

Instruction 51-1270

12-29-15 Rev 2

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Installation Instructions for S&S® Single Bore Throttle Bodies

Kits 17-5070 and 106-4408 fit all 2006-up Harley-Davidson® EFI big twins (except 2008-up touring models with electronic throttle control)

DISCLAIMER:

S&S parts are designed for high performance, closed course, 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 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 judgment when performing installation and operating motorcycle. Good judgment begins with a clear head. Don't let alcohol, drugs or fatigue impair your judgment. 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.



CAUTION



- Before doing any of the following installation, be sure to disconnect the negative cable of your battery.
- Consult an appropriate factory service manual for safety instructions on how to disconnect the fuel system from your motorcycle.
- S&S Fuel Injection is not compatible with E85 fuel. Use of E85 fuel may cause your engine to run poorly and/or damage to system components.



WARNING



- Gasoline is extremely flammable. Please be sure to work in a well ventilated area and do not have an open flame near the work area.
- The following installation should only be done by a qualified technician with the proper tools and training. If you are not comfortable or unsure of your abilities, S&S recommends you contact a local S&S dealer to handle the installation

NOTE: You will have to transfer the following parts from a stock Delphi® style fuel-injection system to the S&S® Single Bore Induction System. If this is a new installation or custom application, the parts will need to be sourced from S&S® or a certified Harley-Davidson® shop.

- Throttle Position Sensor
- Idle Air Control (IAC) Motor
- Manifold Absolute Pressure (MAP) Sensor*
- Intake Manifold Flanges**
- Throttle Cables

* This part is available through S&S (55-5057)

** Long Block Engines for 2006 Touring models may require offset bolt pattern intake manifold flanges (S&S part number 106-3516).

Kit Contents:

17-5070 52 mm Throttle Body Kit for 2006 – Up EFI Big Twins (except 2008 - Up Touring):

- 16-5153 – 52 mm Throttle Body
- 17-0491 – 52 mm Throttle Body Hardware Kit

106-4408 58 mm Throttle Body Kit for 2006 – Up EFI Big Twins (except 2008 - Up Touring):

- 106-3957 – 58 mm Throttle Body
- 106-4664 - 58 mm Throttle Body Hardware Kit

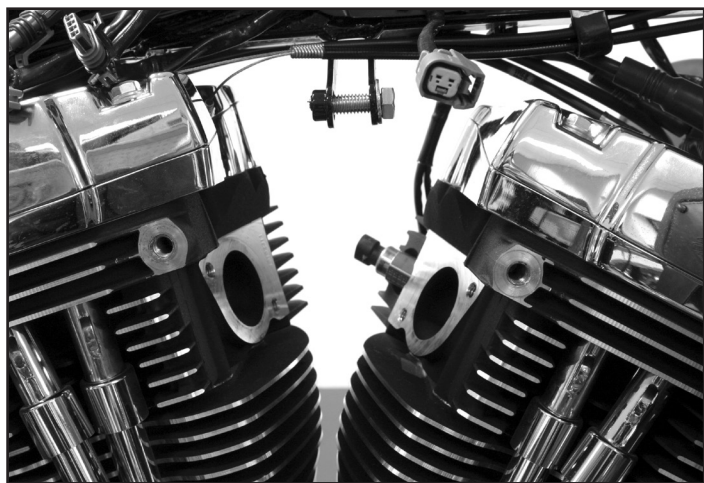
NOTE - All kits contain the following additional components:

- 16-5202** Fuel Rail Kit
- 17-0455** Stock Breather Hardware (2001 - Up)
- 17-0483** Throttle Body Hardware (2001-Up)
- 31-2104** Case Breather Hardware, 4-1/8" Bore Engines with Vacuum Breathing
- 55-5041** Intake Air Temperature Sensor Kit
- 55-5052** Fuel Injector (2 pack)
- 55-5209** Injector Adapter Harness (2 per kit)
- 160-0147** Intake Manifold Flange Mounting Hardware

NOTE - Additional Parts Required (May be included in some kits):

- Air Cleaner Cover and Back Plate Assembly – Varies depending on style and application
- S&S Single Bore Intake Manifold and Seals – Varies depending on engine size.

