



Installation Instructions for S&S® Single Bore Throttle Bodies

Kits 17-5067 and 106-4407 fits all 2001-'05 Harley-Davidson® models equipped with Delphi® fuel-injection

Kits 17-5068 and 106-4406 fits all 1995-'01 Harley-Davidson® models equipped with Magneti Marelli® fuel-injection

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 Harley-Davidson® Delphi® 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 a certified S&S or Harley-Davidson® shop.

- Throttle Position Sensor (if stock module is used)**
- Idle Air Control (IAC) Motor * (2001-05 Delphi)
- Manifold Absolute Pressure (MAP) Sensor* or Barometric (BARO) Pressure Sensor
- Intake Air Temperature (IAT) Sensor*
- Fuel Supply Tube or Lines
- Intake Manifold Flanges
- Throttle Cables

* These parts are also available through S&S. ** If an S&S module is used, a slotted adjustable TP sensor may be required. Please see calibration information for more details.

Additionally, for 2001-up, S&S Delphi® Style module is recommended; or for a 1995-'01, S&S Magneti Marelli® Style module.

Kit Contents:

17-5068 - 52 mm Throttle Body Kit for 1995 – 2001 Touring Models:

- 16-5100 – 52 mm Throttle Body with Throttle Position Sensor
- 17-0456 – 52 mm Throttle Body Hardware Kit
- 16-5207 – Fuel Rail Kit (1995 – 2001 Touring)
- 17-0452 – Throttle Body Hardware (1995-2001 Touring)
- 17-0453 – Stock Breather Hardware (1995-2001)
- 55-5008 – Idle Air Control Motor

106-4406 - 58 mm Throttle Body Kit for 1995 – 2001 Touring Models:

- 106-3954 – 58 mm Throttle Body with Throttle Position Sensor
- 106-4665 – 58 mm Throttle Body Hardware Kit
- 16-5207 – Fuel Rail Kit (1995 – 2001 Touring)
- 17-0452 – Throttle Body Hardware (1995-2001 Touring)

- 17-0453 – Stock Breather Hardware (1995-2001)

- 55-5008 – Idle Air Control Motor

17-5067 - 52 mm Throttle Body Kit for 2001 – 2005 EFI Models (except 2001 Touring):

- 16-5101 – 52 mm Throttle Body
- 17-0456 – 52 mm Throttle Body Hardware Kit
- 16-5203 – Fuel Rail Kit (2001-2005, except 2001 Touring)
- 17-0483 – Throttle Body Hardware (2001-Up)
- 17-0455 – Stock Breather Hardware (2001 - Up)

106-4407 - 58 mm Throttle Body Kit for 2001 – 2005 EFI Models (except 2001 Touring):

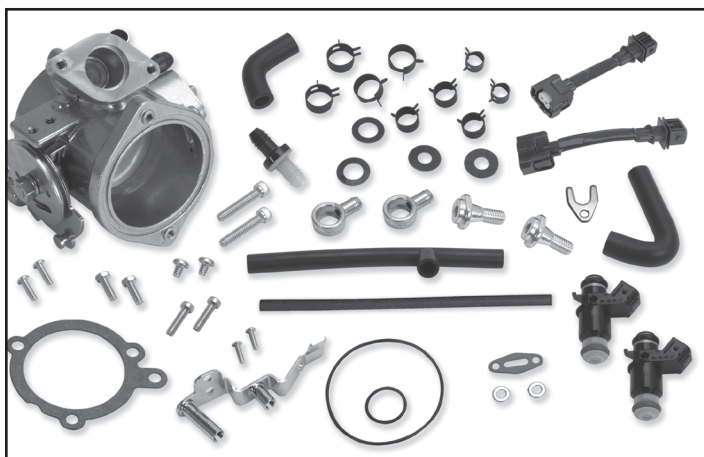
- 160-0146 – 58 mm Throttle Body
- 106-4665 – 58 mm Throttle Body Hardware Kit
- 16-5203 – Fuel Rail Kit (2001-2005, except 2001 Touring)
- 17-0483 – Throttle Body Hardware (2001-Up)
- 17-0455 – Stock Breather Hardware (2001 - Up)

All kits contain the following additional components:

- 31-2104 – Case Breather Hardware, 4-1/8" Bore Engines with Vacuum Breathing
- 55-5052 – Fuel Injector (2 pack)
- 55-5074 – Injector Adapter Harness (2 per kit)
- 160-0147 – Intake Manifold Flange Mounting Hardware

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

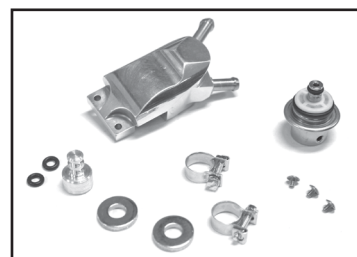
- Air Cleaner Cover and Back Plate Assembly – Varies depending on style and application
- S&S Single Bore Intake Manifold and Seals – Varies depending on engine size.



Throttle Body Kit for S&S Single Bore Induction

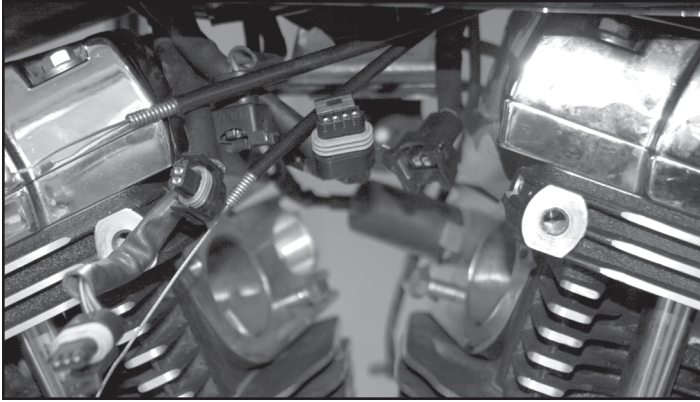


Fuel Rail - 2001-'05 models



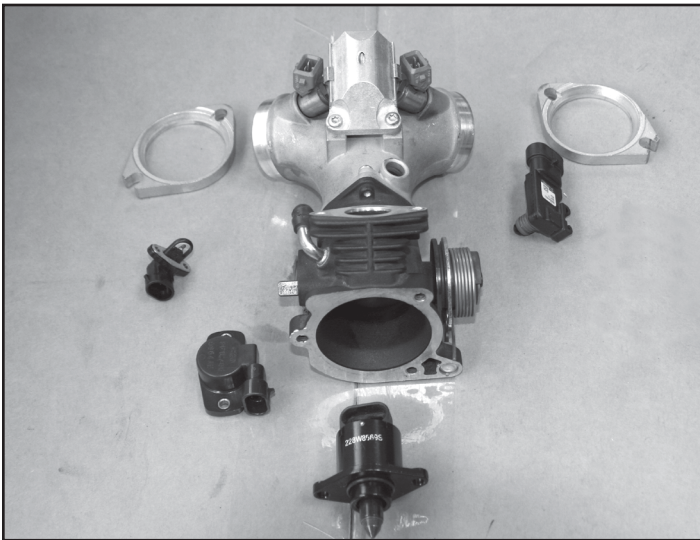
Fuel Rail- 1995-'01 models

- 1- Remove the stock fuel induction system, as shown in **Picture 1**, 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..

