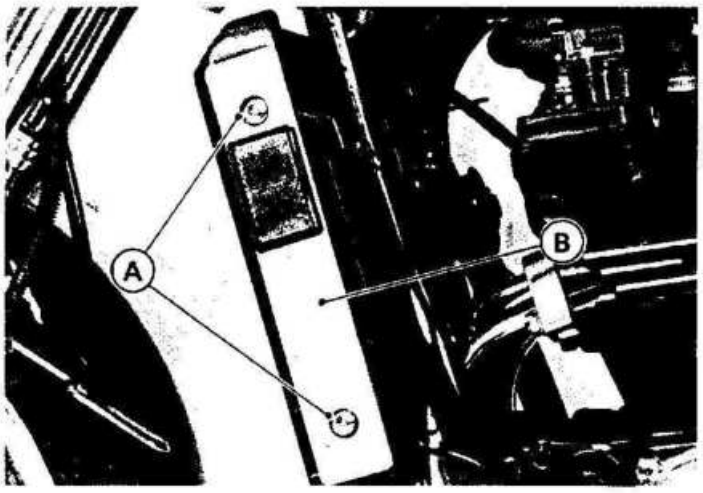
WARNING

○The radiator fan and fan switch are connected directly to the battery. The radiator fan may start even if the ignition switch is off. NEVER TOUCH THE RADIATOR FAN UNTIL THE ENGINE COMPLETELY COOLS OFF. TOUCHING THE FAN BEFORE THE ENGINE COOLS COULD CAUSE INJURY FROM THE FAN BLADES.



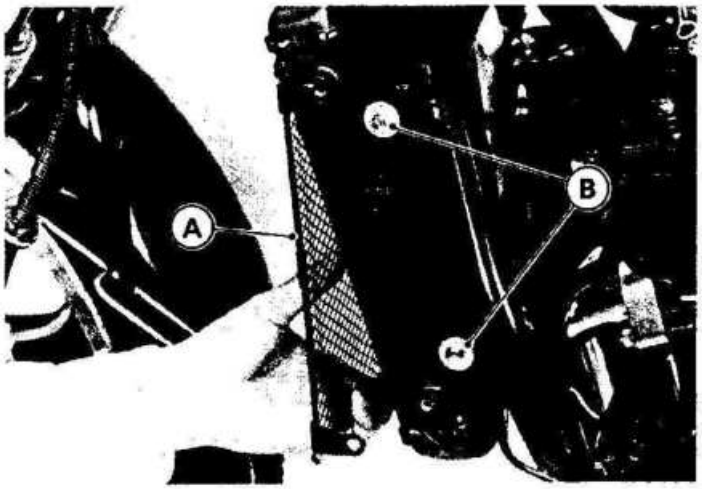
A. Fan Motor Connector

●Remove the radiator side covers by removing the mounting screws.



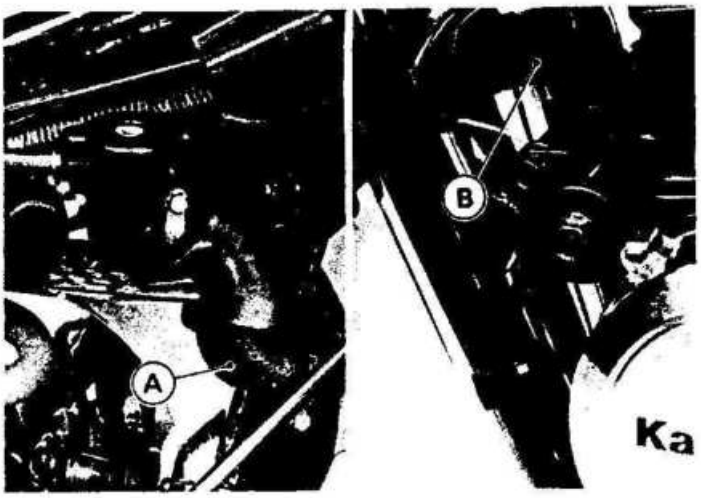
A. Mounting Screws B. Side Covers

○The radiator screen comes off the radiator side covers.
●Pull off the fan switch connector.
●Unscrew the radiator mounting bolts.



A. Screen B. Radiator Mounting Bolts

●Loosen the hose clamps for upper and lower radiator hoses.

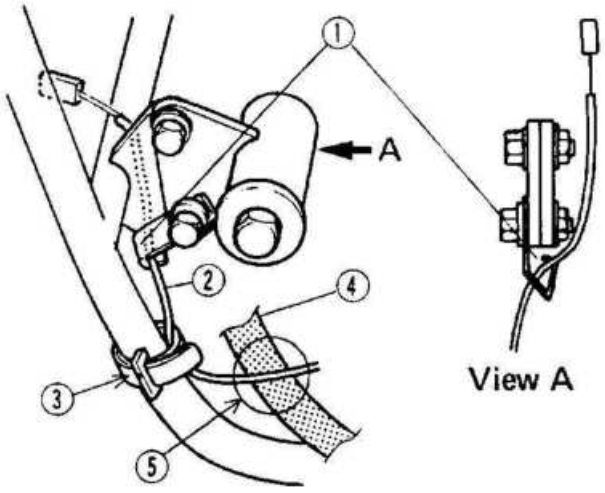


A. Upper Radiator Hose B. Lower Radiator Hose

●Remove the radiator with the radiator fan installed taking care not to damage the radiator core and the radiator fan.

Radiator Installation Note

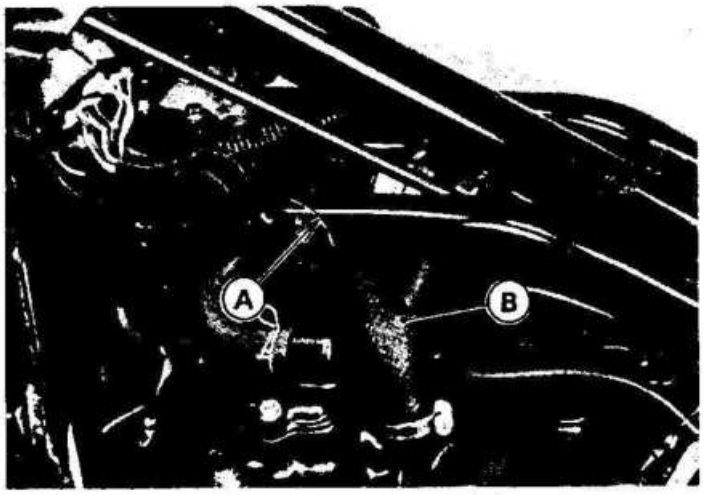
●Run and secure the fan switch lead as shown.

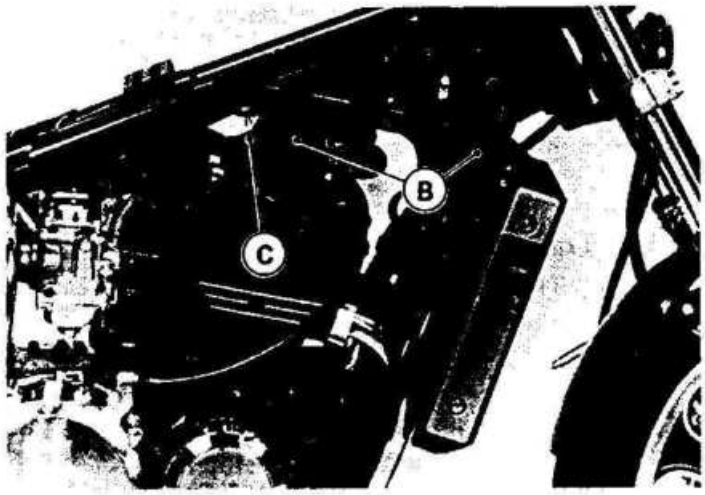


1. Clamp
2. Fan Switch Lead
3. Wiring Strap
4. Radiator Hose
5. Run the lead over the hose.

Radiator Hose, Reservoir Tank Hose Installation Notes

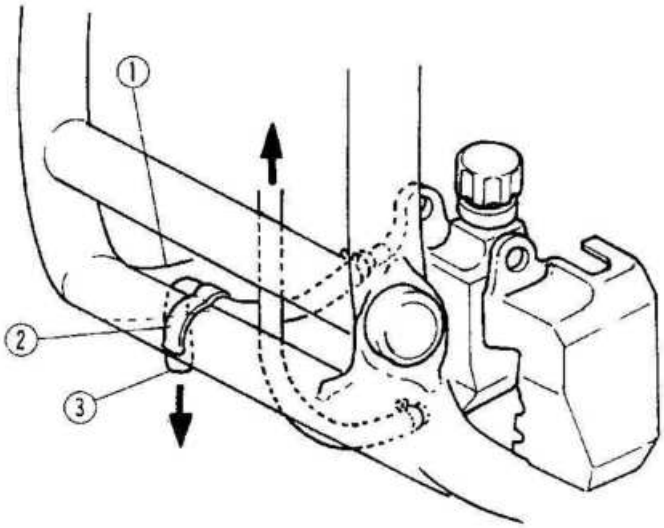
●Install the radiator hoses being careful to follow bending direction. Avoid sharp bending, kinking, flattening, or twisting.





A. Hose Bend
B. Radiator Hoses
C. Upper Reservoir Tank Hose

●Secure the reservoir tank vent hose with a clamp, and bend the hose down at the point where it hits the frame pipe. Make sure it does not touch the muffler.

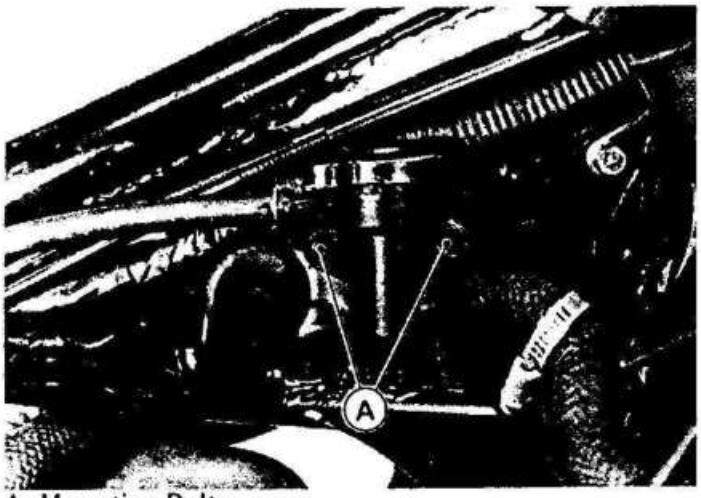


1. Frame Pipe
2. Clamp
3. Reservoir Tank Vent Hose

Thermostat

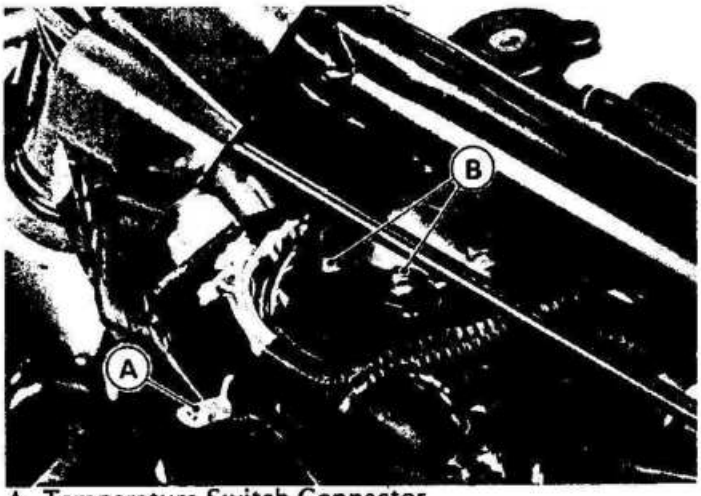
Thermostat Housing Removal

- Drain the coolant (see Coolant Draining in the Base Manual).
- Remove the fuel tank (see Fuel Tank Removal in Fuel System chapter).
- Remove the radiator hose ends on the cylinder head.
- Remove the right front side cover.
- Loosen the radiator hose clamp, and pull the hose off the thermostat housing.
- Remove the thermostat housing mounting bolts (2) on the right side.



A. Mounting Bolts

- Remove the thermostat housing mounting bolts (2) on the left side.
- Pull off the coolant temperature switch connector.

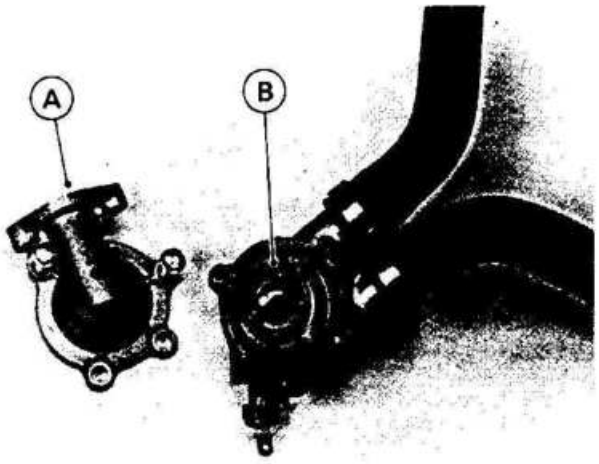


A. Temperature Switch Connector
B. Mounting Bolts

- Take out the thermostat housing.

Thermostat Removal

- Remove the thermostat housing (see Thermostat Housing Removal).
- Remove the thermostat cover bolts and lift off the cover.
- Pull the thermostat out of the thermostat housing.



A. Cover B. Thermostat

Thermostatic Fan Switch
Coolant Temperature Switch

Switch Removal/Installation

Refer to Water Temperature Sensor Removal/Installation Note in the Base Manual.

Engine Top End

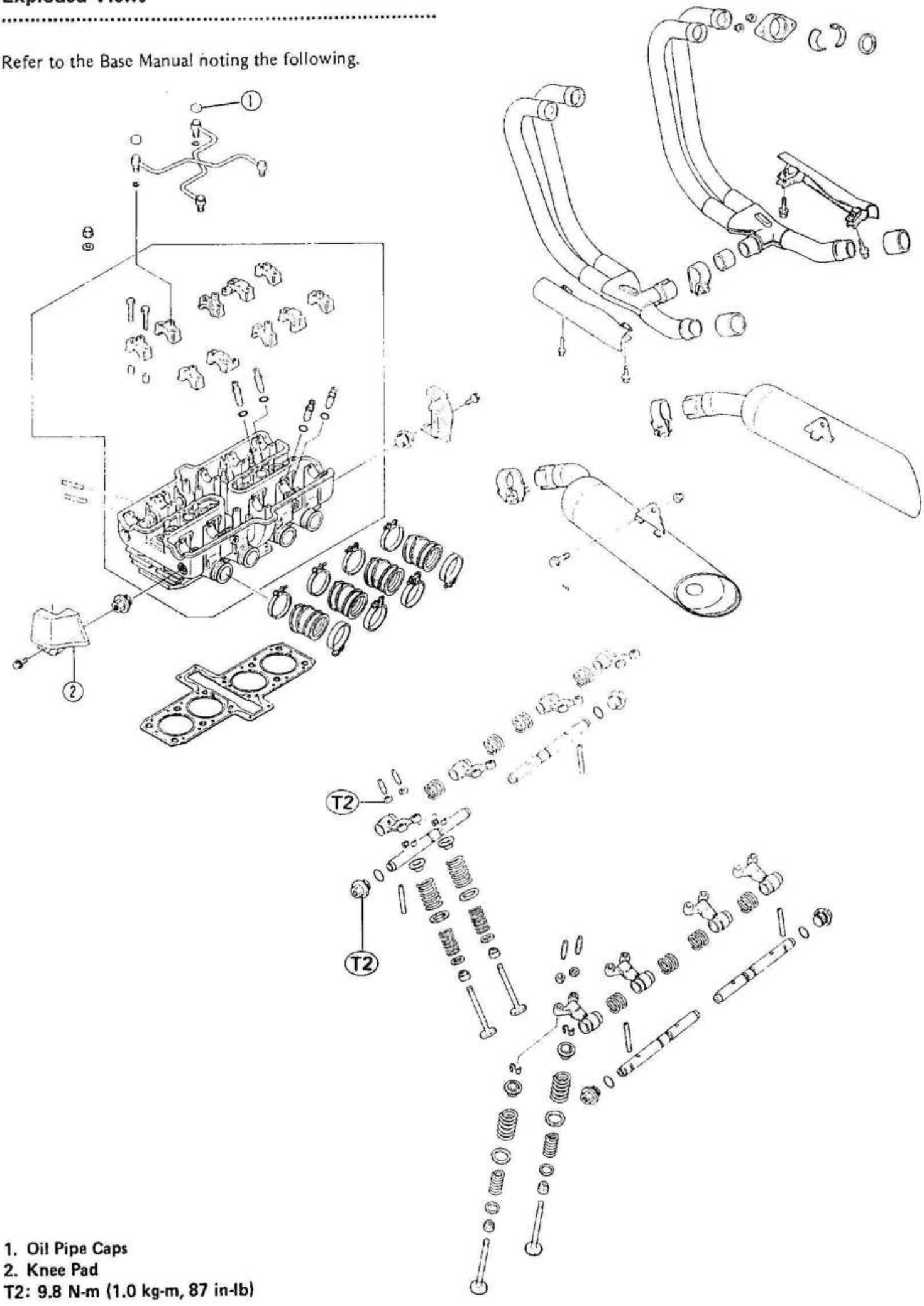
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* : Refer to Base Manual

Exploded Views

Refer to the Base Manual noting the following.

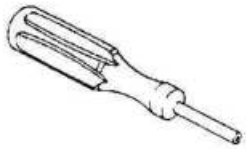


1. Oil Pipe Caps
2. Knee Pad

T2: 9.8 N-m (1.0 kg-m, 87 in-lb)

Special Tools

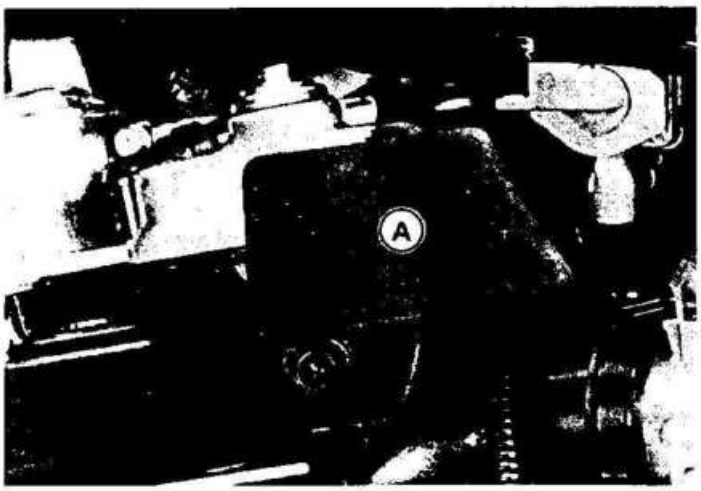
Valve Adjusting Screw Holder: 57001-1217



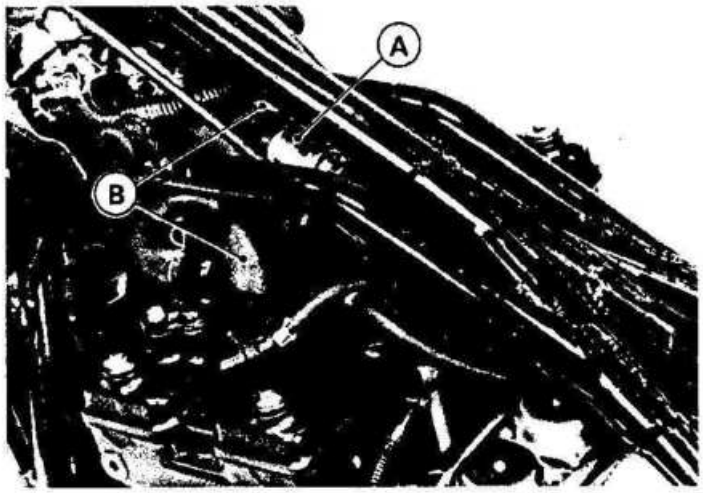
Cylinder Head Cover

Cylinder Head Cover Removal

- Remove the following parts before cylinder head cover removal.
  - Drain Coolant (see Cooling System chapter)
  - Fuel Tank (see Fuel System chapter)
  - Spark Plug Caps
  - Water Hose Ends on Cylinder Head
  - Vacuum Switch Valve (US model)
  - Right-hand Air Suction Valve (US model)
  - Knee Pads

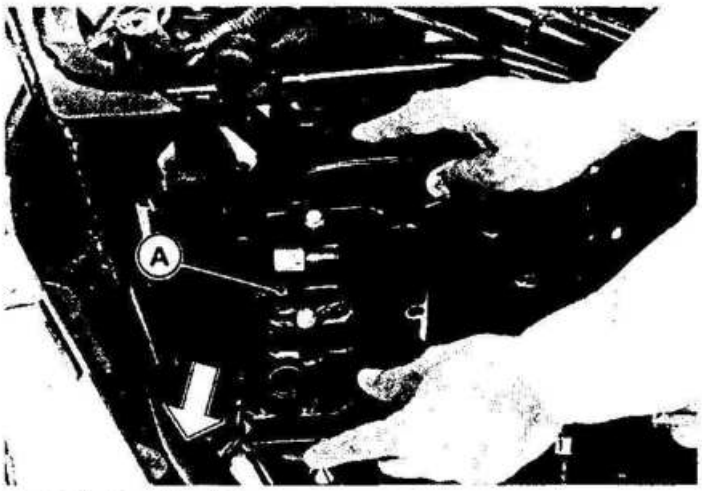


A. Knee Pad



A. Vacuum Switch Valve B. Water Hoses

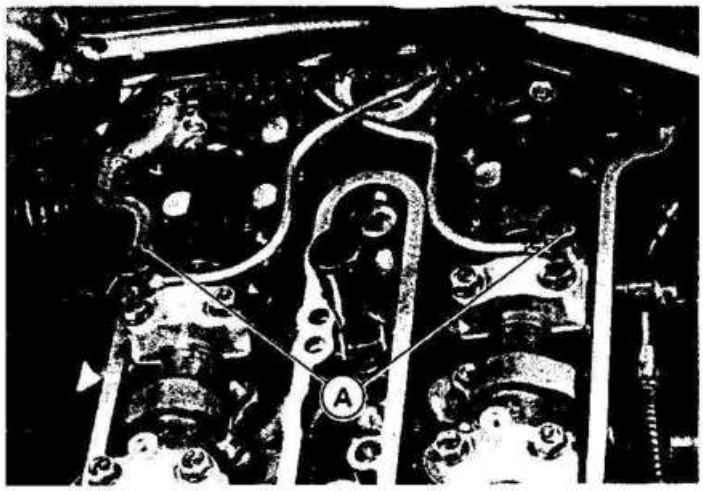
- Pull the water hose ends up between the frame pipes to allow raising the cylinder head cover.
- Remove the cylinder head cover bolts.
- While lifting the head cover up against the frame pipes, slide the cover out the left-hand side.



A. Cylinder Head Cover

CAUTION

○Be careful not to drop the four oil pipe caps into the cylinder head during cylinder cover removal.



A. Oil Pipe Caps (4)

Cylinder Head Cover Installation Note

Refer to p. 4-9 in the Base Manual, noting the following.

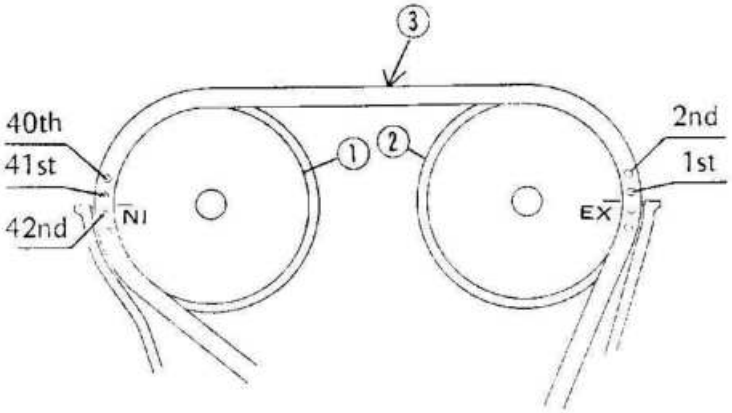
●Be sure to install the oil pipe caps on the oil pipes.

Camshaft, Camshaft Chain, Rocker Shaft

Camshaft Installation
(Including Chain Timing Procedure)

Refer to p. 4-12 in the Base Manual, noting that the marks on the camshaft sprockets are changed as shown.

Camshaft Chain Timing (right side view)

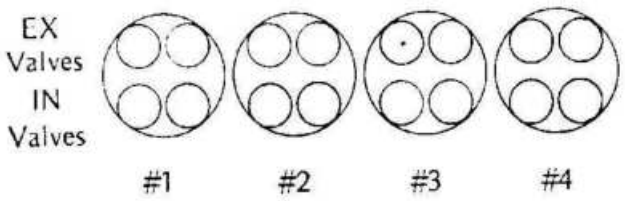


1. Inlet Camshaft Sprocket
2. Exhaust Camshaft Sprocket
3. No slack.

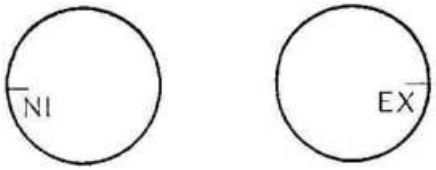
Valve Clearance Measuring Position

#4 Piston TDC at End of Compression Stroke →
Inlet valve clearances of #2 and #4 pistons, and
Exhaust valve clearance of #3 and #4 pistons.

Measuring Valves ☐

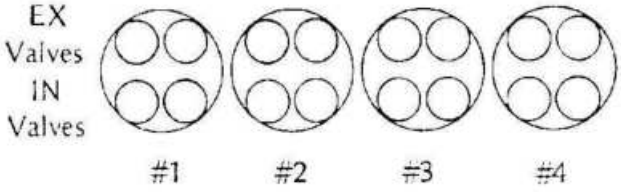


Camshaft Sprocket Position

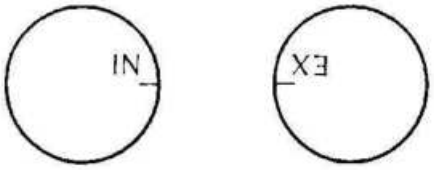


#1 Piston TDC at End of Compression Stroke →
Inlet valve clearance of #1 and #3 pistons, and
Exhaust valve clearance of #1 and #2 pistons.

Measuring Valves ☐



Camshaft Sprocket Position



Valves

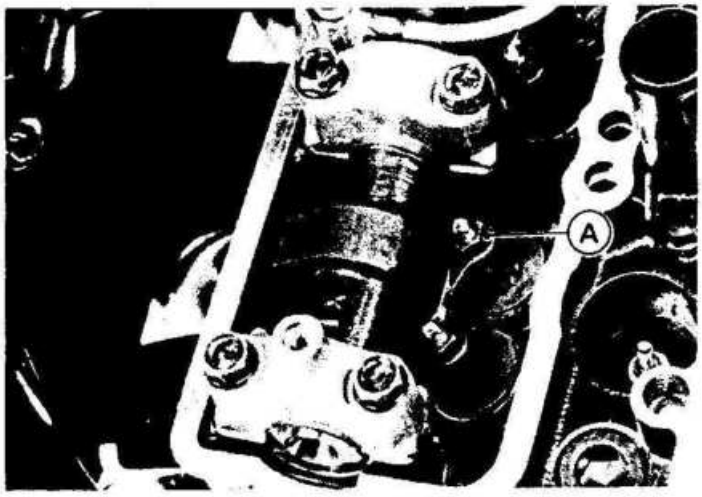
Valve Clearance Inspection

Refer to p. 4-18 in the Base Manual, noting that the marks on the camshaft sprockets are changed as shown.

Valve Clearance Adjustment

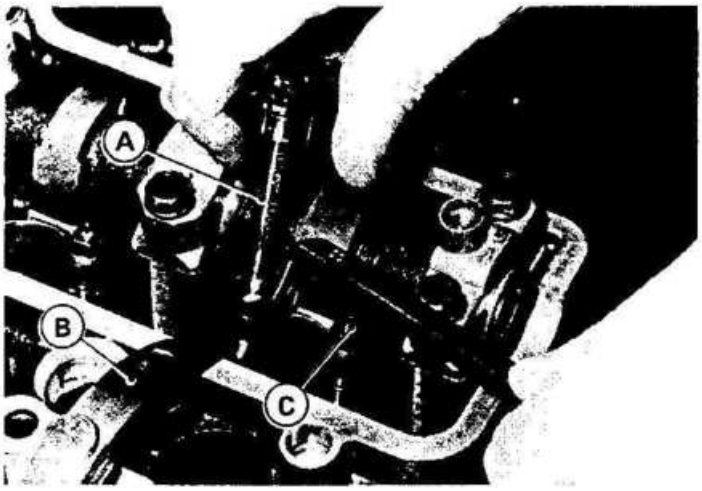
★If the valve clearance is incorrect, the valve clearance must be adjusted.

●Loosen the valve adjusting screw locknut.



A. Adjusting Screw Locknut

- Turn the valve adjusting screw until the correct clearance is obtained.
- Tighten the locknut to **9.8 N-m (1.0 kg-m, 87 in-lb)** of torque while holding the valve adjusting screw with a holder (special tool).



A. Valve Adjusting Screw Holder: 57001-1217
B. Thickness Gauge
C. Adjusting Screw

- Install the pick-up coil cover and gasket.
- Install the cylinder head cover.
- Install the fuel tank.

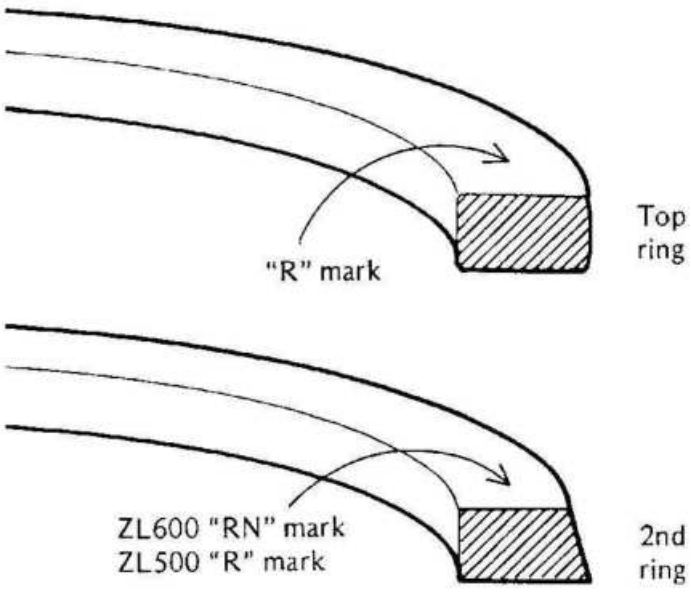
Cylinder, Piston

Piston Installation Note

Refer to pp. 4-25, 4-26 in the Base Manual, noting the following.

- Install the top and second rings so that the marked side of each faces up.

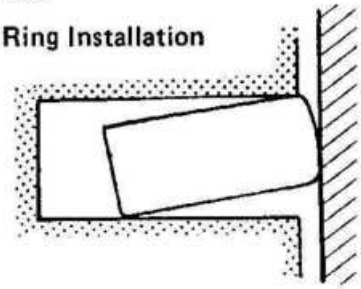
Cross Section of Piston Rings



CAUTION

- **Be careful not to install either ring upside down. The top ring must bend upward for better sealing and the second ring is not symmetrical with respect to the horizontal axis.**

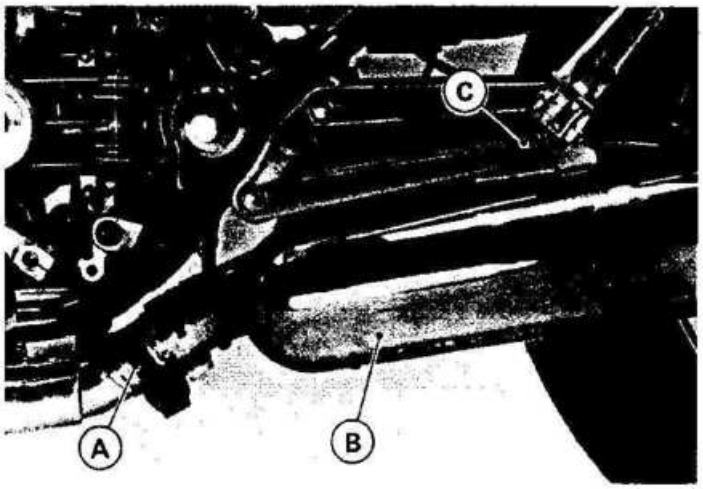
Correct Top Ring Installation



Muffler

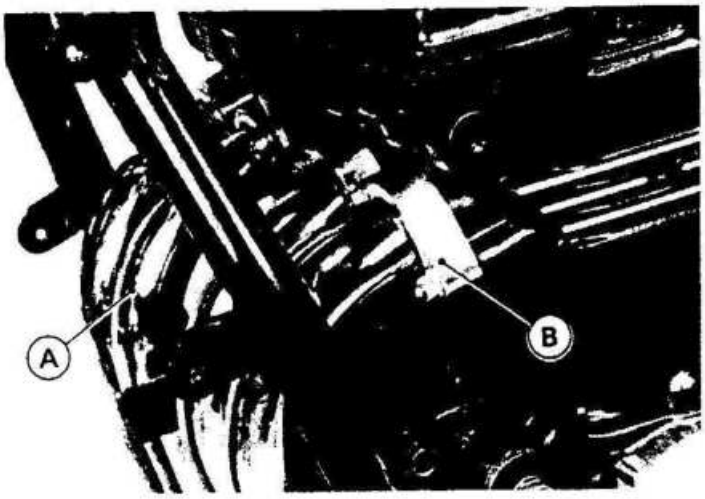
Muffler Removal

- Unscrew the mounting bolt and nut from the footpeg bracket.
- After loosening the clamp securing the muffler connecting pipe, pull out the muffler.



A. Clamp
B. Muffler
C. Mounting Bolt and Nut

- Remove the other muffler in the same manner.
- Remove the radiator after draining the coolant (see Radiator, Radiator Fan Removal in Cooling System chapter).
- Remove the exhaust pipe holder nuts, and slide the holders off its cylinder head studs.
- Remove the split keepers.
- Remove the exhaust pipes and gaskets.



A. Exhaust Pipes B. Holders

Clutch

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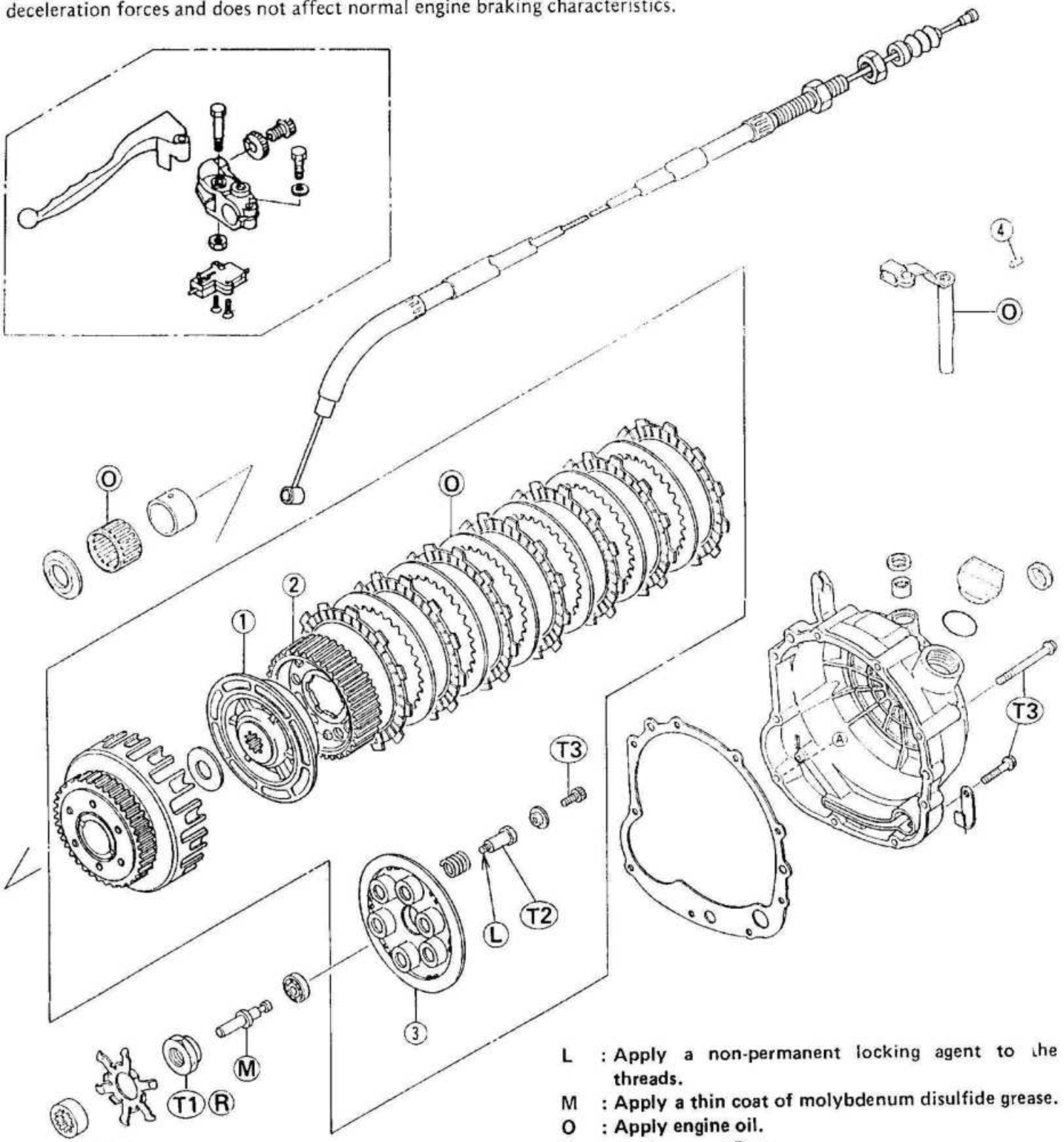
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* : Refer to Base Manual

Exploded View

Deceleration Torque Limiting Clutch

The device reduces loads during extreme engine braking conditions by allowing a limited amount of clutch slippage. Power is transmitted from the sub clutch hub to the clutch hub through three dogs on the sub clutch hub which fit into recesses in the clutch hub. During deceleration, forces are transmitted in the opposite direction from the clutch hub through the dogs to the sub clutch hub. As power is transmitted in the reverse direction, the sub clutch hub and clutch hub rotate against each other slightly and begin to spread. As these pieces are forced apart by the ramps, they work against the clutch springs to reduce pressure on the clutch plates and allow some slippage. This only occurs very heavy deceleration forces and does not affect normal engine braking characteristics.



1. Clutch Hub
2. Sub Clutch Hub
3. Clutch Spring Plate
4. Stopper Pin for Release Shaft

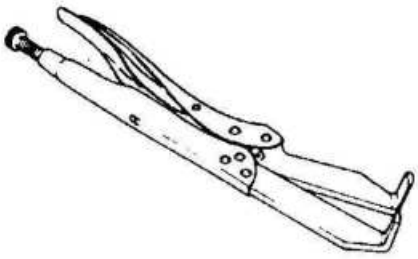
L : Apply a non-permanent locking agent to the threads.
M : Apply a thin coat of molybdenum disulfide grease.
O : Apply engine oil.
R : Replacement Part
T1 : 130 N-m (13.5 kg-m, 98 ft-lb)
T2 : 11 N-m (1.1 kg-m, 95 in-lb)
T3 : 8.8 N-m (0.9 kg-m, 78 in-lb)

Specifications

Item	Standard	Service Limit
Clutch:		
Clutch lever play	2 – 3 mm	– – –
Clutch spring free length	33.2 mm	32.1 mm
Friction and steel plate warp	Less than 0.2 mm	0.3 mm
Spring plate free play (new plates)	0.50 – 0.95 mm	– – –
Spring plate free play (no new plates)	0.50 – 1.20 mm	– – –

Special Tools

Holder: 57001-305



Bearing Driver Adapter: 57001-1092



Clutch

Clutch Release Lever Removal

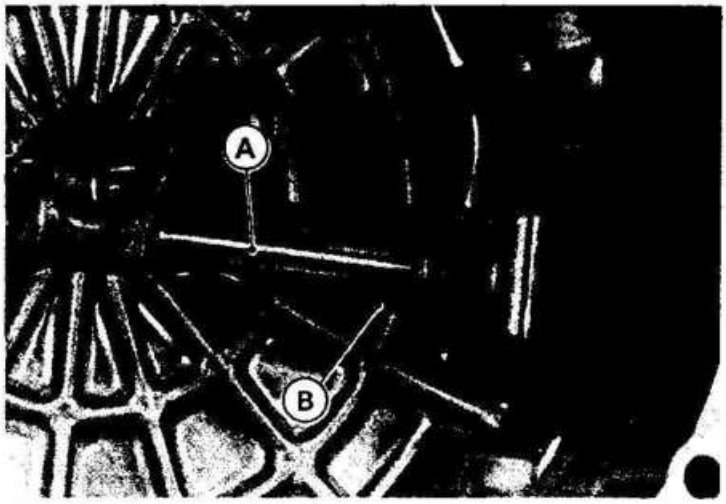
NOTE

○*Do not pull out the clutch release shaft for clutch cover removal.*

CAUTION

○**Clutch release shaft removal damages the oil seal in the clutch cover necessitating the oil seal replacement.**

●If necessary, remove the clutch release shaft after pulling out the pin.

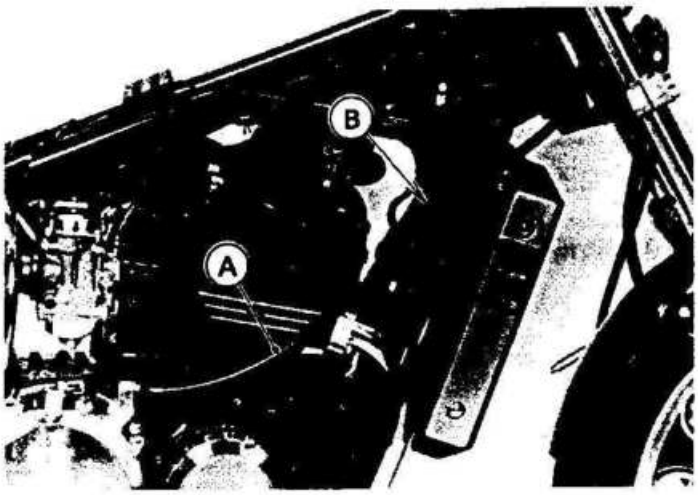


A. Clutch Release Shaft B. Pin

●Replace the oil seal in the clutch cover with a new one.

Clutch Cable Installation

●Run the clutch cable as shown (see Steering Stem Installation in Steering chapter).



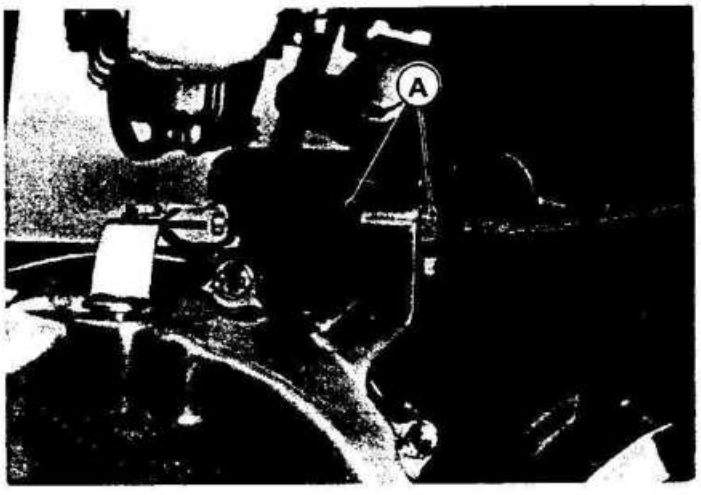
A. Clutch Cable B. Clamp

Clutch Cover Removal

NOTE

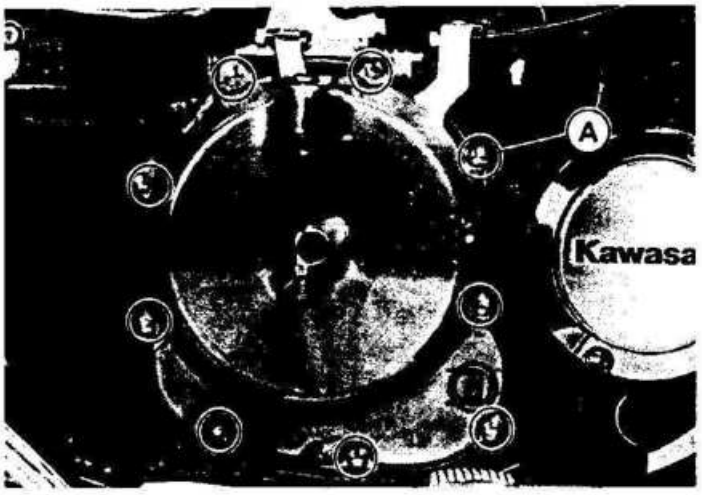
○*Do not pull out the clutch release shaft for clutch cover removal.*

●Drain the engine oil (see Base Manual).
●Loosen the knurled locknut at the clutch lever, and screw in the adjuster.
●Loosen the adjusting nuts, and slide the lower end of the clutch cable to give the cable plenty of play.



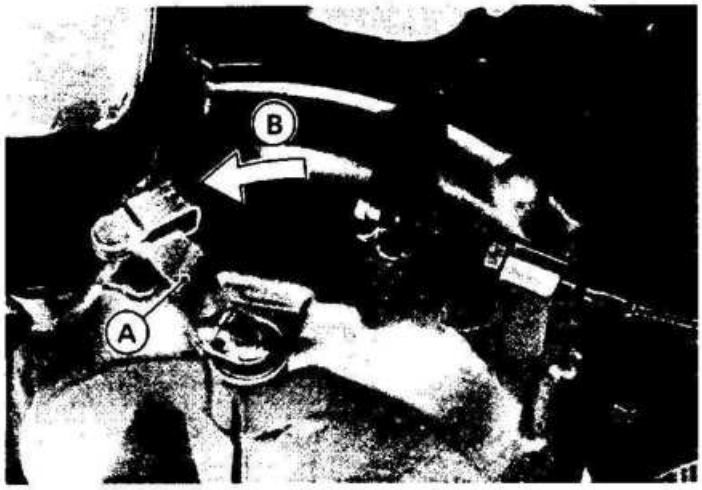
A. Adjusting Nuts

●Remove the clutch cable lower end from the clutch lever.
●Remove the clutch cover bolts.



A. Cover Bolts

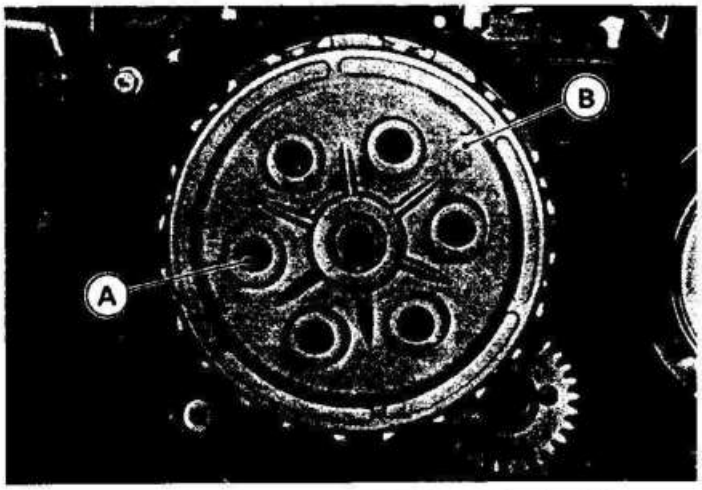
●Turn the release lever **counterclockwise**, and then remove the clutch cover.



A. Release Lever B. Turn counterclockwise

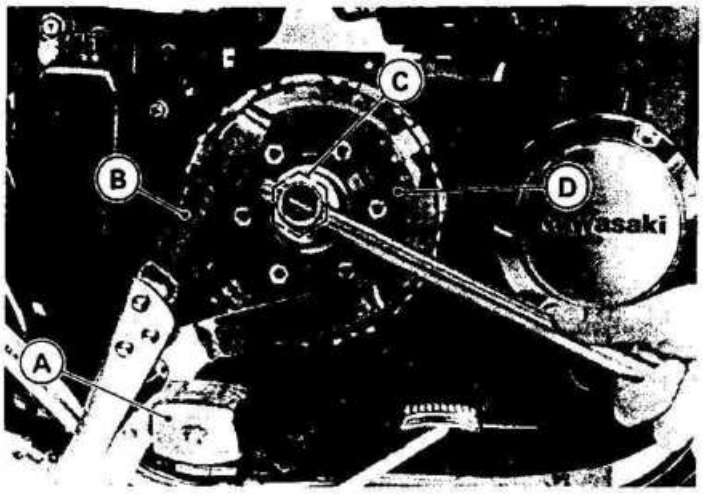
Clutch Removal

●Remove the clutch cover.
●Remove the clutch spring bolts, retainers and springs.
●Remove the spring plate with the spring plate pusher and bearing.



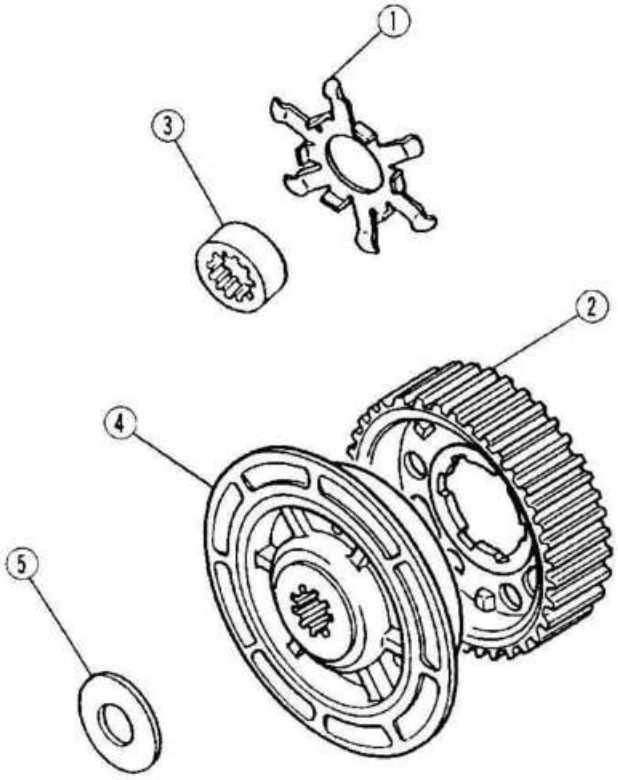
A. Clutch Spring Bolts B. Clutch Spring Plate

- Remove the friction plates and steel plates.
- Remove the clutch hub nut. When loosening the hub nut, use a clutch holder (special tool) to keep the sub clutch hub from turning as shown.



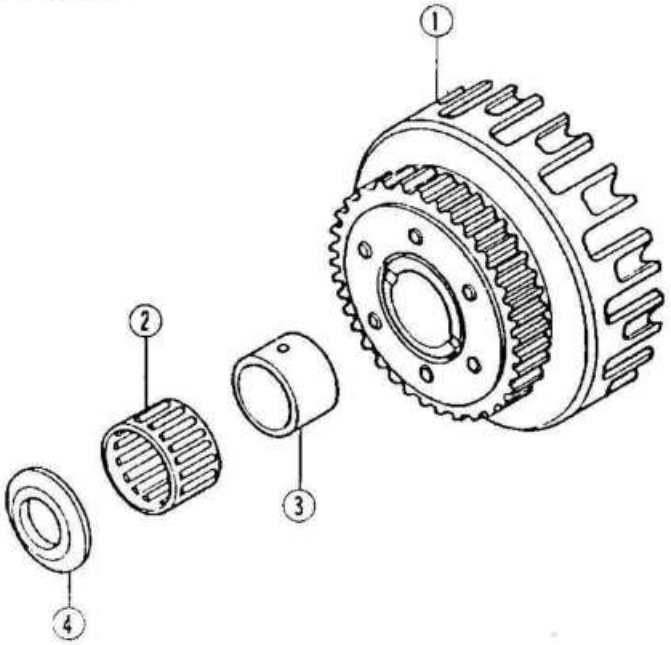
A. Right Footpeg
B. Holder: 57001-305
C. Hub Nut
D. Sub Clutch Hub

- Remove the damper spring, sub clutch hub, collar, clutch hub, and thrust washer.



1. Damper Spring
2. Sub Clutch Hub
3. Collar
4. Clutch Hub
5. Thrust Washer

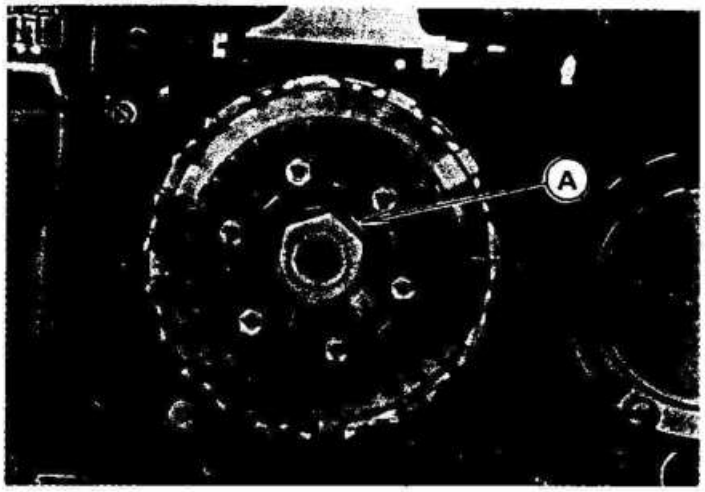
- Remove the clutch housing, needle bearing, bushing and spacer.



1. Clutch Housing
2. Needle Bearing
3. Bushing
4. Spacer

Clutch Installation Note

- Fit the damper spring tongues in the sub clutch hub.



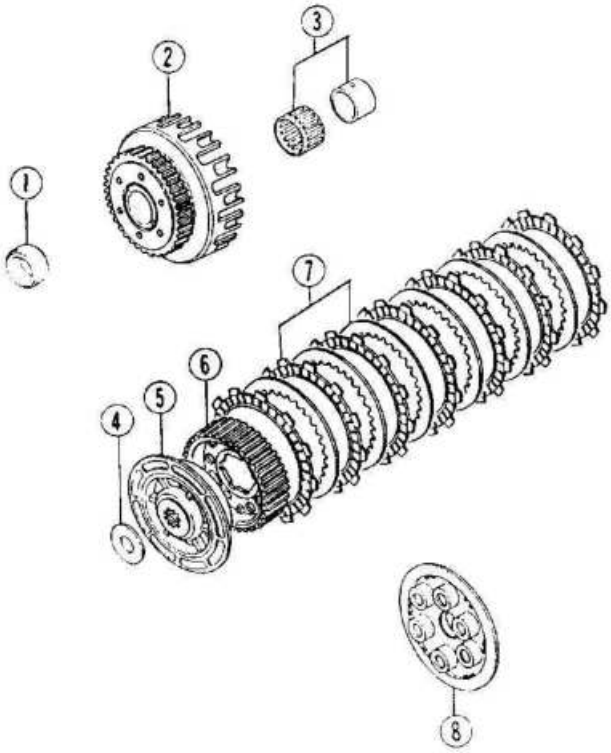
A. Damper Spring Tongues

Spring Plate Free Play Measurement

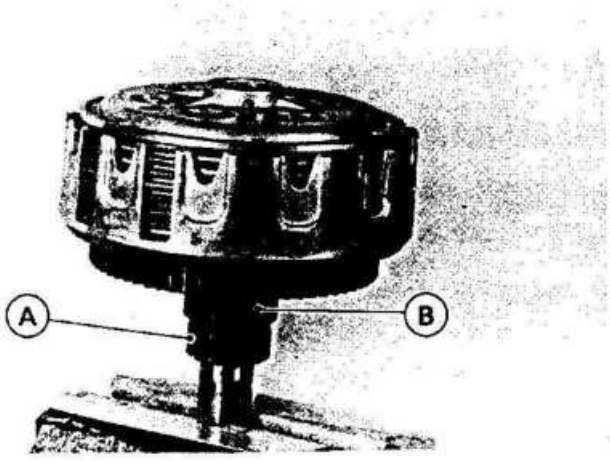
Insufficient clutch free play will cause the engine braking effect to be more sudden, resulting in rear wheel hop. On the other hand, if the free play is excessive, the clutch lever may feel "spongy" or pulsate when pulled.

- Install the following parts on an extra drive shaft as shown.

Spring Plate Free Play Measurement

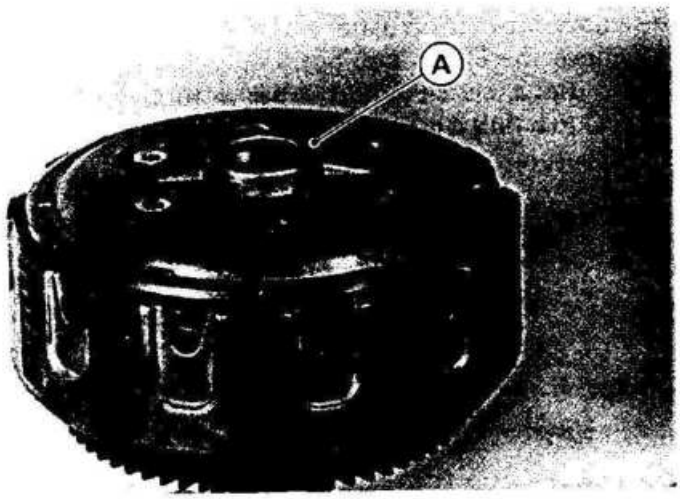


1. Suitable Collar: internal ϕ25 – 25 ℓ
   (e.g. Bearing Driver Adapter: 57001-1092)
2. Clutch Housing
3. Needle Bearing and Bushing
4. Spacer
5. Clutch Hub
6. Sub Clutch Hub
7. Friction Plates and Steel Plates
8. Spring Plate



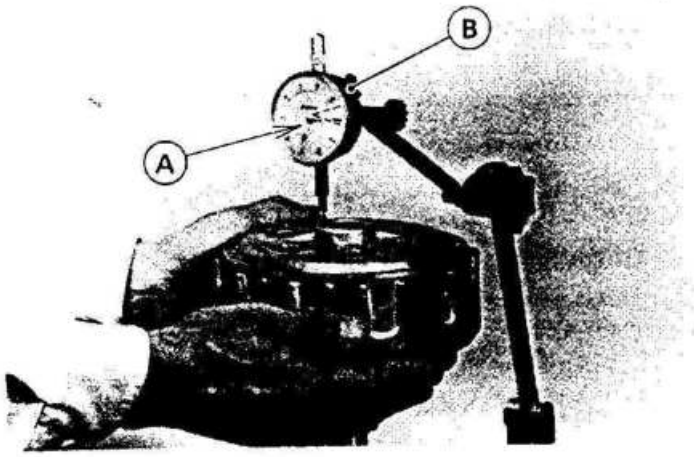
A. Drive Shaft
B. Bearing Driver Adapter: 57001-1092

•To measure the free play, set a dial gauge against the raised center of the clutch spring plate.