- 1- Remove the stock fuel induction system, including the manifold and disconnecting all wire connections. It is up to the technician to determine if the gas tank should be removed or just raised up in the rear to provide clearance for performing this work. See **Picture 1.**



Picture 1

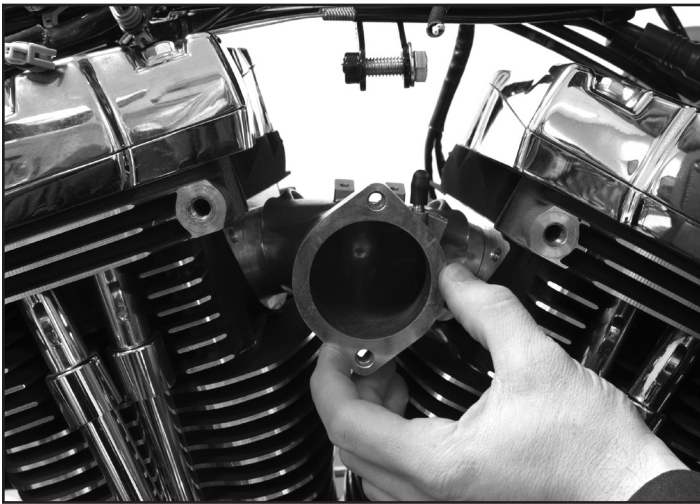
- 2- Disassemble the stock induction system to remove the pre-listed parts for re-use. See **Picture 2.**



Picture 2

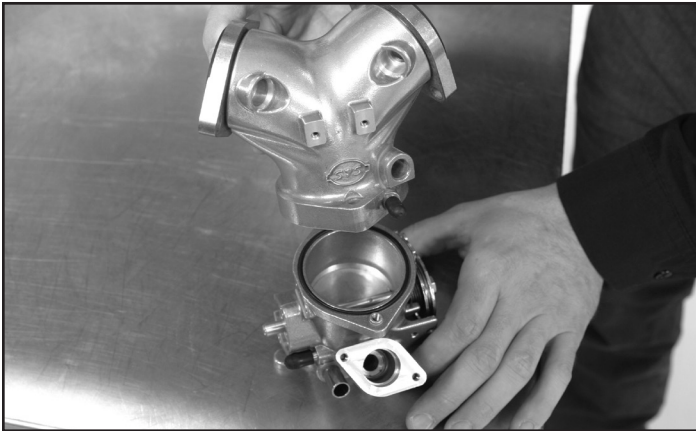


- 3- Verify the new manifold size is appropriate for your motorcycle by sliding it in place as shown in **Picture 3**.



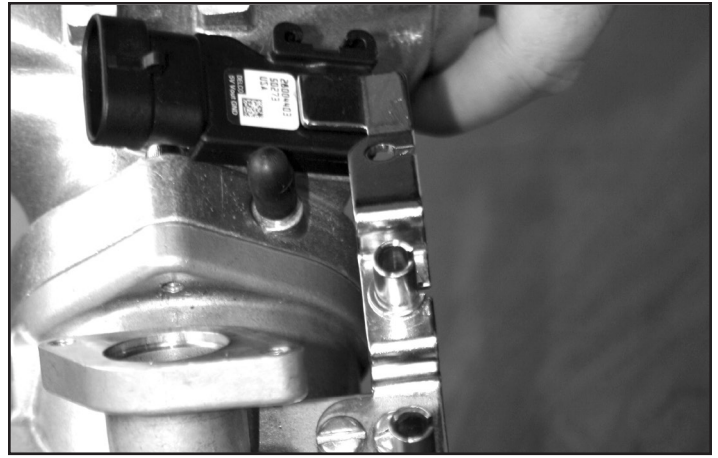
Picture 3

- 4- Install the new O-ring into the throttle body. A light film of clean engine oil can be used to help hold the O-ring in place. Align the manifold to the throttle body as shown in **Picture 4**. Apply purple 222 Loctite® to the 10-24 x 1" socket-head assembly screws (with flat washers) and tighten them to 35-40 in-lbs. Replace this O-ring if the manifold and throttle body are taken apart after being used.