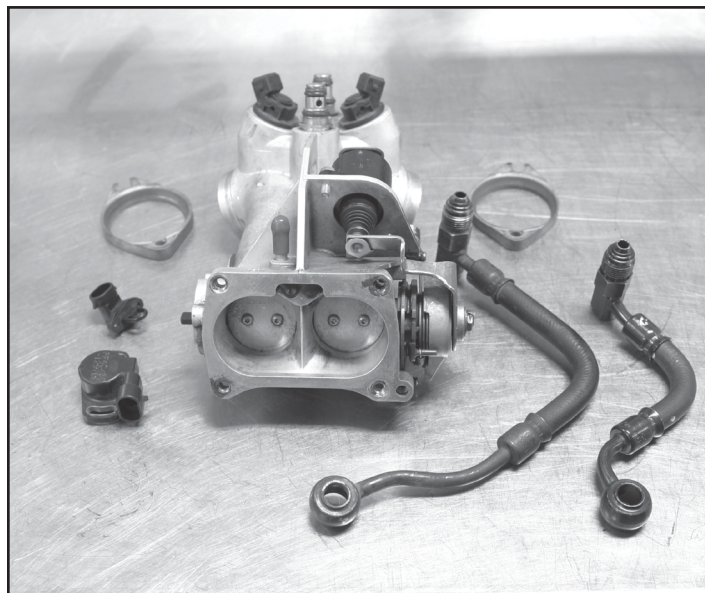


Picture 1

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

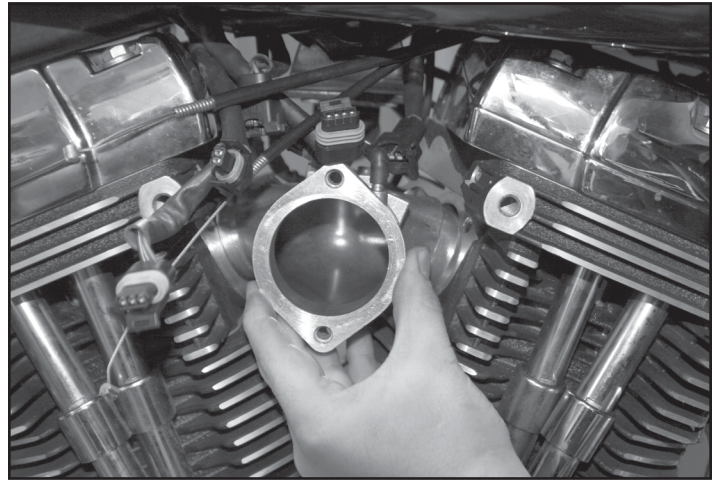


Picture 2 (2001-'05)



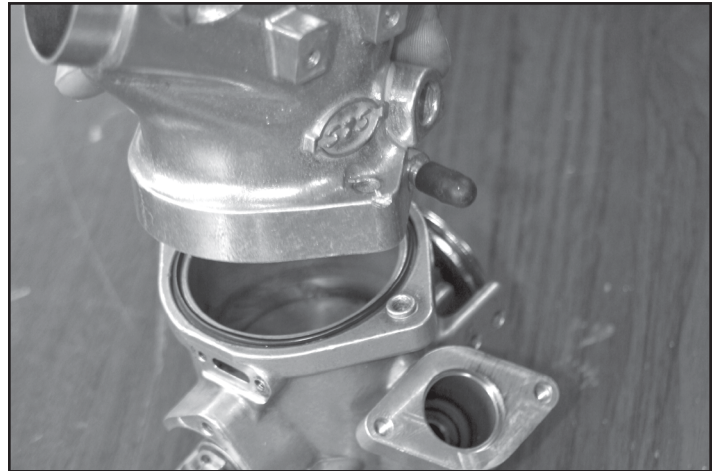
Picture 2a (1995-'01)

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



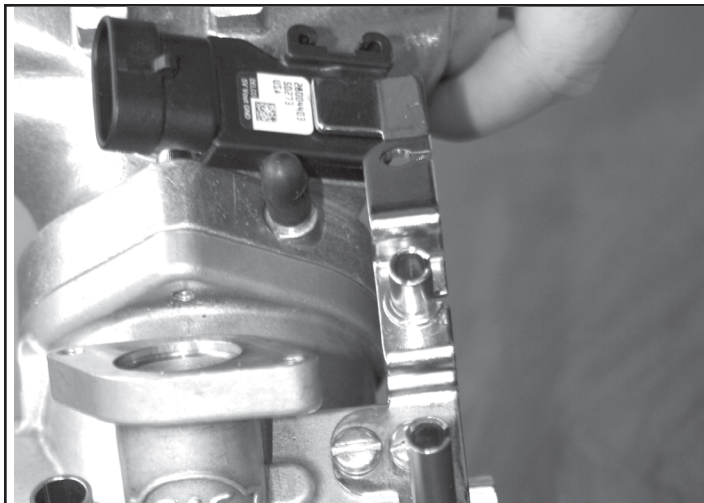
Picture 3

- 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 threadlocker 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.