A. Raised Center

•Move the clutch housing gear back and forth while holding the drive shaft steady. The difference between the highest and lowest gauge readings is the amount of free play.



A. Difference B. Dial Gauge

Clutch Plate Replacement

When renewing all the steel and friction plates, do the following.

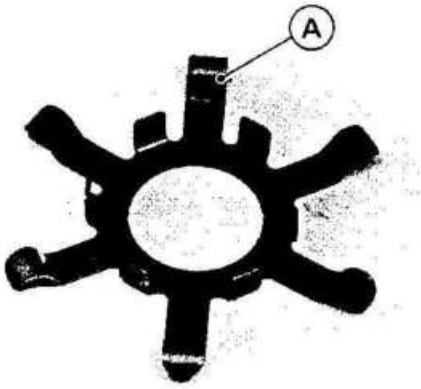
•Install **five 2.3 mm** thick steel plates, one **2.6 mm** steel plate and all **seven** friction plates in the housing temporarily for measurement purposes.

•Measure the free play (see Spring Plate Free Play Measurement).

★If the free play is not within the standard range, change one of the steel plates to a thicker or thinner one to get the correct clearance.

Spring Plate Free Play (With all new friction plates)

Standard: 0.50 – 0.95 mm



A. Damper Spring

Steel Plates

Thickness (mm)	Part Number
2.0	13089-026
2.3	13089-1004
2.6	13089-1067

When reusing the original clutch plates, do the following.

- Install the plates temporarily for measurement purposes.
- Measure the free play (see Spring Plate Free Play Measurement).

★If the free play is not within the standard range, change one of the steel plates to a thicker or thinner one to get the correct clearance.

Spring Plate Free Play (No new friction plates)

Standard: 0.50 – 1.20 mm

Clutch Plate Wear, Damage Inspection

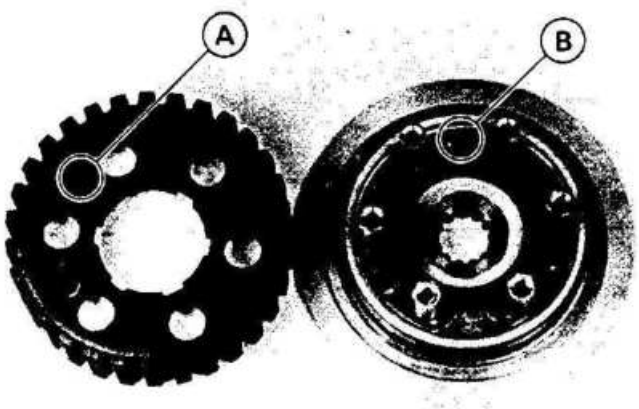
- Visually inspect the plates for signs of seizure, overheating (discoloration), or uneven wear.

★If any plates show signs of damage, replace them with new ones.

Damper Cam Inspection

- Remove the clutch (see Clutch Removal).
- Visually inspect the damper cam, damper spring, and cam follower.

★Replace the part if it appears damaged.



A. Cam (Sub Clutch Hub)
B. Cam Follower (Clutch Hub)

Engine Lubrication System

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- Oil Pan Installation Notes ..... *

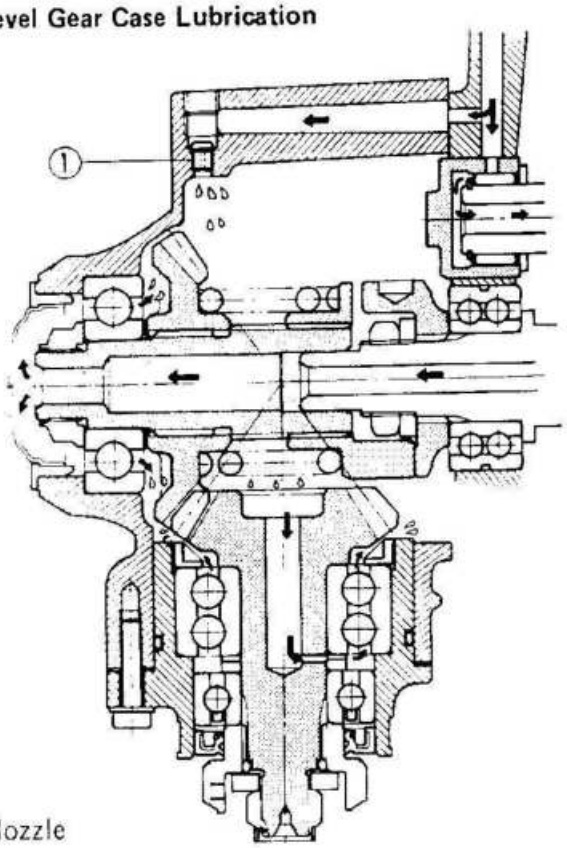
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- Oil Pump Removal ..... *
- Oil Pump Installation Notes ..... *
- Oil Pump Disassembly ..... *
- Oil Pump Assembly Note ..... *
- Oil Pressure Measurement ..... *
- Oil Pump Inspection ..... *
- Relief Valve Inspection ..... *

* : Refer to Base Manual

Engine Oil Flow Chart

Refer to p. 6-3 in the Base Manual, noting the following.

Front Bevel Gear Case Lubrication

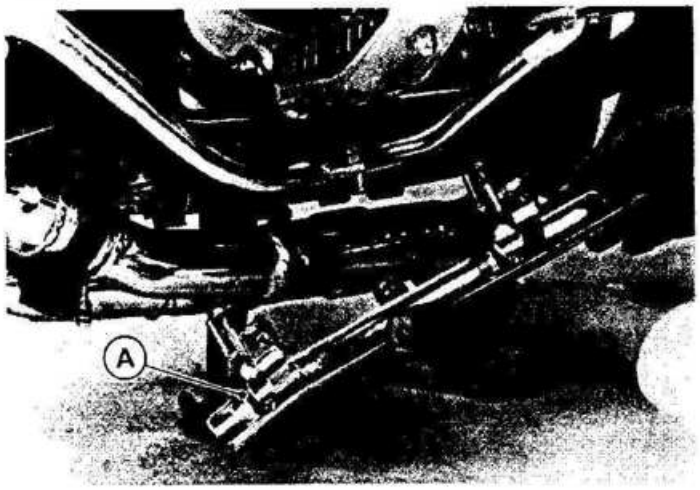


1. Oil Nozzle

Engine Oil and Filter

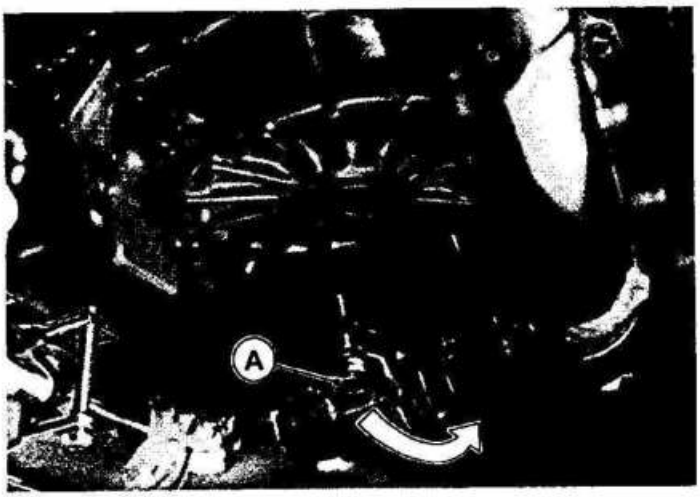
Oil Filter and Mounting Bolt Removal

- With the motorcycle on its side stand, place an oil pan beneath the engine.
- Remove the right muffler cover by taking out the mounting screws(2).



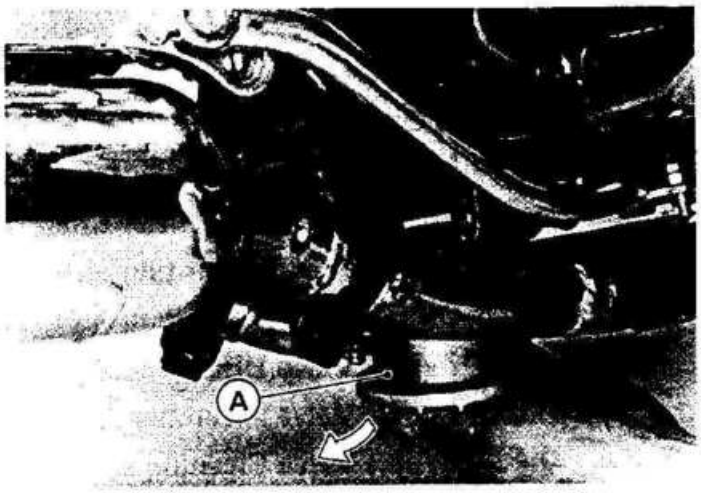
A. Right Muffler Cover

- Loosen the clamp securing the muffler connecting pipe to the mufflers.
- Turn the clamp mounting bolt forward for clearance when removing the oil filter.



A. Clamp Mounting Bolt

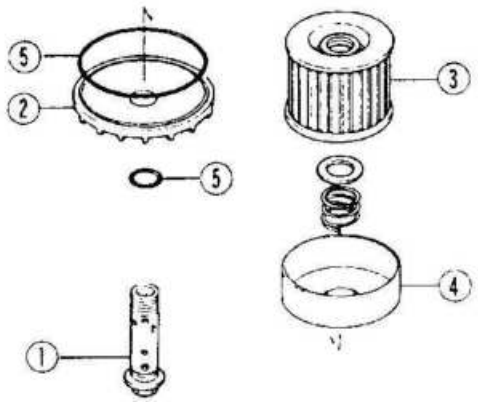
- Unscrew the oil filter mounting bolt and drop the filter down until it hits the muffler connecting pipe.
- Tilt the filter backward and to the left to drop it out.



A. Oil Filter

- Holding the filter steady, turn the mounting bolt to work the filter free and take the filter off the bolt.
- Remove the flat washer, spring, and oil fence, then pull the filter cover off the bolt.
- The oil filter bypass valve is assembled in the mounting bolt.

Oil Filter and Mounting Bolt Installation



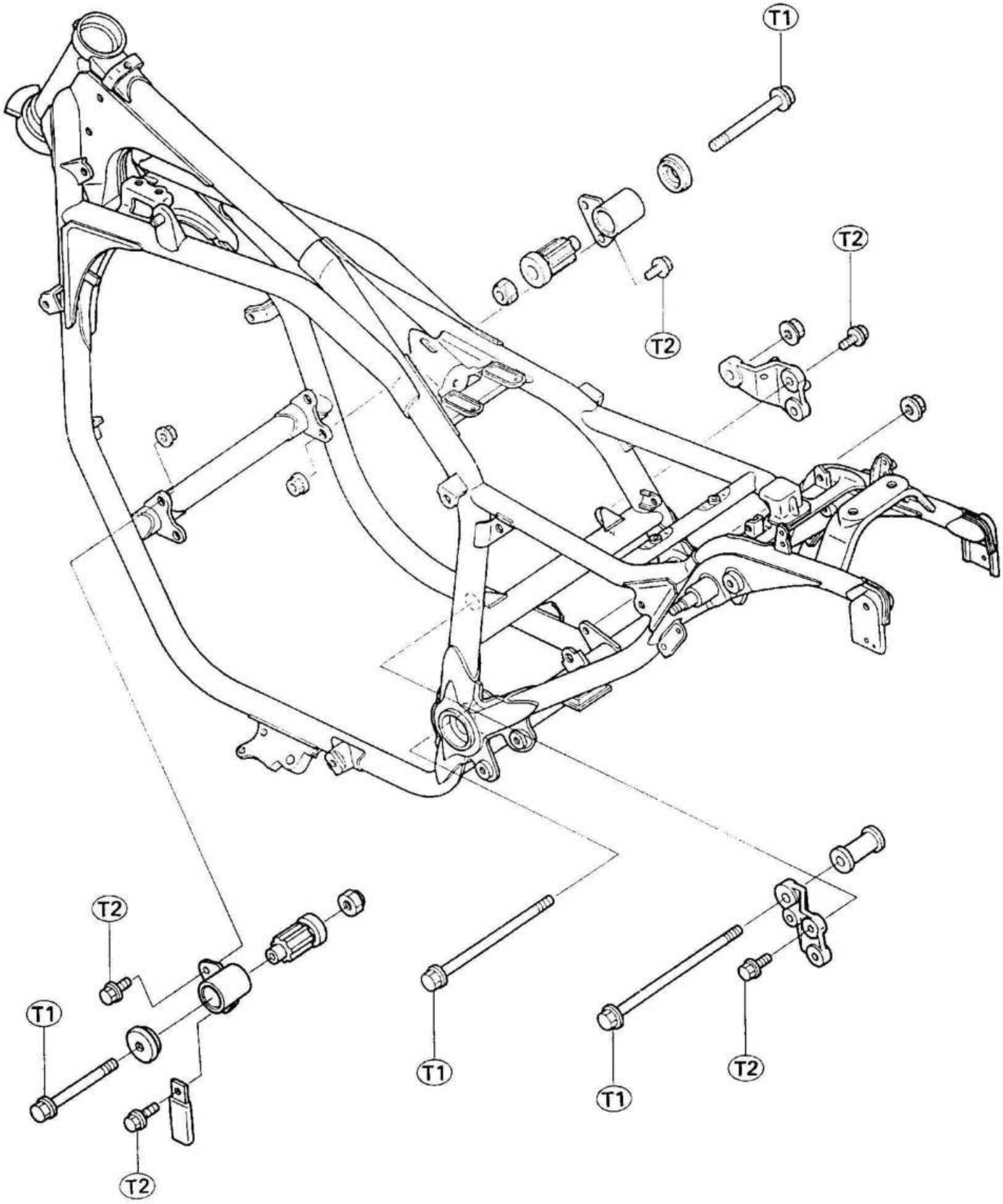
1. Mounting Bolt (Including Bypass Valve)
2. Filter Cover
3. Filter
4. Oil Fence
5. O-rings

Engine Removal/Installation

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Engine Installation Notes 7-4

Exploded View

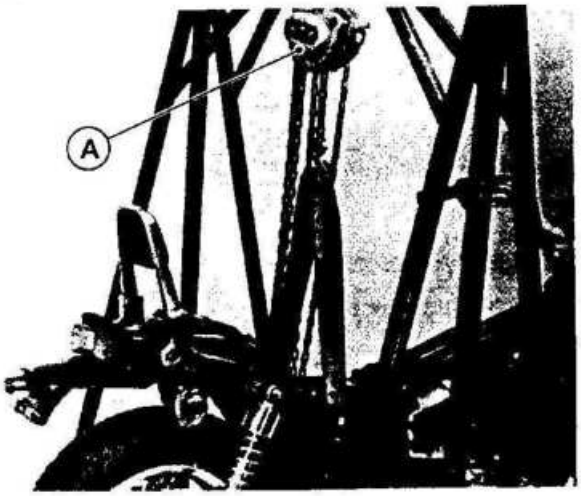


T1 : 34 N-m (3.5 kg-m, 25 ft-lb)
T2 : 25 N-m (2.5 kg-m, 18 ft-lb)

Engine Removal/Installation

Engine Removal

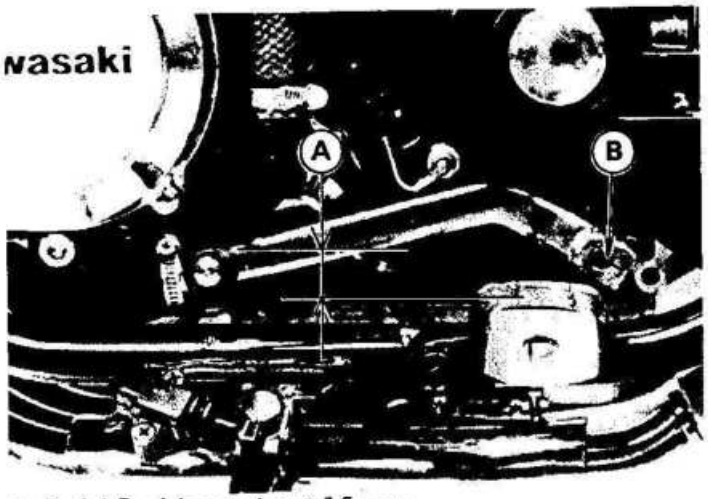
- Drain the engine oil (see Base Manual).
- Drain the coolant (see Base Manual).
- Remove the following parts.
  - Seat (see Frame chapter)
  - Side Covers
  - Fuel Tank (see Fuel System chapter)
  - Ignition Coils (see Electrical System chapter)
  - Radiator (see Cooling System chapter)
  - Muffler (see Engine Top End chapter)
  - Vacuum Switch Valve (Clean Air System: US model)
  - Carburetors (see Fuel System chapter)
  - Surge Tank
  - Water Pump Hose
  - Radiator Hoses
  - Coolant Reservoir Tank
  - Clutch Cable Lower End
  - Choke Cable Lower End
- Position the motorcycle across a hoist to lift the rear wheel off the floor.



A. Hoist

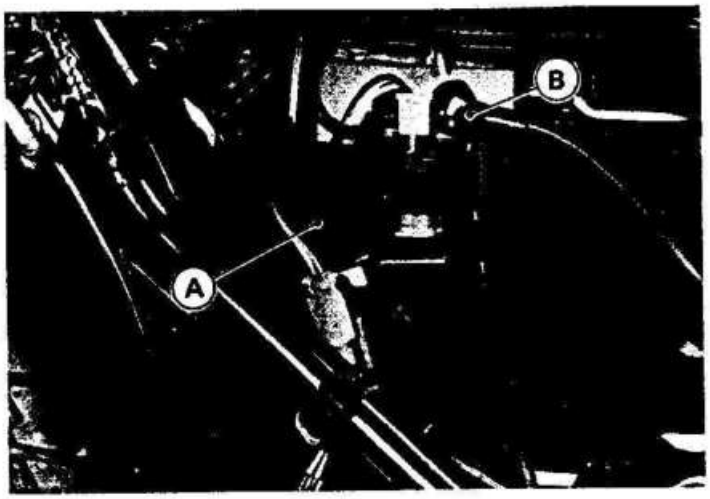
- Remove the rear wheel (see Wheels/Tires chapter).
- Remove the swing arm (see Suspension chapter).
- Remove the shift pedal.

○Before removing the shift pedal, mark the position of the pedal so that it can be installed later in the same position.



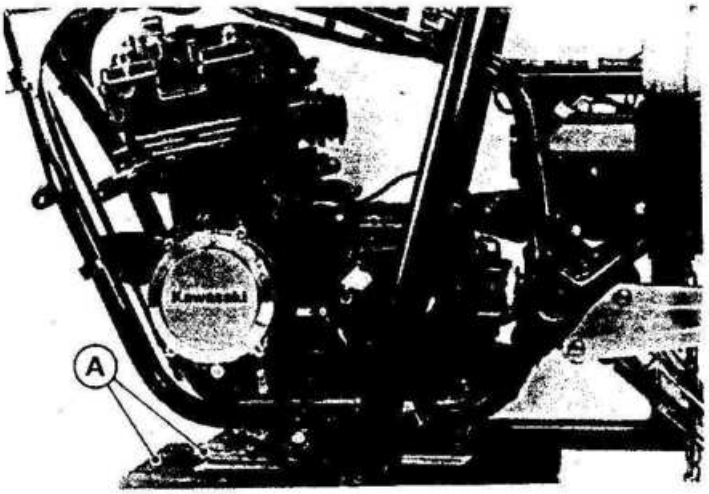
A. Pedal Position : about 15 mm
B. Mark

- Remove the front bevel gear case (see Front Bevel Gear Case Removal).
- Remove the shift mechanism arm and shift shaft.
- Disconnect the wiring from the engine components, and free them from any clamps.
  - Starter Motor Lead
  - Battery Ground Wire
  - Alternator Connector
  - Pickup Coil Wire Connector
  - Oil Pressure Switch Wire Terminal
  - Side Stand Switch Lead



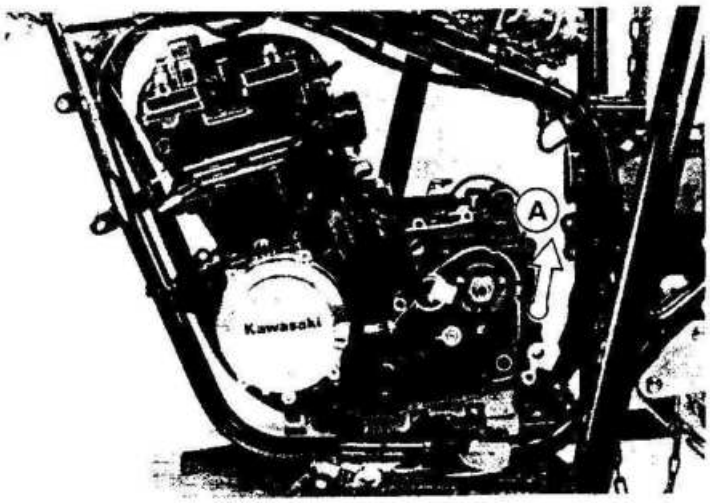
A. Pickup Coil Connector B. Starter Motor Lead

- Support the engine, and remove the mounting bracket bolts and engine mounting bolts.

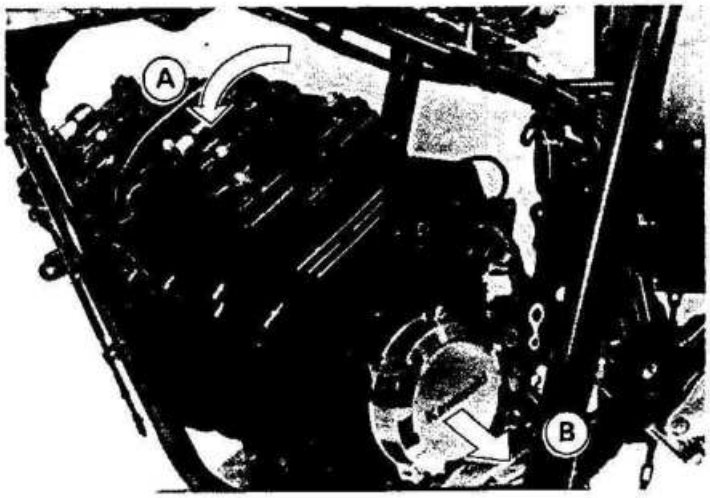


A. Blocks

- Raise the rear part of the engine, and twist the engine counterclockwise to clear the brackets.
- Remove the engine from the vehicle's left side.



A. Lift up here

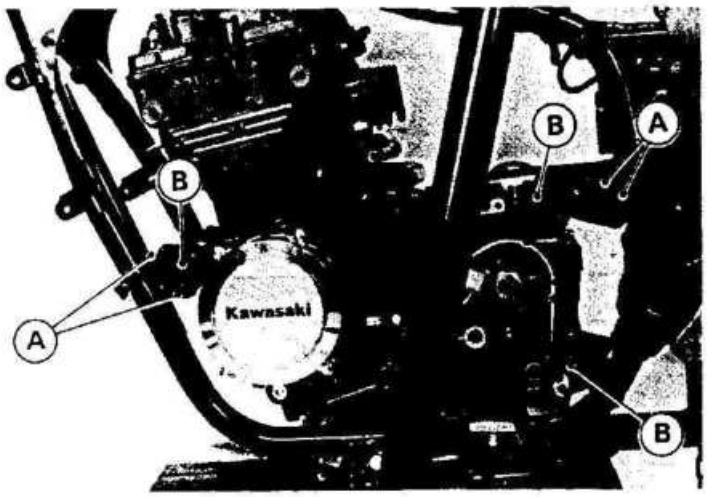


A. Twist the engine unit.
B. Remove the engine unit.

Engine Installation Notes

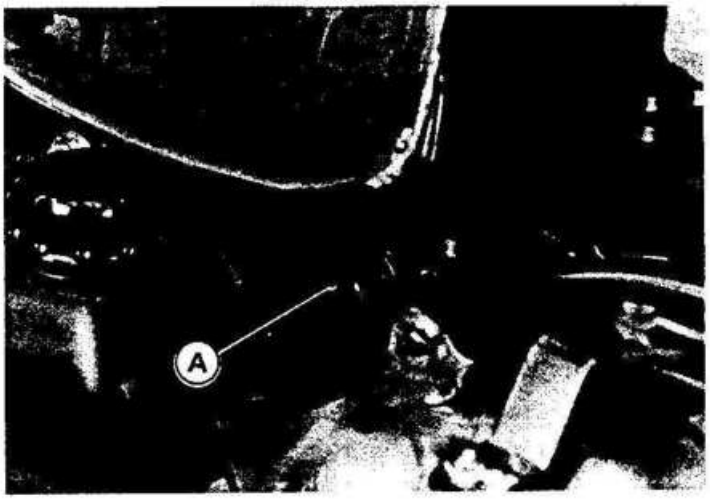
○Engine installation is the reverse of removal. Note the following.

●Tighten the engine mounting bolts and bracket bolts to the specified torque (see Exploded View).



A. Bracket Bolts
B. Engine Mounting Bolts

●Be sure to install the main harness ground lead and battery negative lead on the crankcase.



A. Ground Lead

●Run the following cables and wires correctly (see each appropriate chapter).
Clutch Cable (see Clutch & Steering chapter)
Choke Cable
Throttle Cables (see Fuel System & Steering chapter)
Alternator Lead (see Electrical System chapter)
Starter Motor Lead

●Adjust the following parts (see each appropriate chapter).
Clutch Cable
Choke Cable
Throttle Cables
Brake Pedal Play and Position

●Fill the engine with engine oil (see Base Manual).

●Fill the engine with coolant and bleed air in the cooling system (see Cooling System chapter).

●Adjust the carburetor synchronization and idling.

Crankshaft/Transmission

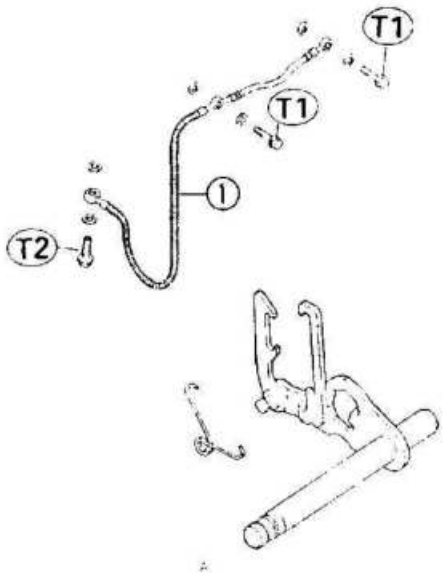
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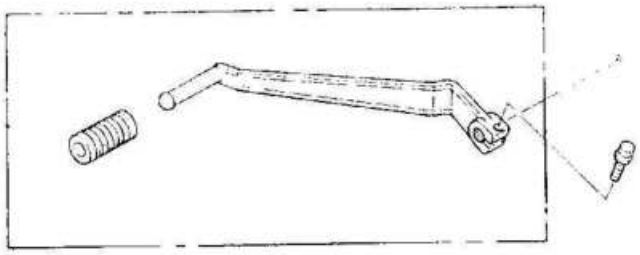
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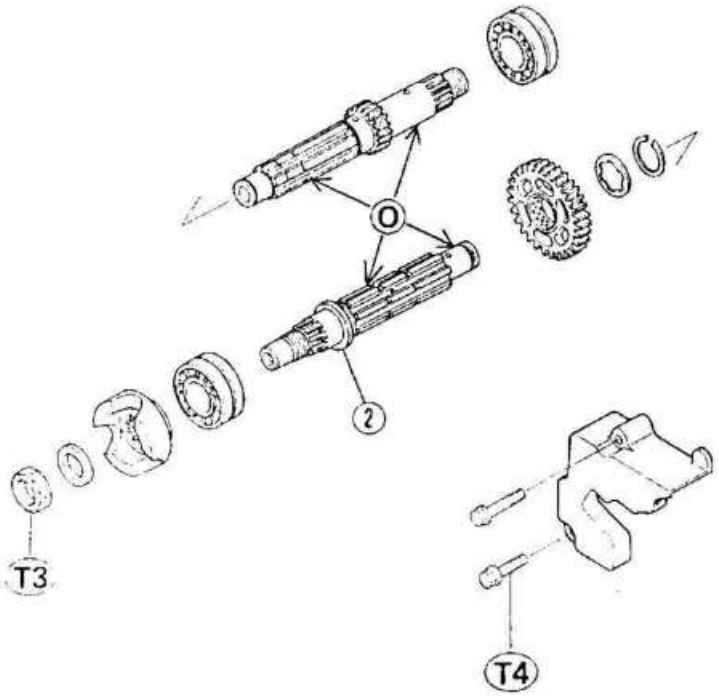
* : Refer to Base Manual

Exploded View

Refer to the Base Manual noting the following.







1. Oil Hose
2. Output Shaft

T1 : 12 N-m (1.2 kg-m, 104 in-lb)
T2 : 25 N-m (2.5 kg-m, 18 ft-lb)
T3 : 120 N-m (12 kg-m, 87 ft-lb)
T4 : 4.9 N-m (0.5 kg-m, 43 in-lb)

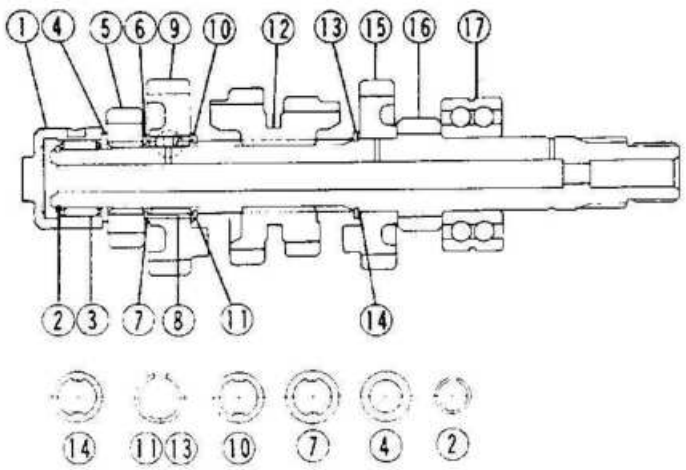
Transmission

Drive Shaft Disassembly

Refer to p. 8-21 in the Base Manual, noting the following.

○ ⑭ Washer is changed to a toothed washer.

Drive Shaft



14. Toothed Washer

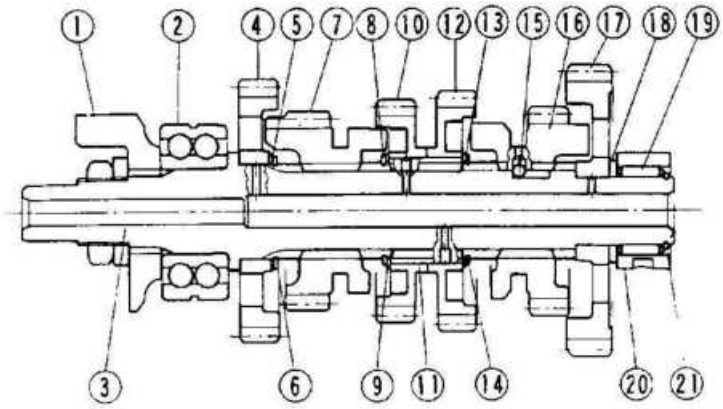
Output Shaft Disassembly

Refer to p. 8-22 in the Base Manual, noting the following.

○ Engine sprocket is changed to a damper cam.

● Tighten the damper cam nut to the specified torque (see Exploded View).

Output Shaft



1. Damper Cam

Wheels/Tires

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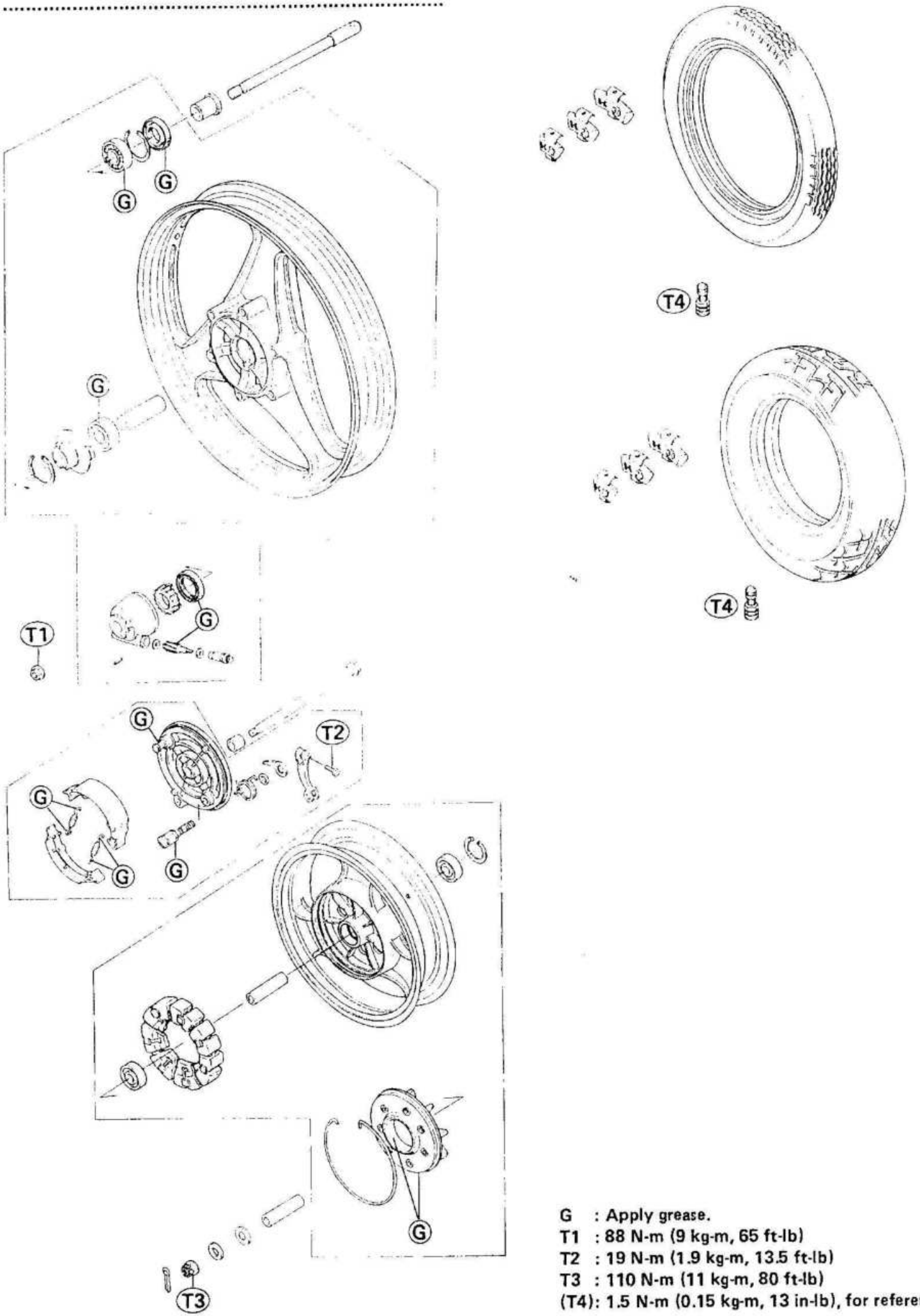
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* : Refer to Base Manual

Exploded View



G : Apply grease.
T1 : 88 N-m (9 kg-m, 65 ft-lb)
T2 : 19 N-m (1.9 kg-m, 13.5 ft-lb)
T3 : 110 N-m (11 kg-m, 80 ft-lb)
(T4): 1.5 N-m (0.15 kg-m, 13 in-lb), for reference

Specifications

Item		Standard
Wheels:		
Wheel balance		Imbalance of less than 10 g (0.02 lb)
Front tire:	Make & type	DUNLOP F17G, tubeless
	Tire size	100/90-18 56H
	Air pressure	221 kPa (2.25 kg/cm², 33 psi)
	Tread depth	4.5 mm (service limit: 1 mm)
Rear tire:	Make & type	DUNLOP K255, Tubeless
	Tire size	150/80-15 70H
	Air pressure	Up to 1,804 N, *1,765 N 245 kPa (184 kg, 406 lb, *180 kg, *397 lb) (2.5 kg/cm², 36 psi)
	Tread depth	7.0 mm (service limit: 2 mm)
Rim runout:	Radial	——, (service limit: 0.8 mm)
	Axial	——. (service limit: 0.5 mm)

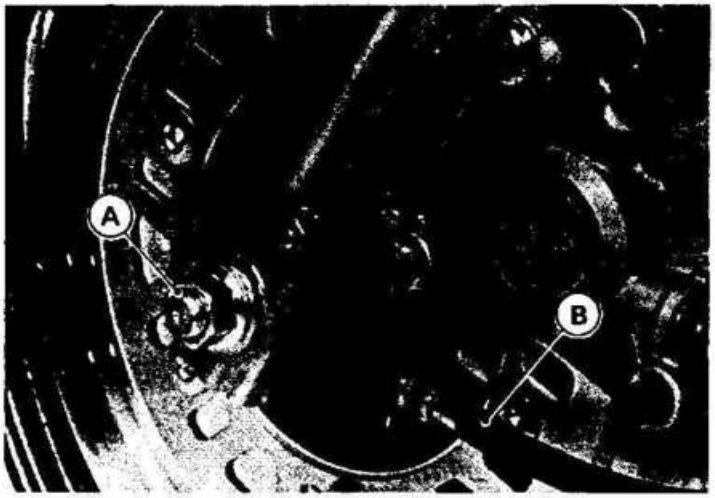
* : US and Canadian Models

Wheels (Rims)

Front Wheel Removal

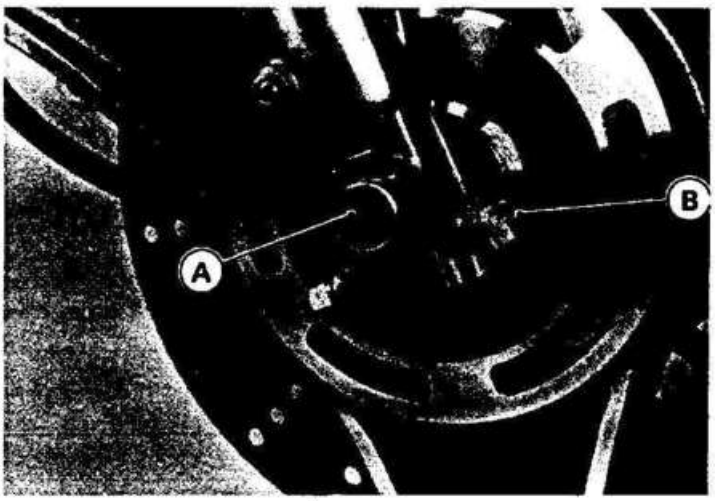
- Remove the following parts before front wheel removal.

Speedometer Cable Lower End
Axle Nut



A. Axle Nut B. Speedometer Cable

Right Side Axle Clamp Bolt and Nut (loosened)

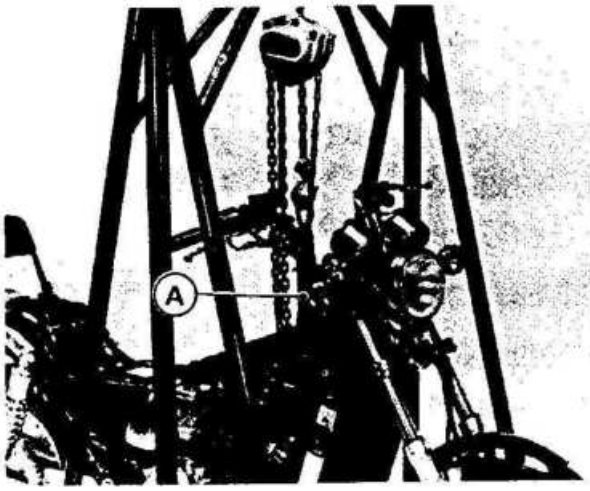


A. Axle B. Axle Clamp Bolt

- Position the motorcycle across a hoist to lift the front wheel off the floor.

CAUTION

○Do not place any type of stand under the exhaust power chamber. This could damage the chamber.



A. Strap

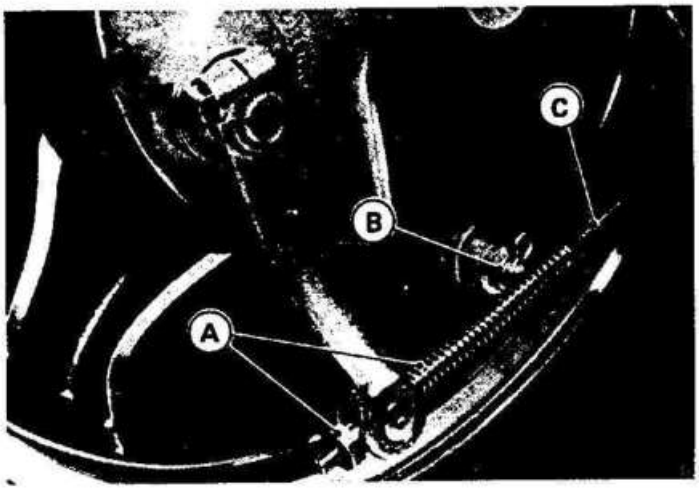
●Remove the axle.
●Remove the front wheel.

CAUTION

○Do not lay the wheel down on the disc. This can damage or warp the disc. Place blocks under the wheel so that the disc does not touch the ground.

Rear Wheel Removal

●Remove the following parts.
Cotter Pin and Axle Nut (loosened)
Seat
Safety Clip and Torque Link Nut and Bolt
Brake Adjusting Nut, Joint and Spring
●Separate the brake rod from the wheel.

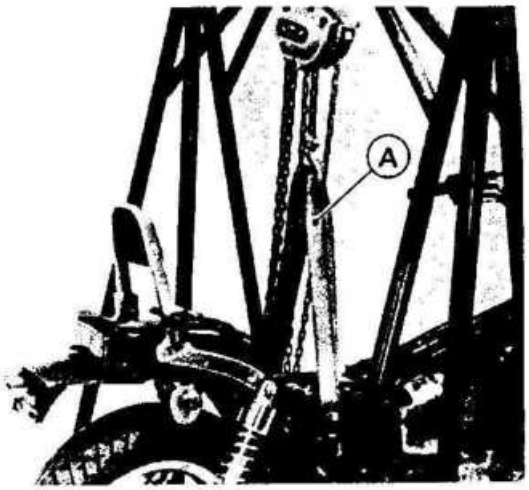


A. Adjusting Nut and Spring
B. Safety Clip and Torque Link Nut
C. Brake Rod

●Position the motorcycle across a hoist to lift the rear wheel off the floor.

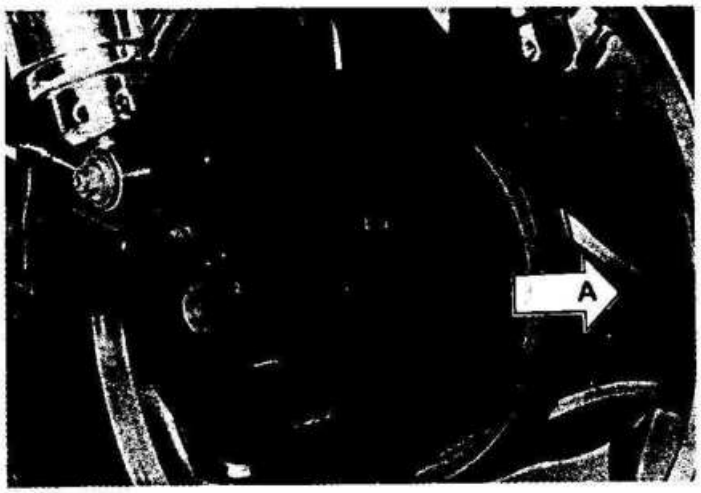
CAUTION

○Do not place any type of stand under the exhaust power chamber. This could damage the chamber.



A. Strap

●Remove the axle nut.
●Pull out the axle and collar.
●Slide the rear wheel toward the right to disengage the wheel from the final gear case.

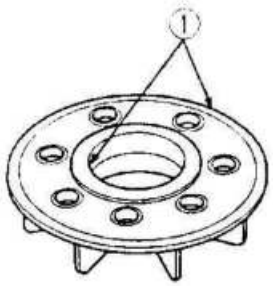


A. Slide the wheel toward the right.

Rear Wheel Installation

●Apply grease to the splined portion and the circumference of the rear wheel coupling.

Rear Wheel Coupling



1. Apply grease.

- To prevent a soft, or "spongy feeling" brake, center the brake panel assembly in the brake drum as follows.
  - Tighten the axle nut to a snug fit.
  - Spin the wheel, and apply the rear brake, and then tighten the rear axle nut to the specified torque.
  - Check the rear brake for weak braking power and brake drag.
- Replace the axle nut cotter pin with a new one.

Tires

Refer to Base Manual, noting the following.

Tire Inspection

Tire Tread Depth

Front	
Standard	**4.5 mm**
Service Limit	**1 mm**
Rear	
Standard	**7.0 mm**
Service Limit	**2 mm**

Tire Air Pressure (when cold)

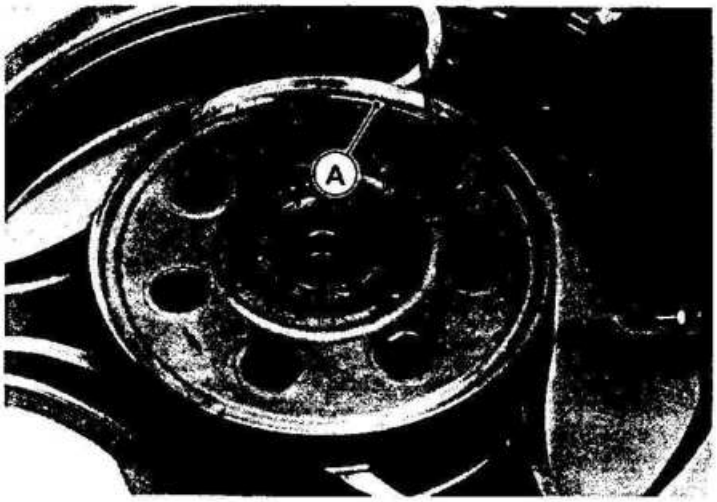
Front:	**221 kPa (2.25 kg/cm², 33 psi)**
Rear: Up to 1,804 N, * 1,765 N (184 kg, 406 lb, *180 kg, *397 lb)	**245 kPa (2.5 kg/cm², 36 psi)**

* : Ⓒ Ⓤ models

Hub Bearings

Rear Hub Bearing Removal

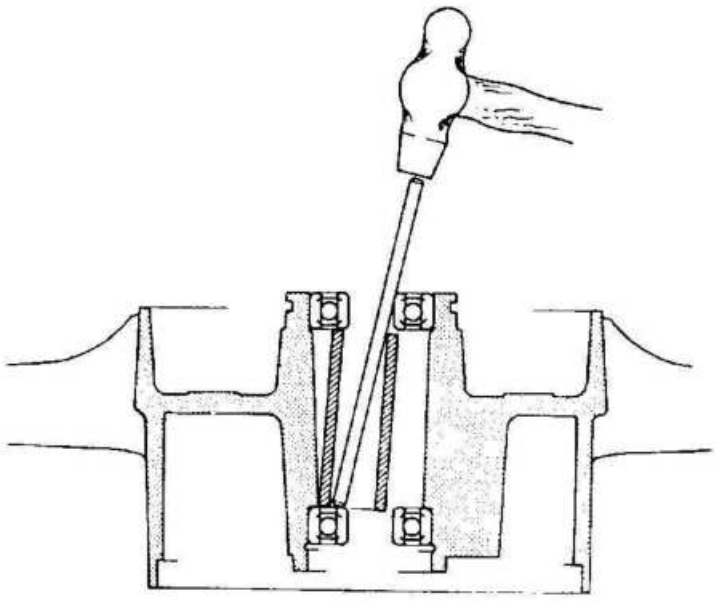
- Remove the rear wheel.
- Remove the brake panel.
- Remove the rear wheel coupling after prying off the snap ring.



A. Snap Ring

- Insert a metal rod into the hub from the left side, and remove the right side bearing by tapping evenly around the bearing inner race.
- Remove the remaining bearing by tapping evenly around the bearing inner race. The distance collar comes out with the bearing.

Bearing Removal

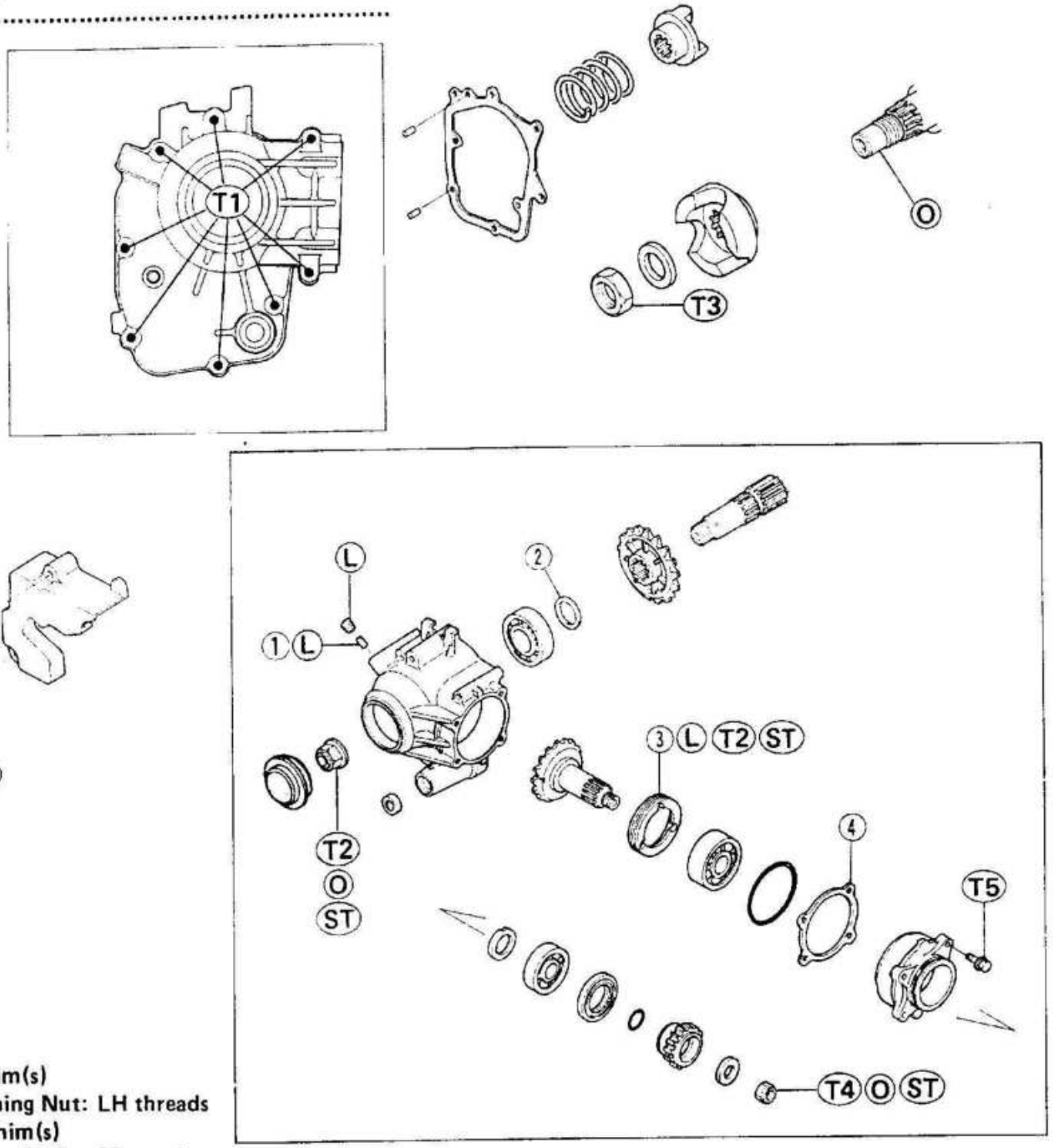


Final Drive

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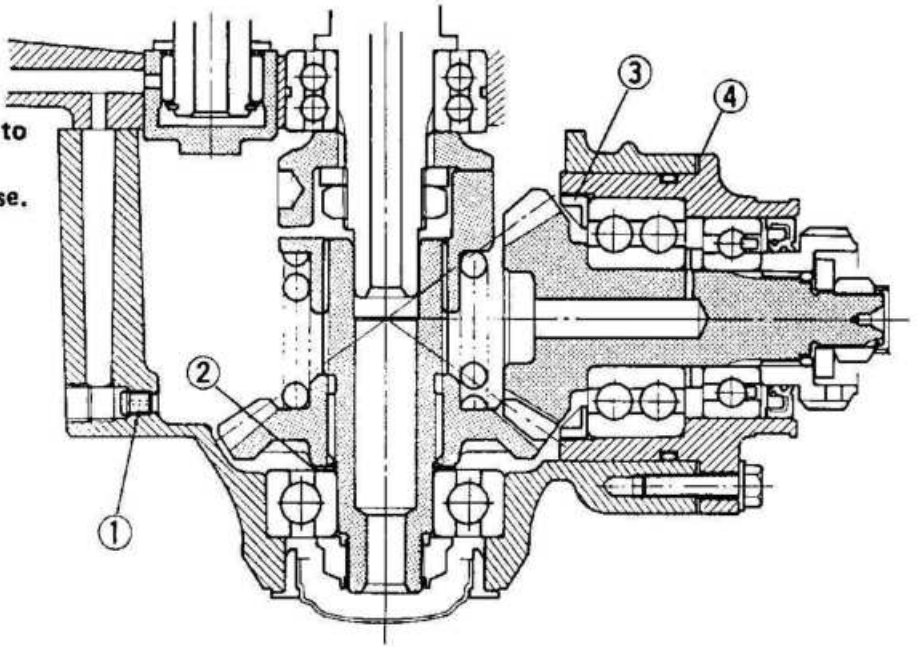
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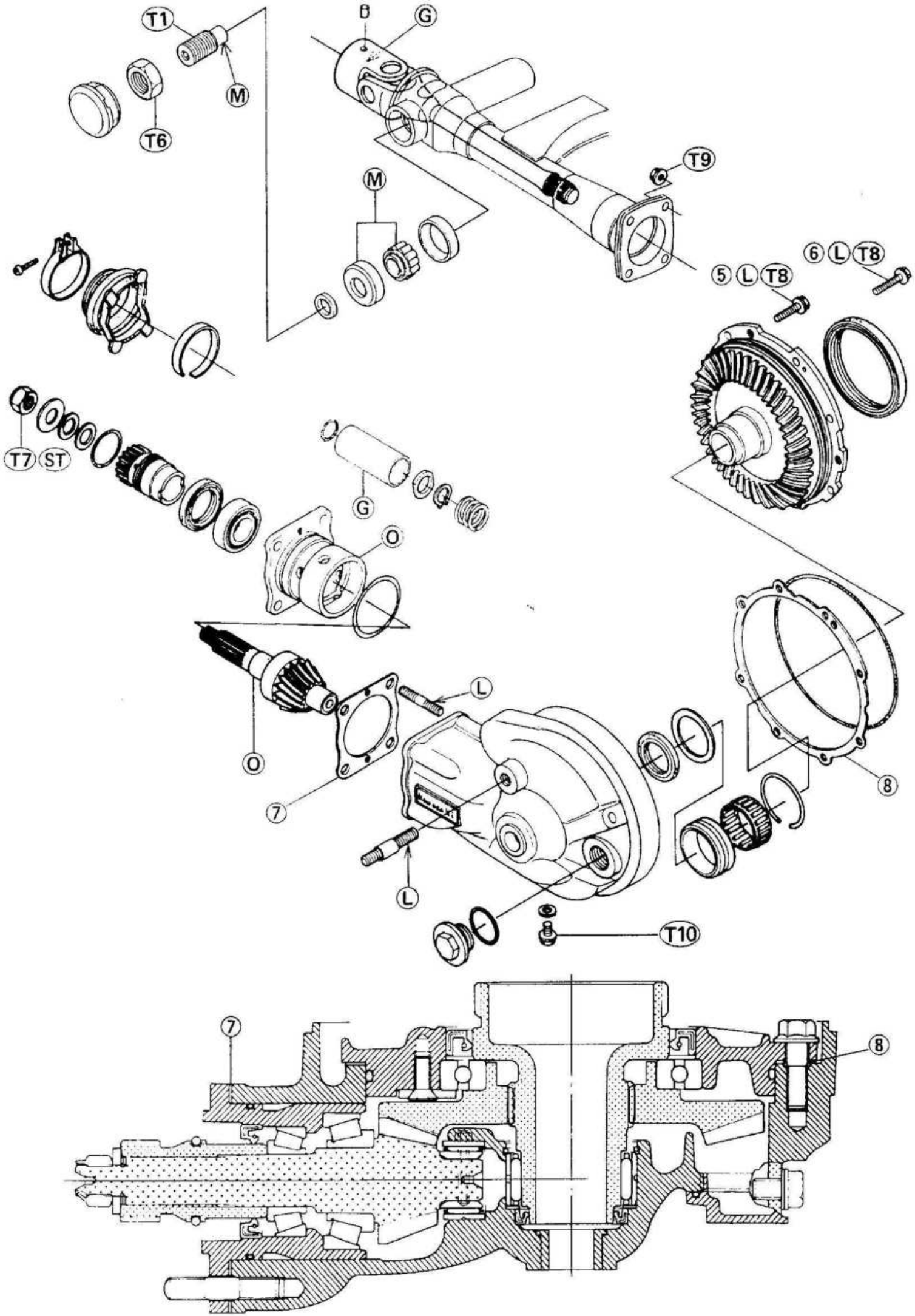
Exploded Views



1. Oil Nozzle
2. Drive Gear Shim(s)
3. Bearing Retaining Nut: LH threads
4. Driven Gear Shim(s)
5. Cover Bolt ϕ8 x P1.0 – 25 mm long
6. Cover Bolt ϕ8 x P1.25 – 28 mm long
7. Pinion Gear Shim(s)
8. Ring Gear Shim(s)

G : Apply a high temperature grease.
L : Apply a non-permanent locking agent to the threads.
M : Apply a molybdenum disulfide grease.
O : Apply oil.
ST : Stake the fastener.
T1 : 9.8 N-m (1 kg-m, 87 in-lb)
T2 : 135 N-m (14 kg-m, 100 ft-lb)
T3 : 120 N-m (12 kg-m, 87 ft-lb)
T4 : 110 N-m (11 kg-m, 80 ft-lb)
T5 : 12 N-m (1.2 kg-m, 104 in-lb)
T6 : 39 N-m (4 kg-m, 29 ft-lb)
T7 : 98 N-m (10 kg-m, 72 ft-lb)
T8 : 23 N-m (2.3 kg-m, 16.5 ft-lb)
T9 : 29 N-m (3 kg-m, 22 ft-lb)
T10 : 20 N-m (2 kg-m, 14.5 ft-lb)
T11 : 4.9 N-m (0.5 kg-m, 43 in-lb)



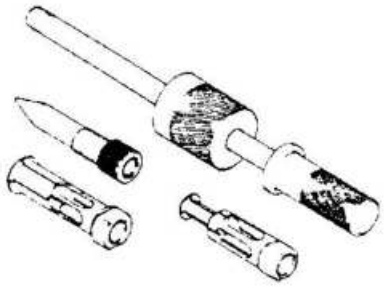

T1
M
T6
B
G
T9
M
6 L T8
5 L T8
T7 ST
G
O
O
L
7
L
T10
8
7
8

Specifications

Item		Standard
Final Gear Case Oil:	Grade	API GL-5 hypoid gear oil
	Amount	190 mL
	Viscosity	When above 5°C (41°F) SAE 90
		When below 5°C (41°F) SAE 80
Final Bevel Gear Backlash:		0.08 – 0.11 mm
Front Bevel Gear Backlash:		0.10 – 0.15 mm

Special Tools

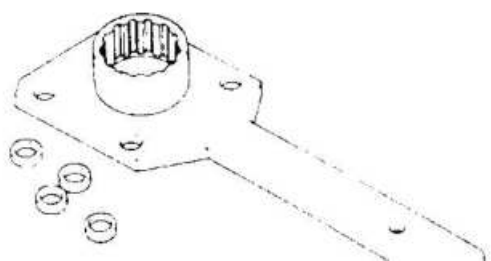
Oil Seal & Bearing Remover: 57001-1058



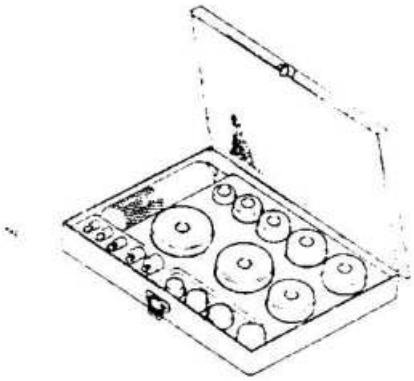
Oil Seal Guide: 57001-1163



Pinion Gear Holder: 57001-1164



Bearing Driver Set: 57001-1129



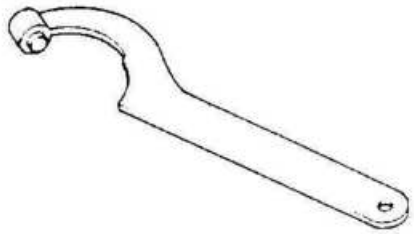
Oil Seal Guide: 57001-264



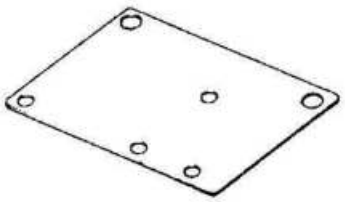
Oil Seal Driver: 57001-1091



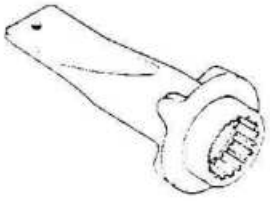
Damper Cam Holder: 57001-1025



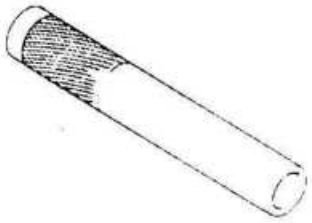
Dial Gauge Holder: 57001-1049



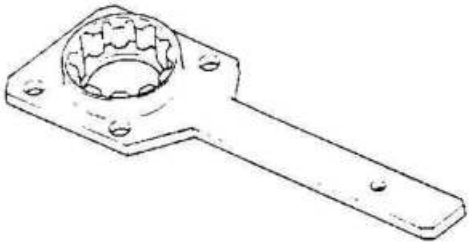
Drive Gear Holder: 57001-1026



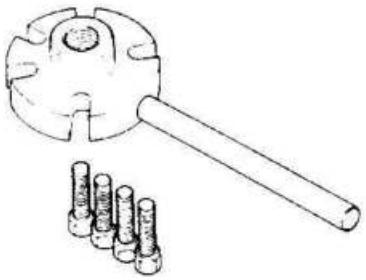
Bearing Driver: 57001-382



Driven Gear Holder: 57001-1027



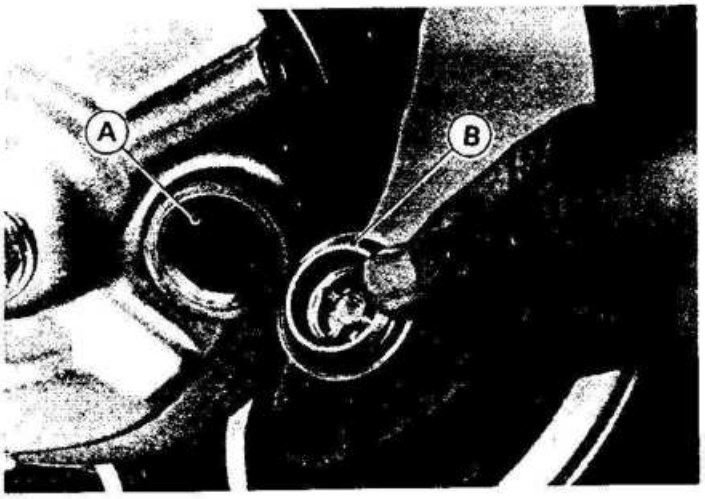
Magneto Holder: 57001-259



Final Gear Case Oil

Final Gear Case Oil Level Inspection

- According to the Periodic Maintenance Chart, or if the lubricant level is suspected of being low, check the final gear case oil level.
- Hold the motorcycle vertical on level ground.
- Unscrew the filler plug. The oil level is correct if a small amount of oil comes out of the opening.

