

Instruction 51-1170
5-8-07

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Because every industry has a leader

S&S® Manifold/Engine Measuring Tools



To get the precision measurement a modified, custom, race or extreme high-performance engine requires, an exact fit between the intake ports and the manifold is required. However, getting these measurements has never been easy. S&S Manifold/Engine Measuring Tools will change that for your shop from the first time you use them.

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 breathed. 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 breathed. 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.

Manifold Measuring Tools

Harley-Davidson® Twin Cam 88® and Evolution® engines

.....	53-0076
S&S® Super Stock®	53-0077
S&S B1-style (4-bolt flange)	53-0079
Shovelhead/ironhead	53-0075*
Baisley-style Oval or Round	53-0078

Engine Measuring Tools

S&S, Evolution®, Twin Cam 88®	53-0070
S&S B1-style (4-bolt flange)	53-0073
Shovelhead/ironhead	53-0075*
Baisley-style Oval or Round	53-0072

*Tool works for measuring both engine and manifold sizes.

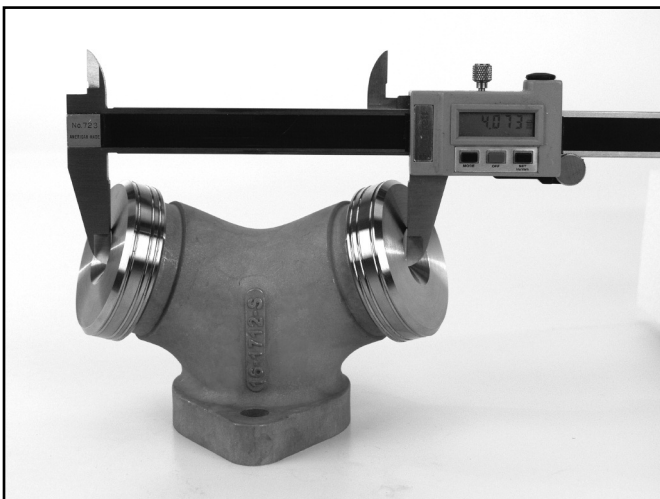
Required Tools

- 1- Spring caliper, inside micrometer or, telescoping gauge
- 2- Dial or electronic caliper

MANIFOLD MEASURING

Manifold Measuring Tools—53-0076, 53-0077, 53-0079, 53-0075, 53-0078

- 1- Place manifold on a flat, solid surface, or hold it securely in your hand.
- 2- Slide the tools over the ends of the manifold runners make sure you do not have to force them in place and that the flat inner surface bottoms on the end of the ports.
- 3- Measure the distance between the tools. See **Picture 1**. The conical cutouts in the tools provide parallel surfaces to take the measurement from.



Picture 1

- 4- Add .030" to all engine measurements (.028 Shovelhead/ironhead-style)—this compensates for the manifold to head clearance.
- 5- Multiply final measurement by 100 to get the manifold number.

S&S® MANIFOLD SIZE CONVERSION CHART FOR HARLEY-DAVIDSON® EVOLUTION® AND TWIN CAM 88® ENGINES AND SPORTSTER® MODELS

Engine Displacement	Old Manifold Size Number	New Manifold Size Number
Stock 883, 1100, 1200, 79"	0	341
91" Sportster	*	343
79" S&S Retro Big Twin	1	355
100" Sportster	1+	357
100" Retro Big Twin	2 -	361
89" Sportster	3	374
100" Evolution Big Twin	5++	387
88" & 100" Evolution Big Twin	6	397
111" S&S 4½" Bore	*	398
100" Twin Cam 88®	*	405
93" & 113" Evolution Big Twin	7	406
117" S&S 4½" Bore	*	408
Stock Evolution Big Twin & Twin Cam 88	8	410
107" Twin Cam 88	*	414
98" Evolution Big Twin	9	416
124" S&S 4½" Bore	*	417
103" Evolution Big Twin & Sportster	12	426
116" Twin Cam 88	*	428

* No old number exists for this manifold length.
It was introduced after the new system was initiated.

MANIFOLD SIZE CONVERSION CHART FOR SHOVELHEAD & IRONHEAD HARLEY-DAVIDSON® SPORTSTER® MODELS

Engine Displacement	Old Manifold Size Number	New Manifold Size Number
Stock Shovelhead & Ironhead Sportster	0	220
93" High Compression Shovelhead	0+	222
93" Shovelhead	*	225
96" Shovelhead	1	228
98" Shovelhead	3	235
103" Shovelhead	5	242

* No old number exists for this manifold length.
It was introduced after the new system was initiated.

These charts are standard S&S manifold sizes. If the size you need is not on these charts you need a special order manifold.

