Instruction Sheet 51-1019
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Because every industry has a leader

Special Instructions For Fully Assembled S&S Flywheel Sets

EXCEPT FOR S&S TWIN CAM STYLE FLYWHEELS, PRESENT S&S FLYWHEELS ARE NOT COMPATIBLE WITH HARLEY-DAVIDSON ELECTRONIC FUEL INJECTION (EFI) MODELS.

General Information
When purchasing any set of S&S flywheels, other than Twin Cam style, customers have the option of purchasing replacement mainshafts and connecting rods. If connecting rods and both mainshafts are ordered, the customer may also choose to have the flywheels assembled by S&S. Twin Cam style flywheels are only sold complete with connecting rods and mainshafts, and almost all Twin Cam style flywheels are sold as complete assemblies.

S&S flywheels are assembled using the mainshafts and connecting rods ordered with the kit. The flywheel assembly is then trued by S&S technicians to a maximum of .001" runout. Typical runout on the bearing surfaces of the mainshafts is less than .0005". The flywheel assembly is then balanced to the specified pistons, with our dynamic balancing machine. All possible care is taken to insure that the assembly is correct, clean, and ready to install in the specified year engine.

The packaging system used by S&S to ship flywheel assemblies is designed to keep the parts clean and true during shipping. This system has proven very reliable and effective. S&S has never had a set of flywheels arrive at it's destination out of true because of poor packaging.

NOTE - If flywheel assembly is checked for runout, measurements should be taken on mainshaft bearing surfaces. Measurements taken on flywheel rim or face will show runout well in excess of .001".

Before installing this assembly, please take time to familiarize yourself with the instructions provided with the kit. All S&S flywheel assemblies are shipped with appropriate kit instructions and S&S connecting rod instructions. Pinion shaft instructions are also supplied with kits for Big Twins from 1954 to present. It is a good idea to save these instructions for future reference.

Preparation For Installation
1. Remove assembly from packaging material. Handle with care to avoid dropping assembly. Avoid any sharp blows to the mainshafts which could potentially shift the flywheels out of true.
2. Using a clean lint free cloth, thoroughly clean flywheel assembly to remove rust preventative oil. Rust preventative oil is not suitable for use as engine oil and must be removed prior to installation. Be sure that assembly remains free of foreign material or contamination before and during installation.

NOTE - Do not immerse or wash assembly in solvent. Connecting rod bearings are coated with assembly grease which may become contaminated by dirt and grit unless absolutely new, clean solvent is used.

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

NOTE - Be sure no Styrofoam "crumbs" from packaging are left on parts. Styrofoam is not abrasive, but it can plug oil feed passages.

CAUTION - Blocked oil feed passages can restrict the flow of oil and may cause premature wear and possible destruction of internal engine components.

3. Inspect assembly to make sure flywheel style, diameter, stroke, and mainshafts are correct for application.

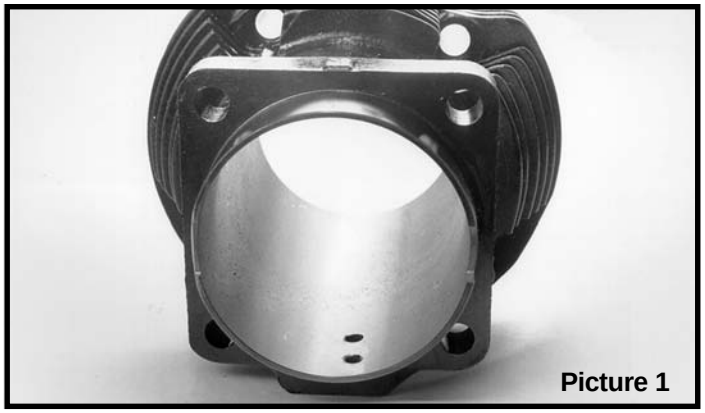
NOTES
- *Big Twin crankcases from 1954 to 1957 must be modified to use the larger diameter 1958 and later style pinion shaft main bearing.*
- *For Big Twin engines 1954 and later, pay particular attention to oil feed hole in bushing end of pinion shaft. Engines before 1973 normally require side oiling pinion shaft. Engines from 1973 and later normally require end oiling pinion shaft. If incorrect pinion shaft type is installed, oil will not be delivered to connecting rod bearings.*

CAUTION - Insufficient oil to connecting rod bearings may cause premature wear or destruction of bearings, races, crankpin, and other internal engine components.

4. Install flywheels in crankcases according to H-D factory procedures and steps outlined in S&S kit instructions.

NOTES:
- *Do not use press to install Timken bearings on sprocket shaft as this can push flywheels out of true.*
- *Do not hammer pinion gear and oil pump drive gear keys into grooves in pinion shaft. If key is tight in groove, file side of key to obtain proper fit.*

CAUTION - Hammering key into tight groove may knock flywheels out of true and may cause irreparable damage to pinion shaft.



Picture 1

5. For Panhead and Shovelhead engines of 4½" or longer stroke, the oil return holes in the stock location must be plugged, and the crankcase must be modified to use the lowered oil return holes. This modification is necessary due to increased piston travel in longer stroke engines. Oil control ring position will be below stock cylinder oil return hole at the bottom of the stroke. If modification is not done, oil will be carried to the combustion chamber by piston rings causing engine to smoke.