Picture 4

- 5- Slide the MAP sensor in place (see **Picture 5**), being sure not to pinch the orange rubber seal --some clean engine oil may make this easier. Install the cable guide and verify it is aligned with the throttle cable actuator. Once alignment is satisfactory, apply Loctite® 222 to the 10-24 x 1/4" screws and tighten to 18-22 in-lbs



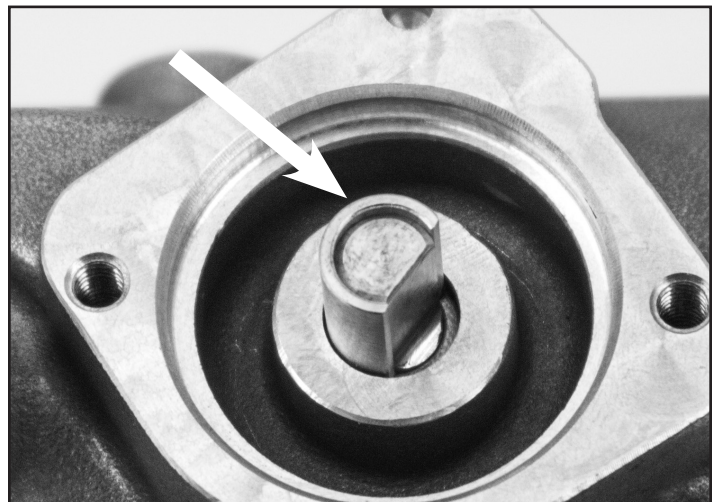
Picture 5

- 6- Using the new S&S® supplied gasket, slide the S&S supplied intake air temperature (IAT) sensor in place (see **Picture 6**). Use Loctite 222 on the T10 Torx button head M3 x .5 x 10mm screws and tighten to 6-8 in-lbs.



Picture 6

- 7- For the stock throttle position sensor attach the "C" shaped spacer to the end of the throttle shaft (see **Picture 7**). Install a 4mm flat washer on each T20 Torx button head M4 x .7 x 12mm screw, apply some Loctite® 222, install Throttle Position Sensor, and torque screws to 18-23 in-lbs.



Picture 7

- 8- Install the new O-ring on the IAC motor. Lubricate the OD of the O-ring with a light film of clean engine oil. Put a 4mm flat washer on each T20 Torx button head M4 x .7 x 12mm screw, coat the threads with Loctite 222. Install the IAC motor and tighten the screws to 18-23 in-lbs. See **Picture 8**.



Picture 8

- 9- Partially install the fuel injectors in the fuel rail. Be sure to orient the black O-rings to the rail and align the clocking tabs with their holes. It may be helpful to lubricate the O-rings with clean engine oil. See **Picture 9**.

NOTE: These are special O-rings that seal pressurized gasoline. If one becomes damaged or abraded it must be replaced immediately.



Picture 9

- 10- Lubricate the lower, orange O-rings of the injectors with clean engine oil and insert them into the manifold with a light squeezing action. See **Picture 10**. Once in place, use Loctite® 222 on the threads of two 8-32 x 5/8" slotted panhead screws and tighten to 15-20 in-lbs. Replace these screws if the fuel rail is removed to perform service work.



Picture 10

- 11- Install the backing washer and O-ring on the fuel supply tube. Lubricate the O-ring with clean engine oil. See **Picture 11**.



Picture 11

- 12- Insert the tube into the fuel rail, position the Y-shaped clip on the fuel rail. Apply Loctite 222 to the T20 Torx button head M4 x 7 x 12mm screw and tighten to 18-23 in-lbs as shown in **Picture 12**.



Picture 12

13- Cut the existing injector connectors from the stock wiring harness. Slide the supplied sleeving over the wiring harness. Slide heat shrink tubing over each of the injector harness wires. Connect the supplied fuel injector connector adaptors to the wiring harness with the supplied butt connectors. On earlier models, the yellow wire with the green stripe of the injector harness should be connected to the same color wire on the stock harness. On later models, this wire is a red wire with a green stripe. Move the heat shrink tubing over the splices and shrink with a heat gun. Slide the sleeve into place. See **Picture 13**.



Picture 13

14- Put the stock manifold flanges on the manifold. **YOU MUST USE THE S&S® MANIFOLD SEALS ON THEM.** The stock manifold seals are too thick and may damage the manifold when the flanges are tightened. Be sure to orient the tapered side towards the manifold and the flat end toward the heads. See **Picture 14**.



Picture 14

Note: Long Block Engines for 2006 Touring models may require offset bolt pattern intake manifold flanges (S&S part number 106-3516). If the intake flange mounting holes on your engine are not symmetrical about the intake port, you will need to use these flanges. Note that offset bolt pattern flanges are marked Front (F) and Rear (R).

