

**Sifton Oil Pump Assembly** features improved oil pump pressure regulation that will ensure correct oiling to all areas of BT engines. This pump kit includes all necessary fittings, snap rings, keys, gaskets and mounting bolts. Can be used either on chain drive or belt drive models. **Note:** On 1970-80 models a drilling operation is required. Oil pump kits with breather include drive gear gasket, breather gear and washers.

Pump	Pump W/Breather	Year	Finish
12-9969		1936-72	Polish
12-9970		1936-72	Chrome
	12-9800	1936-53	Polish
	12-9801	1936-53	Chrome
	12-9806	1954-72	Polish
	12-9807	1954-72	Chrome
12-9969	12-9800	1936-72	Polish
12-9971	12-9802	1973-91	Polish
12-9972	12-9803	1973-91	Chrome
12-9975	12-9804	1992-99	Polish
12-9976	12-9805	1992-99	Chrome

740-701

### Installation Instructions

#### Step: 1). Disassembly

- A. Remove old oil pump and, if applicable, locating dowels and mounting studs from crankcase.
- B. Adequate clearance should exist between oil pump body and crankcase by temporarily installing pump assembly on crankcase. In some instances it may be necessary to remove small amount of material from pump body to obtain correct fit.

**NOTE:** If modification of pump body is necessary, remove minimum amount of material required to properly position oil pump on crankcase. Take special care not to damage gasket surfaces. After modification, clean pump body thoroughly with suitable parts cleaner and compressed air to remove metal filings generated during procedure. Remove all traces of solvent prior to installation.

### CAUTIONS

- Failure to clean oil pump before engine assembly may result in engine damage.
- Improper oil pump installation due to incorrect identification of crankcase year group may result in engine damage.

**CAUTION-** Do not perform Step 2 or 3 on stock 1936-69 crankcases or any other crankcase with angled tappet screen passage. Drilled passage will intersect tappet screen oil passage resulting in loss of oil pressure and serious engine damage.

#### Step: 2). Crankcase Modification – 1970-1972 Only – Plug 3/16” Oil Overflow Hole.

- A. If engine has been removed from chassis, CAREFULLY enlarge hole with .203” (13/64”) drill. If engine has not been disassembled, apply grease to bit and both ends of hole to catch chips. Wrap masking tape around drill .225” from point to use as depth guide. If engine is in chassis, enlarging hole may be difficult. In this case hole may be tapped without enlarging, but extreme caution is required to avoid breaking tap off in hole.

**CAUTION – Drill bit o.d. is close to hole size and may distort hole if drill is not steadied. Distorted hole may cause poor thread fit after hole is tapped.**

- B. Using ¼-20 tap hole deep enough for ¼-20 set screw provided in kit to rest flush with or slightly below gasket surface. If necessary, reapply grease to both sides of hole before inserting tap. Use straight edge to confirm set screw does not protrude above gasket surface.

**NOTE** - Do not tap hole deeply enough for screw to be threaded completely through hole. Goal is to have screw tighten just as it becomes flush with or slightly below oil pump gasket surface.

- C. Apply Loctite to threads and install ¼-20 set screw.

**Step: 3). Crankcase Modification – 1970-1972 – Only. Drill Pressure Valve Relief Hole.**

- A. Install Oil Pump Drill Jig, VT No. 16-0986, on oil pump gasket surface of crankcase.  
B. Use .125" (1/8") drill bit to pressure relief hole into gear cavity. Apply grease to bit and both sides of case. Withdraw drill frequently during procedure to clear chips.

**Step: 4). Optional Crankcase Modification – 1948-1962 or 1966-1969 Plug and Redrill Crankshaft Feed Hole.**

**NOTES:**

- This modification is recommended only if hydraulic lifters are used. Object of modification is to alter 1948-1962 and 1966-1969 crankcases to 1973-later style oiling. With this system heads and lifters get primary, unrestricted oil supply. Main and rod bearings in lower end get secondary, low pressure oil after top end is supplied.
- 1963-1965 and other Panheads with outside oilers cannot utilize Step #4, Optional Crankcase Modification, due to different oil supply system.

**CAUTION – If performed on outside oiler Panheads, modification described in Step 4 will cause oil starvation to top end and extensive oil damage.**

- A. Wrap masking tape around .203" (13/64") drill bit .850" from point to use as depth guide. Carefully drill hole in .850" deep.

