

Instruction sheet No. 0400-1  
Revised 6-26-98

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## Installation Instructions for S&S Air Cleaner for Stock T illotson, Bendix, and Keihin Carburetors on all OHV H-D's and 1994-up Buells

### INTRODUCTION

Installing an S&S air cleaner on a stock carburetor is simple and straightforward. Because this modification increases air flow, however, larger carburetor jets may be required. Additionally, S&S air cleaners for stock carburetors have no provision for the emissions canister purge valve required in some areas. As a result, installing this product may render the motorcycle illegal for street use in California and other areas with similar emissions standards. *It is solely the owner's responsibility to determine the suitability of this product for his use and application.*

S&S air cleaner kits for stock carburetors are available for Big Twins and Sportsters and 1994-up Buells. Kit #17-0199 fits 1966-1984 Shovelheads and 1966-1985 XL's. Kit #17-0105 fits 1994-up Buells. Kit #17-0108 fits 1984-1989 Big Twins and 1986-1987 Sportsters. Kit #17-0109 fits 1993-up Big Twins. Kit #17-0110 fits 1991-up Sportsters. Kits are not available for 1989-1992 Big Twins with CV carbs or 1988-1990 XL"s with CV carbs.

### NOTES

● *Carburetor/air cleaner assembly must be firmly supported. S&S includes support brackets for all models except Buells. Buells utilize OEM support bracket.*

**WARNING** - An improperly mounted carburetor may become detached from the motorcycle, resulting in gas leakage and an immediate health and fire hazard.

- *It is the owner's responsibility to determine if the installation of this air cleaner assembly is in accordance with applicable legal and emissions requirements.*
- *Crankcase and cylinder head vents must be open and free of restriction. To meet C.A.R.B. and similar standards if applicable, crankcase pressure must be*

*vented into air cleaner assembly, not directly into atmosphere.*

● *Thread conversion inserts for heads may be supplied with or without thread locking compound. Loctite 242 or equivalent should be applied to threads of inserts not supplied with thread locking compound. Inserts should be installed in desired position and then left in place. Installing insert in hole activates thread locking compound, making it difficult to change position of insert after installation.*

● *If improperly tightened or loosened by vibration, bolts, screws, etc. located inside air cleaner assembly may fall into engine. S&S recommends applying Loctite 242 or equivalent thread locking compound to threads of all bolts, screws, and nuts located inside air cleaner assembly.*

### CAUTIONS

- **Loose bolt, screw, nut, etc. inside air cleaner will likely be drawn into engine, causing extensive damage not covered under warranty.**
- **Pressure relief passages in crankcase and/or cylinder heads must not be plugged as gasket failure and oil leakage may result.**

### WARNINGS

- **Gasoline is highly flammable, explosive under certain conditions, and the fumes toxic when inhaled. Be sure gasoline petcock is "OFF" before beginning installation, provide adequate ventilation, and disconnect battery ground cable to avoid sparks and accidental engagement of electric starter.**
- **Improperly mounted carburetor may become detached from motorcycle, resulting in immediate health and fire hazard.**