15- Install the 5/16"-18 x 1" hex head screws with flat washers into the lower manifold screw holes in front and rear cylinder heads. With the slotted ends of the flanges towards the bottom of the manifold, slide the throttle body/manifold assembly in position. Be sure the 5/16" washers installed on the lower manifold mounting flange screws are outside the flange and not between the flange and the head. Install the provided S&S cam side screws (5/16-18 x 3/4" SHCS). If a screw longer than 3/4" is used, damage to the heads will result. Lightly snug all four manifold mounting screws but **DO NOT TIGHTEN AT THIS TIME**. Connect the throttle and cruise control cables at this time.

NOTE: The Harley-Davidson® service manual for your model motorcycle will be helpful during this step.

16- Connect all wiring harness leads at this time. Gently push the fuel injectors downward toward the manifold to increase clearance for the connectors. Be sure to connect the front and rear injector harness to the correct injector. Stock H-D® harnesses for the earlier models covered in this instruction use a white wire with a yellow stripe for the front injector control circuit and a green wire with a gray stripe for the rear. Later models use a green wire with a yellow stripe for the front and a gray wire with a yellow stripe for the rear. If you are unsure, check your factory service manual.

17- Install the crankcase breather system.

Engines with a stock style breather system - The breather uses banjo fittings with hollow bolts and connects across the heads to the intake with a T-hose. This hose will need to be trimmed and have spring clamps attached as shown in **Picture 15**. Torque the hollow bolts to 10-12 ft-lbs.



Picture 15

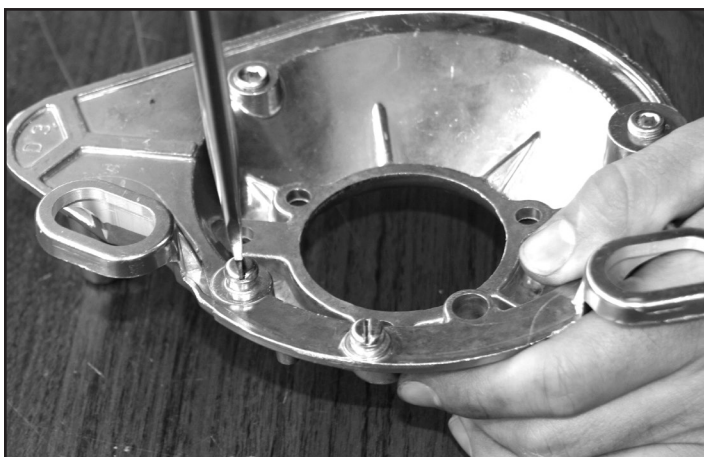
4-1/8 - inch bore or larger engines with a vacuum breathing - install the sharp bent hose on the rear head and install the check valve with the white end towards the head. Mount the other hose on the black end of the check valve and connect it to the throttle body using spring clamps to secure the connections.

18- Once the breathers are secure, install the fuel line per the factory service manual you are working with. Connect the battery and verify the fuel pump turns on to pressurize the system and there are no gas leaks, but **DO NOT START THE ENGINE**. At this time, PC software may also be used to verify sensor readings.

19- Install two 242 Loctite® coated pipe plugs (included in kit) in the air cleaner backplate as shown in **Picture 16**. Torque to 35-45 in-lbs. Also, two pan screws coated with Loctite® 222 must be installed in the backplate in place of the enrichment device. **See Picture 16a.** Torque them to 12-18 in-lbs. Failure to install these screws could allow dirt and debris into the intake system.

