

**Instruction 51-1012  
07-25-12**

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## **Installation and Jetting Instructions for S&S Super E and G Series "Shorty" Carburetors**

### **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.

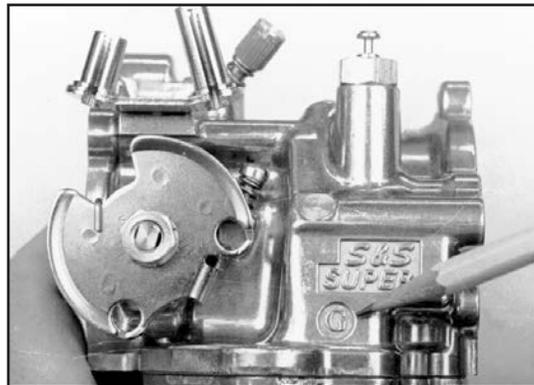
## INTRODUCTION

S&S® Super E and G Shorty carburetors are designed for and Harley-Davidson® big twin and Sportster® models as well as other American v-twin engines. They are butterfly type carburetors with fully adjustable idle mixture and changeable air bleed and mid range and high speed jets. Both carburetors also feature an adjustable accelerator pump and variable enrichment/fast idle device for improved throttle response, engine starting and warm ups.

The Super E has a 1 $\frac{1}{8}$ " (47.6mm) bore and 1 $\frac{1}{16}$ " (39.6mm) venturi. It is identified by an "E" cast into the throttle linkage side of the body below the letters "S&S SUPER". The Super E is recommended for use on any displacement big twin or Sportster.

**NOTE:** Because S&S carburetors are significantly larger than OEM units, unmodified, small displacement engines such as 883 and ironhead Sportster models may experience sluggish low speed response when equipped with S&S carburetors. This can often be minimized with careful tuning.

The Super G has a 2 $\frac{1}{16}$ " (52.3mm) bore and  $\frac{3}{4}$ " (44.5mm) venturi. It is identified by a "G" cast into the carb body. **See Picture 1.** The Super G is recommended for use on modified engines of 100 cubic inches or more. While both carburetors can be made to work on most engines, the Super G is not recommended for small, low compression engines. If there is doubt as to which carburetor to use, S&S suggests the Super E.



Picture 1

### **IMPORTANT NOTE - Recommended for Racing Only.**

S&S carburetors are not legal for use in California on motor vehicles operated on public highways or in other states where similar pollution laws apply. The user shall determine the suitability of the product for his or her use and shall assume all risk and liability in connection therewith.

### **Kit Contents:**

Each complete carb kit includes:

- One S&S Super E or Super G gas carburetor
- One S&S teardrop air cleaner assembly
- One manifold
- Mounting hardware
- Fuel line, fuel line insulator, clamps and overflow line
- Extra main and intermediate jets
- VOES tubing and additional hardware (when applicable)
- Installation and jetting instructions

### **CHROME PLATING THE CARBURETOR**

**NOTE:** S&S does not recommend chrome plating the Super E or G carburetor. Preparation requires polishing with abrasive buffing compounds. These materials invariably plug air and/or fuel passages and other orifices regardless of precautions taken.

### **CAUTION**

The chrome plating process can alter critical operating tolerances in several areas. Additionally, chrome may obstruct fuel passages, possibly altering the fuel mixture and causing engine damage. All manufacturer warranties become void if any part of the carburetor is polished, chrome plated or otherwise altered.

## THROTTLE REQUIREMENTS

**NOTE:** S&S Super E and G carburetors require the use of a two cable, pull open - pull closed throttle assembly. All 1980 and earlier stock H-D® models equipped with a single cable throttle mechanism must be converted to the two cable, pull open-pull closed type. S&S offers these throttle assemblies but does not include them with any carburetor kit because of the multitude of chassis designs and fitment requirements.

### ⚠ WARNING

**Single, braided wire cable throttle mechanisms cannot mechanically close the throttle. If throttle inadvertently sticks in open position, loss of control of motorcycle and personal injury to operator or others may result.**

#### 1980 and Earlier Motorcycles

All stock chassis 1980 and earlier, or any motorcycle equipped with single cable throttle system must be converted to a two cable system. Throttle assembly kits may be ordered separately. See descriptions below.

#### 1981 to Present Big Twin Models

Stock big twin models from 1981 to 1989 have two cable throttle system designed for stock, butterfly type carburetors. Big twins from 1990 to present have a two cable throttle system designed for the stock, constant velocity (CV) type carburetor. In spite of the differences in throttle cables for these year groups, stock throttle cables on all 1981 to present big twin models can be installed on the S&S Super E or G throttle linkage with no cable modification. S&S Super E and G carb kits for 1936 to 1989 big twins contain a throttle cable guide designed for butterfly type throttle cables, and kits for 1990 and later big twins contain a taller throttle cable guide designed for CV type throttle cables. **See Picture 2.** The two throttle cable guides are interchangeable on the carburetor body, and can be changed very easily to update older carburetors or to accommodate custom throttle cables which are not stock for a particular year chassis.



Picture 2

#### 1981 to Present Harley-Davidson® Sportster® Models

Stock Sportster models from 1981 to 1987 have two cable throttle system designed for butterfly type carburetors. 1988 to present models have a two cable throttle system designed for use with the stock constant velocity (CV) type carburetor. A tall guide should be used on 1990-'06 carbureted Harley-Davidson® Sportster® models. See S&S Throttle Cable Application Chart (**Chart 1**).

S&S® THROTTLE CABLE APPLICATION CHART				
Length Total Housing	Length Vinyl Housing	Part Number Open Side	Part Number Close Side	Fitment
36"	32"	19-0430	19-0431	For Buell® with 7/8" handlebars
36"	32"	19-0432	19-0433	To 1995, 1981-'85 FX and FL; All 1981-'85 XL (Also pre-1981 w/2-cable throttle housing replaced) For Buell® with 1" diameter handlebar
36"	32"	19-0436	19-0437	1996-'06 883-1200 XL
39"	35"	19-0434	19-0435	To 1995 Softail® (FXCTC, FXST, FLSTC, FLSTC, FLSTF) 1986-'94 FXR, 1993-'95 Dyna®
39"	35"	19-0438	19-0439	1996-'05 Softail (FXSTS, FXSTC, FLSTC, FLSTF) 1996-'05 Dyna
42"	38"	19-0446	19-0447	To 1995 Custom Application
42"	38"	19-0440	19-0441	1996-'05 Custom Application
48"	44"	19-0462	19-0463	To 1995 All FLT Models
48"	44"	19-0464	19-0465	1996-'05 All FLT Models

Chart 1

## 1996 to 2002 Buell® Models

1996 and 1997 Buell models require special S&S butterfly style throttle cables, which are compatible with the stock 1996-1997 throttle assembly. 1998-'02 carbureted Buell models require installation of stock 1996-'97 throttle grip and the special S&S throttle cables for Buell models when installing Super E or G carburetors.

### S&S THROTTLE KITS

S&S throttle kits fit 1" handlebars and can be used on most chassis. (An adapter sleeve is available for use with earlier, 7/8" OEM handlebars originally equipped with internal throttle cable.) Barrel fittings on S&S® cables readily "plug in" to S&S Super E, G, and stock H-D® 1981-'90 butterfly type carb throttle linkage. Kits include one opening and one closing side cable, left and right grips, and handlebar clamps. Kits with 36", 39", 42", or 48" length cables are available. Length specified refers to overall cable length. Vinyl covered outer housing is 4" shorter than overall length.

Throttle Kit with 36" Cables	Part 19-0450
Throttle Kit with 39" Cables	Part 19-0448
Throttle Kit with 42" Cables	Part 19-0482
Throttle Kit with 48" Cables	Part 19-0449
Adapter Sleeve - 7/8" to 1"	Part 19-0235

**NOTE:** Cables supplied with above kits are interchangeable with 1981-'90 stock H-D butterfly style throttle cables.

### S&S Throttle Cables For 1996 and Later Chassis

These throttle cables feature the "plug in" cable fastener to fit 1996 and later throttle grips, and the correct length inner cable for use with S&S butterfly style carburetors with the shorter cable bracket. These cables must be used in 1996-'02 Sportster installations. These cables may be used on 1996 and later big twin installations if the S&S carb is equipped with the short cable guide bracket. Cables for Buell models fit threaded 1996-'97 Buell throttle grip.

### CARB INSTALLATION

Read instructions thoroughly to familiarize yourself with all procedures before beginning installation. Since this manual covers installation on all models, it may be helpful to highlight the steps that apply to your application.

**NOTE:** Installation of S&S® Super E and G carb kits on certain models is easier with gas tanks removed. Some owners may elect to perform installation without removing gas tanks. This is left to individual discretion. If installer elects to remove tanks or other stock parts, S&S recommends referring to appropriate Harley-Davidson® service manual for correct removal procedure as necessary.

#### 1- Remove Old Carburetor And Manifold

#### WARNING

- **Gasoline is extremely flammable and explosive under certain conditions. Do not smoke around gasoline. Gasoline fumes are toxic when inhaled. Perform installation in a well ventilated area away from open flames or sparks. Any gasoline leak or spill constitutes a health and fire hazard.**
- **If motorcycle has been running, wait until engine and exhaust have cooled to avoid getting burned during installation.**
- **Electrical sparks can ignite explosive gasoline fumes. Failure to disconnect battery while working on motorcycle can also result in inadvertent engagement of starter and personal injury.**

A- Shut off fuel petcock and disconnect battery.

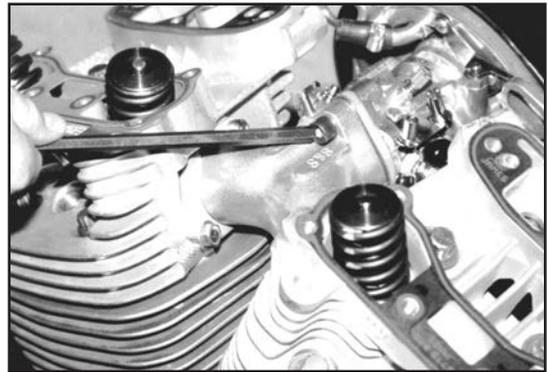
B- Remove air cleaner assembly. Drain fuel from existing carburetor. Remove carburetor, manifold, choke cable and any carburetor mounting hardware.

#### NOTES:

- *Removing and tightening hard to reach Allen bolts like carb-manifold mounting bolts and manifold flange bolts can be greatly simplified by using some special tools. The S&S rocker cover wrenches work very well for this application. **See Picture 3 on next page.** Allen ball-end drivers are also very helpful, and are available at most automotive and tool supply houses. **See Picture 4 on next page.** As an alternative, standard hex wrench can be shortened for convenience.*
- *Some Buell® motorcycles have a breather fitting with 90° elbow on rear head. Due to proximity of frame, elbow must be removed before fitting can be taken off engine.*
- *Loosen fitting and rotate to position convenient for cutting elbow. Secure fitting by tightening against cylinder head. Elbow may be inaccessible to hacksaw. In most instances, a die grinder with cutoff wheel will remove elbow with little difficulty. If die grinder is unavailable, grasp elbow firmly with pliers and snap off, then remove fitting.*



Picture 3



Picture 4

**CAUTION**

Extreme care must be taken to prevent metal chips from entering engine when elbow is removed. S&S® recommends packing breather fitting with grease before removing elbow. Metal chips inside engine will cause extensive damage. Installer bears all responsibility for containment of chips and other debris.

## 2- Prepare Air Cleaner Backplate

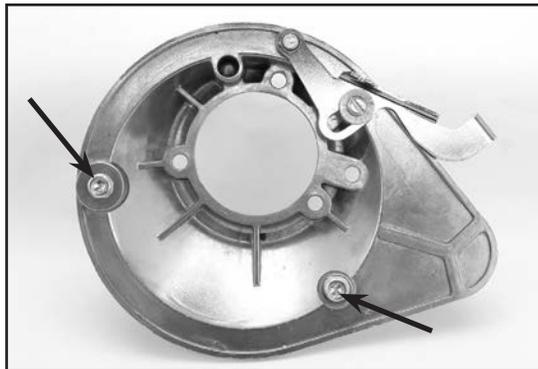
**NOTE:** Fast idle lever screws must not be over tightened. Loctite® or other thread locking compound may be used sparingly on threads to prevent screws from vibrating loose.

**CAUTION**

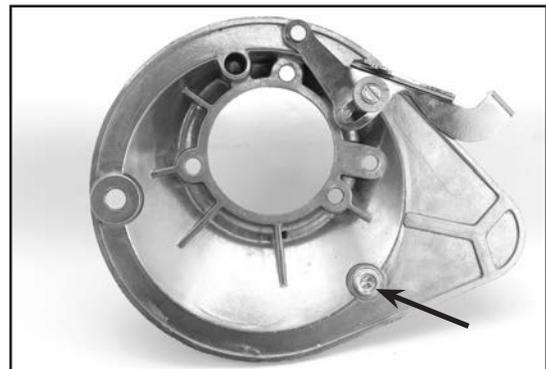
Over tightening fast idle lever screws may damage backplate.

A- 1936-'84 models

- 1- Knucklehead & panhead, 1936 to 1965 - Install plugs into holes in air cleaner backplate. **See Picture 5**
- 2- Shovelhead, 1966 to 1979 and ironhead (IH) Harley-Davidson® Sportster® models, 1957 to 1979 - Install plug into hole in air cleaner backplate. **See Picture 6.**

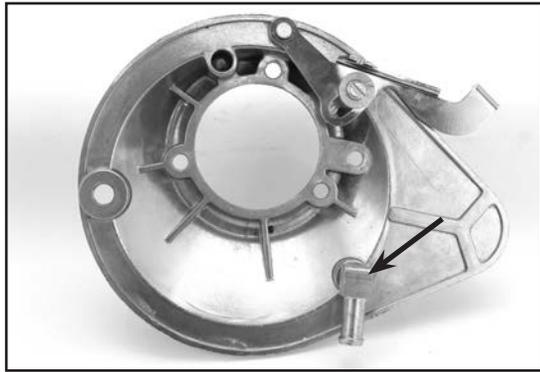


Picture 5

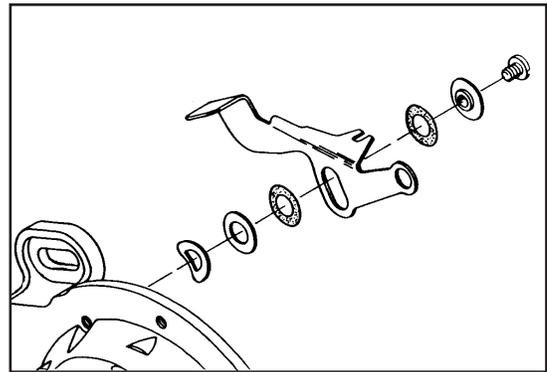


Picture 6

- 3- Shovel, 1980 to 1984 and Sportster® models 1980 to 1985 - Screw crankcase breather vent elbow fitting into hole in air cleaner backplate and angle downward as shown in **Picture 7**.
- 4- On 1983 and 1984 shovel engines press plug into other hole on left.
- 5- Assemble fast idle mechanism as shown in **Figure A**. On current backplates the pivot point for the enricher does not have a screw holding it; a boss has been cast onto the backplate to replace this.

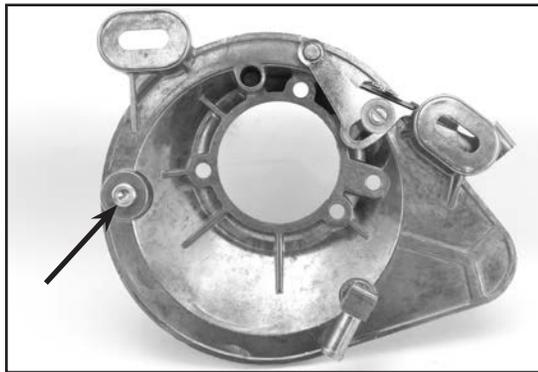


**Picture 7**

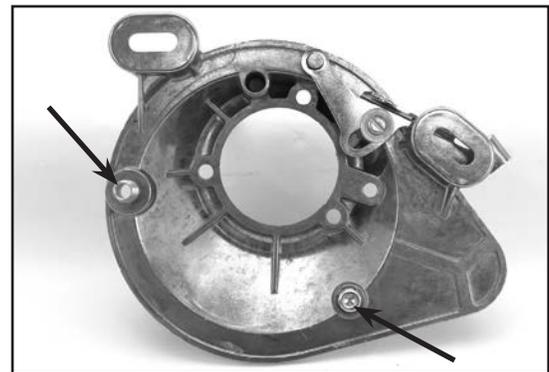


**Figure A**

- B- 1984-'92 Evolution® big twin engines
  - 1- Install plug into hole on left in air cleaner backplate as shown in **Picture 8**.
  - 2- Screw vent hose elbow fitting into remaining hole at right. **See Picture 8**.
  - 3- Refer to step 5 above about assembling the fast idle mechanism.
- C- 1986 to 1990 Sportster models
  - 1- Install plug into hole on right in air cleaner backplate as shown in **Picture 9**.
  - 2- Screw vent hose nipple fitting into remaining hole at left. **See Picture 9**. Elbow fitting supplied in kit may also be used in this location if required.

