

Engine Lubrication System

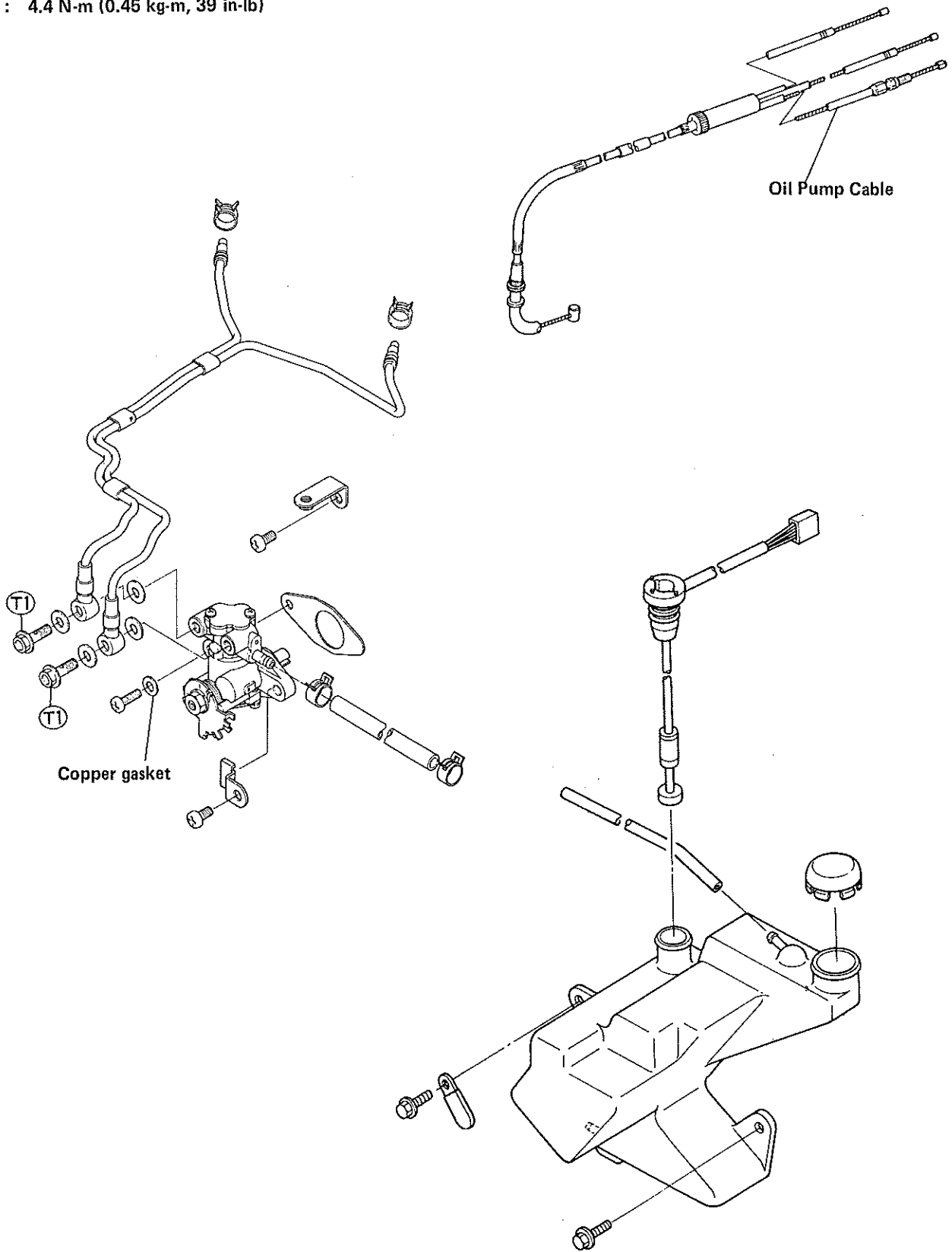
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6-2 ENGINE LUBRICATION SYSTEM