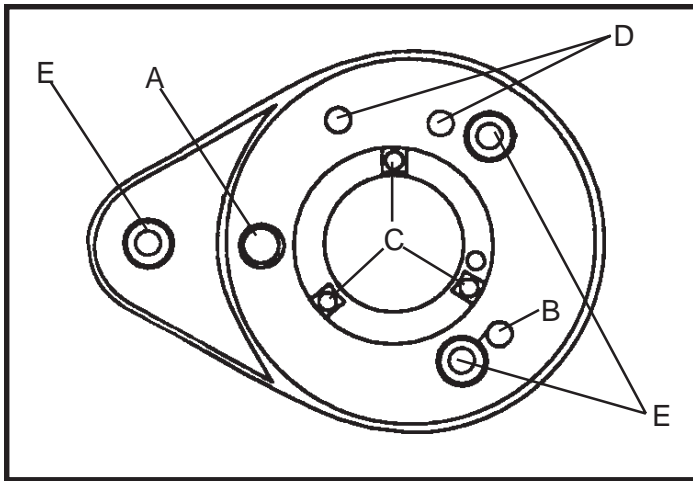


Figure A

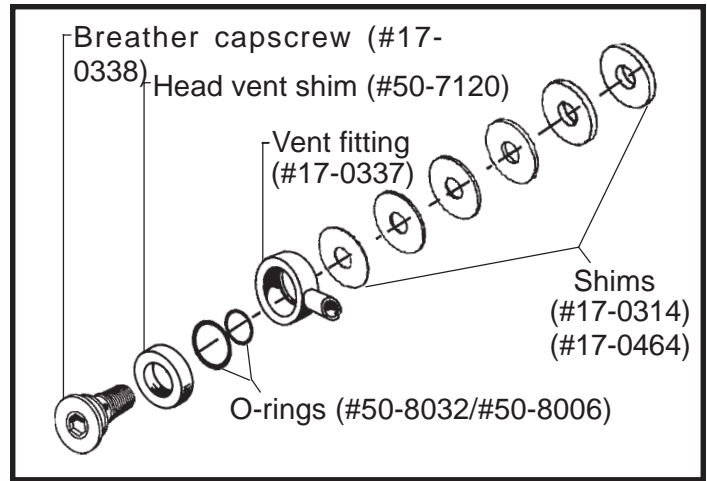


Figure B

### INSTALLATION

1. Remove existing air cleaner assembly and related hardware including cylinder head breather fittings if applicable. Refer to authorized Harley-Davidson Service Manual as needed.

*NOTE - Hose barb on rear cylinder head breather fitting of some Buells must be removed in order to remove fitting from cylinder head. If cut-off wheel or similar tool is used to cut barb off, care must be taken to contain metal chips. S&S recommends packing fitting with grease. An alternative is to grasp barb with pliers and snap off.*

**CAUTION-Failure to contain metal chips can result in extensive engine damage not covered under warranty .**

2. Prepare air cleaner backplate.
  - A. 1966 to 1979 Shovels and 1957 to 1979 Iron Head Sportsters - Press plugs #50-8313 into holes "D" in backplate. **See Figure A.**
  - B. 1980 to 1984 Shovels and 1980 to 1985 Iron Head Sportsters - Apply Teflon tape or thread lubricant to threads of crankcase breather vent elbow fitting #50-8110 and install in hole "A" in backplate. **See Figure A.**
  - C. 1984 to 1989 Big Twins with crankcase vent connected to stock air cleaner with rubber hose - Press plug #50-8312 into hole "B" in backplate. Apply Teflon tape or thread lubricant to threads and screw crankcase breather vent elbow fitting #50-8110 into hole "A." **See Figure A.**
  - D. 1986 and 1987 Sportsters - Press plug # 50-8312 into hole "A" in backplate. Apply Teflon tape or thread lubricant to threads and screw crankcase breather vent elbow fitting, # 50-8110 into hole "B." **See Figure A.** No backplate preparation is required for Buell motorcycles, 1991-up Sportsters, or 1992-up Big Twins that vent through cylinder heads.

3. Install cylinder head breather vent assemblies

*NOTE - Following steps apply only to 1994-up Buells, 1991-up Sportsters, and 1992-up Big Twins that vent crankcase pressure through passages in cylinder heads rather than directly out crankcase.*

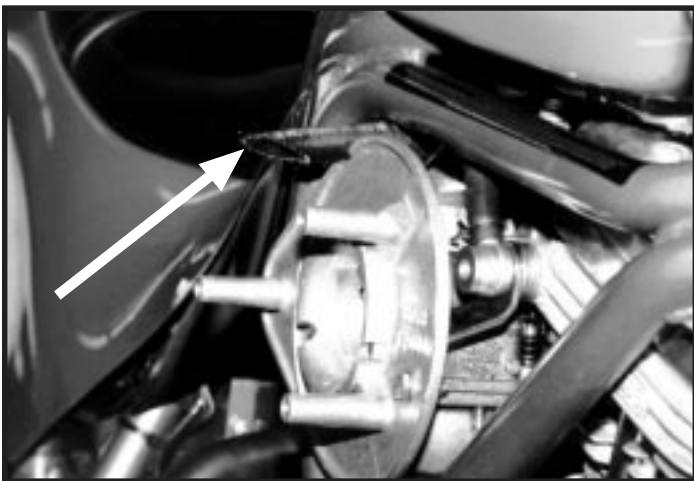
- A. Place head vent shim #50-7120 over breather cap screw #17-0338 and roll  $\frac{5}{8}$ " O.D. o-ring #50-8032 into large diameter o-ring groove closest to head of breather screw. **See Figure B.**
- B. Roll  $\frac{1}{2}$ " O.D. o-ring #50-8006 into small diameter o-ring groove of breather screw. Apply thin film of light grease to o-rings.
- C. Repeat for other breather screw.