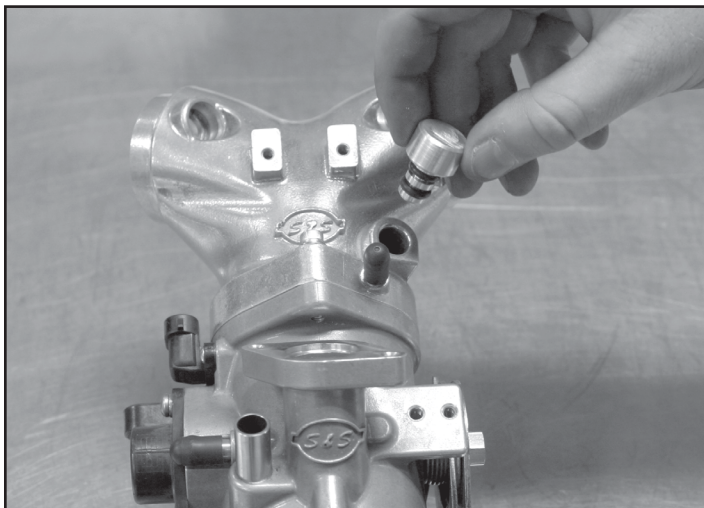


Picture 4

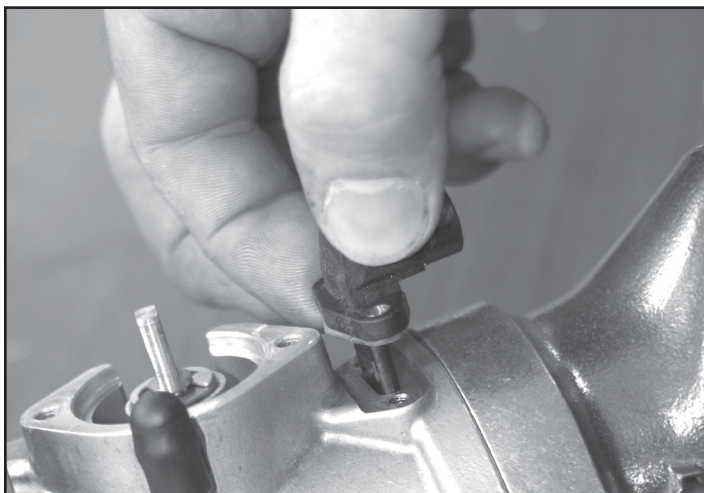
5- For 2001-'05, slide the MAP sensor in place, being sure not to pinch the orange rubber seal—some clean engine oil may make this easier. For 1995-'01, refer to the module instructions to determine whether to install the MAP sensor (**Picture 5**) or the provided plug. (**Picture 5a**) If the plug is used, apply some clean oil to the O-rings. Install them on the plugs and then install the plug. Install the cable guide and verify it is aligned with the throttle cable actuator. Once alignment is satisfactory, apply threadlocker to the 10-24 x 1/4" screws and tighten to 18-22 in-lbs.



Picture 5



Picture 5a



Picture 6

6- Using the new S&S supplied gasket, slide the 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.

7- If the throttle body you are installing has an S&S factory installed Throttle Position Sensor (TPS), it is recommended to use that sensor. However, you should first verify the sensor required for your Engine Control Module (ECM).

- For 2001- 2005 models, except 2001 Touring, if you are using the stock ECM or an aftermarket tuner used in conjunction with the stock ECM, you will need to use the stock TPS.
- If an S&S module is used, a slotted, adjustable TPS may be required. Please see calibration information for more details.
- For 1995 - 2001 Touring Models, use the stock, slotted, adjustable TPS or an S&S 55-5058. Both sensors work the same.
- For 2001-'05, if the stock TPS is used, put a 4mm flat washer on each T20 Torx button head M4 x .7 x 12mm screws, apply some threadlocker and torque screws to 18-23 in-lbs.
- If a slotted, adjustable TPS (55-5058) is used, tighten as listed above. The screws and washers should be installed loose enough to allow rotation to the correct position described later in this instruction. See **Picture 7**.



Picture 7

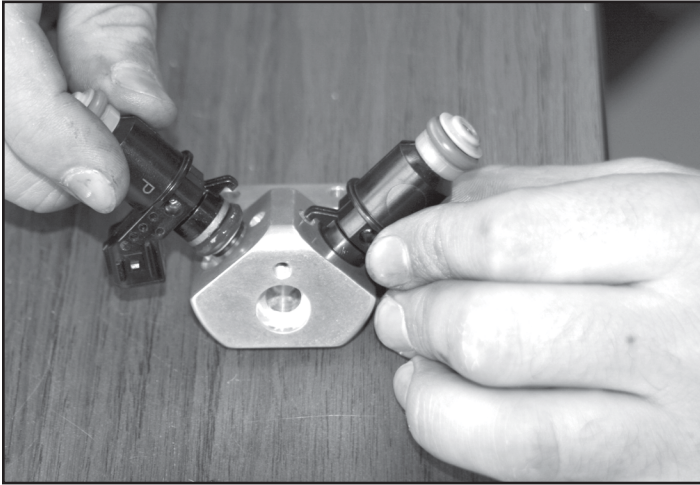
8- Install the new O-ring on the IAC motor. Lubricate the OD of the O-ring with a light film of clean engine oil. Coat the threads of the two hex-head 10-24 x 1/2" screws with Loctite 222. Install the IAC motor with the connector pointing down and tighten the screws to 24-30 in-lbs as shown in **Picture 8**.



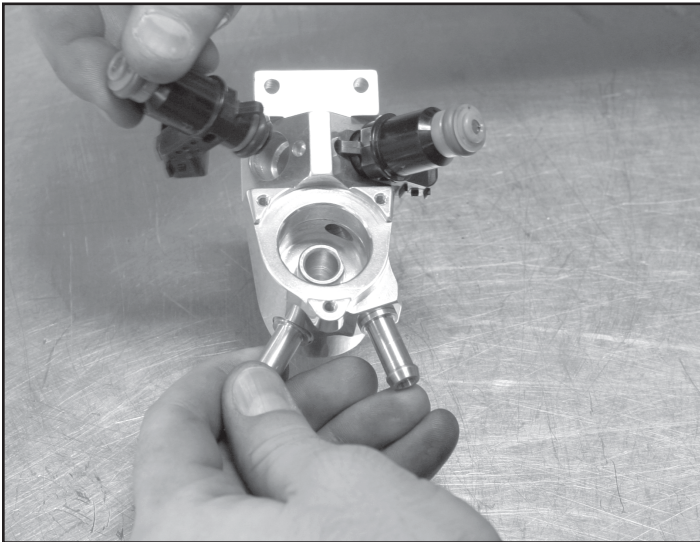
Picture 8

- 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 Pictures 9 and Picture 9a.**

Note - these are special O-rings that seal pressurized gasoline. If an O-ring shows signs of damage or an abrasion—replace it immediately.



Picture 9 (2001-'05)



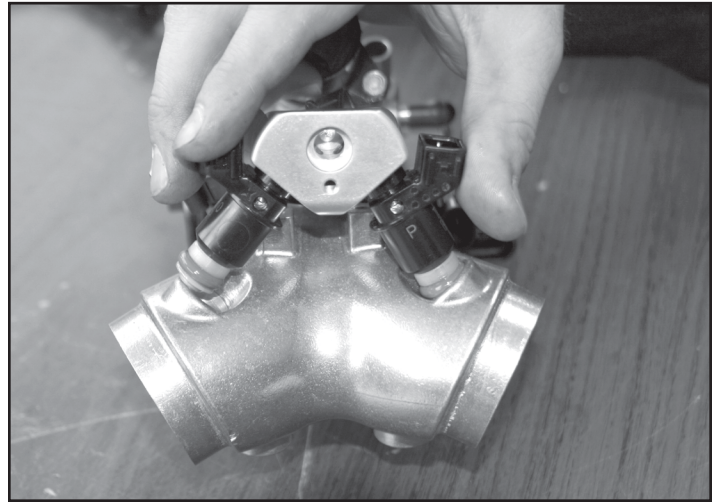
Picture 9a (1995-'01)