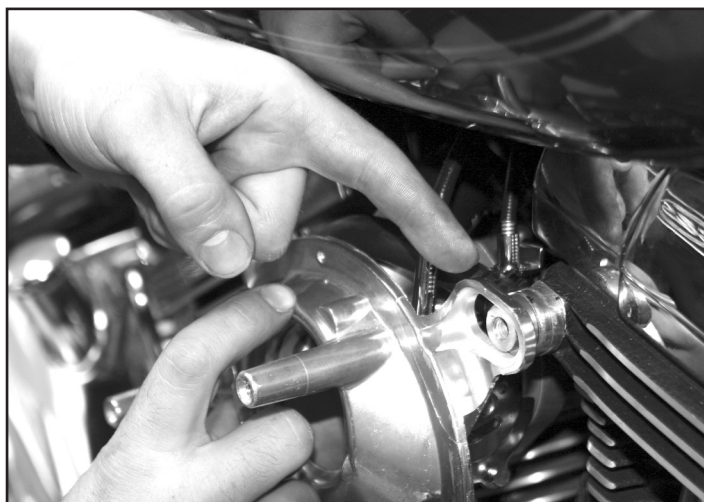


Picture 16



Picture 16a

20- Use a new gasket on the backplate and put it in place noting the number of shims required (see **Picture 17**). Once you select the appropriate shims (included) mount the backing plate to the engine but **DO NOT INSTALL THE SCREWS YET**.



Picture 17

21- Align the throttle body bore and mounting bolt holes with the backing plate. Remove the backing plate, and tighten the manifold mounting bolts to 14-18 ft-lbs.

22- Apply blue threadlock to the three fillister head screws (updated kits use SHCS with a thread-lock patch) and attach the backing plate to the throttle body. **See Picture 18** Tighten screws to 35-45 in-lbs.



Picture 18

23- Attach backing plate to cylinder heads