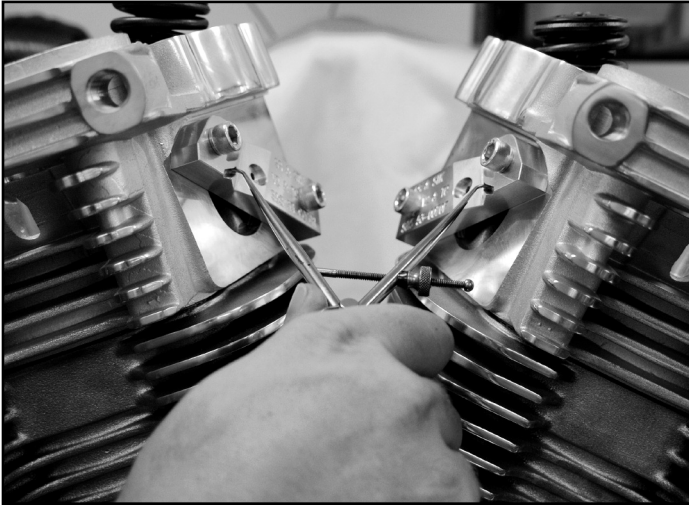
NOTE: The size code of the manifold is actually the distance between the front and rear intake port centerlines measured in 1/100th of an inch.

Example: A size 410 manifold measures 4.10 inches from port to port.

ENGINE MEASURING FOR MANIFOLD SIZING

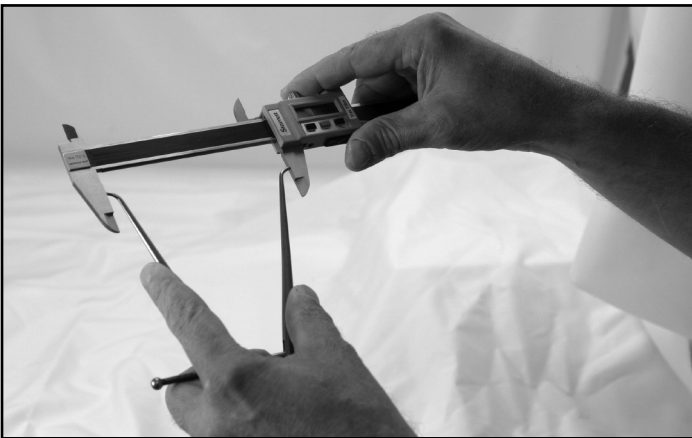
Engine Measuring Tools 53-0070, 53-0072, 53-0073

- 1- The tools are marked front and rear(F or R)—be sure they are installed in the correct position with the lettering facing out.
- 2- Run the $\frac{5}{16}$ fasteners in hand tight. Do not overtighten the fasteners.
- 3- At this point the spring caliper grooves should be horizontal and parallel to each other.
- 4- Insert the tips of an internal spring caliper into the grooves of the measuring tools and open it until there is a very slight amount of drag felt as you slide it out. The measurement can also be done with an inside micrometer or telescoping gauge using the flat measuring surface above the groove.



Picture 2

- 5- Use a dial or digital caliper to measure from tip-to-tip on the spring caliper. This number, multiplied by 100, is the manifold size needed. Example: the port-center-to-port-center measurement on a stock 96ci Super Stock® engine is 4.10, multiply that by 100 and you get 410—the S&S number for the manifold required is 410.

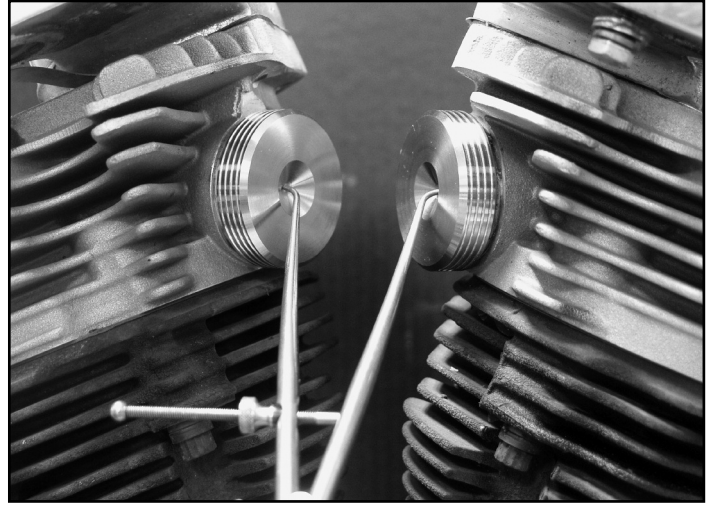


Picture 3

Engine Measuring Tools 53-0075

(Shovelhead/Ironhead Harley-Davidson® Sportster®)

- 1- Slide the tools over the intake ports—be sure you do not have to force them into place.
- 2- Confirm the flat inner surface of the tool has bottomed on the end of the port.
- 3- Use a set of spring calipers to measure the furthest distance between the tools.
- 4- Measure the tip-to-tip distance on the spring calipers with a dial or digital caliper. Multiply this number by 100 to determine your manifold size. Example: the port-center-to-port-center measurement on a 93ci shovelhead is 2.20", multiplied by 100 is 220. The S&S size number for a 93" shovelhead manifold is 220.



Picture 3



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