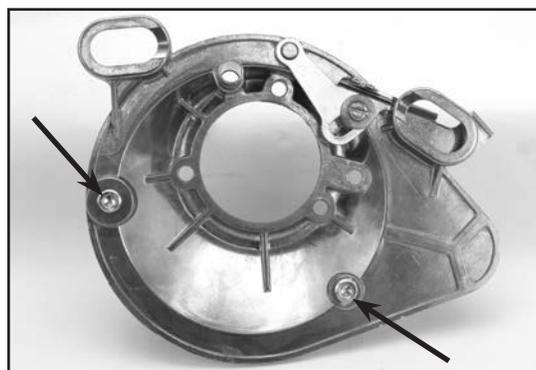


**Picture 8**



**Figure 9**

- 3- Assemble fast idle mechanism as shown in **Figure A**. On current backplates the pivot point for the enricher does not have a screw holding it; a boss has been cast onto the backplate to replace this.
- D- 1993-up big twin & 1991-up Harley-Davidson® Sportster®
  - 1- Install plugs into both holes in air cleaner backplate as shown in **Picture 10**.
  - 2- Refer to step 3 above about assembling the fast idle mechanism.
- E- Buell® motorcycles, 1994 and '02 - Refer to step 3 above about assembling the fast idle mechanism.



**Picture 10**

### 3- Throttle Preparation

**NOTE:** Throttle grip assembly must be assembled correctly and work freely to prevent possible sticking during operation. Throttle must snap closed when released. Cable routing must be free of tight bends to minimize friction between cable and housing.

#### **⚠ WARNING**

**If throttle does not work freely, it may inadvertently stick open possibly causing loss of control of motorcycle and personal injury to operator or others.**

- A- Install new throttle assembly - Motorcycles not equipped with two cable pull open-pull closed type throttle assembly.
  - 1- Remove existing throttle cables and throttle grip assembly. Note routing of stock cables.
  - 2- Install new throttle assembly and throttle cables. Position grip and cables similar to stock position so cables can be angled back toward carb for easy adjustment and free operation.
  - 3- Apply light coat of cable lubricant to cables/fittings.
  - 4- Loosen cable freeplay adjustment locknuts and thread adjusting screw so half of threads are exposed. **See Picture 11.**
- B- Prepare existing throttle assembly - 1981-1989 Harley-Davidson® Sportster® and 1981 and later big twin chassis equipped with two cable pull open-pull closed type throttle assembly.
  - 1- Loosen cable freeplay adjustment locknuts and thread adjusting screw so half of threads are exposed. **See Picture 11.**
  - 2- Clean grease and dirt off cables, cable housings and cable fittings.
  - 3- Apply light coat of cable lubricant to cables and fittings.
- C- Replace throttle cables - Buell® models equipped with constant velocity (CV) type carb.
  - 1- Carefully remove existing cables noting how they are routed.
  - 2- 1998-'02 Buell models – replace throttle assembly with stock 1996-'97 throttle assembly.
  - 3- Install replacement cables using same routing as stock cables.
  - 4- Loosen cable freeplay adjustment locknuts and thread adjusting screw so half of threads are exposed. **See Picture 11.**
  - 5- Apply light coat of cable lubricant to cables and fittings.



Picture 11

### 4- Install New Manifold and Mounting Hardware

**NOTE:** When applicable, all carburetor mounting brackets and hardware supplied in kit must be installed to secure carburetor and air cleaner backplate assembly or air horn rigidly to engine.

#### **⚠ CAUTION**

- Improperly mounted carburetor could loosen unexpectedly, resulting in air leak, poor performance and possible damage to engine or carburetor.
- Incorrect combinations of mounting hardware may cause mounting bolts to bottom out in holes or inadvertently contact other parts possibly causing damage to engine or carburetor components.

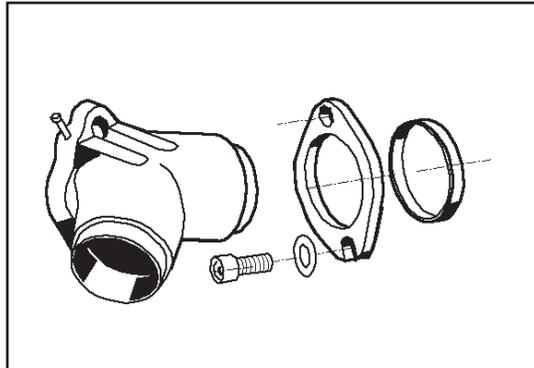
#### **⚠ WARNING**

**Improperly mounted carburetor may break free in event of collision or other vehicle accident creating a fire hazard with potential personal injury to operator/others.**

A- All models: Clean intake ports on cylinder heads to insure proper manifold to head seal.

**NOTE:** Cylinder heads for knucklehead engines 1936-'47 and panhead engines 1948-'54 must be converted to o-ring style manifold and seals. Conversion kits are available from S&S®. See the Flathead Power® vintage section of the S&S Catalog.

B- All models: Install S&S® intake manifold. If applicable, vacuum advance fitting must point upward. For Harley-Davidson® Evolution® and Twin Cam 88® engines manifold flange and seal assembly order, **See Figure B**. Note that bevel side of seal goes toward recess in manifold flange, flat side of seal against head. Do not completely tighten manifold clamps or flange bolts at this time.



**Figure B**

C- Knucklehead and panhead engines - Remove center crankcase stud nut between tappet blocks. Install bracket, to connect bottom carb-manifold mounting bolt to crankcase stud and reinstall nut.

D- Shovelhead engines 1966 to 1982 - Bolt bracket to front rocker cover using  $\frac{5}{16}$ "-18 x  $\frac{5}{8}$ " bolt,  $\frac{5}{16}$ " flatwasher and  $\frac{5}{16}$ " lockwasher provided in kit. Do not tighten at this time. End of bracket with sharp bend goes toward rocker cover.

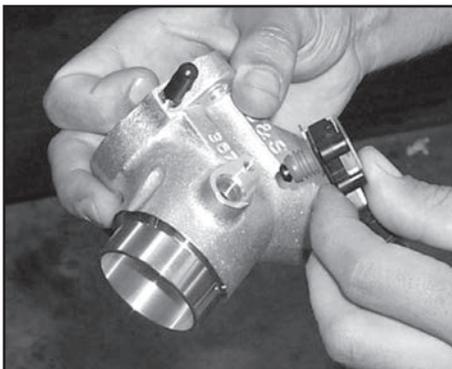
E- Shovelhead engines 1983 to 1984 - Remove center crankcase stud nut between tappet blocks. Install bracket to connect lower carb-manifold mounting bolt to crankcase stud and reinstall nut.

F- Sportster® models 1957 to 1982 - Bolt bracket to front tappet guide using  $\frac{5}{16}$ "-18 x 1  $\frac{1}{4}$ " bolt,  $\frac{5}{16}$ " flatwasher and  $\frac{5}{16}$ " lockwasher provided in kit. Do not tighten. End of bracket with sharp bend goes toward tappet guide.

**NOTE:** E & G carb will not fit Sportster® models equipped with OEM style magneto due to interference between magneto and carb fuel inlet fitting. S&S manufactures no adapters or other components for installing E or G carb on magneto equipped Sportster.

G- Sportster models 1983-'06 and all 1984-'05 big twins- Connect vacuum operated advance ignition switch (VOES) to manifold using 8" piece of black tubing supplied in kit. Cut tubing to shorter length if necessary.

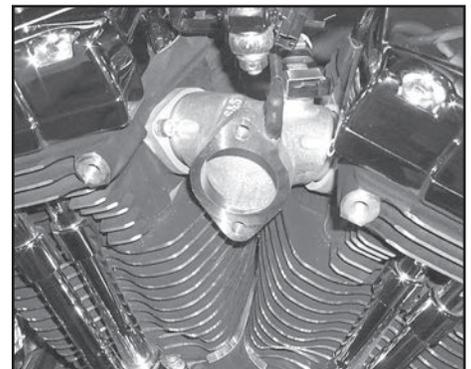
H- Twin Cam 88®, 1999-'06 engines - Install stock map sensor in S&S manifold. **See Picture 12**. Secure sensor to manifold with stock clip and screw. **See Picture 13**. Install manifold on engine with stock hardware. Connect fuel petcock vacuum hose to manifold fitting and connect wiring harness to map sensor. **See Picture 14**.



**Picture 12**



**Picture 13**

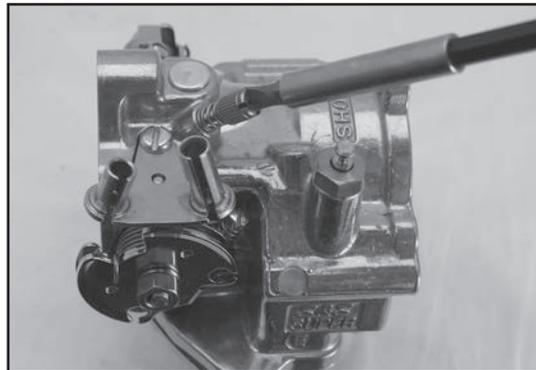


**Picture 14**

## 5- Install Carb

A- Check idle mixture and idle speed screw settings.

- 1- Check setting of idle mixture screw on top of carb body. **See Picture 15.** Turn screw clockwise to close screw, counting number of turns to fully closed position - setting should be 1½ turns. Reset by turning screw counterclockwise to 1½ turns open. After engine is started, screw must be reset as explained in "Adjusting Idle Mixture" section of instructions.



Picture 15

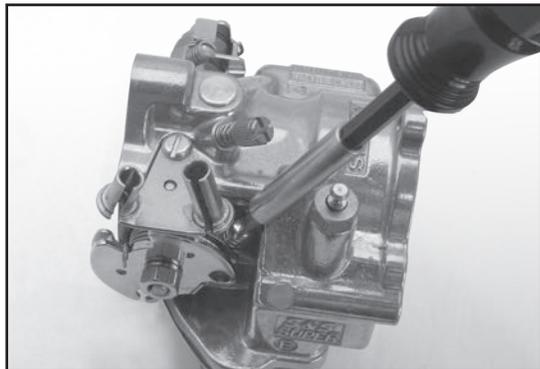
**NOTE:** Turn idle mixture screw in only far enough to contact seat. Do not over tighten.



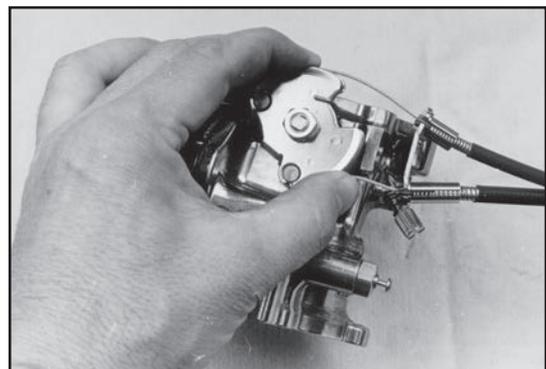
**CAUTION**

**Over tightening idle mixture screw may cause irreversible damage to carburetor body.**

- 2- Check setting of idle speed adjusting screw. **See Picture 16.** Turn screw counterclockwise until it no longer contacts throttle linkage spool. Next, turn screw clockwise until it just contacts spool. Then turn additional ½ turn clockwise to slightly open throttle plate.
- B- Install throttle cables on carburetor.
- 1- Install the proper throttle cable guide on the carburetor.
  - 2- Install opening side throttle cable barrel fitting and throttle cable in throttle linkage and appropriate side of throttle cable housing bracket. Opening side cable housing outside diameter is smaller and measures .190".
  - 3- Repeat step 2 for closing side throttle cable. Closing side cable has a spring around inner cable wire. **See Picture 17.**
  - 4- Apply drop of Loctite® 242 or equivalent to threads of cable bracket screw and reinstall bracket on carburetor.



Picture 16



Picture 17

C- Install carb on manifold

- 1- Bolt carb and insulator block to intake manifold using two ¾"-16 socket cap screws provided in kit. (O-ring side of block faces manifold.) Most carb kits for big twins include two ¾"-16 x 1¼" socket cap screws. Knuckle/pan and 1983-'84 shovel kits include one 1¼" screw and one 1¾" screw. The 1¾" screw is longer to compensate for thickness of support bracket for pan/knuckle or for 1983-'84 shovel engines) and must go in bottom hole. Kits for Harley-Davidson® Evolution® Sportster® models sold after 6-15-01 contain a thicker (¾") insulator block and two ¾"-16 x 1¾" socket cap screws to compensate for the additional thickness of the spacer block. (See important note below and caution concerning insulator block.)

**NOTE:** If insulator block is not installed, manifold bolts supplied in kit will be too long and may bottom in holes. Shorter manifold bolts must be used if insulator block is not installed.

**⚠ CAUTION**

If insulator block is not installed, lower manifold bolt may damage carburetor bowl causing possible gasoline leak.

**⚠ WARNING**

Gasoline is extremely flammable and explosive under certain conditions. Do not smoke around gasoline. Gasoline fumes are toxic when inhaled. Any gasoline leak or spill constitutes a health and fire hazard.

D- Adjust throttle cables

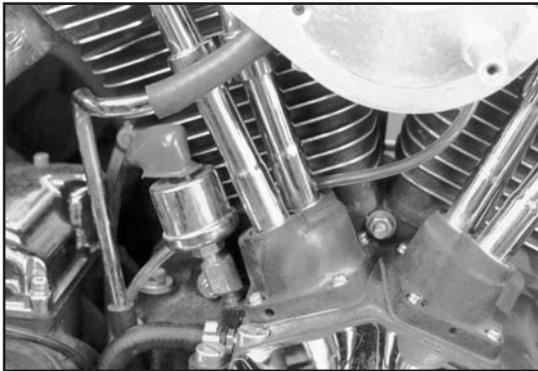
- 1- Turn threaded throttle cable adjusters to remove excessive freeplay.
- 2- Test throttle to insure that it opens and closes freely. Turn handlebars to extreme left and open and close throttle, then turn bars to extreme right and open and close throttle. If throttle binds, loosen cable adjusters to put more freeplay in cables. Tighten adjusting screw locknuts after making final adjustments.

**NOTE:** Throttle must not bind and must snap shut to fully closed position when released.

**⚠ WARNING**

If throttle does not return to fully closed position when released, it may inadvertently stick open, causing possible loss of control of motorcycle and personal injury to operator or others.

- E- Slip fuel overflow hose onto fitting on carb bowl and neatly route behind pushrod tubes. On a big twin model, hose should go toward back of engine. On a Harley-Davidson® Sportster® model, hose should go toward front of engine. Exit end of overflow hose must extend down below engine and away from exhaust pipes. **See Pictures 18 and 19**



Picture 18



Picture 19

**⚠ WARNING**

Overflow hose must not contact hot surface such as exhaust pipe where it could melt and catch fire.

- F- Slip hose clamp over end of fuel line. Apply thin coat of oil to carb fuel inlet fitting and slip end of fuel line on fitting. Position fuel line in such a way as to avoid contact with cylinders and other hot engine parts. Tighten hose clamp. Slip protective fuel line covering over fuel line and position where contact with engine parts could occur. On models equipped with fuel line support guide, use guide if possible. Connect other end of fuel line to gas tank petcock using hose clamp provided.

**NOTE:** Some early Super E and G carbs were equipped with a banjo style swivel fuel inlet. This banjo inlet is no longer available. If this early swivel inlet requires repair, it must be replaced with either a straight inlet, o-ring, and 90° fuel line or current production 360° swivel inlet with 90° inlet and a straight fuel line. See carburetor parts list and line drawing on pages 26 and 27.

