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Because every industry has a leader

Special Instructions for Fully Assembled S&S® Flywheel Sets

EXCEPT FOR S&S® PRESS-TOGETHER FLYWHEELS.

DISCLAIMER:

S&S parts are designed for high performance, off road, racing applications and are intended for the very experienced rider only. The installation of S&S parts may void or adversely effect your factory warranty. In addition such installation and use may violate certain federal, state, and local laws, rules and ordinances as well as other laws when used on motor vehicles used on public highways, especially in states where pollution laws may apply. Always check federal, state, and local laws before modifying your motorcycle. It is the sole and exclusive responsibility of the user to determine the suitability of the product for his or her use, and the user shall assume all legal, personal injury risk and liability and all other obligations, duties, and risks associated therewith.

The words Harley®, Harley-Davidson®, H-D®, Sportster®, Evolution®, and all H-D part numbers and model designations are used in reference only. S&S Cycle is not associated with Harley-Davidson, Inc.

SAFE INSTALLATION AND OPERATION RULES:

Before installing your new S&S part it is your responsibility to read and follow the installation and maintenance procedures in these instructions and follow the basic rules below for your personal safety.

- Gasoline is extremely flammable and explosive under certain conditions and toxic when inhaled. Do not smoke. Perform installation in a well ventilated area away from open flames or sparks.
- If motorcycle has been running, wait until engine and exhaust pipes have cooled down to avoid getting burned before performing any installation steps.
- Before performing any installation steps disconnect battery to eliminate potential sparks and inadvertent engagement of starter while working on electrical components.
- Read instructions thoroughly and carefully so all procedures are completely understood before performing any installation steps. Contact S&S with any questions you may have if any steps are unclear or any abnormalities occur during installation or operation of motorcycle with a S&S part on it.
- Consult an appropriate service manual for your motorcycle for correct disassembly and reassembly procedures for any parts that need to be removed to facilitate installation.
- Use good judgement when performing installation and operating motorcycle. Good judgement begins with a clear head. Don't let alcohol, drugs or fatigue impair your judgement. Start installation when you are fresh.
- Be sure all federal, state and local laws are obeyed with the installation.
- For optimum performance and safety and to minimize potential damage to carb or other components, use all mounting hardware that is provided and follow all installation instructions.
- Motorcycle exhaust fumes are toxic and poisonous and must not be inhaled. Run motorcycle in a well ventilated area where fumes can dissipate.

IMPORTANT NOTICE:

Statements in this instruction sheet preceded by the following words are of special significance.



WARNING

Means there is the possibility of injury to yourself or others.



CAUTION

Means there is the possibility of damage to the part or motorcycle.

NOTE

Other information of particular importance has been placed in italic type.

S&S recommends you take special notice of these items.

WARRANTY:

All S&S parts are guaranteed to the original purchaser to be free of manufacturing defects in materials and workmanship for a period of twelve (12) months from the date of purchase. Merchandise that fails to conform to these conditions will be repaired or replaced at S&S's option if the parts are returned to us by the purchaser within the 12 month warranty period or within 10 days thereafter.

In the event warranty service is required, the original purchaser must call or write S&S immediately with the problem. Some problems can be rectified by a telephone call and need no further course of action.

A part that is suspect of being defective must not be replaced by a Dealer without prior authorization from S&S. If it is deemed necessary for S&S to make an evaluation to determine whether the part was defective, a return authorization number must be obtained from S&S. The parts must be packaged properly so as to not cause further damage and be returned prepaid to S&S with a copy of the original invoice of purchase and a detailed letter outlining the nature of the problem, how the part was used and the circumstances at the time of failure. If after an evaluation has been made by S&S and the part was found to be defective, repair, replacement or refund will be granted.

ADDITIONAL WARRANTY PROVISIONS:

- (1) S&S shall have no obligation in the event an S&S part is modified by any other person or organization.
- (2) S&S shall have no obligation if an S&S part becomes defective in whole or in part as a result of improper installation, improper maintenance, improper use, abnormal operation, or any other misuse or mistreatment of the S&S part.
- (3) S&S shall not be liable for any consequential or incidental damages resulting from the failure of an S&S part, the breach of any warranties, the failure to deliver, delay in delivery, delivery in non-conforming condition, or for any other breach of contract or duty between S&S and a customer.
- (4) S&S parts are designed exclusively for use in Harley-Davidson® and other American v-twin motorcycles. S&S shall have no warranty or liability obligation if an S&S part is used in any other application.

INFORMATION

When purchasing any set of S&S® flywheels, other than press-together, 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. Press-together flywheels are only sold complete with connecting rods and mainshafts, and almost all 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 its destination out of true because of poor packaging.

NOTE: *If the 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 Harley-Davidson® 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.