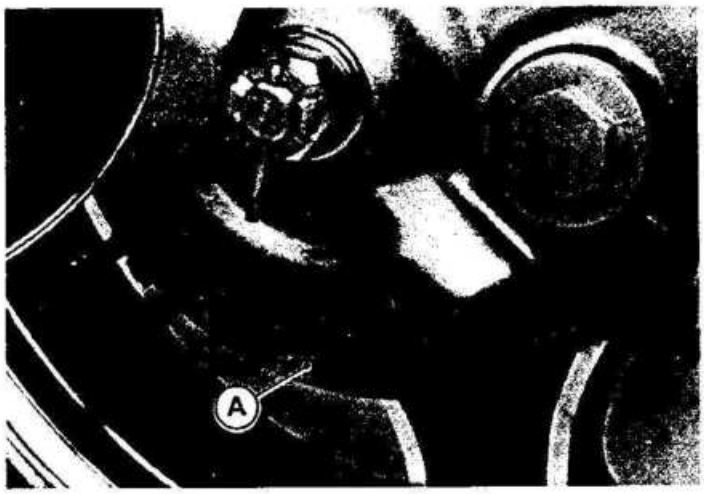


A. Filler Opening B. Filler Cap

★If no oil comes out, first check the final gear case for oil leakage, remedy it if necessary, and add oil through the filler hole. Use the same type and brand of oil that is already in the final gear case.

Final Gear Case Oil Change

- Warm up the oil by running the motorcycle so that the oil will pick up any sediment and drain easily. Then stop it.
- Hold the motorcycle vertical on level ground.
- Place an oil pan beneath the final gear case, and remove the drain plug.



A. Drain Plug

WARNING

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

- After the oil has completely drained out, install the drain plug with a new aluminum gasket, and tighten it to the specified torque (see Exploded View).
- Fill the final gear case with the specified oil and quantity.

Final Gear Case Oil:

Amount	**190 mL**
Grade	**API GL-5 hypoid gear oil**
Viscosity:	
When above 5°C (41°F)	**SAE90**
When below 5°C (41°F)	**SAE80**

NOTE

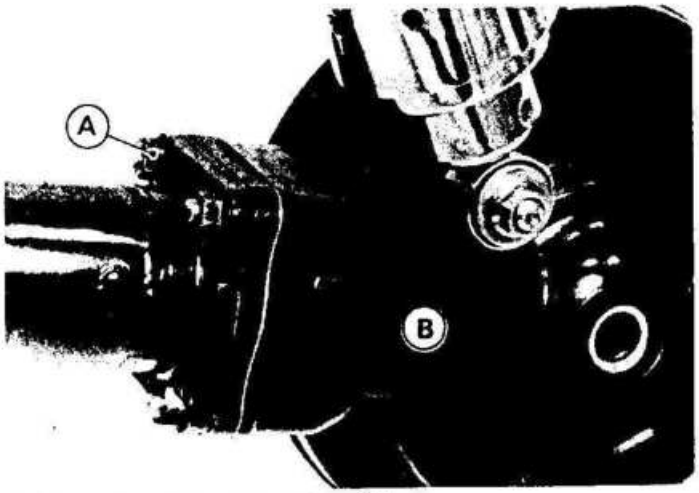
○*The term "GL-5" indicates a quality and additive rating. A "GL-6" rated hypoid gear oil can also be used.*

- Be sure the O-ring is in place, and tighten the filler plug.

Final Bevel Gears

Final Gear Case Removal

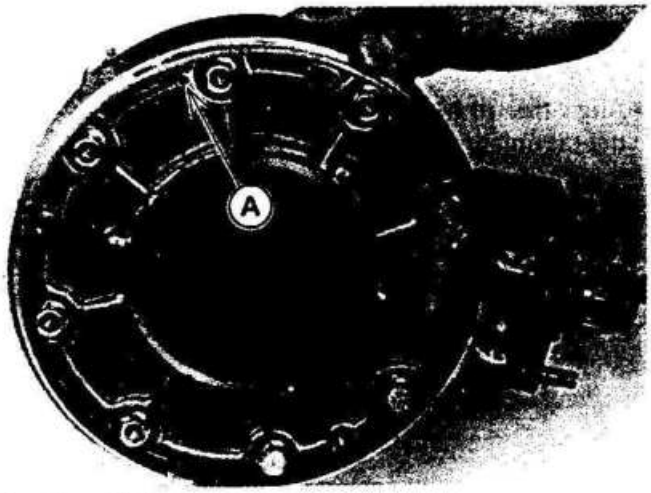
- If the final gear case is to be disassembled, drain the final gear case oil (see Final Gear Case Oil Change).
- Remove the rear wheel (see Wheel/Tires chapter).
- Remove the left muffler (see Muffler Removal in the Engine Top End chapter).
- Unscrew the mounting nuts to remove the left shock absorber.
- Remove the final gear case by taking off the mounting nuts. The spring comes off with the case.



A. Gear Case Mounting Nuts (4)
B. Final Gear Case

NOTE

If the final gear case is full of oil, place the case so that the breather hole is on top.

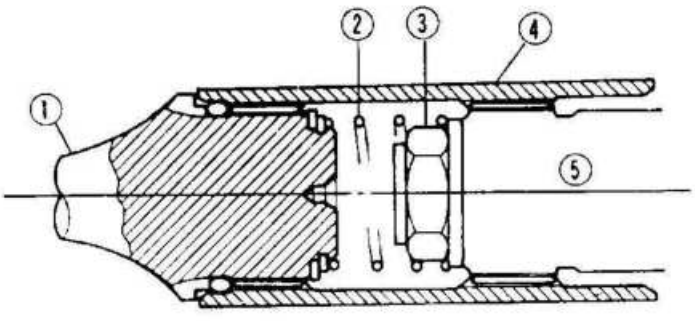


A. Breather Hole

Final Gear Case Installation Notes

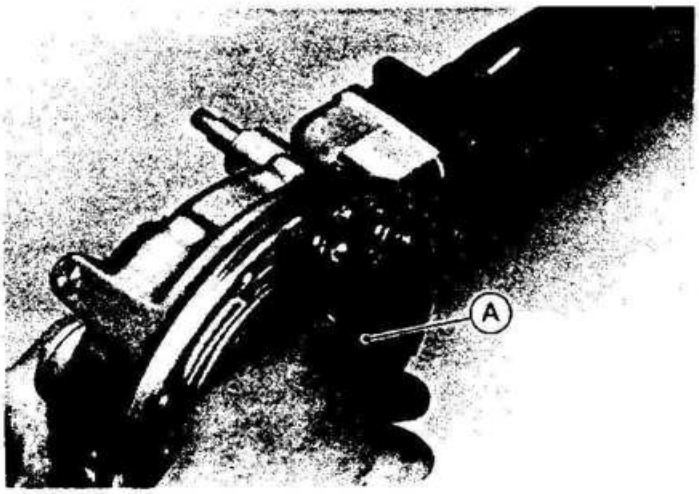
- Lubricate the propeller shaft joint (see Propeller Shaft Joint Lubrication).
- Install the spring on the pinion gear nut so that the smaller diameter end fits onto the nut.

Propeller Shaft Joint Installation



1. Propeller Shaft
2. Coil Spring
3. Nut
4. Joint
5. Pinion Gear

- Fit the pinion gear splines in the propeller shaft joint while turning the ring gear hub.

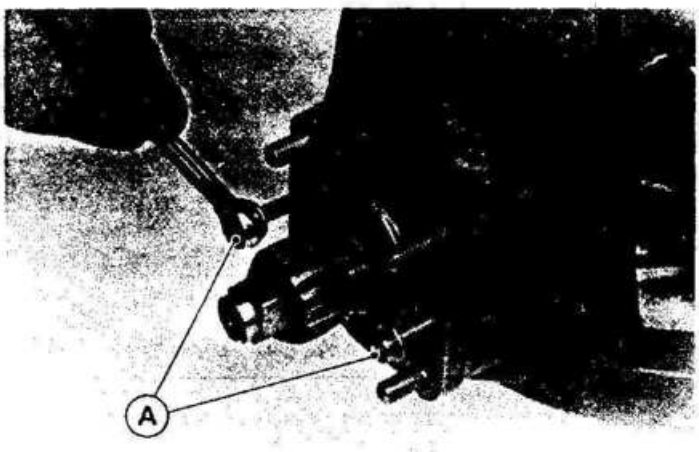


A. Ring Gear Hub

- Tighten the final gear case mounting nuts to the specified torque (see Exploded View).
- Install the rear wheel (see Rear Wheel Installation).
- If the final gear case oil was drained, fill the case with oil (see Final Gear Case Oil Change).

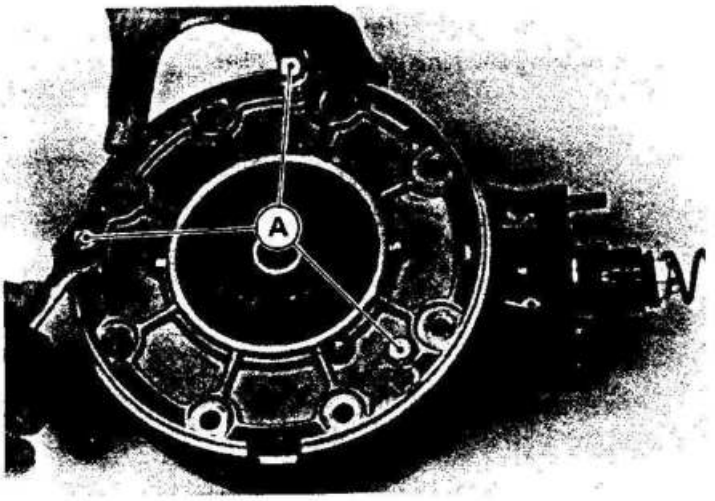
Final Gear Case Disassembly

- Using 6 mm bolts with 1.0 mm pitch threads, jack up the pinion gear assembly.



A. Bolts

- Use three cover bolts to remove the ring gear assembly from the gear case.

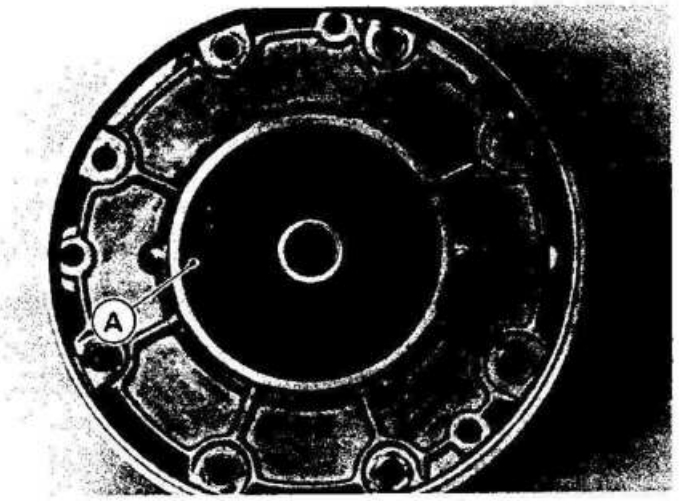


A. Cover Bolts (ϕ8 x p1.25 mm)

●To remove the ring gear oil seal, soak the ring gear assembly in oil and heat the oil to **120 ~ 150°C (248 ~ 302°F)**, and then pry out the seal. Be careful not to scratch the sealing surface on the ring gear hub.

CAUTION

○**Do not heat the case with a torch. This will warp the case.**



A. Ring Gear Oil Seal

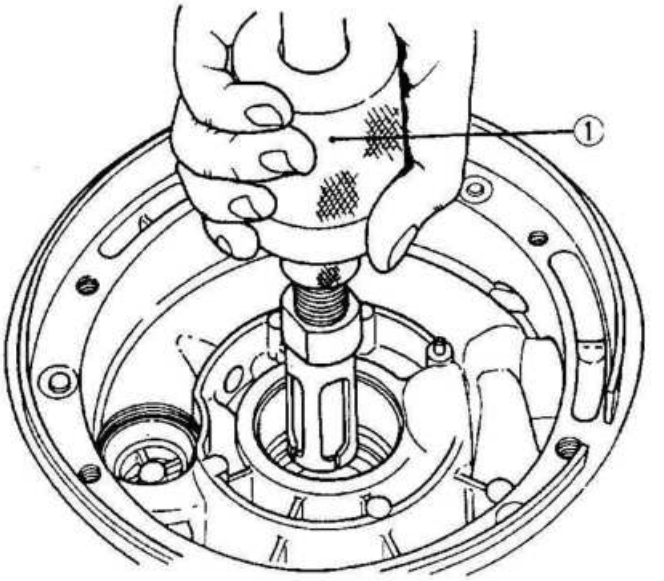
●Remove the needle bearing outer race and oil seal in the final gear case as follows.
○Remove the snap ring and needle bearing.
○Soak the final gear case in oil and heat the oil to approximately **100°C (212°F).**

CAUTION

○**Do not heat the case with a torch. This will warp the case.**

○Pull out the oil seal and bearing outer race together using the oil seal & bearing remover (special tool).

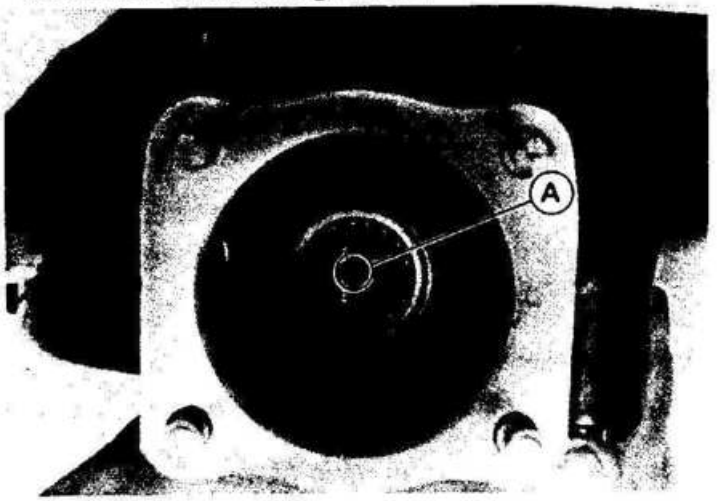
Oil Seal and Bearing Outer Race Removal



1. Oil Seal & Bearing Remover: 57001-1058

Final Gear Case Assembly Notes

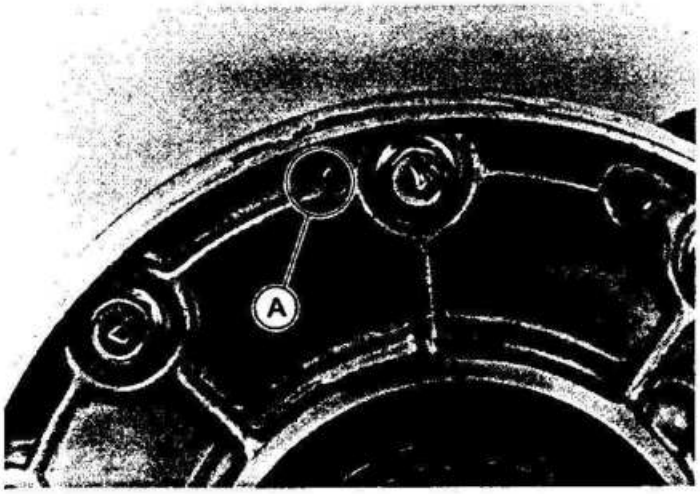
●Align the oil hole in the needle bearing outer race with the oil hole in the final gear case.



A. Oil Hole

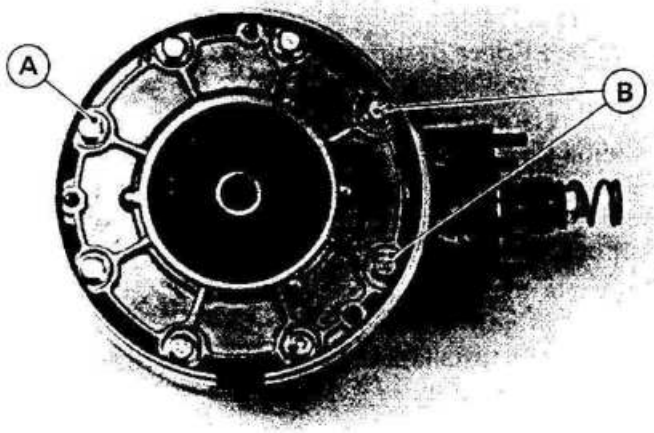
●Apply a non-permanent locking agent to the inner end of each stud to prevent oil leakage.

●The ring gear and pinion are lapped as a set in the factory to get the best tooth contact. They must be installed as a pair, never replace one without the other.
●Check and adjust the preload of the tapered roller bearing, if necessary (see Pinion Gear Bearing Preload Adjustment).
●When final gear case parts are replaced, the final bevel gears must be adjusted (see Final Gear Backlash and Tooth Contact Adjustment).
●If no parts of the final bevel gear case are replaced, install the shims in the original positions to keep the gear backlash and the tooth contact unchanged.
●Blow the breather hole clean with compressed air.



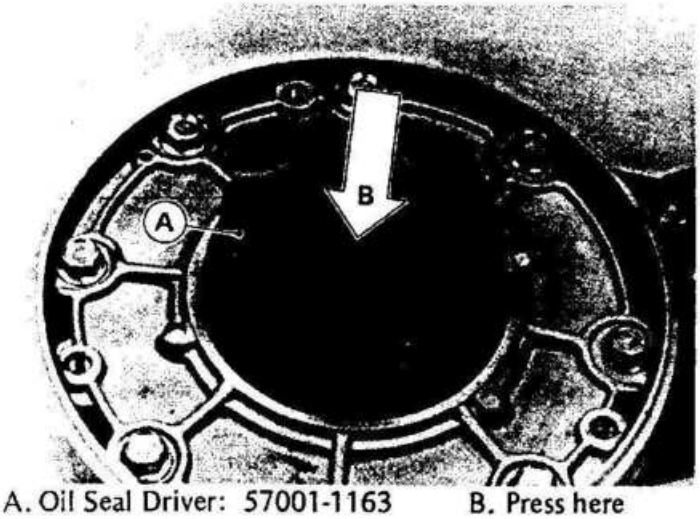
A. Breather Hole

•Apply a non-permanent locking agent to the threads of the cover bolts, and tighten to the specified torque (see Exploded View).
○Be sure to install the correct bolts in the positions shown.



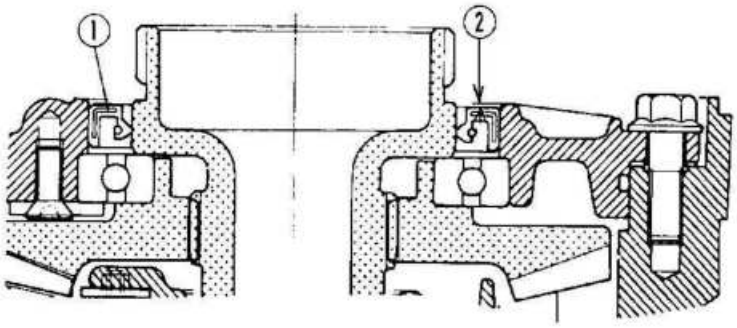
A. φ8 x P1.25 – 28 ℓ
B. φ8 x P1.0 – 25 ℓ

•Use the oil seal driver (special tool) to drive the oil seal being careful of its installation direction and depth as shown.



A. Oil Seal Driver: 57001-1163 B. Press here

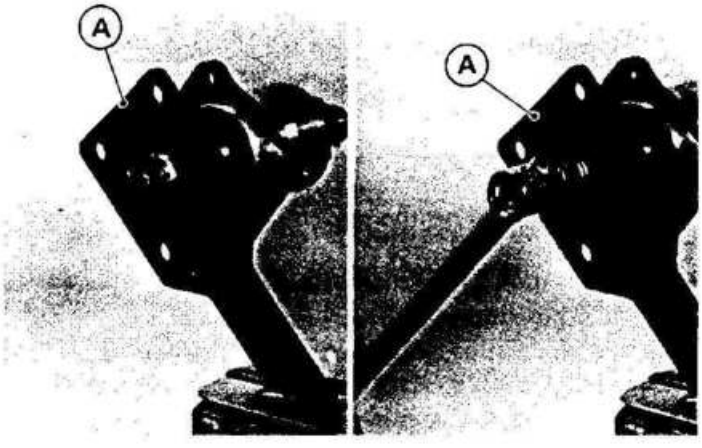
Ring Gear Oil Seal Installation



1. Ring Gear Oil Seal
2. 1 mm

Pinion Gear Disassembly

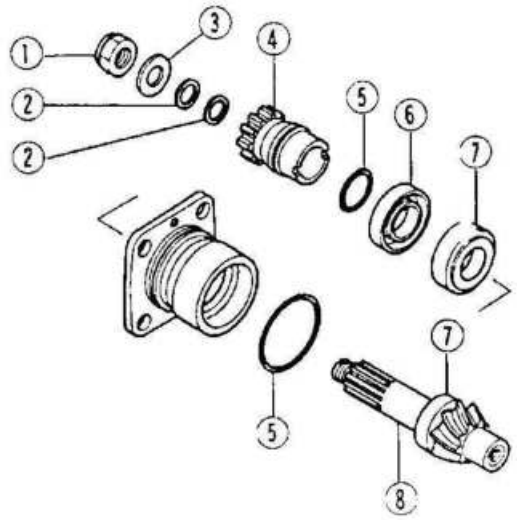
•Remove the pinion gear assembly (see Final Gear Case Disassembly).
•Pry open the pinion gear nut.
•Unscrew the pinion gear nut using the pinion gear holder (special tool).



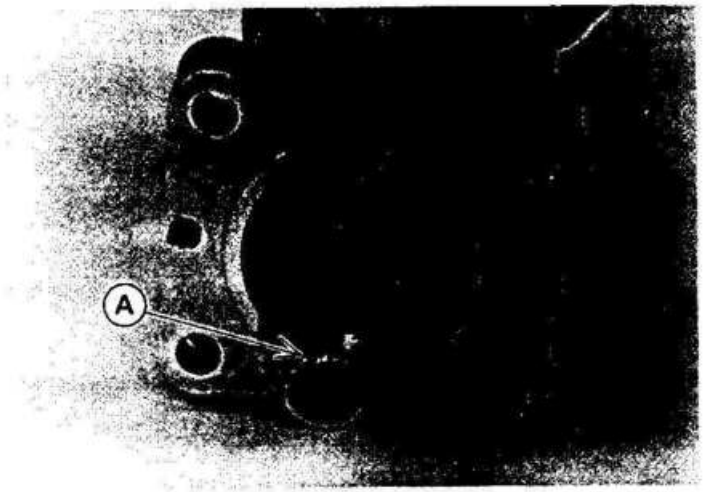
A. Pinion Gear Holder: 57001-1164

•Remove the washer and the shim(s).
•Remove the pinion shaft joint with the O-ring.
•Remove the pinion gear with the tapered roller bearing as one unit.
•Remove the roller bearing outer race in the bearing housing and the oil seal using the bearing driver set (special tool: 57001-1129), or a metal rod.

Pinion Gear Assembly



1. Pinion Gear Nut
2. Shims
3. Washer
4. Pinion Gear Shaft Joint
5. O-rings
6. Oil Seal
7. Tapered Roller Bearings
8. Pinion Gear



A. Stake the pinion gear nut.

Pinion Gear Assembly

- Assembly is the reverse of disassembly. Note the following.
- The pinion gear and ring gear are lapped as a set in the factory to get the best tooth contact. They must be replaced as a set.
- Check the tapered roller bearing (see Tapered Roller Bearing Inspection).
- Install the tapered roller bearing using the bearing driver set (special tool: 57001-1129).
- Check and adjust the preload of the tapered roller bearing (see Pinion Gear Bearing Preload Adjustment).
- Check the oil seal (see Oil Seal Inspection).
- Drive the oil seal in using the bearing driver set (special tool: 57001-1129).
- Install the pinion gear with the tapered roller bearing as one unit.
- Check the O-ring on the pinion shaft joint for any kind of damage. And replace it if necessary.
- Install the shim(s) and the washer.
- Replace the pinion gear nut with a new one.
- Tighten the pinion gear nut to the specified torque (see Exploded View).
- Stake the pinion gear nut with a punch.

CAUTION

○When staking the nut, be careful not to apply shock to the pinion bearings. Such a shock could damage the pinion and/or bearings.

- Be sure to check and adjust the bevel gear backlash and tooth contact, when any of the parts which influence these items are replaced (see Final Bevel Gear Adjustment).

Pinion Gear Bearing Preload Adjustment

Preload Measurement:

- Check and adjust the bearing preload in the following cases.

○When any of the parts listed below are replaced with new ones.

Tapered Roller Bearings
Bevel Gears
Bearing Housing
Pinion Gear Joint
Final Gear Case

○When the pinion gear nut is loosened, even if the purpose is not to replace the parts.

- Assemble the pinion gear bearing housing, and tighten the pinion gear nut to the specified torque. Oil seal and O-ring installations are not required until the correct bearing preload is obtained.

CAUTION

○To start with, choose a shim or shims so that the bearings are just SNUG with NO play but also with NO preload.

○Any over-preload on the bearings could damage the bearings.

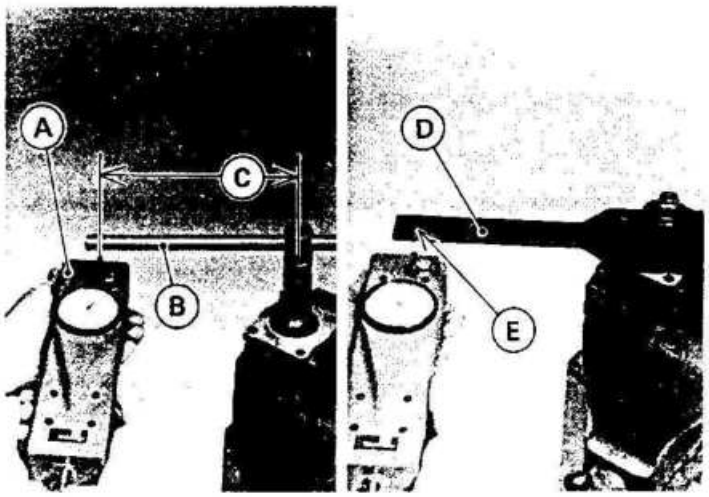
- Apply a little final gear case oil to the bearings, and turn the gear shaft more than 5 turns to allow the bearings to seat.
- Measure the bearing preload. Bearing preload is defined as the force or torque which is needed to start the gear shaft turning.

NOTE

○Preload can be measured either with a spring scale or a beam-type torque wrench. When measured with a spring scale, the preload is designated by force (N, kg), and when measured with a torque wrench, it is designated by torque (N-m, kg-m, in-lb).

Using Spring Scale:

Hook the spring scale on the handle at the point 200 mm from the center of the gear shaft. Hold the bearing housing in a vise so that the gear shaft axis is vertical. Apply force to the handle horizontally and at a right angle to it.

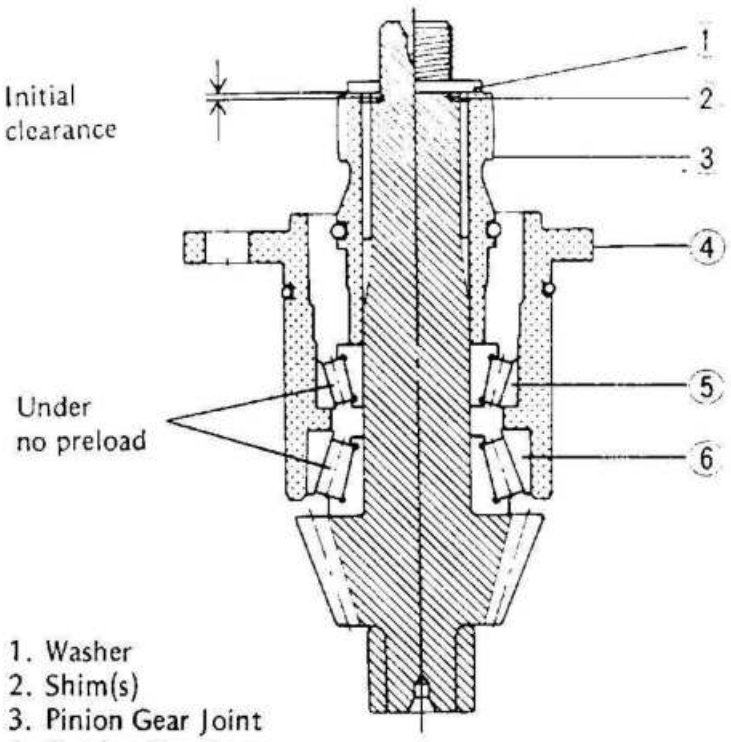


A. Spring Scale
B. Handle of Wrench
C. 200 mm
D. Pinion Gear Holder: 57001-1164
E. Hole

*If the preload is out of the specified range, replace the shims under the flat washer, and re-check the preload. Refer to the next paragraph to select suitable shim.

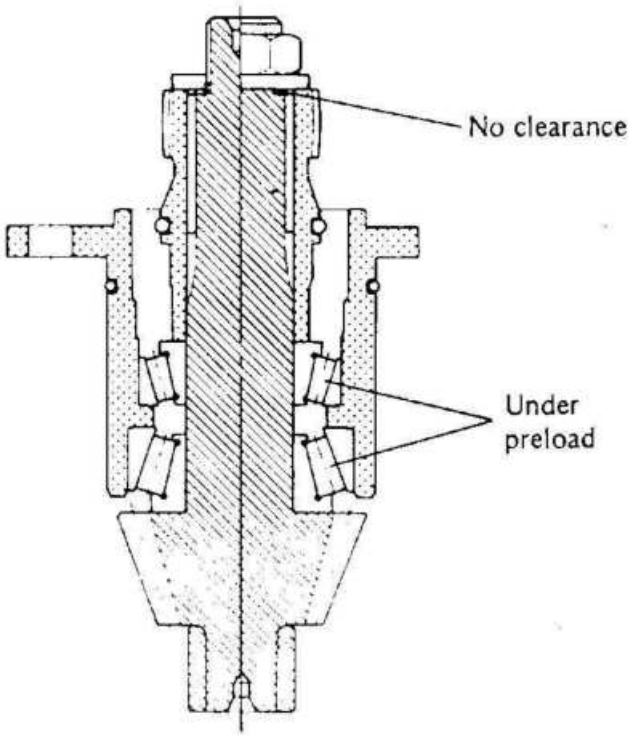
Preloading Bearings

(A) Before tightening



1. Washer
2. Shim(s)
3. Pinion Gear Joint
4. Bearing Housing
5. Tapered Roller Bearing
6. Tapered Roller Bearing

(B) After tightening



Preload for Pinion Gear Bearings

Using spring scale:
2.9 – 4.9 N (0.30 – 0.50 kg, 0.7 – 1.1 lb)

Using torque wrench:
0.6 – 1.0 N·m (0.06 – 0.10 kg-m, 5.2 – 8.7 in-lb

Preload Adjustment:

- To increase preload, decrease the thickness of the s of the shim(s).
  To decrease preload, increase the thickness of t shim(s).
- Change the thickness a little at a time.
- Re-adjust the bearing preload, and re-adjust if necessa

Shims for Preload Adjustment (*: Standard)

Thickness	Part Number
0.1	92025-1287
0.2	92025-1288
0.3	92025-1289
0.5	92025-1290
0.6	92025-1291
0.7	92025-1292
0.8	92025-1293
*0.9	92025-1294
1.0	92025-1295
1.30	92025-1282
1.32	92025-1283
1.34	92025-1284
1.36	92025-1285
1.38	92025-1286

Final Gear Backlash and Tooth Contact Adjustment

The **backlash** (distance one gear will move back and forth without moving the other gear) and **tooth contact pattern** of the bevel gears must be correct to prevent the gears from making noise and being damaged.

When replacing any one of the following parts which influence the backlash and tooth contact of bevel gears, make sure to check and adjust them. First, adjust the backlash of the bevel gears. Second, get the correct tooth contact pattern by replacing shims. Last, check to see if backlash is within the standard. If backlash is out of range, repeat above procedure again.

Parts which change the backlash and tooth contact are:

Ring Gear and Gear Case Cover
Pinion Gear Assembly
Tapered Roller Bearings
Final Gear Case

NOTE

○*After replacing any one of the parts listed above, install the standard shim both at the ring gear side and the pinion gear side.*

The amount of backlash is influenced by the ring gear position more than by the pinion gear position. Tooth contact location is influenced by pinion gear position more than by ring gear position.

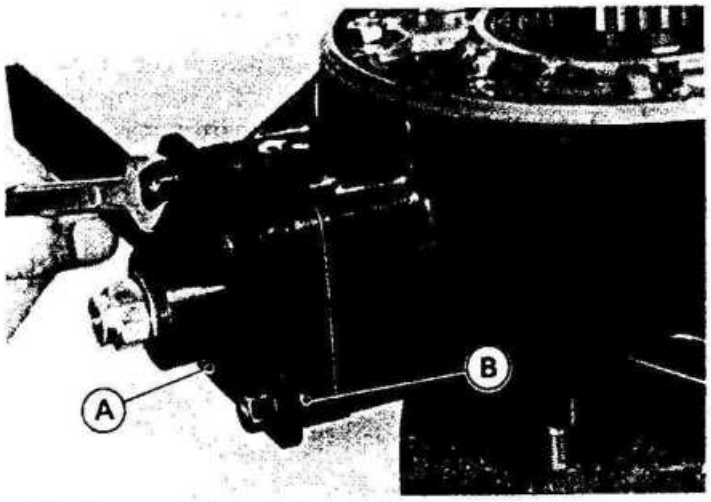
First change ring gear shim(s) until the backlash is correct, then adjust the tooth contact by changing the pinion gear shim(s).

CAUTION

○**The ring gear and pinion gears are lapped as a set at the factory to get the best tooth contact. They must be replaced together.**

Backlash Adjustment:

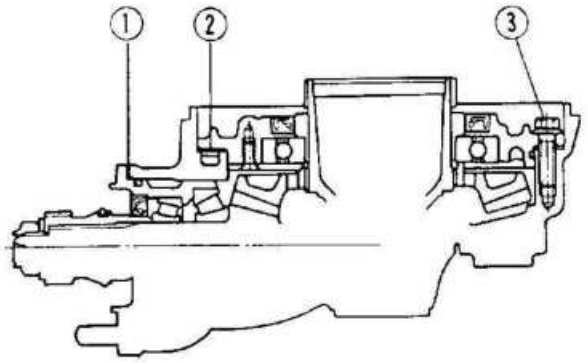
- Clean any dirt and oil off the teeth of the bevel gears.
- Secure the pinion gear holder and spacers (special tools) on the final gear case with the final gear case nuts (4).
- Tighten the final pinion gear bearing housing mounting nuts to the specified torque (see Exploded View).
- Temporarily install the rear axle shaft.



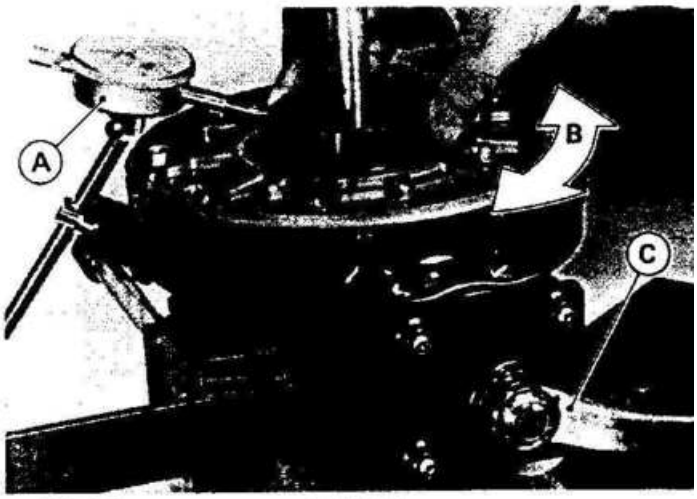
A. Holder: 57001-1164 B. Spacers

- Set up a dial gauge against the end of the rear hub coupling.
- Check the backlash during the tightening of the cover mounting bolts, and stop to tighten them immediately if you feel the backlash of the gears is gone. Then, change the ring gear shim with a thicker one.

Final Gear Case Assembly



1. Shim(s) for Pinion Gear
2. Shim(s) for Ring Gear
3. Cover Mounting Bolts



A. Dial Gauge
B. Move
C. Hold

NOTE

○*Backlash, or gear lash is the amount of movement of one gear relative to the other, measured with one gear stationary.*

★If the amount of backlash is out of the standard range, replace the shim(s) of the ring gear and check the backlash. Repeat if necessary.

☆Change the size a little at a time.

Gear Backlash

Standard	**0.08 – 0.11 mm**

Ring Gear Shims for Backlash Adjustment

Thickness (mm)	Part Number
0.15	92025-1336
0.5	92025-1337
0.6	92025-1338
0.7	92025-1339
0.8	92025-1340
0.9	92025-1341
1.0	92025-1342
1.2	92025-1343

Tooth Contact Adjustment:

NOTE

○*Check to see that there is no dirt or oil on the gear teeth.*

○*Special compounds are available from automotive supply stores for the purpose of checking differential gear tooth patterns and contact. Use one of these for checking the bevel gears.*

○*The checking compound must be smooth and firm, with the consistency of tooth paste.*

○*Using a paint brush, apply a thin layer to the teeth. If painted too thickly, the exact tooth pattern may not appear.*

●Apply checking compound to 4 or 5 teeth of the pinion gear.

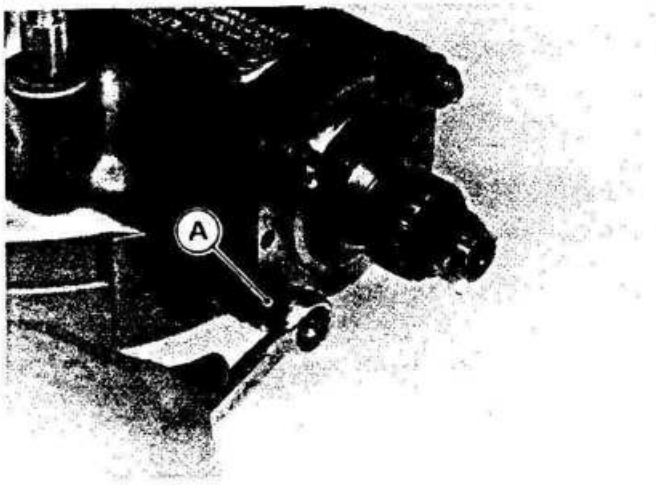
●Set the pinion gear assembly in the final gear case.

●Install the spacers (4) for the pinion gear holder (special tool) on the studs bolts (4) and tighten the case mounting nuts to the specified torque. This prevents the mating surface damage.

●Turn the pinion gear for one revolution, first in the drive direction and then in the reverse (coast) direction.

●Turn it with the pinion joint holder (special tool), while creating a drag on the ring gear with the ring nut wrench (special tool).

●Pull out the pinion gear assembly, and check the drive pattern and coast pattern of the bevel gear teeth.

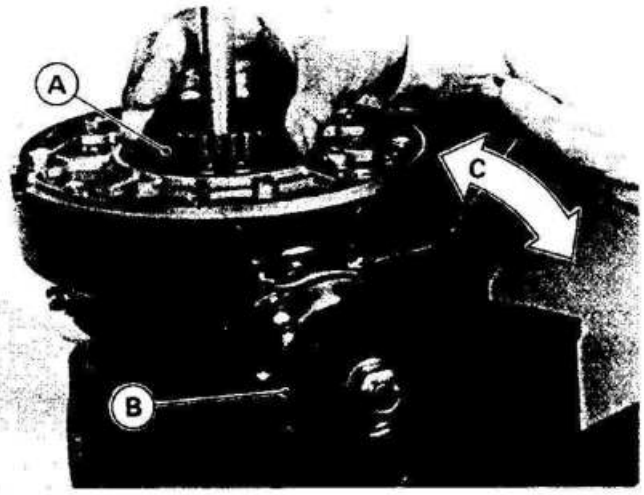


A. Spacers

NOTE

○*The tooth contact patterns of both (drive and coast) sides should be centrally located between the top and bottom of the tooth. The drive pattern can be a little closer to the toe and the coast pattern can be somewhat longer and closer to the toe. The drive side of the ring gear tooth is the convex side, and the coast side is the concave side.*

●If the correct tooth contact pattern cannot be obtained, replace shims in the manner described below. Then erase the original tooth contact pattern, and apply checking compound as mentioned in the preceding step.

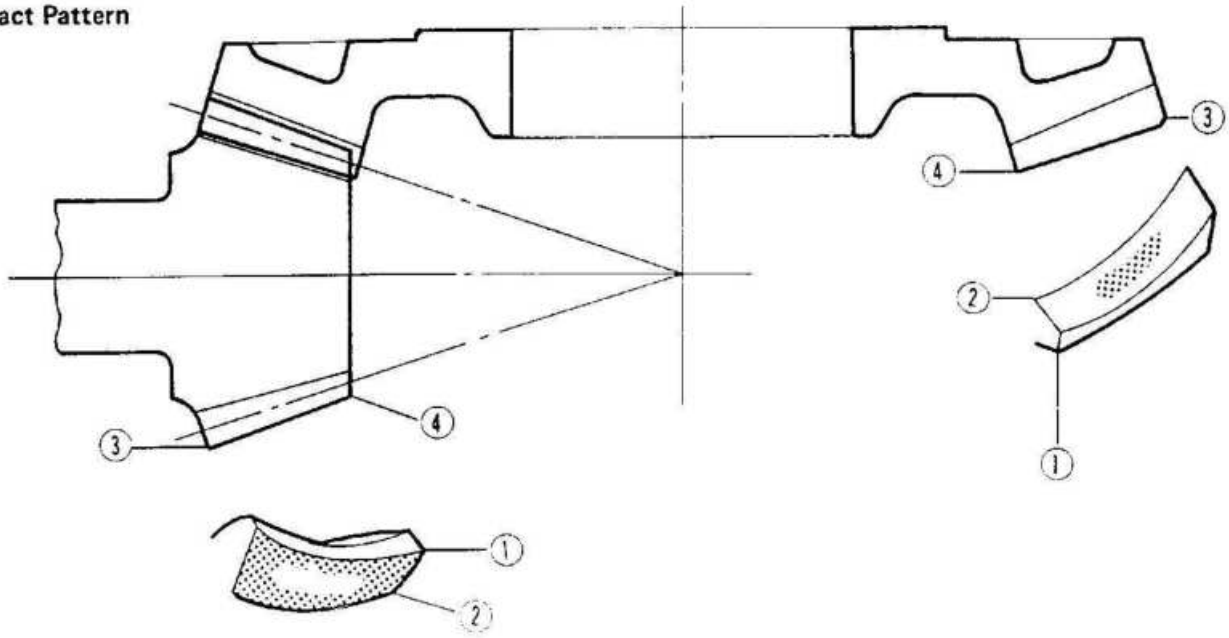


A. Drug C. Turn
B. Holder: 57001-1164

Pinion Gear Shims for Tooth Contact Adjustment (*: Standard)

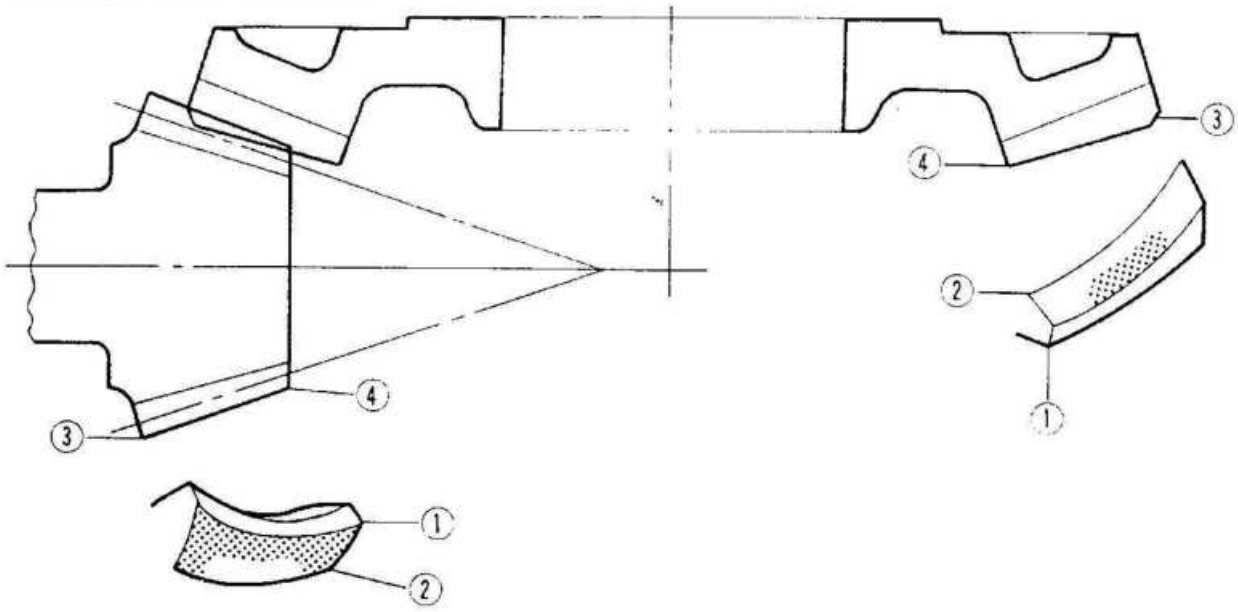
Thickness (mm)	Part Number
0.15	92025-1312
0.5	92025-1313
0.6	92025-1314
*0.7	92025-1315
0.8	92025-1316
0.9	92025-1317
1.0	92025-1318
1.2	92025-1319

Correct Tooth Contact Pattern

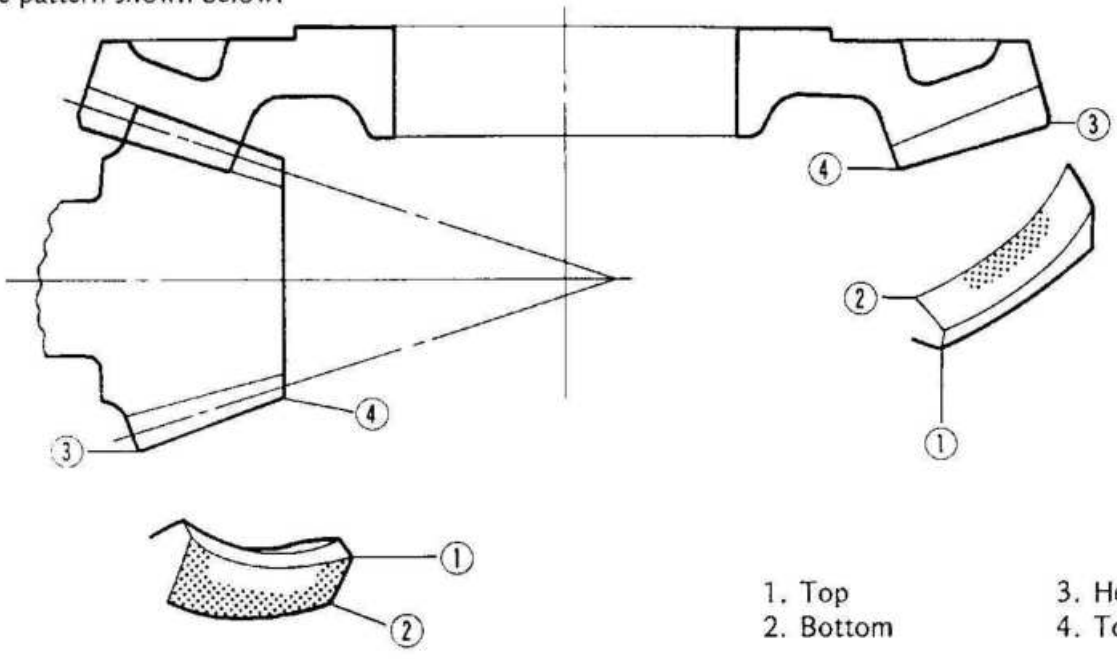


Incorrect Tooth Contact Patters

Example 1: Decrease the size of the pinion gear shim(s) by 0.05 mm to correct the pattern shown below.



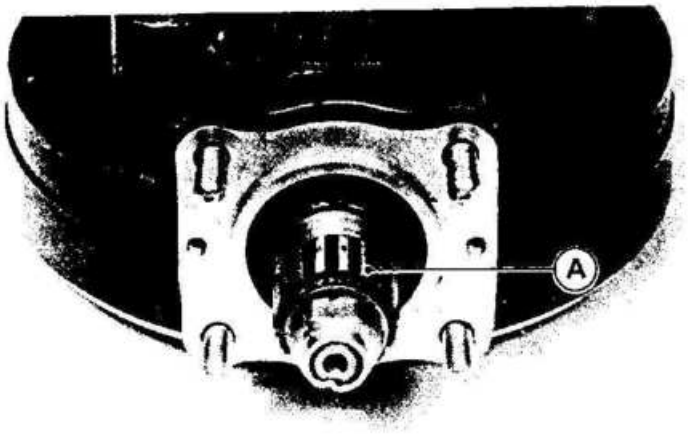
Example 2: Increase the size of the pinion gear shim(s) by 0.05 mm to correct the pattern shown below.



1. Top
2. Bottom
3. Heel
4. Toe

Bevel Gear Inspection

- Visually check the bevel gears for scoring, chipping, or other damage.
- ★Replace the bevel gears as a set if either gear is damaged.
- Visually inspect the splines of the pinion gear joint.
- ★If they are badly worn or chipped, replace the joint with a new one.



A. Check splined portion.

Tapered Roller Bearing Inspection

- Using a high flash-point solvent, wash the tapered roller bearing.
- Visually check the tapered roller bearing for scoring, chipping, or other damage.
- ★If there is any doubt as to the condition of the bearing, replace it.

Oil Seal Inspection

- Inspect the oil seal.
- ★Replace it if the lips are misshapen, discolored (indicating that the rubber has deteriorated), hardened, or been otherwise damaged.

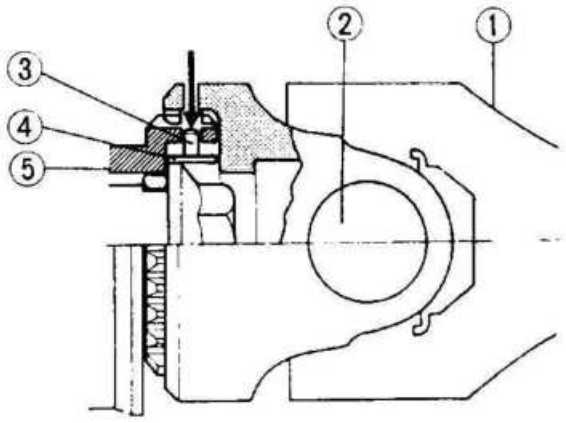
Propeller Shaft

Propeller Shaft Removal

- Remove the final gear case (see Final Gear Case Removal).
- Remove the swing arm (see Swing Arm Removal in Suspension chapter).
- Remove the propeller shaft from the front bevel gear case as follows.

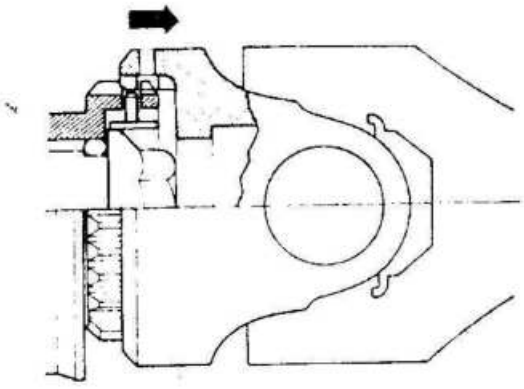
Disengagement of Propeller Shaft from Bevel Gear Case

(1) Push the locking pin about 3 mm into the drive gear joint, and hold the pin.

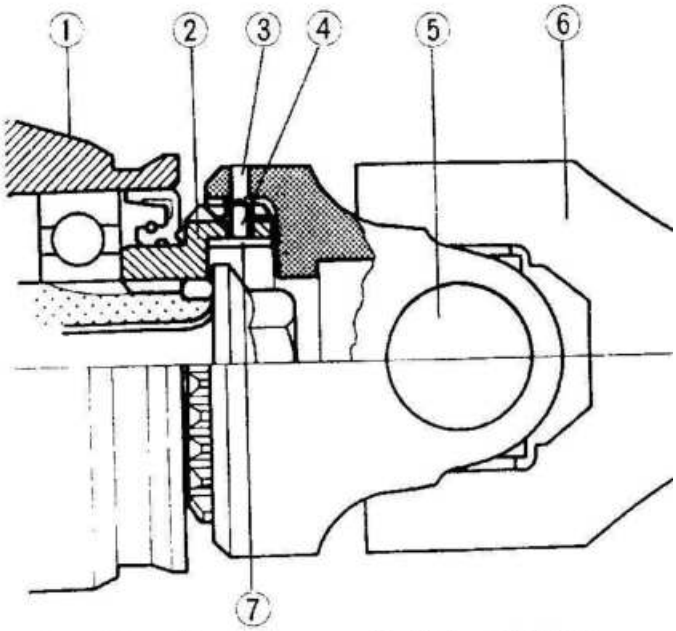


1. Propeller Shaft
2. Universal Joint
3. Locking Pin
4. Spring
5. Driven Gear Joint

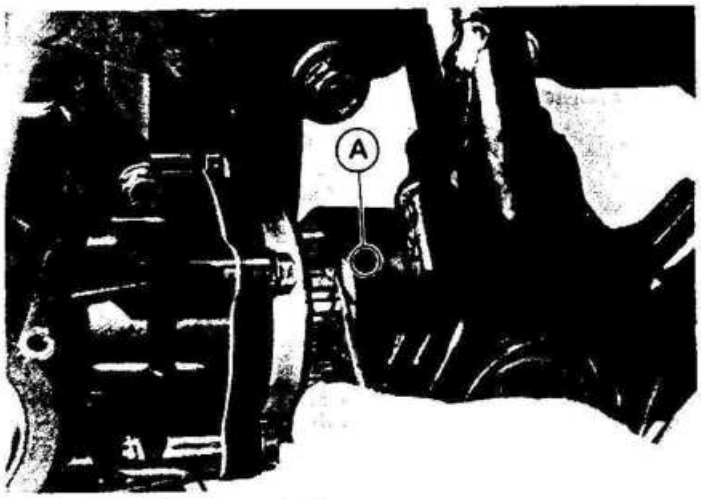
(2) Slip the propeller shaft off the joint.