**⚠ WARNING**

Fuel line must be clamped securely and not contact hot surfaces such as exhaust pipes where it could melt and catch fire.

## 6- Install Air Cleaner Backplate

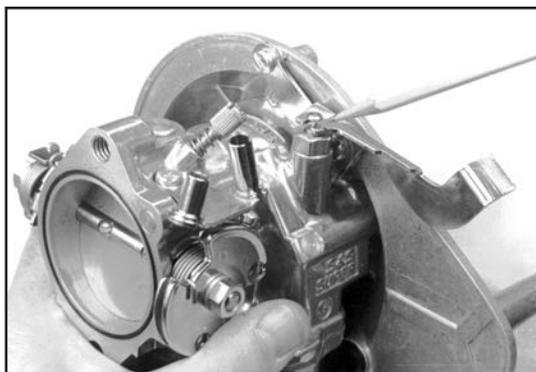
**NOTE:** Air cleaner backplate screws supplied with kit have thread locking compound on threads. If screw without thread locking compound is used, a thread locking product such as Loctite® 242 must be applied, and screws properly tightened.

### CAUTION

Failure to apply thread locking compound or properly tighten screws may cause screws to loosen and fall into engine, causing engine damage not covered under warranty.

A- All big twin & Sportster® models 1966 to 1982

- 1- Mount air cleaner backplate on carb using three ¼"-20 x ⅝" screw/washer assemblies. Confirm that enrichment device lever, engages enrichment device plunger. **See Picture 20.** Tighten backplate mounting screws to 5-7 ft-lbs (60-84 in-lbs).
- 2- Bolt carb mounting bracket to air cleaner backplate. Head of ⅝"-18 x 1" bolt should rest in hex recess on inside of backplate with threaded portion extending through backplate, two ⅛" shims and bracket. Secure with ⅝" flatwasher and locknut provided.



Picture 20

3- Final tighten of all mounting bracket bolts and manifold clamps.

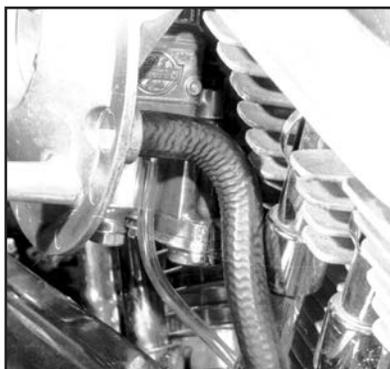
4- 1980-'84 big twin & Harley-Davidson® Sportster® models 1980 to 1985 - Connect crankcase breather hose to air cleaner backplate hose fitting. **See Pictures 21 and 22.**

B- Evolution® big twin 1984 to 1992 and Sportster models 1986 to 1990

- 1- 1992 big twin models with crankcase breather vented from cases to air cleaner backplate - Install thread-ert in each cylinder head air cleaner mounting bolt hole. This converts stock ½"-13 thread to ⅝"-18 thread. Surface of thread-ert should be just below surface of cylinder head. **See Picture 23.**



Picture 21



Picture 22



Picture 23

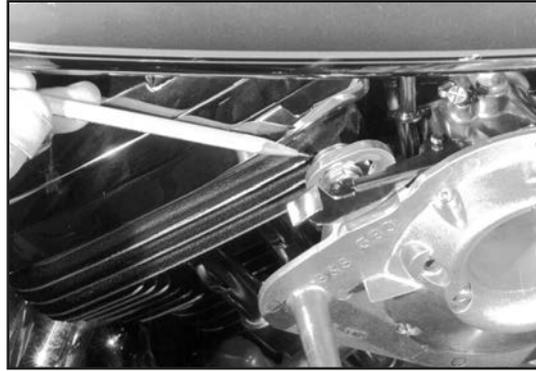
### NOTES:

- Most 1992 big twins have crankcase breather routed from case to air cleaner backplate. However, some late 1992 engines have breather routed from heads to air cleaner backplate through air cleaner mounting bosses. If crankcase breather is routed through heads, 1993 and later carb kit must be installed. Follow instructions for installation on 1993 engine.
- Thread-erts may be supplied with or without thread locking compound on threads. Loctite® 242 or equivalent should be applied to threads of thread-erts not supplied with thread locking compound. Thread-erts should be installed in desired position and left in place.
- Installing thread-ert in hole activates thread locking compound making it difficult to change position of thread-ert after installation.

### CAUTION

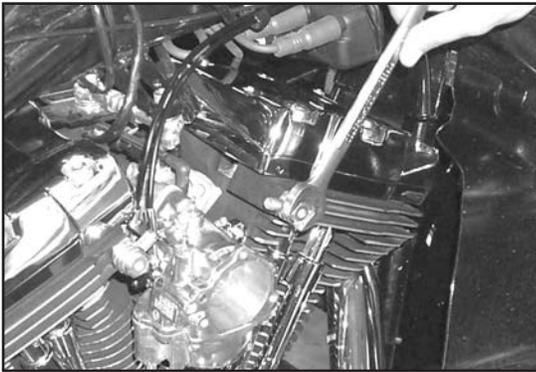
Cylinder head vent passages in "head breather" type engine must not be plugged as oil leakage and engine damage may result. Same applies to crankcase vent in "case breather" type engine.

- 2- Mount the air cleaner backplate on carb using three 1/4"-20 x 5/16" screw/washer assemblies. Confirm that enrichment device lever, engages enrichment device plunger. **See Picture 20.** Tighten backplate mounting screws to 5-7 ft-lbs (60-84 in-lbs).
- 3- Fill gap between backplate mounting ears and cylinder heads with shims provided in S&S shim kit.
- 4- Bolt backplate to cylinder heads with 5/16"-18 x 1 1/4" bolts, flat washers and lock washers. **See Picture 24.**

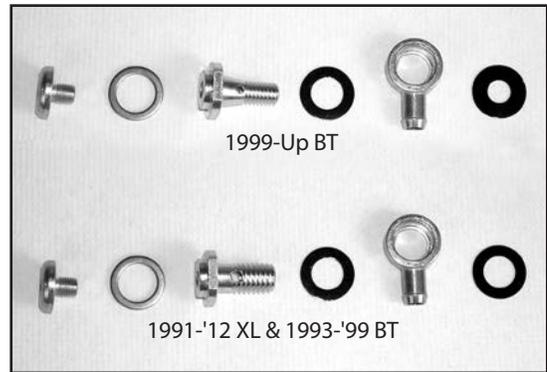


Picture 24

- 5- Final tighten all mounting bracket bolts and manifold clamps.
  - 6- Connect crankcase breather hose to air cleaner backplate hose fitting. **See Pictures 21 and 22, page 11.**
- C- Evolution® big twin engines 1993-'99 (kits sold after 2/1/01), Sportster® models 1991-'06 (kits sold after 6-15-01), and all Twin Cam 88° engines 1999-up.
- 1- Install breather fittings in heads. **See Picture 25.** Apply red Loctite® to threads and torque to 15-20 ft-lb. **See Picture 26** for component placement.



Picture 25

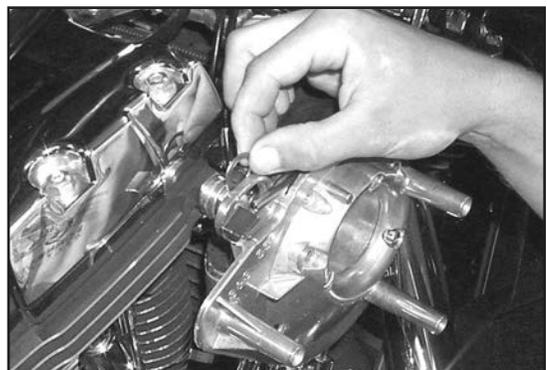


Picture 26

- 2- Install breather hose between breather fittings with long hose runner toward rear cylinder breather fitting. Position hose in such a way that it is not kinked and does not interfere with travel of the enrichment lever. Trim ends of vent hose as required. Secure hose to fittings with spring clamps.
- 3- Install backplate and gasket. Connect the short "T" of the breather hose to the steel nipple fitting on the back of backplate. **See Picture 27, below left.** Secure hose to backplate fitting with hose clamp. Confirm that fast idle lever has properly engaged enrichment plunger. Tighten screws holding backplate to carburetor to 5-7 ft-lbs (60-84 in-lbs).
- 4- Determine which of the provided shims correctly fills the gaps between backplate and breather fittings. **See Picture 28, below right.**



Picture 27



Picture 28

- 5- Fill gap between backplate mounting ears and cylinder heads with correct shims. Install screws to attach backplate to breather fitting. Torque to 8-12 ft-lb with no Loctite. **See Picture 29.**
- D- Buell® models 1994-'02
- 1- Place washer on breather screw.
  - 2- Roll  $\frac{5}{8}$ " O.D. o-ring into large diameter o-ring groove closest to head of breather screw.
  - 3- Roll  $\frac{1}{2}$ " O.D. o-ring into small diameter o-ring groove of breather screw. Apply thin film of light grease to o-rings.
  - 4- Repeat for other breather screw
  - 5- Loosely install bracket on front head using spacers and breather banjo bolt assembly. **See Picture 30.** Install banjo bolt assembly in rear head, but do not tighten.



Picture 29



Picture 30

**NOTE:** At least one thick spacer will be required between breather banjo fittings and heads. Breather fitting o-rings are easily damaged. It is suggested that they be lubricated with light grease before installation. If possible, replacement o-rings should be obtained beforehand if banjo assemblies are removed in future.

- 6- Position of backplate support bracket must be determined before backplate can be permanently installed. Temporarily install backplate. Rotate bracket to align hole in bracket with hole in backplate. Mark position of bracket with pencil mark on cylinder head to act as guide for final installation. Remove backplate.
- 7- Place ends of rubber T-hose over breather fittings for trial fit. **See Picture 31.** Temporarily install backplate using correct number of spacers. Hose must be routed so as to be free of kinks and not interfere with operation of fast idle lever.
- 8- Remove backplate, shorten hose ends as needed for correct fit, reinstall hose and secure with tie-wraps. Tighten banjo bolt breather screws.



Picture 31

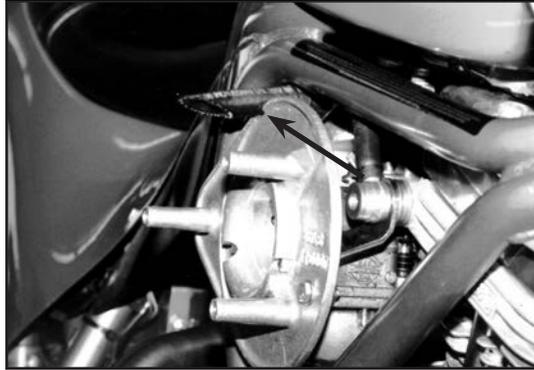
- 9- Install backplate for final assembly. Confirm that fast idle lever has properly engaged enrichment plunger and secure backplate to support with  $\frac{1}{4}$ " bolt, flat washer, and locknut provided. Tighten three backplate screws to 5-7 ft-lbs (60-84 lbs).

**NOTE:** Backplate screws supplied with kit have pre-applied thread locking compound on threads. If screw without thread locking compound is used, a thread locking compound such as Loctite® 242 must be applied to threads, and screws properly tightened. If screws are removed in future, Loctite® 242 or equivalent must be applied before reinstallation.

**⚠ CAUTION**

**Failure to apply thread locking compound or properly tighten screws may cause screws to loosen and fall into engine, resulting in engine damage not covered under warranty.**

10- For street use, insert 1¼" steel tubing provided into short "tee" of T-hose and place ¾" O.D. x 2.80" hose over other end of tubing. Hose must rest in notch in backplate, with bevel down. Secure with Tie-wraps when correctly positioned. **See Picture 32.**



**Picture 32**

**NOTE:** An additional, 36" length of hose is provided for "Race Only" applications. It should be attached to T-hose in place of 2.80" hose, and routed to overflow or "catch can" as required by event organizer. Breather hose should be routed in upward direction as much as possible. Because crankcase oil-air mist exits from hose, hose and catch can must be mounted securely and well away from hot or moving parts as well as tires and brakes.

**⚠ WARNING**

**Oil on tire or brakes can result in loss of control of motorcycle, resulting in possible serious injury or death to operator and others.**

**7- Final assembly and checks.**

- A- Check carb to manifold mounting bolts.
- B- Check carb to air cleaner backplate mounting screws.
- C- Check each of following that is applicable:
  - Carb mounting bracket to head bolts
  - Mounting bracket to air cleaner bakplate.
  - Mounting bracket to center case stud.
  - Mounting bracket to tappet guide bolt.
  - Mounting bracket to head breather vent fitting.
  - Air cleaner backplate to head mounting bolts.
- D- Check fuel line connections and routing. Avoid hot surfaces.
- E- Check vacuum operated ignition advance connections if applicable.
- F- Check crankcase to backplate vent hose connections if applicable.
- G- Check fuel overflow hose routing. Avoid hot surfaces.
- H- Test throttle to be sure it opens and closes freely. Turn handlebars to extreme left and open and close throttle, then turn bars to extreme right and check throttle. When released, throttle should snap closed in all positions.
- I- Reassemble components that were removed or disassembled for carb installation. Consult authorized Harley-Davidson® service manual for installation procedure for stock parts not covered in S&S® carb instructions.
- J- Check fuel needle and seat assembly. Fill gas tank with just enough fuel to test system. Lean motorcycle over towards carburetor side, turn on fuel petcock and wait 20 seconds. If gas runs out end of carb or out overflow hose, turn off petcock and check needle and seat. See "General Information."
- K- Check fuel inlet fitting and fuel line connections for leaks. Hose clamps must be tight.

**NOTE:** Fuel needle and seat assembly must completely shut off fuel supply to carburetor bowl. Fuel inlet fittings and fuel line connections must not leak.

**⚠ CAUTION**

**Gasoline leaking past inlet needle may flood engine causing contamination of oil supply and damage to engine.**

**⚠ WARNING**

**Any gasoline leak represents a health and fire hazard.**

L- Install air cleaner element and air cleaner cover using three ¾"-20 x 1" mounting screws provided. Insure that element goes around outside edge of locating tang at 9 o'clock position on backplate. Correctly installed element will remain in place on backplate without support.

Filter element supplied with carb kits for Buell® models is foam type. Beveled vent hose in kits for Buell bikes must rest in notch in backplate and go between air cleaner element and chromed outer cover. Hose bevel should angle down toward element. **See Picture 33.**



Picture 33

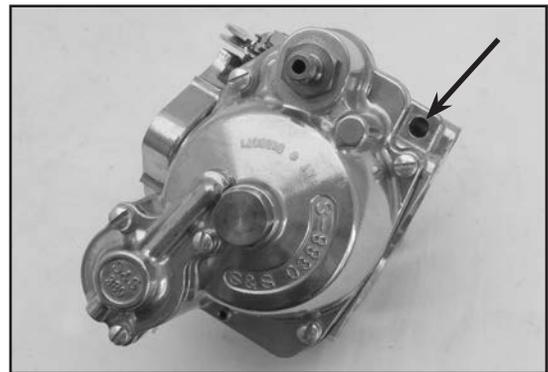
M- Fill gas tank.

**INSTALLATION NOTES:**

- In designing the S&S® Super E and G carbs S&S has made every effort to keep overall assembled length as short as possible. Due to the short installed length of the carb assembly, the air cleaner cover may contact the gas tank of four-speed shovelhead chassis. In such instances an optional chromed, notched cover that will provide additional clearance can be ordered. **See Picture 34, below right.** If a new, undamaged Super E/G cover is shipped to S&S prepaid, it will be exchanged for the difference in cover prices. See your authorized S&S dealer for this service.
- An optional 1" spacer block can be installed between carb and manifold as an alternative, or existing air cleaner cover modified to provide 1/8" minimum clearance.
- Bowl vent screw should be removed for any all-out racing application which includes use of air horn or air cleaner without filter element. Exposed passage in carb body maintains equal pressure between float bowl and atmosphere. **See Picture 35, below left.**
- On any application where air horn is used instead of air cleaner, S&S carb mounting bracket must be used to securely fasten carb to engine. See line drawing on page 28.



Picture 34



Picture 35

**CAUTION**

Improperly mounted carburetor may loosen from engine resulting in gas or air leaks, poor performance and possible damage to carburetor or other components.

**WARNING**

Any gasoline leak represents a potential health and fire hazard.