Exploded View

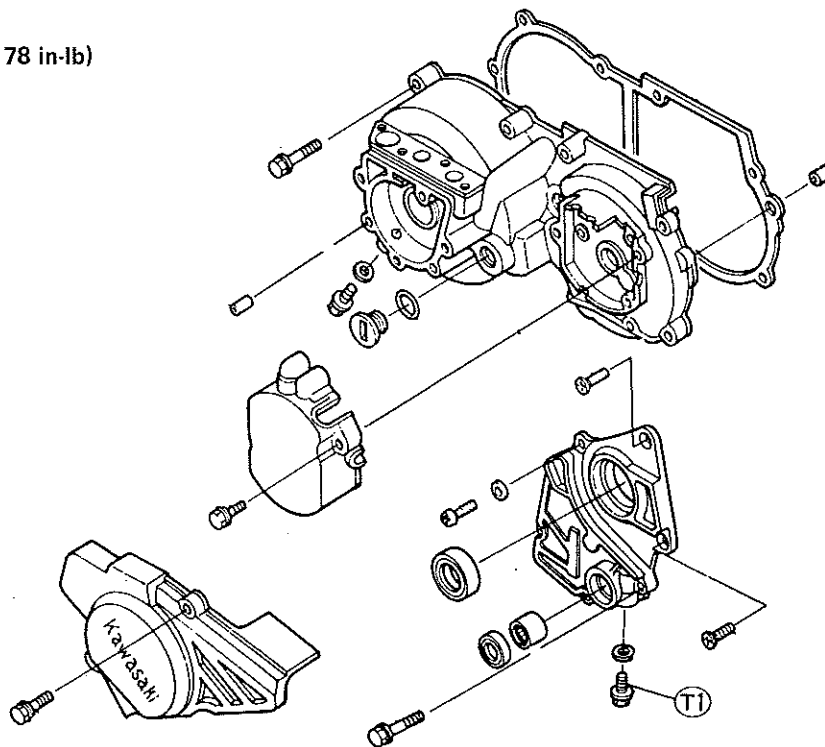
T1: 4.4 N-m (0.45 kg-m, 39 in-lb)



Specifications

Item	Standard	Service Limit
Engine Lubrication System:		
Transmission oil: Grade	SE class	
Viscosity	SAE 10W30 or 10W40	
Amount	1.1 L	
Engine oil pump: Oil pump output @2,000 r/min (rpm), 3 min.	3.7 – 4.6 mL (per one outlet)	---

Transmission Drain Plug
 T1: 8.8 N-m (0.9 kg-m, 78 in-lb)



6-4 ENGINE LUBRICATION SYSTEM

Transmission Oil

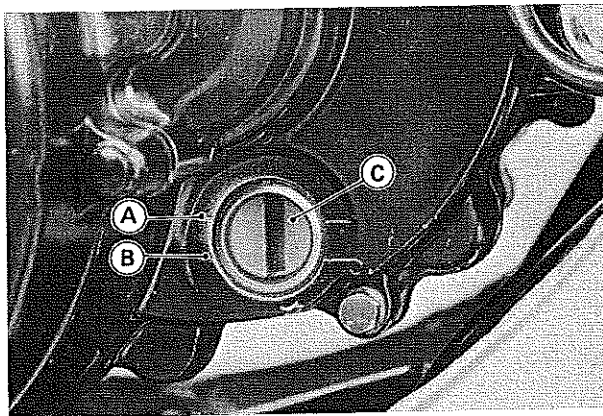
In order for the transmission and clutch to function properly, always maintain the transmission oil at the proper level and change the oil periodically.

WARNING

Motorcycle operation with insufficient, deteriorated, or contaminated transmission oil will cause accelerated wear and may result in transmission seizure, accident, and injury.

Oil Level Inspection

- If the motorcycle has just been used, wait several minutes for all the oil to drain down.
- If the oil has been poured in since the motorcycle was last used, kick the engine over 3 or 4 times with the ignition switch left in the OFF position. This ensures that the oil will "settle".
- Situate the motorcycle so that it is perpendicular to the ground.
- Check the oil level through the oil level gauge.
- ★ The oil level should come up between the upper and lower levels.



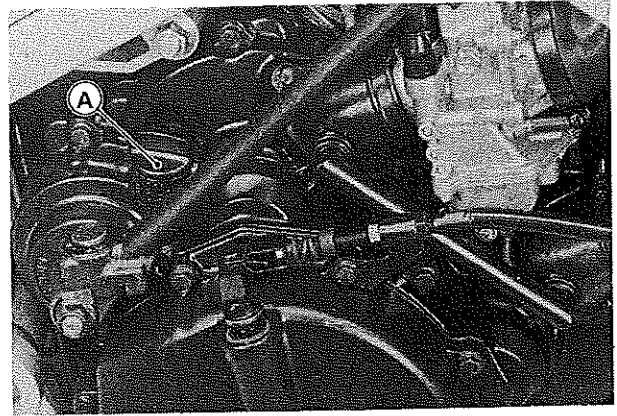
A. Upper Level
B. Lower Level

C. Oil Level Gauge

- ★ If the oil level is too high, remove the excess oil, using a syringe or some other suitable device.
- ★ If the oil level is too low, add oil through the oil filler opening. Use the same type and make of oil that is already in the engine.