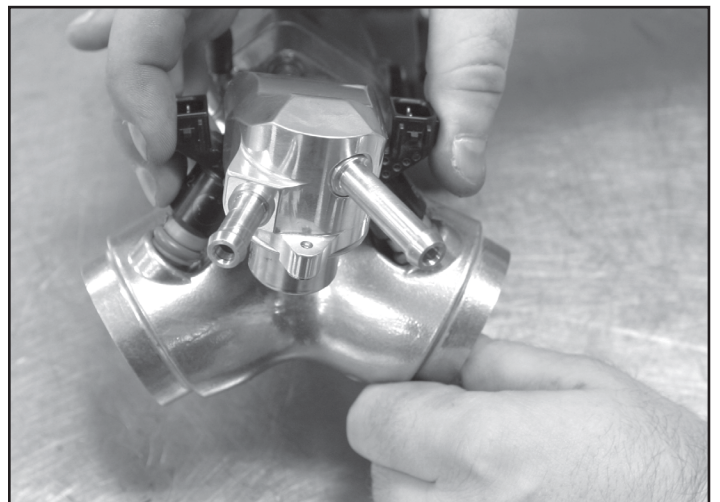
Picture 9b

For 1995-'01, install the included 4-Bar (58 psi) pressure regulator. Use clean engine oil on the O-rings. Coat the threads of the three 6-32 x 3/16" screws with Loctite 222. Install the screws and torque to 6 to 8 in-lbs. Note, a small clearance between the flange of the regulator and screw heads may exist after they are torqued down. **See Picture 9b.**

- 10- Lubricate the lower, orange O-rings of the injectors with clean engine oil and insert them into to the manifold with a light squeezing action. See **Pictures 10 & 10a.** Once in place, use threadlocker 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.

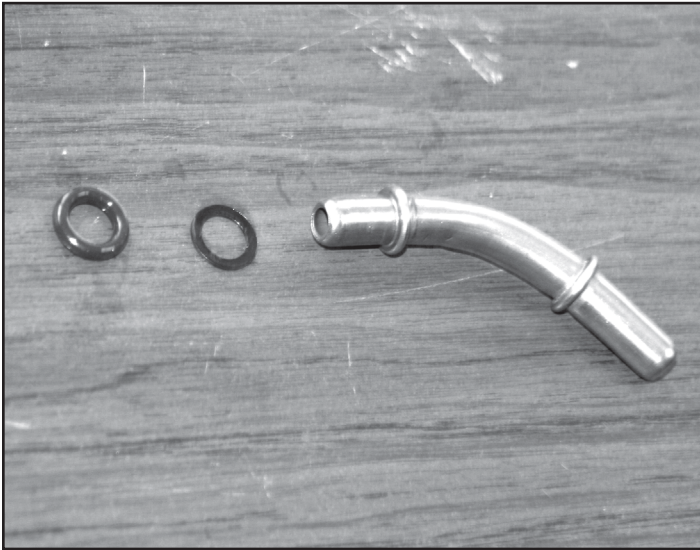


Picture 10 (2001-'05)

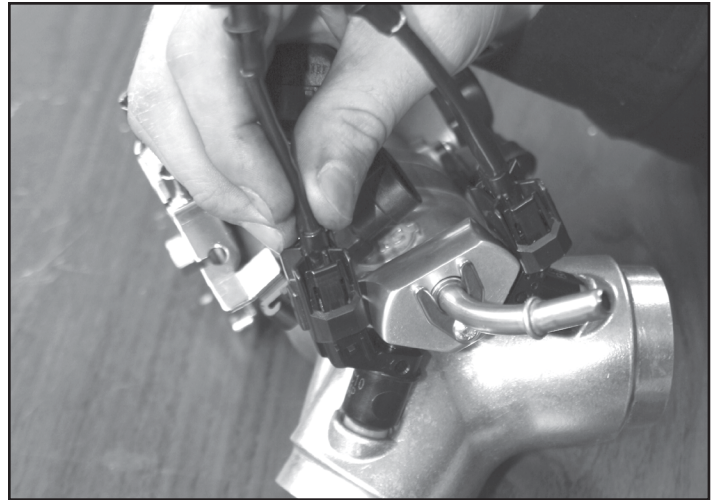


Picture 10a (1995-'01)

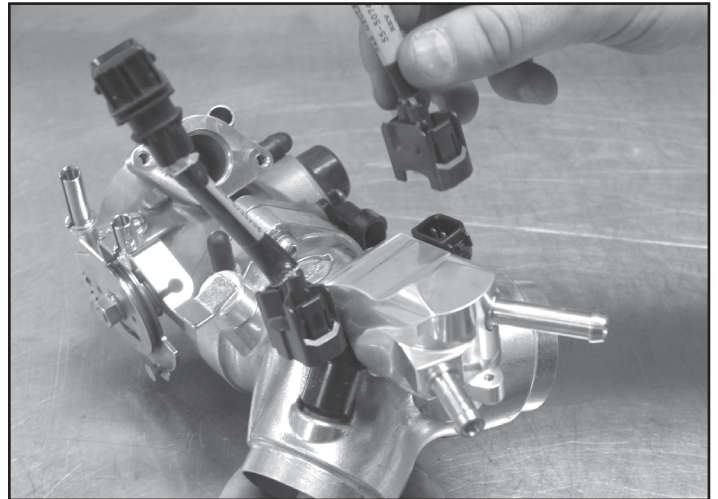
11- For 2001-'05, install the backing washer and O-ring on the fuel supply tube in the order shown in **Picture 11**. Lubricate the O-ring with clean engine oil. When the tube is in place, position the Y-shaped clip on the fuel rail and tighten the Loctite 222 coated T20 Torx button head M4 x 7 x 12mm screw to 18-23 in-lbs.



Picture 11



Picture 12 (2001-'05)

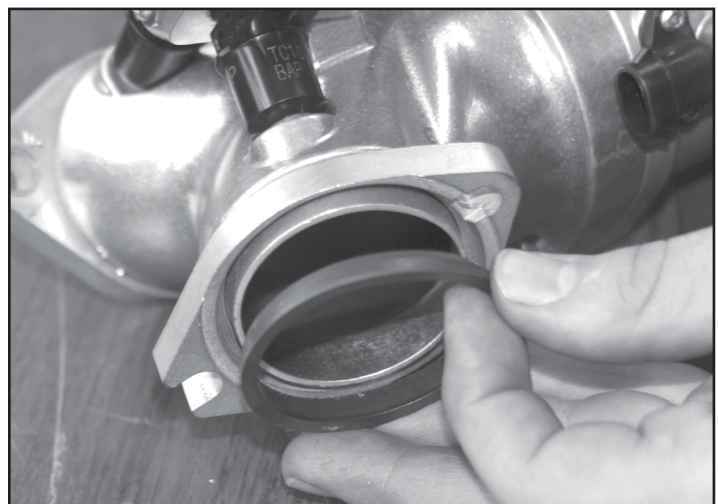


Picture 12a (1995-'01)

13- Put the stock manifold flanges on the manifold. Note that flanges are marked Front (F) and Rear (R).