Propeller Shaft Engagement with Bevel Gear Case



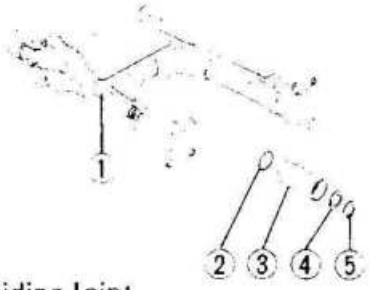
1. Bevel Gear Case
2. Driven Gear Joint
3. Locking Pin Access Hole
4. Locking Pin
5. Universal Joint
6. Propeller Shaft
7. Spring



A. Locking Pin Access Hole

- If necessary, remove the circlip and washer from the rear end of the propeller shaft.
- Pull the propeller shaft sliding joint off the propeller shaft.

Propeller Shaft



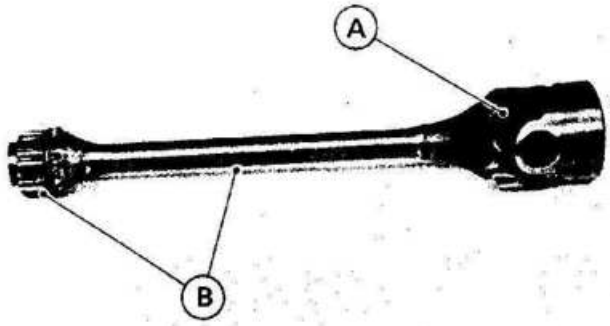
1. Propeller Shaft
2. O-ring
3. Propeller Shaft Sliding Joint
4. Washer
5. Circlip

Propeller Shaft Installation

- Installation is the reverse of removal. Note the following.
- Check the O-ring on the rear end of the propeller shaft for any kind of damage, and replace it if necessary.
- Lubricate the propeller shaft joint (see Propeller Shaft Joint Lubrication).
- After connecting the propeller shaft to the front bevel gear case, pull the propeller shaft rearward to check that the shaft is secured in place by the locking pin.

Propeller Shaft Inspection

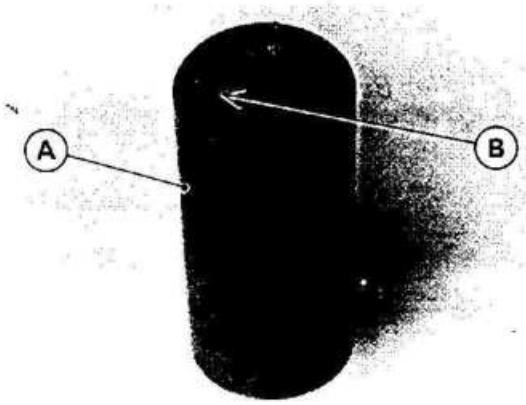
- Check that the universal joint works smoothly without rattling or sticking.
- ★If it does not work smoothly, the needle bearings of the universal joint are damaged. Replace the propeller shaft assembly with a new one.
- Visually inspect the bending of the shaft and the wear of the splined section at the rear end of the shaft.
- ★If it is bent at all, replace the propeller shaft assembly. Do not attempt to straighten a bent shaft.



A. Check universal joint.
B. Inspect shaft and splined portion.

Propeller Shaft Joint Inspection

- Visually inspect the internal splines of the propeller shaft sliding joint.
- ★If they are badly worn or chipped, replace the joint with a new one.



A. Propeller Shaft Joint
B. Check the splined portion.

Propeller Shaft Joint Lubrication

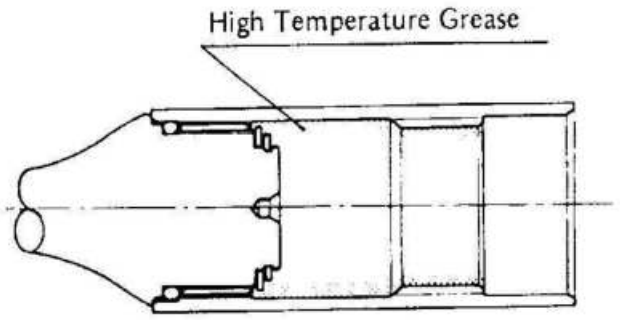
Usually the center of the swing arm pivot does not coinside with the center of the propeller shaft universal joint. As the rear wheel moves up and down, the distance between the front bevel driven gear and the final pinion gear will change to some extent. To allow the propeller shaft to adjust to these variations in length, a sliding joint is used at the rear end of the propeller shaft. Lubricate the propeller shaft joint in accordance with the Periodic Maintenance Chart.

- Remove the final gear case and propeller shaft (see Final Gear Case Removal and Propeller Shaft Removal).
- Wipe off the old grease from the propeller shaft sliding joint and pinion gear joint.
- Pack the propeller shaft sliding joint with 17 mL (14 grams) of high temperature grease.

Grease for Sliding Joint Lubrication

Type:	**High temperature grease**
Amount:	**17 mL (14 grams)**

Propeller Shaft Sliding Joint Lubrication

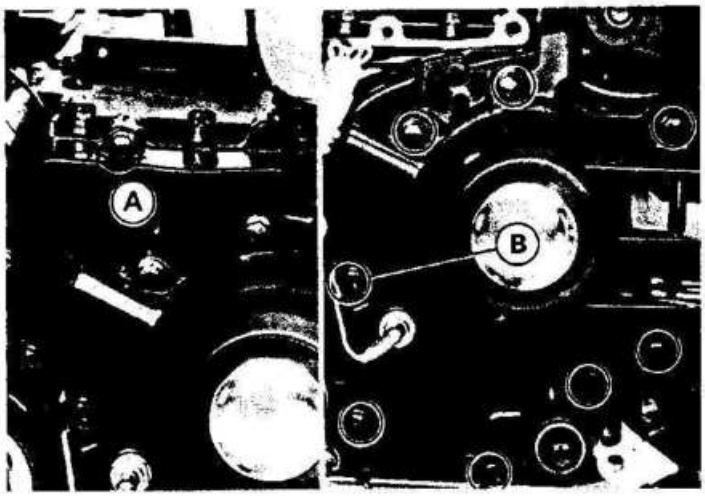


- Wipe off the old grease from the joint at the front end of the propeller shaft and from the driven shaft joint.
- Apply a thin coat of a high temperature grease to the joint splines.
- Install the parts removed.

Front Bevel Gears

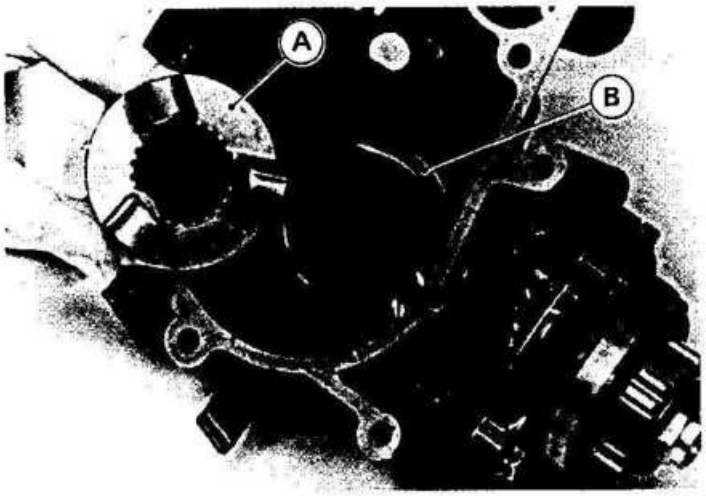
Front Bevel Gear Case Removal

- Remove the following parts before front bevel gear case removal.
  - Rear Wheel
  - Final Gear Case
  - Swing Arm
  - Propeller Shaft
- Disconnect the oil pressure switch connector and neutral switch connector.
- Remove the shift pedal.
- Remove the harness retaining cover.
- Unscrew the front bevel gear case mounting bolts and remove the front bevel gear case.



A. Harness Retaining Cover
B. Mounting Bolts (8)

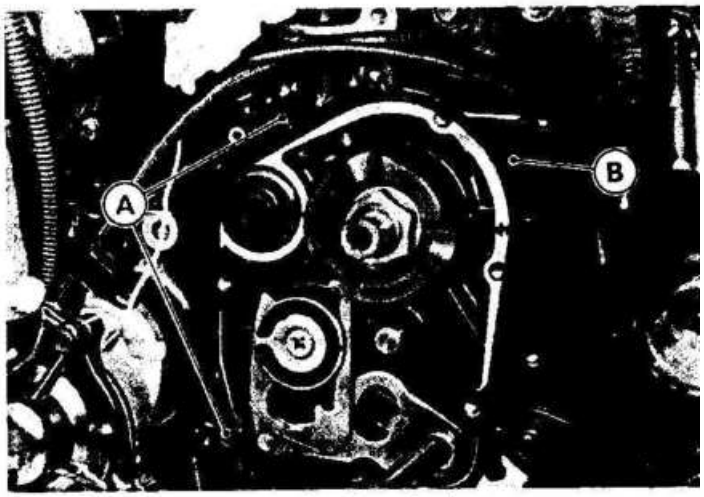
○The cam follower and the damper spring come off with the bevel gear case.



A. Cam Follower B. Damper Spring

Front Bevel Gear Case Installation Notes

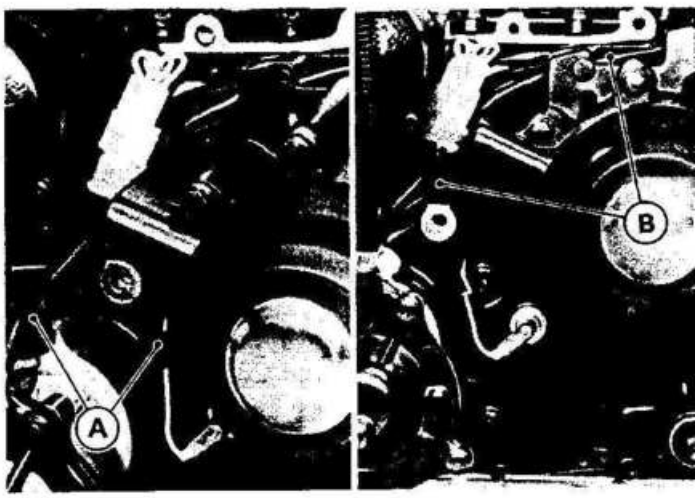
- Installation is the reverse of removal. Note the following.
- Check to see that the knock pins and the new gasket are in place on the case.



A. Knock Pins B. New Gasket

- Run the alternator leads, neutral switch lead and oil pressure switch lead as shown.

○Fit the leads in the groove and secure them with the clamps.



A. Clamps B. Groove

oMake sure they do not get pinched by the gear case.
•For oil seal at the shift shaft, apply a high temperature grease to the seal lip, and use oil seal guide (special tool) to protect the seal during front bevel gear installation.



A. Oil Seal Guide: 57001-264

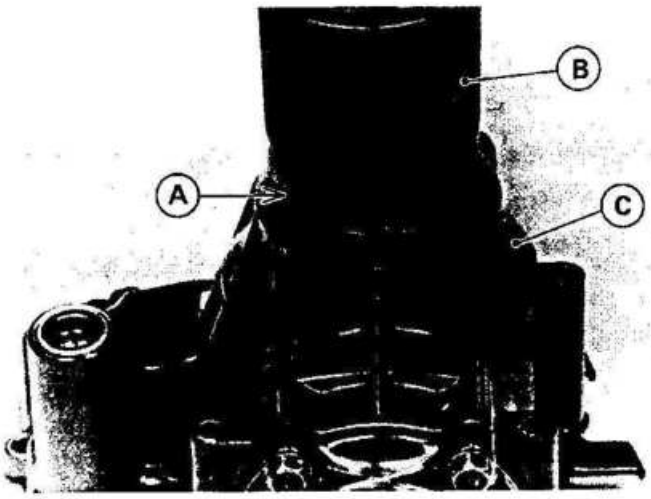
•The damper cam spring suspends the case, so tighten the gear case mounting bolts gradually and evenly to the specified torque (see Exploded Views).
•Check the engine oil level and add oil if necessary (see Oil Level Inspection in the Base Manual).

Front Bevel Gear Case Disassembly

•Remove the front driven gear (see Front Driven Gear Removal).
•Remove the front drive gear (see Front Drive Gear Removal).
•Remove the drive gear bearing using the bearing driver (special tool: 57001-1129) which does not contact inner race.

Front Bevel Gear Case Assembly Notes

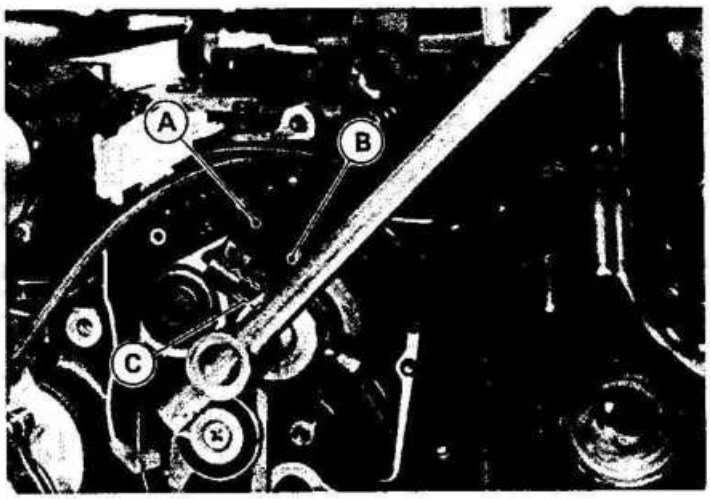
•Assembly is the reverse of disassembly. Note the following.
•The drive and driven shaft bevel gears are lapped as a set at the factory to get the best tooth contact. They must be replaced as a set.
•Apply a non-permanent locking agent to the oil line plug and nozzle to prevent oil leakage.
★Adjust the front bevel gears if necessary (see Front Bevel Gear Backlash and Tooth Contact Adjustment).
•Inspect the drive gear bearing for damage (see Drive Gear Bearing Inspection).
•Check the O-ring on the bearing housing for any kind of damage, and replace it if necessary.
•Tighten the bearing housing mounting bolts to the specified torque (see Exploded View).
•Press the cap into the case using the oil seal driver (special tool) which does not contact the metal part of the cap.



A. Cap
B. Oil Seal Driver: 57001-1091
C. Front Bevel Gear Case

Damper Cam Removal

•Remove the front bevel gear case (see Front Bevel Gear Case Removal in Final Drive chapter).
•Use the damper cam holder (special tool) to hold the damper cam stationary, and remove the damper cam nut.



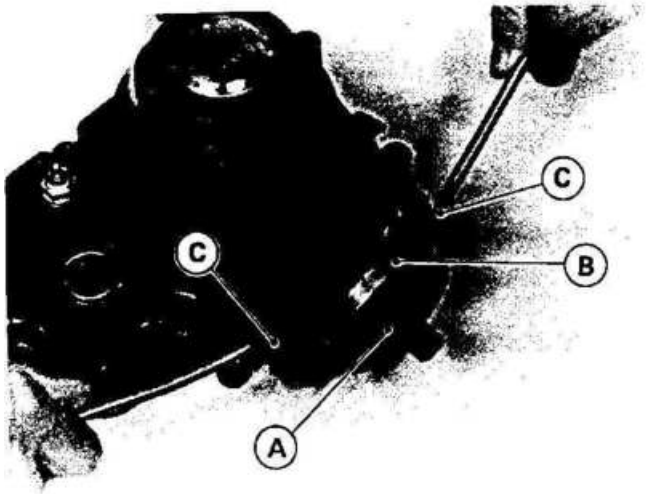
A. Holder: 57001-1025
B. Damper Cam
C. Insert the holder pin in the hole.

Damper Cam Installation Note

•Tighten the damper cam nut to the specified torque (see Exploded View).

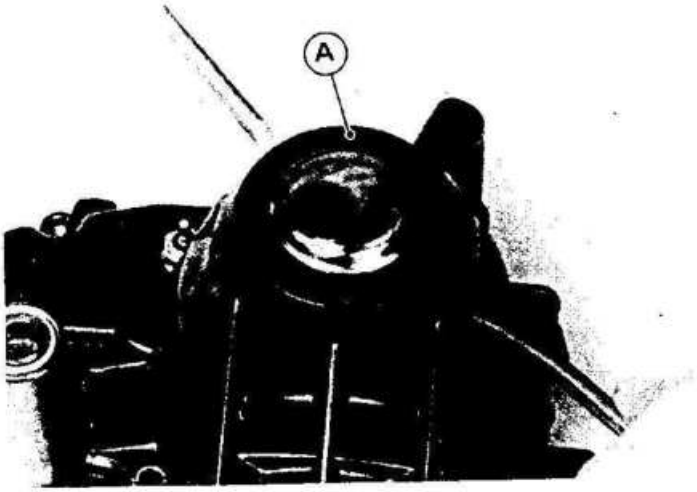
Front Drive Gear Removal

•Remove the driven shaft bevel gear assembly and the bearing housing (see Front Driven Gear Removal).



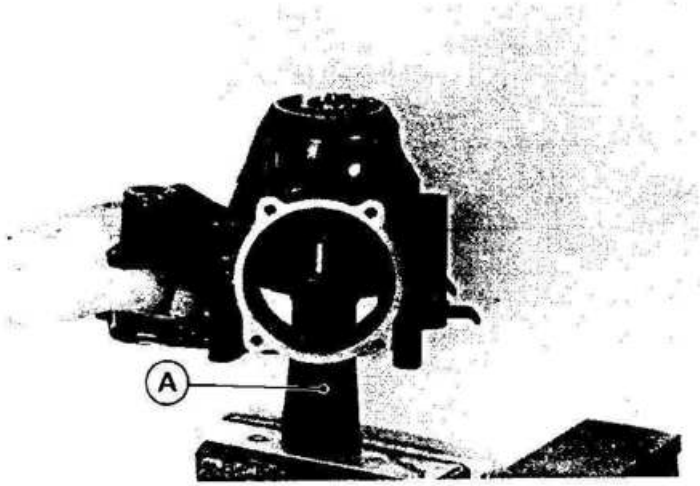
A. Front Driven Gear Assembly
B. Bearing Housing
C. Pry Points

•Pry off the gear case cap.



A. Cap

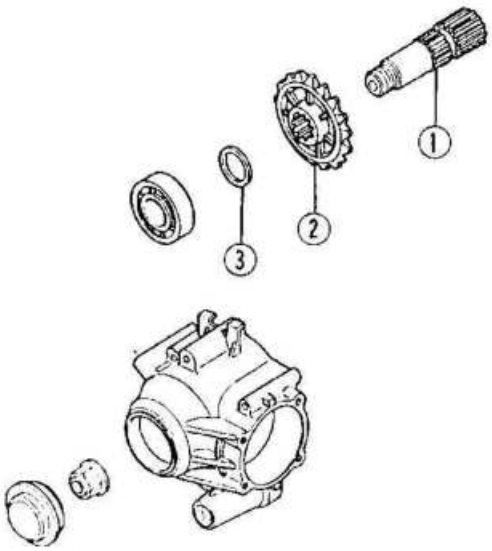
•Pry open the drive gear nut with a small chisel.
•Unscrew the drive gear nut using the drive gear holder (special tool).



A. Drive Gear Holder: 57001-1026

•Remove the drive shaft with the drive shaft bevel gear and shim(s) from the case.

Drive Shaft Bevel Gear



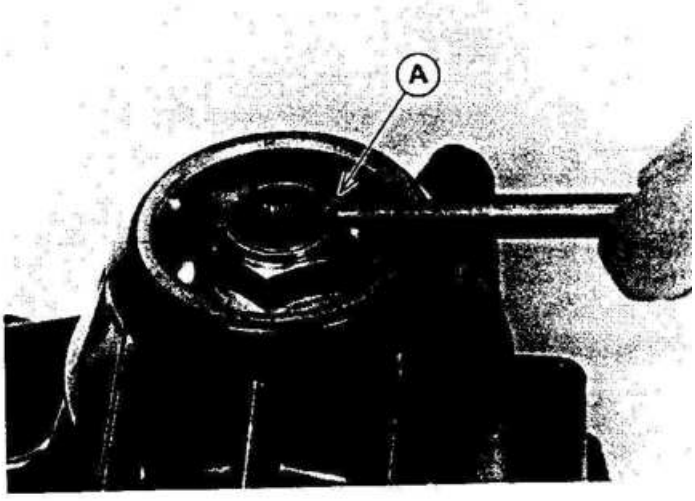
1. Drive Shaft
2. Drive Shaft Bevel Gear
3. Shim(s)

Front Drive Gear Installation Notes

•Inspect the drive shaft bevel gear for damage (see Bevel Gear Inspection).
•When installing the drive gear nut, apply oil to its threads and seating surface.
•Tighten the drive gear nut to the specified torque (see Exploded View).
•Stake the drive gear nut to secure it in place.

CAUTION

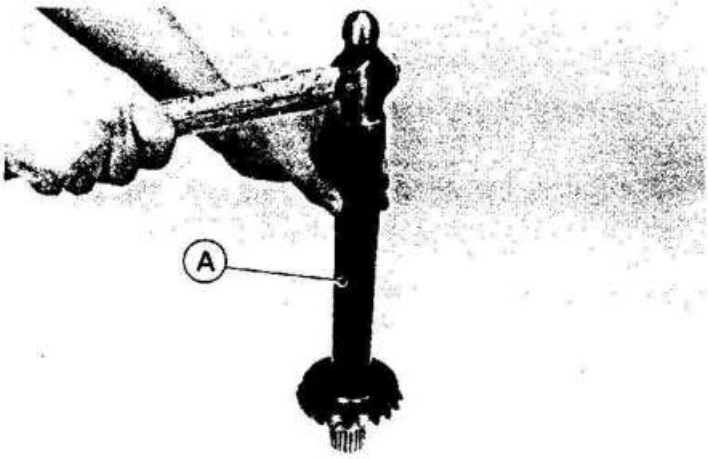
○When staking the nut, be careful not to apply shock to the shaft and bearing. Such a shock could damage the shaft and/or bearing.



A. Stake here

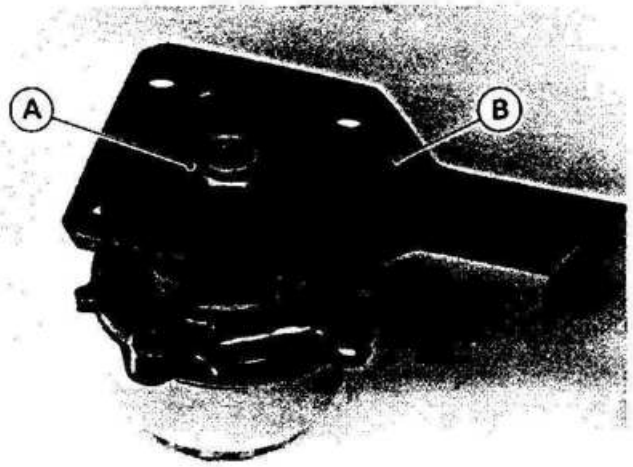
Front Drive Gear Assembly Note

•Install the bevel gear on the drive shaft with a driver (special tool) until the gear is firmly seated against the cam damper splines.



A. Bearing Driver: 57001-382

•Pry open the driven gear nut with a small chisel.
•Holding the driven shaft bevel gear assembly with the driven gear holder (special tool), unscrew the driven gear nut.

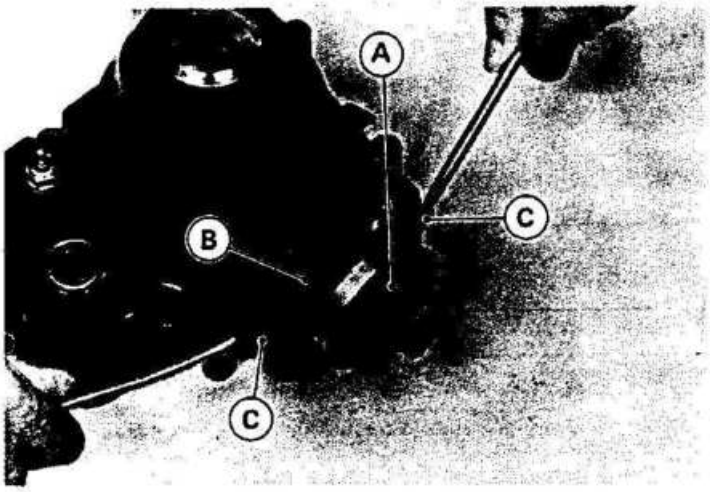


A. Driven Gear Nut
B. Driven Gear Holder: 57001-1027

•Remove the driven gear joint with its O-ring.
•Remove the driven shaft bevel gear from the bearing housing.

Front Driven Gear Removal

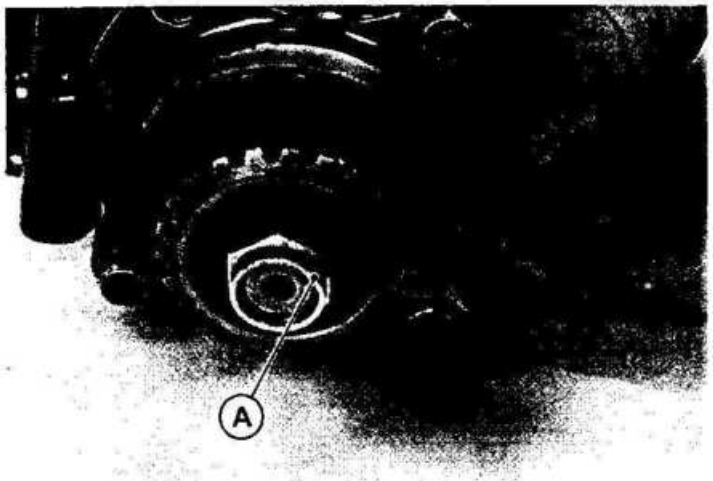
•Remove the front bevel gear case (see Front Bevel Gear Case Removal).
•Take out the cam follower and damper spring.
•Unscrew the bearing housing mounting bolts.
•Pry at the two points shown to remove the bearing housing and driven shaft bevel gear assembly. The shim(s) comes off with them.



A. Front Driven Gear Assembly
B. Bearing Housing
C. Pry Points

Front Driven Gear Installation Notes

○Installation is the reverse of removal. Note the following.
○The drive and driven shaft bevel gears are lapped as a set at the factory to get the best tooth contact. They must be replaced as a set.
•Tighten the driven gear nut to the specified torque (see Exploded Views).
•Stake the driven gear nut to prevent it from loosening.



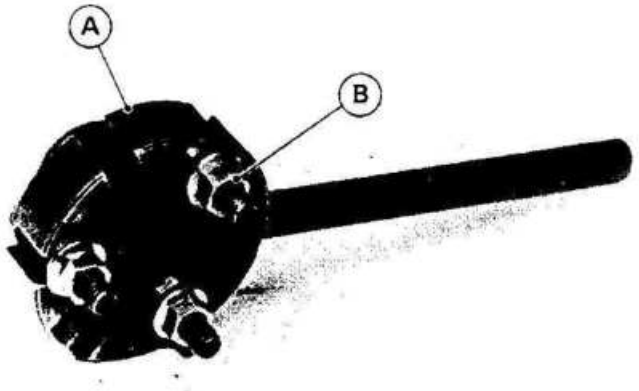
A. Stake the nut.

CAUTION

○**When staking the nut, be careful not to apply shock to the driven shaft bevel gear and their bearings. Such a shock could damage the driven shaft and/or bearings.**

Front Bevel Gear Bearing Housing Disassembly

- Hold the bearing housing in a vise.
- Pry open the bearing retaining nut with a small chisel.
- Install three ϕ8 x 35 long bolts on the magneto holder as pins.

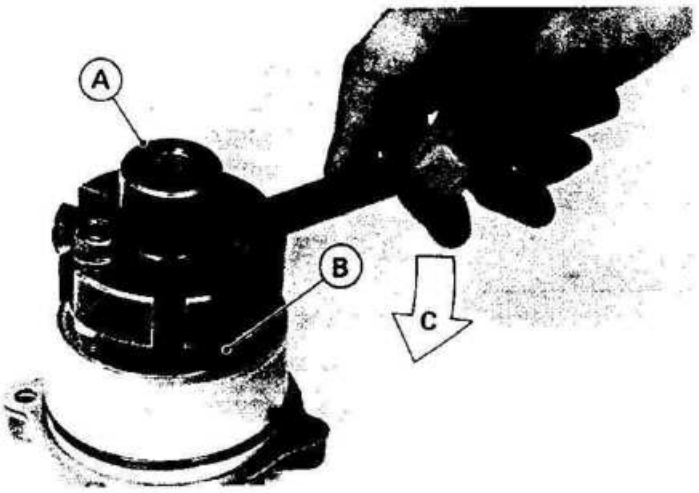


A. Magneto Holder: 57001-259
B. Bolts and Nuts

- Unscrew the bearing retaining nut using the modified magneto holder (special tool).

NOTE

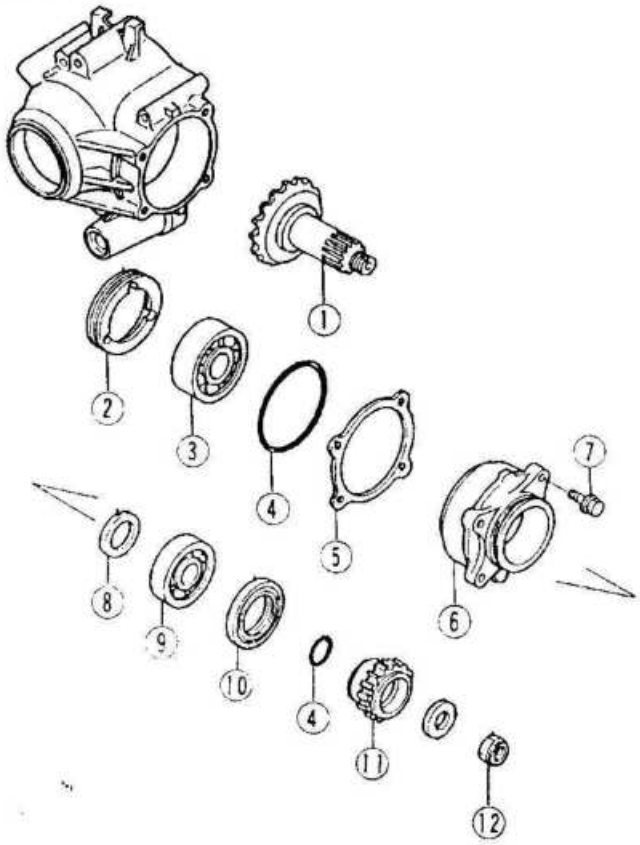
○*The bearing retaining nut has left-hand threads. Turn the holder clockwise for removal.*



A. Magneto Holder: 57001-259
B. Bearing Retaining Nut
C. Turning Direction for Removal

- Pull out the oil seal using a suitable hook.
- Remove the ball bearings using a metal rod and a bearing driver (special tool: 57001-1129) which does not contact the bearing inner race.

Driven Shaft Bevel Gear

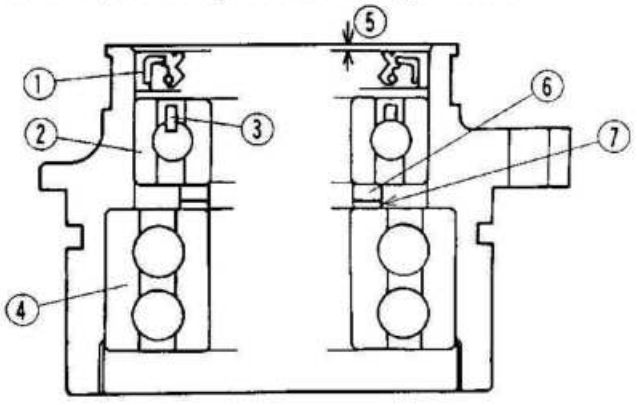


1. Front Driven Gear
2. Bearing Retaining Nut
3. Double Row Bearing
4. O-rings
5. Shim(s)
6. Bearing Housing
7. Mounting Bolts
8. Spacer
9. Single Row Bearing
10. Oil Seal
11. Driven Gear Joint
12. Driven Gear Nut

Front Bevel Gear Bearing Housing Assembly

- Check the ball bearing for damage.
- Install the double row bearing until it bottoms out.
- Install the spacer so that the oil groove faces to the double row bearing.
- After installing the spacer, install the single row bearing and the oil seal in the direction shown.

○Face the plastic cage of the bearing outboard.



1. Oil Seal
2. Single Row Bearing
3. Plastic Cage
4. Double Row Bearing
5. 1 mm
6. Spacer
7. Oil Groove

- Apply a non-permanent locking agent to the threads of the bearing retaining nut.
- Tighten the bearing retaining nut to the specified torque (see Exploded Views) using the modified magneto holder (57001-259).
- Stake the retaining nut to prevent it from loosening.

Front Bevel Gear Backlash and Tooth Contact Adjustment

Improper backlash and/or tooth contact of bevel gears lead to noise and damage of gears.

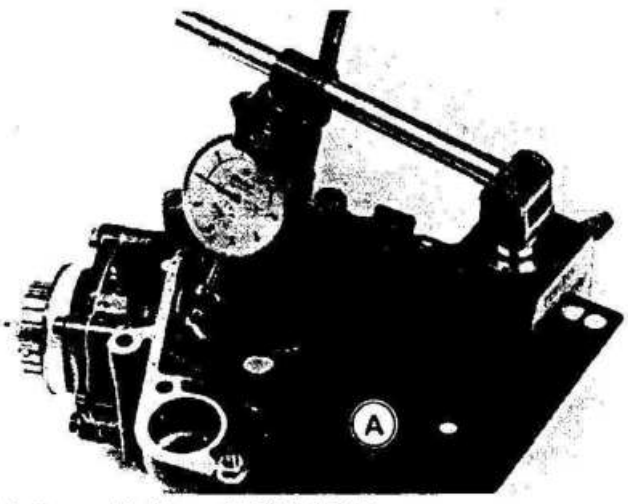
When replacing any one of the parts which influences the backlash and tooth contact of the bevel gears, make sure to check and adjust them. First, adjust the backlash. Second, get the correct tooth contact. Last, check to see if backlash is within the standard. If backlash is out of range, repeat above procedure again. Backlash and tooth contact adjustments for the bevel gears are accomplished by moving the bevel gear(s) closer to or away from each other. This is done by changing thickness of the shims between each bearing housing and the front bevel gear case.

Parts which change the backlash and tooth contact are as follows.

Front Bevel Gear Case
Drive and Driven Bevel Gears
Front Bevel Gear Drive Shaft
Bearing Housing
Single Row Bearing for Drive Gear
Double Row Bearing for Driven Gear

Backlash Adjustment:

- Clean any dirt and oil off the bevel gear teeth.
- Install the drive and driven shaft assemblies into the front bevel gear case.
- First install the standard shims (see the shim table) between the bearing housing and front bevel gear case, and between the drive gear and the ball bearing.
- Tighten the drive gear nut to the specified torque (see Exploded Views).
- Install the dial gauge holder (special tool), using a 6 mm bolt (front bevel gear case mounting bolts) and nut.
- Hold the drive gear steady.



A. Dial Gauge Holder: 57001-1049

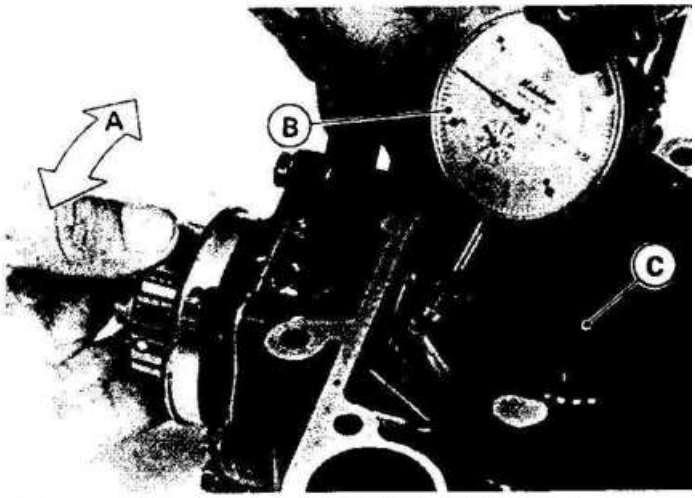
- Check the backlash during the tightening of the driven gear bearing housing mounting bolts, and stop to tighten them immediately if you feel the backlash of the gears is gone. Then, replace the shim at the drive gear and/or the shim at the driven gear housing.

NOTE

○Backlash, or gear lash is the amount of movement of one gear relative to the other, measured with one gear stationary.

Front Bevel Gear Backlash

Standard	**0.10 – 0.15 mm**



A. Move
B. Dial Gauge
C. Hold the drive gear

★If the backlash is incorrect, replace the shim at the drive gear and/or the shim at the driven gear housing and recheck the backlash.

Shims for Drive Shaft Bevel Gear (* : Standard)

Thickness (mm)	Part Number
0.15	92025-1688
0.5	92025-1689
0.6	92025-1690
0.7	92025-1691
0.8	92025-1692
0.9	92025-1693
1.0	92025-1694
1.1	92025-1695
1.2	92025-1696

Shims for Driven Shaft Bevel Gear (* : Standard)

Thickness (mm)	Part Number
0.10	92025-1772
0.15	92025-1773
0.70	92025-1774
*0.80	92025-1775
1.00	92025-1776
1.20	92025-1777

Tooth Contact Adjustment:

- Remove the dial gauge and its holder from the gear case.
- Clean any dirt and oil off the teeth of the bevel gears.
- Apply checking compound to 4 or 5 teeth of the driven gear.

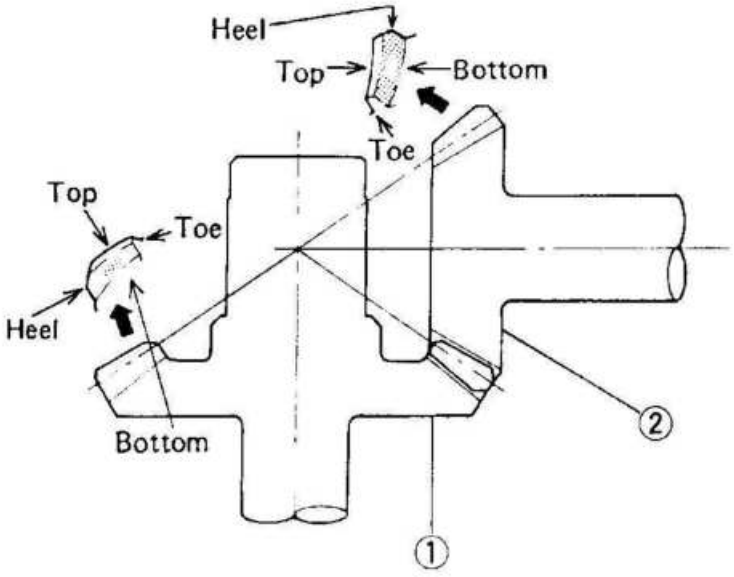
NOTE

○Apply the checking compound to the teeth in a thin, even coat with a fairly stiff paint brush. If painted too thickly, the exact tooth pattern may not appear.
○The checking compound must be smooth and firm, with the consistency of tooth paste.
○Special compounds are available from automotive supply stores for the purpose of checking differential gear tooth patterns and contact. Use this for checking the bevel gears.

- Turn the driven gear for 3 or 4 revolutions in the drive and reverse (coast) directions, while creating a drag on the drive gear.
- Check the drive pattern and coast pattern of the bevel gear teeth. The tooth contact patterns of both drive and coast sides should be centrally located between the top and bottom of the tooth.

★If the tooth contact pattern is incorrect, replace the shims as shown. Then erase the tooth contact patterns, and check them again. Also check the backlash every time the shims are replaced. Repeat the shim change procedure as necessary.

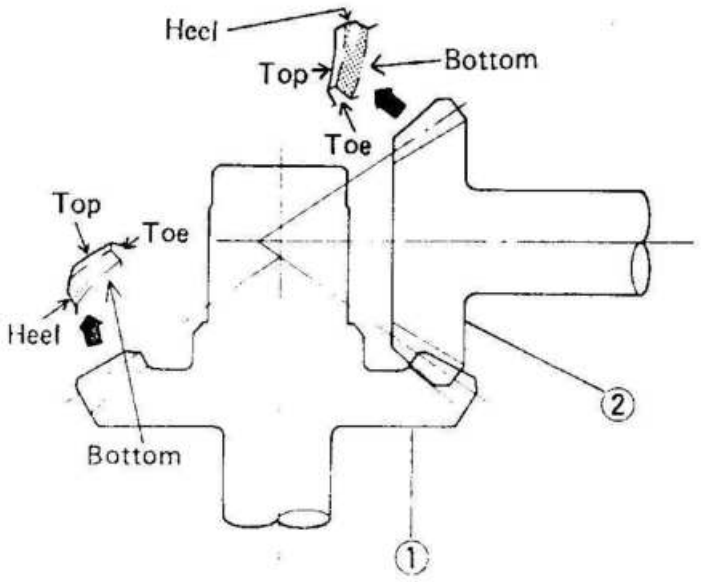
Correct Tooth Contact Pattern



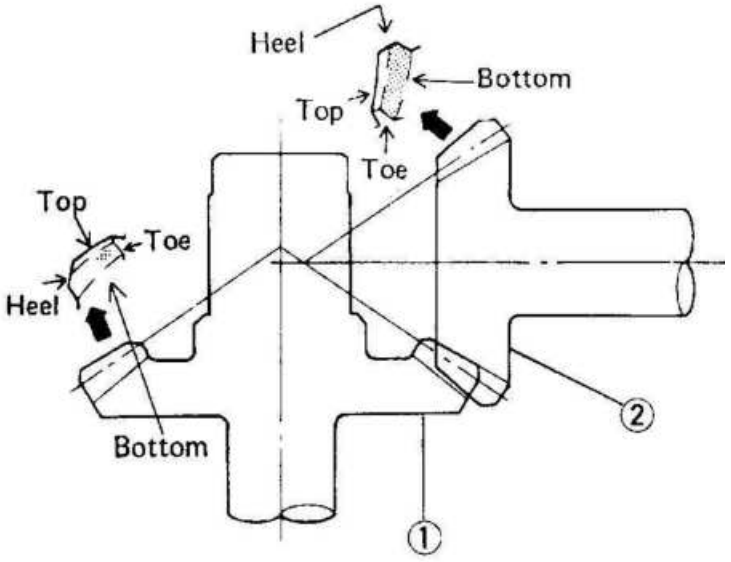
1. Drive Shaft Bevel Gear
2. Driven Shaft Bevel Gear

Incorrect Tooth Contact Patterns

Example 1: **Increase** the thickness of the shim pack at the drive gear by 0.05 mm, and **increase** the thickness of the shim pack at the driven gear housing by 0.1 mm to correct the pattern.



Example 2: **Decrease** the thickness of the shim pack at the drive gear by 0.05 mm, and **decrease** the thickness of the shim pack at the driven gear housing by 0.1 mm to correct the pattern.



1. Drive Shaft Bevel Gear
2. Driven Shaft Bevel Gear

Front Bevel Gear Inspection

●Visually check the bevel gears for scoring, chipping, or other damage.

★Replace the bevel gears as a set if either gear is damaged.

Oil Seal Inspection

●Inspect the oil seal.

★Replace it if the lips are misshapen, discolored (indicating that the rubber has deteriorated), hardened or otherwise damaged.

Front Bevel Gear Bearing Inspection

○Since the ball bearings are made to extremely close tolerances, the wear must be judged by feel rather than measurement. Clean each bearing in a high flash-point solvent, dry it (do not spin the bearing while it is dry), and oil it with engine oil.

○Spin the bearing by hand to check its condition.

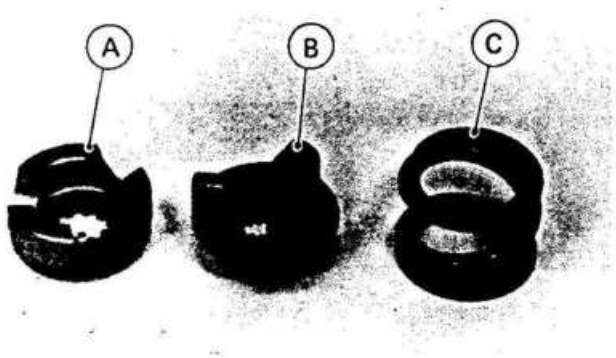
★If the bearing is noisy, does not spin smoothly, or has any rough spots, replace it.

Cam Damper Inspection

●Remove the damper cam (see Damper Cam Removal).

●Visually inspect the cam damper, cam follower, and spring.

★Replace any parts that appear damaged.



A. Damper Cam
B. Cam Follower
C. Spring

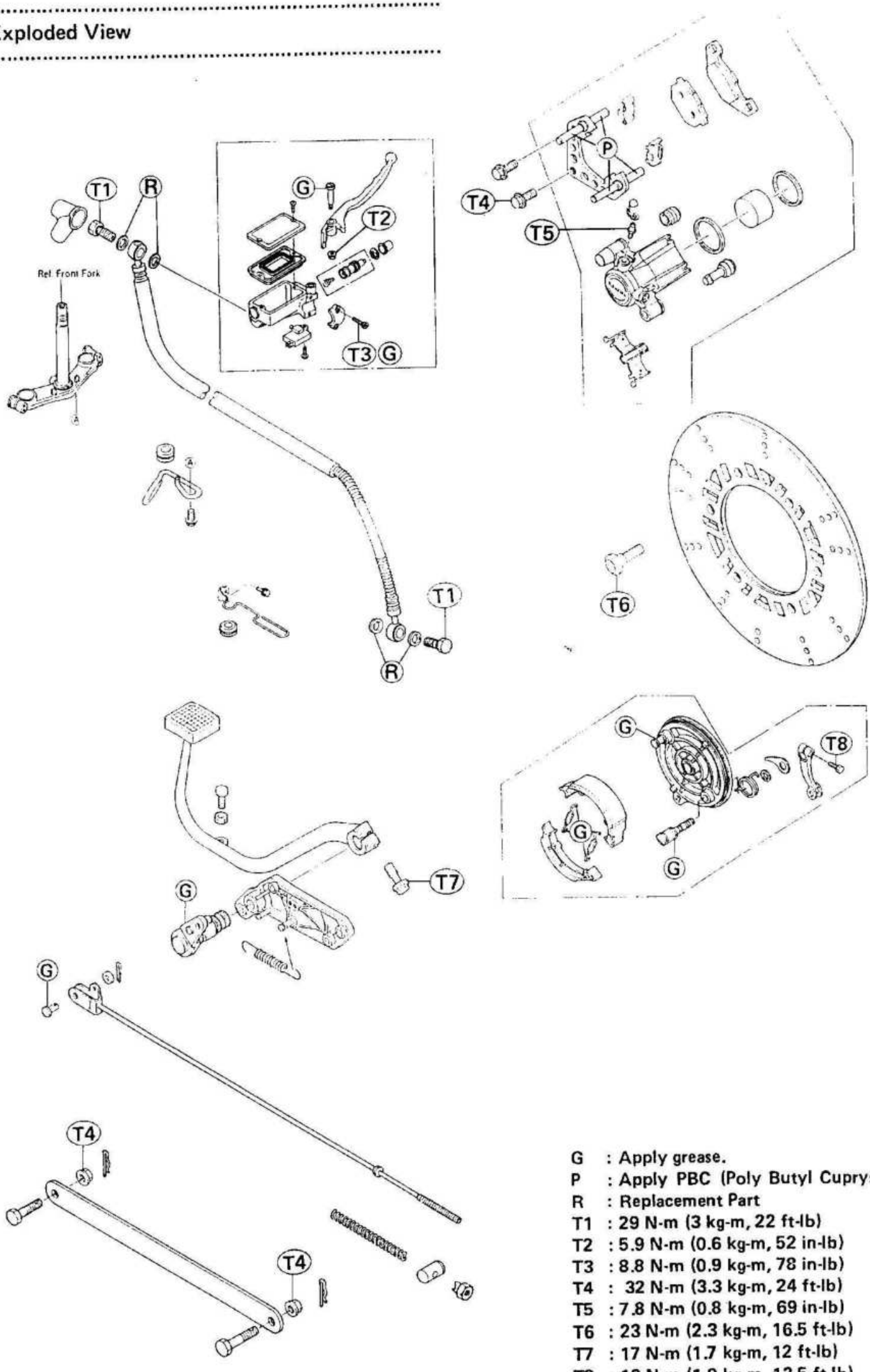
Brakes

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* : Refer to Base Manual

Exploded View

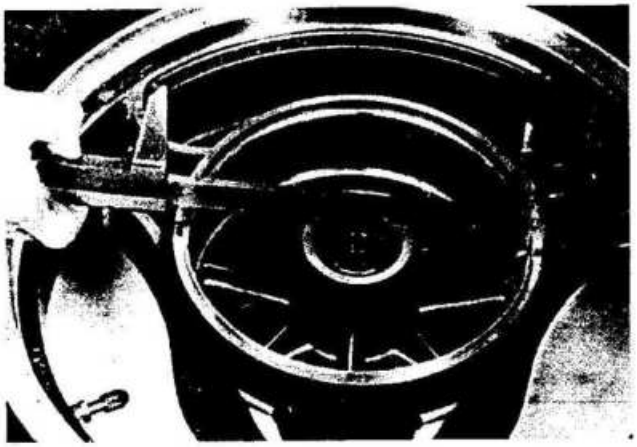


G : Apply grease.
P : Apply PBC (Poly Butyl Cuprysil) grease.
R : Replacement Part
T1 : 29 N-m (3 kg-m, 22 ft-lb)
T2 : 5.9 N-m (0.6 kg-m, 52 in-lb)
T3 : 8.8 N-m (0.9 kg-m, 78 in-lb)
T4 : 32 N-m (3.3 kg-m, 24 ft-lb)
T5 : 7.8 N-m (0.8 kg-m, 69 in-lb)
T6 : 23 N-m (2.3 kg-m, 16.5 ft-lb)
T7 : 17 N-m (1.7 kg-m, 12 ft-lb)
T8 : 19 N-m (1.9 kg-m, 13.5 ft-lb)

Specifications

Item		Standard	Service Limit
Brakes:			
Brake fluid grade		D.O.T.4	
Brake lever		Non-adjustable	
Brake pedal position		9 mm below top of footpeg	
Brake pedal play		20 – 30 mm	
Brake light switch:	Front	Non adjustable	
	Rear	ON after about 15 mm pedal travel	
Front disc brake:			
Pad lining thickness		4.85 mm	1 mm
Disc thickness		4.8 – 5.1 mm	4.5 mm
Disc runout		under 0.2 mm	0.3 mm
Rear drum brake:			
Cam lever angle		80 – 90°	
Drum inside diameter		180.00 – 180.16 mm	180.75 mm

Brake Drum Inside Diameter Measurement



Recommended Brake Fluid

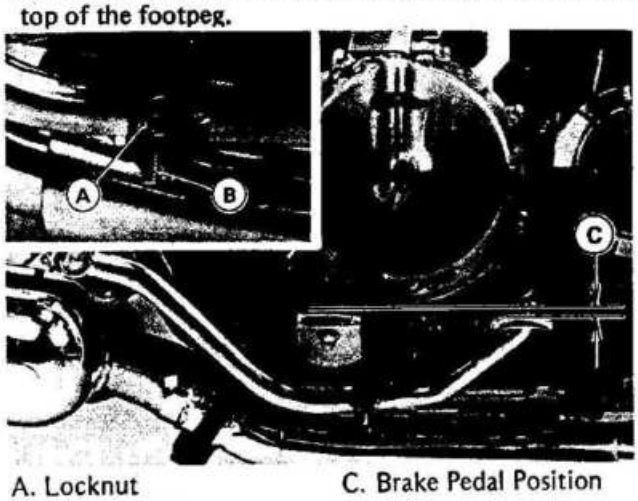
Castrol Girling Universal
Castrol GT (LMA)
Castrol Disc Brake Fluid
Check Shock Premium Heavy Duty

Brake Adjustment

Rear Brake:

Rear Brake Pedal Position Adjustment

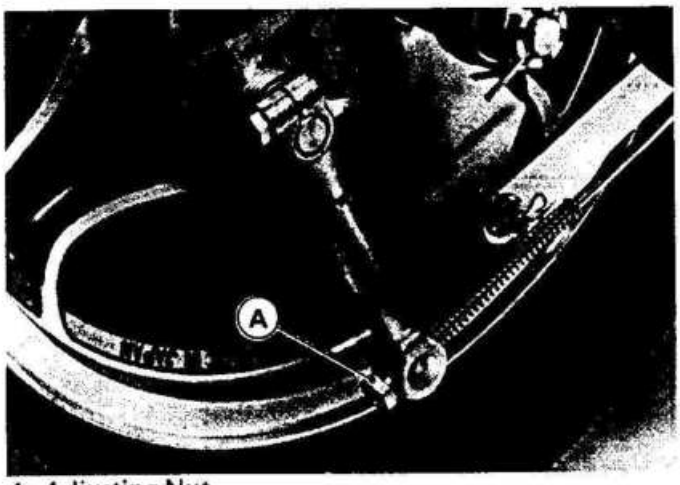
•Check the position of the brake pedal, relative to the top of the footpeg.



A. Locknut
B. Adjuster Bolt
C. Brake Pedal Position

Brake Pedal Position

Below top of footpeg: 9 mm



A. Adjusting Nut

- Loosen the locknut and turn the adjuster bolt until the brake pedal is correctly positioned.
- Tighten the locknut securely.
- After adjusting the pedal position, check the rear brake light switch and brake pedal free play, and adjust them if necessary.

Brake Light Switch

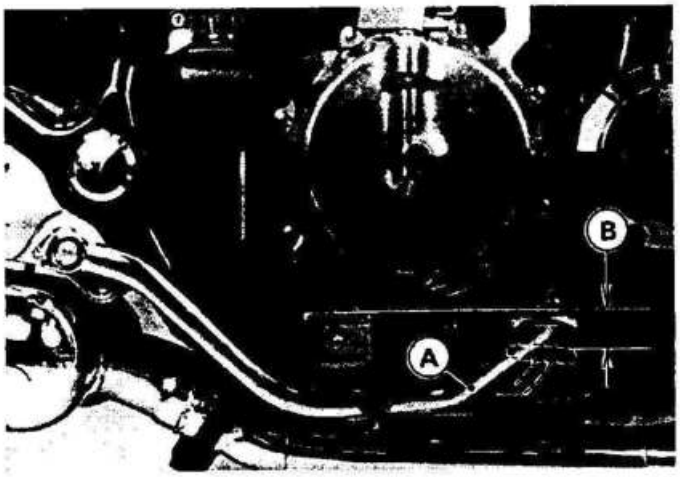
ON after about 15 mm travel

NOTE

○*If the pedal position cannot be adjusted by turning the adjuster bolt, the brake pedal may be deformed or incorrectly installed.*

Rear Brake Pedal Free Play Adjustment

- Depress the rear brake pedal lightly by hand. This is the free play.



A. Rear Brake Pedal B. Play

Brake Pedal Play

Standard: 20 to 30 mm

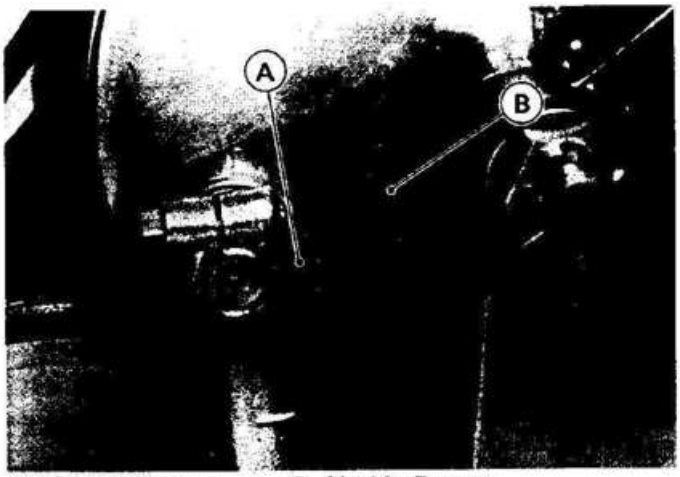
★If the rear brake pedal free play is incorrect, adjust it.

- Turn the adjusting nut at the brake panel, as shown.

Rear Brake Lining Wear Inspection

- Check that the brake lining wear indicator points within the USABLE RANGE when the rear brake is fully applied.

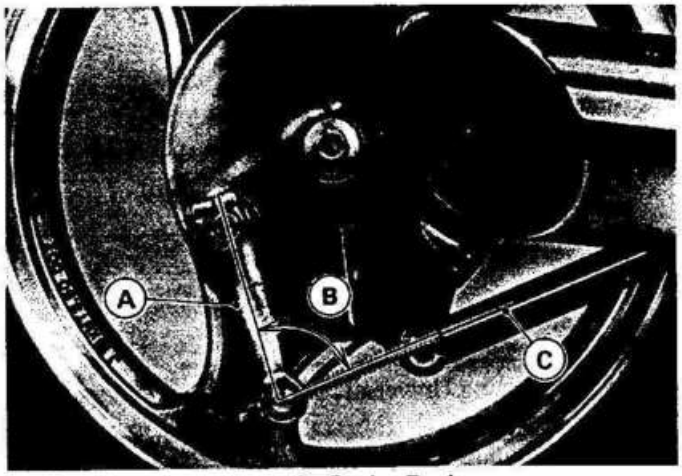
★If does not, the brake shoes must be immediately replaced and the other brake parts examined.



A. Wear Indicator B. Usable Range

- Check that the rear brake cam lever comes to an **80 – 90°** angle with the rear brake rod when the rear brake is fully applied.

★If it does not, adjust the rear brake cam lever angle.



A. Cam Lever C. Brake Rod
B. 80 – 90°

Cam Lever Angle

Standard: 80° – 90°

WARNING

○Since a cam lever angle greater than 90° reduces braking effectiveness, cam lever angle adjustment should not be neglected.

Rear Brake Cam Lever Angle Adjustment

- Remove the bolt and take off the cam lever.
- Mount the cam lever at a new position so that the cam lever comes to an **80° – 90°** angle with the rear brake rod when the brake is fully applied.
- Adjust the brake play.

WARNING

○A change in cam lever angle is caused by wear of internal brake parts. Whenever the cam lever angle is adjusted, also check for drag and proper operation, taking particular note of the brake lining wear indicator position.

○In case of doubt as to braking effectiveness, disassemble and inspect all internal brake parts. Worn parts cause the brake to lock or fail.

Brake Fluid

Brake Fluid Change

Brake Fluid Requirement

Recommended fluids are given in the table below. If none of the recommended brake fluids are available, use extra heavy-duty brake fluid only from a container marked D.O.T.4.

Recommended Brake Fluid

Type	D.O.T.4
Brand	Castrol Girling Universal
	Castrol GT (LMA)
	Castrol Disc Brake Fluid
	Check Shock Premium Heavy Duty

Brake Panel

Brake Panel Disassembly

- Remove the rear wheel (see Rear Wheel Removal in Wheels/Tires chapter).
- Pull the panel assembly out of the wheel.