NOTE

If the oil must be refilled but the type and brand of the oil that already is in the engine are unidentified, change the oil in the engine completely.

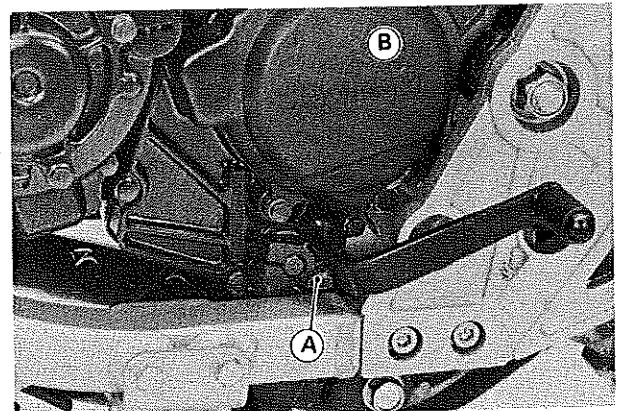


A. Oil Filler Opening Plug

- Install the oil filler opening plug.

Oil Changing

- Warm up the engine thoroughly so that the oil will pick up any sediment and drain easily. Then stop the engine.
- Place an oil pan beneath the engine.
- Remove the transmission drain plug.



A. Transmission Drain Plug B. Chain Cover

- With the motorcycle perpendicular to the ground, let the oil completely drain.
- After the oil has completely drained, install the drain plug with its gasket. Proper torque for it is shown in Exploded Views.

NOTE

Replace the damaged gasket with a new one.

- Fill the engine up to the proper level with a transmission oil specified in the table.
- Check the oil level.

Transmission Oil

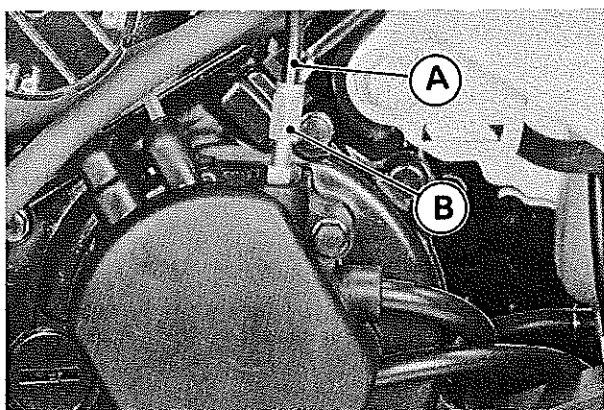
Grade	:	SE class
Viscosity	:	SAE 10W30 or 10W40
Capacity	:	1.1 L

Oil Pump and Carburetor Synchronization

Oil pump cable stretch will upset the synchronization between the oil pump and the carburetor, necessitating pump cable adjustment.

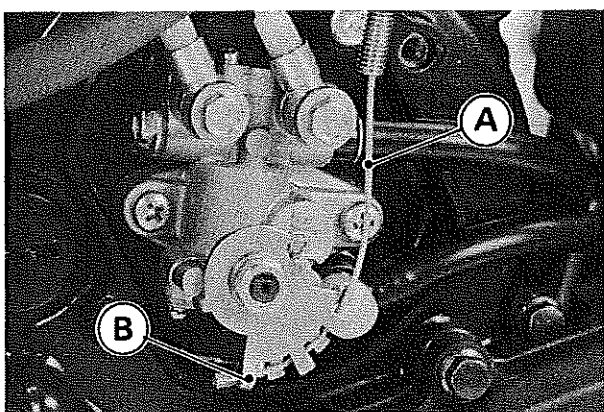
Synchronization Inspection

- Check the throttle grip play. (see Throttle Grip Inspection).
- Remove the oil pump cover.
- Check to see that the outer cable end of the oil pump is fully seated in the cable adjuster.



A. Outer Cable B. Cable Adjuster

- Make sure the tab on the oil pump lever is bent to hold the oil pump inner cable securely.



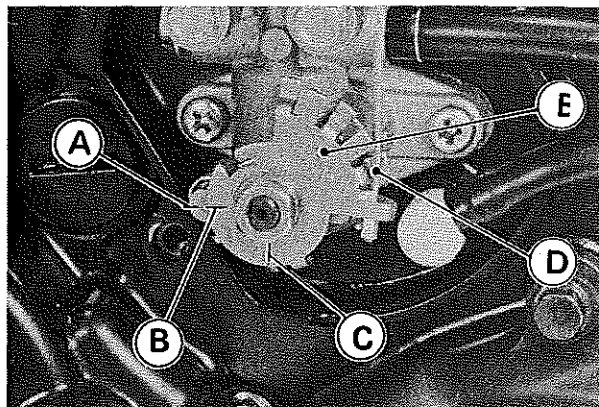
A. Inner Cable B. Tab

- Turn the throttle grip fully, and check to see if the synchronization mark on the pump lever aligns with the mark on the lever stop.