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 than 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.**

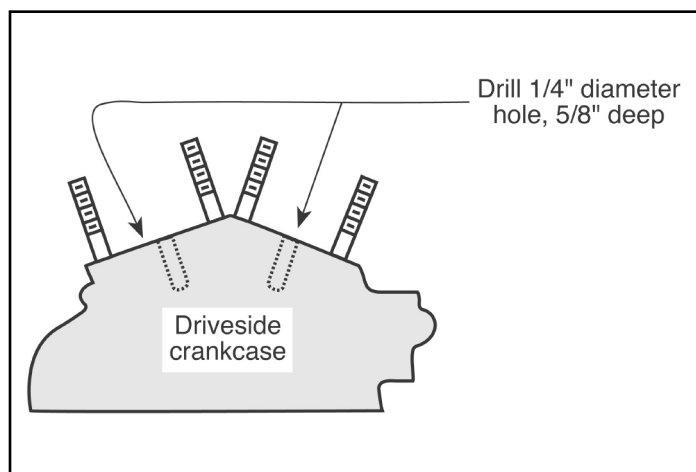
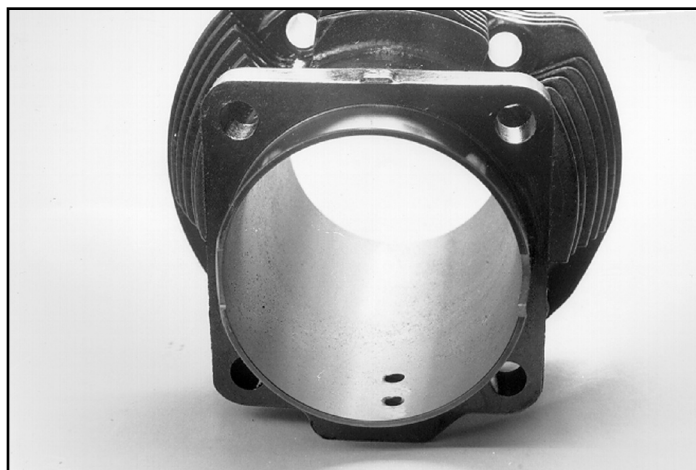


Figure 1

- 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.**



Picture 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 ⅝" on center below gasket surface. These early production cylinders can be used with strokes up to 4¾" where base plates are not used.

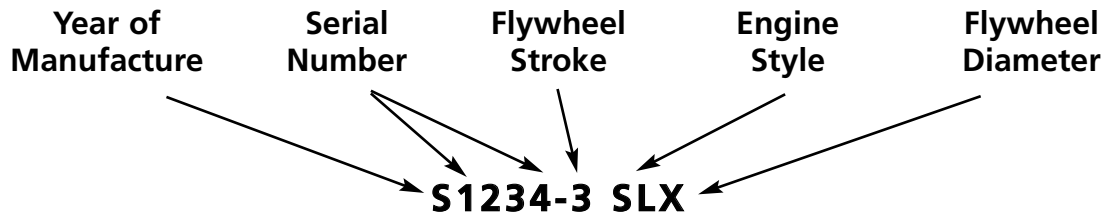
- G. Clean dirt, filings, etc. out of passageways.
- H. Press a piece of ¾" long x ⅜" O.D. steel tubing (93-1032) provided in kit into oil return hole in base gasket surface until tubing is flush with surface. Ream hole slightly with drill to remove any burrs that may exist.
- I. Clean with solvent and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

SEE PAGE 4 FOR FLYWHEEL IDENTIFICATION.

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. Press-together 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	4 ³ / ₈ "
2	4 ¹ / ₂ "
3	4 ³ / ₄ "
4	5"
5	4 ¹ / ₄ " (Stock 80")
6	4 ⁵ / ₈ "
12	5 ¹ / ₄ "
13	3 ¹ / ₂ " (Stock 61")
14	3 ³ / ₂ " (Stock 74")
16	5 ¹ / ₈ "
17	4"
18	3 ³ / ₈ "

Big 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 Big Twin
J	Delkron 4 Cam
H	McClure 4 Cam

Four Cam Stroke Codes	
Code	Stroke
1	4 ¹ / ₁₆ "
2	4 ³ / ₁₆ "
3	4 ⁷ / ₁₆ "
4	4 ¹ / ₂ "
6	4 ⁵ / ₈ "
7	4 ¹³ / ₁₆ "
8	5"
11	4 ¹ / ₂ "
12	5 ¹ / ₄ "
15	3 ¹³ / ₁₆ " (Stock)
16	5 ¹ / ₈ "

Big Twin Stroke Codes	
Code	Engine Styles
None	8 ¹ / ₂ " (Stock)
A	8 ³ / ₈ " (Stock 61")
X	8 ¹ / ₄ "

Four Cam Diameter Codes	
Code	Engine Style
None	7 ¹ / ₈ " (Stock)
A	7 ³ / ₄ "
X	7 ¹ / ₂ "

Big Twin Stroke 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§†	1986-1999
DR§†‡	1986-1999

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

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

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

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