WARNING

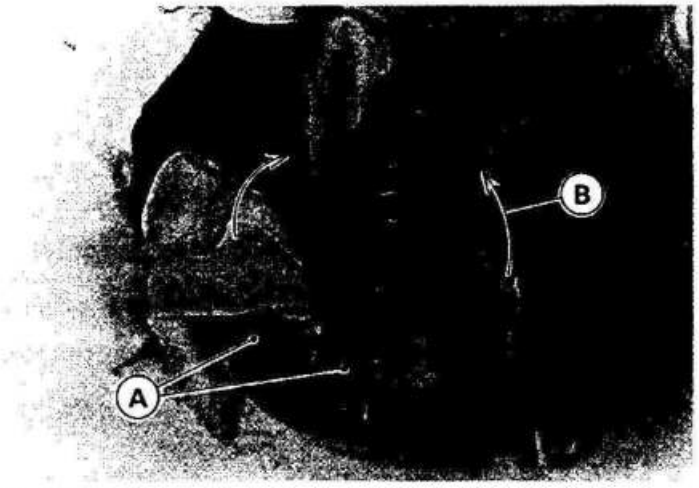
○Brake linings contain asbestos fiber. Inhalation of asbestos may cause serious scarring of the lungs and may promote other internal injury and illness, including cancer. Observe the following precautions when handling brake linings.

○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.

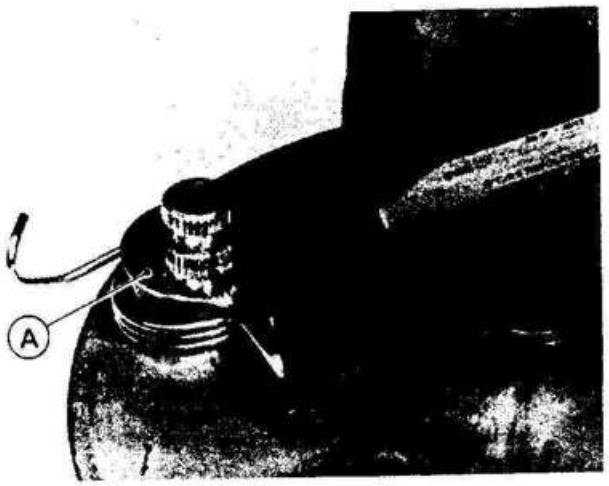


A. Brake Shoes B. Lift

- Before removing the brake cam lever, or the indicator, mark the position of the cam lever, or the indicator so that it can be installed later in the same position.



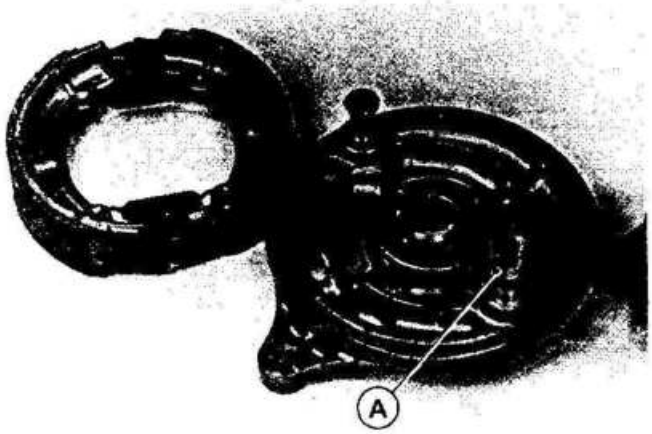
A. Brake Cam Lever



A. Indicator

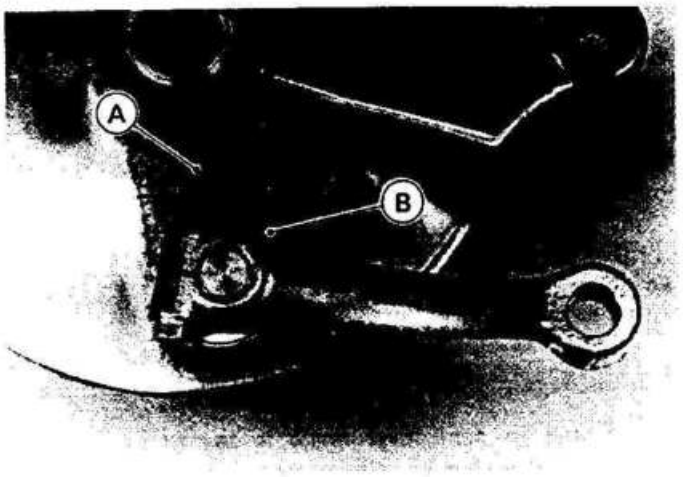
Brake Panel Assembly Notes

- Clean the old grease from the camshaft and regrease it. Apply grease to the center of shaft and very lightly on the cam surfaces. Do not overgrease.
- Push the camshaft into the panel. The brake cam is symmetrical.



A. Brake Cam

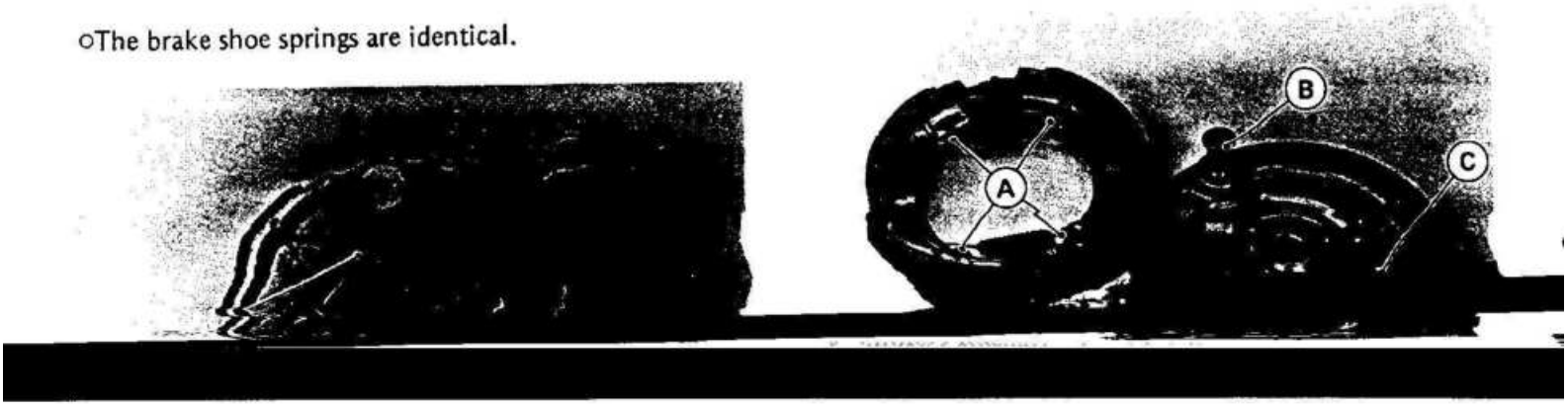
- The brake shoe springs are identical.
- Fit the springs onto the brake shoes. Wrap a clean cloth around the linings to prevent grease or oil from getting on them, and install the shoes on the brake panel.
- Install the dust seal and fit the indicator in its original position on the camshaft.
- Install the return springs.
- Once the shoes have been replaced, fit the indicator on the serrations so that it points to the right end of the USABLE RANGE.



A. USABLE RANGE B. Indicator

Rear Brake Camshaft Lubrication

- Disassemble the rear 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. Do not get any grease on the brake shoe linings, and wipe off any excess grease so that it does not get on the linings or drum after brake assembly.

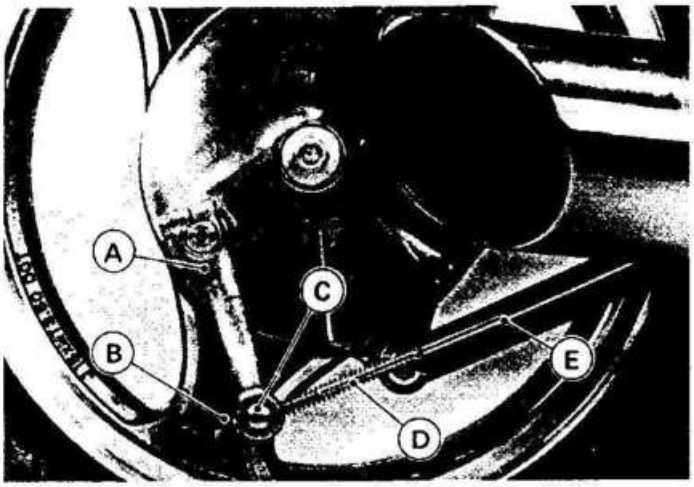


•Assemble the rear drum brake.
•Adjust the brake pedal position and play.

Brake Pedal

Brake Pedal/Shaft Removal

•Remove the brake rod adjusting nut at the rear wheel.
•Pull the rod end out of the cam lever on the brake panel. Do not lose the joint and spring.



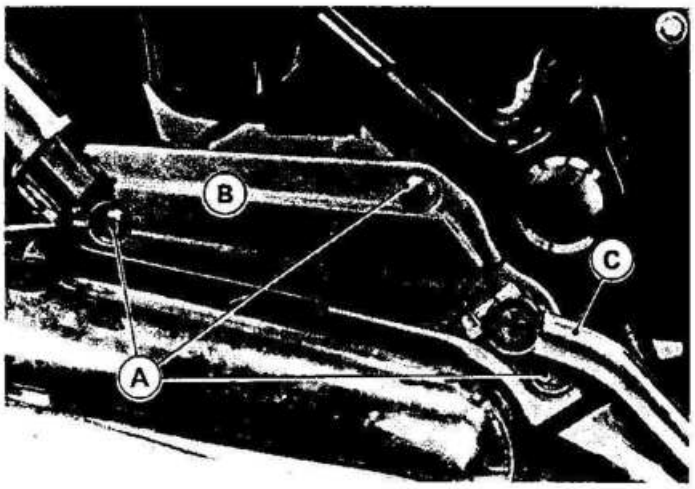
A. Cam Lever
B. Adjusting Nut
C. Joint
D. Spring
E. Brake Rod

•Remove the right side cover and pull off the brake switch connector.



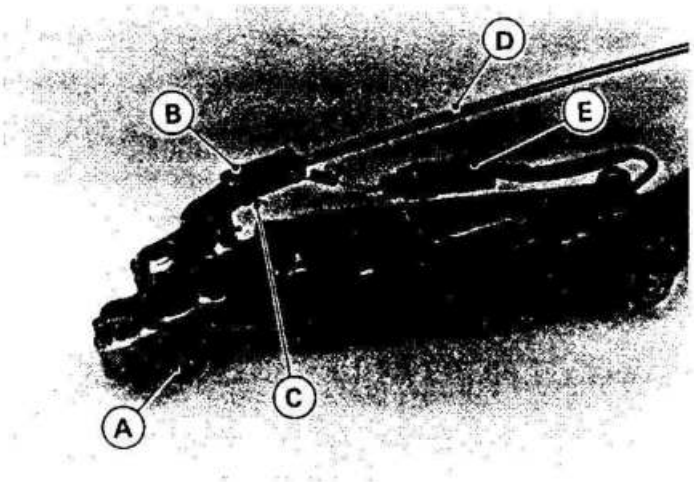
A. Brake Switch Connector

•Screw in the brake pedal adjusting bolt in order to free the brake pedal.
•Unscrew the mounting bolt to remove the brake pedal.
•Take out the footpeg bracket mounting bolts to remove the bracket with the brake shaft, brake rod, footpeg, and brake switch.



A. Mounting Bolts
B. Footpeg Bracket
C. Brake Pedal

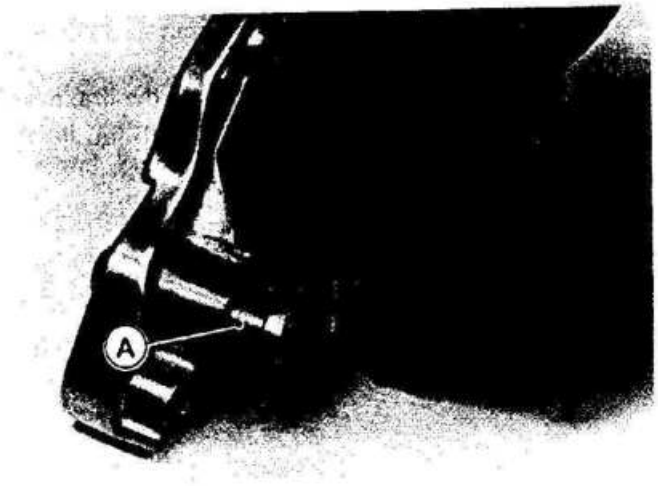
•Press in the rear brake light switch tabs and then pull the switch with the spring installed up and out of the stay.
•Remove the pedal shaft after unhooking the return spring.
•Take out the cotter pin and the clevis pin to separate the shaft from the brake rod.



A. Pedal Shaft
B. Clevis Pin
C. Cotter Pin
D. Brake Rod
E. Brake Switch

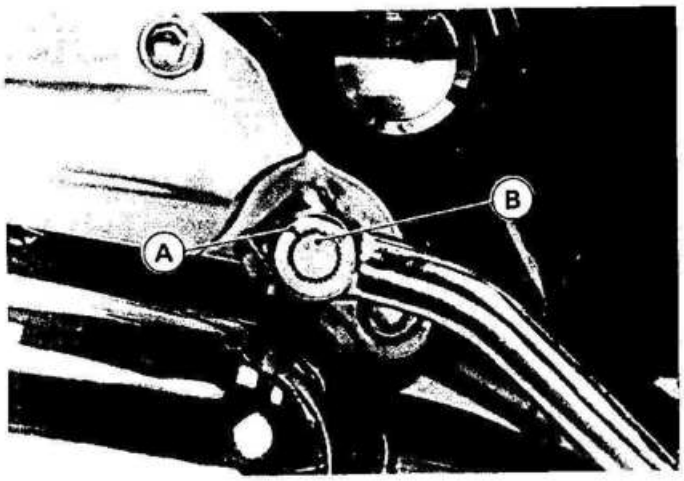
Brake Pedal/Shaft Installation Notes

•Grease the brake shaft and the clevis pin before installation.



A. Brake Shaft

- Insert a new cotter pin, and bend the end.
- Install the footpeg bracket and tighten the mounting bolts.
- Install the brake pedal on the shaft so that the slot on the pedal is aligned with the mark on the shaft.



A. Slot B. Mark

- Check the brake pedal position, brake switch and pedal play. Readjust them if necessary.

Suspension

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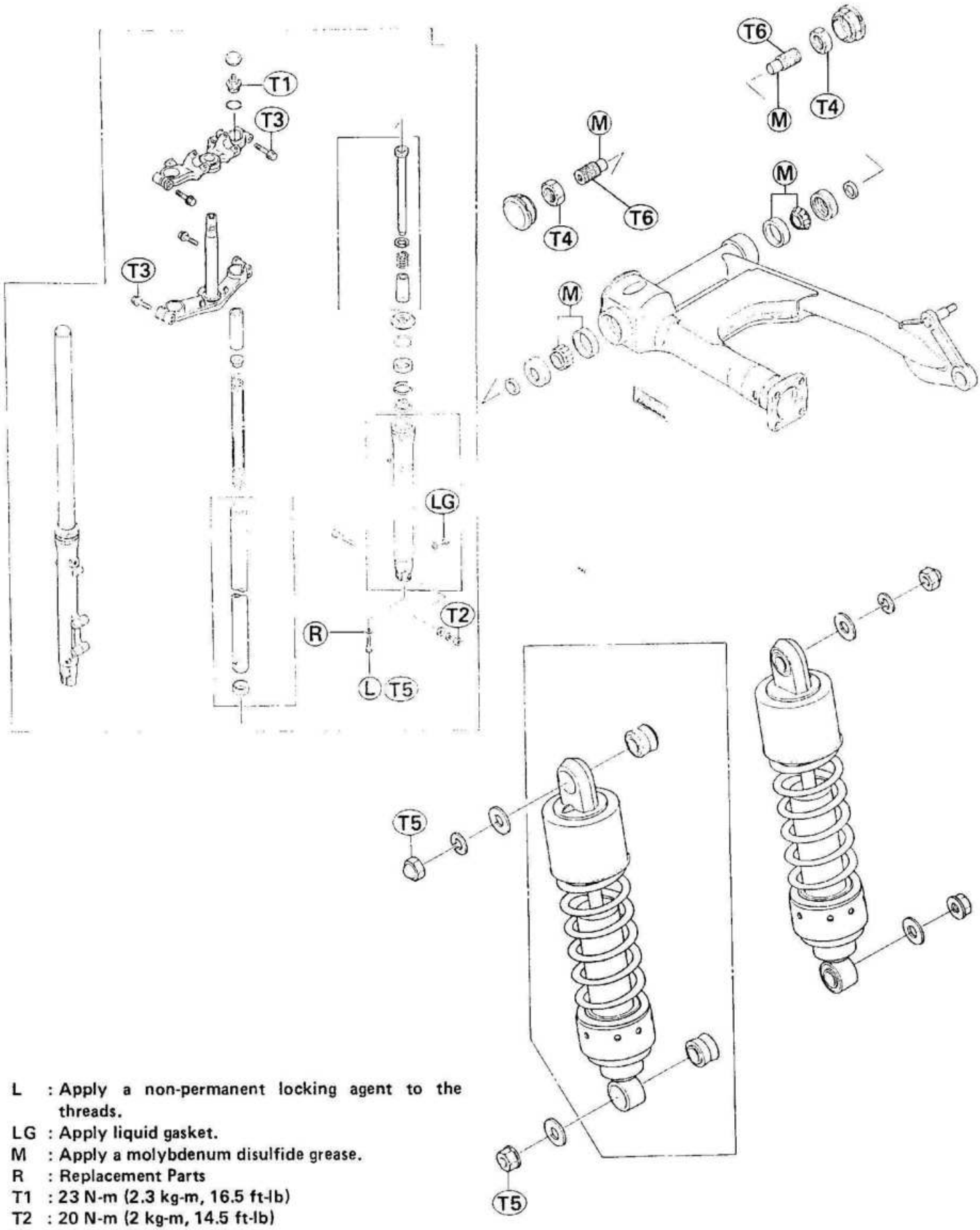
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* : Refer to Base Manual

Exploded View



L : Apply a non-permanent locking agent to the threads.
LG : Apply liquid gasket.
M : Apply a molybdenum disulfide grease.
R : Replacement Parts
T1 : 23 N-m (2.3 kg-m, 16.5 ft-lb)
T2 : 20 N-m (2 kg-m, 14.5 ft-lb)
T3 : 22 N-m (2.2 kg-m, 16 ft-lb)
T4 : 39 N-m (4 kg-m, 29 ft-lb)
T5 : 29 N-m (3 kg-m, 22 ft-lb)
T6 : 9.8 N-m (1 kg-m, 87 in-lb)

Specifications

Front Fork (per one unit)

Oil viscosity	:	SAE 10W – 20
Oil capacity	:	310 ±4 mL (completely dry) approx. 265 mL (when oil changing)
Oil level	:	141 ±2 mm below from top of inner tube (compressed without main spring)
Air pressure	:	Atmospheric pressure

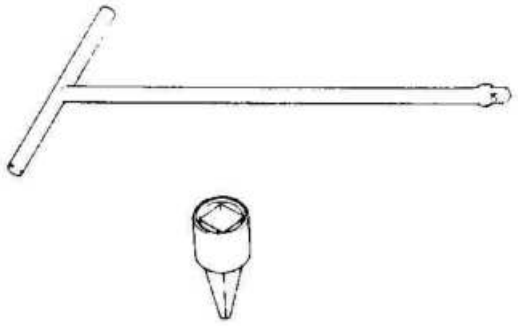
Rear Shock Absorber (per one unit)

Spring preload setting	:	No. 1
Damper setting	:	No. 2, Ⓤ Ⓒ No. 1

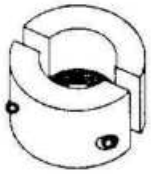
Ⓒ : Canadian Model
Ⓤ : US Model

Special Tools

Front Fork Cylinder Holder Adapter: 57001-1057
Front Fork Cylinder Holder Handle: 57001-183



Fork Outer Tube Weight: 57001-1218



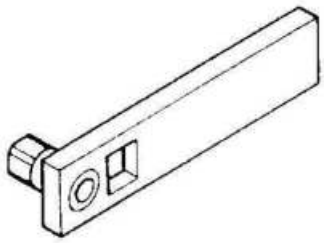
Front Fork Oil Seal Driver: 57001-1104



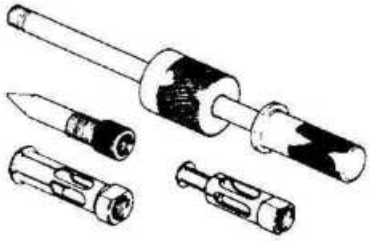
Front Fork Oil Seal Driver: 57001-1219



Socket Wrench Holder: 57001-1225



Oil Seal & Bearing Remover: 57001-1058



Front Fork

Air Pressure Adjustment

●Position the motorcycle across a hoist to lift the front wheel off the floor.

CAUTION

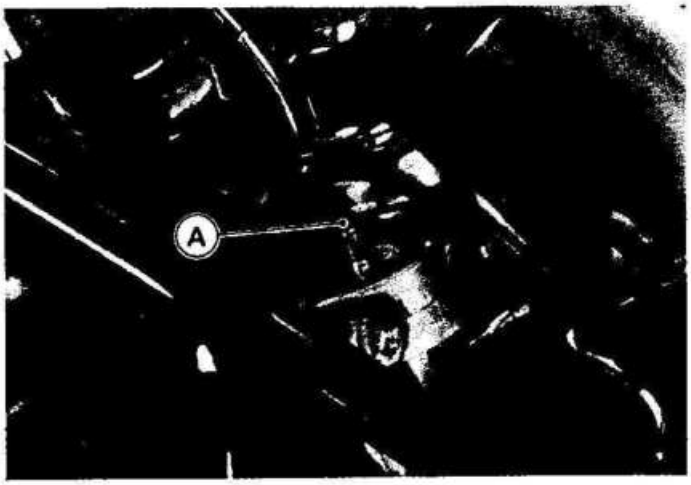
○**Do not place any type of stand under the exhaust power chamber. This could damage the chamber.**

●Check or adjust the air pressure when the front fork is cold (room temperature).

Front Fork Air Pressure

Standard:	**Atmospheric pressure**

●Check or adjust the air pressure as follows.
○Remove the air valve cap.
○Push in the valve core briefly to equalize the pressure.



A. Valve Core

○Install the air valve cap.

NOTE

○*Additional air pressure is not recommended since atmospheric pressure is the most suitable setting for all types of riding.*

WARNING

○**Do not incinerate the front fork without first removing the air valve or it may explode.**
○**Do not remove the springs and rely on air only. Correct springs must be used in this suspension system. Use without springs can lead to a condition causing accident and injury.**

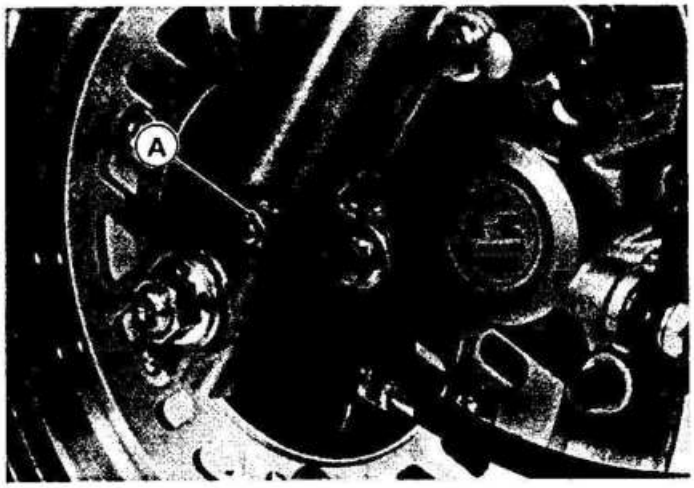
Fork Oil Changing

●Position the motorcycle across a hoist to lift the front wheel off the floor.

CAUTION

○**Do not place any type of stand under the exhaust power chamber. This could damage the chamber.**

●Remove the top plug.
●Pull out the collar, fork spring seat and fork spring.
●Remove the drain screw.



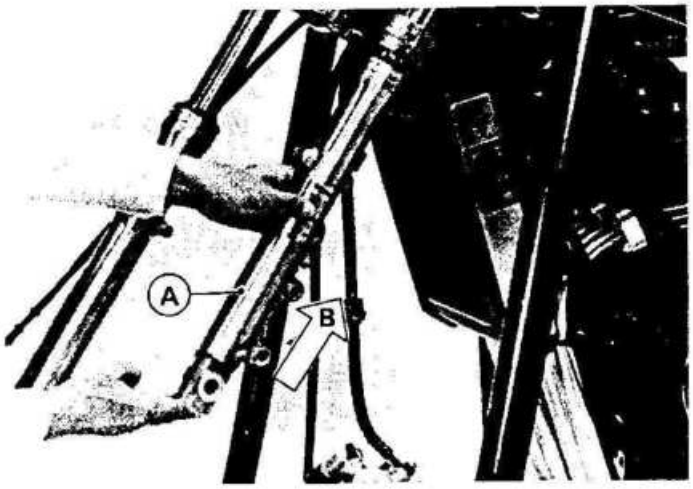
A. Drain Screw

●Allow the oil to drain into a suitable container. If you pump the fork leg to force out the oil, be sure to catch the oil in a container as it squirts out.
●Wash the drain screw threads clean of oil, and blow them dry.
●Apply a non-permanent locking agent to the threads of the drain screw, and install the screw and gasket.
●Pour in the type and amount of oil and adjust the oil level.

Front Fork Oil

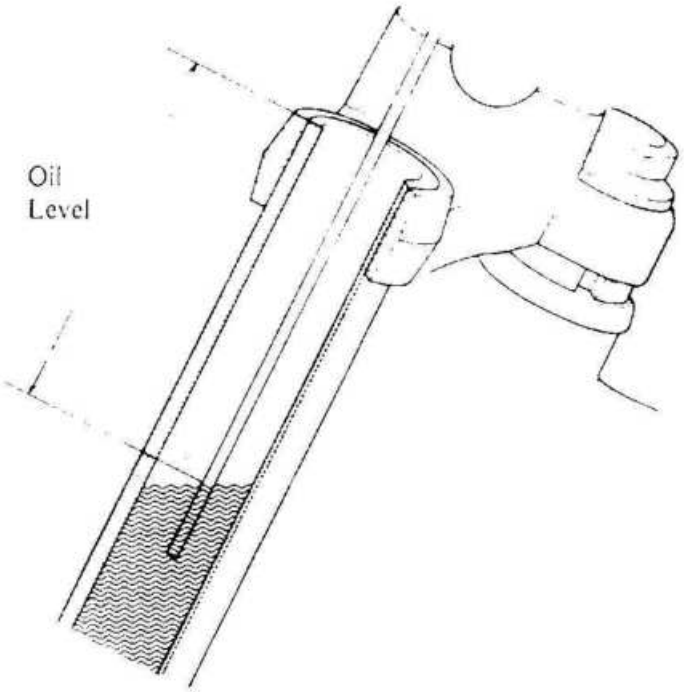
Viscosity:	**SAE 10W – 20**
When changing oil:	**about 265 mL**
After disassembly and completely dry:	**310 ±4 mL**
Oil level:	**141 ±2 mm**

●Remove the caliper.
●Remove the front wheel (see Front Wheel Removal).
●With the fork leg bottom held, push up the fork leg a few times to expel the air in the fork oil.
●With the fork **fully pushed up**, insert a tape measure or rod in the inner tube, and measure the distance from the top of the inner tube to the oil.



A. Fork Leg B. Push up the leg

Fork Oil Level Measurement



★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 dependent upon correct oil level. Higher level than specified may cause oil leakage and seal breakage. So be sure to maintain the specified level.**

- Inspect the O-ring on the top plug, and replace it with a new one if it is damaged.
- Install the spring, spring seat and collar.
- Install the top plug.
- Change the oil of the other fork leg in the same manner.
- Adjust the air pressure.

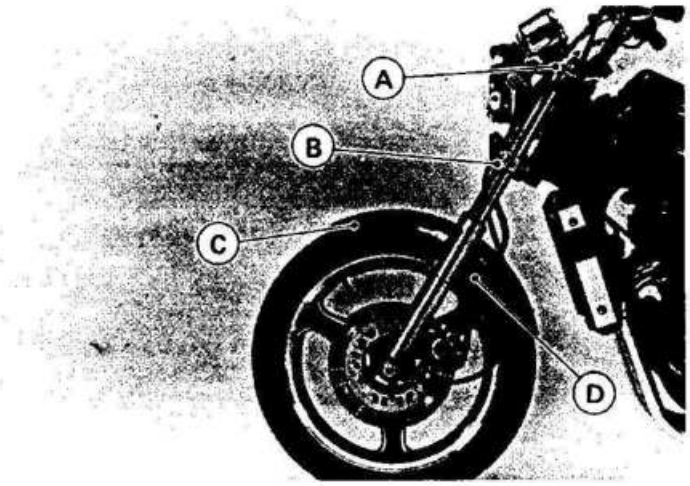
Front Fork Removal (each fork leg)

- Position the motorcycle across a hoist to lift the front wheel off the floor.

CAUTION

○**Do not place any type of stand under the exhaust power chamber. This could damage the chamber.**

- Remove the following parts.
  Caliper (see Brakes chapter)
  Front Wheel (see Wheels/Tires chapter)
  Front Fender (see Frame chapter)
  Upper Clamp Bolt (loosen)
  Lower Clamp Bolt (loosen)
  Brake Hose Clamp

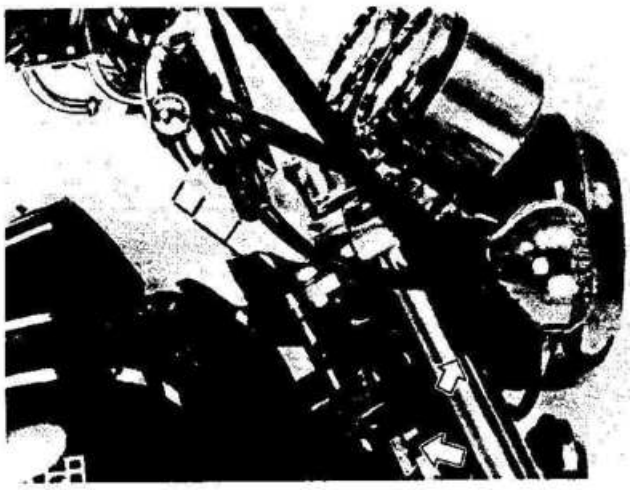


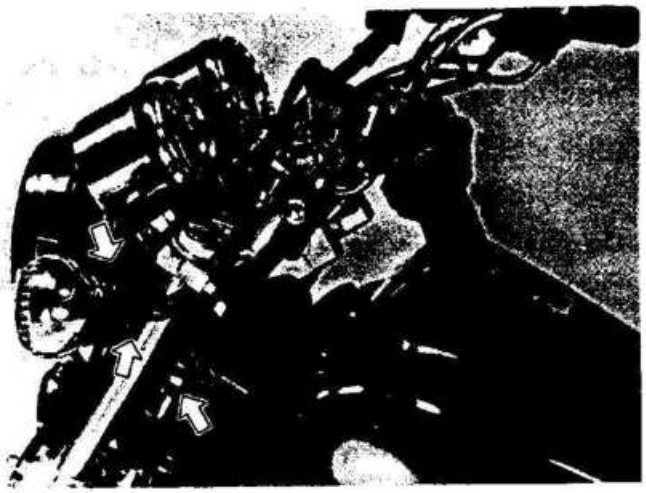
A. Upper Clamp Bolt C. Fender
B. Lower Clamp Bolt D. Brake Hose Clamp

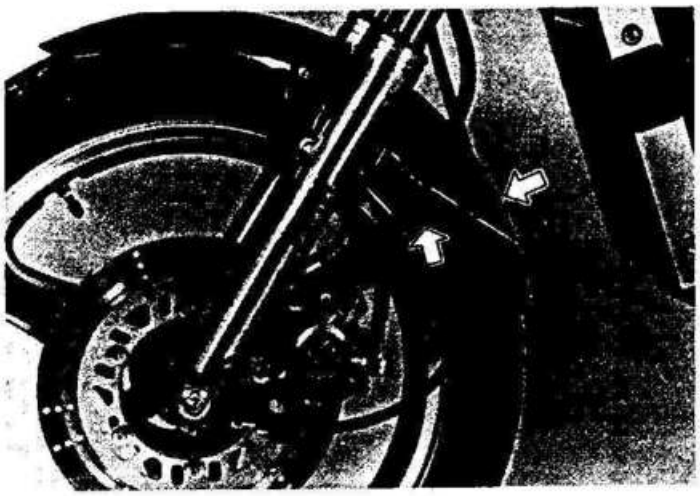
- With a twisting motion, work the fork leg down and out.

Front Fork Installation

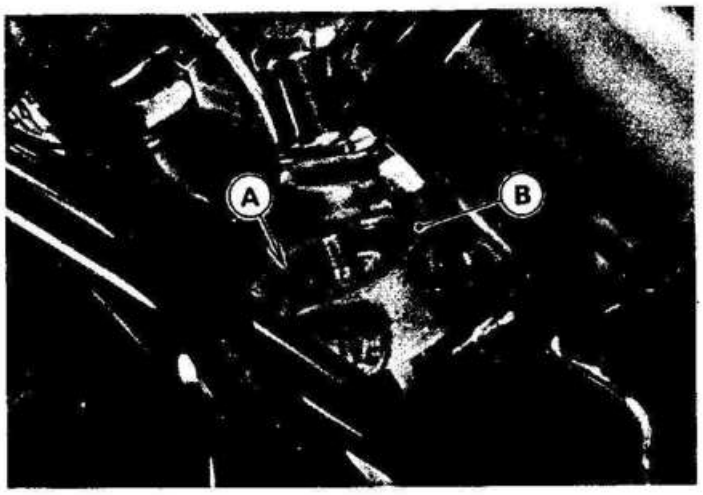
- Route the cables, the wiring looms and the brake hose correctly. They must not hinder handlebar movement. (see Steering Stem Installation in Steering chapter).







•Install the fork tube so that the top of the fork inner tube is aligned with the upper surface of the upper bracket.



A. Inner Tube Top
B. Upper Surface of the Upper Bracket

•Tighten the clamp bolts to the specified torque (see Exploded View).
•Tighten the caliper mounting bolts to the specified torque.
•Check the front brake after installation.

Front Fork Disassembly

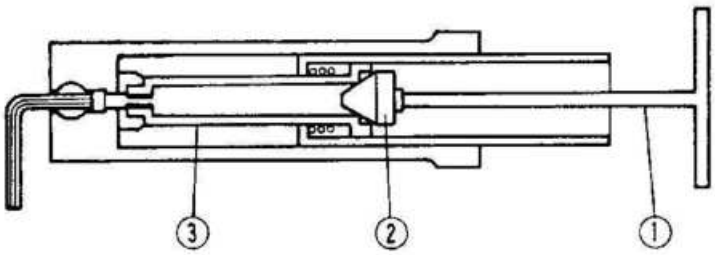
•Remove the top plug, collar, spring seat, and spring (see Fork Oil Change).
•Remove the front fork leg (see Front Fork Removal).

NOTE

○*The top plug should be removed before the fork is separated.*

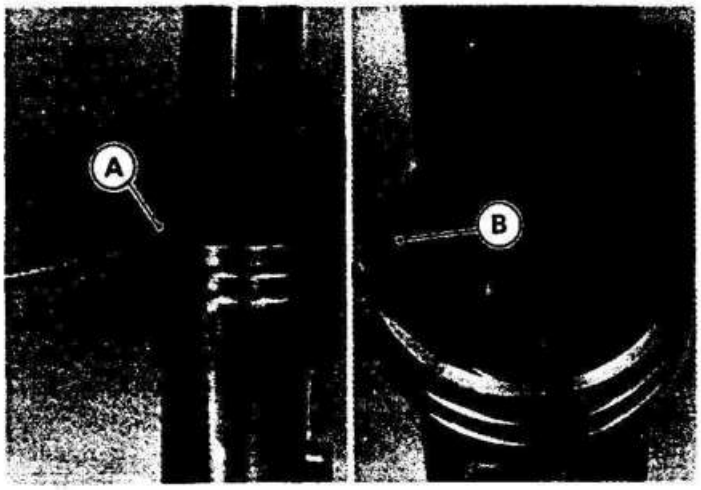
•Pour out the fork oil, and take out the main spring.
•Stop the front fork cylinder from turning by using the front fork cylinder holder and adapter (special tools). Unscrew the Allen bolt, and take off the bolt and gasket from the bottom of the outer tube.

Front Fork Cylinder Removal



1. Front Fork Cylinder Holder Handle: 57001-183
2. Adapter: 57001-1057
3. Front Fork Cylinder

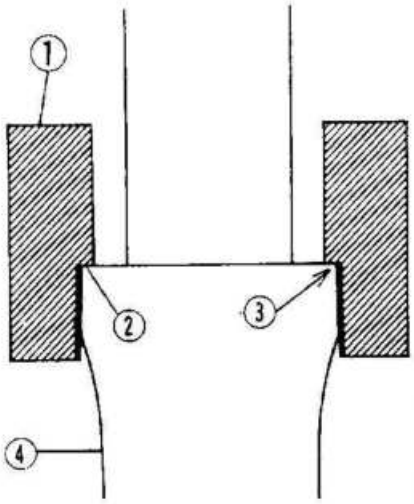
•Remove the piston, cylinder unit and short spring by turning the front fork upside down.
•Separate the inner tube from the outer tube as foolows.
○Remove the dust seal from the outer tube.
○Remove the snap ring from the outer tube.



A. Dust Seal B. Snap Ring

•Use the fork outer tube weight (special tool) to separate the inner tube from the outer tube.
•Mount the weight (special tool) on the top of the outer tube by fitting the step of the weight (special tool) to the top corner of the outer tube.

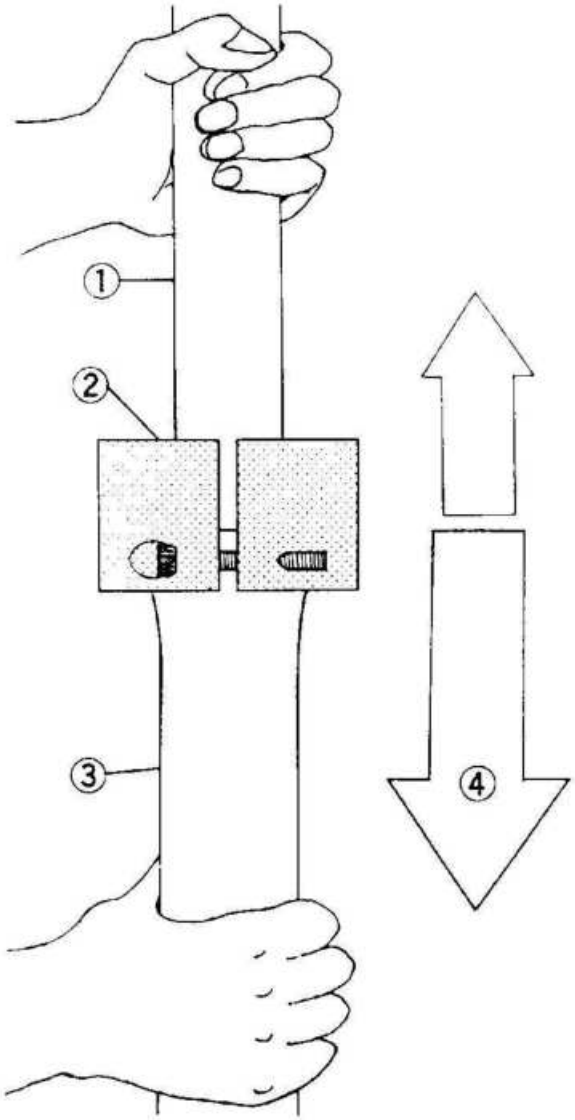
Weight Mounting



1. Weight: 57001-1218
2. Step
3. Corner
4. Outer Tube

●Holding the inner tube by hand in a vertical position, push and pull the outer tube several times to pull out the inner tube.

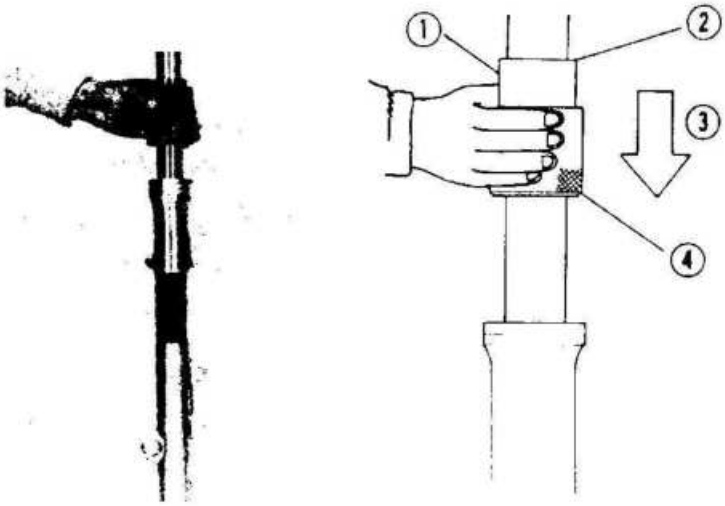
Front Fork Separation



1. Inner Tube
2. Weight: 57001-1218
3. Outer Tube
4. Push and pull

○The driver (special tool) may also be used for outer tube separation. Face the big end of the driver downward.

Front Fork Outer Tube Removal

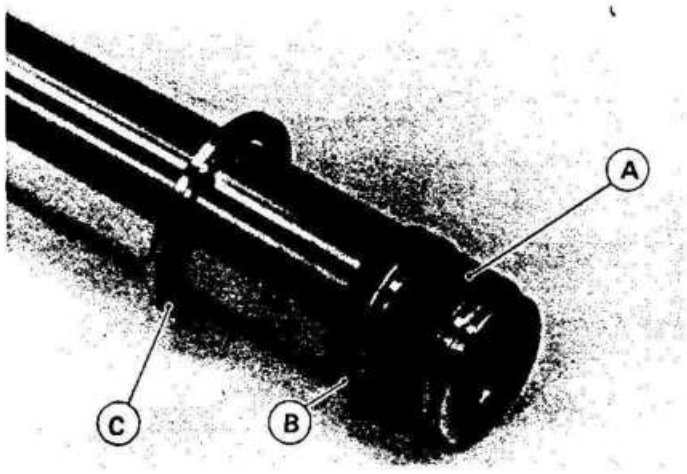


1. Driver: 57001-1104
2. Small End
3. Tap
4. Big End

CAUTION

○**To avoid damaging the inner tube guide bush, do not tap the outer tube when the fork leg is horizontal on a work bench.**

●Remove the oil seal, washer and outer tube guide bush, from the inner tube after removing the outer tube from the inner tube.
●Push the cylinder base out of the outer tube bottom.



A. Inner Tube Guide Bush
B. Outer Tube Guide Bush
C. Washer

Front Fork Assembly

●Fork assembly is the reverse of disassembly. Pay attention to the following item.

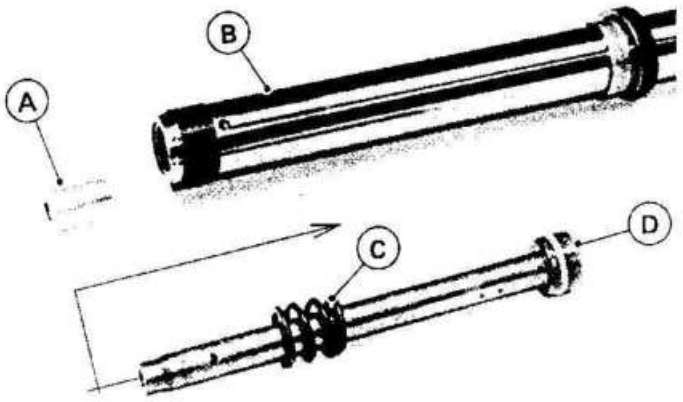
○Check the top plug O-ring. Replace them with new ones if damaged.

○Replace the removed oil seal with a new one.

○Inspect the guide bushes (see Guide Bush Inspection), and replace them with new ones if necessary.

○Insert the cylinder unit with the short spring installed into the inner tube.

○Insert the cylinder base in the bottom of the outer tube.



A. Cylinder Base
B. Inner Tube
C. Short Spring
D. Cylinder Unit

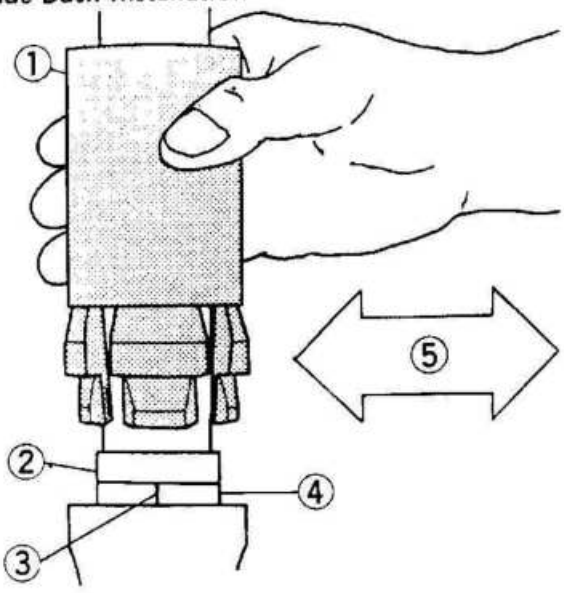
○Insert the inner tube and cylinder as a set into the outer tube.

○Apply a non-permanent locking agent to the Allen bolt.

●Install a new gasket and tighten the Allen bolt to the specified torque, using the front fork cylinder holder handle, and holder adapter (57001-183, 1057) to stop the cylinder from turning.

●Install the outer tube guide bush with a used guide bush as a tool by tapping the used guide bush with the driver (special tool) until it stops. The slit of the bush must be faced toward the left or right.

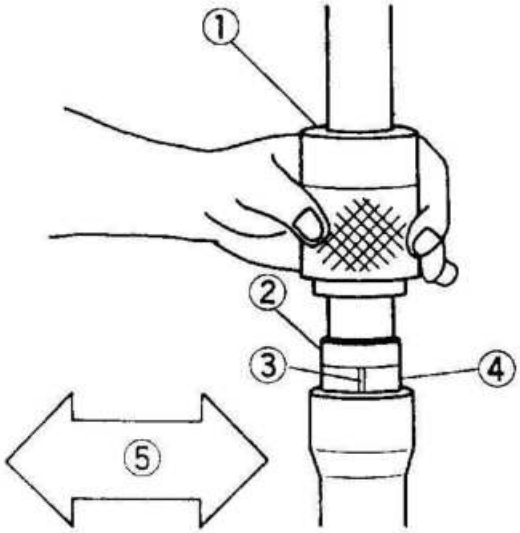
Guide Bush Installation



1. Driver: 57001-1219
2. Used Guide Bush
3. Slit
4. New Guide Bush
5. Front and Rear

○The driver (57001-1104) may also be used for guide bush installation.

Guide Bush Installation

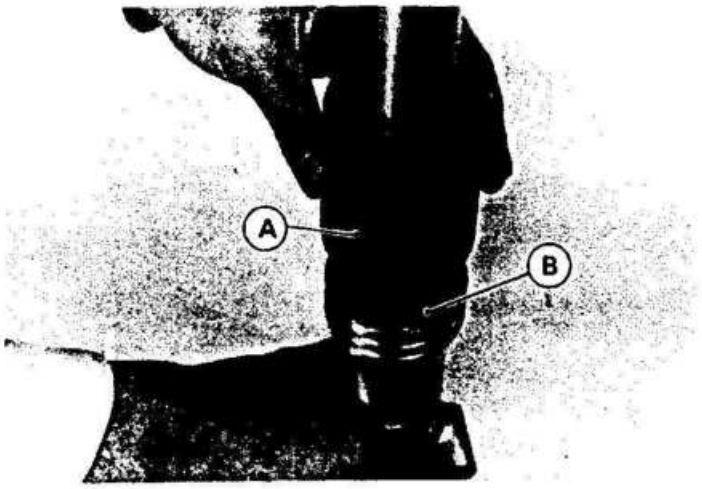


1. Driver: 57001-1104
2. Used Guide Bush
3. Slit
4. New Guide Bush
5. Front and Rear

●Install the washer.

●Replace the oil seal with a new one.

●Apply oil to the outside, and install it with the oil seal driver (special tools) so that the marked side faces out.



A. Oil Seal Driver: 57001-1104
B. Oil Seal

●Push the dust seal into the outer tube with the oil seal driver (57001-1104). Face the big end of the driver downward.

●Install the fork main spring so that the closed coil end faces up.



A. Up

○Insert the spring seat and the collar.

●After installing the fork tube, install the top plug and tighten it to the specified torque (see Exploded View).

Spring Tension

Refer to p. 12-9 in the Base Manual, noting the following.

Fork Spring Free Length

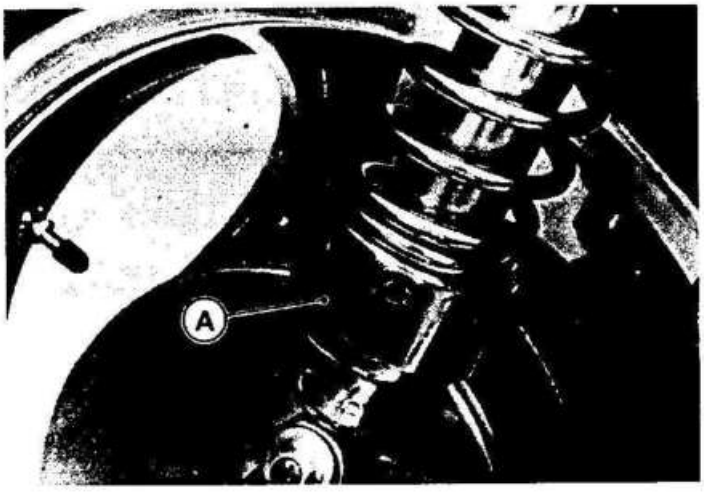
Standard:	486.5 mm
Service Limit:	476 mm

Rear Shock Absorber

The rear shock absorbers can be adjusted by changing the spring preload and damping force to suit various riding and loading conditions.

Spring Preload Adjustment

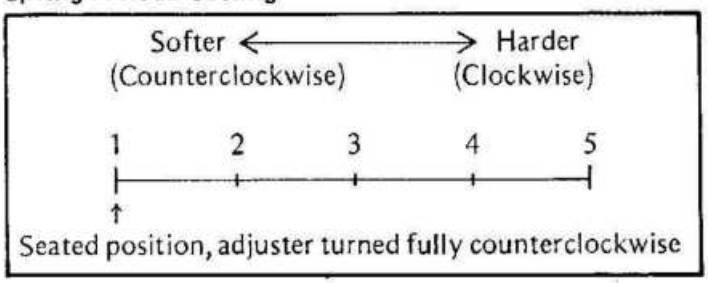
The spring adjusting sleeve on the rear shock absorber has 5 positions so that the spring can be adjusted for different road and loading conditions.



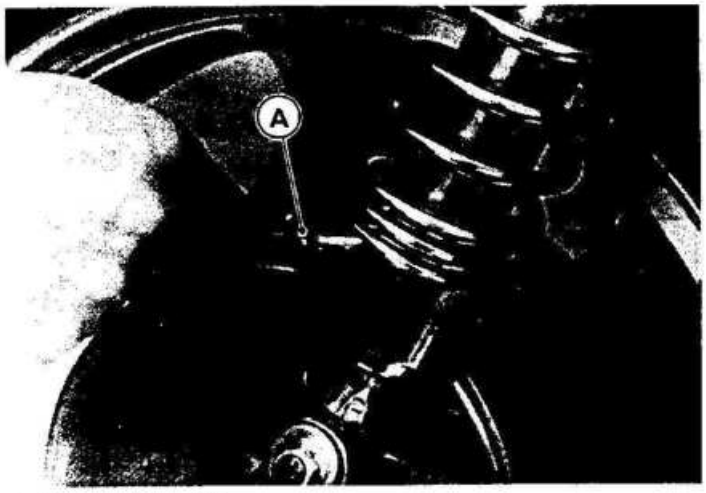
A. Adjusting Sleeve

★If the spring action feels too soft or too stiff, adjust it in accordance with the following table.

Spring Preload Setting



1: Standard set position



A. Screwdriver Bit

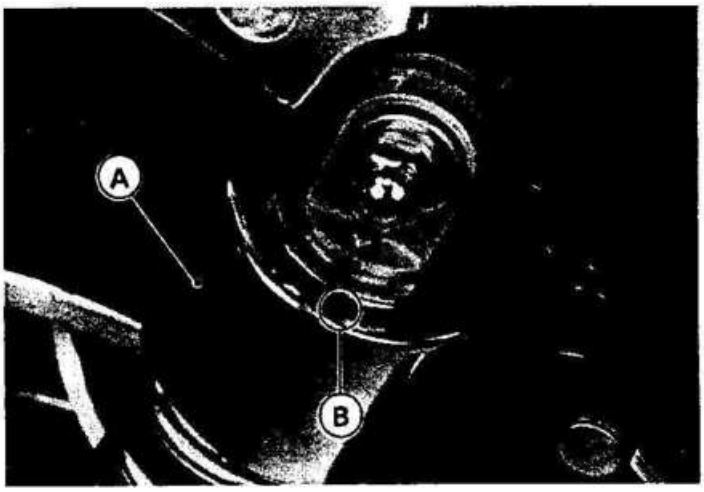
WARNING

○**If both spring adjusting sleeves are not adjusted equally, handling may be impaired and a hazardous condition may result.**

Damping Force Adjustment

●Turn the adjuster to the desired number until you feel a click. The numbers on the adjuster show the setting position of the damper.

●Be sure to turn both adjusters to the same setting position.



A. Damper Adjuster B. Position Number

WARNING

○If both adjusters are not adjusted equally, handling may be impaired and a hazardous condition may result.

NOTE

○The damping force can be left soft for average riding. But it should be adjusted harder for high speed riding, or riding with a passenger. If the damping feels too soft or too stiff, adjust it in accordance with the following table:

○The recommended setting position is as follows for one rider with no accessories.

No. 1 : Ⓤ Ⓒ Models

No. 2 : Other than Ⓤ Ⓒ Models

Damper Force

Setting Position	Damping Force	Setting	Load	Road	Speed
1		Soft	Light	Good	Low
2		↑	↑	↑	↑
3					
4		↓	↓	↓	↓
5	Stronger	Hard	Heavy	Bad	High

Rear Shock Absorber Removal

●Position the motorcycle across a hoist to lift the rear wheel off the floor.

CAUTION

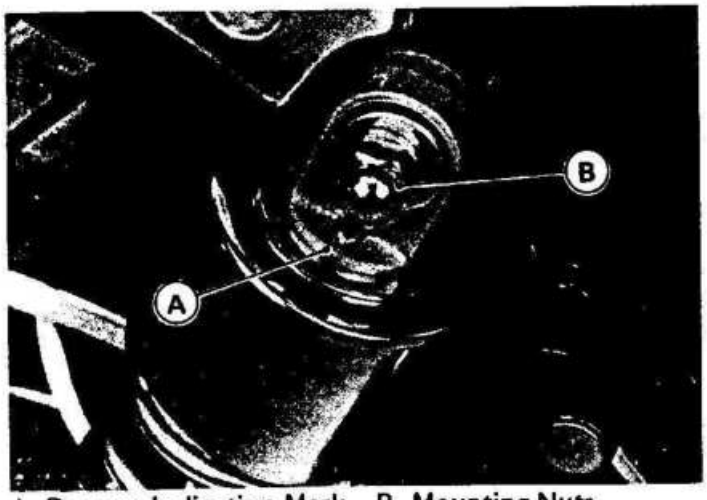
○Do not place any type of stand under the exhaust power chamber. This could damage the chamber.

●Remove the nuts, lockwashers, and flat washers from both ends of the shock absorber.

●Pull off the rear shock absorber.

Rear Shock Absorber Installation Note

●Install the shock absorber with the damper indication mark facing outward.



A. Damper Indication Mark B. Mounting Nuts

●Tighten the upper and lower mounting nuts to the specified torque (see Exploded View).

Rear Shock Absorber Inspection

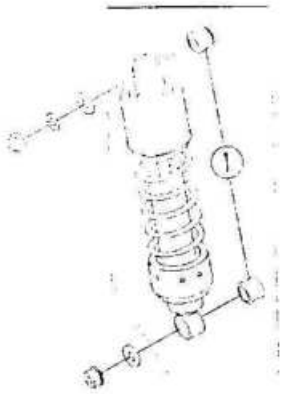
Since the rear shock absorbers are sealed units which cannot be disassembled, only external checks are necessary.

WARNING

○If one unit is damaged, replace both shock absorbers as a set. If only one unit is replaced and the two are not balanced, motorcycle instability at high speeds may result.

●Check the rubber bushings.

★Replace any that are worn, cracked, hardened, or otherwise damaged.



1. Rubber Bushings

Swing Arm

Swing Arm Removal

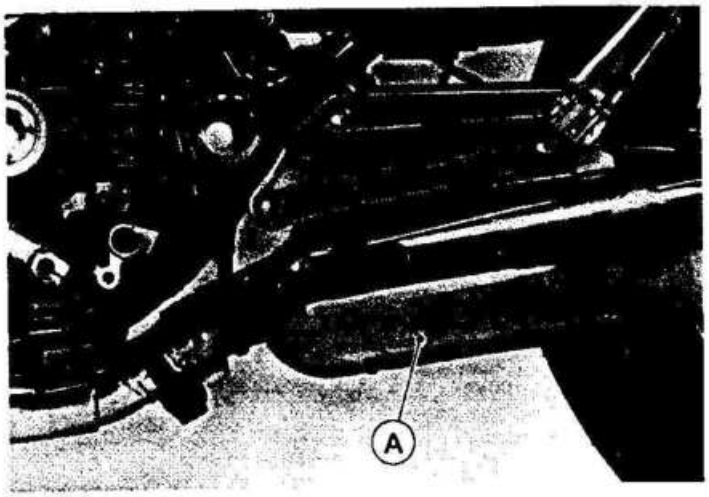
●Remove the following parts.