NOTE

○The pump lever has two marks on it. One is the synchronization mark which is used to check the oil pump synchronization, and the other is the idle mark which is not used during oil pump synchronization.

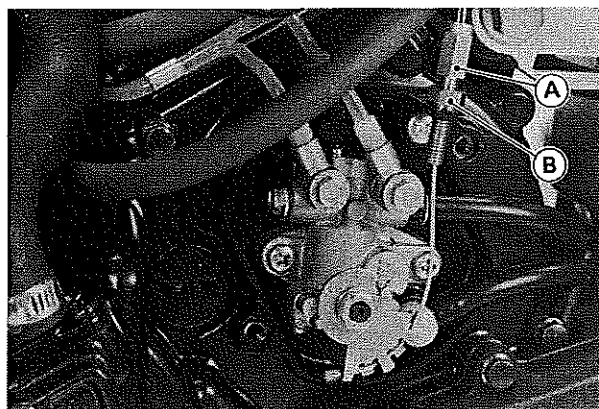
- ★If they do not line up, adjust the oil pump cable as follows.



A. Mark on Lever Stop D. Inner Cable
B. Synchronization Mark E. Pump Lever
C. Idle Mark

Synchronization Adjustment

- Loosen the oil pump cable adjuster locknut, and turn the adjuster to synchronize the pump with the carburetor.



A. Cable Adjuster B. Locknut

- Tighten the locknut, and check the pump synchronization. Re-adjust if necessary.
- Install the oil pump cover.

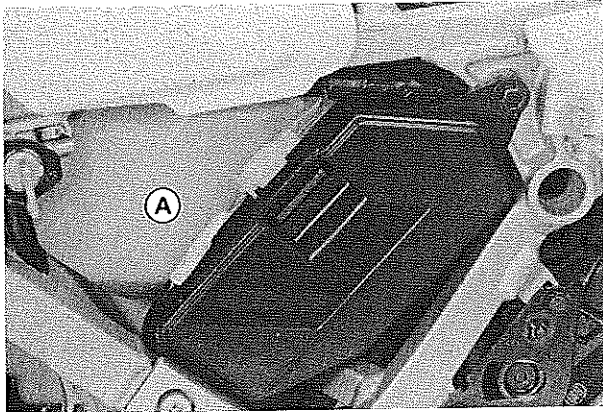
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Engine Oil Pump

Bleeding the Oil Pump

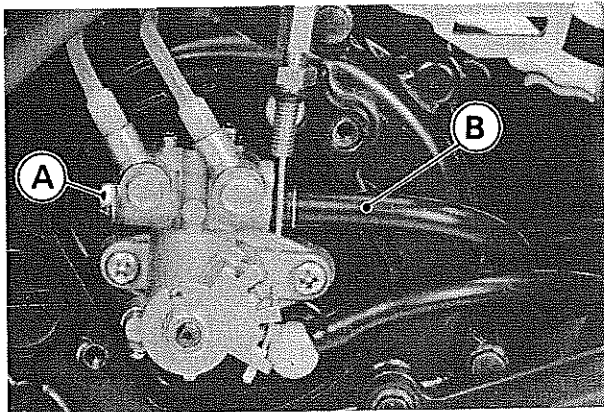
When either of the oil pump hoses has been removed, air may become trapped inside, which will obstruct oil flow.

- First check that there is plenty of engine oil in the oil tank.



A. Oil Tank

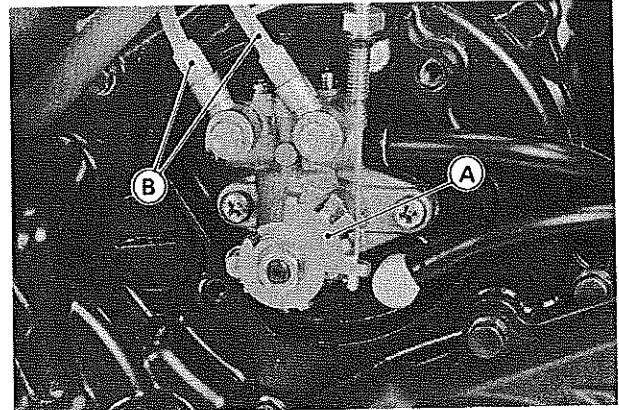
- Remove the oil pump cover.
- Bleed the air from the oil pump inlet hose and oil pump body by backing out the bleeder bolt on the oil pump body a couple of turns. Leave it until the oil flows out of the bleeder bolt, and tighten the bolt securely.