*NOTE - Breather fitting o-rings are easily damaged. It is suggested that replacements be obtained prior to removing breather fittings in future.*

- D. Pass breather screws through breather fittings #17-0337 and mounting brackets #17-0309. *NOTE - Buells utilize OEM support bracket.* Turn screws 2-3 threads into cylinder heads.
- E. Install backplate on carb.
- F. Slide mounting bracket outward until it contacts backplate and measure distance between support bracket and cylinder head to determine number of shims required to fill gap.

*NOTE - At least one .125" shim must be installed between breather fitting and cylinder head. Otherwise breather screw may bottom out in cylinder head, resulting in oil leak and possible damage to head or screw.*

Remove backplate and breather screw assemblies, then install shims and reinstall breather screw assemblies. Do not tighten at this time.



Picture 1

- G. Align breather fitting outlets to permit installation of T-hose and reinstall backplate. On models other than Buells, shift mounting brackets to align holes in brackets with holes in backplate, and mark position of brackets on cylinder head. Remove backplate and tighten breather screws, assuring that brackets remain in correct position.
- H. Install rubber T-hose #17-0339 over cylinder head breather fittings with hose tee toward rear of engine. Hose must not be kinked or otherwise obstructed, and should be trimmed to length as needed. Once proper fit is obtained, secure T-hose to breather fittings with black tie-wraps provided.
- I. Place wire tie over tee of T-hose, insert 1/4" length of metal tubing #50-8121 into tee and tighten wire tie. Place hose clamp over short length of beveled hose #17-0365, slide hose over metal tubing with beveled end out and facing down, and tighten wire tie. **See Picture 1.**

*NOTE - A 36" length of hose is provided for race applications. This hose may be used to rout crankcase*

*fumes/oil mist to a 'catch can' or similar device as required and approved by race organizer.*

**WARNING - Vent hose must not contact hot or moving surfaces that could damage it and expose brakes or tires to crankcase oil/air mist. Oil on these components could result in loss of control of motorcycle with death or severe injury to operator and others.**

4. Install mounting bracket and backplate.
  - A. 1966 to 1984 Shovels and 1957 to 1985 Sportsters
    1. Attach mounting bracket to engine. 1966-1982 Shovels normally utilize bracket #17-0092 which attaches to bottom of front rocker box and air cleaner backplate. 1983-1984 Shovels normally utilize bracket #16-0471 which attaches to center case stud and lower carb-manifold bolt. Ironhead Sportsters normally utilize bracket #17-0093, which attaches to front intake lifter guide bolt and air cleaner backplate. **See Figure C.** Do not tighten bracket completely at this time.

#### NOTES

- Parts from different year group installed on motorcycle by previous owners may require different support bracket. Adjustable bracket #16-0471 attaches to center case bolt and lower carb-manifold bolt. It is recommended for '83-'84 Shovels and works on most other models as well. See following note regarding bolt length. **See Figure C.**
- Adequate thread engagement must exist between mounting stud/bolt and nut. Longer stud or bolt may be required to compensate for thickness of mounting bracket. Caution must be taken, however, to insure that bolt is not long enough to damage carburetor or other