NOTE - Engines with strokes shorter then 4½" do not require this step.

A. If using stock cylinder base gaskets, place base gasket on cylinder base gasket surface, and punch ¼" hole in gasket directly in center of oil return hole in base gasket surface of cylinder. S&S gaskets are pre-punched.
B. Place gasket on driveside crankcase half in its respective position. Mark crankcase gasket surface through ¼" diameter hole in gasket.
C. Drill ¼" diameter hole perpendicular into crankcase gasket surface ⅝" deep. **See Figure 1.**
D. Perform **Steps A through C** on other cylinder.
E. Bolt front and rear cylinders on drive side crankcase half.
F. Using lower oil return hole in cylinder spigots as a guide, drill ¼" diameter connecting holes in crankcase to intercept holes drilled ⅝" deep in **Step C**. **See Picture 1 and Figure 1.**

NOTES:

- *If base plates are to be used, be sure they are in place.*
- *Lower oil return hole in current production S&S cylinders is ½" on center below base gasket surface of cylinder. This dimension allows the use of up to 5" stroke using a ⅛" thick base plate. Some early production cylinders have lower oil hole located about 5/16" on center below gasket surface. These early production cylinders can be used with strokes up to 4¾" where base plates are not used.*

G. Clean dirt, filings, etc. out of passageways.
H. Press a piece of ¾" long x ⅜" O.D. steel tubing (Part #93-1032) provided in kit into oil return hole in base gasket surface until tubing is flush with surface. "Ream" hole slightly with drill to remove any burrs that may exist.

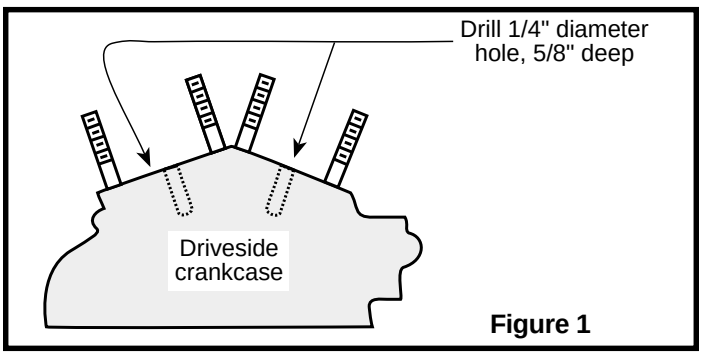


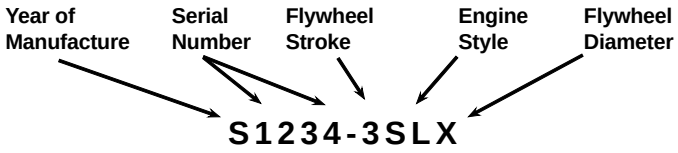
Figure 1

I. Clean with solvent and compressed air.

NOTE - A very tight press fit with 100% seal is not critical as tube will sufficiently divert oil flow to new hole. Loctite may be applied to tube if fit seems too loose.

Flywheel Identification

Style, stroke, and diameter of S&S flywheels can be determined by examining the serial number which is stamped on the rim of both flywheels in the set. Usually the flywheel serial number can be read through the timing plug hole of an assembled engine. Twin Cam style flywheel serial numbers are stamped on the inside rim of S&S flywheels. A cylinder must be removed in order to read serial number.



Big Twin Stroke Codes	
Code	Stroke
1	4⅜"
2	4½"
3	4¾"
4	5"
5	4 ¼" (Stock 80")
6	4⅝"
12	5¼"
13	3 ½" (Stock 61")
14	3 31/32" (Stock 74")
16	5⅛"
17	4"
18	3⅝"

BT Engine Style Codes	
Code	Engine Style
E	1936-'54
L	1955-'71
AL	1972-Early '81
SE*	1955-Early '81
BL	Mid 1981-Up
SL*	Mid 1981-Up
SF	1999-Up Twin Cam
J	Delkron 4 Cam
H	McClure 4 Cam

Sportster Stroke Codes	
Code	Stroke
1	4 1/16"
2	4 3/16"
3	4 5/16"
4	4 17/16"
6	4⅝"
7	4 13/16"
8	5"
11	4½"
12	5¼"
15	3 13/16" (Stock)
16	5⅛"

BT Diameter Codes	
Code	Engine Style
None	8½" (Stock)
A	8⅜" (Stock 61")
X	8¼"

XL Diameter Codes	
Code	Engine Style
None	7⅞" (Stock)
A	7¾"
X	7⅝"

XL Engine Style Codes	
Code	Stroke
None	1957-1976
B	1957-Early '81
SB*	1957-Early '81
BD†	1977-Early '81
SBD*†	1977-Early '81
C	Mid 1981-'85
SC*	Mid 1981-'85
SCD*†	Mid 1981-'85
SCDR*†‡	Mid 1981-'85
D§†	1986-Up V²
DR§T‡	1986-Up V²

* Flywheels machined for special S&S sprocket shaft and stock pinion shaft.

§ Flywheels machined for special S&S V² XL pinion and sprocket shafts.

† Flywheel machined to use either 1977 to 1986 style Torrington main bearing or 1987 and later style caged roller pinion shaft main bearing assembly.

‡ Machined for user 1986 and later stock XL connecting rod bearings.