YOU MUST USE THE S&S® MANIFOLD SEALS. 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 side to the heads as shown in **Picture 13**.



Picture 13

12- Gently push the injectors downward toward the manifold to increase clearance for connecting the wire connectors. Connect the adapter wiring harnesses to the fuel injectors. Listen for an audible click and then gently pull on the connection to verify positive engagement. See Pictures 12 & 12a for year model specific applications.

- 14- 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.
- 15- With the slotted ends of the flanges towards the bottom of the manifold, slide the manifold up in its basic mounting position. Be sure the 5/16" washers installed with the lower manifold mounting flange screws are installed outside the flange and not between the flange and the head. Install the provided cam side screws (5/16-18 x 3/4" SHCS). Lightly snug all four manifold mounting screws BUT DO NOT TIGHTEN AT THIS TIME.

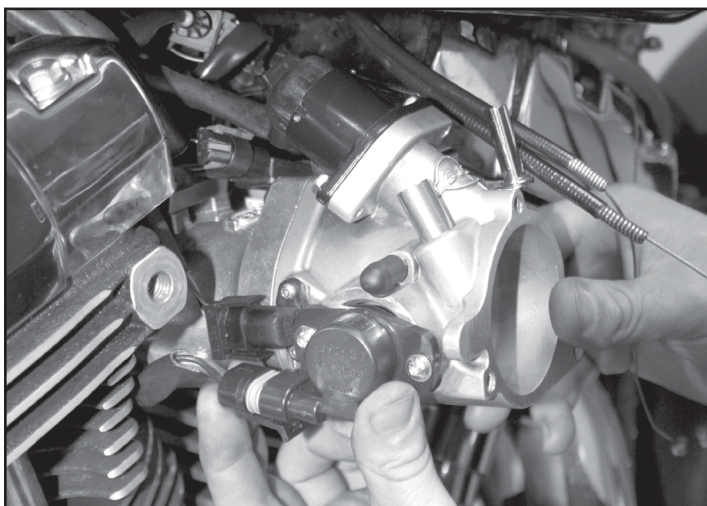


If a screw longer than 3/4" is used, damage to the heads will result.

- 16- Connect the throttle and cruise control cable at this time.

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

- 17- Connect all wiring harness leads at this time. Be sure to connect the front and rear injector adapter harness to the corresponding connectors on the stock harness. Stock H-D® harnesses for the models covered in this instruction use a white wire with a yellow



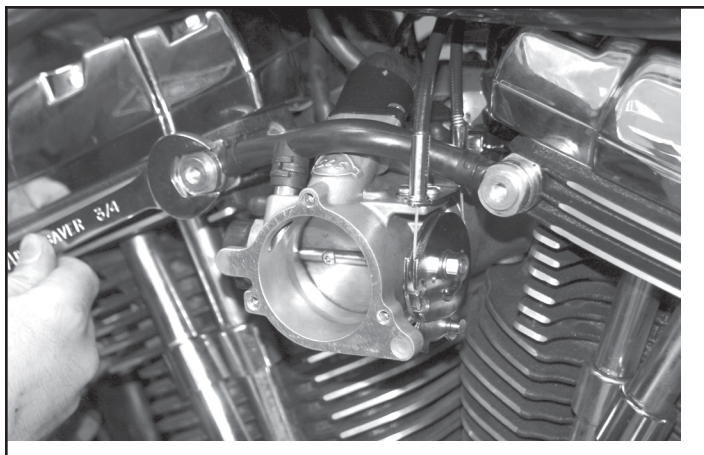
Picture 14

stripe for the front injector control circuit and a green wire with a gray stripe for the rear. If you are unsure, check your factory service manual. See **Picture 14**.

- 18- 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.

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.



Picture 15

- 19- For 2001-'05, 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 and adjust the throttle position sensor voltage if necessary.

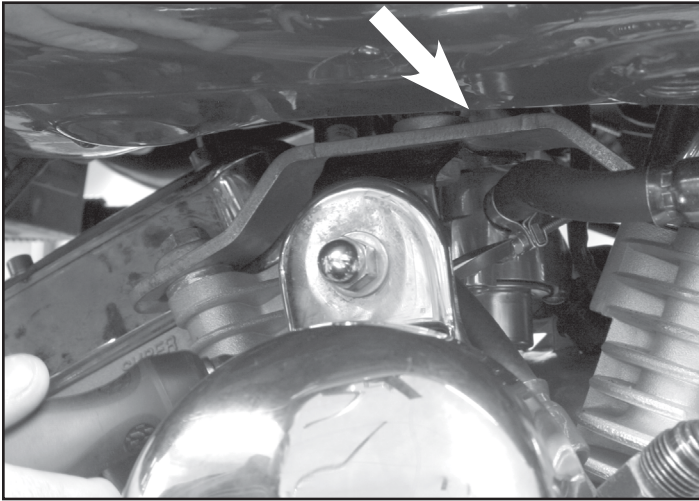
- 20- For 1995-'01, remove the banjo fittings from the stock fuel lines. The line may be cut behind the sleeve. See **Picture 16**.

NOTE - If lines are abraded or cracked they must be replaced.



Picture 16

21- Slide the special hose clamps onto the lines. Install the lines on the fittings pressed into the fuel rail. Align the line fittings with the tank. Remove the lines and trim the lengths of the rubber ends so they do not touch the upper motor mount crossover bracket or engine. To provide clearance, you may need to remove this bracket and install the washers provided. Then reinstall the bracket. See **Picture 17**



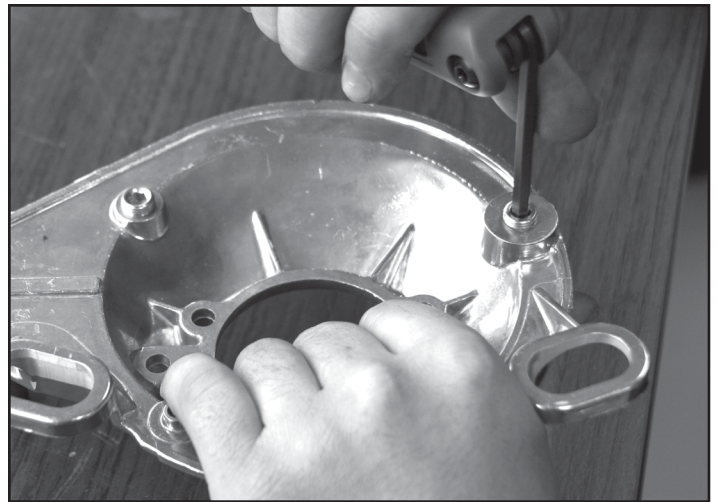
Picture 17

22- Torque the hose clamps 12-18 in-lbs. Install or lower fuel tank and connect the fuel lines to the fuel tank See **Picture 17a**. 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 and adjust the throttle position sensor voltage if necessary. Unless otherwise specified in the module tuning software documentation, the closed-throttle voltage for an adjustable slotted sensor should be 0.50V to 0.51V for an S&S ECM. Rotate the sensor to get this reading, apply threadlocker and torque the screws 18-23 in-lbs..