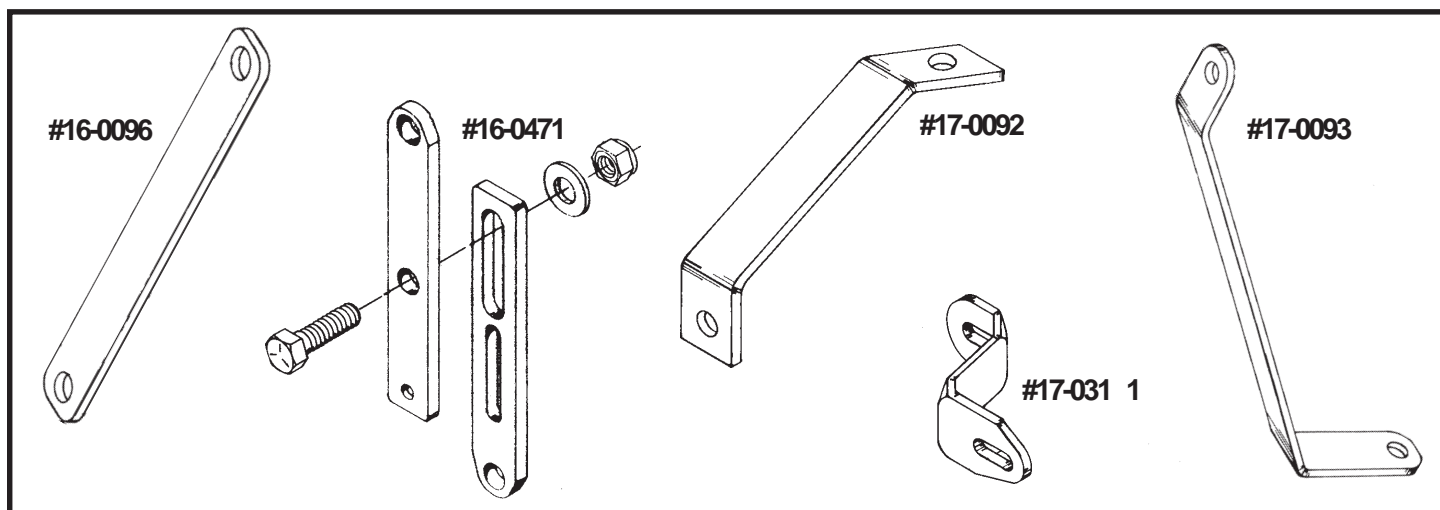
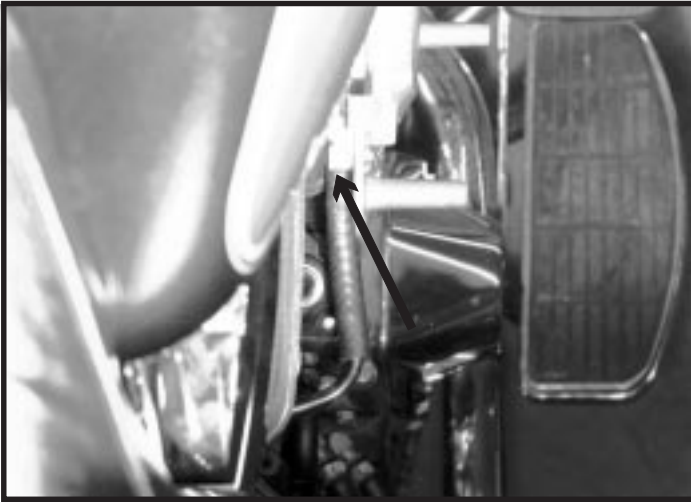


Figure C



Picture2

part when tightened.

**CAUTION** - Mounting bracket bolt of incorrect length may cause parts damage not covered under warranty.

2. Align hole in other end of bracket with lower carb-manifold bolt or hole in backplate according to type bracket used. Bracket may require slight bend or shims for correct fit. If gap exists between backplate and mounting bracket, install shims or washers (not supplied) to fill gap. Secure bracket to backplate with  $\frac{1}{4}$ -28 bolt, flatwashers, and Nyloc locknut. Tighten to 10-12 ft-lbs. If bracket attaches to manifold bolt, confirm that adequate thread engagement exists between bolt and carburetor body. If longer bolt is required, insure that bolt is not long enough to bottom out against carburetor.
3. Tighten other end of bracket.

*NOTE* - Locknut or thread locking compound must always be used on backplate bolt to prevent bolt from vibrating loose and falling into engine.

#### CAUTIONS

- Failure to use locknut, apply thread locking compound, or properly tighten nut may cause bolt to loosen and fall into engine, resulting in extensive engine damage not covered under warranty
- Excessively long manifold bolt may bottom against carburetor, causing permanent damage and possible gasoline leak. See previous warnings concerning gasoline.

- B. 1984-1989 Big Twins and 1986-1987 Sportsters (crankcase vent only)
  1. Insert vent hose connector #50-8111 into