- G carb using air cleaner assembly without filter element flows approx. 7 CFM (10" test pressure) less than carb with 4" air horn. E carb w/air cleaner assembly, no filter, flows same as with 4" air horn. S&S recommends using air filter element for all street applications.
- S&S has found that trimming approximately 3/4" off rim of S&S air cleaner cover has resulted in as much as 3 HP increase on Dynojet® 150 chassis dynamometer. However, this increases exposure of filter element to weather and contamination, so filter should be inspected regularly and washed or replaced as needed.

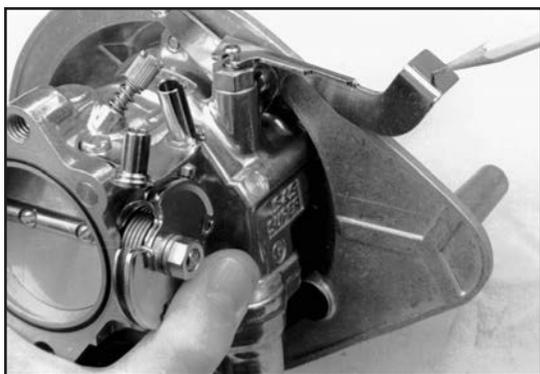
## CARB OPERATION

### 1. Starting Procedure of Carb Operation

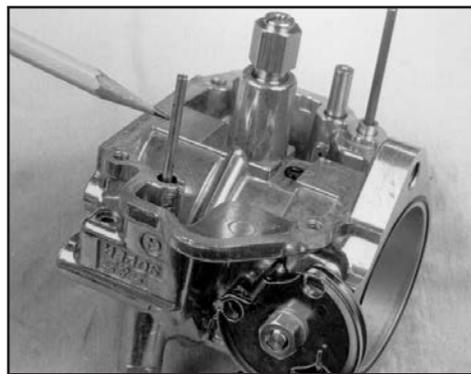
S&S Super E & G carburetors do not have a conventional choke. Instead, a mixture enrichment/fast idle device is used for starting and engine warm-ups. The enrichment device utilizes separate air and fuel pickup passageways and is engaged by pulling fast idle lever upward. **See Picture 36, below left.** Super E & G carburetors also feature a fully adjustable accelerator pump which is actuated by quick throttle movements at partial throttle openings and can be used as an additional starting aid.

#### ENRICHMENT DEVICE NOTES:

- Enrichment/fast idle pickup tube located directly below fast idle plunger, is pressed into carburetor body and must not be removed. **See Picture 37,**



Picture 36



Picture 37

#### ⚠ CAUTION

Removal of enrichment/fast idle pickup tube from carburetor body may cause irreversible damage to carburetor.

- Plunger nut, plunger spring, and plunger, may be removed for cleaning purposes.
- If air cleaner backplate is removed, be sure fast idle lever and enrichment plunger are engaged properly when backplate is reinstalled. **See Picture 20.**
- S&S® enrichment system operates on manifold vacuum. If throttle is opened while starting engine, vacuum will be reduced and enrichment system will not function normally.

A- Cold Starts

- 1- Open fuel petcock.

**NOTE:** When motorcycle is not running, fuel petcock/shutoff valve should be turned off to prevent possible leakage should needle and seat not seal properly.

#### ⚠ CAUTION

Gasoline leaking past inlet needle may flood engine causing oil contamination and engine damage.

#### ⚠ WARNING

Gasoline leaking past inlet needle may flood engine and surrounding area creating a potential health and fire hazard.

- 2- Prime engine with one or more squirts from accelerator pump. Ambient temperatures below 60° may require increased priming, up to 6-7 squirts depending upon exact temperature and carb jet size.
- 3- Pull fast idle level, to fully raised position.
- 4- Turn on ignition.

**NOTE:** Some engines, especially those equipped with magnetos, will start easier if given two prime kicks BEFORE ignition is turned on. For reliable starting, magneto should be equipped with kill button to disable ignition for prime kicks.

- 5- With throttle closed, kick engine through or engage electric starter.
- 6- If engine fails to start immediately, crack throttle enough to barely open butterfly and continue to kick or engage starter until engine fires.
- 7- After engine starts, position lever to maintain rpm at approximately 1000-1200 rpm with throttle closed. Lever may gradually be pushed down to closed position as engine warms. Engine should be warmed sufficiently to idle with fast idle lever off in 1 to 4 minutes or after a few miles of riding.

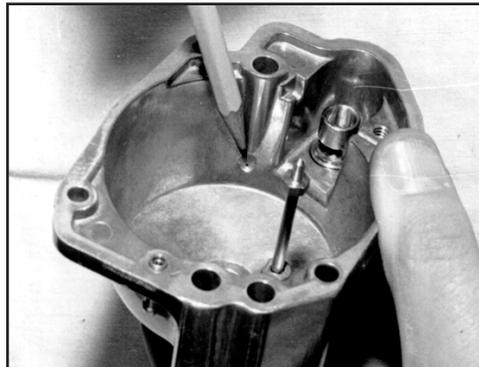
**NOTE:** Operating engine with fast idle lever up for excessive time will result in fouled spark plugs. Push lever completely down as soon as engine will run smoothly without enrichener.

**B- Hot Starts**

- 1- Open fuel petcock.
- 2- Turn on ignition.
- 3- With throttle closed, kick engine through or engage electric starter.
- 4- If engine fails to start immediately, open throttle slightly and continue to kick or engage starter until engine fires.

**C- Troubleshooting Tips - engine will not start:**

- 1- Fuel supply exhausted.
- 2- Weak or no spark - discharged battery, worn points, faulty condenser, ignition module, coil, spark plug wires, or magneto.
- 3- Plug gap too wide - S&S uses .025" to .030" plug gap on engines with points type ignition and stock coil. Electronic ignitions and high output coils can run wider plug gaps.
- 4- Improper ignition timing - Worn or poorly maintained mechanical advance units sometime stick in advanced position causing hard starting, kick-back and erratic idle.
- 5- Tight tappet adjustment - If solid tappets are adjusted too tightly, valves may not seat properly, and the loss of compression may prevent the engine from starting.
- 6- Improper idle mixture and/or engine idle rpm setting. If idle mixture is set incorrectly, throttle plate must be opened farther with the idle speed screw in order to maintain idle speed. This reduces manifold vacuum and makes the enrichment circuit less effective. See "Adjusting Carburetor - Idle Circuit."
- 7- Enrichment device feed hole (**See Picture 38**) in bowl plugged. Clear with compressed air.



Picture 38

**CAUTION**

**Do not use wire or drill to clear hole. If size of hole is changed, starting system will be altered and carburetor bowl irreversibly damaged.**

**WARNING**

**Compressed air and particles dislodged by compressed air are potentially harmful to eyes and body. Wear protective goggles when using compressed air and always direct air stream away from yourself and others nearby.**

- 8- Improper diagnosis of rich or lean mixture condition. If engine backfires in carb, mixture is usually lean and engine must be reprimed. If there is no response after three kicks or if engine pops in exhaust pipes, mixture is probably too rich. Leave switch on and slowly open throttle ¼ turn with each successive kick until engine fires.

- 9- If engine was running properly before installation of carburetor, no other changes were made and carb settings were confirmed as instructed previously, hard starting is likely caused by incorrect intermediate jet or starting routine. Remain calm and patient while attempting to start motorcycle, and experiment with different starting procedures (throttle and enricher position, number of squirts from accelerator pump, etc.), especially with kickstart motorcycle. Carb tuning and ignition tuning and maintenance are critical for kick start motorcycles.

If severe flooding is suspected, turn ignition off, slowly roll throttle to wide open position, and kick 6-8 times to clear engine. Then close throttle to approximately 1/8 turn, turn ignition on and kick until engine starts.

If insufficient fuel is suspected, remove air cleaner cover and confirm accelerator pump operation, with motor off, by snapping throttle open from closed position. Fuel should exit accelerator pump nozzle directly behind main discharge tube in carburetor bore.

If not, increase accelerator pump setting by turning adjustment screw out, in counterclockwise direction. Replace air cleaner cover and attempt to start motorcycle according to procedure previously described.

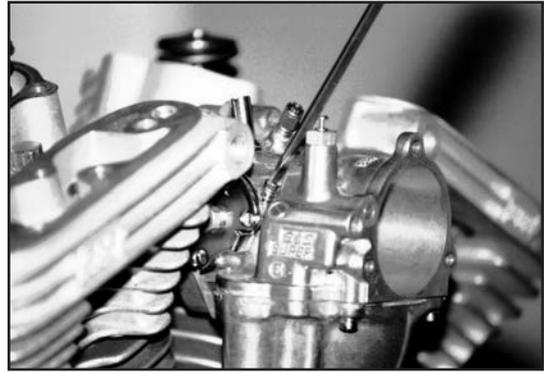
If more than 2-3 squirts from accelerator pump are required to start motorcycle with temperature 60° or above, larger intermediate jet may be required. This may also be caused by incorrect idle mixture adjustment or a manifold leak. Refer to following sections for additional information on tuning.

## 2- Adjusting Carburetor

- A- Adjusting Idle Circuit - Idle mixture screw regulates air/fuel mixture at idle speeds and has been angled forward for greater accessibility. **See Picture 39, below left.** Throttle stop/engine rpm adjustment screw is located on boss on rear side of carburetor body. **See Picture 40, below right.** During assembly S&S® adjusts both screws to settings that should work for first start-up after installation.



Picture 39



Picture 40

- 1- Start engine and run until slightly warm (approximately 1 to 2 minutes).
- 2- Turn RPM adjustment screw to obtain idle of approximately 1000 RPM.
- 3- Turn idle mixture screw clockwise, slowly leaning mixture until engine starts to die. Next, turn screw counterclockwise, slowly richening mixture, until engine RPM fall off. Mixture adjustment is correct when screw is positioned about halfway between these points, or approximately 1/4 to 1/2 turn out from lean side of adjustment range.

**NOTE:** Turning screw out (counterclockwise) makes idle mixture richer. Turning screw in (clockwise) makes mixture leaner. Normally, correctly adjusted screw will be between 1/4 and 3/4 turns out from bottom if intermediate jet size is correct. Note that mixture screw must be adjusted according to Step 3 above. Do not leave screw at initial 1 1/2 turn setting without fine tuning.

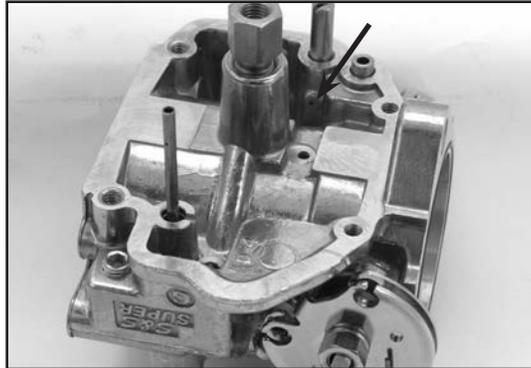
- 4- After initial idle mixture adjustment, reset engine idle to approximately 1000 RPM. Lower idle speed can cause hard starting, poor throttle response, erratic idle and unnecessary engine wear.
- 5- After engine has reached normal operating temperature, repeat Steps 3 and 4.

### IDLE CIRCUIT NOTES:

- If idle adjustments are made before engine is fully warmed, idle mixture will be rich when engine reaches operating temperature. This is especially true for engines with aluminum cylinders such as Harley-Davidson® Evolution® and Twin Cam 88°. If ambient temperature is below 60 degrees, engine may require 10-15 minutes of normal riding to reach operating temperature.
- Whenever intermediate jet change is made, idle mixture screw must be readjusted.
- If the idle mixture screw is more than 1 3/4 turns out after idle mixture is correctly adjusted, it is a fairly good indication that the intermediate jet may be too small and should be changed to the next larger size. If the idle mixture screw ends up less than 1/4 turn out, the intermediate jet may need to be changed to the next smaller size. Be aware that idle mixture screw adjustment can be effected by other factors, but can quite often indicate rich or lean intermediate jetting.
- If idle mixture screw is turned completely in, engine should not run at idle. If engine continues to run at idle with idle mixture screw seated, recheck initial setting of idle speed screw, and make sure enrichment plunger is seated.

B- Troubleshooting Tips - engine will not idle:

- 1- Improper idle mixture or rpm setting.
- 2- Intake manifold air leak.
- 3- Malfunctioning automatic advance mechanism or other ignition problem.
- 4- Foreign material in air or gas passageway in carb causing gas flow restriction to idle or intermediate circuit. **Picture 41** shows intermediate air bleed metering hole. **Picture 41** shows intermediate jet metering hole. Clear holes with compressed air.



Picture 41

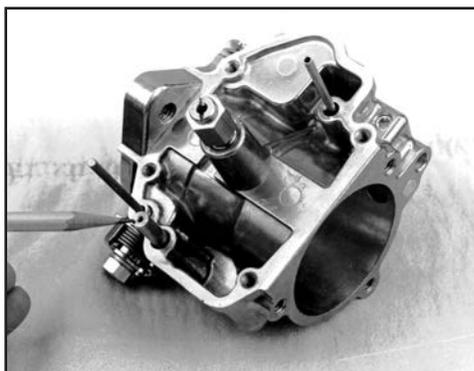
**CAUTION**

Do not use wire or drill to clear hole. If size of hole is altered, starting system will be altered and carburetor bowl irreversibly damaged.

**WARNING**

Compressed air and particles dislodged by compressed air are potentially harmful to eyes and body. Wear protective goggles when using compressed air and always direct air stream away from yourself and others nearby.

- 5- Enrichment/fast idle plunger not seated causing excessively rich mixture. Be sure enrichment lever is fully disengaged (in down position) allowing plunger to bottom and seal passageway. Remove air cleaner backplate. Lift and release plunger several times, letting it "snap" closed to fully seat against carb body. When backplate is reinstalled on carb, be sure lever is engaged in plunger properly and that plunger is not lifted as mounting screws are tightened. **See Picture 20, page 11.**
  - 6- ¼" insulator block between carb and manifold omitted. Heat transfer from manifold to carb may cause temporary rich condition at idle and low rpm when engine restarted after being shut off for 10 to 20 minutes. Install insulator block to minimize heat transfer.
- C- Adjusting Intermediate System - (See Jetting Chart Page 23) Intermediate range is used most often under normal riding conditions. It controls fuel delivery from just off idle to approximately 2500-3000 rpm or 55 to 60 mph depending on gearing. Close attention must be paid when selecting intermediate jet to achieve optimum performance and best gas mileage. Intermediate jet (**See Picture 42**), is reached by removing float bowl assembly. Size of metering hole in intermediate jet is stamped in thousandths of an inch on end or side of jet. Size of intermediate jet installed in new carburetor from S&S® is indicated on tag attached to carb or on printed label on carburetor packing box. Keep this information handy for future reference, especially when contacting S&S Technical Services Dept. for assistance. It is a good idea to record any jetting changes for future reference.



Picture 42

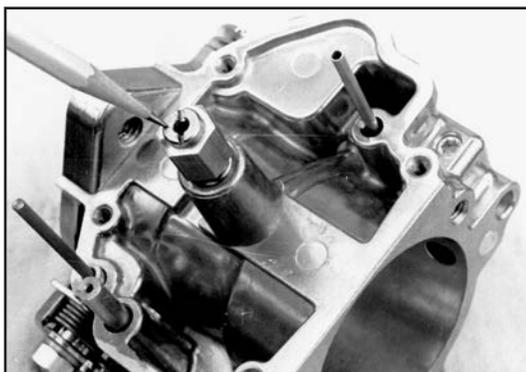
### Intermediate Jetting Procedure:

- 1- Ride motorcycle several miles to bring engine up to normal operating temperature.
- 2- Check idle mixture adjustment to be sure setting is correct with fully hot engine.
- 3- Check throttling characteristics by slowly rolling throttle on from a steady speed. This should be done at rpm levels of approximately 2000, 2500, and 3000 rpm. (Depending upon gearing, vehicle speeds will usually be between 30 and 60 MPH). "Popping" or "spitting" (backfiring) in air cleaner indicates lean condition requiring that intermediate jet be changed to next larger size (size is stamped on end or side of jet).
- 4- Change jet accordingly, adjust mixture screw and repeat road test. Smallest intermediate jet that eliminates this condition should provide best gas mileage.