A. Bleeder Bolt B. Inlet Hose

- Bleed the air from the outlet hoses with the engine idling (below 2,000 rpm), and with the oil pump lever opened fully to maximize the pump output by pulling the oil pump cable outer tube.
- Keep the engine idling until the air is completely pumped out.

- ★ If air bubbles continue to appear in the outlet hoses, check the oil hose connections at the pump and tank.



A. Oil Pump Lever: opened fully B. Outlet Hose

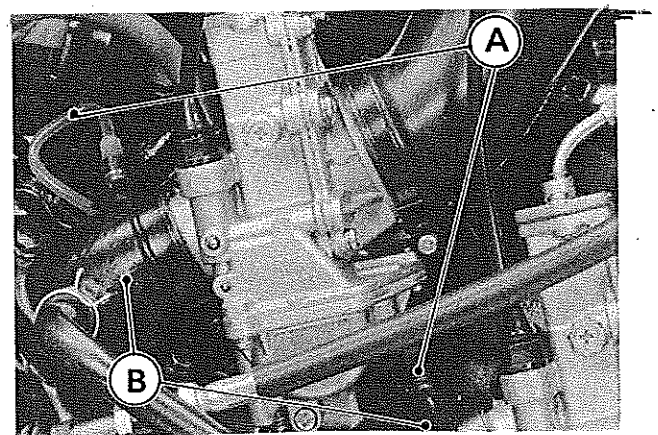
Oil Pump Performance Test

CAUTION

- Use a 30:1 mixture of gasoline to oil in the fuel tank or the optional fuel tank in place of the gasoline normally used.
- Make sure the work area is well ventilated.

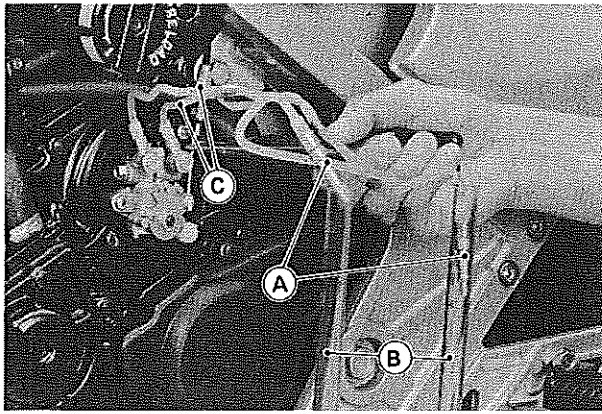
If a drop in oil pump performance is suspected, check the rate that the oil is being pumped.

- Remove the oil pump cover.
- Remove the oil pump outlet hoses from the carburetor holders. Fit the holes with suitable bolts ($\phi 6$ mm \times L16 mm) instead of the outlet hoses.



A. Outlet Hoses B. Carburetor Holder

- Lay the hoses as shown in the figure, to lead the pump output into containers.



A. Check Valve
B. Container
C. Outlet Hose

- Start the engine, and keep it at 2,000 rpm.
- Opening the oil pump lever fully, collect the oil that is, being pumped for 3 minutes. If the each quantity of oil collected corresponds with the table, the oil pump is operating properly.

Oil Pump Output

Standard: 3.7 – 4.6 mL per one outlet hose

† 3 minutes measurement at 2,000 rpm of engine speed, oil pump lever fully opened.

- ★ If the oil pump output is subnormal, inspect the oil pump, the inlet and outlet tubes for oil leaks.
- ★ If any oil leaks is not found, replace the oil pump.

Oil Pump Check Valve Inspection

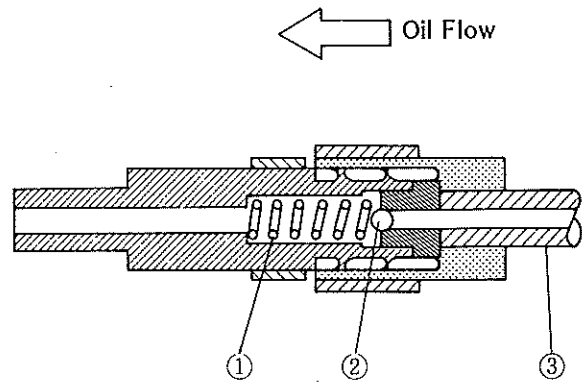
The check valve opens when oil pressure is in the direction of the indication mark, and allows oil flow in that one direction only. When the engine or the oil pump is stopped, the check valve stops oil flow, and any oil that has passed a check valve is prevented from returning.