For stock style breather systems - Install the backplate shims. Apply 242 Loctite to the two special $\frac{5}{16}$ -24 x $\frac{3}{8}$ " screws and install them through the backing plate. Torque to 8-12 ft-lbs.

For $\frac{1}{2}$ " bore engines with vacuum breather systems - Place flat washers on the $\frac{5}{16}$ -18 x $1\frac{1}{4}$ " screws, apply 242 Loctite® and install through the backing plate, shims and spacers into the heads and torque to 10-12 ft-lbs.



Picture 19

24- Apply 242 Loctite to the air cleaner mounting screws and install the air cleaner, air cleaner cover and tighten the screws to 35-45 in-lbs. **See Picture 19.**

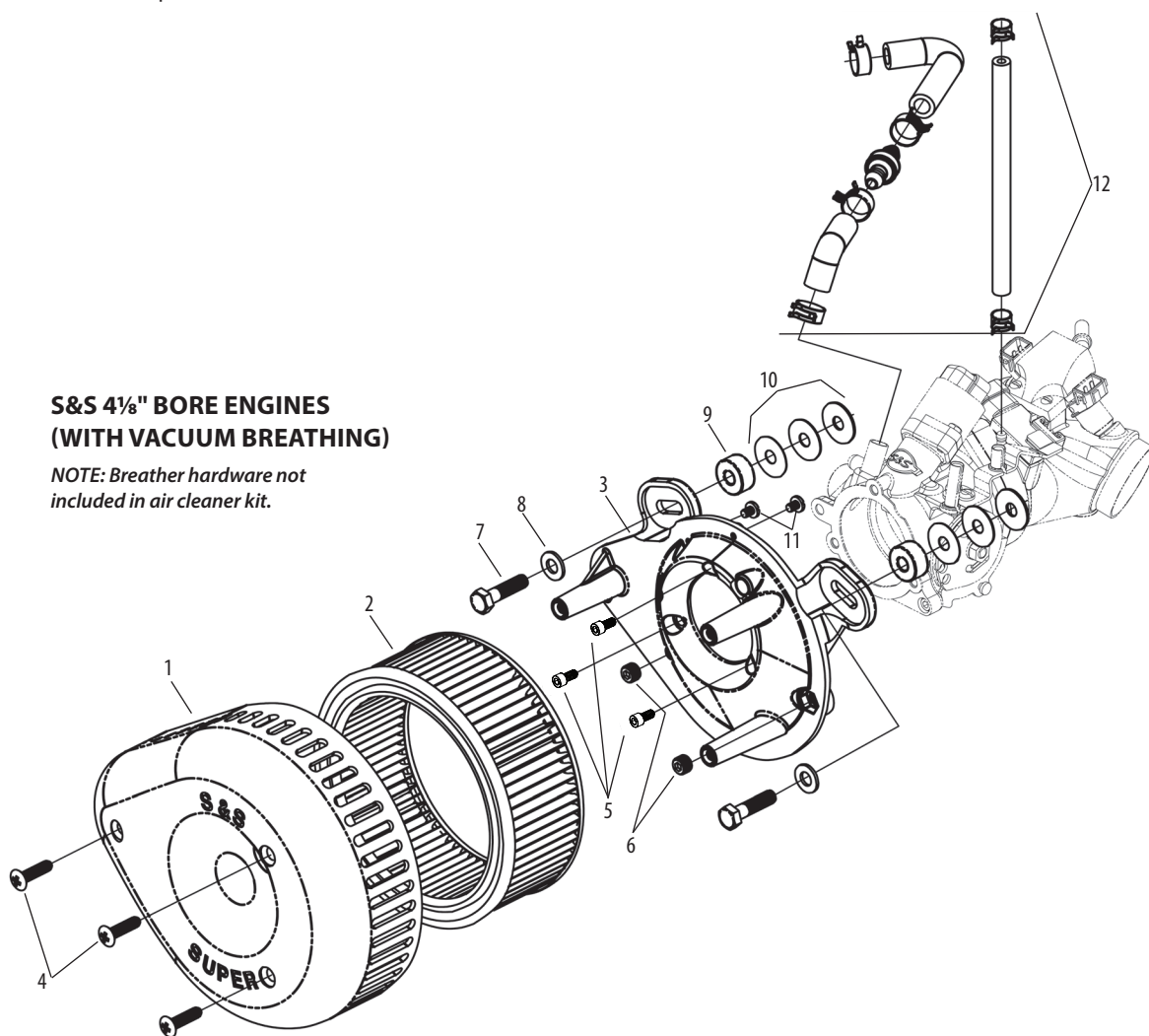
25- Reinstall any components removed for the installation. Install the new tune-file and start motorcycle.