### INTERMEDIATE SYSTEM NOTES:

- It is helpful to shut off accelerator pump while fine tuning intermediate circuit as fuel supplied by pump can mask jetting symptoms. Consult "Accelerator Pump" section of instructions.
- Whenever intermediate jet is changed, idle mixture screw must be readjusted.
- Elevation changes: A simple readjustment of idle mixture screw will often compensate for changes in elevation of several thousand feet. S&S test riders have ridden through changes upwards of 7000 feet without changing jets. In other cases, and depending upon accuracy of initial jetting, a change in intermediate and/or main jet may be required.
- Higher elevation makes engine run richer, meaning that smaller jets may be required to correct overly rich condition. Lower elevation, nearer sea level, makes engine leaner so larger jets may be required. While rich condition can cause fouled spark plugs and poor performance, lean condition can result in engine damage. If smaller jets are installed for higher elevation, remember to install larger jets for operation at lower elevation.
- Intermediate jet provides majority of fuel under average operating conditions. While it is tempting to change main jet because it is more accessible, in most cases intermediate jet should be changed to properly address elevation/altitude-related problem.

D- Adjusting High Speed Circuit or Main Jet - High speed circuit begins around 2500-3000 rpm or 55-60 mph under steady speed conditions, and operates to maximum attainable speed. High speed circuit will be pulled in at much lower rpm if throttle is cracked open. Main jet size is best determined by testing at drag strip or dynamometer because maximum miles per hour, rpm and horsepower are most reliable indicators of correct jetting. Main jet (**See Picture 43**), is reached by removing bowl plug. (See Jetting Chart Page 23).



Picture 43

### High Speed (Main) Jetting Procedure:

- 1- Drag strip/dynamometer procedure
  - a- Sufficiently warm engine to begin testing.
  - b- Make run noting engine rpm and final speed or horsepower.
  - c- Richen main jet by increasing jet size .004" and make second run. Again, note rpm and final speed or horsepower.
  - d- Continue procedure until mph/horsepower falls off.
  - e- Decrease or lean main jet size by .002" to gain best rpm and mph. When making runs on drag strip, strive for consistent miles per hour, not lowest ET.
- 2- Street Procedure - S&S uses "rpm" method to determine main jet size. Under racing conditions this level is where horsepower peaks and begins to taper off and is where gear shifts occur. Main jet that makes engine accelerate strongest or rpm through gears quickest is correct.

**NOTE:** Placing engine under load by accelerating uphill may make result of jet change more pronounced and easier to interpret.

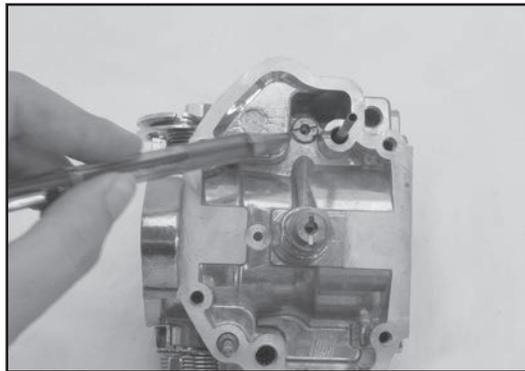
- a- Warm engine to operating temperature.
- b- Accelerate rapidly through gears noting how quickly and smoothly engine reaches rpm level where pull of engine begins to fade and gear shift occurs.
- c- If engine backfires in carburetor and sputters or "breaks up" and/or dies during acceleration, increase or richen main jet size .004" larger and road test again. Note engine smoothness and how easily engine reaches rpm where gear shift occurs.

- d- If engine runs flat and sluggish or "blubbers" or will not take throttle, decrease or lean main jet size .004" smaller and road test again. Note engine smoothness and how easily engine reaches rpm where gear shift occurs.
- e- Continue changing main jets until jet which makes engine accelerate or rpm through gears quickest and smoothest is identified. S&S's® experience is that jetting about .006" smaller (leaner) than correct will make engine break up and quit. Jetting about .006" larger (richer) will make engine blubber and miss.

**NOTES:**

- Correct carb jetting is essential for optimum performance on street, strip and dynamometer. Other common causes of poor performance in modified engine are inappropriate exhaust and incorrect ignition timing.
- S&S special main jet tool is extremely handy for changing main jets. Try it, you'll like it!

- E- Troubleshooting Tips for Intermediate and High Speeds Engine will not run at steady speed or rpm or quits for no apparent reason:
- 1- Restriction in fuel supply system - Gas tank vent plugged, needle and seat not working properly (See "General Information"), gas petcock too small, or defective vacuum petcock. Stock petcock is generally adequate, but may require running on reserve to provide sufficient fuel for big inch engines. If fuel delivery to carb is questionable, S&S recommends Pingel brand high flow petcock.
  - 2- Faulty ignition/electrical system - Fouled plugs, worn points or condenser, defective coil or solid state module, improper ignition timing, loose wire, faulty circuit breaker or ignition switch. Many ignition/electrical problems occur repeatedly at same rpm because of vibration specific to that rpm.
  - 3- Incorrect intermediate and/or high speed jetting. See "Adjusting Carb - Intermediate System" and "High Speed Circuit or Main Jet."
  - 4- Foreign material in air or gas passageway in carb causing flow restriction. **Picture 41 (page 19)** shows intermediate air bleed metering hole. **Picture 44** shows main discharge air bleed metering jet. Use compressed air to clear holes.



Picture 44

**⚠ CAUTION**

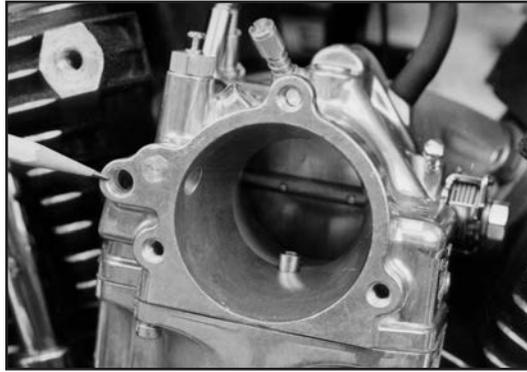
**Do not use wire or drill to clear hole in carb bowl. If size of hole is altered, starting system will be altered and carburetor bowl irreversibly damaged.**

**⚠ WARNING**

**Compressed air and particles dislodged by compressed air are potentially harmful to eyes and body. Wear protective goggles when using compressed air and always direct air stream away from yourself and others nearby.**

**NOTE:** Small amounts of engine oil deposited on air cleaner element by crankcase or cylinder head vent is normal and should not cause problem.

- 6- No air cleaner used or air cleaner used is brand other than S&S. Some air cleaners restrict air flow so that carb cannot draw air as freely as needed. Also, some air cleaners may obstruct bowl vent hole on inlet end of carb and change bowl air pressure. **See Picture 45.**



**Picture 45**

**NOTE:** Bowl vent hole passage leads to cavity above fuel in bowl. Passage equalizes bowl pressure and atmospheric pressure. If high or low bowl pressure relative to atmospheric pressure develops, engine may run erratically.

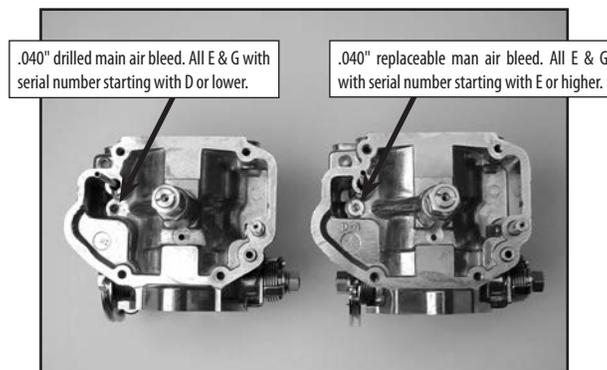
- 7- Insulator block between carb and manifold not used. Heat transfer from manifold to carb may cause temporary rich condition at idle and low rpm when engine is restarted after being shut off for 10 to 20 minutes. Install insulator block to reduce heat transfer.
- 8- Air cleaner without element or air horn used without removing bowl vent screw located in downward facing boss on throttle cable side of carburetor body. **See Picture 35, page 15.**
- 9- Valve train defect - Leaking or sticky valves, weak or broken springs, pushrod flex, improper clearances for high lift cam, or defective camshaft with improper valve timing.
- 10- Inappropriate exhaust system.

**NOTE:** S&S® has found that long, large diameter exhaust pipes, either baffled or unbaffled, may present insurmountable tuning problems when combined with S&S carburetor. If engine equipped with such pipes does not respond to normal tuning procedure, contact exhaust manufacturer for his tuning suggestions or call S&S for exhaust recommendation.

- 11- Too much gear- Horsepower insufficient to pull gearing.
- 12- Incorrect float setting - Setting float too high will cause engine to run rich at idle and at low speeds, and may prevent jet change from correcting over rich mixture. Float setting too low will cause poor off idle response and may cause mixture to "lean out" at high speed or when motorcycle leaned over in curve due to insufficient fuel reserve in bowl. See General Information on Page 25 for float jetting instructions and specifications.
- 13- Fuel standoff - Occasionally, fuel may be seen misting out carburetor when air cleaner is removed. Because carburetor is simply a conduit through which air and fuel enter engine, it does not cause fuel standoff. Usual cause is cam timing.
- 14- Overflow hose missing from the carb bowl can cause engine to miss and break up at high speeds. This problem will more than likely not occur on the dyno because the motorcycle is not moving through the air.

### **Adjustable Air Bleed for Super E and G Carburetors**

The main air bleed passage in S&S Super "E" and "G" carburetors produced for the 2004 model year and later is fitted with a replaceable .040" jet in place of the .040" drilled main air bleed passage. The replaceable jet allows changing the size of the main air bleed. Carburetors with this modification can be identified by a serial number that begins with the letter E or higher. **See Picture 46.**



**Picture 46**

## NOTES:

- The standard .040" diameter air bleed is the optimum size for most engine combinations, and should not be changed under most circumstances, regardless of intermediate and main jet selections.
- Changing the main air bleed size should be done only after determining a mid range driveability problem cannot be corrected by changing the intermediate and main jets.
- For tuning the main air bleed, S&S® recommends an initial increase from the standard .040" jet to an .048" jet as a starting point. Available jets and part numbers are listed in the S&S catalog.
- It is never necessary to reduce the size of the main air bleed below .040".
- Shifting the start of main jet operation to a point higher up the rpm scale can lessen the effects of mid rpm driveability problems caused by mismatched cam and exhaust systems, but will not allow the engine to perform as well as it would with a well designed exhaust system.

## INTERMEDIATE AND HIGH SPEED NOTES:

- Carburetor jetting and spark plug color - While spark plug color may be used to help determine carburetor jetting, S&S recommends that our instructions be used as primary jetting guide and that plug color indications be used as secondary aid. Different brands of gasoline, gasoline additives, engine heat, type of plugs, and spark plug heat range can effect plug color making plug reading difficult for average tuner. Also, new plugs usually require road test of 10 miles or more to properly develop color. This means that quarter mile tests may not be long enough to be a good indication of carb jetting. It is best to use recommended spark plug type and to consult spark plug manufacturer with questions.
- If bike is used exclusively on drag strip where engine temperatures vary, slightly richer jets may be necessary to obtain best performance. Larger jets and richer mixtures will enable one to run colder engine which is sometimes desirable. This is best determined by experimentation.
- Cams and exhaust systems can make some engines difficult to carbureate. S&S has found that certain cams and exhaust systems cause poor performance at a specific rpm, and attempts to correct problem with carb tuning usually degrade carburation at other rpm ranges. A combination of cam overlap, reversion, and back pressure, or even lack of back pressure, can cause mixture dilution at certain rpm. This will result in loss of power, engine roughness, or misfiring.
- Drag pipes - For knucklehead, panhead, shovelhead, and ironhead Harley-Davidson® Sportster® models, 1 3/4" O.D. drag pipes with straight cutoff end 28" to 30" long will work well with almost any camshaft or other performance modification. 2" O.D. drag pipes are not recommended for any application except very large competition engines.
- The use of drag pipes is not recommended for Evolution motors in street application.
- Muffled exhaust systems - A good, economical street exhaust system consists of stock header pipes with cross-over tube and low restriction mufflers such as S&S® slip-on mufflers. This system typically produces 10 horsepower more than drag pipes in midrange, where vast majority of normal riding occurs. Contact S&S for current exhaust recommendations.
- For any all-out racing application which includes use of air cleaner without element or use of air horn, bowl vent screw (**See Picture 36, page 13**), should be removed to insure atmospheric air pressure exists in bowl. If high or low bowl pressure relative to atmospheric pressure develops, engine may run erratically.
- Modifying S&S® carburetor - While it is not S&S' intent to discourage purchase of other manufacturers' products, they should be approached with the understanding that some alter the S&S carburetor's design and function. In such cases, manufacturer of installed item must be contacted for tuning guidelines, not S&S.

F- Adjusting Accelerator Pump - Function of accelerator pump is to improve throttle response when rapidly opening throttle at low rpm and to aid cold starts. Pump travel screw regulates volume of fuel delivered by accelerator pump. **See Picture 47.** During assembly, S&S sets screw for maximum volume to aid during initial start-up after installation. Turning screw inward or in clockwise decreases delivered pump volume. Turning screw outward or counterclockwise increases delivered volume.



Picture 47

- 1- Warm engine to operating temperature.
- 2- Turn pump travel adjusting screw inward or clockwise until screw contacts pump actuator arm. This limits actuator arm travel and shuts off pump.

**CAUTION**

**Closing adjusting screw with excessive force may cause irreversible damage to screw threads in carburetor body.**

- 3- Perform intermediate and high speed jetting tests to determine proper jetting.
- 4- With engine warm and at idle, blip throttle and note throttle response.
- 5- Turn pump travel screw outward or counter clockwise about ¼ turn at a time and recheck throttle response until engine no longer hesitates. This is usually about two turns out.
- 6- Road test motorcycle noting throttle response at idle and at levels in 500 rpm increments from idle to 3000-3500 rpm.
- 7- Set pump travel screw at point where best throttle response is noted with minimum pump travel. Minimum pump travel is recommended to conserve fuel, prevent spark plug fouling, and curtail black smoke from pipes when “blipping” throttle. Black smoke from pipes is usually an indication of a rich condition or excessive accelerator pump travel.

**NOTE:** Final accelerator pump adjustment should be confirmed by riding motorcycle and noting throttle response with motorcycle underway. Because of displacement, compression ratio, cam timing, exhaust design and other, related factors, many engines will stumble or bog if throttle is abruptly cranked fully open with engine at idle. If correct carburetor (E or G) is installed and engine properly tuned and equipped with appropriate exhaust and cam, stumble should disappear under normal riding conditions.

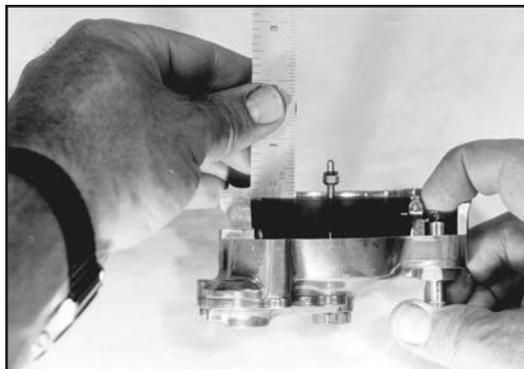
**GENERAL INFORMATION NOTES:**

- Carburetor body has six drilled passages that are permanently sealed with drive plugs.

**CAUTION**

**Removal of these plugs may cause irreversible damage to carburetor.**

- To insure proper seal so needle completely shuts off fuel supply entering bowl, float hinge, needle lift and needle must work freely and not bind. Float must not contact bowl gasket. If problem is suspected, remove bowl and check float movement. If obvious misalignment, binding or sticking occurs, remove, straighten and reinstall to obtain free movement. Reset float level and double check for free movement. To check, remove bowl (not accelerator pump cap) and raise float until needle is in closed position and spring in top of needle is compressed. Top of float opposite the needle and seat assembly should be ⅛" to ⅜" below bowl gasket surface. Float must not contact bowl gasket. See cut away bowl in **Picture 48**.
- When motorcycle is not running, fuel shutoff valve should always be turned off to prevent possible leakage should needle and seat not seal completely.