- Check valves are assembled at the end of the outlet hoses and can not be removed from the tube.
- If oil will not pass through the check valve, clean the valve out by using a high flash-point solvent in a squirt gun or syringe.
- ★ If the check valve does not work properly after being cleaned out, whether allowing oil to pass in both directions or not allowing oil to pass at all, replace the outlet hoses.

CAUTION

- Do not use compressed air on the valve since doing so would damage the valve spring.

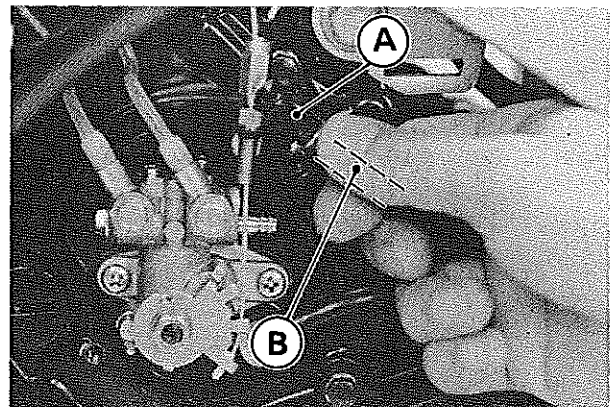
Check Valve



- 1. Spring
- 2. Steel Ball
- 3. Outlet Hose

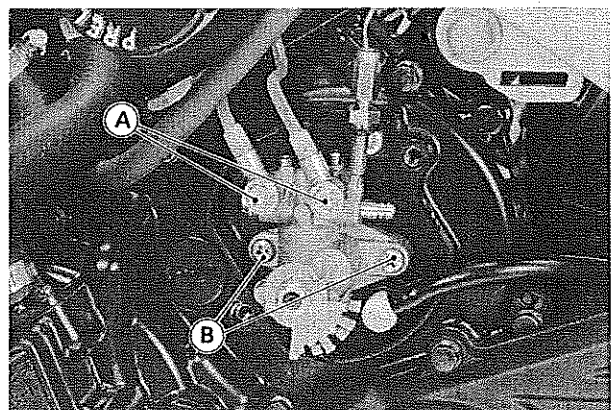
Oil Pump Removal

- Remove the oil pump cover on the engine left side.
- Pull off the oil pump inlet hose. Screw one of the mounting bolts into the inlet hose to keep the oil from flowing out.



A. Bolt
B. Inlet Hose

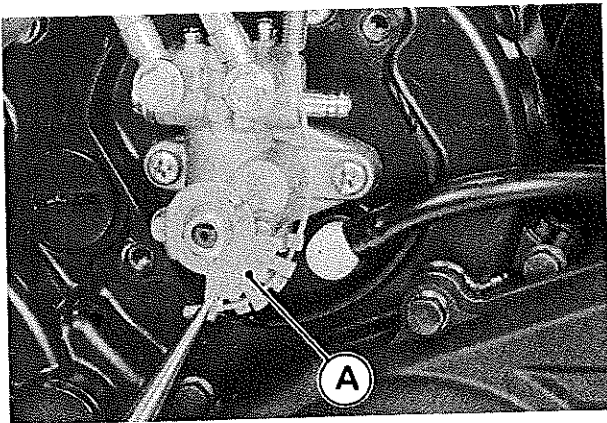
- Remove the banjo bolts of the oil pump outlet hoses.



A. Banjo Bolts
B. Screws

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- Remove the oil pump cable from the oil pump lever.



A. Oil Pump Lever

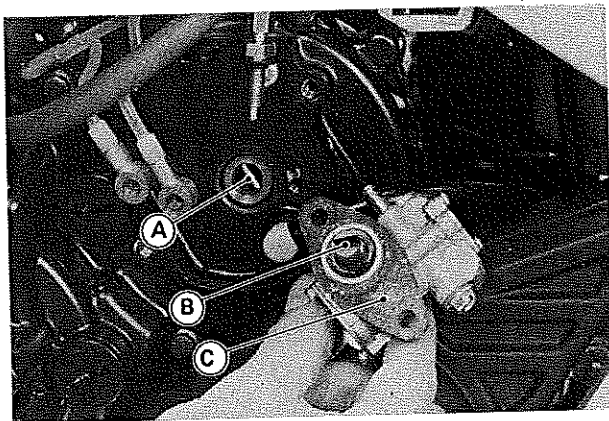
- Remove the oil pump.