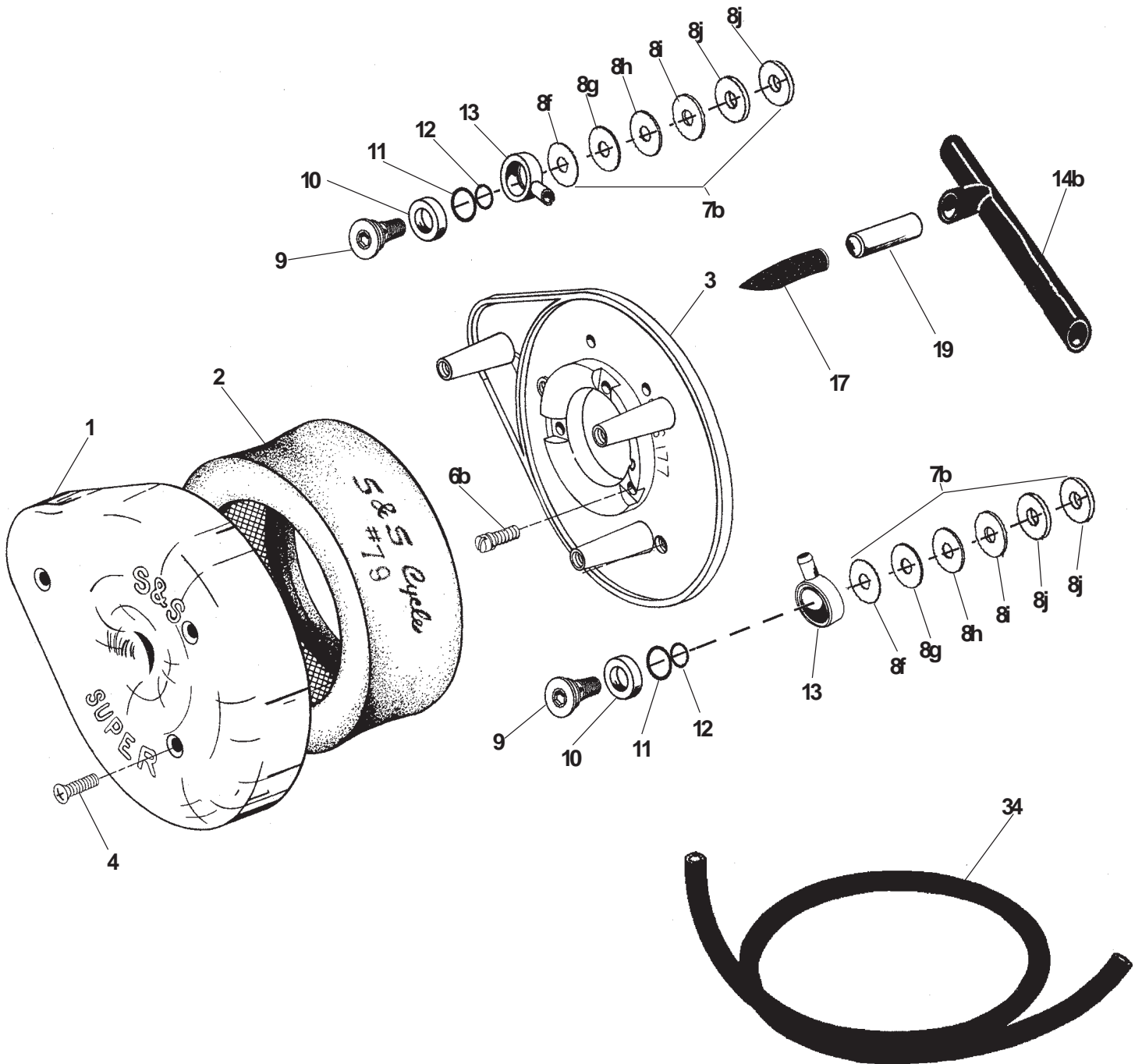
end of existing crankcase vent hose, place S&S crankcase vent hose #17-0113 over other end of connector, and secure with hose clamp. Place second clamp over vent hose and attach end of hose to elbow fitting #50-8110 in backplate. **See Picture 2.** Secure with clamp.

2. Align holes in mounting bracket #17-0311 (two required) with air cleaner support holes in cylinder heads and secure with  $\frac{5}{16}$ -18 x 1- $\frac{1}{4}$ " bolts and lockwashers.
3. Attach backplate to carb and determine number of shims or washers required to fill gap between backplate and mounting bracket. Remove screws, apply a few drops of Loctite 242 or equivalent to threads and reinstall but do not tighten completely. Following step must be completed quickly, before Loctite on backplate screws can harden. See important prior comments regarding use of Loctite.
4. Insert  $\frac{5}{16}$ -18 bolts of appropriate length through backplate, shims, mounting bracket, and lockwasher. Apply a few drops of Loctite 242 (blue) or equivalent to threads, install nuts and lockwashers, and tighten to 10-12 ft-lbs. Tighten 3 backplate screws to same spec.

#### C. 1994-present Buells, 1992-present Big Twins (cylinder head vent), and 1991-present Sportsters

1. Apply Loctite 242 or equivalent to backplate screws, install backplate, and tighten screws to 10-12 ft-lbs. Route vent hose over notch in backplate. Hose must rest between filter element and chrome teardrop cover after element and cover are installed. See previous important comments regarding use of Loctite.
5. Install filter element and air cleaner cover. Secure with three air cleaner cover screws #50-0072 to complete installation.
6. Start motorcycle, inspect for leaks, and test ride. Engine should run smoothly after proper warm-up. Surging or misfire may indicate lean carburetion. If necessary, consult professional mechanic regarding possible need to install larger carburetor jets.