**NOTE** – Drill size is very close to hole size and may distort hole if drill is not steadied.

**CAUTION – Distorted hole may cause poor thread fit after hole is tapped.**

- B. Using ¼-20 tap, carefully thread hole deeply enough for ¼-20 set screw provided in kit to bottom out with screw head .540" to .600" below gear surface. Remove tap periodically, clear chips and install set screw to check depth.

**NOTE:** - Do not tap hole deeply enough for set screw to block tappet screen oil feed passage. This will restrict oil supply to lifters and cylinder heads.

**CAUTION – Restricted oil supply may cause extensive engine damage.**

- C. On 1948-1952 crankcases, blow air into intersecting hole in pump gasket surface to remove chips. On 1953-1969 crankcases, remove oil plug and lifter screen filter assembly and blow air into passage to remove chips.

**NOTE:** - Before attempting to remove chips, remove set screw to allow chips to escape.

**WARNING – Compressed air and particles dislodged by compressed air are potentially harmful. Wear protective goggles when using compressed air and direct air stream away from yourself and others nearby.**

- D. Apply Loctite to threads of ¼-20 set screw provided and install screw to depth of .540" to .600" below gear cover gasket surface.  
E. Install Oil Pump Drill Jig, VT No. 16-0986; on crankcase oil pump gasket surface.  
F. Wrap masking tape around .187" (13/16") drill bit .750" (3/4") from drill point. Using tape as depth guide, drill hole into pump gasket surface .375" (3/8") deep, until it breaks into passageway just tapped. (Hole to be drilled is 3/8" deep and drill jig is 3/8" thick 3/8"+3/8"=3/4").

**NOTE:** - Do not drill hole too deep. Hole must not extend into gear cavity side of crankcase.

**CAUTION – Improperly drilled feed hole may cause oil to bleed off into gear cavity resulting in oil pressure loss and possible engine damage.**

- G. Remove drill jig and blow air into passage to remove chips.

**CAUTION – Metal filings, dirt and other foreign matter can cause extensive damage to oil pump and engine.**

**WARNING – Compressed air and particles dislodged by compressed air are potentially harmful. Wear protective goggles when using compressed air and direct air stream away from yourself and others nearby.**

**Step: 5). Optional Bottom Supply – All Years.**

- A. Determine whether you wish oil supply to feed in top or bottom of pump cover.
- B. Remove and position “S” (supply) fitting accordingly.

**Step: 6). Primary Chain Oil Supply – 1936 to 1964 Only.**

- A. Remove small hose fitting to the right of “S” fitting on top of pump cover.
- B. Install 1/16” pipe plug provided in hardware package.
- C. Install brass washer, 10-32 locknut and adjuster screw provided in hardware package into threaded hole in side of pump body and bottom screw two or three times to seat screw properly.

**NOTE:** - *Installing plug screw instead of needle valve adjusting screw will not shut off flow of oil, resulting in excess oil blown from the breather.*

**NOTE:** - *Do not over tighten adjusting screw.*

**CAUTION – If screw is over tightened, damage to threads in pump body and/or adjusting screw seat may result.**

- D. Turn screw out about ½ turn and tighten locknut against brass washer and body.

**NOTE:** - *After engine has been run for a period of time it may be necessary to readjust screw to achieve desired oil volume to primary chain. More often than not, final screw setting will be closer to the fully closed position.*

**Step: 7). Primary Chain Oil Supply – 1965 to 1972 Only.**

- A. Use small hose fitting to the right of “S” fitting on top of pump cover for primary chain oil supply.
- B. Install brass washer, 10-32 locknut and adjuster screw provided in hardware package into threaded hole in side of pump body and bottom screw two or three times to seat screw properly.

**NOTE:** - *Do not over tighten adjusting screw.*

**CAUTION – If screw is over tightened, damage to threads in pump body and/or adjusting screw seat may result.**

- C. Turn screw out about 1-1/2 turns and tighten locknut against brass washer and body.

**NOTE:** - *This setting should provide about 1 to 1-3/4 Ozs./minute of flow to primary chain @ 2500 RPM. This can be checked by disconnecting hose to primary chain and measuring delivery of pump into measuring container for one minute @ 2500RPM after engine has been warmed to operating temperature.*

**Step: 8). Oil Pump Installation – All Years.**

- A. Thoroughly clean complete pump assembly of all contamination. Recoat all moving parts with oil.