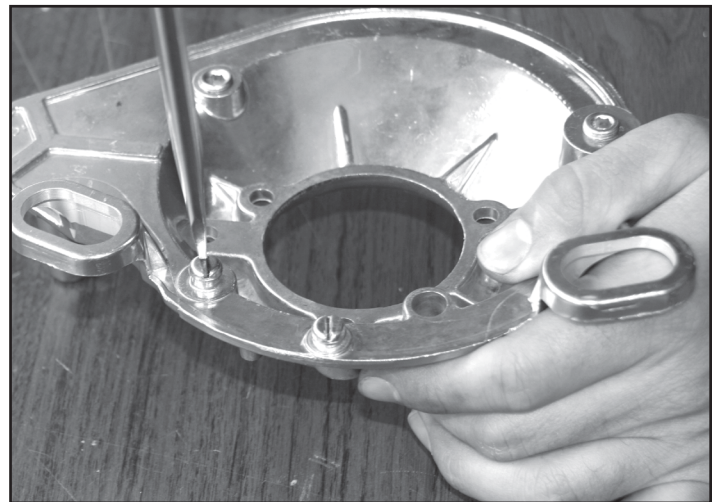


Picture 17a

23- Install two threadlocker coated included pipe plugs in the air cleaner backing plate as shown in **Picture 18**. Torque to 35-45 in-lbs. Also, two pan screws coated with threadlocker must be installed in the backing plate in place of the enrichment device. Torque them to 12-18 in-lbs. Failure to install these screws could allow dirt and debris into the intake system. See **Picture 18a**.

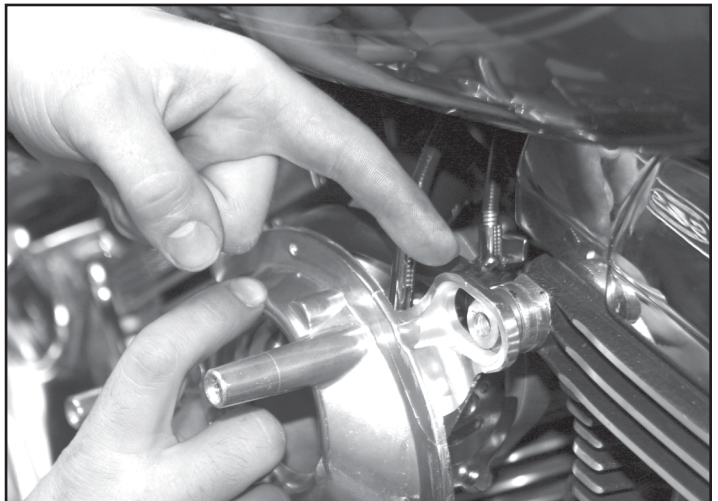


Picture 18

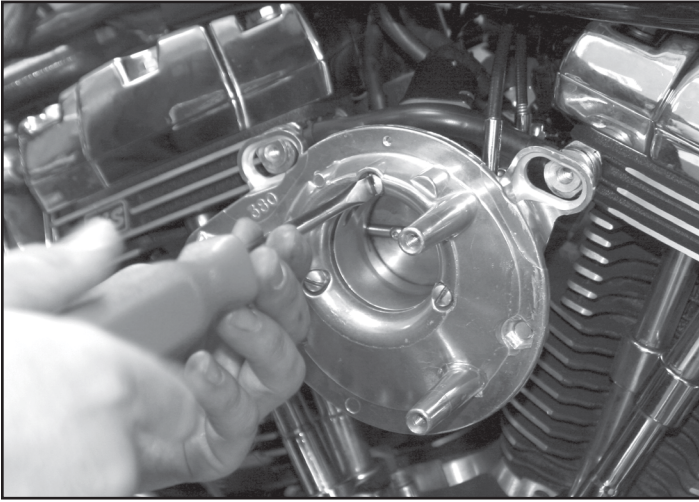


Picture 18a

24- Use a new gasket on the backing plate and put it in place noting the number of shims required to fill the gap between the backing plate mounting tabs and the cylinder head. See **Picture 19**. Once the appropriate shims (included) are determined, mount the backing plate to the throttle body with the three fillister head screws (newer kits use SHCS with a thread-lock patch). See **Picture 20**. **DO NOT INSTALL CYLINDER HEAD MOUNTING SCREWS YET.**

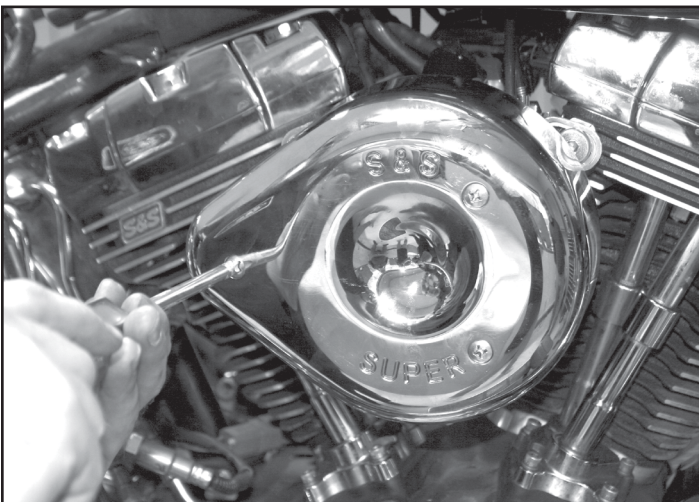


Picture 19



Picture 20

- 25- 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.
- 26- Apply blue threadlock to the three fillister head screws and attach the backing plate to the throttle body. See **Picture 20**. Tighten screws to 35-45 in-lbs
- 27- 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.
- 28- For $\frac{4}{8}$ " bore engines with vacuum breather systems, place flat washers on the $\frac{5}{16}$ -18 x $1\frac{1}{4}$ " screws, apply threadlocker and install through the backing plate, shims and spacers into the heads and torque to 10-12 ft-lbs.
- 29- Apply 242 Loctite to the air cleaner cover mounting screws and install the air filter and air cleaner cover. Tighten the screws to 35-45 in-lbs. See **Picture 21**



