

Instruction 51-1052
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Because every industry has a leader

Installation Instructions: S&S® Billet Rocker Covers for Harley-Davidson® Twin Cam 88®

DISCLAIMER:

S&S parts are designed for high performance, off road, racing applications and are intended for the very experienced rider only. The installation of S&S parts may void or adversely 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 inhaled. Do not smoke. Perform installation in a well ventilated area away from open flames or sparks.
- If motorcycle has been running, wait until engine and exhaust pipes have cooled down to avoid getting burned before performing any installation steps.
- Before performing any installation steps disconnect battery to eliminate potential sparks and inadvertent engagement of starter while working on electrical components.
- Read instructions thoroughly and carefully so all procedures are completely understood before performing any installation steps. Contact S&S with any questions you may have if any steps are unclear or any abnormalities occur during installation or operation of motorcycle with a S&S part on it.
- Consult an appropriate service manual for your motorcycle for correct disassembly and reassembly procedures for any parts that need to be removed to facilitate installation.
- Use good judgement when performing installation and operating motorcycle. Good judgement begins with a clear head. Don't let alcohol, drugs or fatigue impair your judgement. Start installation when you are fresh.
- Be sure all federal, state and local laws are obeyed with the installation.
- For optimum performance and safety and to minimize potential damage to carb or other components, use all mounting hardware that is provided and follow all installation instructions.
- Motorcycle exhaust fumes are toxic and poisonous and must not be inhaled. 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.

Kit Contents:

Base, rocker cover, S&S®	
Chrome billet (2 each)	#90-4068
Polished billet (2 each)	#90-4074
Plain Billet (2 each)	#90-4066
Cover, top rocker, S&S	
Chrome billet (2 each)	#90-4069
Polished billet (2 each)	#90-4076
Plain billet (2 each)	#90-4067
Capscrew, socket head, ¼-20 x ¾"	
(12 each, H-D® #4069A)	#50-0067
Capscrew, socket head w/flat washer	
⅝-18 x ¾" (12 each)	#50-0099
Washer, flat ¼" x ⅞" x ⅛" (12 each)	
H-D® #6099	#50-7017
Gasket set, rocker cover billet (1 each)	
	#90-4073
Loctite® 243, 0.5ml. tube (1 each)	
	#51-9003

NOTE: All reference to Harley-Davidson® 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 Harley-Davidson part number shown.

Introduction

S&S rocker covers for Harley-Davidson Twin Cam 88® engines utilize original Harley-Davidson rocker arm support plates and breather assemblies. Otherwise this kit includes all hardware and gaskets required for installation.

S&S rocker covers can be installed with engine in frame. S&S Rocker Cover Wrench Set #53-0040 is helpful in areas where motorcycle frame prevents use of conventional tools. S&S strongly recommends use of torque wrench and Loctite® 243 (S&S #51-9003, included in kit) on all fasteners.

S&S also recommends the installer become familiar with Twin Cam 88® "Top End Overhaul Procedure" section in Harley-Davidson® Service Manual before beginning installation. Refer to Harley-Davidson® Service Manual for additional information as needed. S&S rocker covers are designed to accept valve springs up to 1.660" O.D. with no modification. In most instances, they will accept valve lifts to .710" without modification.

NOTES

- Threads should be cleaned with Loctite® primer or equivalent prior to applying Loctite®.
- It remains engine builder's responsibility to check operating clearances. Clearances should be checked between valve spring/collar and rocker housing base as well as between rocker arm and top rocker cover. S&S recommends minimum of .060" between rocker arm and top collar. A distance of .025" is sufficient between valve spring/top collar and rocker housing base. Cylinder head must also be set up for correct lift.

⚠ CAUTION

- Failure to establish correct operating clearances can result in extensive engine damage not covered under warranty.
- It is installer's responsibility to use Loctite® and tighten fasteners to correct torque values. Failure to install fastener correctly may result in fastener vibrating loose and causing extensive engine damage not covered under warranty.

⚠ WARNING

Sparks from motorcycle electrical system can ignite gasoline fumes. To prevent sparks as well as prevent electric starter from becoming engaged inadvertently and causing personal injury, disconnect battery and remove from motorcycle before proceeding.

1. Wash motorcycle, taking care to remove dirt from engine and surrounding area of motorcycle. Remove gas tank and clean engine and surrounding area with compressed air.

⚠ CAUTION

Dirt and other contaminants can cause extensive damage if allowed to fall into engine.