Picture 48

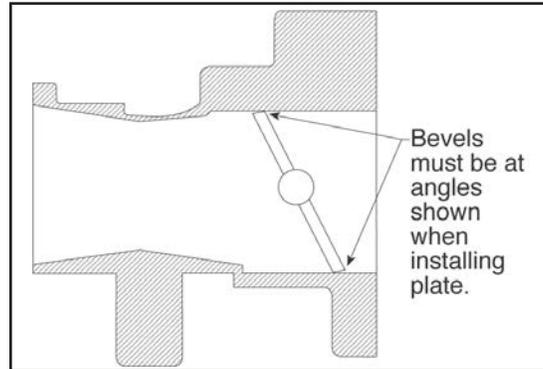
**CAUTION**

**Gasoline leaking past inlet needle may flood engine causing contamination of oil supply and damage to engine.**

**WARNING**

**Any gasoline leak constitutes a fire and health hazard.**

- Throttle plate and throttle shaft should be checked annually for signs of wear. Replace if necessary. If carb body throttle shaft bushings are worn, carb must be returned to S&S® for repair. If throttle plate removed, be sure to reinstall correctly. **See Figure C.** Beveled edges of plate must fit flat against carb throat.



**Figure C**

- If accelerator pump cap is removed, lift cap slowly so small spring checkballs and o-rings are not lost.
- For racing, S&S offers two air horn conversion kits which include appropriate mounting hardware and a substitute enrichment device. One includes a 2½" air horn and the other includes a 4" air horn.
- If fuel delivery from stock petcock appears insufficient, S&S recommends that a high flow performance petcock be installed.

**IMPORTANT NOTES:**

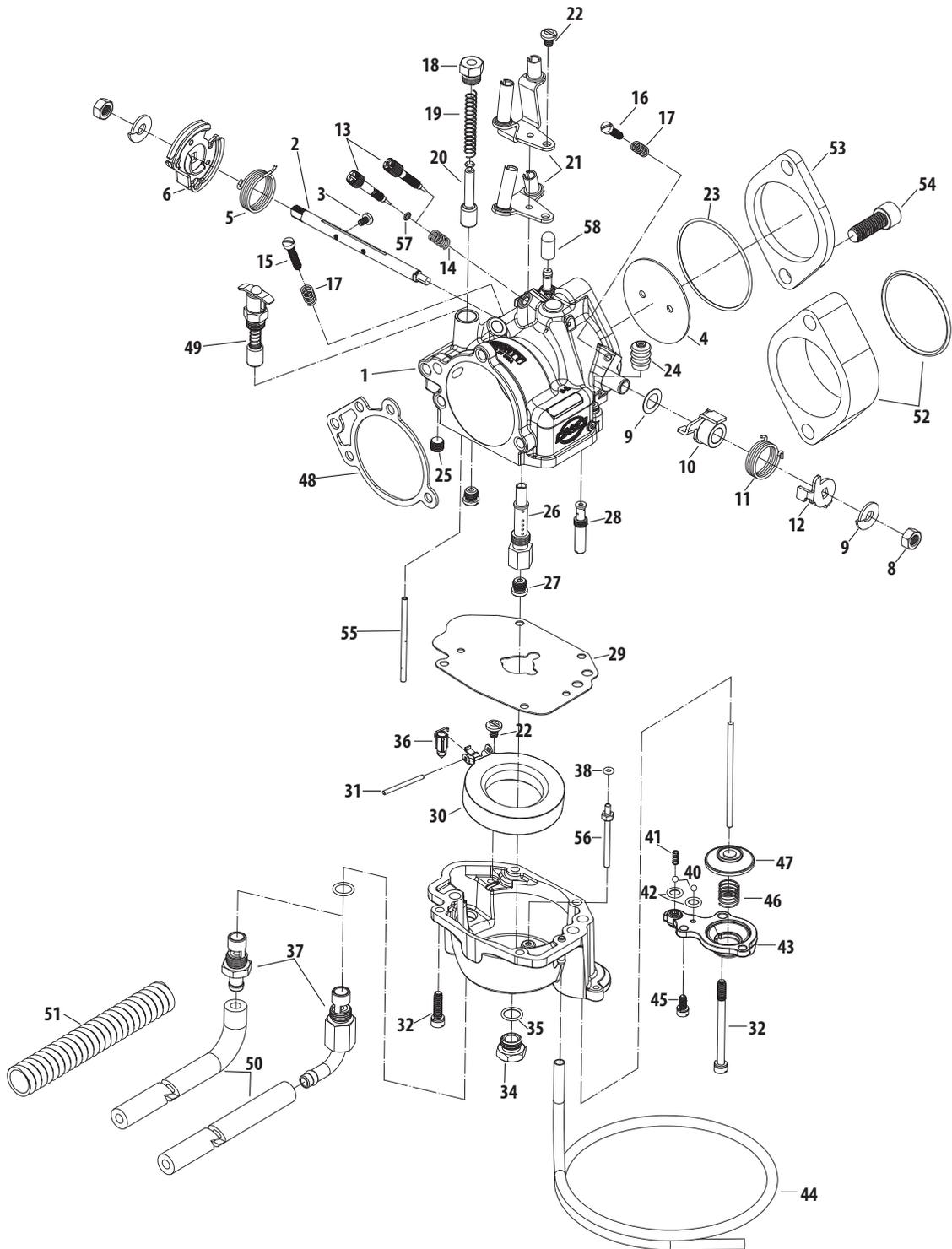
- We at S&S feel we have designed and manufactured a superior product and will stand behind it. If you have questions or problems, first refer to this instruction manual. Answers to nearly all questions can be found herein. If your problem cannot be resolved, call 608-627-8324 for technical assistance. Do not, however, call until you have become thoroughly familiar with this manual.
- S&S also has a complete carburetor repair and rebuild service that provides quality work at a fair price. If you are not properly equipped to service an S&S carburetor and do not have a qualified repair shop nearby, we recommend that you contact us for a Return Authorization (RA) number and send the carburetor to us. Be sure to include a note with your name and address, RA number, and a detailed description of any problems or repairs needed. Thanks for using S&S products!

<b>S&amp;S® SUPER E &amp; G JETTING</b>						
Displacement	Stockers	88ci	96ci	100ci	107ci	113ci
Idle Mixture Screw	1 to 1½ Turns					
Intermediate Jet	0.028	0.0295	0.031	0.031	0.031	0.031
Main Jet	0.066	0.072	0.076	0.076	0.076	0.078

## SUPER E & G CARBURETOR BODY AND RELATED PARTS

1. Carb body assembly			
1 $\frac{7}{8}$ " Super E	11-2381		
2 $\frac{1}{16}$ " Super G	11-2391		
2. Throttle shaft			
1 $\frac{7}{8}$ " Super E – Includes two plate screws	11-2383		
2 $\frac{1}{16}$ " Super G – Includes two plate screws	11-2483		
3. Throttle plate screw - (two required)			
each	50-0055-S		
10 pack	50-0064		
4. Throttle plate			
1 $\frac{7}{8}$ " Super E	11-2055		
2 $\frac{1}{16}$ " Super G	11-2355		
5. Throttle return spring (each)	11-2382		
5 Pack	11-3502		
6. Throttle spool	11-2385		
7. Throttle shaft lock washer (two required)	50-7031		
10 pack	50-7073		
8. Throttle shaft nut (two required) (each)	11-2350		
5 pack	11-2363		
9. Throttle shaft nylon washer (each)	50-7050		
10 pack	50-7072		
10. Pump actuator lever	11-2376		
11. Actuator spring (each)	11-2375-S		
5 pack	11-3501		
12. Pump actuator arm	11-2377		
13. Idle mixture screw (each)	11-2354		
5 pack	11-2378		
w/O-ring Groove (each)	110-0003		
Idle Mixture Screw Kit for 4 hole carbs (contains 110-0003 & 500-0036)	110-0068		
14. Idle mixture screw spring (each)	11-2052		
10 Pack	11-2060		
15. Idle speed screw (each)	50-0038		
10 Pack	50-0150		
16. Pump adjustment screw (each)	50-0039		
10 Pack	50-0146		
17. Idle speed/pump adjuster spring (each)	11-2048		
10 pack	11-2053		
18. Plunger nut (each)	11-2344		
5 Pack	11-2372		
19. Plunger spring (each)	11-2340		
10 Pack	11-2359		
20. Fast idle plunger	11-2343		
21. Cable guide assembly			
Use with butterfly style cables	11-2339		
Use with constant velocity style cables	11-2338		
2004 - 06 XL	11-2337		
22. Cable clamp/float pin screw (each)	50-0041		
10 Pack	50-0062		
23. O-ring			
1 $\frac{7}{8}$ " Super E (each)	50-8016		
10 Pack	50-8094		
2 $\frac{1}{16}$ " Super G (each)	50-8015		
10 pack	50-8093		
24. Bellows seal (each)	11-2266		
5 Pack	11-2279		
25. Bowl vent plug (each)	50-0105		
10 pack	50-0151		
26. Main discharge tube	11-2085		
27. Main jet – State size – See jet section			
28. Intermediate Jets – State size – See jet section in catalog			
Series #94 fits all Super 1 $\frac{7}{8}$ ", 2 $\frac{1}{16}$ " 2 $\frac{1}{4}$ " gas carburetors.			
Sizes available: .025", .0265", .028", .0295", .031", .032", .033", .036", .040".			
29. Bowl gasket (each)	11-2386		
10 pack	11-2387		
30. Float	11-2187		
31. Float pin (each)	11-2369		
5 Pack	11-2370		
32. Bowl screw			
10-24 x $\frac{3}{4}$ " - Three required (each)	50-0034		
10 Pack	50-0063		
10-24 x 2 $\frac{3}{8}$ " - One required (each)	50-0040		
10 Pack	50-0061		
33. Carb bowl (only)	11-2388		
Carb bowl complete assembly	11-2388P		
34. Bowl plug (each)	11-2090		
5 pack	11-2092		
35. Seat o-ring* – (required with part #11-2465 & #11-2466 only when replaces 360° style fuel inlet.) (each)	50-8009		
10 pack	50-8095		
36. Needle			
1 $\frac{7}{8}$ " Super E & 2 $\frac{1}{16}$ " Super G	11-2195		
Racing only	11-2197		
37. Seat			
1 $\frac{7}{8}$ " E & 2 $\frac{1}{16}$ " G (Replaces part #11-2347)			
Uses part #11-2195 needle	11-2465		
Racing only (Replaces part #11-2348)			
Uses part #11-2197 needle	11-2466		
Racing only - threaded fuel inlet (6AN .157" ID for Super E or G)			
Uses part #11-2195 needle	11-2395		
Racing only - threaded fuel inlet – (6AN .235" ID for Super E or G)			
Uses part #11-2197 needle	11-2396		
Permeation Compliant fuel inlet seat Super E or G.			
Uses part #11-2195 needle	106-2011		
38. Ejector nozzle o-ring (each)	50-8011		
10 Pack	50-8096		
39. Pump pushrod (each)	11-2373		
5 Pack	11-2393		
40. Ball check - (two required) (each)	50-8090		
10 pack	50-8125		
41. Ball check spring (each)	11-2374		
5 Pack	11-2392		
42. Pump cap o-ring - (two required) (each)	50-8012		
10 Pack	50-8100		
43. Pump cap assembly	11-2389		
44. Overflow hose per 24" (each)	19-0262-S		
10 Pack	19-0263		
45. Pump cap screw 8-32 - (two required) (each)	50-0042		
10 Pack	50-0098		
46. Diaphragm spring (each)	11-2275		
10 pack	11-2278		
47. Diaphragm	11-2282		
48. Gasket, backplate (each)	106-1724		
10 pack	106-2328		
49. Enrichment device (Use with air horn only)	11-2084		
50. Fuel line With 90° bend* 19"			
Use with part #11-2465 or #11-2466			
19-0475A			
Straight Permeation Compliant, 311" x .563" x 17.5"			
Use with part #106-2011, 90° seat	190-0001		
51. Fuel line insulator – 12"			
19-0172			
52. Spacer, Kit, Carb, 1- $\frac{7}{8}$ " x 1"	16-0057*		
Spacer, Kit, Carb, 2- $\frac{1}{16}$ " x 1"	16-0357*		
Spacer, Kit, Carb, 2- $\frac{1}{4}$ " x 1"	16-0157*		
*Use with 1" Spacer Block	16-0058		
53. Insulator Block, Manifold, Super E, w/O-ring,			
1 $\frac{7}{8}$ " x $\frac{1}{4}$ "	16-0491		
1 $\frac{7}{8}$ " x $\frac{3}{8}$ "	16-0497		
Insulator Block, Manifold,			
Super G, w/O-ring 2- $\frac{1}{16}$ " x $\frac{1}{4}$ "	16-0492		
Insulator Block, Manifold,			
Super G, w/O-ring 2- $\frac{1}{16}$ " x $\frac{3}{8}$ "	16-0498		
Insulator Block, Manifold			
Super D, w/O-ring, 2- $\frac{1}{4}$ " x $\frac{1}{4}$ "	16-0499		
54. Screw,			
1" x $\frac{3}{8}$ "-16	50-0161		
1 $\frac{1}{4}$ " x $\frac{3}{8}$ "-16	50-0162		
1 $\frac{3}{8}$ " x $\frac{3}{8}$ "-16	50-0163		
2" x $\frac{3}{8}$ "-16	50-0164		
2 $\frac{1}{4}$ " x $\frac{3}{8}$ "-16	50-0165		
2 $\frac{1}{2}$ " x $\frac{3}{8}$ "-16	50-0166		
1 $\frac{1}{4}$ " x $\frac{1}{4}$ "-20	50-0008		
1 $\frac{1}{2}$ " x $\frac{1}{4}$ "-20	50-0079		
2 $\frac{1}{4}$ " x $\frac{1}{4}$ "-20	50-0078		
55. Tube, Fast Idle Pick-Up, Super E/G,			
125" x 2.350", Brass	0381F		
56. Tube, Ejector Nozzle, Super E/G, Flared, Brass	106-6124		
57. O-ring, 3mm x 5mm x 1mm, Fluorosilicone			
each	500-0036		
10 pack	500-0148		
58. Cap, VOES Fitting, $\frac{3}{16}$ " x $\frac{5}{16}$ " x $\frac{1}{2}$ ", Rubber	50-8372		

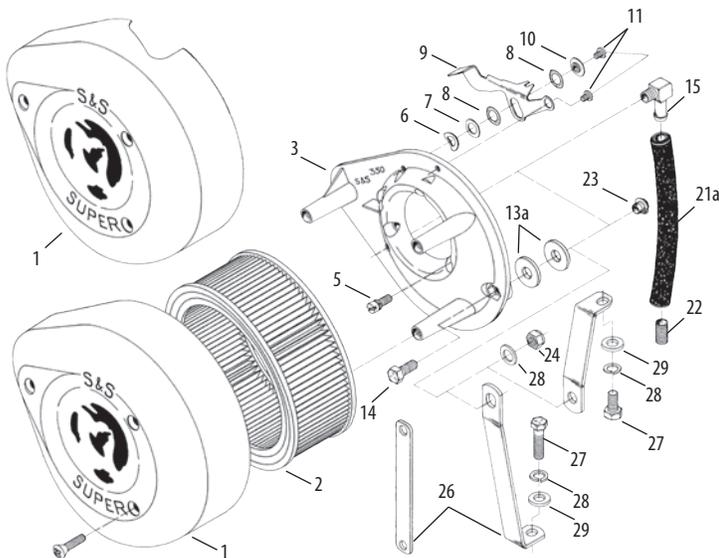
\*Early Super E & G Carburetors equipped with a 360° banjo style fuel inlet that require service must be converted to the current production style fuel inlet. To update production Super E and G carburetors equipped with an early 360° style inlet select the appropriate fuel inlet seat and fuel line from this line drawing