Line drawing for:  
S&S Air Cleaner Kit for 1994-up Buell with stock butterfly carb.  
Part#17-0105

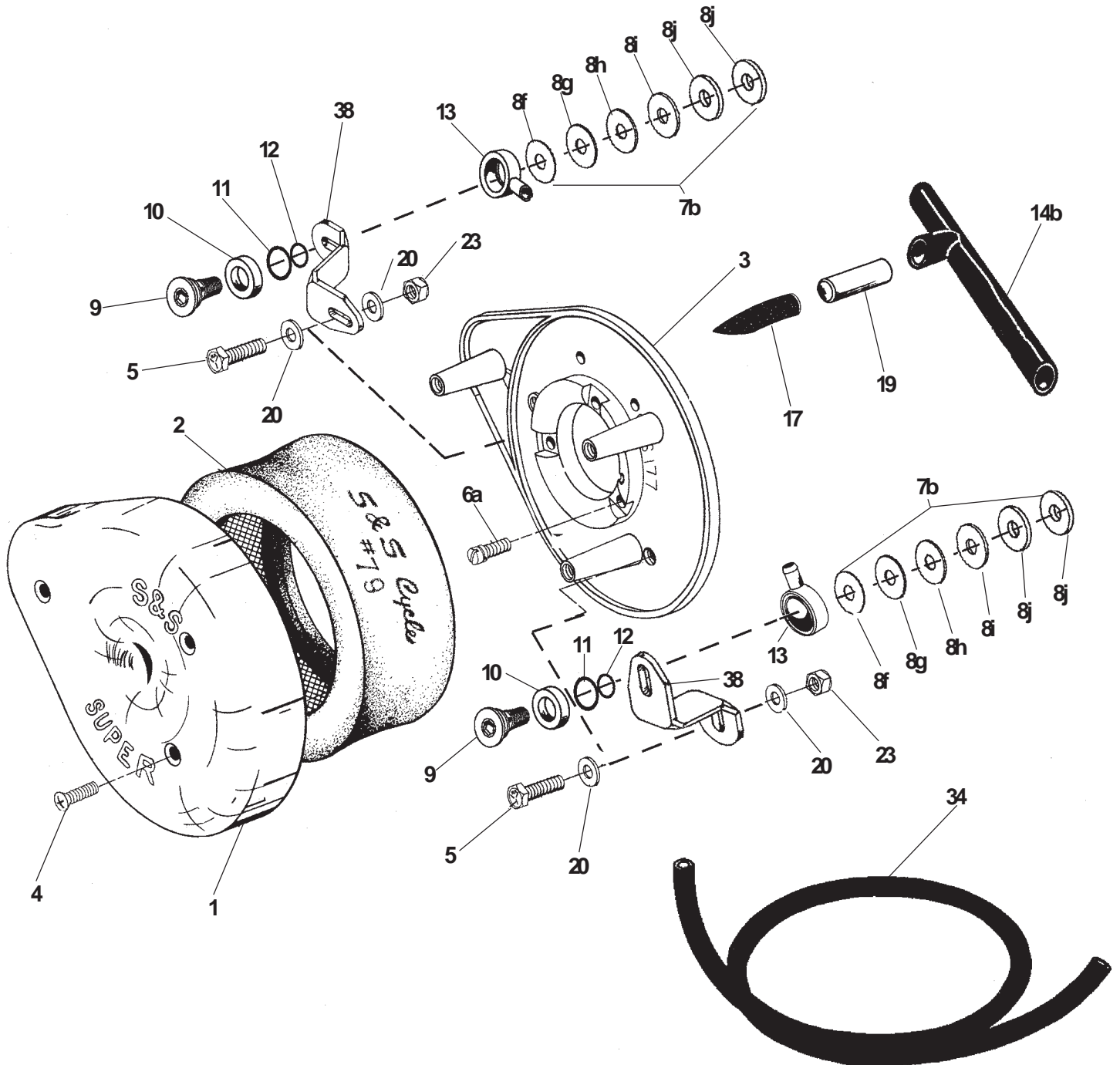


Line drawing for:

S&S Air Cleaner Kit for 1993-up Big T  
Part#17-0109

win with stock butterfly carb.