Left Muffler (see Engine Top End chapter)

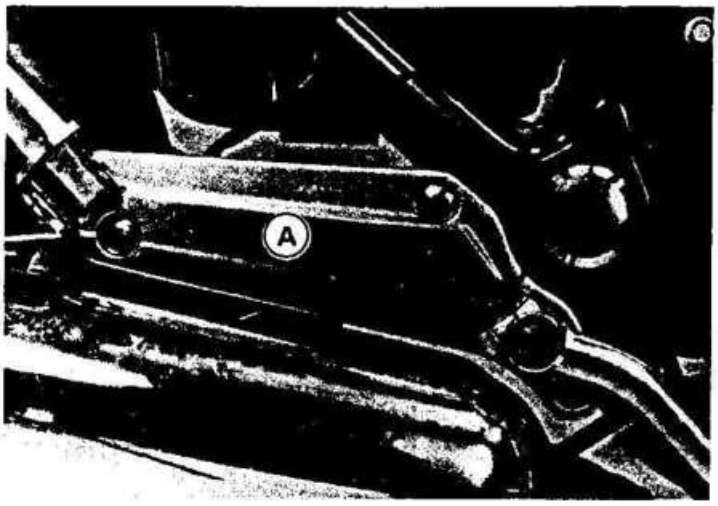
Rear Wheel (see Wheels/Tires chapter)

Final Gear Case (see Final Drive chapter)

Right Footpeg Bracket (see Brake Pedal/Shaft) Removal in Brakes chapter)

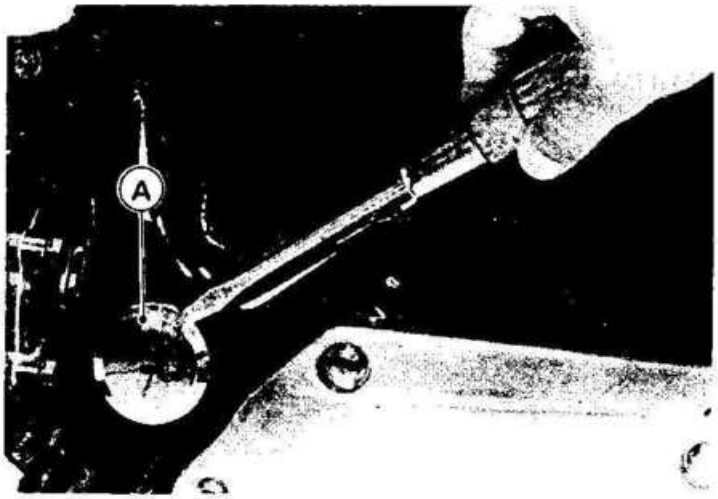


A. Left Muffler



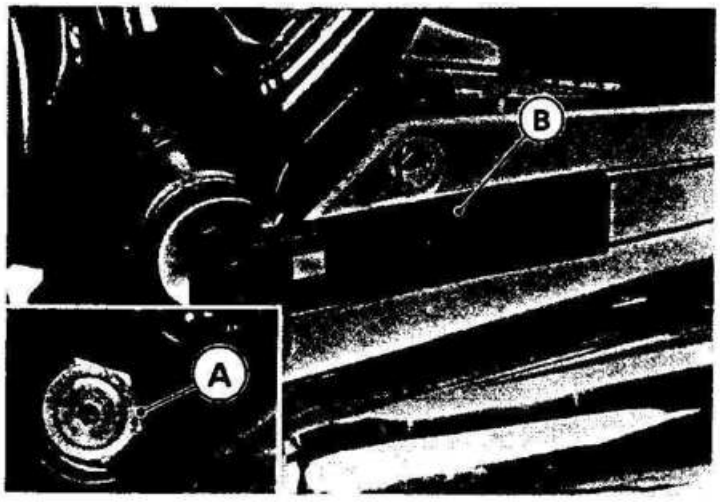
A. Right Footpeg Bracket

•Pry off the right and left swing arm caps.



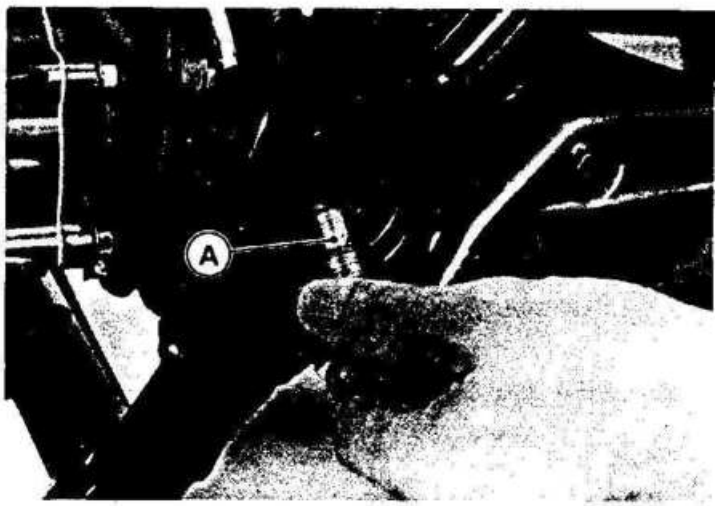
A. Caps

•Unscrew the locknut using a socket wrench holder (special tool).



A. Locknut
B. Socket Wrench Holder: 57001-1225

•While holding the swing arm, remove the swing arm shafts.

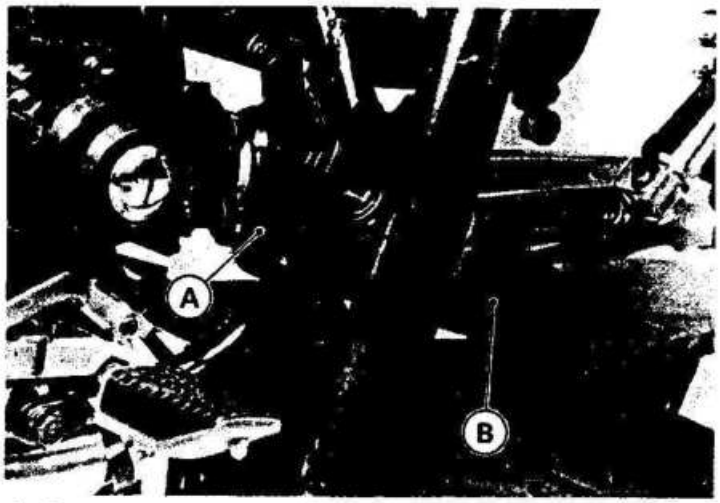


A. Swing Arm Shaft

•Pull back the swing arm out of the frame.

Swing Arm Installation and Alignment

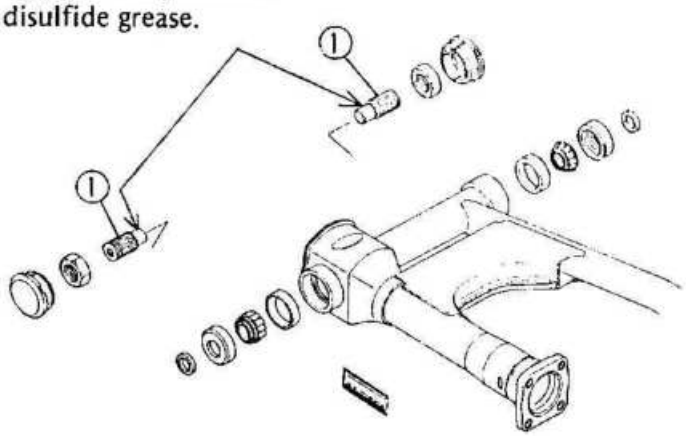
•Lubricate the swing arm shaft bearings before swing arm installation (see Swing Arm Lubrication).
•Temporarily install the swing arm with the boot attached.



A. Boot B. Swing Arm

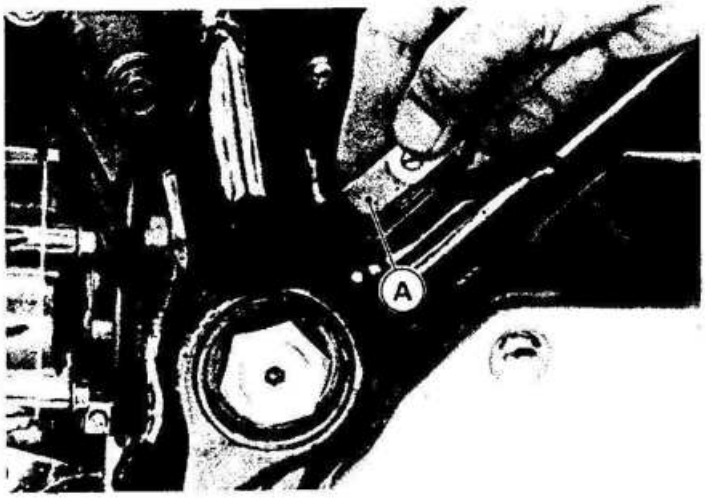
•Grease the swing arm shaft with a molybdenum disulfide grease.

Apply a molybdenum disulfide grease.



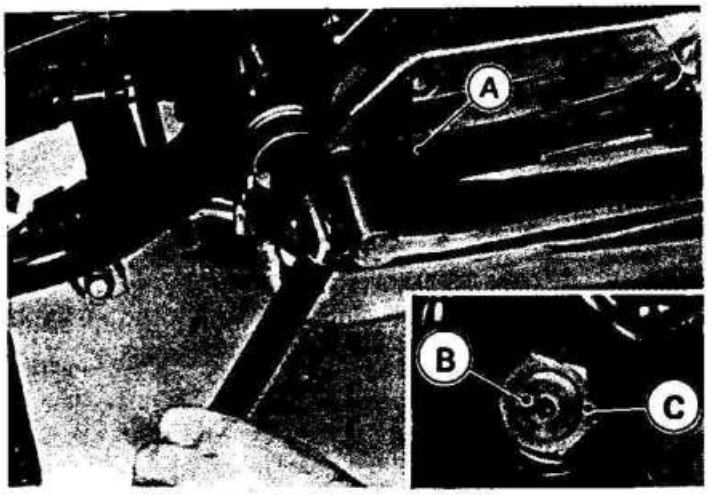
1. Swing Arm Shafts

●Temporarily install the swing arm shafts, locknuts, seal collars, and swing arm.
●Adjust the swing arm left side clearance as follows.
○Insert a suitable shim, **1.6 mm** thick, between the frame gusset and the swing arm left side.



A. Shim

○Screw in the right swing arm shaft until the swing arm stops against the shim and to the specified torque (see Exploded View).
○Tighten the locknut to the specified torque (see Exploded View) using the socket wrench holder (special tool).

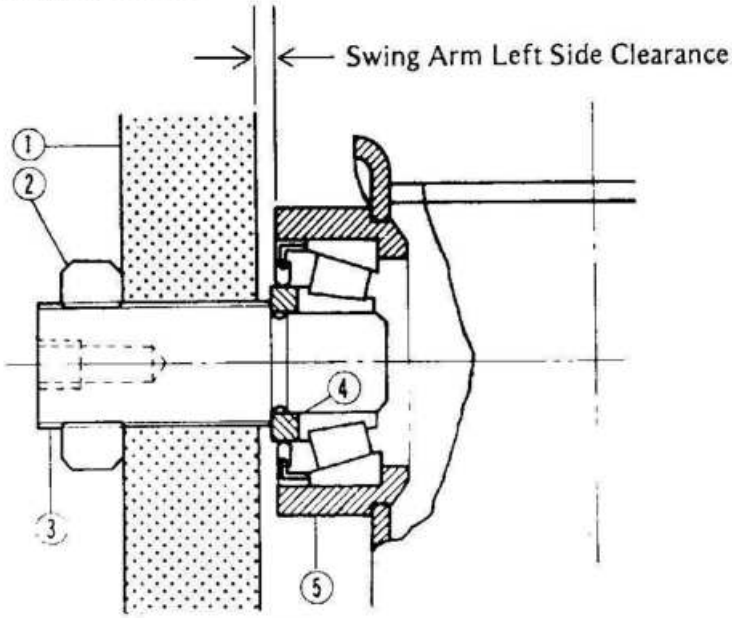


A. Socket Wrench Holder: 57001-1225
B. Swing Arm Shaft
C. Locknut

○Take out the suitable shim from the swing arm left side.
○Be sure to insert the seal collar.
○Screw in the left swing arm shaft until it stops and to the specified torque, then tighten the locknut to the specified torque (see Exploded View).

Swing Arm Left Side Clearance: 1.5 – 1.7 mm

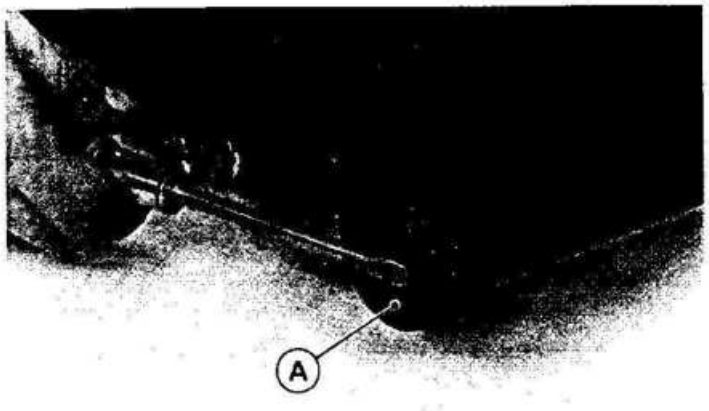
Swing Arm Pivot



1. Frame Gusset (left side)
2. Locknut
3. Swing Arm Shaft
4. Seal Collar
5. Swing Arm

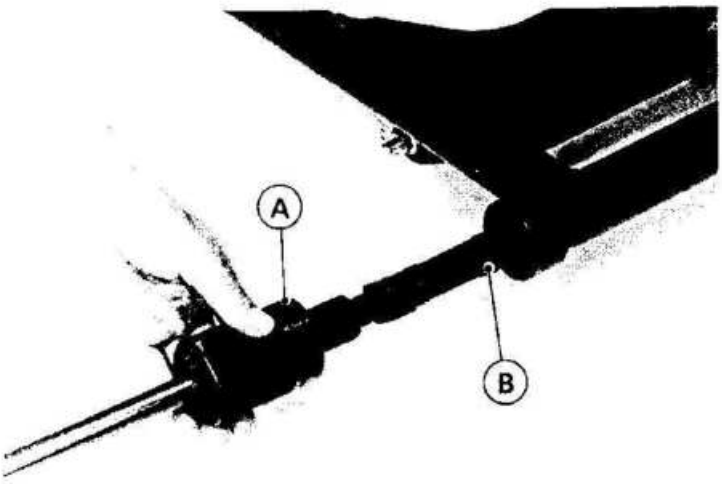
Swing Arm Disassembly

●Pull out the grease seals and take out the tapered roller bearing.



A. Grease Seal

●Pull out the outer races of the tapered roller bearings using the oil seal and bearing remover and adapter (special tools).



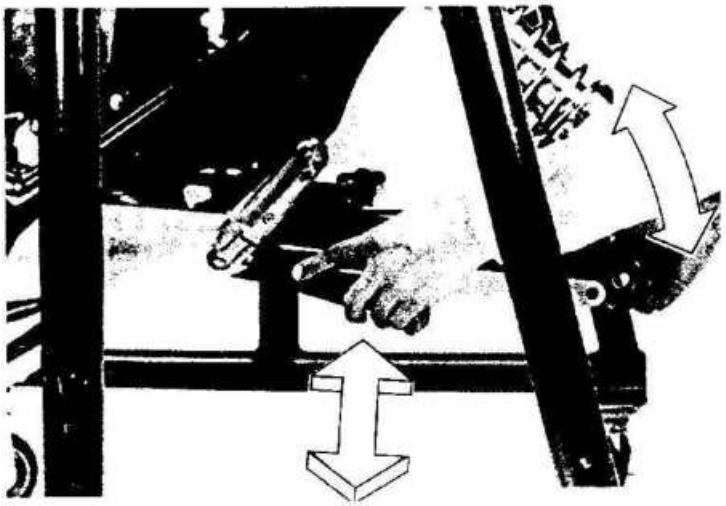
A. Remover: 57001-1058 B. Adapter: 57001-1062

Swing Arm Assembly Note

- Use a suitable bearing driver in the bearing driver set (57001-1129) to press in the tapered roller bearing outer races and grease seals.

Swing Arm Bearing Inspection

- Remove the rear wheel, both rear shock absorbers, and final gear case.
- Move the swing arm up and down to check for abnormal friction, and push and pull it from side to side to check for bearing play.

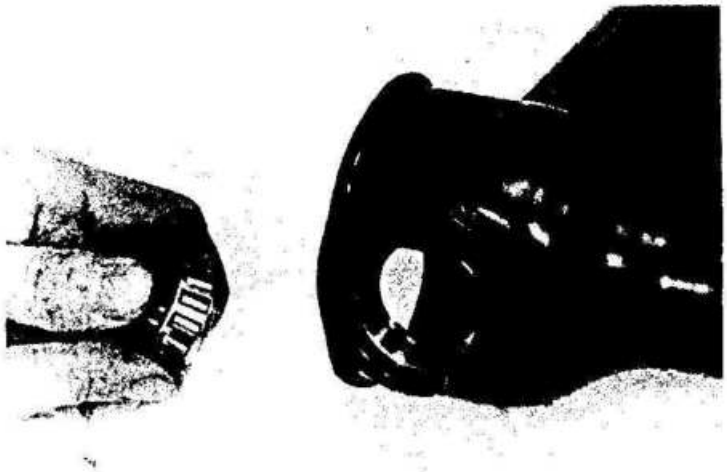


- If abnormal friction is felt, the bearings are damaged. Replace the right and left bearings and grease seals.
- The play developed during use may indicate bearing damage. In this case, remove the swing arm and inspect the bearings. Replace the right and left bearings if one of the bearings is damaged.

Swing Arm Lubrication

Grease the swing arm shaft bearings with a molybdenum disulfide chassis assembly grease in accordance with the Periodic Maintenance Chart.

- Remove the swing arm, and remove the grease seals from both sides of the swing arm (see Swing Arm Disassembly Notes).
- Clean out the old grease from the bearings.
- Apply grease liberally to the 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.



- Install the new grease seals, smearing them with a thin coat of molybdenum disulfide grease.
- Install the swing arm (see Swing Arm Installation).

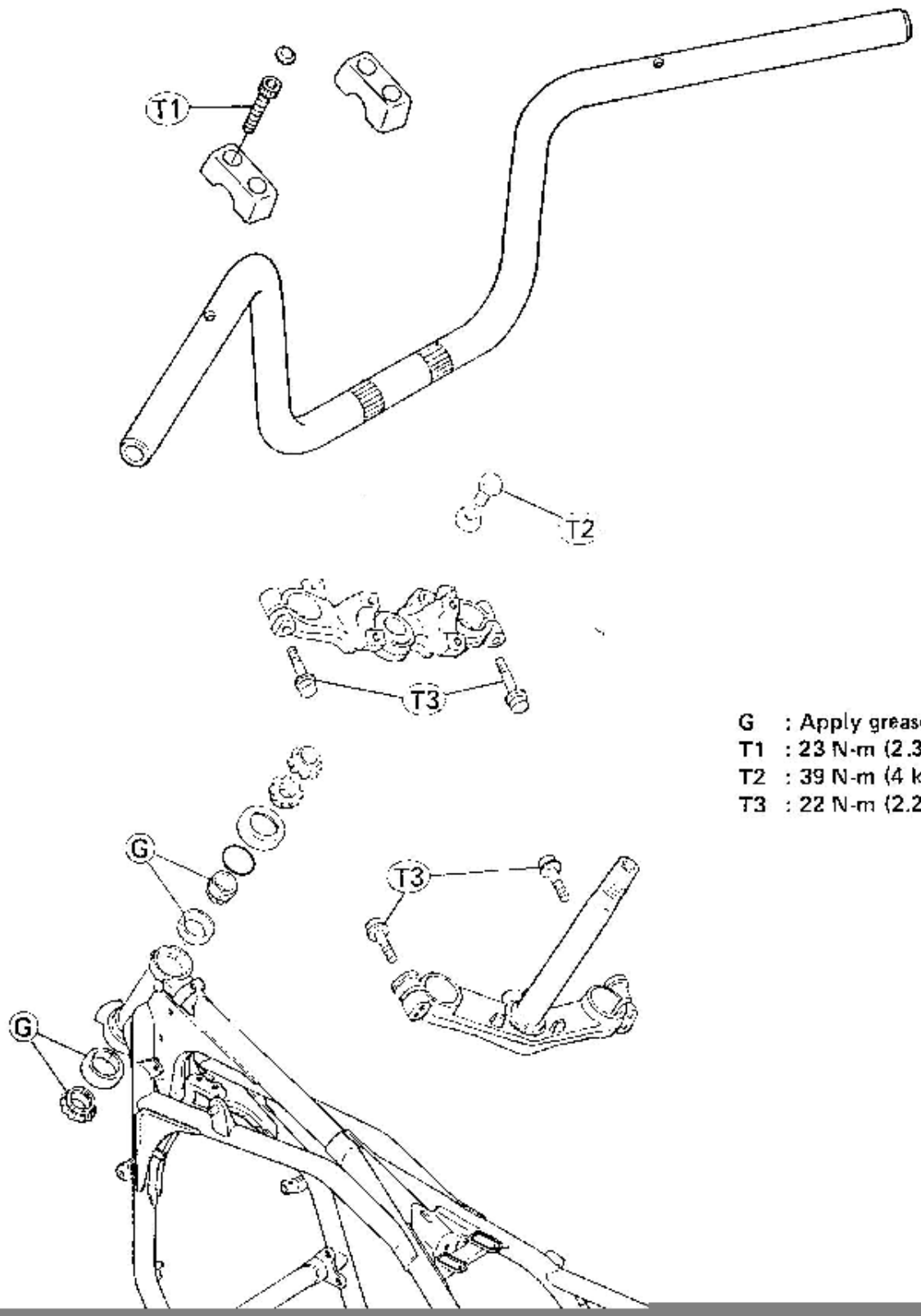
Steering

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* : Refer to Base Manual

Exploded View



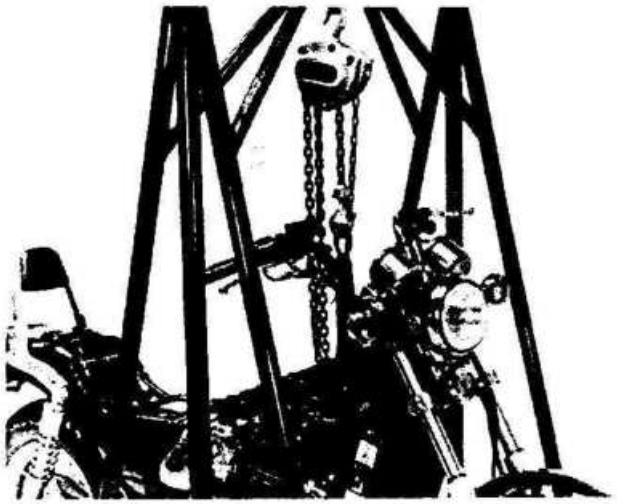
G : Apply grease.
T1 : 23 N-m (2.3 kg-m, 16.5 ft-l
T2 : 39 N-m (4 kg-m, 29 ft-lb)
T3 : 22 N-m (2.2 kg-m, 16 ft-lb

Steering Adjustment

Steering Inspection

Refer to p. 13-4 in the Base Manual, noting the following.

○Position the motorcycle across a hoist to lift the front wheel off the floor.



CAUTION

○**Do not place any type of stand under the exhaust power chamber. This could damage the chamber.**

Steering Adjustment

●Loosen the following parts.
Front Fork Lower Clamp Bolts
Stem Head Bolt

●Position the motorcycle across a hoist to lift the front wheel off the floor.

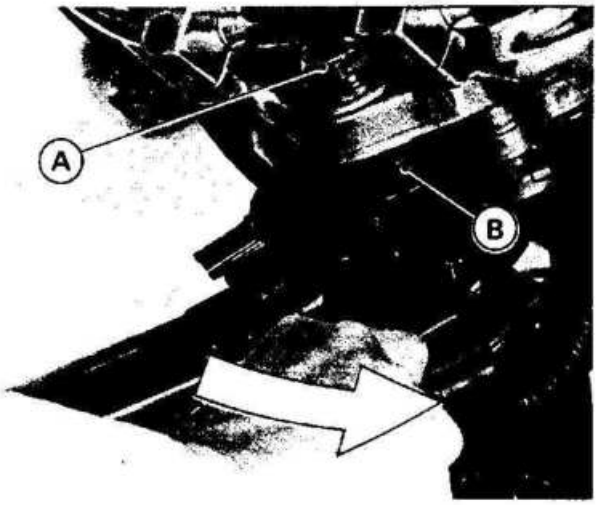
CAUTION

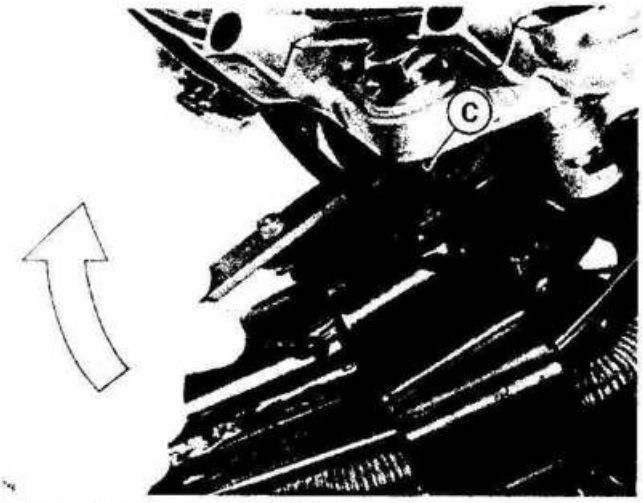
○**Do not place any type of stand under the exhaust power chamber. This could damage the chamber.**

●Loosen the stem locknuts all the way with the stem nut wrench (special tool).

NOTE

○*Do not separate the upper and lower stem locknuts.*
○*Loosen the steering by turning the lower stem locknut counterclockwise.*
○*Tighten the steering by turning the upper stem locknut clockwise.*





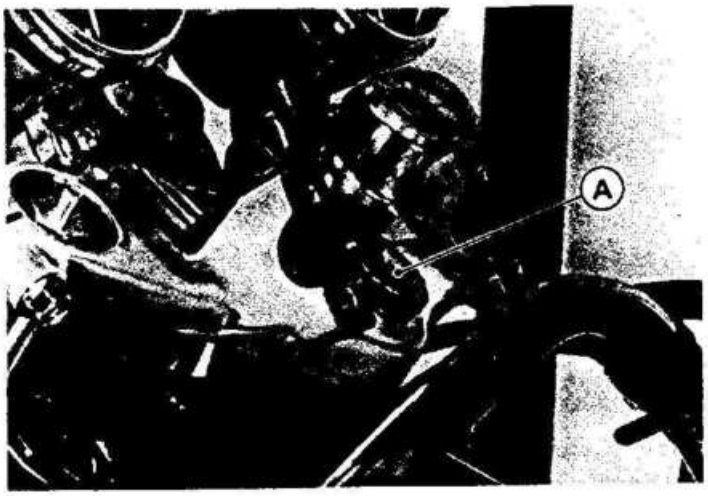
A. Stem Head Bolt
B. Lower Stem Locknut
C. Upper Stem Locknut

●If the steering is too tight, loosen the stem locknuts a fraction of turn; if the steering is too loose, tighten the locknuts a fraction of a turn. Turn the locknut 1/8 turn (maximum) at a time.
●Tighten the following parts to the specified torque (see Exploded View).
Steering Stem Head Bolt
Front Fork Lower Clamp Bolts
●Check the steering again.
★If the steering is still too tight or too loose, repeat the adjustment.
●Install the parts removed.
●Check that the cables and wires are routed properly (see Steering Stem Installation).

Steering Removal/Installation

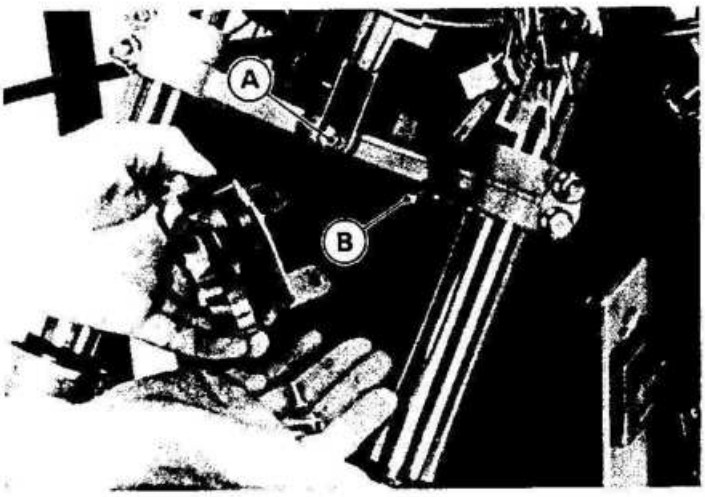
Steering Stem Removal

●Remove the following parts.
Fuel Tank (see Fuel System chapter)
Handlebar (see Handlebar Removal)
Stem Head Bolt
Speedometer Cable
Wiring Connectors in Headlight Unit



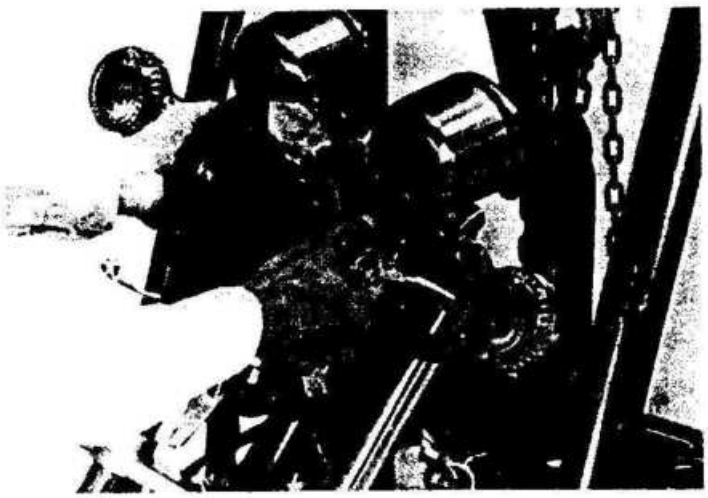
A. Stem Head Bolt

- After removing the horn assembly, unscrew the stay mounting bolt.
- Unscrew the brake hose clamp bolt.

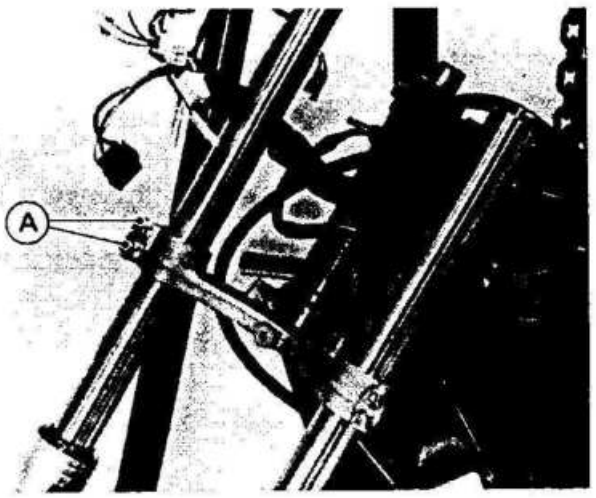


A. Stay Mounting Bolt B. Brake Hose Clamp Bolt

- Loosen the fork upper clamp bolts and lift up the upper bracket, meter units, headlight unit and turn signal lights as a set.

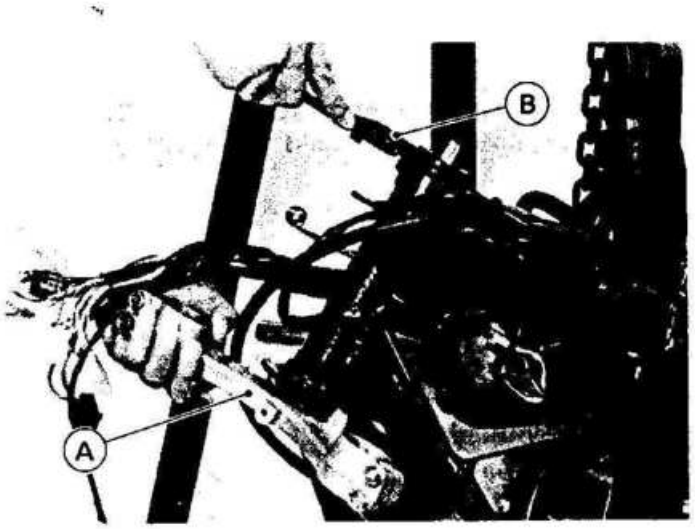


- Remove the front wheel (see Front Wheel Removal in Wheels/Tires chapter).
- Loosen the fork lower clamp bolts and pull out the front fork legs with the front fender installed.



A. Lower Clamp Bolts

- Push up the stem base, and remove the steering stem locknuts with the stem nut wrench (special tool), then remove the steering stem and stem base.



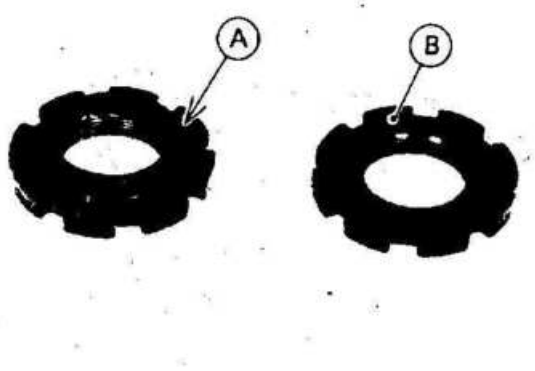
A. Steering Stem and Stem Base
B. Stem Nut Wrench: 57001-1100

- Remove the steering stem cap, O-ring, and upper tapered roller bearing inner race.

Steering Stem Installation

- Install the locknut so that the stepped side faces down, and then install the plain locknut by hand.

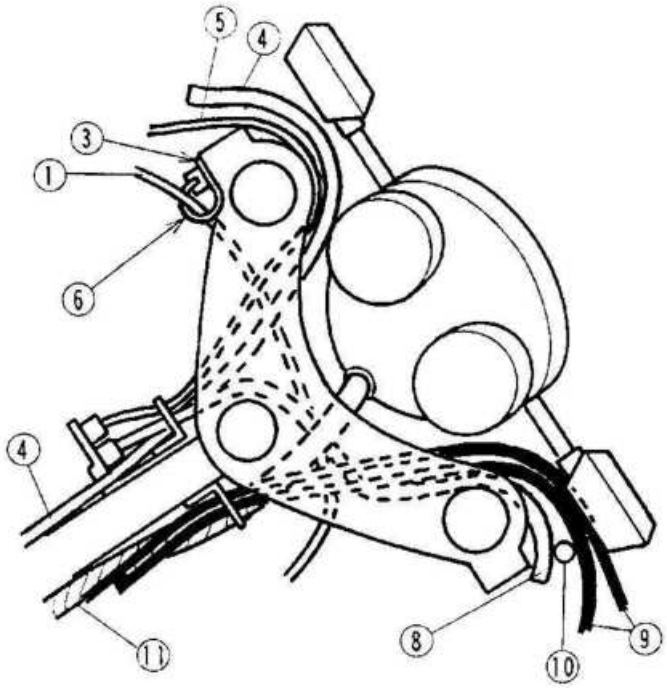
o Since lockwasher is not on the models, omit the installation of this lockwasher.



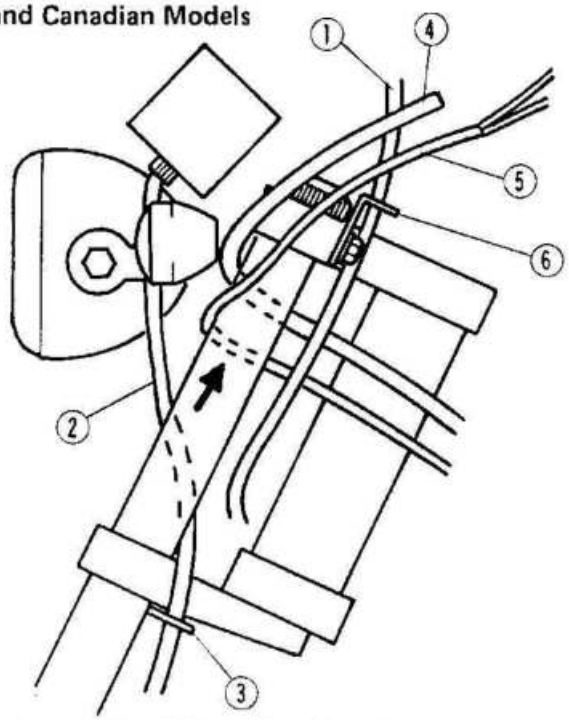
A. Step B. Plane Locknut

- Route the cables, the wiring looms and the brake hose correctly. They must not hinder handlebar movement.

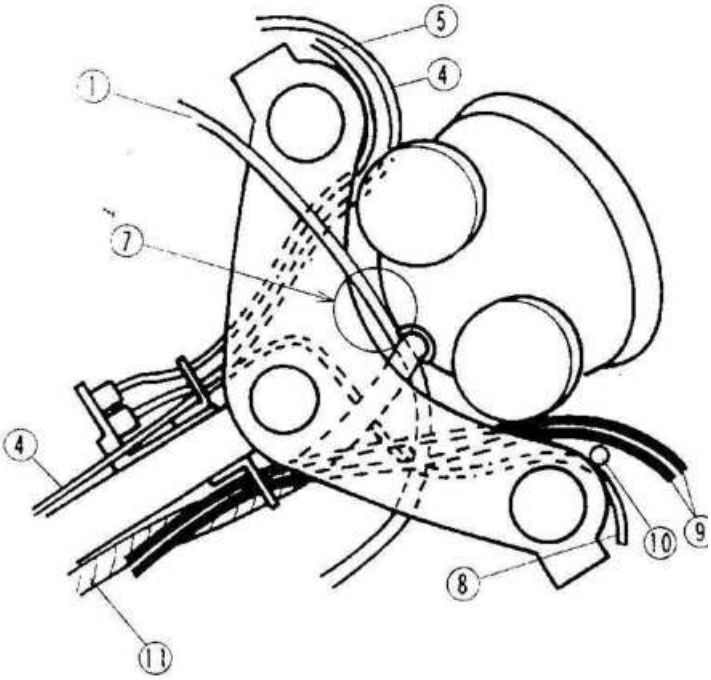
US and Canadian Models



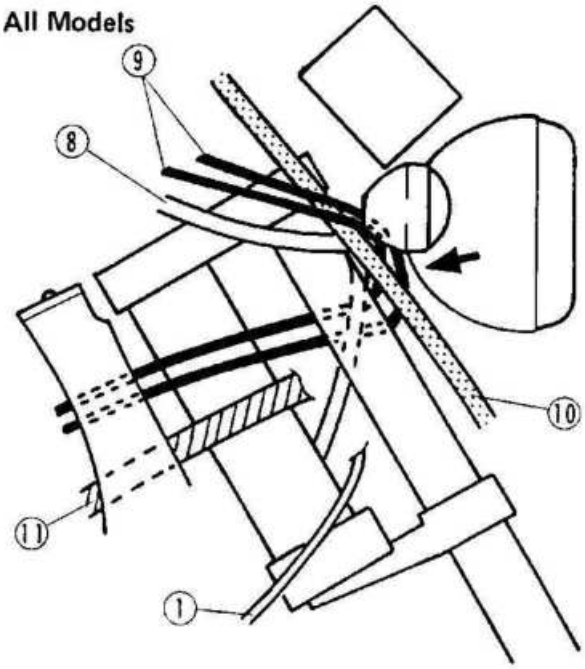
US and Canadian Models



Other than US and Canadian Models



All Models



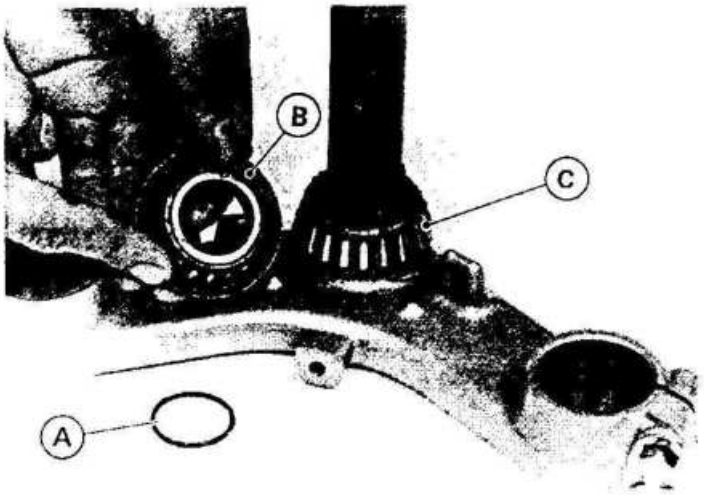
1. Clutch Cable
2. Speedometer Cable
3. Clamps
4. Choke Cable
5. Wiring Loom for Left-hand Switch
6. Run the clutch cable into the clamp (US and Canada).
7. Run the clutch cable between the meters (Other than US and Canada).
8. Wiring Loom for Right-hand Switch
9. Throttle Cables
10. Brake Hose
11. Main Harness

Steering Maintenance

Steering Stem Bearing Lubrication

Refer to p. 13-6 in the Base Manual, noting the following.

○The grease seal on the lower stem bearing is eliminated, while an O-ring and a bearing with grease seal are adopted for the upper stem bearing.

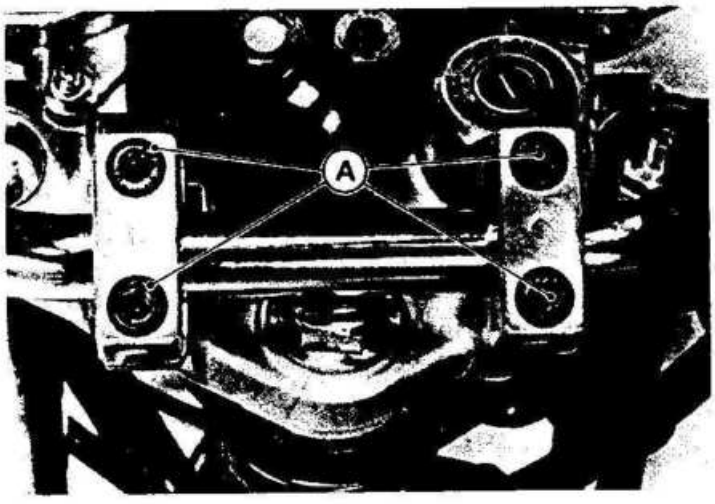


A. O-ring
B. Upper Bearing
C. Lower Bearing

Handlebar

Handlebar Removal

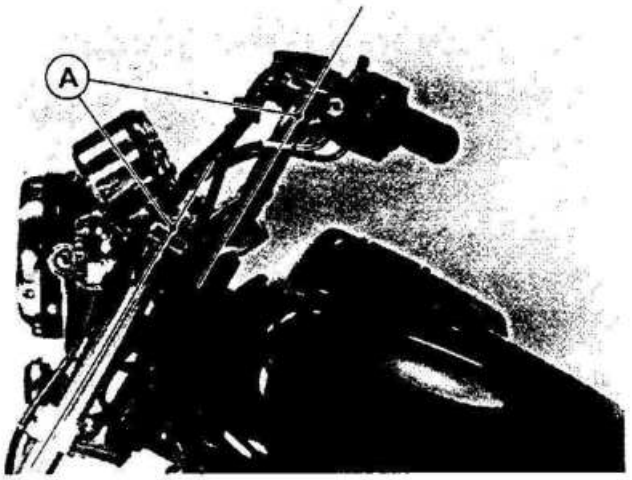
●Remove the following parts. Refer to the appropriate chapters.
Left Switch Housing
Right Switch Housing
Throttle Grip
Master Cylinder
Clutch Cable
Choke Cable
Handlebar Clamp Bolts
Handlebar



A. Handlebar Clamp Bolts

Handlebar Installation Notes

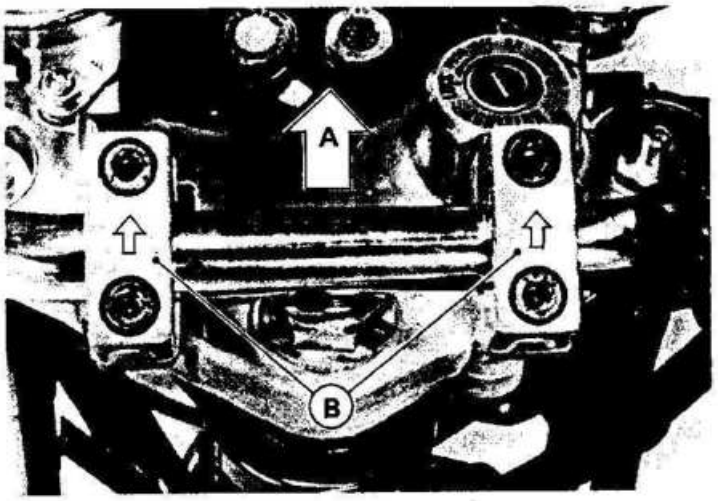
●Install the handlebar clamp caps and bolts so that the angle of the handlebar matches the angle of the front fork as shown.



A. Parallel

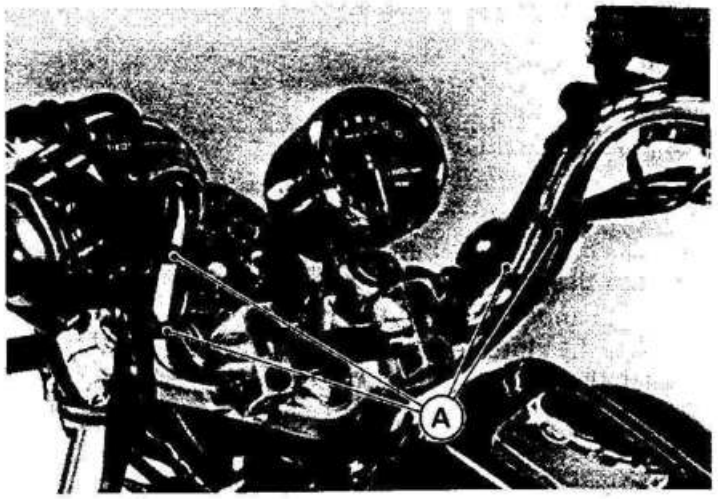
●Install the handlebar clamps so that the arrow mark on the clamp points to the front.

●Tighten the front clamp bolts first, and then the rear clamp bolts to the specified torque (see Exploded View). There will be a gap at the rear part of the clamp after tightening.



A. Front
B. Arrow Marks

●Secure the switch wiring looms with the wiring straps as shown.



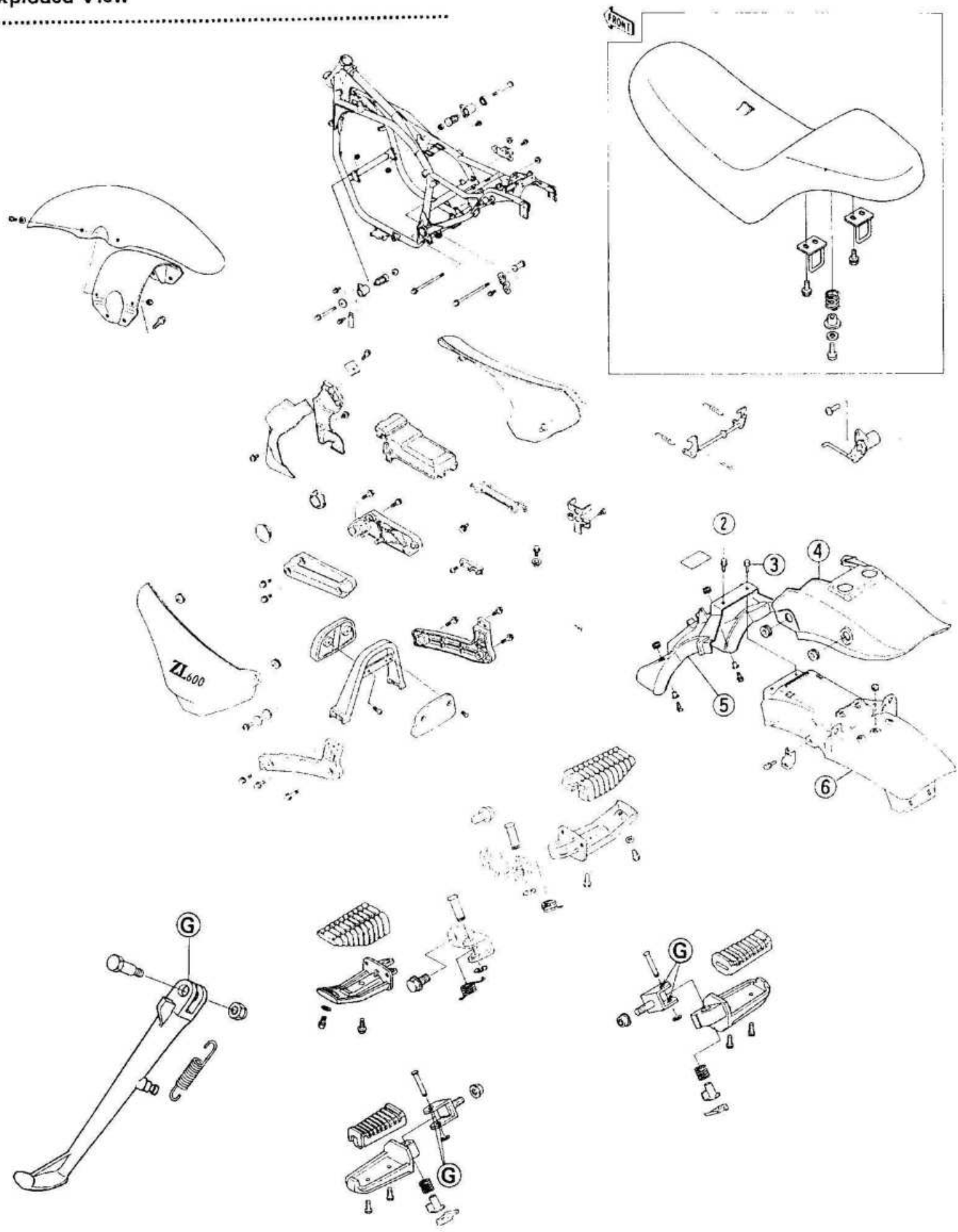
A. Wiring Straps.

Frame

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Exploded View

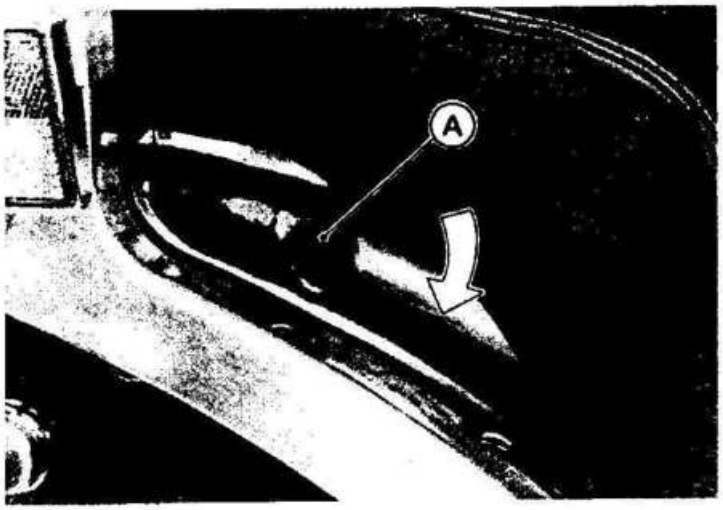


G : Apply grease
1. Document/Tool Kit Container
2. LH Mounting Bolt, 20 mm long
3. RH Mounting Bolt, 25 mm long
4. Rear Fender Upper Section
5. Rear Fender Front Section
6. Rear Fender Rear Section

Seat

Seat Removal

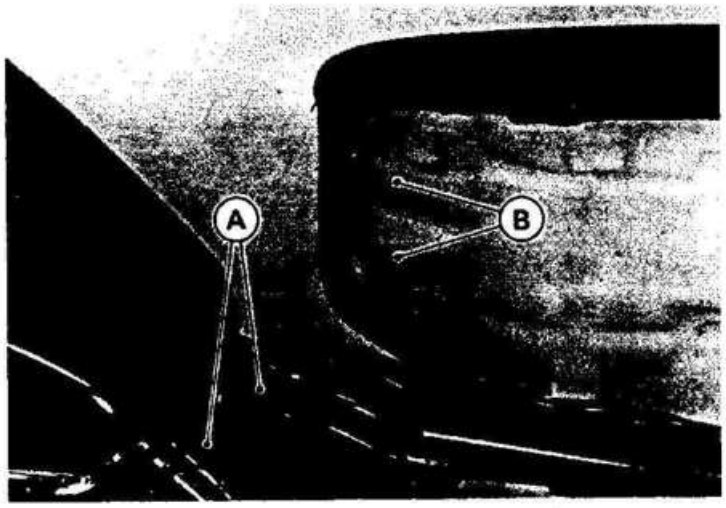
●Insert the ignition switch key into the seat lock, turn it clockwise, and swing open the seat.



A. Seat Lock

Seat Installation

●Slip the hook on the front bottom end of the seat under the brace on the frame.



A. Braces B. Hooks

●Push down the rear part of the seat until the lock clicks.



A. Push down here.

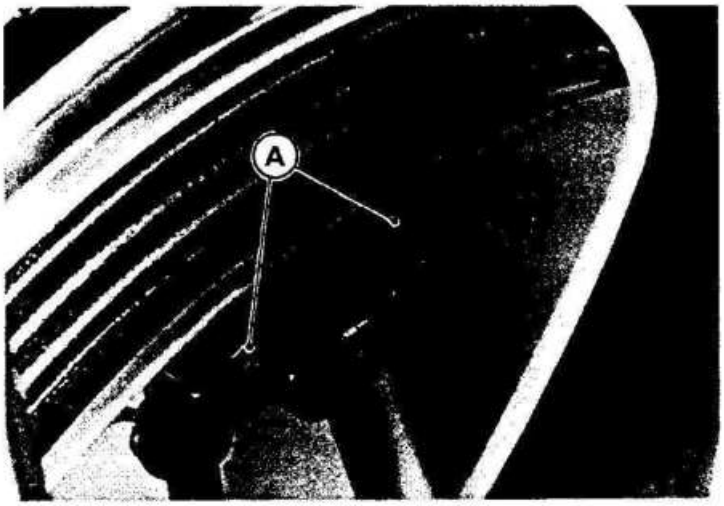
Fenders

Front Fender Removal

CAUTION

○**Be careful not to scratch the painted surface during removal or installation.**

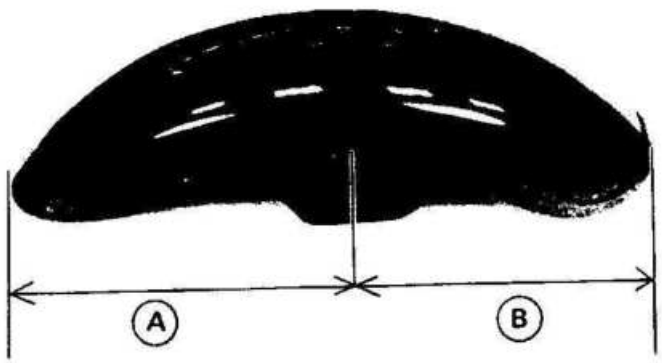
●Remove the mounting bolts on both sides to separate the fender from the front fork. The fender may be removed with the wheel installed.



A. Bolts

Front Fender Installation Note

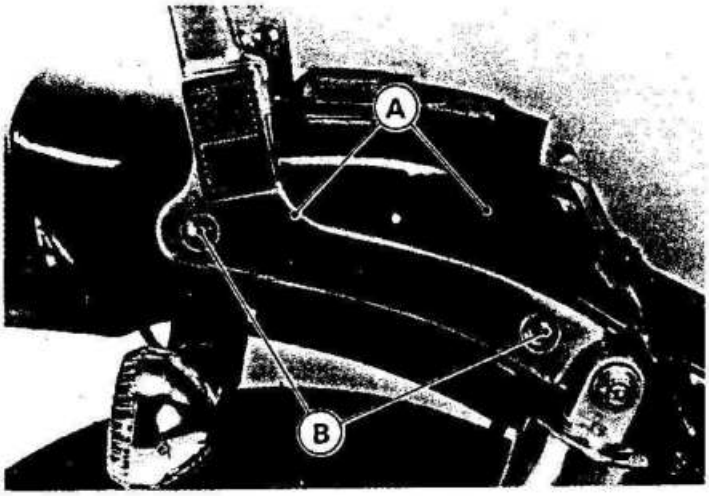
●Install the front fender so that the longer side faces to the front.



A. Longer Side B. Shorter Side

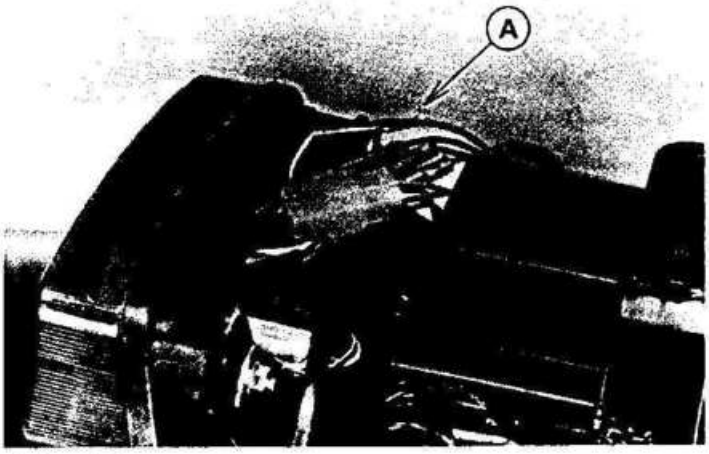
Rear Fender Rear Section Removal

- Remove the seat.
- Remove the grip and rear fender upper section by taking out the mounting bolts.



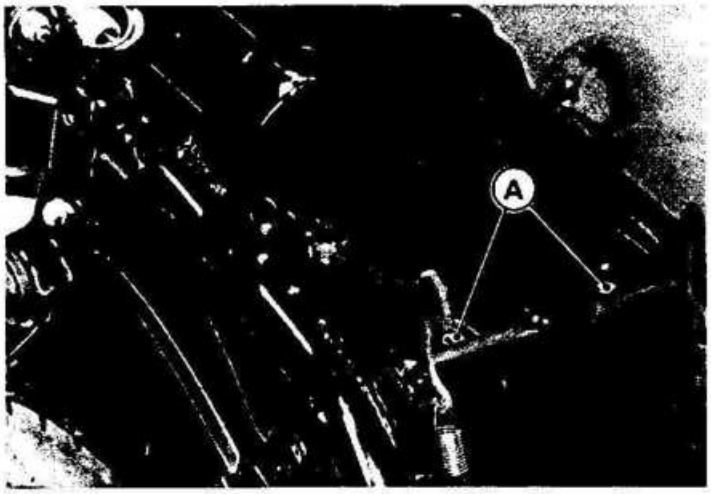
A. Grip and Rear Fender Upper Section
B. Mounting Bolts

- Disconnect the tail/brake light lead connectors and the turn signal light lead connectors.

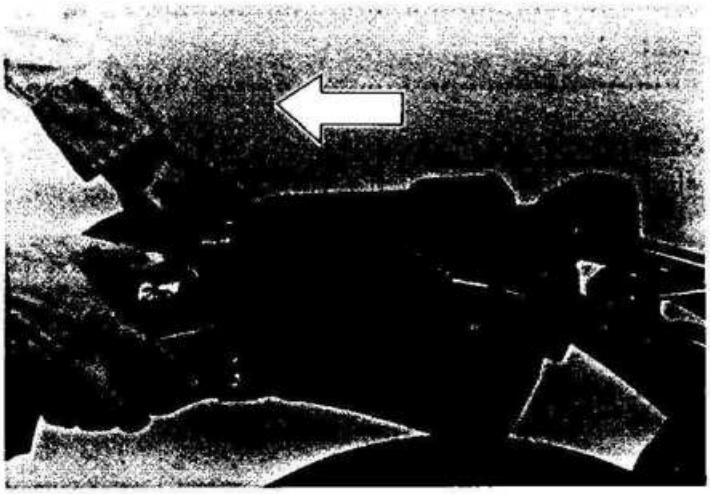


A. Lead Connectors

- Remove the rear fender rear section and the turn signal lights after unscrewing the upper mounting bolts.