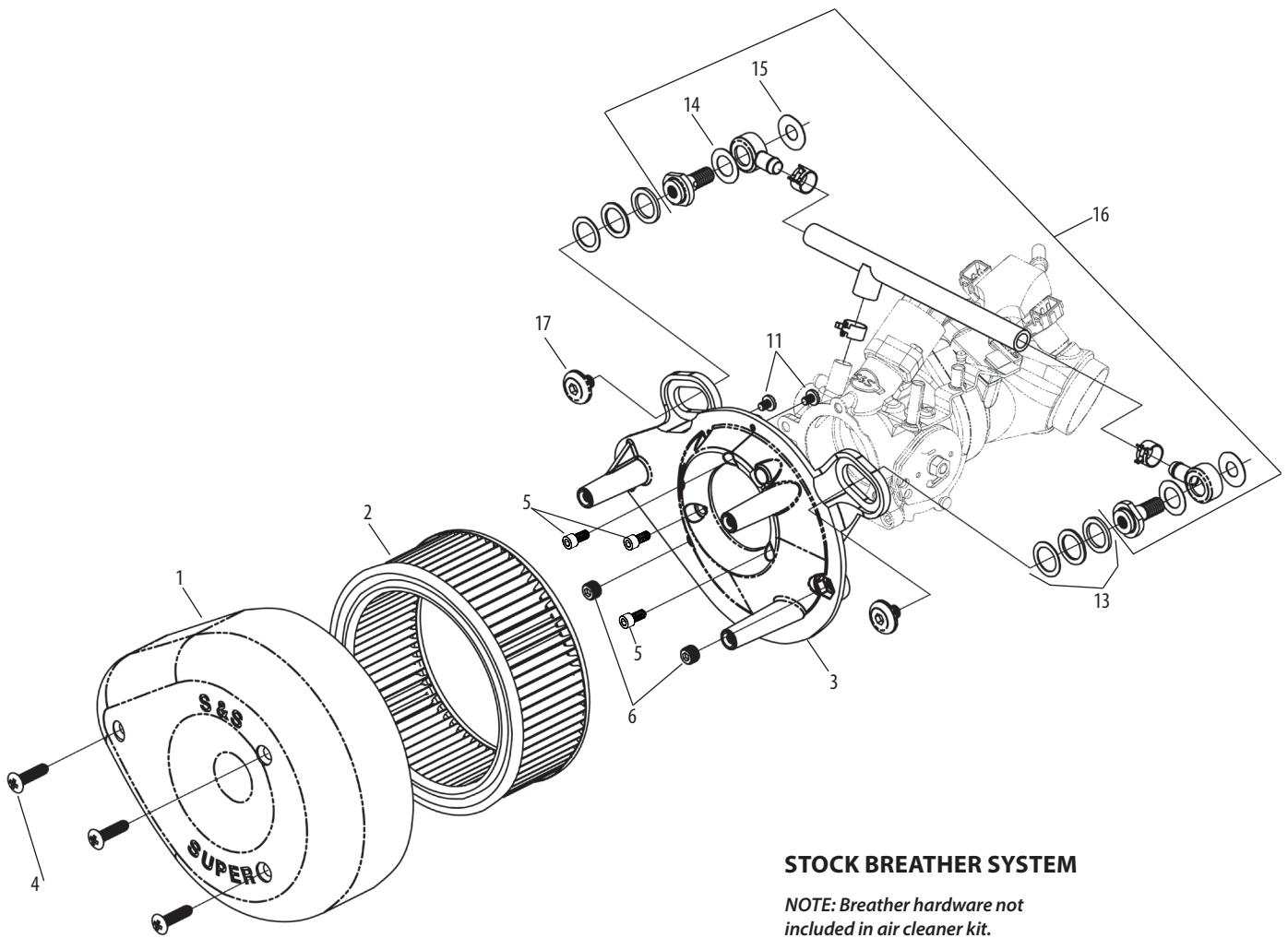
REPLACEMENT PARTS FOR S&S® AIR CLEANERS FOR S&S SINGLE BORE THROTTLE BODIES

1. Air Cleaner Cover		
Slasher (slotted chrome)	17-0004	
Chrome	17-0378	
2. Element, pleated	106-4722	
3. Backplate		
Stock Breather System 52mm	17-0120	
Stock breather system 58mm	106-4666	
S&S 4-1/8" bore engines 52mm		
(with vacuum breathing)	17-0380	
S&S 4-1/8" bore engines 58mm		
(with vacuum breathing)	106-4667	
4. Screws, Air Cleaner Cover, 1/4-20 x 1 (10 Pack)	50-0094	
5. Screws, SHC,w/ Thread Lock,1/4-20 x 1/2" (10 Pack)	106-2105	
6. Pipe plug, 1/8, air cleaner backplate (10 Pack)	50-1015	
7. Mounting bracket bolt, hex 5/16-18 x 1 1/4 (ea.)	50-0110	
8. Flat washer, 5/16" x 1/16" (ea.)	50-7034	
9. Shim, .850" x .325" x .400"	50-7027	
10. Shim kit for 4 1/8" bore	17-0314	
Individual shims:		
5/16" x .018" (ea.)	50-7038	
5/16" x .030" (ea.)	50-7039	
5/16" x .048" (ea.)	50-7040	
5/16" x .105" (ea.)	50-7041	
11. Screw, cable guide & air cleaner backplate		
10-24 x 1/4 (10 Pack)	50-0062	
12. Breather hardware for 4 1/8" bore		
w/ vacuum breathing	31-2104	
13. Shims, individual		
5/8 x 7/8 x .025 (10 Pack)	50-7110	
5/8 x 7/8 x .050 (10 Pack)	50-7111	
5/8 x 7/8 x .075 (10 Pack)	50-7112	
14. Silicone washer, 1/2" ID (10 Pack)	50-7057	
15. Silicone washer, 3/8" ID (10 Pack)	50-7059	
16. Stock breather system hardware	17-0455	
17. Screw, wide head 5/16-24 x .36 (ea.)	17-0346	
18. Air cleaner hardware kit		
Stock breather system	17-0482	
S&S 4 1/8" bore w/ vacuum breathing	17-0481	

S&S 4 1/8" BORE ENGINES (WITH VACUUM BREATHING)