**CAUTION – Metal filings, dirt and any other foreign contamination in the engine oil may cause premature wear and/or irreversible damage to the oil pump, bearings and other internal engine components.**

- B. Install oil pump in a normal fashion following standard procedures. Use ¼-24 mounting bolts provided for 1948 to 1978 installations and ¼-20 mounting bolts provided for 1979 to present installations. Use flat washers provided only on 2-3/4” bolts and lock washers only on 1-1/2” bolts. Final torque specifications of 90-120 in. lbs. are recommended with paper gaskets.

**NOTE:** - *Pump bodies, covers and gaskets look similar to stock parts but are unique. THEY MUST NOT BE MIXED WITH STOCK PARTS.*

**CAUTION – Improper combinations of oil pump parts may impair the overall function of the pump resulting in oil leaks, improper oil pressure and possible damage to engine.**

- C. Install drive shaft gear key and snap ring, taking care not to stretch or otherwise damage snap ring.

**NOTE:** - *Insure that drive shaft key and snap ring are installed properly. If snap ring is installed incorrectly, sprung or otherwise damaged, it may become dislodged or allow gear key to come out.*

**CAUTION – Loss of oil pump drive gear snap ring or key will result in disengagement of oil pump causing loss of oil pressure and possible engine damage.**

- D. Prime pump by removing oil pump check ball valve and injecting clean motor oil into pump supply fitting while turning oil pump drive gear. (A large plastic squeeze bottle works well for priming pump.) Replace check ball, spring and cap after oil fills check ball cavity.

**CAUTION – “Air lock” or cavitation can occur if trapped air is not released from oil pump after installation. It can occur with new pump as well as used pump that has been removed from engine and interferes with oil circulation. It is installer’s responsibility to remove trapped air by priming pump prior to running engine and to confirm correct pump operation with engine running.**

- E. Install pinion shaft oil pump drive gear, pinion gear and remaining parts in gear case following standard H-D procedure. Note that pinion shaft oil pump drive gear has chamfer on one side. Place gear on pinion shaft with chamfer toward shoulder on shaft, facing center of engine. Connect all lines.

**CAUTION – Installing pinion shaft oil pump drive gear backwards on pinion shaft may cause stress riser resulting in eventual failure of shaft. Damage caused by incorrect installation of gear or other parts is not covered under warranty.**

### **Step: 9). Initial Startup and Post-Operation Checks – All Years.**

After pump has been installed and primed, oil lines connected in correct manner and oil tank filled to correct level, confirm oil circulation with oil pressure gauge and by removing cap from oil tank and observing oil return to tank. If oil is not seen returning to tank, remove return line from tank and placing end in drain pan to confirm oil circulation.

**NOTE:** - Engine oil circulates under pressure. Areas exposed to escaping oil should be covered with rags and engine turned off immediately after oil circulation is confirmed to minimize oil loss.

**WARNING – Oil on tires or brakes can cause loss of control of motorcycle resulting in serious injury to operator or others.**

- A. After confirming oil circulation, run engine for several minutes and check for leaks.  
B. If applicable, confirm flow rate of primary chain oiler.

### **NOTES:**

- *Low oil pressure is often blamed on oil pump when actual cause is worn bushings or another internal component. A new oil pump will not correct problems caused by worn parts and excessive operating clearances. If low oil pressure exists after new oil pump is installed, check bearing clearances and other possible causes such as installation of different gear cover, tappet guides, etc.*
- *With engine hot, typical oil pressure reading is 3-4 PSI at 1000 RPM idle, 12-15 PSI at normal highway speeds or approximately 2500 RPM. Faulty oil pressure gauge should not be overlooked as possible source if low pressure reading is encountered. H-D warning light comes on at approximately 3 PSI, and is fairly reliable. Light may flicker at low RPM, but should quickly go out with slight increase in engine speed.*
- *Sudden clatter in previously quiet hydraulic lifter may indicate lifter failure OR excessively low oil pressure and should be investigated. It is not unusual for hydraulic lifters to clatter when a new or recently rebuilt engine is first started, but noise should disappear as lifters pump up. Time required depends on several factors including brand of lifter and temperature.*

### **ADDITIONAL NOTES:**

- **Excess oil in Knuckleheads** – Due to the method of removal or rocker arm oil in Knuckleheads, the increased oil volume generated by pump may be more than the removal system can scavenge. If returning oil in these engines becomes a problem, it can be corrected by metering the flow of oil to the heads through the oil line fitting in the gear cover.
- **Belt drive primarys** – Installation of a primary belt drive on an oil pump equipped engine is not a problem.
- **1936 to 1964 crankcase using** – Shut off metering screw on side of pump body and remove fitting in pump cover and replace with 1/16” pipe plug provided.