Oil Pump Installation Notes

CAUTION

- Do not attempt to install the left engine cover with the pump installed, or the pump may be broken.

- Install the new gasket.
- When mounting the oil pump, note the position of the pin in the crankshaft, and then turn the oil pump shaft so that it will fit onto the pin.

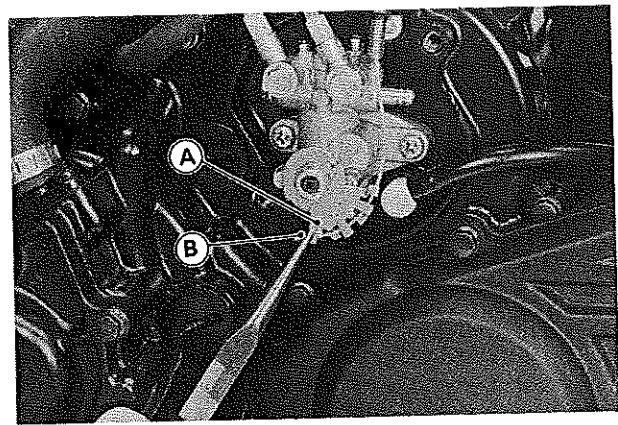


A. Crankshaft Pin
B. Pump Shaft Slot
C. Gasket

- Install the pump cable.

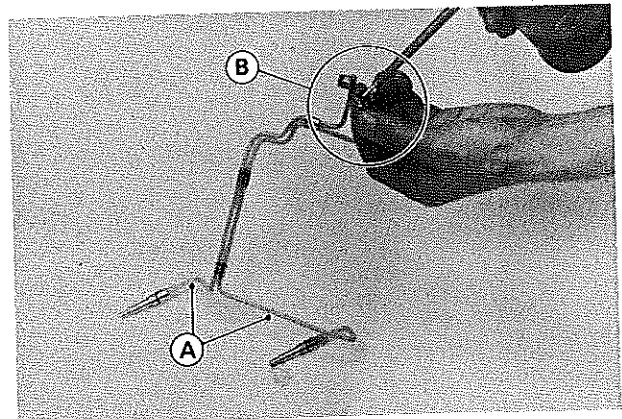
CAUTION

- Make sure the tab on the oil pump lever is bent to hold the cable nipple securely. If loose, the cable may slip out, resulting in piston seizure.



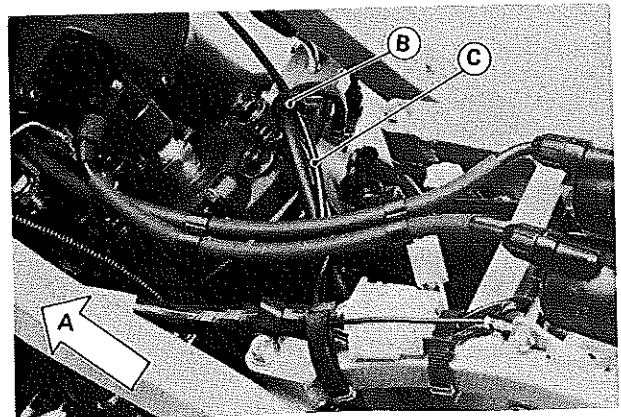
A. Tab
B. Cable Nipple

- Install the inlet hose.
- Fill the outlet hoses with 2-stroke oil. This shortens air bleeding time.



A. Outlet Hose
B. Apply a 2-stroke oil.

- Bleed the oil pump (see Oil Pump Bleeding).
- Route the oil pump cable as shown.



A. Front
B. Clamp
C. Oil Pump Cable

- Adjust the oil pump cable (see Oil Pump Synchronization).

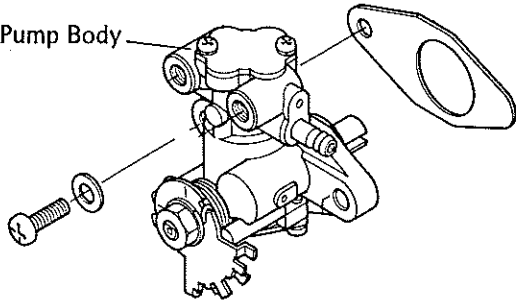
Oil Pump Assembly Caution

CAUTION

⊖If the trouble is with internal parts of the oil pump, replace the pump as a unit. The pump is precision made with no allowance for replacement of individual parts.