*NOTE: Breather hardware not
included in air cleaner kit.*

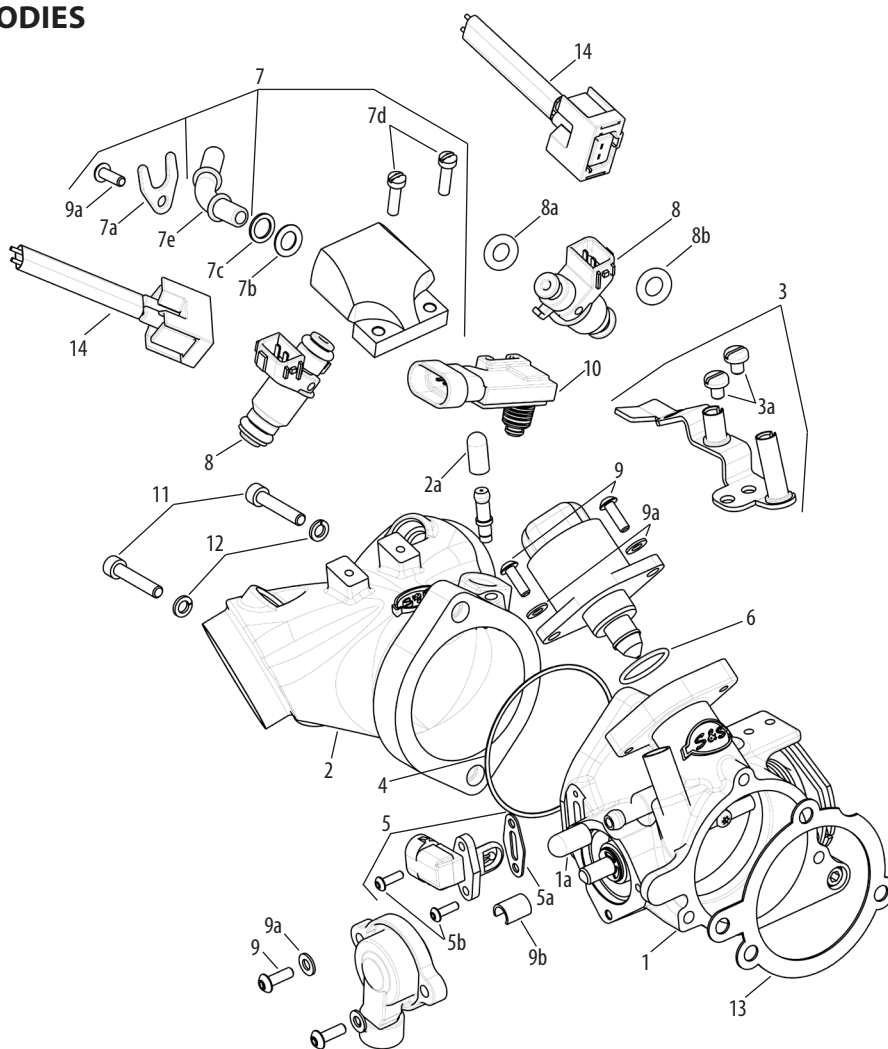




STOCK BREATHER SYSTEM

NOTE: Breather hardware not included in air cleaner kit.

REPLACEMENT PARTS FOR S&S® SINGLE BORE THROTTLE BODIES



1. Throttle body 52mm	16-5153	7d. Screw, rail (ea.).....	50-0039
Throttle body 58mm	106-3957	7e. Fuel inlet tube	50-0485
1a. Cap, canister purge (ea.).....	50-8266-S	8. Fuel injector (ea.)	55-5052A
2. Manifold.....	See catalog for correct size	(2 Pack)	55-5052
2a. Cap, rubber, manifold, fitting (ea.)	50-8372	8a. O-ring, injector top, black (ea.).....	50-8264-S
3. Throttle cable guide packet, w/hardware	55-5084	8b. O-ring, injector bottom, orange (ea.)	50-8265-S
3a. Screw, cable guide & A/C backplate (10 Pack.).....	50-0062	9. Screw, IAC TP sensor & fuel rail (ea.)	50-0358-S
4. O-ring, throttle body to manifold (ea.)	50-7967-S	9a. Washer, IAC TP sensor (ea.).....	50-7145-S
5. Intake air temperature sensor w/hardware	55-5041	9b. Spacer	55-5201
5a. Gasket, IAT (ea.).....	16-5009-S	10. MAP sensor	55-5057
5b. Screw, M3, IAT ((ea.)	50-0357-S	11. Screw, throttle body to manifold (ea.).....	50-0359-S
6. O-ring, IAC (ea.).....	50-8149-S	12. Washer, lock, #10, throttle body to manifold (ea.).....	50-7000
7. Fuel rail kit 2006-up	16-5202	13. Gasket, backplate 52mm (ea.).....	106-1724
7a. Tube clip, fuel rail inlet (ea.)	50-0391-S	Gasket, backplate 58mm (ea.).....	106-4662
7b. O-ring, fuel rail inlet (ea.).....	50-8137-S	14. Harness, injector adapter (ea.)	55-5209
7c. Backing washer, o-ring, fuel rail inlet (ea.).....	50-0349-S		