Picture 21

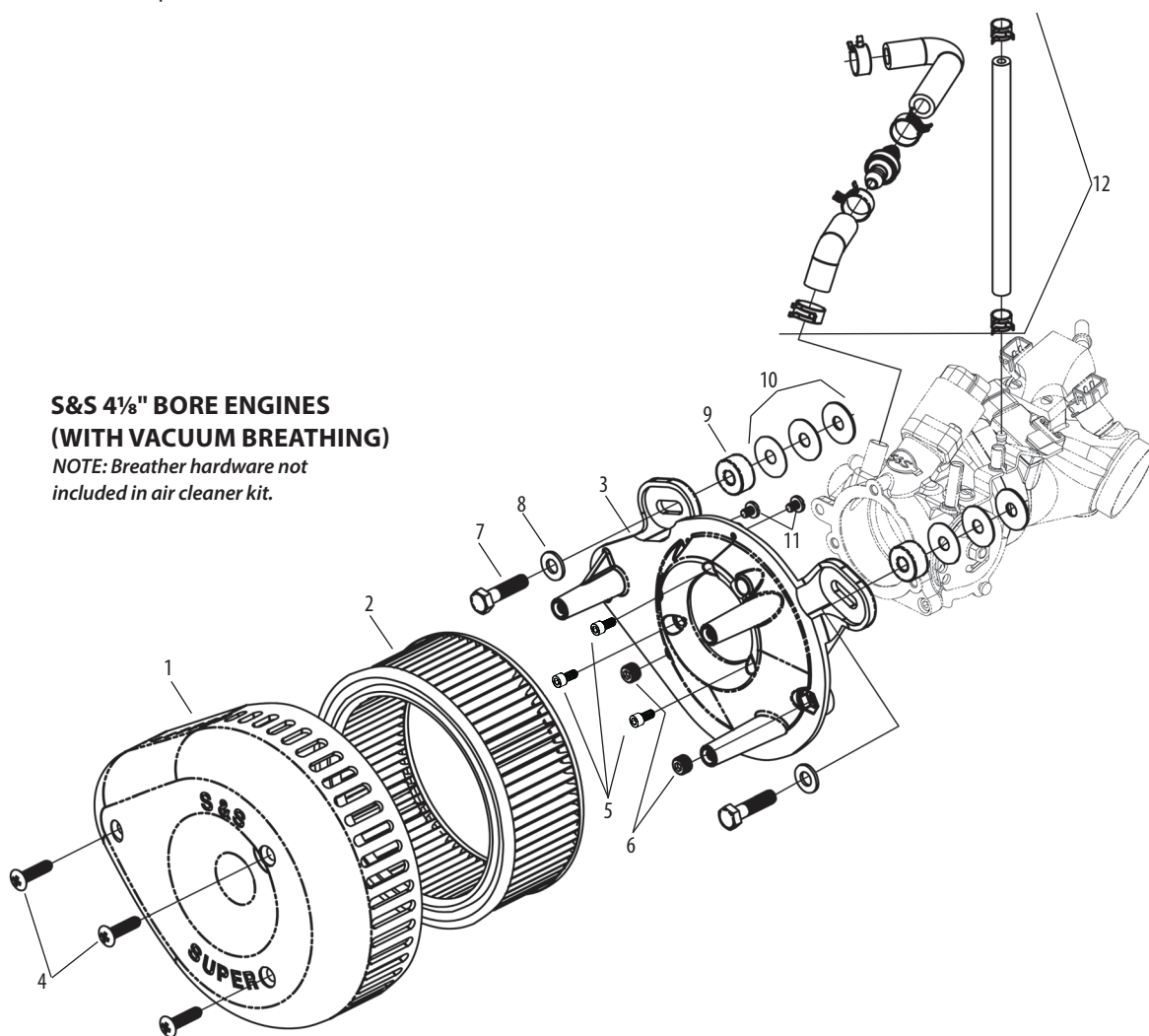
- 30- Reinstall any components removed for the installation. Install the new tune file and start motorcycle.

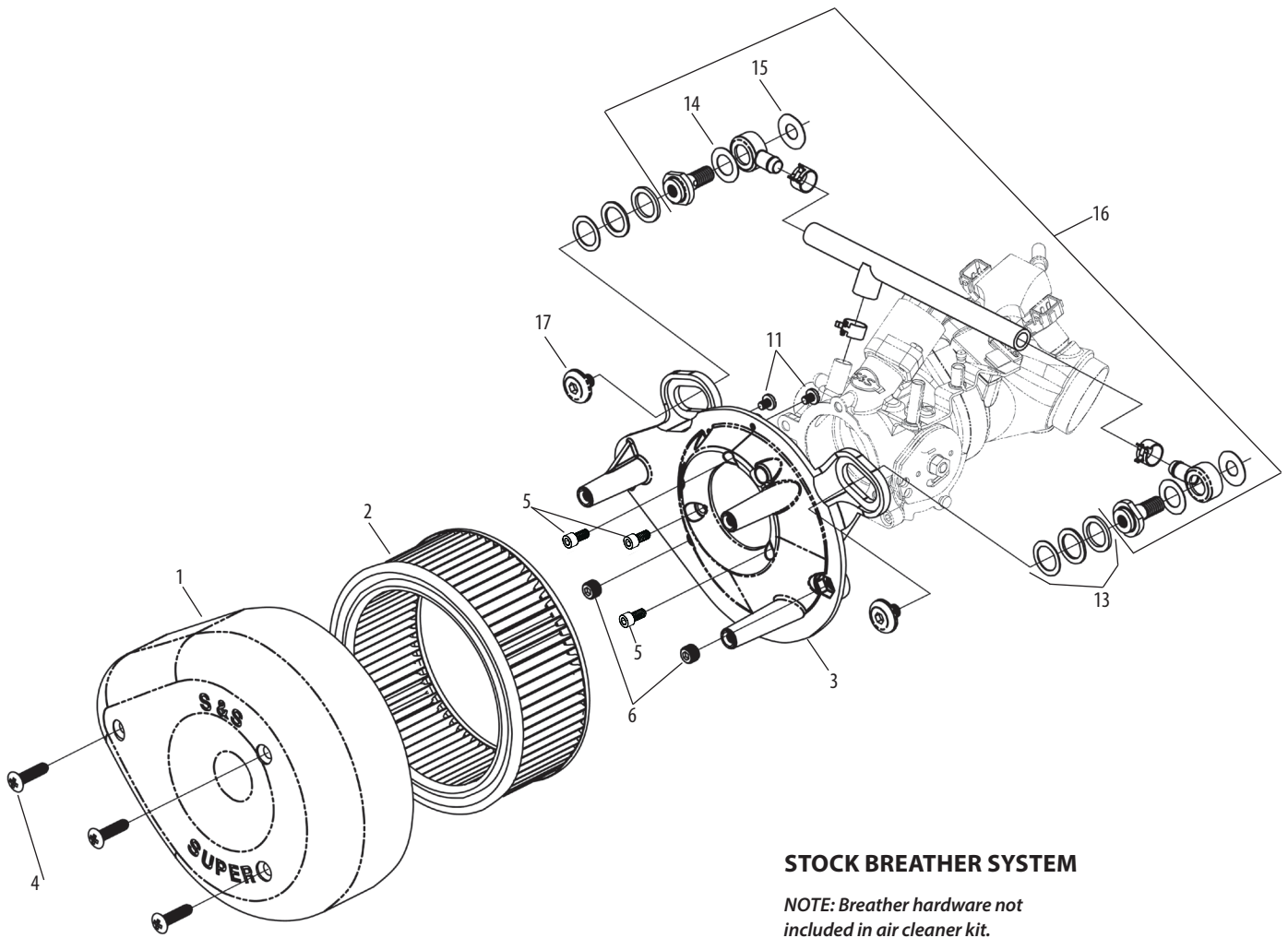
REPLACEMENT PARTS FOR S&S® AIR CLEANERS FOR SINGLE BORE THROTTLE BODIES

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

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

NOTE: Breather hardware not
included in air cleaner kit.