S&S Air Cleaner Kit for 1991-up Sportster with stock butterfly carb.  
Part#17-01 10



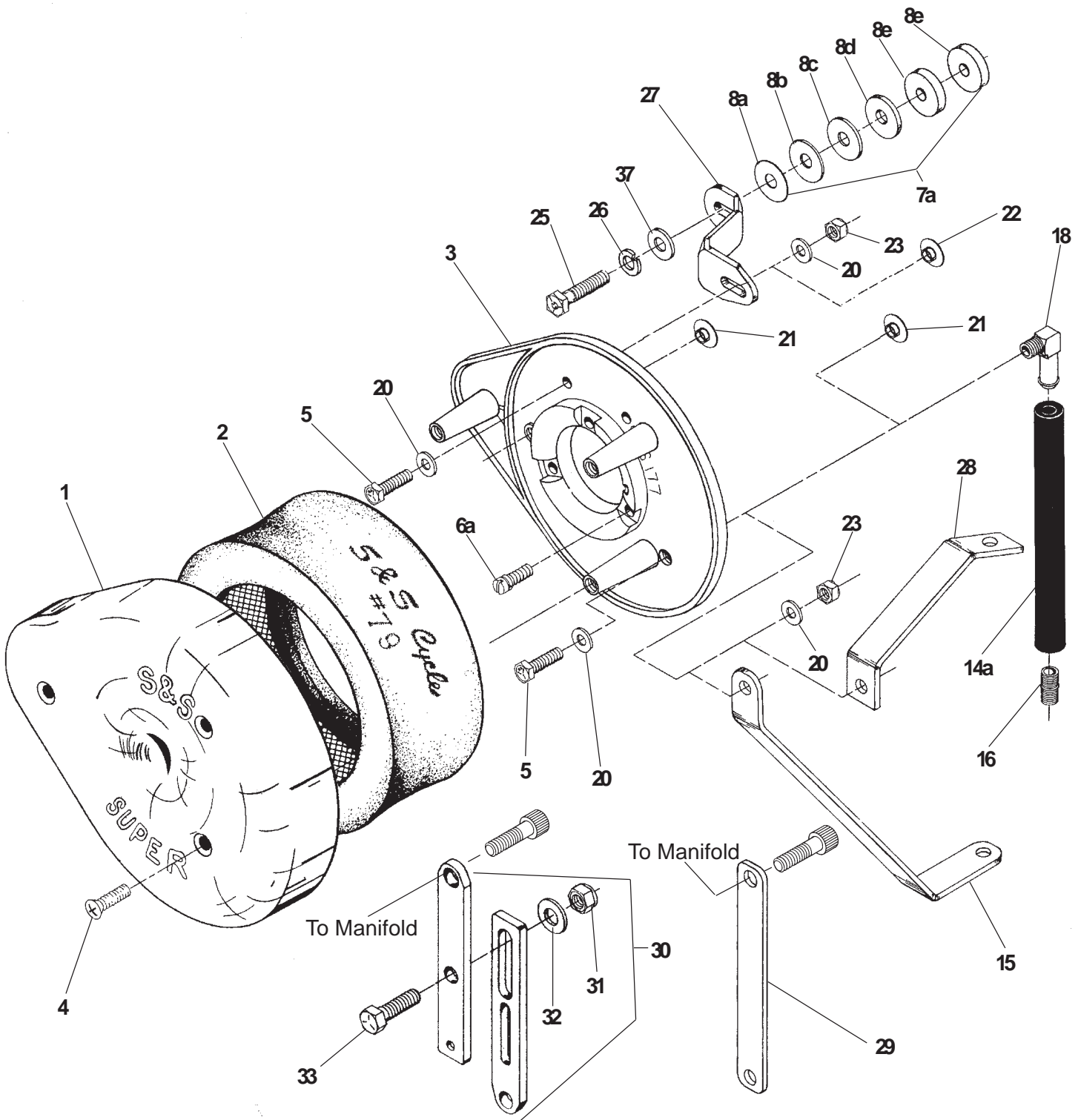
Line drawing for:

S&S Air Cleaner Kit for 1984-1989 Big T  
with stock butterfly carb. ....

win, 1986-1987 Sportster  
Part#17-0108

S&S Air Cleaner Kit for 1966-1984 Shovel Big T  
with stock butterfly carb .....  
Part#17-0199