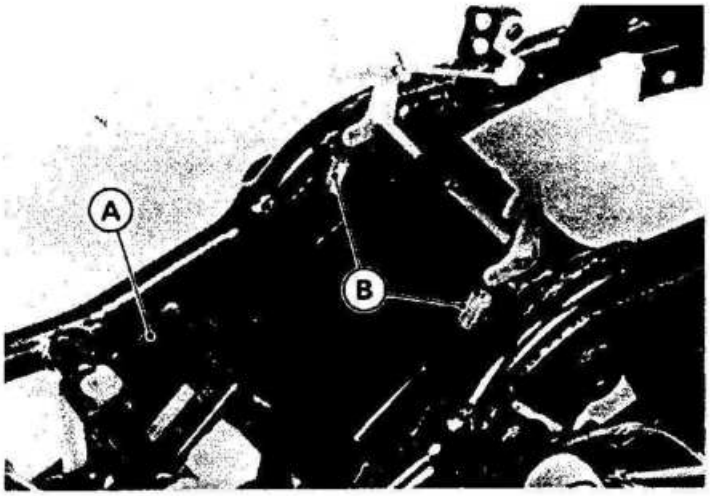


A. Upper Mounting Bolts



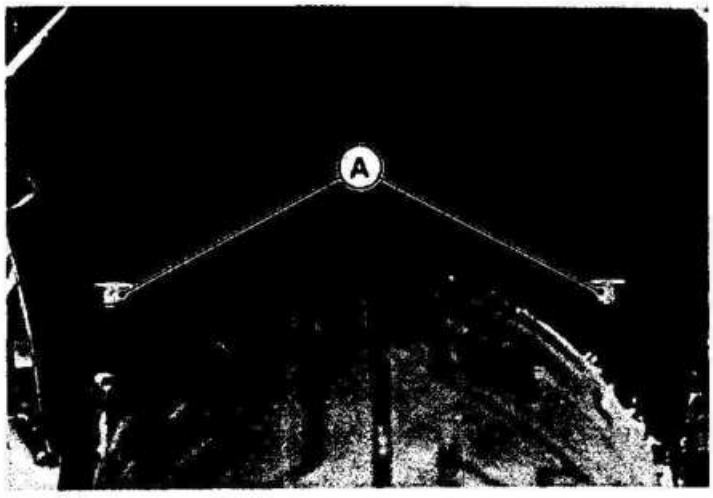
Rear Fender Front Section Removal

- Remove the rear fender rear section.
- Pull out the IC ignitor and the seat hook springs.



A. IC Ignitor B. Seat Hook Springs

- Remove the lower mounting bolts and take off the fender toward the rear.



A. Lower Mounting Bolts

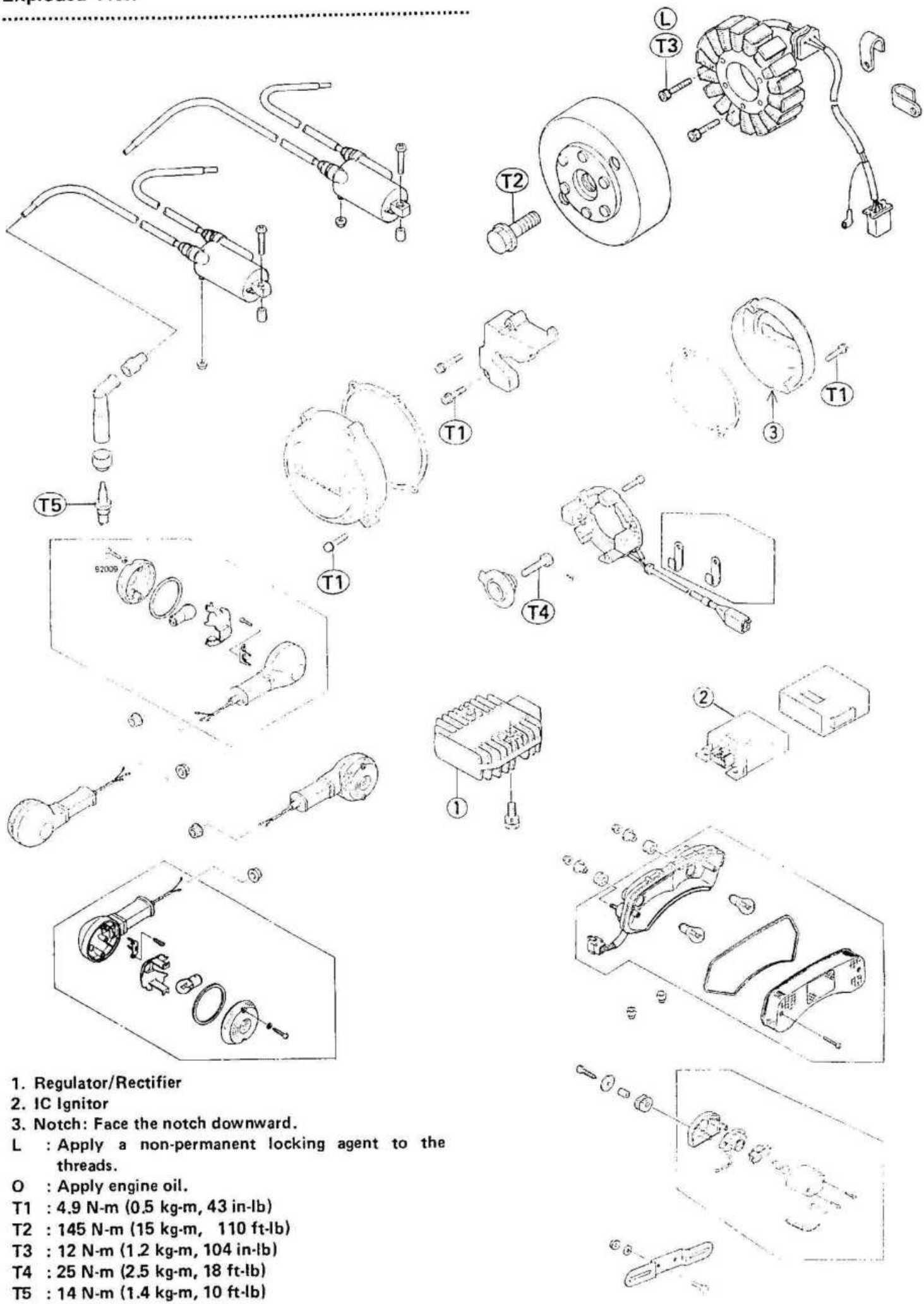
Electrical System

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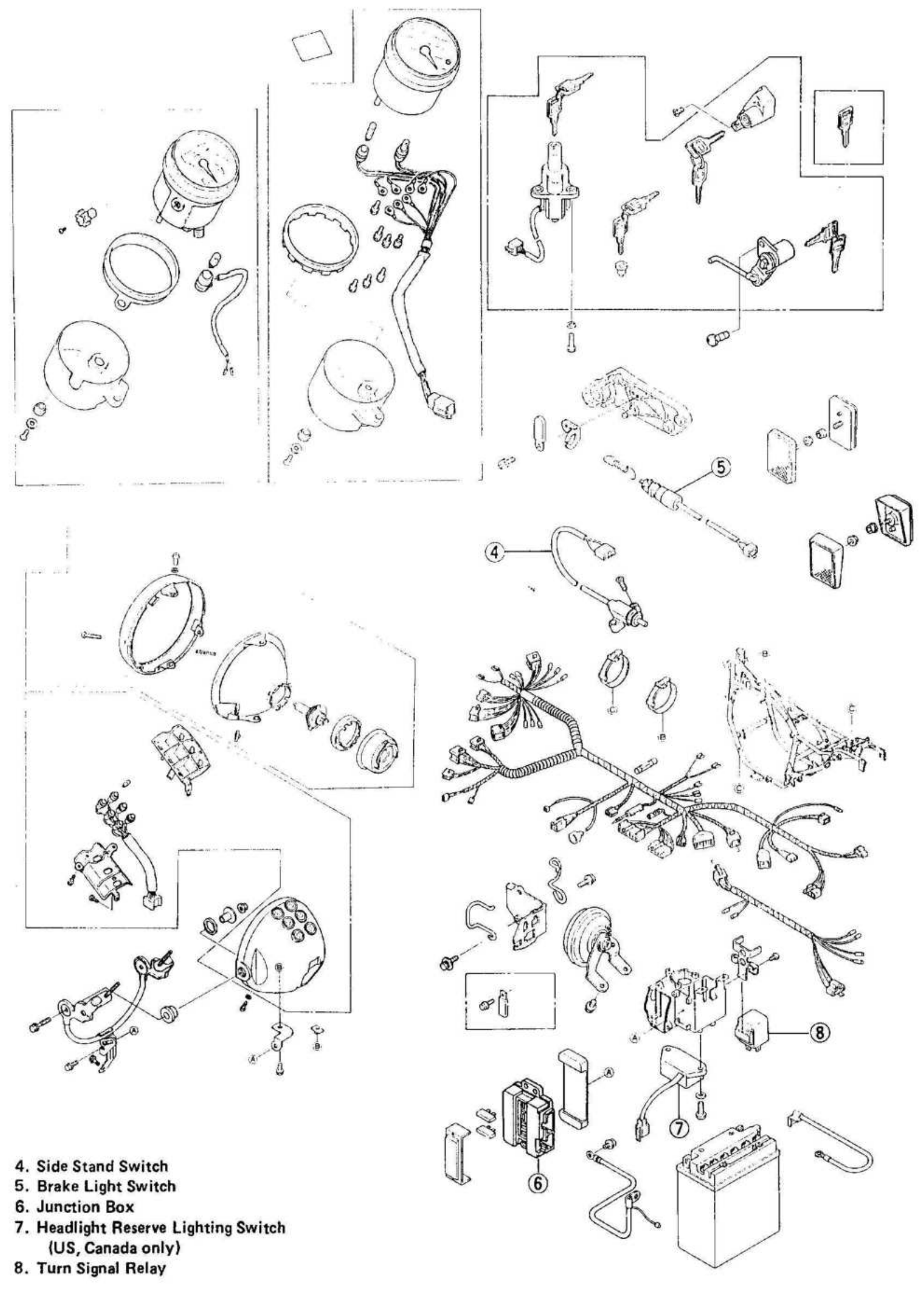
* : Refer to Base Manual

Exploded View



1. Regulator/Rectifier
2. IC Ignitor
3. Notch: Face the notch downward.

L : Apply a non-permanent locking agent to the threads.
O : Apply engine oil.
T1 : 4.9 N-m (0.5 kg-m, 43 in-lb)
T2 : 145 N-m (15 kg-m, 110 ft-lb)
T3 : 12 N-m (1.2 kg-m, 104 in-lb)
T4 : 25 N-m (2.5 kg-m, 18 ft-lb)
T5 : 14 N-m (1.4 kg-m, 10 ft-lb)



4. Side Stand Switch
5. Brake Light Switch
6. Junction Box
7. Headlight Reserve Lighting Switch
   (US, Canada only)
8. Turn Signal Relay

Specifications

Refer to the Base Manual noting that the fuel level sensor is eliminated and the water temperature sensor is replaced by a coolant temperature switch.

Switch and Sensor

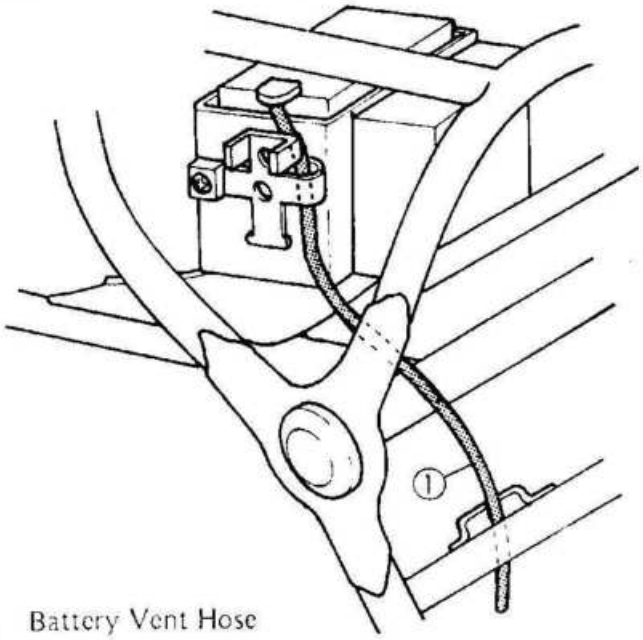
Rear brake light switch:	
On after about 15 mm pedal travel	
Coolant temperature switch (120°C):	
Off	117 – 123°C above (243 – 253°F)
On	about 113°C under (235°F)

Battery

Battery Vent Hose Routing

- Route the battery vent hose as shown.

Battery Vent Hose Routing



1. Battery Vent Hose

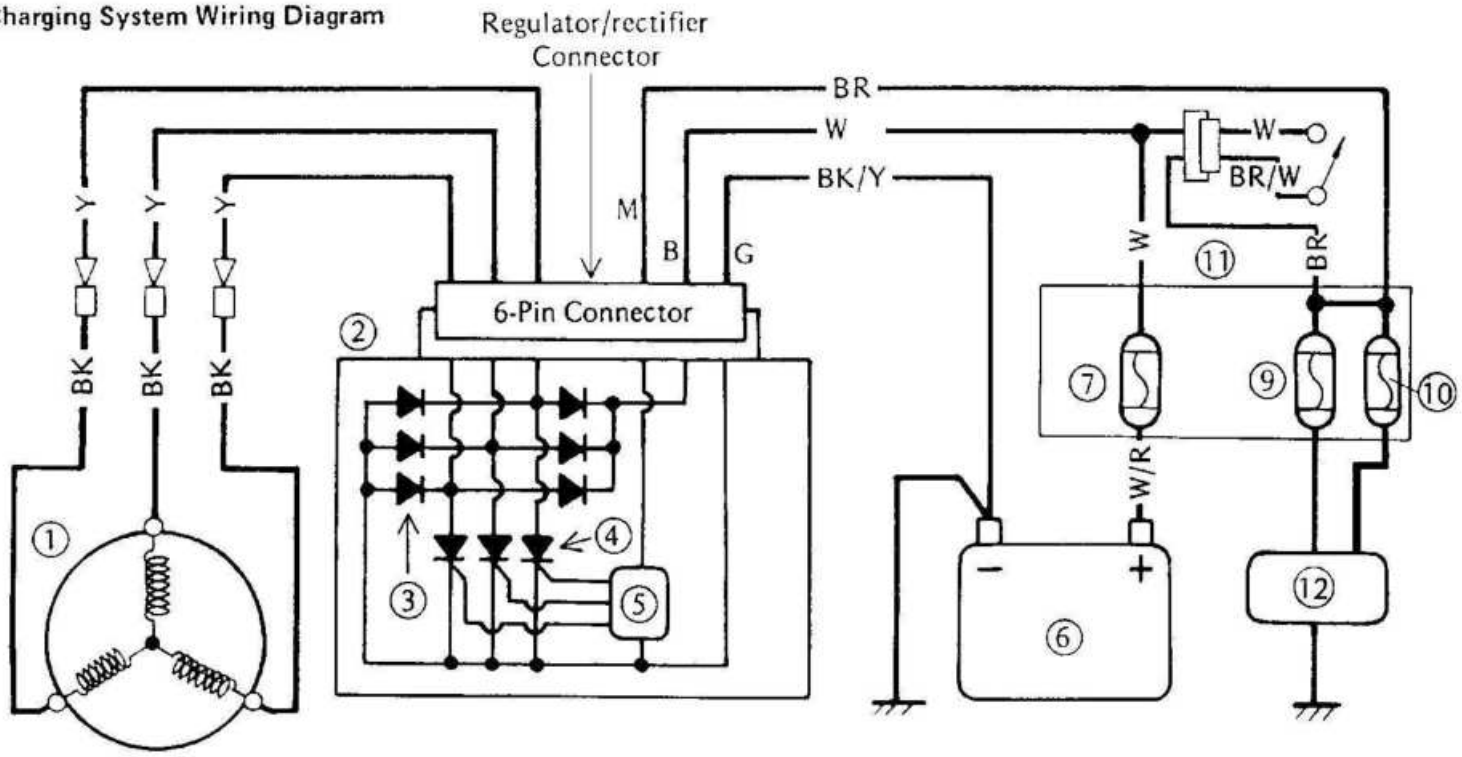
WARNING

Always keep the battery vent hose free of obstruction, and make sure it does not get pinched, crimped, or melted shut by contact with the hot muffler. If battery gases cannot escape through this hose, they can explode the battery.

Charging System

Refer to the Base Manual noting the following.

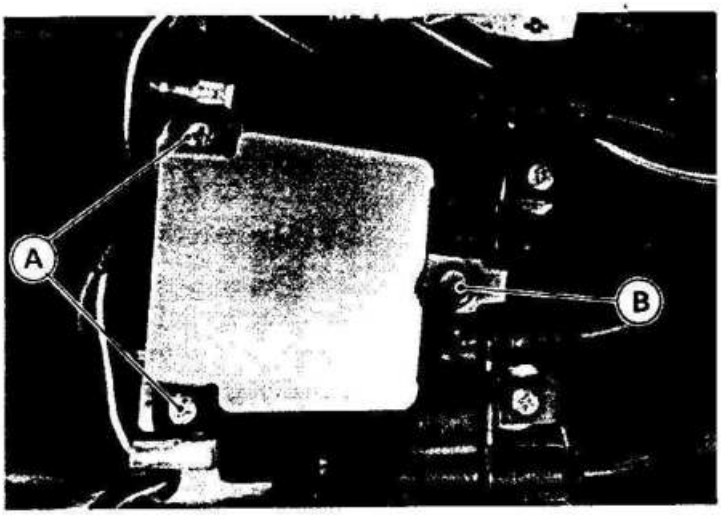
Charging System Wiring Diagram



1. Alternator
2. Regulator/rectifier
3. Diodes
4. Thyristors
5. Control Circuit
6. 12 V Battery
7. Main 30 A Fuse
8. Ignition Switch
9. 10A Fuse for Headlight
10. 10A Fuse for Taillight
11. Junction Box
12. Loads: Headlight, Meter Unit, Ignition System, Turn Signal Lights, Brake Lights, Cooling Fan, Horn

Ignition Coil Removal

- Remove the seat.
- Remove the fuel tank (see Fuel System chapter).
- Unscrew the coil mounting bolt and screws.



A. Screws B. Bolt

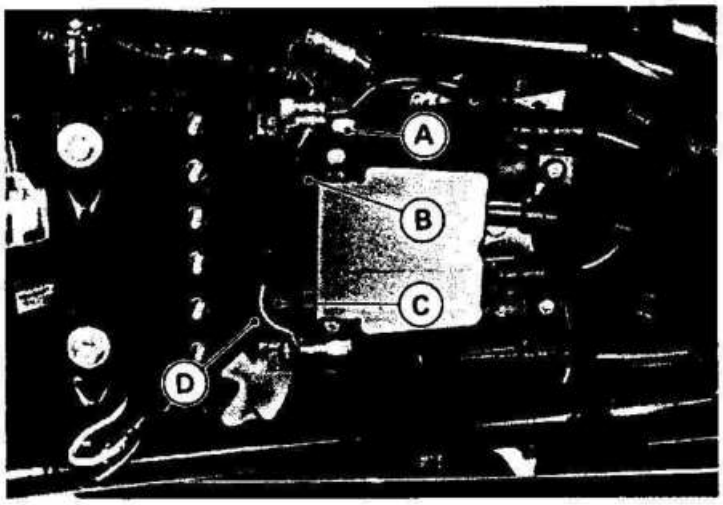
- Pull the spark plug caps off the spark plugs.
- Remove the rubber grommets from the plug caps.
- Pull the leads through the gap between the frame pipe and the surge tank.

★If the plug caps are difficult to run through the gap, unscrew the caps from the leads.

- Remove the ignition coil assembly.

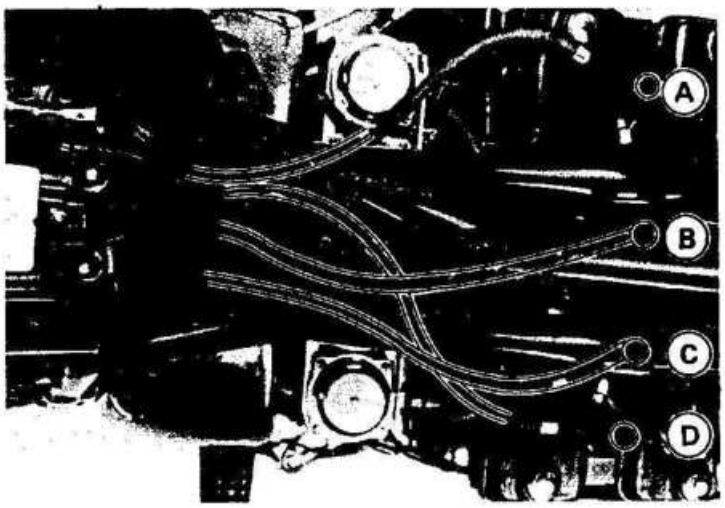
Ignition Coil Installation Notes

- Connect the primary leads to the primary terminals as shown.



A. BK Primary Lead C. G Primary Lead
B. R Primary Lead (short) D. R Primary Lead (long)

- Connect each spark plug lead to each spark plug as shown.

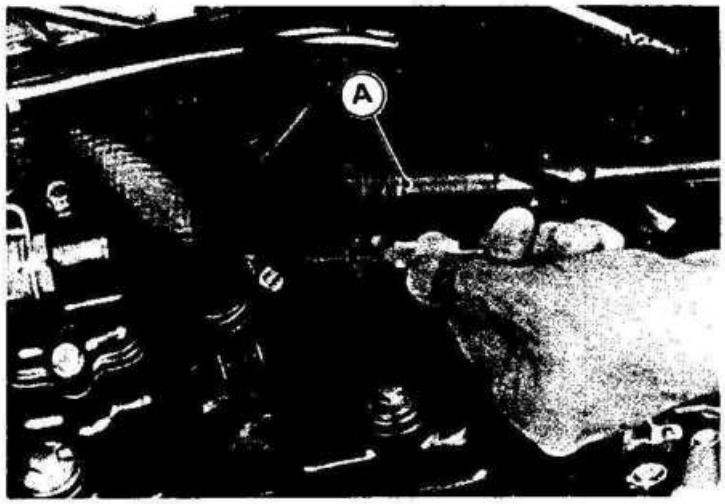


A. To No. 1 Spark Plug C. To No. 3 Spark Plug
B. To No. 2 Spark Plug D. To No. 4 Spark Plug

- Route the spark plug leads correctly (see Fuel System chapter).

Spark Plug Removal

- Remove the fuel tank in order to remove the middle two plugs.
- Pull off the spark plug caps.
- Remove the spark plug using the spark plug wrench (owner's tool or special tool).

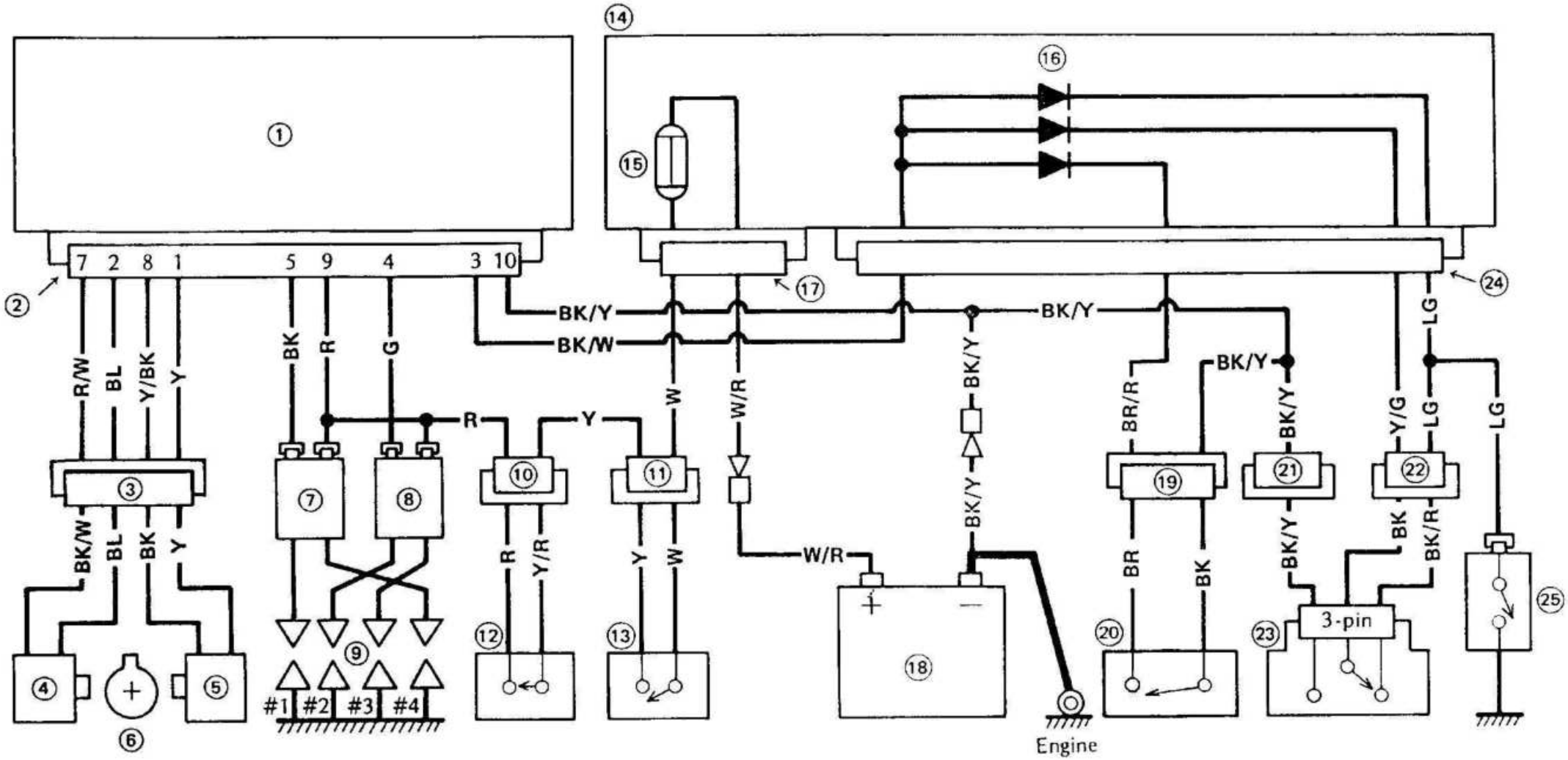


A. Spark Plug Wrench: 57001-1024

Spark Plug Installation Note

- Tighten the spark plug to the specified torque (see Exploded View in the Base Manual).

Ignition System Wiring Diagram

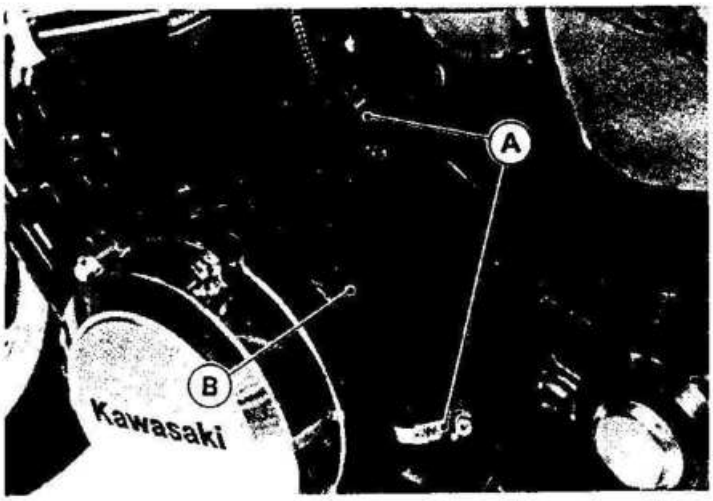


1. IC Ignitor
2. IC Ignitor 10-pin connector
3. Pickup coil 4-pin connector
4. Pickup coil for #2 and #3 cylinder
5. Pickup coil for #1 and #4 cylinder
6. Timing rotor
7. Ignition coil for #1 and #4 cylinders
8. Ignition coil for #2 and #3 cylinders
9. Spark plugs
10. Engine stop switch 4-pin connector (US model: 6-pin connector)
11. Ignition switch 9-pin connector
12. Engine stop switch
13. Ignition switch
14. Junction box
15. Main 30 A fuse
16. Diodes
17. Junction box 8-pin connector
18. Battery
19. Side stand switch 3-pin connector
20. Side stand switch
21. LH switch 9-pin connector
22. Starter lockout switch 2-pin connector
23. Starter lockout switch
24. Junction box 10-pin connector
25. Neutral switch

Electric Starter System

Starter Motor Removal

- Drain the coolant (see Coolant Draining in Cooling System).
- Loosen the clamps and pull the water hose off the water pump and the water pipe left side.



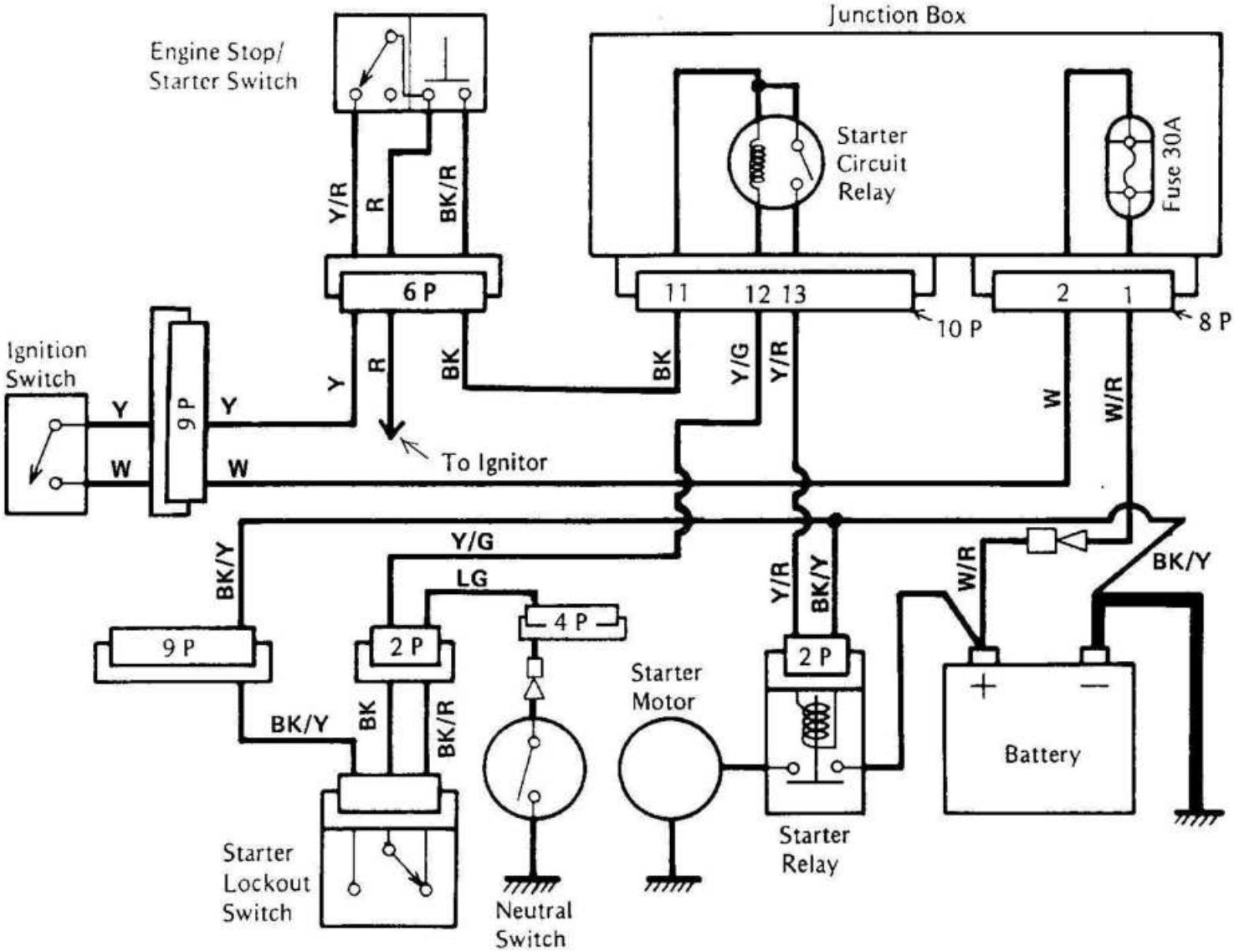
A. Clamps B. Water Hose

- Remove the starter mounting bolts.



A. Mounting Bolts

Electric Starter Circuit



●Pull out the starter motor halfway and disconnect the starter cable at the terminal.
●Take out the starter motor.



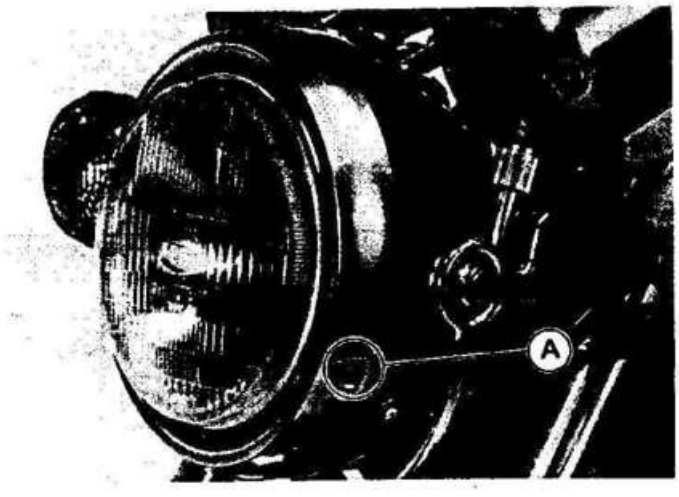
A. Terminal

Lighting System

The headlight beam is adjustable both horizontally and vertically. If not properly adjusted horizontally, the beam will point to one side rather than straight ahead. If adjusted too low vertically, neither low nor high beam will illuminate the road far enough ahead. If adjusted too high vertically, the high beam will fail to illuminate the road close ahead, and the low beam will dazzle oncoming drivers. In most areas it is illegal to ride with an improperly adjusted headlight.

Headlight Beam Horizontal Adjustment

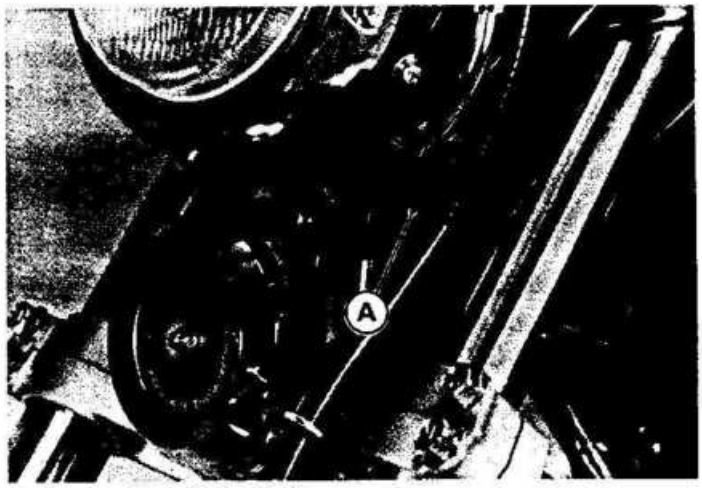
●Turn the small screw on the headlight rim in or out until the beam points straight ahead. Turning the adjusting screw **clockwise** makes the headlight beam point to the **right.**



A. Adjusting Screw

Headlight Beam Vertical Adjustment

●Loosen the lower headlight bolt.
●Adjust the headlight vertically.
●Tighten the lower headlight bolt.



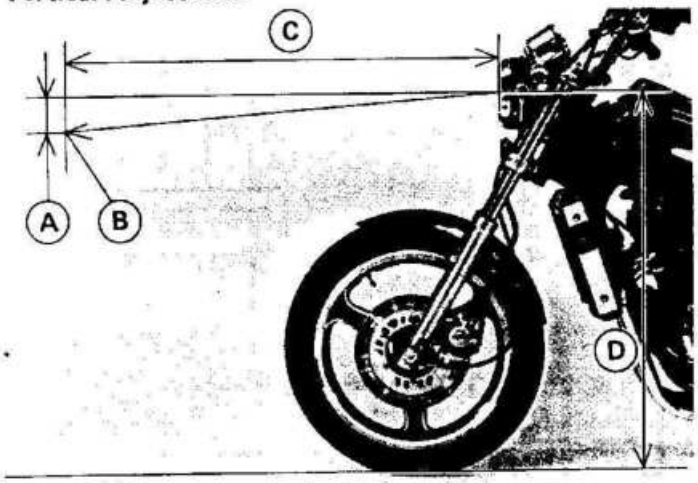
A. Lower Headlight Bolt

NOTE

○*On high beam, the brightest point should be slightly below horizontal with the motorcycle on its wheels and the rider seated. Adjust the headlight to the proper angle according to local regulations.*

○*For US model, the proper angle is 0.4 degrees below horizontal. This is a 50 mm (2 in) drop at 7.6 m (25 ft) measured from the center of the headlight with the motorcycle on its wheels and the rider seated.*

Vertical Adjustment



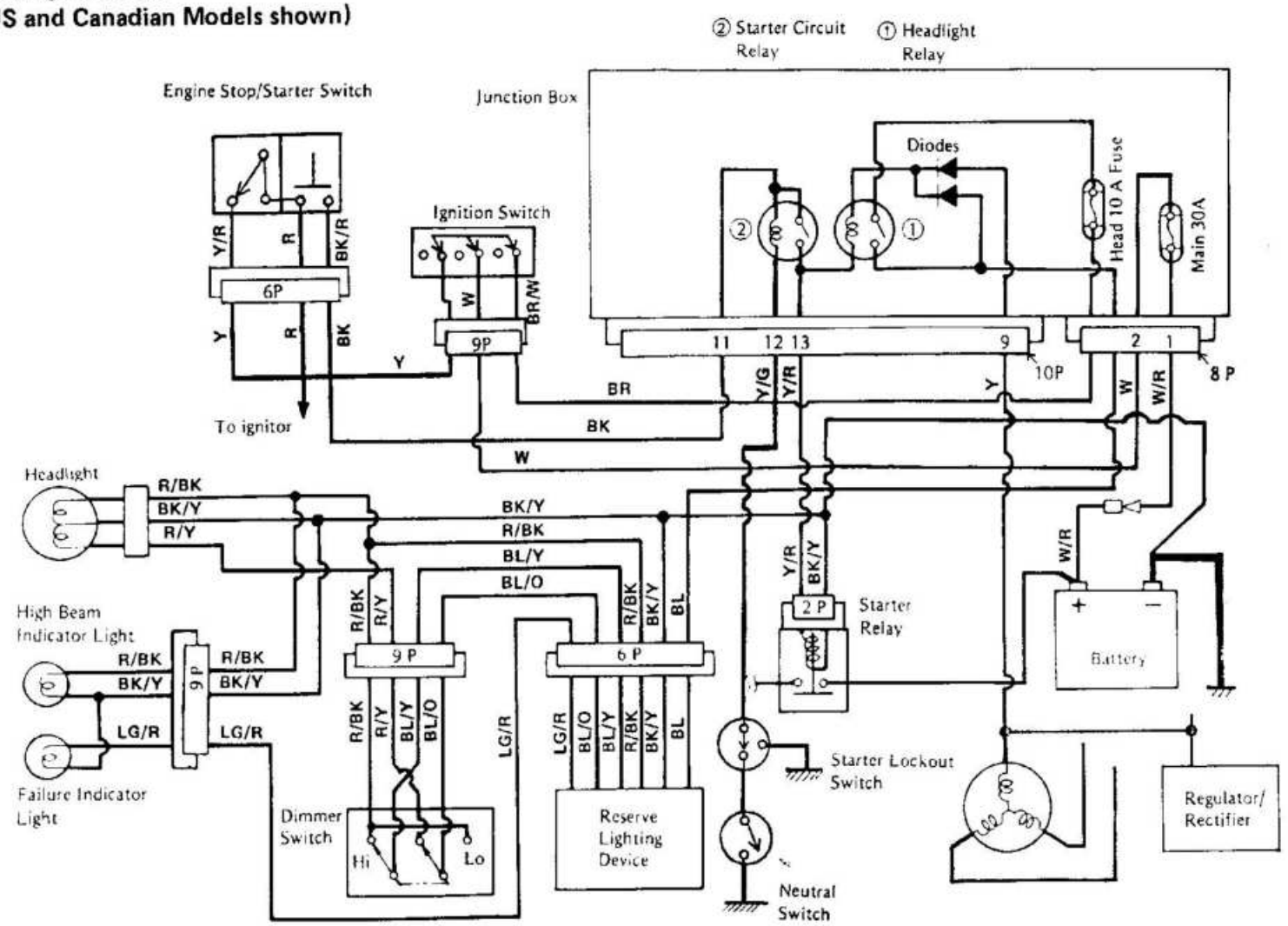
A. 50 mm (2 in)
B. Center of Brightest Spot
C. 7.6 m (25 ft)
D. Height of Headlight Center

Headlight Bulb Replacement Notes

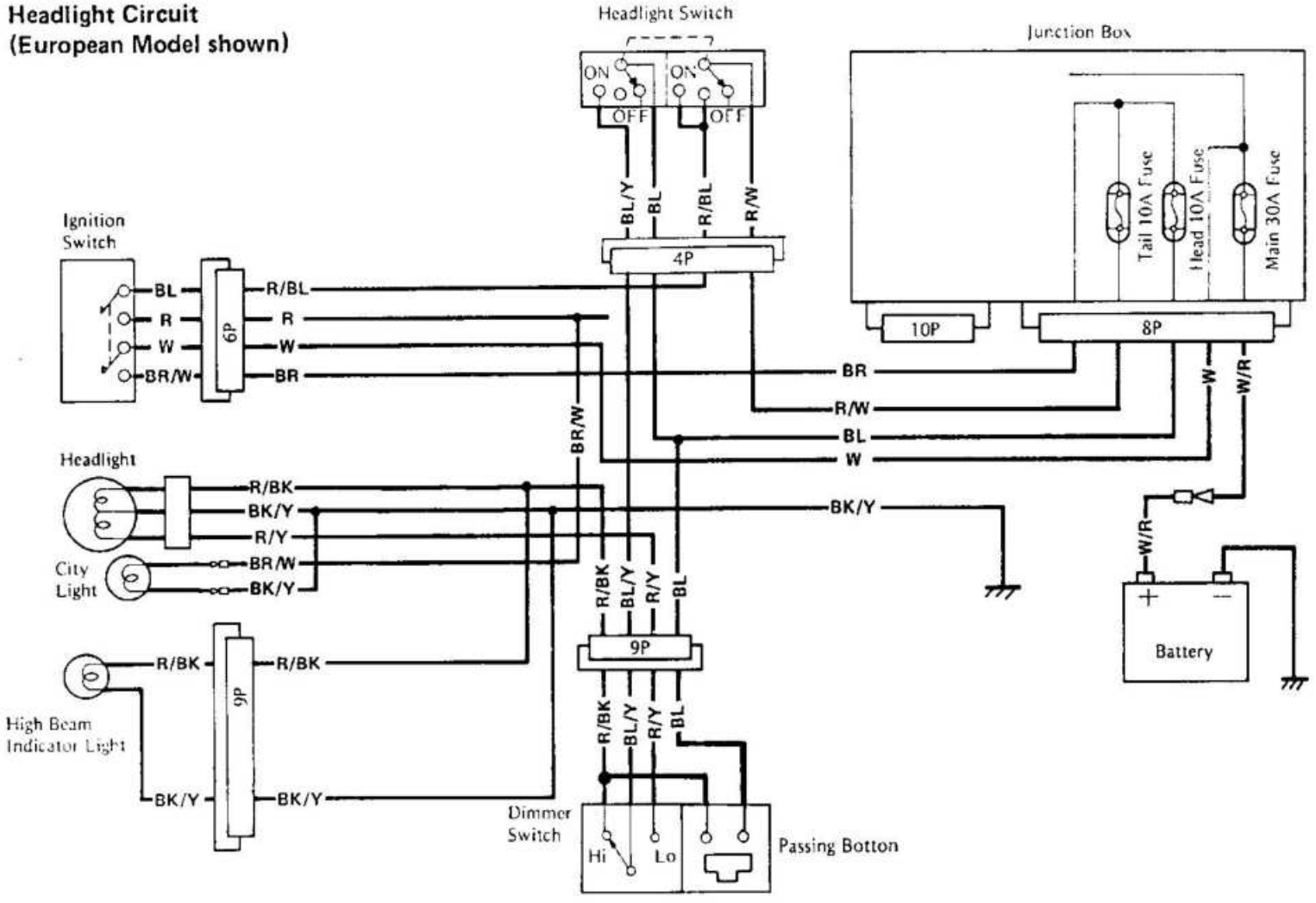
CAUTION

○**When handling the quartz-halogen bulbs, never touch the glass portion with bare hands. Always use a clean cloth. Oil contamination from hands or dirty rags can reduce bulb life or cause the bulb to explode.**

Headlight Circuit
(US and Canadian Models shown)

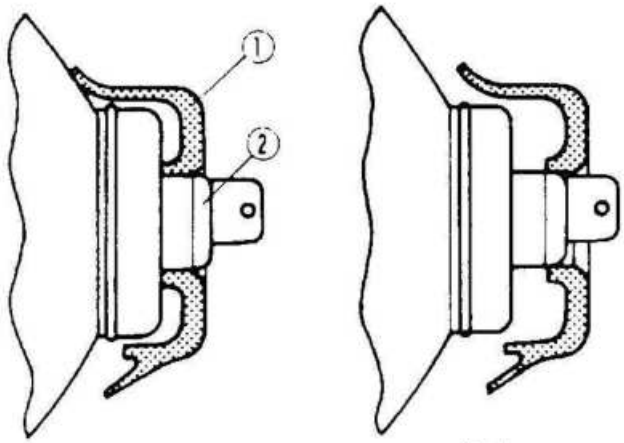


Headlight Circuit
(European Model shown)



●Fit the dust cover onto the bulb firmly as shown in the figure.

Dust Cover Installation



Good Bad

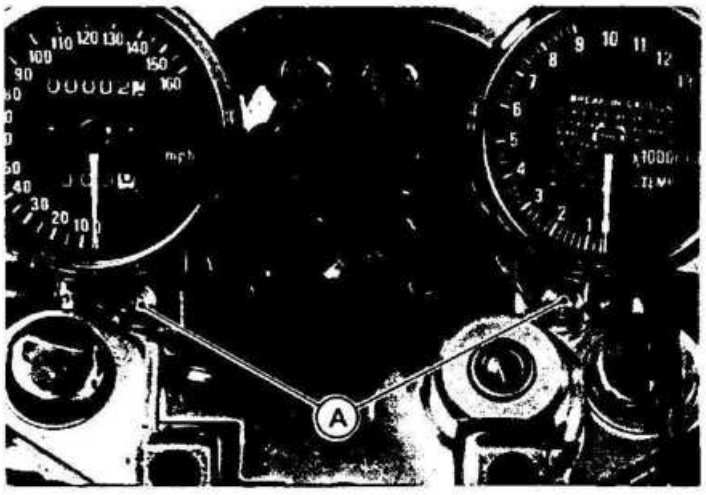
1. Dust Cover
2. Headlight Bulb

Meters and Indicators

Meter and Indicator Removal

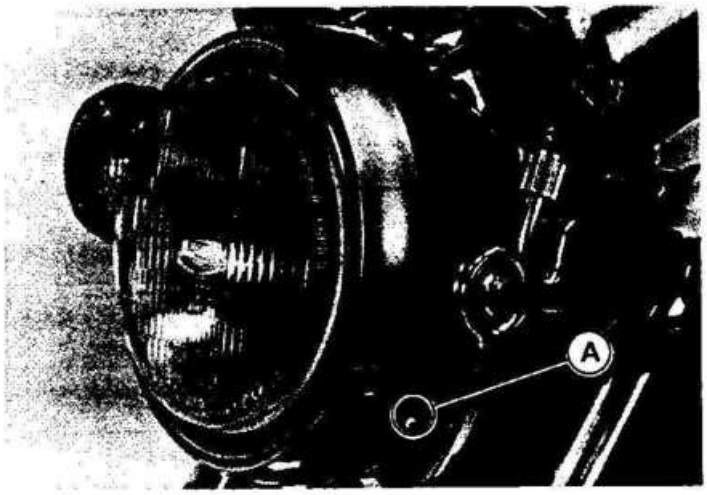
●Unscrew the mounting nuts in order to remove each meter unit.

●Unscrew the speedometer cable to remove the speedometer.



A. Meter Mounting Nuts

●Remove the headlight mounting screws and drop out the headlight unit.



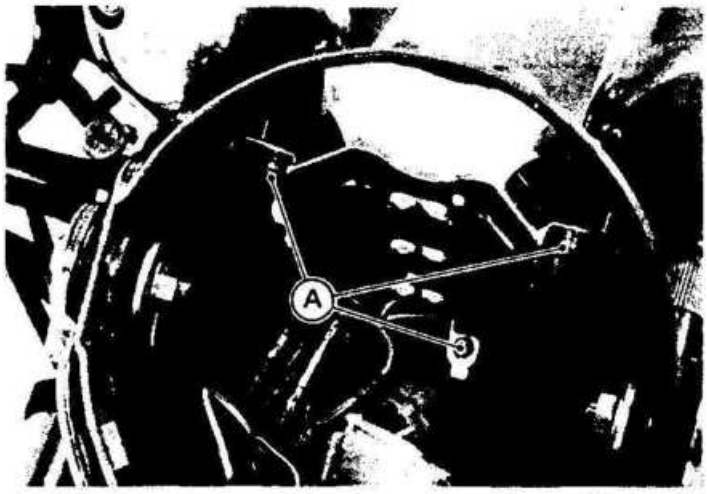
A. Mounting Screws

●Pull off the connector and remove each unit.

CAUTION

○**Place the meter so that the face is up. If a meter or gauge is left upside down or sideways for any length of time it will malfunction.**

●Remove the mounting screws to take out the indicator light unit.



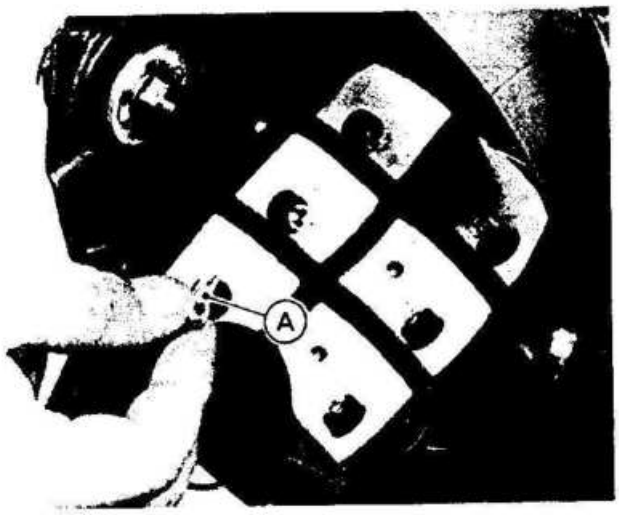
A. Mounting Screws

Bulb Replacement Notes

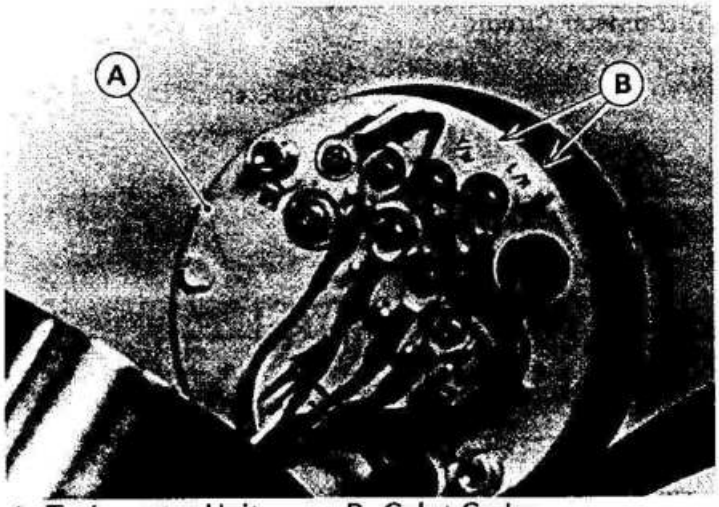
●To remove the wedge-base type bulbs (indicator and illumination), pull out the bulb sockets and pull the bulbs out of the sockets.

CAUTION

○**Do not use bulbs rated for greater wattage than the specified value, as the meter or gauge panel could become warped by excessive heat radiated from the bulbs.**

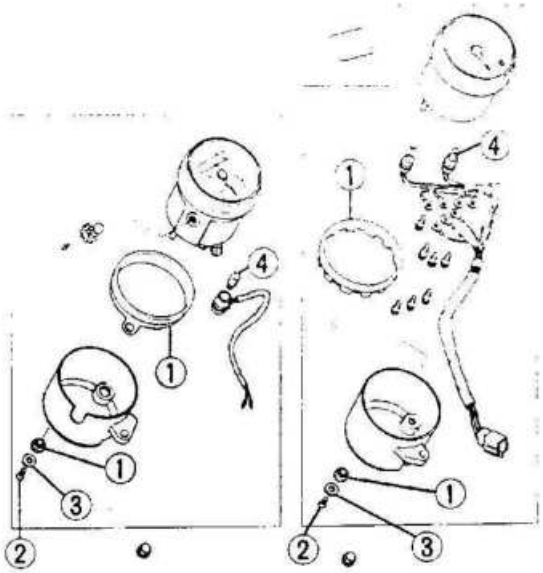


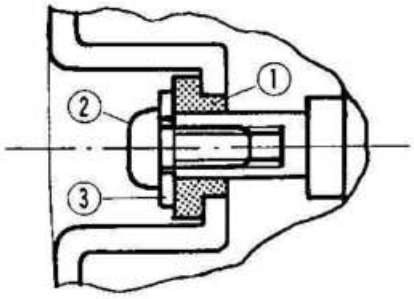
A. Indicator Bulb



A. Tachometer Unit B. Color Codes

Meters





1. Dampers
2. Screws
3. Washers
4. Illumination Lights

Tachometer Unit Assembly Note

- Install each lead of the tachometer unit on the original positions. The color codes are marked on the unit.

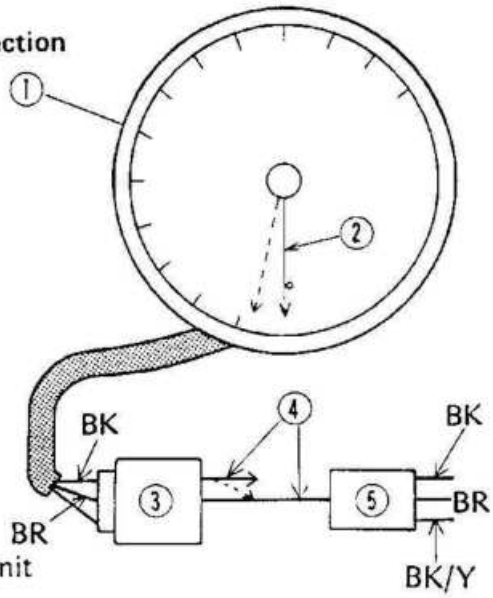
Tachometer Inspection

NOTE

○*Tachometer inspection is explained on the assumption that the ignition system operates normally.*

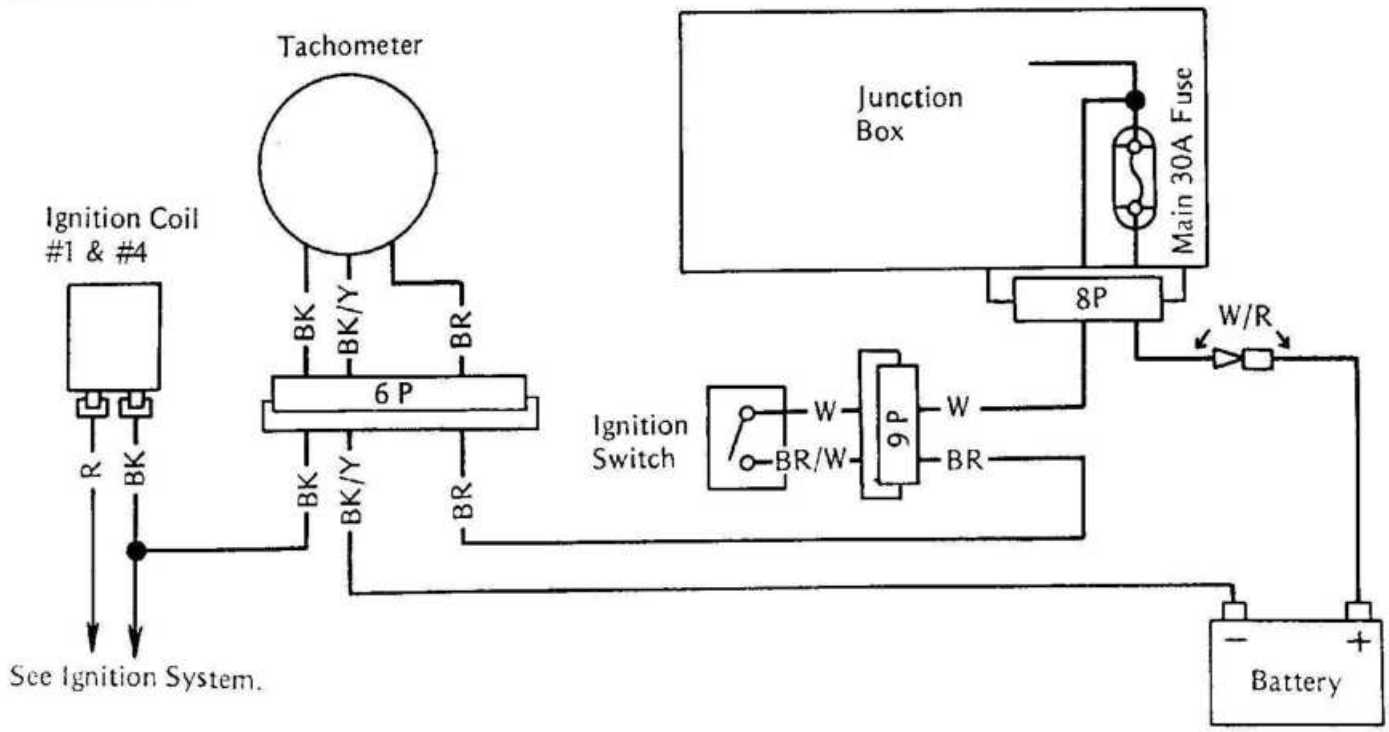
- Check to see that the rubber dampers are installed in those positions (see Bulb Replacement Notes).
- ★Install new dampers if any are missing.
- Check to see that the rubber dampers are in good condition. They should not be hard or cracked.
- ★Replace any damaged rubber dampers with new ones.
- Check to see that all meter mounting screws and nuts are tightened securely.
- ★Tighten any loose fasteners.
- Check the tachometer circuit wiring (see Wiring Inspection).
- ★If all wiring and components other than the tachometer unit check out good, the unit is suspect. Check the unit as shown.
- Turn the ignition switch ON.
- With the BR lead connected, open or connect the BK lead to the BR lead repeatedly. Then, the meter hand should flick.

Tachometer Inspection



1. Tachometer Unit
2. Hand
3. Tachometer Male Connector
4. Auxiliary Leads
5. Tachometer Female Connector

Tachometer Circuit



★If the hand does not flick, replace the tachometer unit.

Coolant Temperature Warning System Inspection

- Inspect the coolant temperature warning light and the system wiring (see Wiring Inspection).
- Turn on the ignition switch.