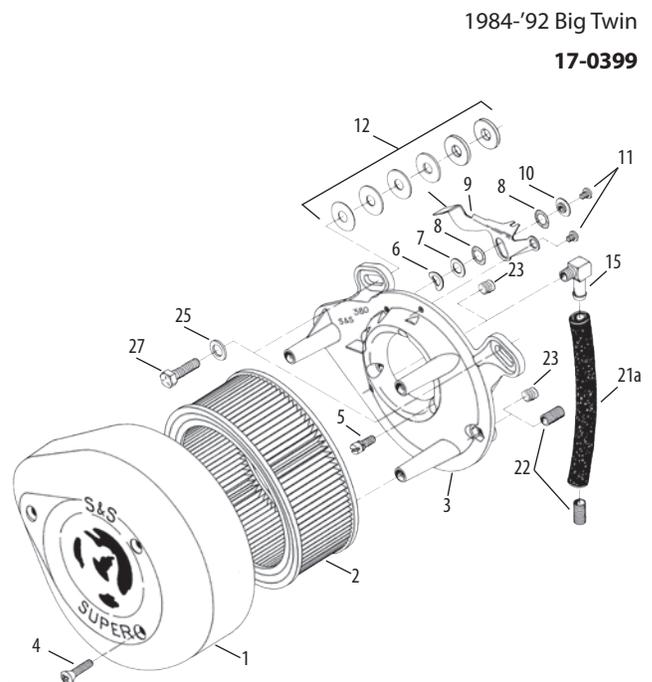
**REPLACEMENT PARTS FOR S&S SUPER E & G AIR CLEANERS FOR 1936-UP BIG TWINS**

- 1 Air cleaner cover – All  
(Except shovelhead w/5 gallon tanks & cylinders + .075")  
Chrome ..... **17-0378**  
Black ..... **17-0384**  
Slasher ..... **17-0004**  
Shovelhead w/5 gallon tanks & cylinders +.075" **17-0372**
- 2 Element, pleated carbon ..... **17-0375**  
Element, pleated cotton ..... **106-4722**
- 3 Backplate  
BT 1936-'84 ..... **17-0330**  
BT 1984-'92, S&S 4 1/8" bore  
Manufactured prior to 1-1-03 ..... **17-0380**  
BT 1993-'99, BT 1999-up ..... **17-0336**  
4 1/8" Bore – Manufactured after 1-1-03 ..... **17-0387**
- 4 Cover Screw  
Nickel (each) ..... **50-0072**  
10 pack ..... **50-0094**  
Black (each) ..... **50-0310-S**  
3 pack ..... **50-0310**  
TÜV Style (Chrome) (each) ..... **50-0347-S**  
10 pack ..... **50-0347**
- 5 Backplate screw, with threadlock ..... **106-2105**
- 6 Fast idle friction washer ..... **50-7035**  
10 pack ..... **50-7058**
- 7 Fast idle steel washer ..... **50-7037**  
10 pack ..... **50-7061**
- 8 Fast idle nylon washer ..... **50-7036**  
10 pack ..... **50-7060**
- 9 Fast idle lever ..... **17-0329**
- 10 Fast idle brass washer ..... **50-7007**  
10 pack ..... **50-7010**
- 11 Fast idle lever screw (one required for current  
backplate) ..... **50-0041**  
10 pack ..... **50-0062**
- 12 Shim kit  
BT 1984-'92 ..... **17-0314**  
(Includes two each 3/16" x .018", 3/16" x .030",  
3/16" x .048", 3/16" x .105", and four each 3/16" x .125")  
BT 1993-'99 ..... **17-0464**  
(Includes two each 1/2" x .018", 1/2" x .030",  
1/2" x .048", 1/2" x .105", and four each 1/2" x .125")
- 13 Shims,  
a BT 1984-'92, S&S 4 1/8" Bore  
3/16" x .018" ..... **50-7038**  
10 pack ..... **50-7107**  
3/16" x .030" ..... **50-7039**  
10 pack ..... **50-7070**  
3/16" x .048" ..... **50-7040**  
10 pack ..... **50-7068**  
3/16" x .105" ..... **50-7041**  
5 pack ..... **50-7062**  
3/16" x .125"  
(Use on BT 1936-'84 when insulator block  
is installed.) ..... **50-7042**  
5 pack ..... **50-7066**

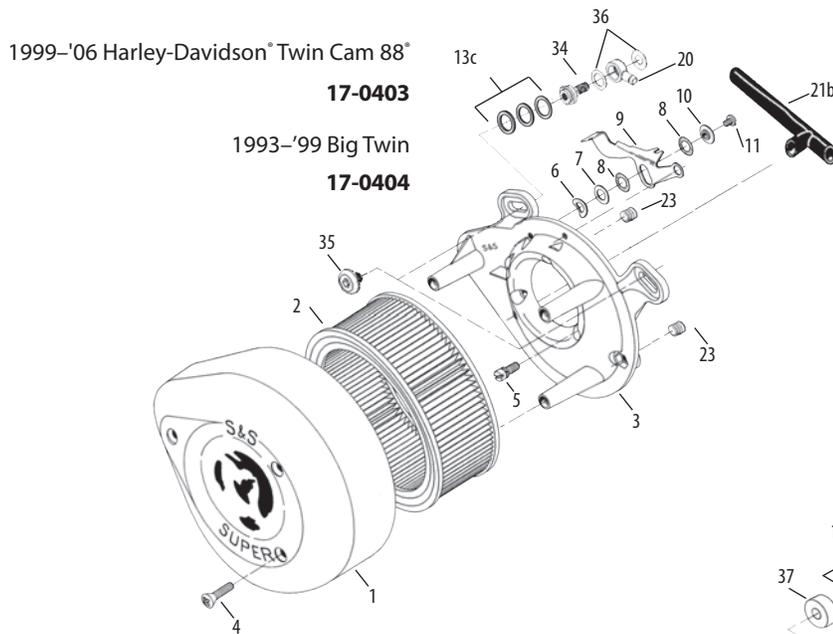
- b BT 1993-'06  
3/8" x .025" ..... **50-7113**  
10 pack ..... **50-7110**  
3/8" x .050" ..... **50-7114**  
10 pack ..... **50-7111**  
3/8" x .075" ..... **50-7115**  
10 pack ..... **50-7112**
- 14 Backplate mounting bolt – BT 1936-'84  
3/16"-18 x 1" ..... **50-0108**  
10 pack ..... **50-0155**
- 15 Elbow fitting ..... **50-8110**  
5 pack ..... **50-1005**
- 16 Breather screw  
Standard length ..... **17-0338**  
1" Longer (Use with 1" spacer block.) ..... **17-0343**
- 17 Breather screw o-ring – 3/8" O.D ..... **50-8032**  
10 pack ..... **50-8130**
- 18 Breather screw o-ring – 1/2" O.D ..... **50-8006**  
10 pack ..... **50-8077**
- 19 Breather screw washer ..... **50-7119**
- 20 Breather fitting ..... **17-0350**  
2 pack ..... **17-0355**
- 21 Crankcase breather hose  
a. BT 1978-'92 ..... **17-0113**  
b. BT 1993-'99 ..... **17-0339**
- 22 Vent hose connector ..... **50-8111**
- 23 Backplate plug 1/8"-27 ..... **50-8331**  
10 pack ..... **50-1015**
- 24 Locknut – 3/16"-18  
(Use with support bracket - see #26.) ..... **50-5021**



1936-'84 Big Twin  
**17-0400, 17-0440 Notched**



1984-'92 Big Twin  
**17-0399**

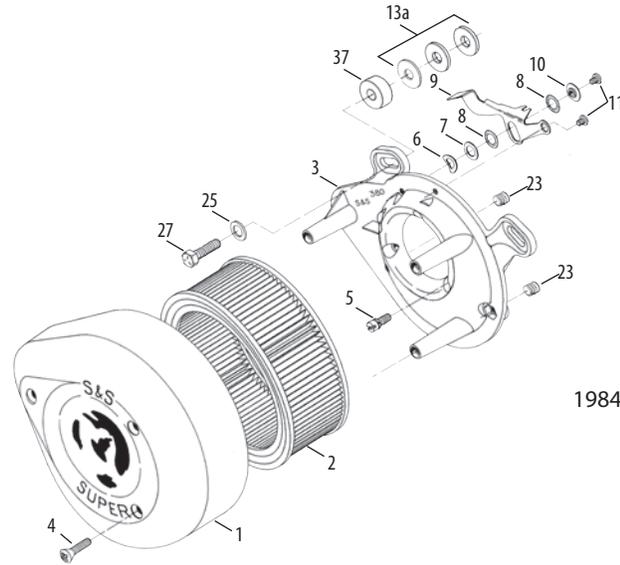


1999-'06 Harley-Davidson® Twin Cam 88®

**17-0403**

1993-'99 Big Twin

**17-0404**



1984-'05 Big Twin

4 1/8" Bore

**17-0416**

- 25 Flatwasher – 5/16" x 1/16" ..... **50-7034**
- 26 Support bracket
  - XL 1957-'85 ..... **17-0393**
  - BT 1966-'82 ..... **17-0392**
  - BT 1983-'84 ..... **16-0471**
  - BT 1948-'65 ..... **16-0096**
- 27 Mounting bracket bolt – Big Twin
  - 1966-'84 – 5/16"-18 x 5/8" ..... **50-0106**
  - 10 pack ..... **50-0220**
  - 1984-'92, S&S 4 1/8" Bore – 5/16"-18 x 1 1/4" ... **50-0110**
- 28 Lockwasher – 5/16" ..... **50-7032**
- 29 Flatwasher – 5/16" x 1/8" ..... **50-7032**
- 30 Wire tie (NS) ..... **50-8003**
- 31 Hose clamp (NS) ..... **50-8002**
- 32 Air cleaner assembly
  - Includes:  
Chrome cover, backplate, filter element,  
and hardware kit.)
  - BT 1936-'84 ..... **17-0400**
  - BT 1966-'84 with five gallon tanks  
and cylinders .075" longer than stock ..... **17-0440**
  - BT 1984-'92 ..... **17-0399**
  - BT 1993-'99 ..... **17-0404**
  - BT 1999-'06 ..... **17-0403**
- 33 Mounting hardware package (NS)
  - Includes all parts needed to install following style air  
cleaners:
  - BT 1936-'84 ..... **17-0441**
  - BT 1984-'92 ..... **17-0458**
  - BT 1993-'99 ..... **17-0439**
  - BT 1999-'06 ..... **17-0437**
  - 4 1/8 Bore ..... **17-0460**
- 34 Screw vent fitting
  - a. BT 1993-'99 ..... **17-0347**
  - b. BT 1999-up ..... **17-0345**
- 35 Screw, air cleaner to head ..... **17-0346**

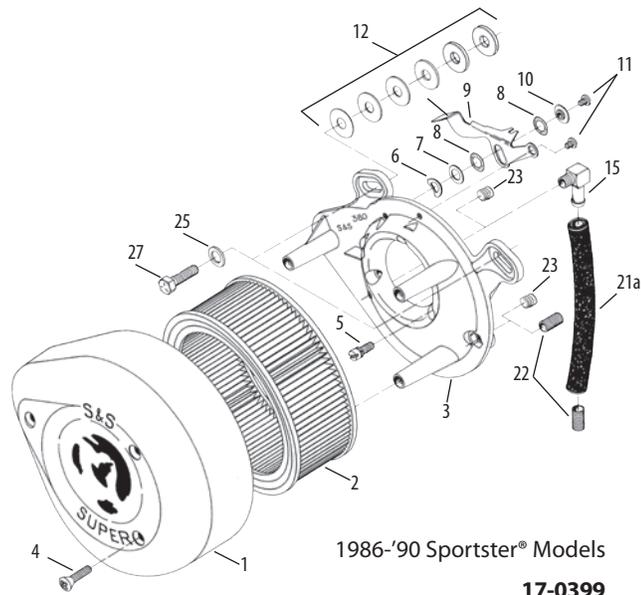
- 36. Washer, silicone coated steel
  - BT 1993-'99 & BT 1999-up, .520" ..... **50-7055**
  - 10 pack ..... **50-7057**
  - BT 1999-up, .380" ..... **50-7054**
  - 10 pack ..... **50-7059**
- 37. Shim, .850" x .325" x .400"
  - S&S 4 1/8" Bore ..... **50-7027**
- 38. Spring clamps (NS) ..... **50-8001**
- 39 Thread insert 1/2"-13 to 5/16"-18 (NS)
  - (Used on 1992 big twins.) ..... **50-8151**
- 40 Breather conversion kit BT (NS) ..... **17-0486**
  - Convert early S&S air cleaners for 1993-'99 BT with o-ring  
breather fittings to new style breather hardware.

**NOTE:**

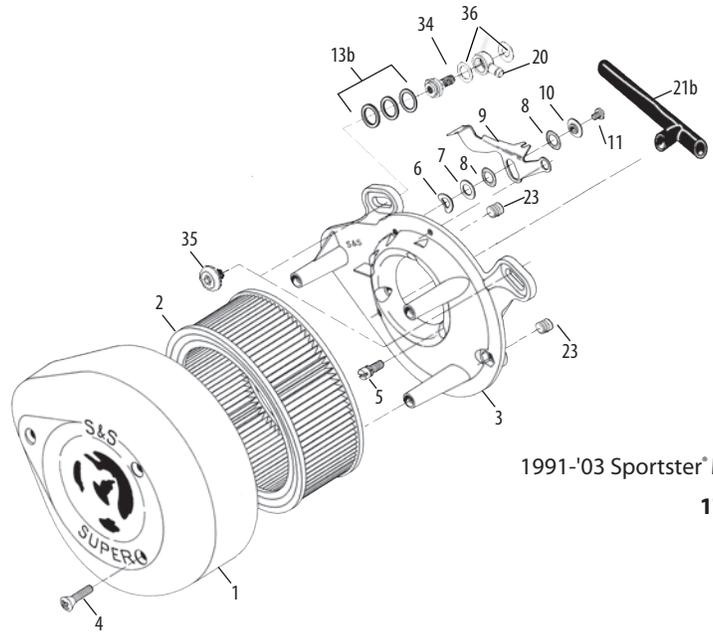
The line drawing is used for illustration purposes only. Not all of the parts shown are included and used in every carb installation. Parts followed by an N/A are no longer available. Those followed by an (NS) means parts are not shown.