Oil Pump

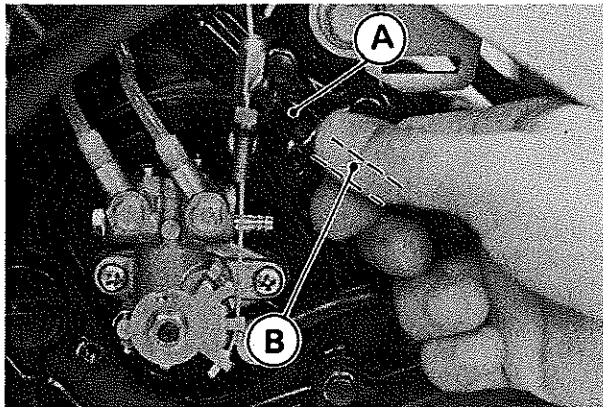
Oil Pump Body



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Engine Oil Tank
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Removal Note

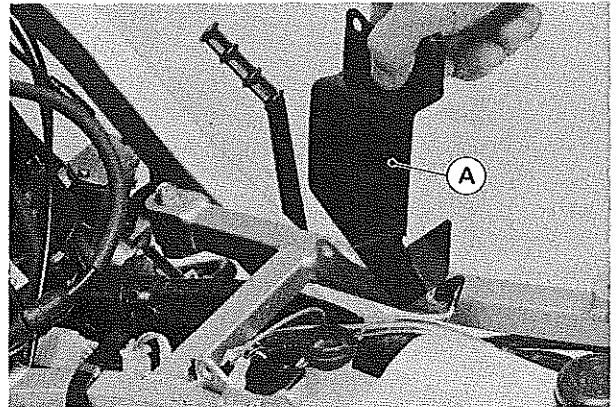
- Remove the oil pump cover. Pull off the oil pump inlet hose. Screw one of the mounting bolts into the inlet hose to keep the oil from flowing out, and keep the end of the hose upward.



A. Mounting Bolt B. Inlet Hose from the Tank

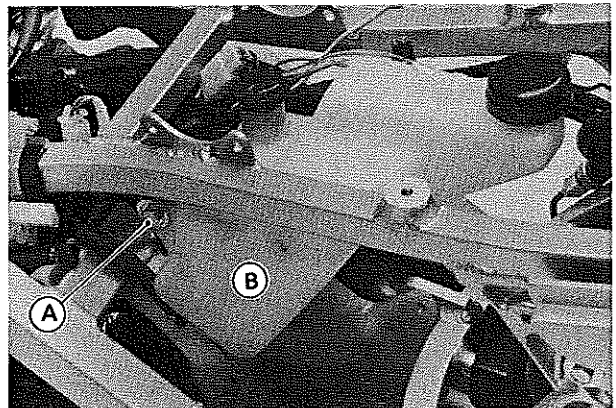
- Remove the following parts (see Rear Muffler Removal in Engine Top End).
 - Seat and fuel tank
 - Tool case
 - Storage case
 - Battery and battery case
 - Rear brake master cylinder and brake hose

- Remove the ignition coils and brakcet.



A. Ignition Coil Bracket

- Remove the oil tank.



A. Bolt B. Oil Tank

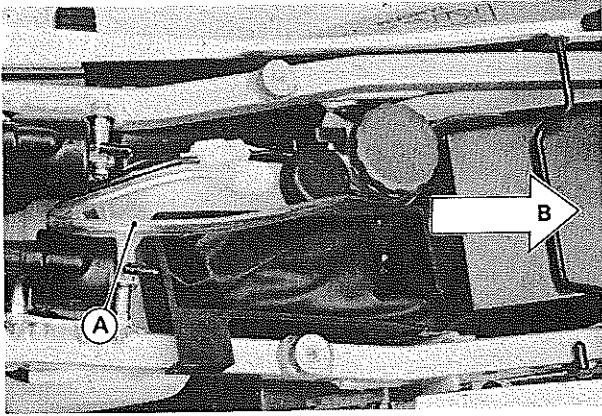
Oil Tank Installation Note

- Route the oil tank breather tube, being sure that the tube does not get pinched or twisted.
- Make sure the tube is kept away from the rear muffler.

CAUTION

- Always keep the oil tank breather tube free of obstruction, and make sure it does not get pinched, crimped, bent sharply, or melted by the exhaust pipe. If the breather is obstructed, engine oil flow to the oil pump will be hindered and serious engine damage will occur.

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A. Breather Tube

B. Rear

★If any air has gotten trapped in the oil pump inlet hose, bleed the oil pump (see Oil Pump Bleeding).

CAUTION

○To avoid serious engine damage, air in the oil pump line must be removed by bleeding.