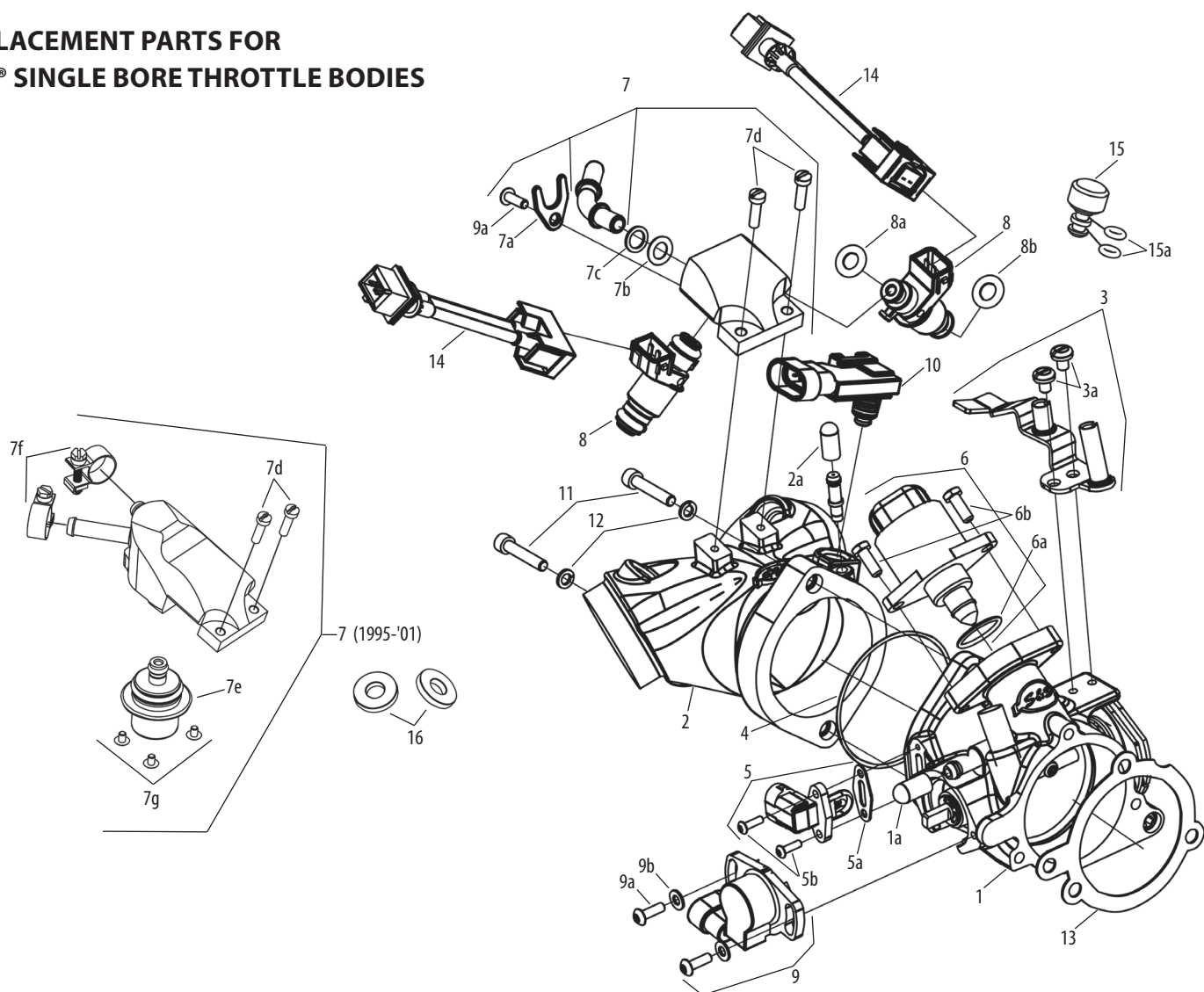




STOCK BREATHER SYSTEM

NOTE: Breather hardware not included in air cleaner kit.

REPLACEMENT PARTS FOR S&S® SINGLE BORE THROTTLE BODIES



1. Throttle body	
52mm.....	16-5101
58mm.....	160-0146
1a. Cap, canister purge (ea.).....	50-8266-S
2. Manifold.....	See catalog for correct size
2a. Cap, rubber, manifold, fitting (ea.).....	50-8372
3. Throttle cable guide packet, w/hardware.....	55-5084
3a. Screw, cable guide & A/C backplate (10 Pack).....	50-0062
4. O-ring, throttle body to manifold (ea.).....	50-7967-S
5. Intake air temperature sensor w/hardware.....	55-5041
5a. Gasket, IAT (ea.).....	16-5009-S
5b. Screw, M3, IAT (ea.).....	50-0357-S
6. Idle air control motor w/hardware.....	55-5085
6a. O-ring, IAC (ea.).....	50-8149-S
6b. Screw, 10-24, IAC (ea.).....	50-0356-S
7. Fuel rail kit	
2001-'05 fuel inlet tube not included.....	16-5203
1995-'01.....	16-5207
7a. Tube clip, fuel rail inlet (ea.).....	50-0391-S
7b. O-ring, fuel rail inlet (ea.) (2001-'05).....	50-8137-S
7c. Backing washer, o-ring, fuel rail inlet (ea.) (2001-'05).....	50-0349-S
7d. Screw, rail (ea.).....	50-0039
7e. Pressure regulator (1995-'01).....	16-5297
7f. Clamp, (ea.) (1995-'01).....	50-8352
7g. Pressure Regulator screw (ea.) (1995-'01).....	50-0279-S
8a. O-ring, injector top, black (ea.).....	50-8264-S
8b. O-ring, injector bottom, orange (ea.).....	50-8265-S
9. Throttle position sensor.....	550-0408
9a. Screw, TP sensor & fuel rail (ea.).....	50-0358-S
9b. Washer, TP sensor (ea.).....	50-7145-S
10. MAP sensor.....	55-5057
11. Screw, throttle body to manifold (ea.).....	50-0359-S
12. Washer, lock, #10, throttle body to manifold (ea.).....	50-7000
13. Gasket, backplate	
52mm (ea.).....	106-1724
58mm (ea.).....	106-4662
14. Harness, injector adapter (ea.).....	55-5074
15. 15. MAP sensor hole plug (w/ O-rings) 1995-'01.....	50-8350
15a. O-ring (ea.) 1995-'01.....	50-8133-S
16. Motor mount bracket washer (ea.).....	50-7053