

Instruction 51-1055
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Because every industry has a leader

Installation Instructions: S&S® Cylinder Torque Plate Kit for 1984-1999 Big Twin

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 affect 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.

S&S® Cylinder Torque Plate Kits for 1984-1999 big twin are designed to enable the engine builder to simulate operating stress conditions when boring and/or honing stock bore and up to 4" big bore cylinders.

Torque Plate Kit 53-0016 is for stock bore and 3 3/8" big bore cylinders. It includes the following parts:

- Part 53-0017 (1) Head-end torque plate
- Part 53-0018 (1) Base-end torque plate
(Distinguished by tab attached to edge)
- Part 53-0014 (1) Torque plate stabilizer arm
- Part 50-0192 (4) 7/16" - 20 x 7" Grade 8 SHC screws

Torque Plate Kit 53-0030 is for 4" big bore cylinders. It includes the following parts:

- Part 53-0031 (1) Head-end torque plate, 1.0" thick
- Part 53-0032 (1) Base-end torque plate, 3/8" thick
- Part 53-0014 (1) Torque plate stabilizer arm
- Part 53-0034 (1) Tab, torque plate,
- Part 50-0192 (4) 7/16" - 20 x 7" Grade 8 SHC screws
- Part 50-0108 (3) 3/8" - 18 x 1" HHC screws
- Part 50-0191 (4) 7/16" - 20 x 6" SHC screws

NOTES:

- Always observe professional practices and wear safety glasses and protective clothing when operating machinery.
- S&S torque plates 53-0017, 53-0018, 53-0031 and 53-0032 are hardened and must not come into contact with cutter or honing stones during operation.

⚠ CAUTION

Improper operation of machinery or fixtures can damage motorcycle parts, tools and/or machinery components.

Note that torque values for torque plate hardware may vary significantly from values used to assemble engine.

⚠ WARNING

Improper operation of machinery and associated equipment can cause personal injury to operator and others nearby. Contact a professional mechanic if unsure of correct procedure.

When boring any cylinder it is recommended that an S&S Torque Plate Kit be used in conjunction with the correct S&S Boring Fixture. Fixture part 53-0006 is for stock bore and 3 3/8" big bore cylinders. Fixture part 53-0000 is for 4" big bore cylinders.

Boring Cylinders, stock - 3 3/8" bore

Clean and inspect cylinders prior to boring or honing. Refer to Harley-Davidson® Service Manual as necessary. Procedure recommended for boring stock bore and 3 3/8" cylinders is as follows:

Boring Bar Method

1. Apply light coat of 20W50 motor oil to threads and underside of heads of 7/16" - 20 x 7" sockethead capscrews provided, and bolt cylinder between cylinder end of boring fixture and head end torque plate, part 53-0017. Machined side of torque plate faces gasket surface. Position cylinder base toward boring fixture and boring bar. Center torque plate on cylinder bore so boring cutter will not strike torque plate during operation.
2. Torque bolts to 40 ft-lbs. in same pattern used to install heads during engine assembly. **See Figure 1.** Tighten bolts in following stages:
 - Stage I 10 ft-lbs.
 - Stage II 20 ft-lbs.
 - Stage III 40 ft-lbs.

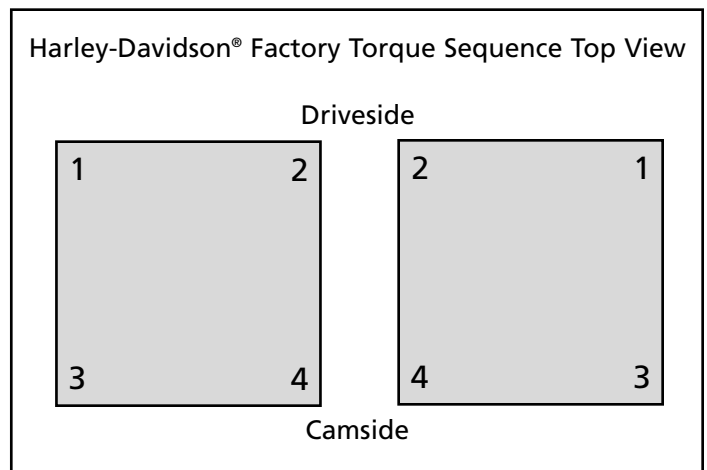


Figure 1

3. Bore cylinder to desired size.
4. Repeat procedure for remaining cylinder.

Sunnen® Hone Method

It is recommended that a vertical Sunnen® hone be used when boring or honing cylinders. If a horizontal hone is used, care must be taken to avoid honing bore out of round.

⚠ CAUTION

Weight of cylinder/torque plate assembly on horizontal hone can cause honing stones to cut unevenly resulting in irreparable damage to cylinder.