Test 1

- Disconnect the coolant temperature switch lead and oil pressure switch lead, then ground them to the frame or engine using auxiliary leads.

★If the warning indicator is lit, inspect the coolant temperature switch and the oil pressure switch. Replace any switch if damaged.

★Otherwise, replace the tachometer.

Test 2

- Open the oil pressure switch lead with the temperature switch lead grounded.

★If the warning indicator is lit, replace the tachometer.

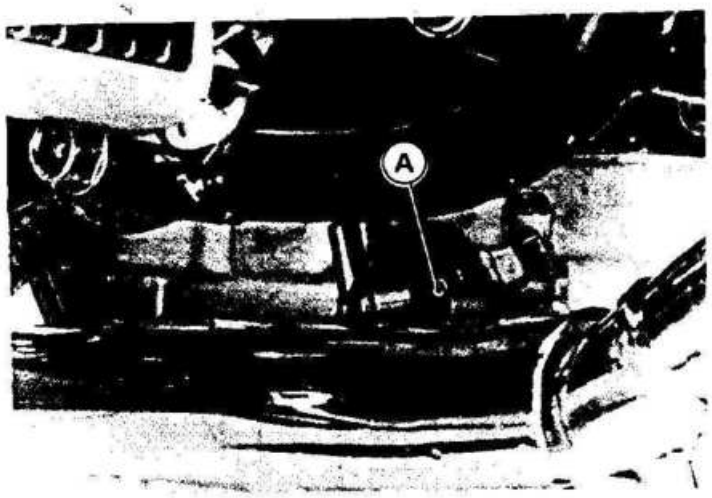
★Otherwise, inspect the temperature switch and the oil pressure switch. Replace any switch, if damaged.

Test 3

- Open the temperature switch lead with the oil pressure switch lead grounded or ungrounded.

★If the warning indicator is lit, check the temperature switch and the oil pressure switch. Replace any switch, if damaged.

★Otherwise, replace the tachometer.



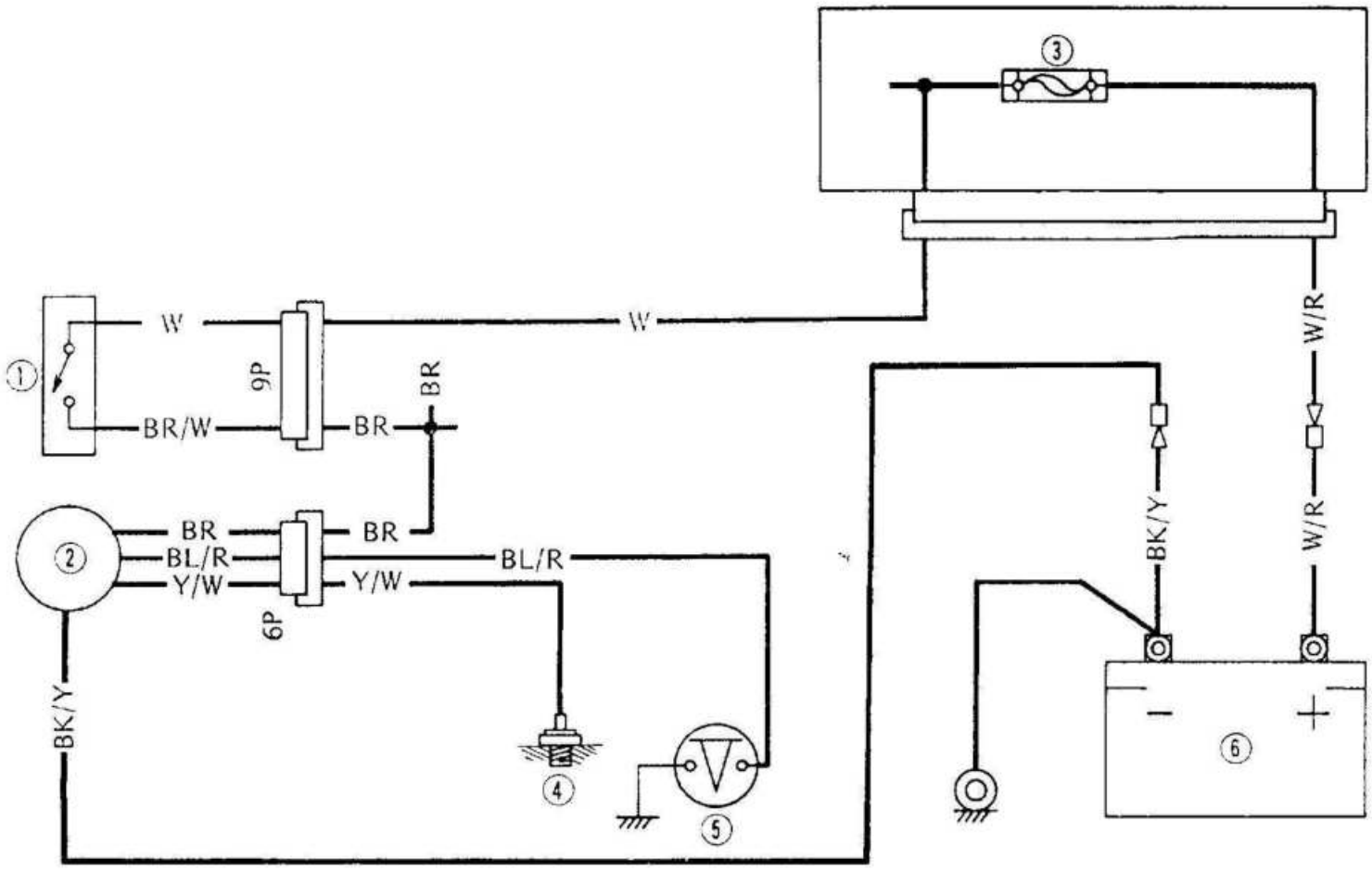
A. Oil Pressure Switch



A. Auxiliary Leads for Coolant Temperature Switch and Oil Pressure Switch

Coolant Temperature Warning System

The coolant temperature warning light (LED-Light Emitting Diode) goes on when the ignition switch is turned on and goes off soon after the engine starts running (oil pressure switch off) to ensure that its circuit functions properly. The warning light also goes on whenever the coolant temperature rises to **120°C (248°F)** or higher when the motorcycle is in operation. If it stays on, stop the engine and check the coolant level in the reservoir tank after the engine cools down.

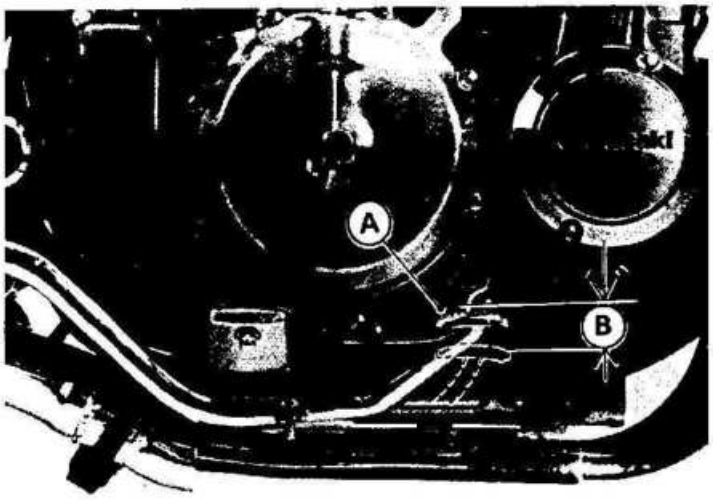


1. Ignition Switch
2. Warning Indicator
3. Main 30A Fuse
4. Coolant Temperature Switch on Thermostat Housig
5. Oil Pressure Switch
6. Battery

Switch and Sensors

Rear Brake Light Testing

- Turn on the ignition switch.
- Check the operation of the rear brake light switch by depressing the brake pedal. The brake light should go on after about **15 mm** of pedal travel.



A. Rear Brake Pedal B. 15 mm

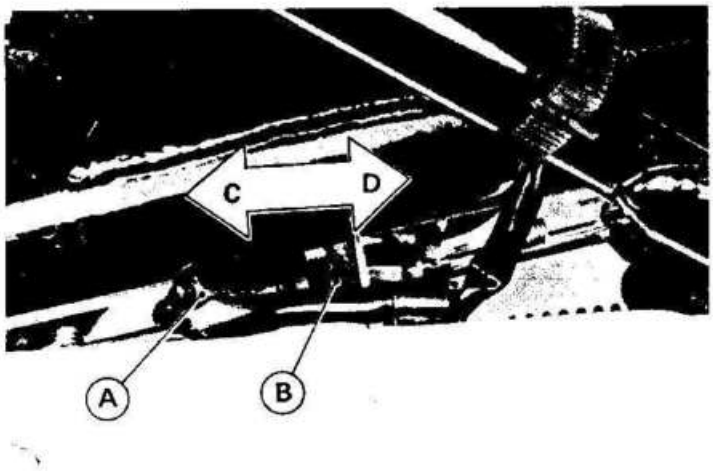
☆If it does not, adjust the brake light switch.

Rear Brake Lighting Position Adjustment

- Turn the adjusting nut to adjust the switch.

CAUTION

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



A. Rear Brake Light Switch C. Lights sooner.
B. Adjusting Nut D. Lights later.

Switch Inspection

Refer to the Base Manual noting the following.

Starter Button Connections

	BK/R	R
Free		
Push on	○	○

Front Brake Light Switch Connections

	BK	BK
When brake lever is pulled in	○	○

Side Stand Switch Connections

	BR	BK
When side stand is up	○	○
When side stand is down		

Starter Lockout Switch Connections

	BK/Y	BK	BK/R
When clutch lever is pulled in	○	○	
When clutch lever is released		○	○

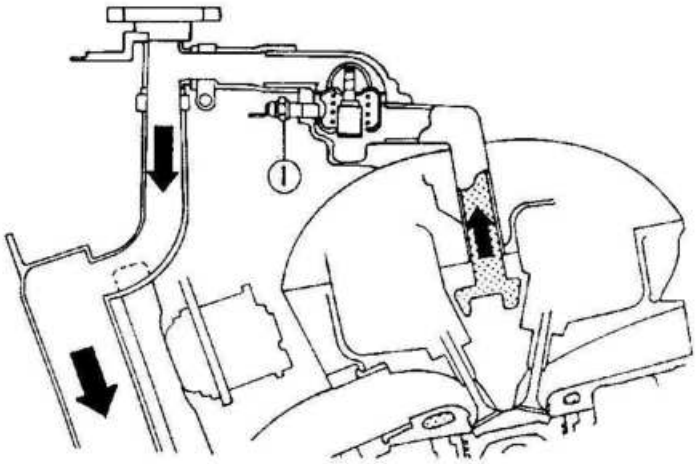
Coolant Temperature Switch Inspection

Refer to Fan Switch Inspection in the Base Manual noting the following.

Coolant Temperature Switch (120°)* Resistance

Temperature Change		Resistance Change		
Atmospheric temperature		not more than 0.5 Ω (On)		
Raise →	117 – 123°C (243 – 253°F)	0.5 Ω (On)	→	∞ (Off)
113°C (253°F) ←	– Lower	0.5 Ω (On)	←	∞ (Off)

* : taper thread



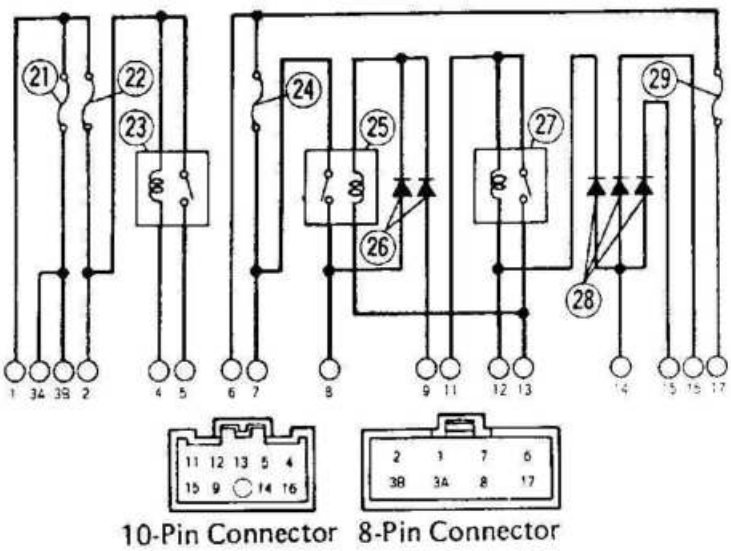
1. Coolant Temperature Switch

Junction Box

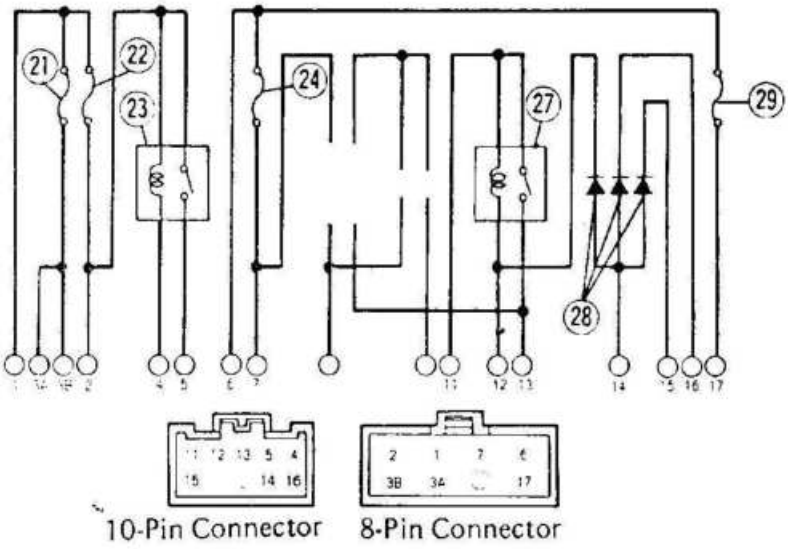
The junction box has fuses, relays and diodes. The relays and diodes can not be removed. For other than US and Canadian Models, it has not a headlight relay.

Junction Box Internal Circuit

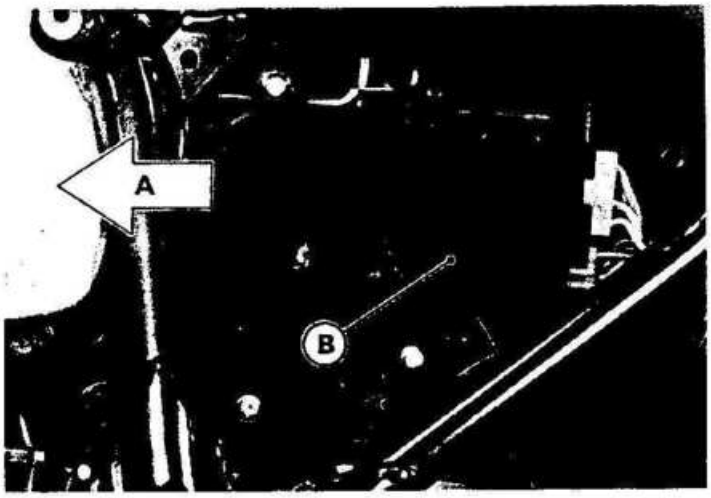
(US and Canadian Model)



(Other than US and Canadian Model)



21. Accessory 10A Fuse
22. Main 30A Fuse
23. Fan Relay
24. Headlight 10A Fuse
25. Headlight Relay
26. Diodes
27. Starter Circuit Relay
28. Diodes for Safety Device
29. Tail Light 10A Fuse



A. Front B. Junction Box

Junction Box Fuse Circuit Inspection

- Remove the junction box from the motorcycle.
- Pull off the connectors from the junction box.
- Make sure all connector terminals are clean and tight, and none of them have been bent.
- ★Clean the dirty terminals, and straighten slightly-bent terminals.
- Check conductivity of the numbered terminals.
- ★If the meter does not read as specified, replace the junction box.

Fuse Circuit Inspection

Meter Connection			Meter Reading (Ω)
1	–	2	0
1	–	3A	0
6	–	7	0
6	–	17	0
1	–	7	∞
*3A	–	8	*∞
*8	–	17	*∞

* : **US and Canadian Models only**

Fan, Starter Relay and Headlight Relay Inspection

- Remove the junction box from the motorcycle.
- Check conductivity of the following numbered terminals by connecting an ohmmeter and one 12 V battery to the junction box as shown.

★If the meter does not read as specified, replace the junction box.

Relay Circuit Inspection (with the battery disconnected)

Meter Connection	Meter Reading (Ω)
2-5	∞
4-5	∞
*7-8	*∞
7-13	∞
11-13	∞
12-13	∞

* : US and Canadian Models only

Relay Circuit Inspection (with the battery connected)

Meter Connection	Battery Connection +	—	Meter Reading (Ω)
2-5	2	4	0
*7-8	*9	13	*0
11-13	11	12	0

* : US and Canadian Models only

Diode Circuit Inspection

- Remove the junction box from the motorcycle.
- Pull off the connectors from the junction box.
- Check conductivity of the following pair of terminals.

Terminal for Diode Circuit Inspection

***13-8, *13-9, 12-14, 15-14, 16-14**

*** : US and Canadian Models only**

★The resistance should be zero in one direction and infinite in the other direction. If any diode shows zero or infinite in both directions, the diode is defective and the junction box must be replaced.

Electrical Wiring

Wiring Inspection

- Visually inspect the wiring for signs of burning, fraying, etc..

★If any wiring is poor, replace the damaged wiring.

- Pull each connector apart and inspect it for corrosion, dirt, and damage.

★If the connector is corroded or dirty, clean it carefully. If it is damaged, replace it.

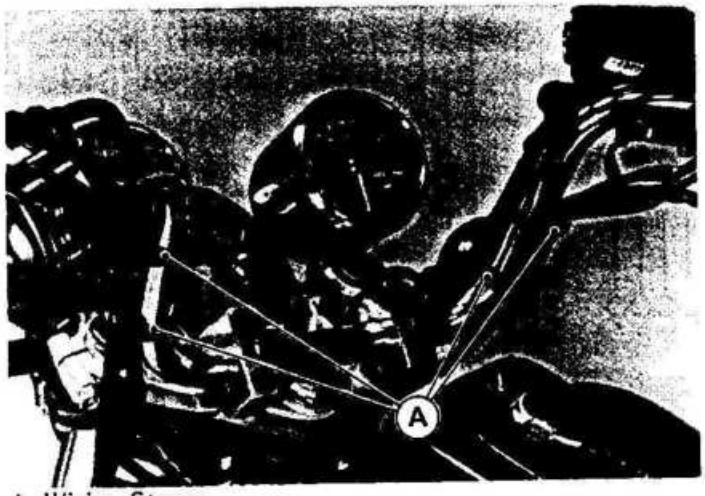
- Check the wiring for continuity.

○Use the wiring diagram to find the ends of the lead which is suspected of being a problem.
○Connect an ohmmeter between the ends of the leads.
○Set the meter to the x 1 Ω range, and read the meter.

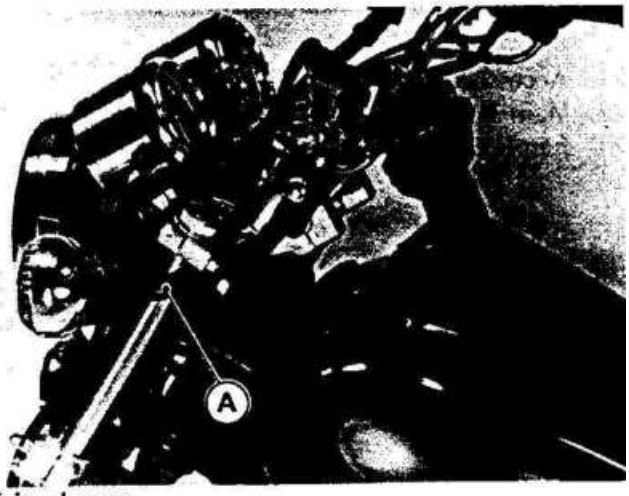
★If the meter does not read 0 Ω, the lead is defective. Replace the lead or the wiring loom if necessary.

Wiring Routing and Parts Location

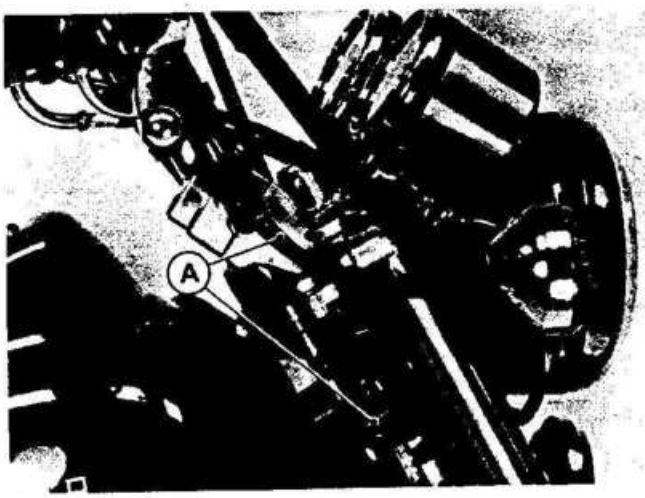
- Run the wire leads as shown.



A. Wiring Straps

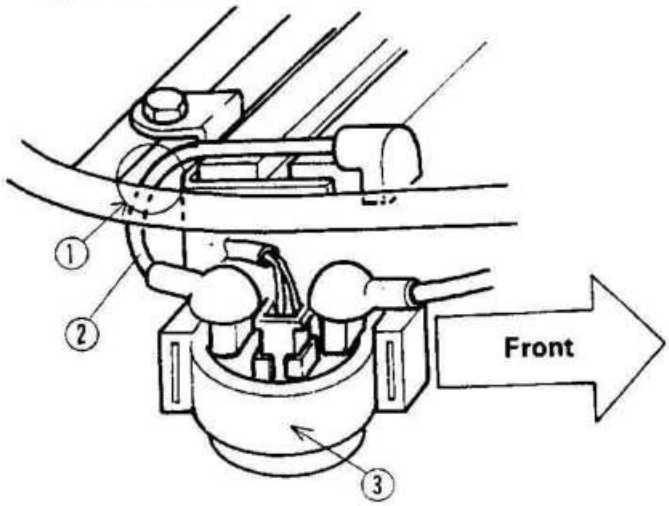


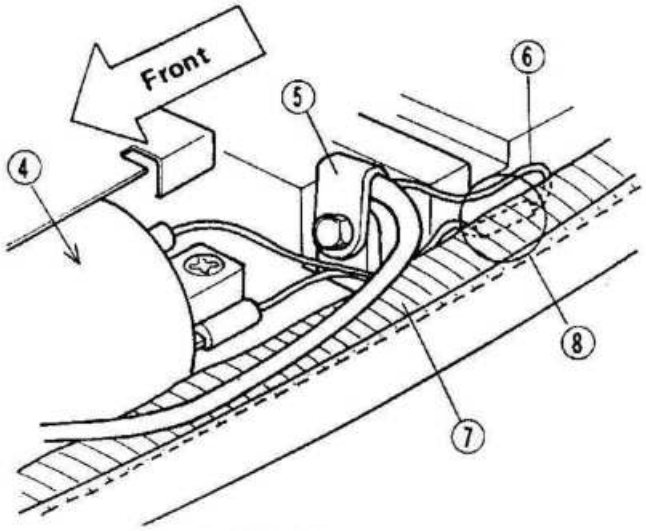
A. Wiring Loom



A. Wiring Looms

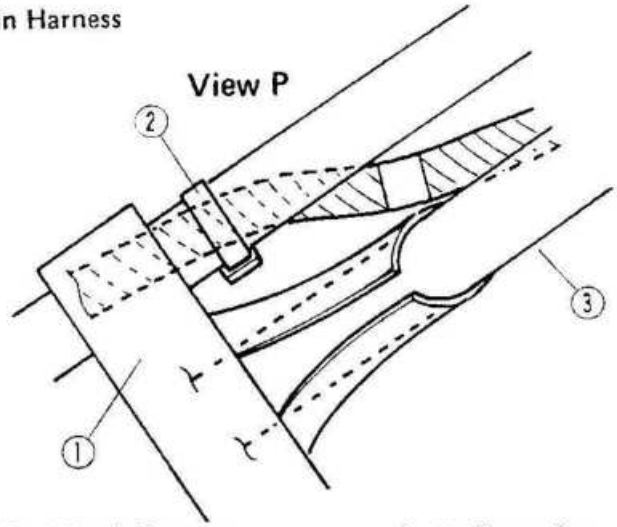
Battery Terminals

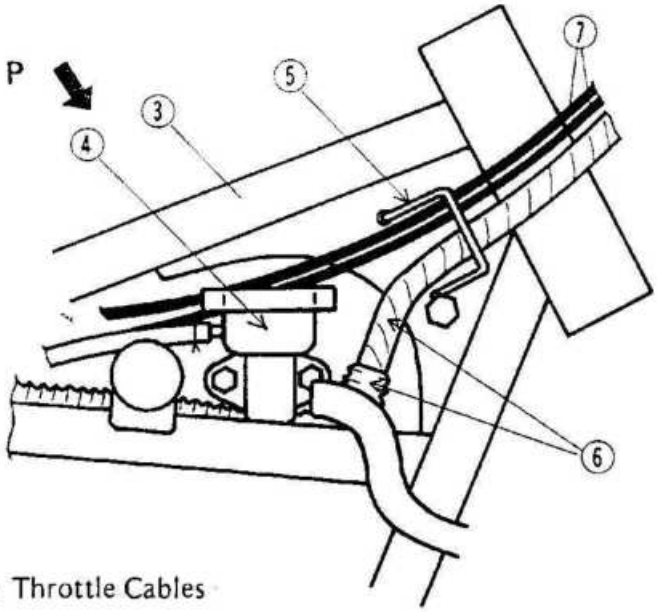




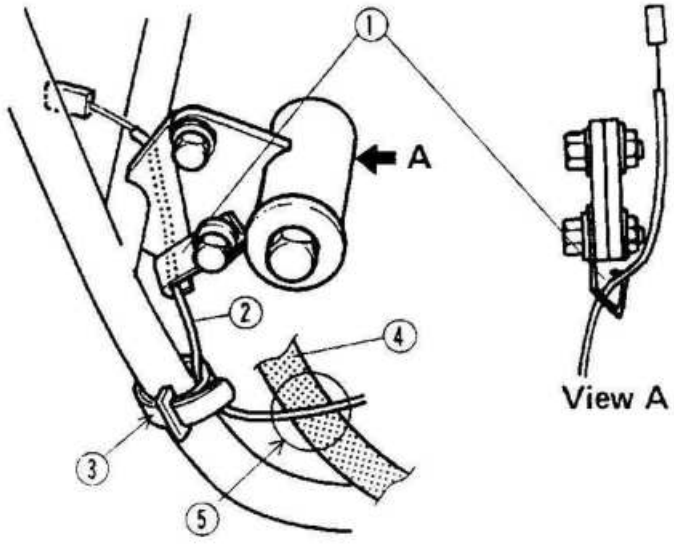
1. Run the lead under the frame pipe.
2. Battery Positive Terminal
3. Starter Relay
4. Ignition Coil
5. Battery Negative Terminal
6. Main Harness Ground Lead
7. Main Harness
8. Push the ground lead in between main harness and battery.

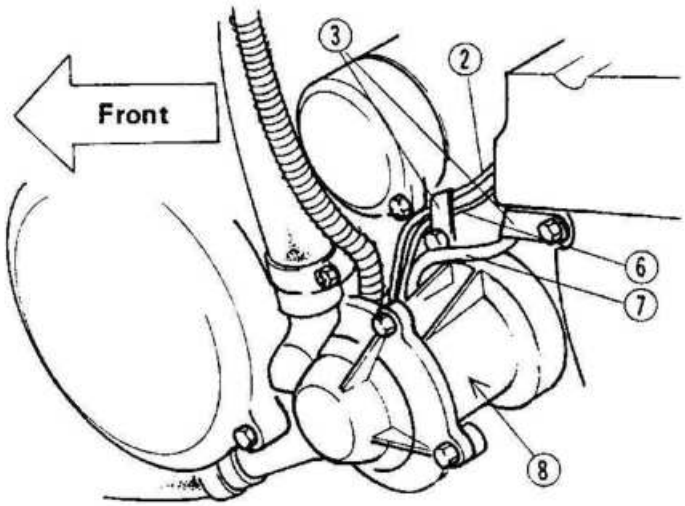
Main Harness



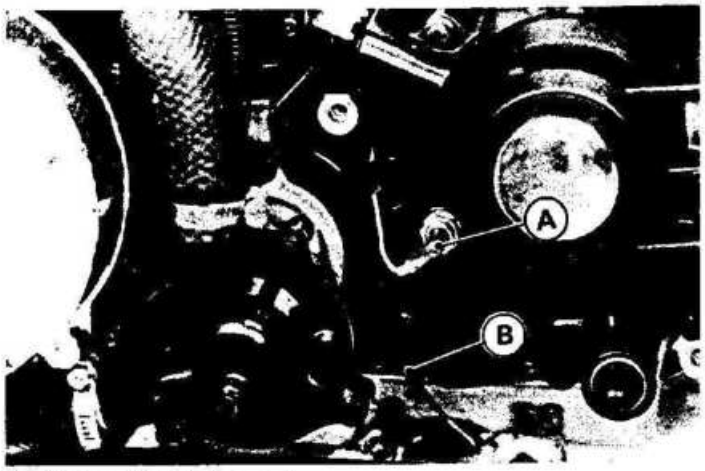


1. Fuel Tank Damper
2. Wiring Strap
3. Main Frame Pipe
4. Radiator Cap
5. Clamp
6. Main Harness
7. Throttle Cables

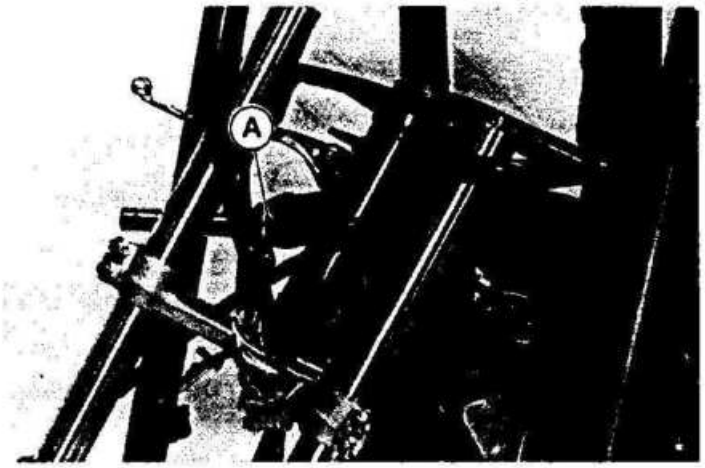




1. Clamp
2. Fan Switch Lead
3. Wiring Straps
4. Radiator Hose
5. Run the lead over the hose
6. Alternator Lead
7. Side Stand Switch Lead
8. Water Pump

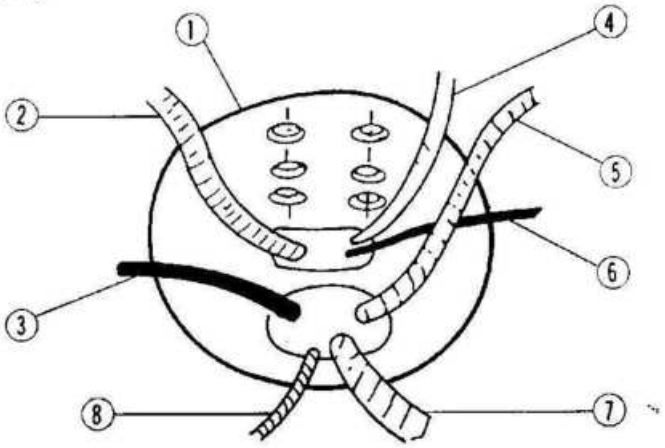


A. Neutral Switch Lead
B. Oil Pressure Switch Lead



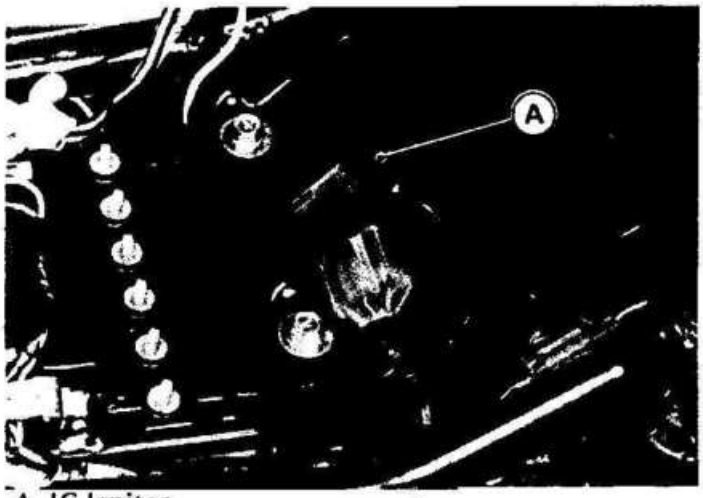
A. Headlight Wire Loom

Headlight Wire Routing

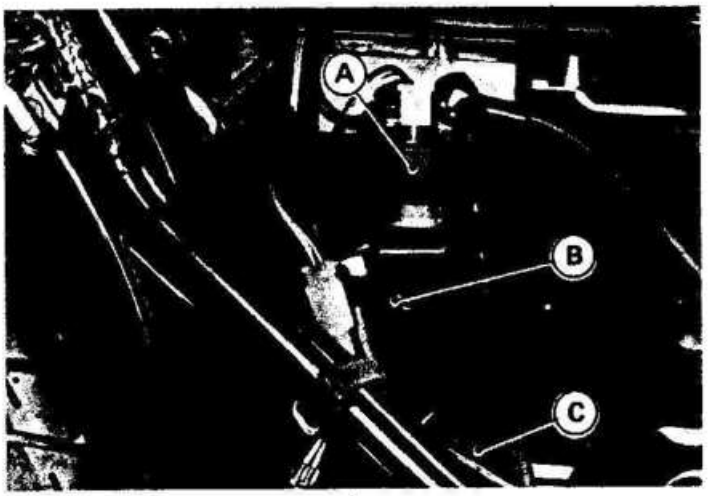


1. Headlight Body
2. Speedometer Lead
3. Left Turn Signal Lead
4. Ignition Switch Lead
5. Tachometer Lead
6. Right Turn Signal Lead
7. Main Harness
8. Horn Lead

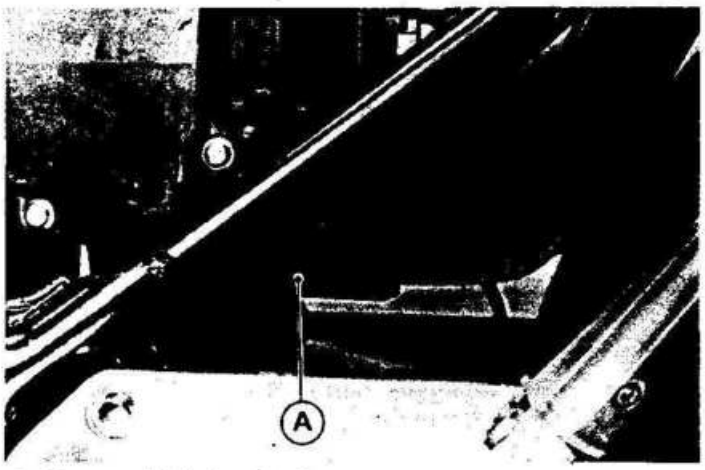
Electrical System Parts Location



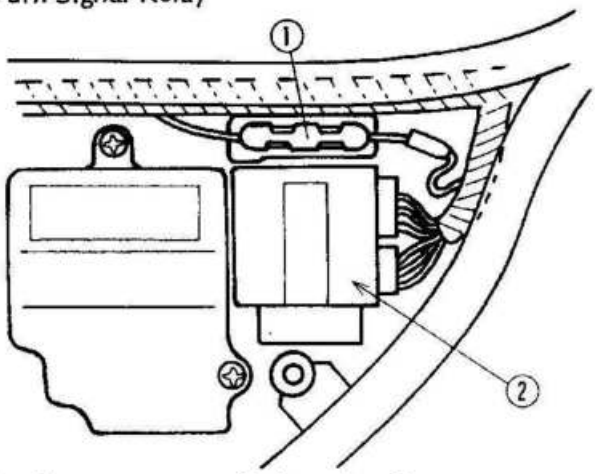
A. IC Ignitor



A. Starter Relay
B. Turn Signal Relay
C. Regulator/Rectifier

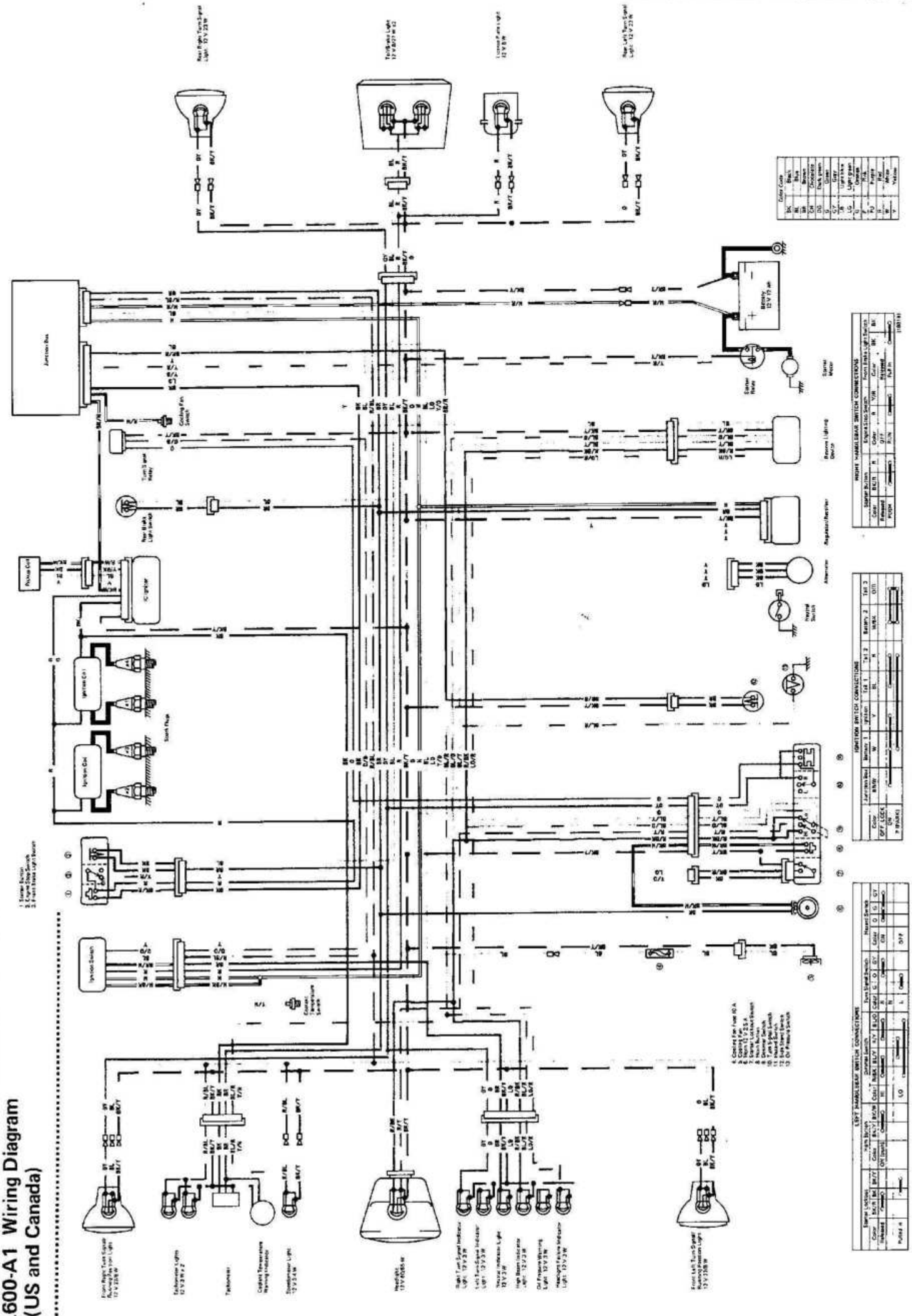


A. Reserve Lighting Device

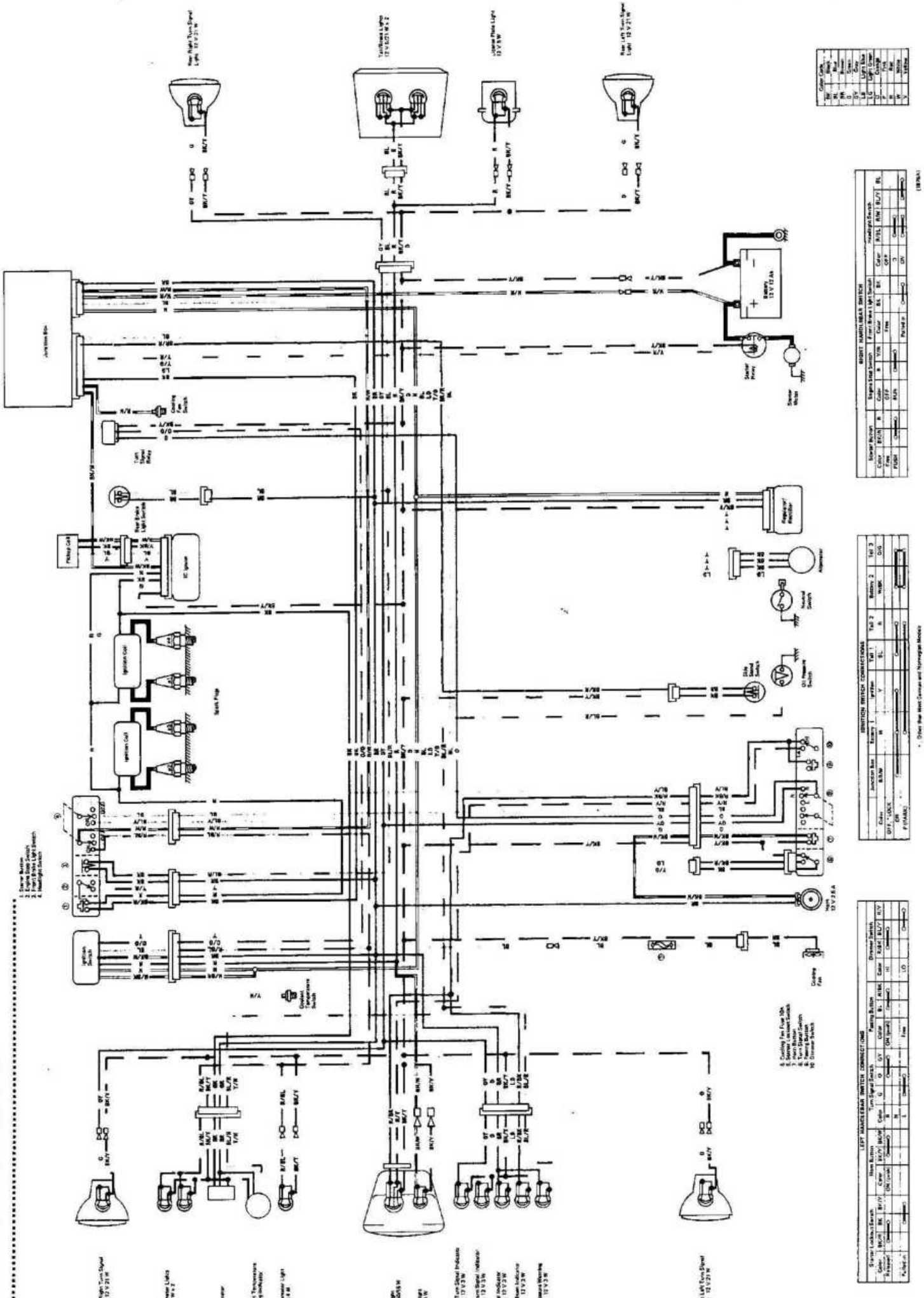


1. Fan Fuse
2. Junction Box

ZL600-A1 Wiring Diagram (US and Canada)



ZL500-A1/ZL600-A1 Wiring Diagram (Other than US and Canada)



Appendix

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Spark Plug Inspection ..... *
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Nut, Bolt, and Fastener Tightness 16-6
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Unit Conversion Table ..... *

* : Refer to Base Manual

Troubleshooting Guide

NOTE

○*This is not an exhaustive list, giving every possible cause for each problem listed. It is meant simply as a rough guide to assist the troubleshooting for some of the more common difficulties.*

Engine Doesn't Start, Starting Difficulty:

Starter motor not rotating:
- Starter lockout or neutral switch trouble
- Starter motor trouble
- Battery voltage low
- Relays not contacting or operating
- Starter button not contacting
- Wiring open or shorted
- Ignition switch trouble
- Engine stop switch trouble
- Fuse blown

Starter motor rotating but engine doesn't turn over:
- Starter motor clutch trouble

Engine won't turn over:
- Valve seizure
- Rocker arm seizure
- Cylinder, piston seizure
- Crankshaft seizure
- Connecting rod small end seizure
- Connecting rod big end seizure
- Transmission gear or bearing seizure
- Camshaft seizure

No fuel flow:
- Fuel tap vacuum hose clogged
- Fuel tank air vent obstructed
- Fuel tap clogged
- Fuel line clogged
- Float valve clogged

Engine flooded:
- Fuel level in carburetor float bowl too high
- Float valve worn or stuck open
- Starting technique faulty
- (When flooded, crank the engine with the throttle fully open to allow more air to reach the engine.)

No spark; spark weak:
- Battery voltage low
- Spark plug dirty, broken, or maladjusted
- Spark plug cap or high tension wiring trouble
- Spark plug cap not in good contact
- Spark plug incorrect
- IC ignitor trouble
- Neutral, starter lockout, or side stand switch trouble
- Pickup coil trouble
- Ignition coil trouble
- Ignition or engine stop switch shorted
- Wiring shorted or open
- Fuse blown

Compression Low:
- Spark plug loose
- Cylinder head not sufficiently tightened down
- No valve clearance
- Cylinder, piston worn
- Piston ring bad (worn, weak, broken, or sticking)
- Piston ring/land clearance excessive
- Cylinder head gasket damaged
- Cylinder head warped
- Valve spring broken or weak
- Valve not seating properly (valve bent, worn, or carbon accumulation on the seating surface)

Poor Running at Low Speed:

Spark weak:
- Battery voltage low
- Spark plug dirty, broken, or maladjusted
- Spark plug cap or high tension wiring trouble
- Spark plug cap shorted or not in good contact
- Spark plug incorrect
- IC ignitor trouble
- Pickup coil trouble
- Ignition coil trouble

Fuel/air mixture incorrect:
- Pilot screw maladjusted
- Pilot jet, or air passaged clogged
- Air bleed pipe, bleed holes clogged
- Pilot passage clogged
- Air cleaner clogged, poorly sealed, or missing
- Starter plunger stuck open
- Fuel level in carburetor float bowl too high or too low
- Fuel tank air vent obstructed
- Carburetor holder loose
- Air cleaner duct loose

Compression low:
- Spark plug loose
- Cylinder head not sufficiently tightened down
- No valve clearance
- Cylinder, piston worn
- Piston ring bad (worn, weak, broken, or sticking)
- Piston ring/land clearance excessive
- Cylinder head warped
- Cylinder head gasket damaged
- Valve spring broken or weak
- Valve not seating properly (valve bent, worn, or carbon accumulation on the seating surface)

Backfiring when deceleration:
- Vacuum switch valve broken (US model)
- Air suction valve trouble (US model)

Other:
- IC ignitor trouble
- Carburetors not synchronizing
- Carburetor vacuum piston doesn't slide smoothly
- Engine oil viscosity too high
- Drive train trouble
- Final gear case oil viscosity too high
- Brake dragging

Poor Running or No Power at High Speed:

Firing incorrect:
- Spark plug dirty, broken, or maladjusted
- Spark plug cap shorted or not in good contact
- Spark plug incorrect
- IC ignitor trouble
- Pickup coil trouble
- Ignition coil trouble

Fuel/air mixture incorrect:
- Starter plunger stuck open
- Main jet clogged or wrong size
- Jet needle or needle jet worn
- Air jet clogged
- Fuel level in carburetor float bowl too high or too low
- Bleed holes of air bleed pipe or needle jet clogged
- Air cleaner clogged, poorly sealed, or missing
- Air cleaner duct poorly sealed
- Water or foreign matter in fuel
- Carburetor holder loose
- Fuel tank air vent obstructed
- Fuel tap clogged
- Fuel line clogged

Compression low:
- Spark plug loose
- Cylinder head not sufficiently tightened down
- No valve clearance
- Cylinder, piston worn
- Piston ring bad (worn, weak, broken, or sticking)
- Piston ring/land clearance excessive
- Cylinder head gasket damaged
- Cylinder head warped
- Valve spring broken or weak
- Valve not seating properly (valve bent, worn, or carbon accumulation on the seating surface.)

Knocking:
- Carbon built up in combustion chamber
- Fuel poor quality or incorrect
- Spark plug incorrect
- IC ignitor trouble

Backfiring when deceleration:
- Vacuum switch valve broken (US model)
- Air suction valve trouble (US model)

Miscellaneous:
- Throttle valve won't fully open
- Carburetor vacuum piston doesn't slide smoothly
- Brake dragging
- Clutch slipping
- Overheating
- Engine oil level too high
- Engine oil viscosity too high
- Drive train trouble
- Final gear case oil viscosity too high

Overheating:

Firing incorrect:
- Spark plug dirty, broken, or maladjusted
- Spark plug incorrect
- IC ignitor trouble

Fuel/air mixture incorrect:
- Main jet clogged or wrong size
- Fuel level in carburetor float bowl too low
- Carburetor holder loose
- Air cleaner poorly sealed, or missing
- Air cleaner duct poorly sealed
- Air cleaner clogged

Compression high:
- Carbon built up in combustion chamber

Engine load faulty:
- Clutch slipping
- Engine oil level too high
- Engine oil viscosity too high
- Drive train trouble
- Final gear case oil viscosity too high
- Brake dragging

Lubrication inadequate:
- Engine oil level too low
- Engine oil poor quality or incorrect

Coolant temperature warning system incorrect:
- Coolant temperature warning light broken
- Coolant temperature switch broken

Coolant incorrect:
- Coolant level too low
- Coolant deteriorated

Cooling system component incorrect:
- Radiator clogged
- Thermostat trouble
- Radiator cap trouble
- Thermostatic fan switch trouble
- Fan relay in junction box trouble
- Fan motor broken
- Fan blade damaged
- Water pump not turning
- Water pump impeller damaged

Over Cooling:

Cooling system component incorrect:
- Thermostatic fan switch trouble
- Thermostat trouble

Clutch Operation Faulty:

Clutch slipping:
- No clutch lever play
- Friction plate worn or warped
- Steel plate worn or warped
- Clutch spring broken or weak
- Clutch release mechanism trouble
- Clutch hub or housing unevenly worn
- Clutch inner cable catching

Clutch not disengaging properly:
- Clutch lever play excessive
- Clutch plate warped or too rough
- Clutch spring compression uneven
- Engine oil deteriorated
- Engine oil viscosity too high
- Engine oil level too high
- Clutch housing frozen on drive shaft
- Clutch release mechanism trouble
- Clutch hub locknut loose

Gear Shifting Faulty:

Doesn't go into gear; shift pedal doesn't return:
- Clutch not disengaging
- Shift fork bent or seized
- Gear stuck on the shaft
- Gear positioning lever binding
- Neutral positioning lever binding
- Shift return spring weak or broken
- Shift return spring pin loose
- Shift mechanism arm spring broken
- Shift mechanism arm broken
- Shift pawl broken

Jumps out of gear:
- Shift fork worn
- Gear groove worn
- Gear dogs and/or dog holes worn
- Shift drum groove worn
- Gear positioning lever spring weak or broken
- Shift fork pin worn
- Drive shaft, output shaft, and/or gear splines worn

Overshifts:
- Gear positioning lever spring weak or broken
- Shift mechanism arm spring broken

Abnormal Engine Noise:

Knocking:
- IC ignitor trouble
- Carbon built up in combustion chamber
- Fuel poor quality or incorrect
- Spark plug incorrect
- Overheating

Piston slap:
- Cylinder/piston clearance excessive
- Cylinder, piston worn
- Connecting rod bent
- Piston pin, piston holes worn

Valve noise:
- Valve clearance incorrect
- Valve spring broken or weak
- Camshaft bearing worn

Other noise:
- Connecting rod small end clearance excessive
- Connecting rod big end clearance excessive
- Piston ring worn, broken or stuck
- Piston seizure, damage
- Cylinder head gasket leaking
- Exhaust pipe leaking at cylinder head connection
- Crankshaft runout excessive
- Engine mounts loose
- Crankshaft bearing worn
- Primary and secondary shaft sprockets worn or chipped
- Camshaft chain tensioner trouble
- Camshaft chain, sprocket, guide worn
- Air suction valve damaged (US model)
- Vacuum switch valve damaged (US model)

Abnormal Drive Train Noise:

Clutch noise:
- Weak or damaged rubber damper
- Clutch housing/friction plate clearance excessive
- Clutch housing gear worn
- Damper spring for deceleration torque limiting clutch broken or weak

Transmission noise:
- Bearings worn
- Transmission gears worn or chipped
- Metal chips jammed in gear teeth
- Engine oil insufficient

Drive line noise:
- Bevel gear bearings worn
- Bevel gears worn or chipped
- Bevel gears maladjusted
- Rear wheel coupling damaged
- Insufficient lubricant

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 warped
- Caliper trouble

Drum brake noise:
- Brake linings overworn or worn unevenly
- Drum worn unevenly or scored
- Brake springs weak or broken
- Foreign matter in hub
- Brake not properly adjusted

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

Oil Pressure Warning Light Goes On:

Engine oil pump damaged
Engine oil pump screen clogged
Engine oil level too low
Engine oil viscosity too low
Camshaft bearings worn
Crankshaft bearings worn
Oil pressure switch damaged
Wiring damaged
Relief valve stuck open
O-ring at the oil pipe in the crankcase damaged

Exhaust Smokes Excessively:

White smoke:
Piston oil ring worn
Cylinder worn
Valve oil seal damaged
Valve guide worn
Engine oil level too high

Black smoke:
Air cleaner clogged
Main jet too large or fallen off
Starter plunger stuck open
Fuel level in carburetor float bowl too high

Brown smoke:
Main jet too small
Fuel level in carburetor float bowl too low
Air cleaner duct loose
Air cleaner poorly sealed or missing

Handling and/or Stability Unsatisfactory:

Handlebar hard to turn:
Steering stem locknut too tight
Bearing damaged
Steering bearing lubrication inadequate
Steering stem bent
Tire air pressure too low

Handlebar shakes or excessively vibrates:
Tire worn
Swing arm pivot bearing worn
Rim warped, or not balanced
Wheel bearing worn
Handlebar clamp loose
Steering stem head bolt loose

Handlebar pulls to one side:
Frame bent
Wheel misalignment
Swing arm bent or twisted
Steering maladjusted
Front fork bent
Right/left fork oil level uneven
Right/left rear shock absorbers unbalanced

Shock absorption unsatisfactory:
(Too hard)
Front fork oil excessive
Front fork oil viscosity too high
Front fork air pressure too high
Tire air pressure too high
Front fork bent
(Too soft)
Front fork oil insufficient and/or leaking
Front fork oil viscosity too low
Front fork, rear shock absorber spring weak
Rear shock absorber oil leaking

Brake Doesn't Hold:

Disc brake:
Air in the brake line
Pad or disc worn
Brake fluid leak
Disc warped
Contaminated pad
Brake fluid deteriorated
Primary or secondary cup damaged
Master cylinder scratched inside

Drum brake:
Brake maladjusted
Brake linings or drum worn
Overheated
Water in brake drum
Brake cam, camshaft worn
Oil on brake linings

Battery Discharged:

Battery faulty (e.g., plates sulphated, shorted through sedimentation, electrolyte level too low)
Batterly leads making poor contact
Load excessive (e.g., bulb of excessive wattage)
Ignition switch trouble
Alternator trouble
Wiring faulty
Regulator/Rectifire trouble

Battery Overcharged:

Regulator/rectifier trouble

General Lubrication

Lubrication

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

NOTE

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

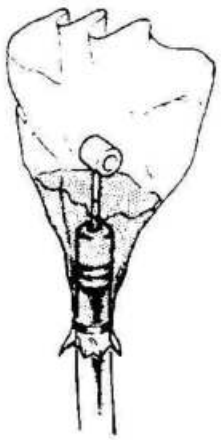
Pivots: Lubricate with Motor Oil.
- Clutch Lever
- Front Brake Lever
- Rear Brake Rod Clevis Pin
- Rear Brake Pedal
- Rear Brake Rod Joint
- Side Stand

Points: Lubricate with Grease.
- Throttle Inner Cable Lower Ends
- Throttle Inner Cable Upper Ends
- Speedometer Inner Cable*
- Choke Inner Cable Upper End
- Choke Inner Cable Lower End
- Clutch Inner Cable Upper End
- Clutch Inner Cable Lower End
- Handlebar Throttle Grip Portion

*Grease the lower part of the inner cable sparingly.

Cables: Lubricate with Motor Oil.
- Choke Cable
- Clutch Cable
- Throttle Cables

Cable Lubrication



Nut, Bolt, and Fastener Tightness

Tightness Inspection

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

NOTE

○*Check engine fastener tightness when the engine is cold (at room temperature).*

○If there are loose fasteners, retighten them to the specified torque following the specified tightening sequence. Refer to the appropriate chapter for torque specifications. If torque specifications are not in the appropriate chapter, see the Standard Torque Table. First loosen each fastener by ½ turn, then tighten it.

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

Nut, Bolt, and Fastener to be checked

Wheels:
- Front Axle Nut
- Front Axle Clamp Nut
- Rear Axle Nut
- Rear Axle Nut Cotter Pin

Brakes:
- Front Master Cylinder Clamp Bolts
- Front Caliper Mounting Bolts
- Brake Cam Lever Bolt
- Torque Link Nuts
- Torque Link Nut Safety Clips
- Brake Lever Pivot Nut
- Brake Pedal Bolt
- Brake Rod Clevis Pin Cotter Pin

Suspension:
- Front Fork Clamp Bolts
- Front Fender Mounting Bolts and Screws
- Rear Shock Absorber Nuts
- Swing Arm Pivot Shaft Locknuts

Steering:
- Stem Head Bolt
- Handlebar Clamp Bolts

Engine:
- Engine Mounting Bolts and Nuts
- Engine Mounting Bracket Nuts, Bolts
- Muffler Connecting Pipe Clamp Bolts
- Muffler Mounting Nuts
- Muffler Mounting Bolts
- Exhaust Pipe Holder Nuts
- Shift Pedal Bolt
- Clutch Lever Pivot Nut

Others:
- Side Stand Pivot Bolt and Nut
- Front Footpeg Circlips
- Rear Footpeg Circlips
- Right Switch Housing Screws
- Front Footpeg Bracket Bolts
- Rear Footpeg Bracket Bolts and Nuts

LIST OF ABBREVIATIONS

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

Read OWNER'S MANUAL before operating.

MODEL APPLICATION

Year	Model	Beginning Frame No.
1986	ZL500-A1 (European Model)	ZL500A-000001
	ZL600-A1 (US Model) (other than US Model)	JKAZL4A1□GA000001, or ZL600A-000001

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

KAWASAKI
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Part No. 99924-1073-51