# REPLACEMENT PARTS FOR S&S® SUPER E AND G AIR CLEANERS FOR 1986-UP HARLEY-DAVIDSON® SPORTSTER® MODELS

- |   |                  |  |                 |  |                |
|---|------------------|--|-----------------|--|----------------|
| 1. Air cleaner cover  |                  | 13. Shims,   |                 | 16. Breather screw   |                |
| Chrome.....   | <b>17-0378</b>   | a. XL 1986-'90   |                 | Standard length .....  | <b>17-0338</b> |
| Black.....  | <b>17-0384</b>   | $\frac{5}{16}$ " x .018" (each) .....                        | <b>50-7038</b>  | 1" Longer (Use with 1" spacer block.) .....                    | <b>17-0343</b> |
| Slasher .....   | <b>17-0004</b>   | 10 pack .....  | <b>50-7107</b>  | 17. Breather screw o-ring - $\frac{5}{8}$ " O.D. (each)...     | <b>50-8032</b> |
| 2. Element, pleated .....   | <b>106-4722</b>  | $\frac{5}{16}$ " x .030" (each) .....                        | <b>50-7039</b>  | 10 pack .....  | <b>50-8130</b> |
| Element, pleated carbon .....   | <b>17-0375</b>   | 10 pack .....  | <b>50-7070</b>  | 18. Breather screw o-ring - $\frac{1}{2}$ " O.D. (H-D® #11110) |                |
| 3. Backplate  |                  | $\frac{5}{16}$ " x .048" (each) .....                        | <b>50-7040</b>  | each.....  | <b>50-8006</b> |
| XL 1957-'85.....  | <b>17-0330</b>   | 10 pack .....  | <b>50-7028</b>  | 10 pack .....  | <b>50-8077</b> |
| XL 1991-'03.....  | <b>17-0336</b>   | $\frac{5}{16}$ " x .105" (each) .....                        | <b>50-7041</b>  | 19. Breather screw washer .....                                | <b>50-7119</b> |
| XL 1986-'90 Manufactured prior to 1-1-03.....   | <b>17-0380</b>   | 5 pack .....   | <b>50-7062</b>  | 20. Breather fitting (each).....                               | <b>17-0350</b> |
| XL 2004-'06.....  | <b>17-0361</b>   | $\frac{5}{16}$ " x .125" (Use on BT 1936-'84 and XL 1957-'85 |                 | 2 pack .....   | <b>17-0355</b> |
| 4. Cover screw  |                  | when insulator block is installed.) (each).....              | <b>50-7042</b>  | 21. Crankcase breather hose                                    |                |
| Chrome (each).....  | <b>50-0072</b>   | 2 pack .....   | <b>50-7042P</b> | a. XL 1978-'90 .....   | <b>17-0113</b> |
| 10 pack .....   | <b>50-0094</b>   | 5 pack .....   | <b>50-7066</b>  | b. XL 1991-'06 .....   | <b>17-0339</b> |
| Black (each).....   | <b>50-0310-5</b> | b. XL 1991-up  |                 | 22. Vent hose connector .....                                  | <b>50-8111</b> |
| 5. Backplate screw, Zinc Plated (each) ..   | <b>106-2084</b>  | $\frac{5}{8}$ " x .025" (each) .....                         | <b>50-7113</b>  | 23. Backplate plug $\frac{1}{8}$ "-27 (each) .....             | <b>50-8331</b> |
| 10 pack .....   | <b>106-2105</b>  | 10 pack .....  | <b>50-7110</b>  | 10 pack .....  | <b>50-1015</b> |
| 6. Fast idle friction washer (each) .....   | <b>50-7037</b>   | $\frac{5}{8}$ " x .050" (each).....                          | <b>50-7114</b>  | 24. Locknut - $\frac{5}{16}$ "-18                              |                |
| 10 pack .....   | <b>50-7061</b>   | 10 pack .....  | <b>50-7111</b>  | (Use with support bracket - see #26) .....                     | <b>50-5021</b> |
| 8. Fast idle nylon washer (each) .....  | <b>50-7036</b>   | $\frac{5}{8}$ " x .075" (each).....                          | <b>50-7115</b>  | 25. Flatwasher - $\frac{5}{16}$ " x $\frac{1}{16}$ " .....     | <b>50-7034</b> |
| 10 pack .....   | <b>50-7060</b>   | 10 pack .....  | <b>50-7112</b>  | 26. Support bracket  |                |
| 9. Fast idle lever .....  | <b>17-0329</b>   | .515" x 1" x .125" (each).....                               | <b>50-7090</b>  | XL 1957-'85.....   | <b>17-0393</b> |
| 10. Fast idle brass washer (each) .....   | <b>50-7007</b>   | 5 pack .....   | <b>50-7101</b>  | XL 2004-Up .....   | <b>17-0305</b> |
| 10 pack .....   | <b>50-7010</b>   | 14. Backplate mounting bolt - XL 1957-'85                    |                 | 27. Mounting bracket bolt - XL 1957-'90 and                    |                |
| 11. Fast idle lever screw (one required) ..   | <b>50-0041</b>   | $\frac{5}{16}$ "-18 x 1" (each).....                         | <b>50-0108</b>  | 2004-'06   |                |
| 10 pack .....   | <b>50-0062</b>   | 10 pack .....  | <b>50-0155</b>  | $\frac{5}{16}$ "-18 x $1\frac{1}{4}$ ".....                    | <b>50-0110</b> |
| 12. Shim kit  |                  | 15. Elbow fitting (each).....                                | <b>50-8110</b>  | 28. Lockwasher - $\frac{5}{8}$ ".....                          | <b>50-7032</b> |
| XL 1986-'90 .....   | <b>17-0314</b>   | 5 pack .....   | <b>50-1005</b>  | 29. Flatwasher - $\frac{5}{16}$ " x $\frac{1}{16}$ " .....     | <b>50-7033</b> |
| (Includes two each $\frac{3}{16}$ " x .018"; $\frac{5}{16}$ " x .030";                      |                  |  |                 | 30. Wire tie (N/S) .....                                       | <b>50-8003</b> |
| $\frac{5}{16}$ " x .048"; $\frac{5}{16}$ " x .105"; and four each $\frac{5}{16}$ " x .125") |                  |  |                 | 31. Hose clamp (N/S) .....                                     | <b>50-8002</b> |
| XL 1991-up .....  | <b>17-0464</b>   |  |                 |  |                |
| (Includes two each $\frac{1}{2}$ " x .018"; $\frac{1}{2}$ " x .030";                        |                  |  |                 |  |                |
| $\frac{1}{2}$ " x .048"; $\frac{1}{2}$ " x .105"; and four each $\frac{1}{2}$ " x .125")    |                  |  |                 |  |                |

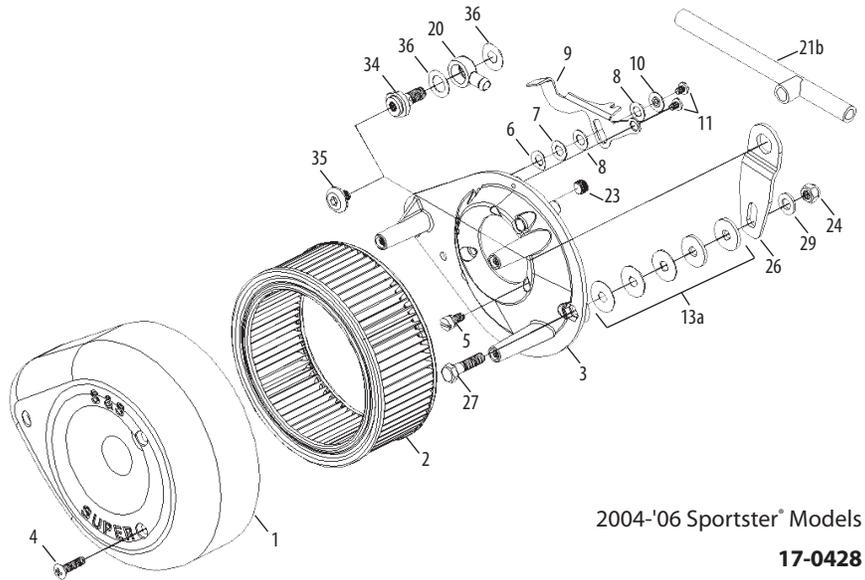


- 32. Air cleaner assembly (Includes: Chrome cover, backplate, filter element, and hardware kit)
  - XL 1957-'85 .....17-0400
  - XL 1986-'90.....17-0399
  - XL 1991-'03.....17-0404
- 33. Mounting hardware package (N/S)
  - Includes all parts needed to install following style air cleaners:
  - XL 1957-'85 .....17-0441
  - XL 1986-'90.....17-0458
  - XL 1991-'03.....17-0439
- 34. Screw vent fitting
  - a. 1991-'12 XL .....17-0347
- 35. Screw, air cleaner to head .....17-0346
- 36. Washer, silicone coated steel
  - XL 1991-'06, .520" (each) .....50-7055
  - 10 pack .....50-7057
- 37. Spring clamps (N/S).....50-8001
- 38. Breather conversion kit (N/S)
  - Convert early S&S air cleaners for 1991-'03 XL with o-ring breather fittings to new style breather hardware. XL kits include special insulator block, and manifold screws.
  - XL 1 7/8" carbs.....17-0487



1991-'03 Sportster® Models  
**17-0404**

**(N/S) = Not Shown**



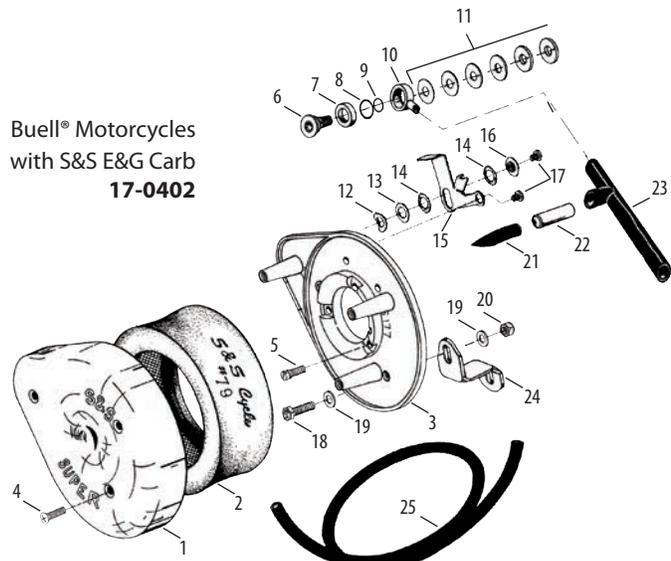
2004-'06 Sportster® Models  
**17-0428**

**NOTE:**

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## REPLACEMENT PARTS FOR S&S® AIR CLEANERS FOR BUELL® MOTORCYCLES

1. Air cleaner cover  
 Chrome..... **17-0078**  
 Black..... **17-0075**
2. Air cleaner element ..... **17-0079**
3. Air cleaner backing plate  
 Super E & G carburetors ..... **17-0000**  
 Stock carburetors..... **17-0003**
4. Cover screw  
 Chrome (each)..... **50-0072**  
 10 pack ..... **50-0094**  
 Black (each)..... **50-0310-S**
5. Air cleaner backplate screw  
 For S&S Super E&G  
 Zinc Plated (each)..... **106-2084**  
 10 pack ..... **106-2105**  
 For CV (each)..... **50-0076**
6. Cap screw, breather, &  
 air cleaner mount ..... **17-0338**
7. Shim, .620" I.D. x .800" O.D. x .185"  
 each ..... **50-7120**  
 5 pack ..... **106-2956**
8. O-ring ½" O.D. x ⅝" I.D. x ⅛" CS (each) **50-8032**  
 10 pack ..... **50-8130**
9. O-ring ⅜" O.D. x ½" I.D. x ⅛" CS (H-D® #11110)  
 each ..... **50-8006**  
 10 pack ..... **50-8077**
10. Breather fitting (each) ..... **17-0350**  
 2 pack ..... **17-0355**
11. Shim kit air cleaner backplate  
 (includes 4 each of .018", .030", .048") . . . . **17-0464**  
 Replacement Shims  
 ½" x 1" x .018 (each) ..... **50-7085**  
 ½" x 1" x .030 (each) ..... **50-7086**  
 ½" x 1" x .048 (each) ..... **50-7087**  
 10 pack ..... **50-7098**  
 ½" x 1" x .105 (each) ..... **50-7089**  
 10 pack ..... **50-7097**  
 ½" x 1" x .125 (each) ..... **50-7090**  
 5 pack ..... **50-7101**
12. Washer, friction, spring (each) . . . . . **50-7035**  
 10 pack ..... **50-7058**
13. Washer, flat .323" x ⅝" x ⅛" (each) . . . **50-7037**  
 10 pack ..... **50-7061**
14. Washer, flat, nylon .323" x ⅝" x .020"  
 each ..... **50-7036**  
 10 pack ..... **50-7060**
15. Lever, fast idle, ..... **17-0327**
16. Washer, flat w/step, brass (each) . . . . **50-7007**  
 10 pack ..... **50-7010**
17. Screw, PH slotted 10-24 x ¼" (each) . . . **50-0041**  
 10 pack ..... **50-0062**
18. Screw, HH, cap, ¼"-28 x ⅞" . . . . . **50-0074**
19. Washer, flat, ¼" x ⅝" x ⅛" (each) . . . . **50-7020**  
 10 pack ..... **50-7076**
20. Locknut - ¼" -28 (H-D® #7683)(each) . . . . **50-5010**  
 10 pack ..... **50-5015**
21. Hose, breather vent ..... **17-0365**
22. Fitting, hose, Buell air cleaner . . . . . **50-8121**
23. Hose, breather ..... **17-0339**
24. Bracket, carb support, air cleaner . . **17-0309**
25. Tubing, rubber - ⅜" x ⅝" x 3' . . . . . **19-0169A**



**NOTE:**

All reference to H-D® part numbers is for identification purposes only. We in no way are implying that any of S&S Cycle's products are original equipment parts or that they are equivalent to the corresponding H-D® part number shown.

**REPLACEMENT MANIFOLD PARTS**

1-3- Intake manifold  
See S&S® Catalog for part numbers.

4- Manifold bolts  
 $\frac{3}{8}$ "-16 x 1" ..... **50-0161**  
*10 pack* ..... **50-0186**  
 $\frac{3}{8}$ "-16 x 1 $\frac{1}{4}$ " ..... **50-0162**  
*10 pack* ..... **50-0177**  
 (Use in bottom hole with 16-0096 or 16-0471 bracket or in top and bottom holes with 16-0491 or 16-0492 insulator block.)  
 $\frac{3}{8}$ "-16 x 1 $\frac{3}{8}$ " ..... **50-0163**  
*5 pack* ..... **50-0178**  
 (Use in bottom hole with 16-0096 or 16-0471 bracket and 16-0491 or 16-0492 insulator block.)  
 $\frac{3}{8}$ "-16 x 2" ..... **50-0164**  
*5 pack* ..... **50-0185**  
 $\frac{3}{8}$ "-16 x 2 $\frac{1}{4}$ " ..... **50-0165**  
*5 pack* ..... **50-0180**  
 $\frac{3}{8}$ "-16 x 2 $\frac{1}{2}$ " ..... **50-0166**

5- Manifold o-ring - 1955-'78 Harley-Davidson® BT & Sportster® ..... **50-8046**  
*10 pack* ..... **50-8132**

6- Manifold rubberband - 1979-'85 BT & Sportster ..... **16-0238**  
*10 pack* ..... **16-0245**

7- Manifold o-ring - 1984-up BT & 1986-up Sportster  
S&S Manifold ..... **16-0235**  
*10 pack* ..... **16-0243**

8- Manifold clamps  
O-ring pre 1979 ..... **16-0230**  
Band 1979 to '85 ..... **16-0231**

9- Manifold Flanges 1984-'06 BT & 1986-'06 Sportster  
Front mounting flange ..... **16-0232**  
*5 pack* ..... **16-0600**  
Rear mounting flange ..... **16-0233**  
*5 pack* ..... **16-0601**

10- Carb mounting bracket - 1948-'65 BT ..... **16-0096**

11- Carb mounting bracket assembly ..... **16-0471**  
(Includes 1 each 2-piece bracket 50-0108, 50-7034, 50-5021)

12- Support bracket bolt -  $\frac{5}{16}$ "-18 x 1" ..... **50-0108**  
*10 pack* ..... **50-0155**

13- Flat washer -  $\frac{5}{16}$ " x  $\frac{1}{16}$ " ..... **50-7034**

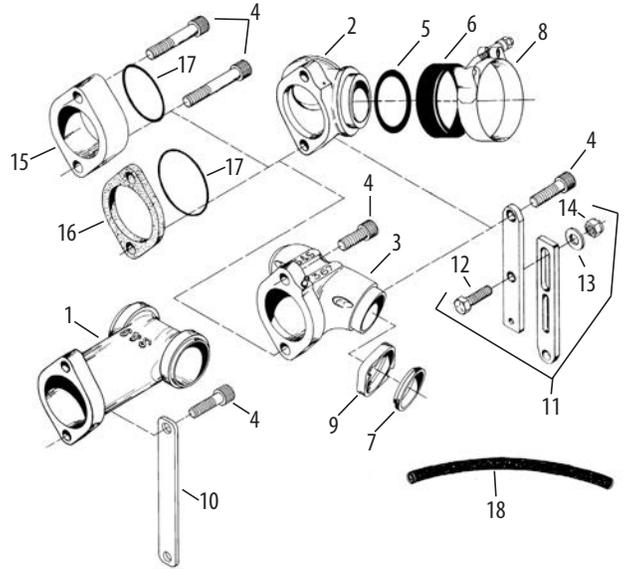
14- Lock nut -  $\frac{5}{16}$ "-18 ..... **50-5021**

15- 1" Aluminum spacer blocks  
For 1 $\frac{7}{8}$ " Super E ..... **16-0057**  
(Includes 1 each 1" spacer block & 50-8013 o-ring)  
For 2 $\frac{1}{4}$ " Super G ..... **16-0357**  
(Includes 1 each 1" spacer block & 50-8015 o-ring)

16- Insulator blocks  
1 $\frac{7}{8}$ " Super E - All big twins ..... **16-0491**  
(Includes 1 each insulator block & 50-8016 o-ring)  
2 $\frac{1}{4}$ " Super G - All big twins ..... **16-0492**  
(Includes 1 each insulator block & 50-8015 o-ring)  
1 $\frac{7}{8}$ " E - for Sportster (Manufactured after 6-15-01) ..... **16-0497**  
(Includes 1 each insulator block & 50-8016 o-ring)  
2 $\frac{1}{4}$ " - for Sportster (Manufactured after 6-15-01) ..... **16-0498**  
(Includes 1 each insulator block & 50-8015 o-ring)

17- Manifold orings  
For 1 $\frac{7}{8}$ " E carb body & insulator block ..... **50-8016**  
*10 pack* ..... **50-8094**  
For 1 $\frac{7}{8}$ " spacer block ..... **50-8034-5**  
*2 pack* ..... **50-8034**  
For 2 $\frac{1}{4}$ " G carb body, insulator block, & spacer block ..... **50-8015**  
*10 pack* ..... **50-8093**

18- VOES tubing - 9" piece ..... **19-0395**  
*5 pack* ..... **19-0398**



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**NOTES:**

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