- Place machined sides of head-end torque plate, part 53-0017, and base-end torque plate, part 53-0018, against gasket surfaces of cylinder. Apply light coat of SAE 20W-50 engine oil to threads and underside of heads of four $\frac{7}{16}$ " x 20 x 7" socket head capscrews provided and insert screws through holes in head-end torque plate. Thread capscrews into base-end torque plate. Center head-end torque plate on cylinder bore so honing stones and guide shoes will not hit plate during honing operation.
- Torque bolts to 40 ft-lbs. Torque bolts to 40 ft-lbs. in same cross-pattern used to install heads during engine assembly. Tighten bolts in stages:

Stage I	10 ft-lbs.
Stage II	20 ft-lbs.
Stage III	40 ft-lbs.
- Position cylinder/torque plate assembly on hone quill. Use stabilizer arm, part 53-0014, to prevent cylinder from rotating during boring/honing operation. Additional holes in torque plates allow repositioning of assembly to achieve a straight, round bore.
- Repeat steps for remaining cylinder.

Honing Cylinders - 3 $\frac{3}{8}$ " bore Hand Method

- Apply light coat of 20W50 motor oil to threads and underside of heads of $\frac{7}{16}$ " - 20 x 7" sockethead capscrews provided and bolt head-end torque plate, part 53-0017, to base-end torque plate, part 53-0018, with cylinder in between. Machined sides of plates face gasket surfaces of cylinder. Center head-end torque plate on cylinder so honing stones will not strike plate during honing operation.
- Torque bolts to 40 ft-lbs. using same cross pattern utilized in final assembly. Tighten bolts in stages.

Stage I	10 ft-lbs.
Stage II	20 ft-lbs.
Stage III	40 ft-lbs.
- Using tab welded on base-end torque plate, secure cylinder/torque plate assembly in vise and hone to desired size.
- Repeat procedure for remaining cylinder.

Sunnen® Hone Method

Procedure to hone cylinders using Sunnen® hone is identical to procedure used to bore cylinders with Sunnen® hone. Refer to previous section describing boring procedure with Sunnen® hone.

4" Bore Cylinders

NOTE: Stud pattern in S&S® 4" Bore Torque Plate Kit and Boring Fixture is designed for S&S cylinders. Pattern may not be compatible with cylinders from other manufacturers.

Procedure for boring and honing 4" bore cylinders is same as described prior for stock bore, 3 $\frac{3}{8}$ " cylinders. Mount 4" bore cylinder on torque plates as follows:

CAUTION

Failure to mount cylinders according to following procedure may result in boring cylinder out-of-round.

- Using $\frac{5}{16}$ x 1" bolt provided, attach 1 $\frac{1}{2}$ " x 2 $\frac{3}{4}$ " tab to bottom of base-end torque plate 53-0032.

NOTE: Only one tapped hole is provided in case-end torque plate for $\frac{5}{16}$ " bolt. With tab correctly installed, dowels on tab will engage unthreaded holes on either side of hole threaded for $\frac{5}{16}$ " bolt.

- Place base gasket of same type to be used on engine on cylinder base and insert base-end of cylinder into base-end torque plate 53-0032. Four $\frac{1}{2}$ " holes in torque plate must align with four cylinder stud holes in cylinder.
- If present, cylinder head alignment dowels in top of cylinder should be left in place. Otherwise install dowels for alignment purposes.
- Using dowel pins for alignment, carefully place head-end torque plate 53-0031 on cylinder. Align four $\frac{1}{2}$ " holes in torque plates with cylinder stud holes in cylinder.
- Apply light coat of SAE 20W-50 engine oil to threads and underside of heads of four $\frac{7}{16}$ " - 20 x 7" socket head capscrews provided and insert screws through holes in head-end torque plate. Thread capscrews into base-end torque plate.
- Tighten capscrews evenly in following stages according to sequence. See Figure 2. Note that sequences are different for front and rear cylinder.

Stage I	8 ft-lbs.
Stage II	18 ft-lbs.
Stage III	40 ft-lbs.
Stage IV	55 ft-lbs.

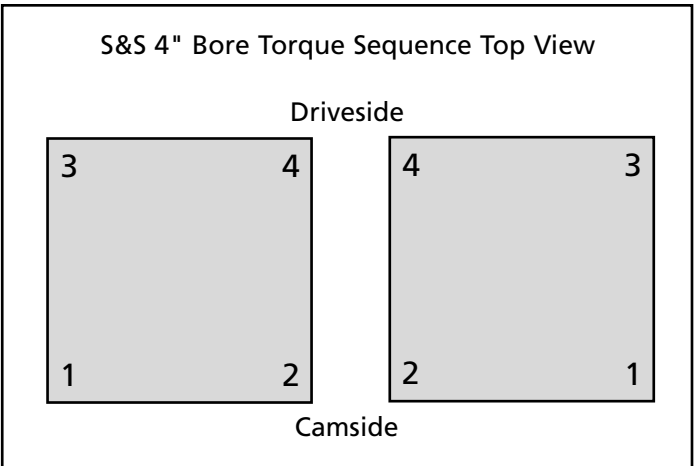


Figure 2



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