⚠ WARNING

High pressure air is potentially hazardous. Wear eye protection during use and direct air stream away from face and others nearby.

2. Remove stock top rocker covers. Remove pushrod cover retainers from front cylinder pushrods and collapse pushrod covers.
3. Remove spark plugs, place motorcycle in gear, and rotate engine to place intake and exhaust pushrods for front cylinder at lowest point on cam. Confirm that both pushrods can be rotated with light finger pressure. See **Picture 1**.



Picture 1



Picture 2



Picture 3

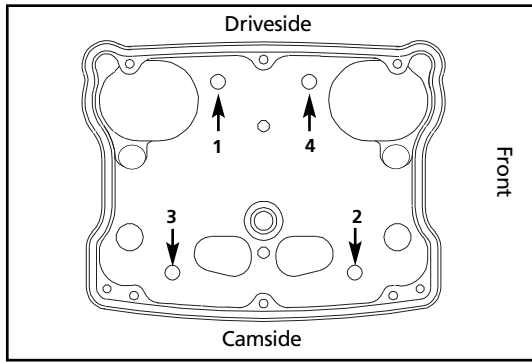


Figure 1

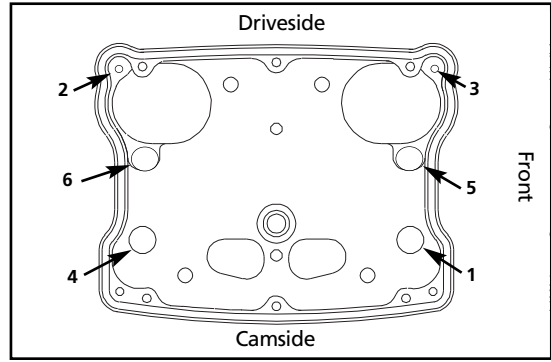


Figure 2

CAUTION

Failure to confirm pushrod/lifter placement before proceeding with installation can result in damage to rocker arm support plates and other parts. With pushrods at lowest point, front piston will be at TDC on Compression stroke.

4. Remove breather cover and baffle assembly. See Picture 2.
5. Remove rocker arm/rocker support plate. See Picture 3.

NOTE - Gradually loosen rocker arm support bolts in following sequence (See Figure 1):

1. Left (driveside) rear
2. Right (camside) front
3. Right (camside) rear
4. Left (driveside) front

Loosen bolts in sequence and in ¼-turn increments for first ¾ turn. Bolts can then be removed according to normal procedure.

6. Remove lower rocker housing bolts.

NOTE - Gradually loosen lower rocker housing bolts in following sequence (See Figure 2):

1. Right (camside) front
2. Left (driveside) rear
3. Left (driveside) front
4. Right (camside) rear
5. Center front
6. Center rear

Loosen bolts in sequence and in ¼-turn increments for first ¾ turn. Bolts can then be removed according to normal procedure.

7. Remove lower rocker housing and gasket from head. Remove oil and any remaining gasket material from cylinder head gasket surface and clean gasket surface with lacquer thinner.

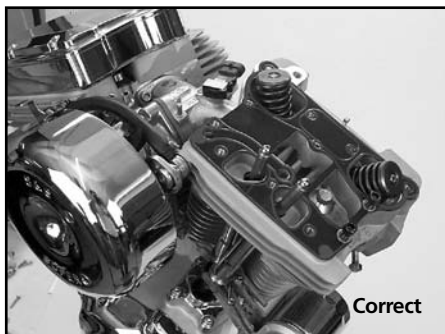
WARNING

Lacquer thinner is extremely flammable, potentially explosive, and the fumes toxic when inhaled. Read manufacturer's cautions on container and use only in a well-ventilated area away from sparks and open flame.

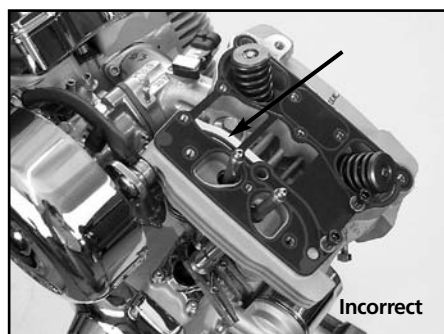
8. Place S&S® lower rocker housing gasket on cylinder head. Gasket must cover breather channel in cylinder head.

NOTE - It is possible to install gasket incorrectly. Before proceeding, confirm that gasket is correctly placed and covers breather channel in cylinder head. See Pictures 4A and 4B.