win, 1957-1985 Sportster  
Part#17-0199



## S&S Air Cleaner Assemblies for Stock Carburetors Parts and Mounting Hardware

1. <b>Aircleaner cover</b> .....	Part#17-0078	13. <b>V entfitting</b>	
2. <b>Element</b> .....	Part#17-0079	BT 1993-up & XL 1991-up .....	Part#17-0337
3. <b>Backplate</b>		14. <b>Crankcase breather vent hose</b>	
1966-'89 Big Twin, 1966-'87 Sportsters .....	Part#17-0180	a. BT 1984-1992 & XL 1986-1990 .....	Part#17-01 13
1993-up Big Twin .....	Part#17-0001	b. BT 1993-up & XL 1991-up .....	Part#17-0339
1991-up Sportster .....	Part#17-0002	15. <b>Air cleaner support bracket</b> '57-'85 XL .....	Part#17-0093
'94-up Buell .....	Part#17-0003	16. <b>Vent hose connector nipple</b> .....	Part#50-81 11
4. <b>Coverscrew</b> .....	Part#50-0072	17. <b>Vent hose, XL '91-up</b> .....	Part#17-0365
5. <b>Screw, HHC 1/4-28 x 7/8"</b> .....	Part#50-0074	18. <b>90° Elbow fitting</b> .....	Part#50-81 10
6. <b>Backplatescrew</b> ,		19. <b>Hose fitting</b> .....	Part#50-8121
a. SLTD FH w/lockwasher 1/4-20 x 3/4" .....	Part#50-0073	20. <b>Flatwasher, 1/4"</b> .....	Part#50-7021
b. LTD FH w/lockwasher 1/4-20 x 1" .....	Part#50-0076	21. <b>Backplate plug, black plastic</b> .....	Part#50-8312
7. <b>Shim kit</b>		22. <b>Plug, press-in clear plastic</b> .....	Part#50-8313
a. <b>BT 1966-1989 &amp; XL 1966-1987</b>		23. <b>Support bracket locknut</b> 1/4-28 x 7/8" .....	Part#50-5010
(includes 2 ea. 5/16" x .018", 5/16" x .030",		24. <b>Air cleaner support bracket</b>	
5/16" x .048", 5/16" x .105" & 4 ea. 5/16" x .125") ....	Part#17-0314	'84-'91 V <sup>2</sup> BT & '86-'90 V <sup>2</sup> XL .....	Part#17-0312
b. <b>BT 1993-up, XL 1991-up, Buell 1994-up</b>		25. <b>Support bracket screw</b> , 5/16"-18 x 1 1/4" .....	Part#50-01 10
(includes 2 ea. 1/2" x .018", 1/2" x .030", 1/2" x .048", 1/2" x .105",		26. <b>Lockwasher 5/16"</b> .....	Part#50-7032
and 4 ea. 1/2" x .125") .....	Part#17-0464	27. <b>Support bracket, AC/head V<sup>2</sup>, stock</b> .....	Part#17-031 1
8. <b>Shim</b>		28. <b>Air cleaner support bracket</b> '66-'82 BT .....	Part#17-0092
<b>BT 1966-1989 &amp; XL 1966-1987</b>		29. <b>Support bracket - Panhead</b> .....	Part#16-0096
a. 5/16" x .018" .....	Part#50-7038	30. <b>Support bracket - 1983-1984 Shovels</b> .....	Part#16-0471
b. 5/16" x .030" .....	Part#50-7039	31. <b>Lock nut, 5/16" x 18</b> .....	Part#50-5021
c. 5/16" x .048" .....	Part#50-7040	32. <b>Flat washer, 5/16" x 1/16"</b> .....	Part#50-7034
d. 5/16" x .105" .....	Part#50-7041	33. <b>Support bracket screw</b> 5/16"-18 x 1" .....	Part#50-0108
e. 5/16" x .125" .....	Part#50-7042	34. <b>Rubber tubing</b> 3/8" x 5/8" x 1' .....	Part#19-0169
<b>BT 1993-up, XL 1991-up, Buell 1994-up</b>		35. <b>Wire tie (Not shown)</b> .....	Part#50-8003
f. 1/2" x .018" .....	Part#50-7085	36. <b>Hardare kit (Not shown)</b>	
g. 1/2" x .030" .....	Part#50-7086	Air cleaner mounting, 94-up Buell .....	Part#17-0050
h. 1/2" x .048" .....	Part#50-7087	Air cleaner mounting, E/G '94-up Buell .....	Part#17-0051
i. 1/2" x .105" .....	Part#50-7089	Air cleaner mounting, V <sup>2</sup> .....	Part#17-0244
j. 1/2" x .125" .....	Part#50-7090	Air cleaner mounting, '93-up BT .....	Part#17-0052
9. <b>Breather capscrew</b> .....	Part#17-0338	37. <b>Washer, flat</b> 3/8" x 7/8" x .146 .....	Part#50-7053
10. <b>Shim, head vent</b> .62 I.D. x .80 O.D. x .185 ...	Part#50-7120	38. <b>Carb support bracket</b>	
11. <b>Breather screw o-ring</b> 5/8" O.D. .....	Part#50-8032	V <sup>2</sup> w/CV carb, '94-up Buell .....	Part#17-0309
12. <b>Breather screw o-ring</b> 1/2" O.D. .....	Part#50-8006		