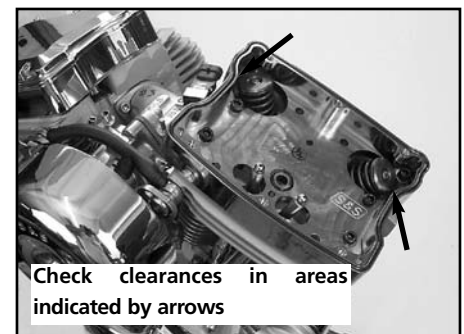
9. Prepare threads of six ⅝-18 x ⅜ S&S rocker housing screws according to Loctite® instructions and apply Loctite® 243 supplied with kit.
10. Install screws in front and rear driveside holes of lower rocker housing and install housing on cylinder head. Screws will hold gasket in correct position as remaining screws are installed.
11. Install four remaining lower rocker housing screws and gradually tighten to 15-18 ft-lbs. using sequence described in Step 6. Measure clearance between valve spring and rocker cover with feeler gauge. Minimum is .025". See Picture 5.



Picture 4A



Picture 4B



Picture 5

12. Place stock rocker support plate assembly in rocker arm housing. Prepare stock bolts for Loctite® according to manufacturer's instructions and apply Loctite® to threads. Insert two short rocker support plate bolts in holes in left (driveside) of plate and two long support plate bolts in right (camside) holes. Gradually tighten support plate bolts to 15-18 ft-lbs. according to sequence described in Step 5.

NOTE - Hydraulic lifters may require a few minutes to bleed down after rocker assembly is installed. Do not rotate engine until pushrods can be turned with light finger pressure.

13. Prepare breather cover/baffle assembly bolts for Loctite® and apply Loctite® according to manufacturer's instructions.

14. Separate top and bottom halves of breather cover/baffle assembly, clean gasket surfaces, and install center gasket supplied with S&S® rocker housing kit. See **Picture 6**. Place other gasket supplied with kit on lower rocker housing and install breather cover and baffle assembly. See **Picture 7**. Tighten bolts evenly to 90-120 in-lbs.

15. Confirm clearance between rocker arm and top rocker cover by applying layer of clay at least .060" thick inside areas of cover that will come closest to rocker arm at maximum lift. Temporarily install cover with four screws and rotate engine through two complete revolutions. Remove cover and examine clay. Layer of clay above rocker arm must remain at least .060" thick. If dented, indentation must leave at least .060" of clay between rocker arm and cover. Remove all traces of clay and thoroughly clean rocker and cover with clean, lint-free cloth.

16. Install one flat and one fiber washer on each of six 5/16-18 x 3/4 rocker cover screws.

NOTE - Install flat washer on screw first. Fiber washer goes between flat washer and rocker cover.

Prepare rocker cover screws for Loctite® and apply Loctite® to threads. Install rocker cover and gradually tighten screws to 9-12 ft-lbs. in following sequence (**See Picture 8**):

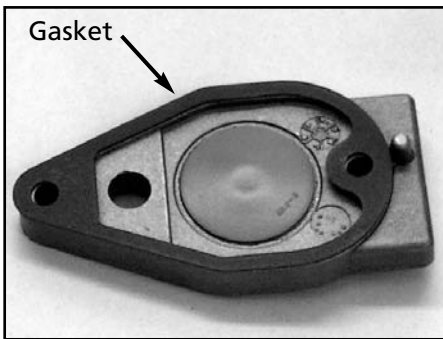
Right (camside) front

1. Left (driveside) rear
2. Left (driveside) front
3. Right (camside) rear
4. Left (driveside) center
5. Right (camside) center

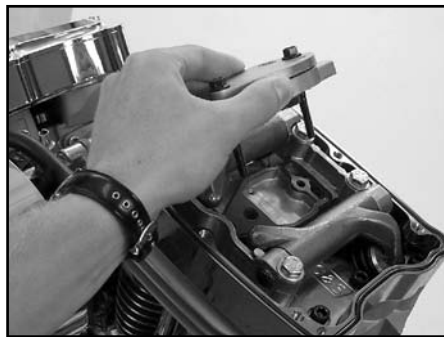
17. Extend pushrod covers and replace retainer clips.

18. Remove covers from rear cylinder pushrods. Rotate engine to place pushrods at lowest point on cam with rear piston at TDC. Repeat procedure described above.

19. Replace parts removed for installation, start motorcycle and inspect for gas and oil leaks.



Picture 6



Picture 7



Picture 8