

Instruction 106-6399
08-09-2014

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Installation Instructions for S&S Valve Spring Kit 106-6398 for 1936-'47 Harley-Davidson® Knucklehead Big Twin and S&S KN-Series Engines.

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.

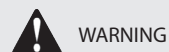
SAFE INSTALLATION AND OPERATION RULES:

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.

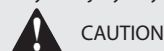
IMPORTANT NOTICE:

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.

Valve Spring Specification Chart	
Installed Height	1.315" ± .005"
Seat Force	158 lb
Open Force at max lift	348 lb
Maximum Valve Lift	.480"

1. S&S valve spring kit 106-6398 for 1936-'47 Harley-Davidson knucklehead big twin engines and S&S KN-Series engines is designed to be used with stock valve cover tins or with S&S die-cast alloy "tins". Each application requires a different installation procedure and a few different parts. For either installation, not all parts in the kit will be used.
2. Machine stock valve guides. This kit is not compatible with stock valve guides. If using stock valve guides, the top portion above the flange must be machined to the dimension shown in Figure 1. Compatible guides are available from S&S.

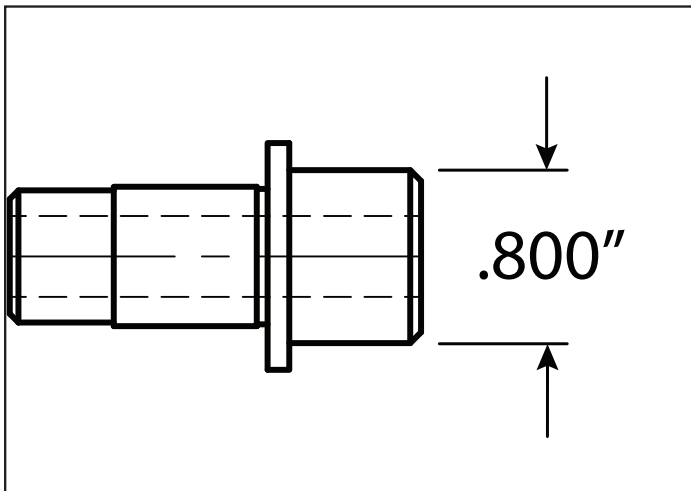


Figure 1

3. Installation with S&S die-cast alloy 'tins'
 - a. Install valve guides in cylinder heads without tins. S&S tins are not held in place against the heads by the valve guide, as in installations with stock tins.
 - b. Confirm and Adjust Spring Installed Height
 - i. Temporarily install valve, S&S alloy tin, lower gasket, bottom collar, top collar and top collar keepers. Do not install seal or valve springs. See Figure 2.

NOTE: If valve guide holes in cylinder heads are damaged, S&S has oversized guides available. Ream hole to the next oversize.

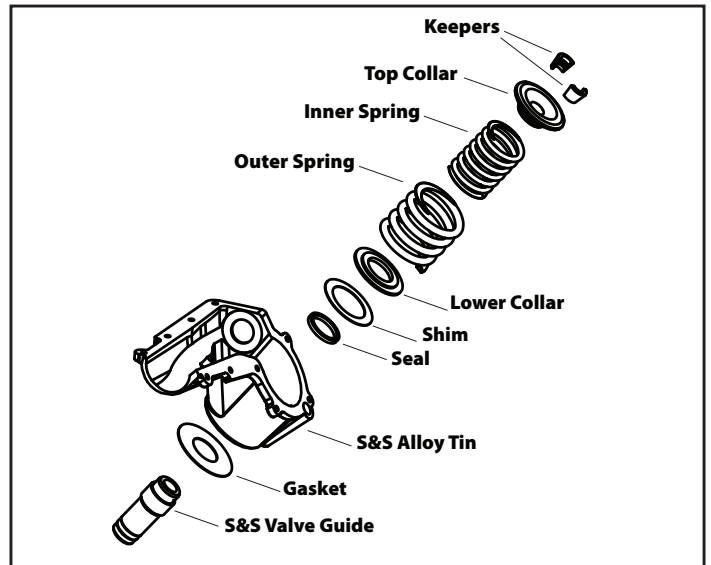


Figure 2

- ii. Pull the top collar tightly against keepers to seat them in top collar. Measure the distance between the top of the valve guide and the bottom of the top collar. This distance is the valve free travel and must be .060" more than the valve lift of the camshaft to be used. See Figure 3

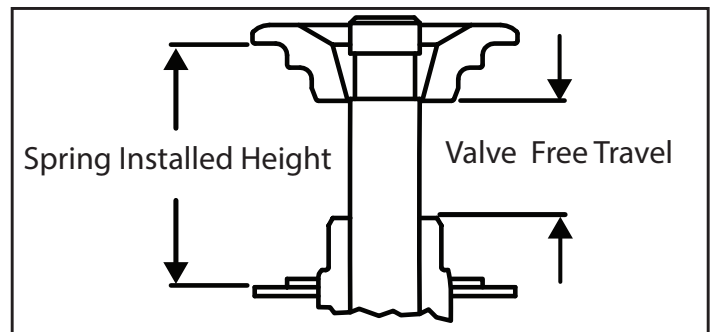


Figure 3

- iii. Measure the distance between the top spring seating surface of the bottom collar the bottom spring seating surface of the top collar. See Figure 3. This is the spring installed height.
- iv. Refer to the Valve Spring Specification Chart. If installed height is more than 1.320" place a shim under the bottom collar to reduce installed height. If installed height is less than 1.310", valve seat must be ground to increase valve stem protrusion.
- v. Normally the intake valve will not require a shim, and the exhaust valve will require one.
- c. Once spring height is confirmed, reassemble with seal and valve springs as shown in Figure 2. Coat both sides of the bottom gasket with Permatex® Right Stuff® sealant.
4. Installation with stock steel tins
 - a. Install gasket, tins, and valve guide as shown in Figure 4. Coat both sides of the gasket with Permatex® Right Stuff sealant before installation. The valve guide holds the tins in place against the cylinder head when stock tins are used.

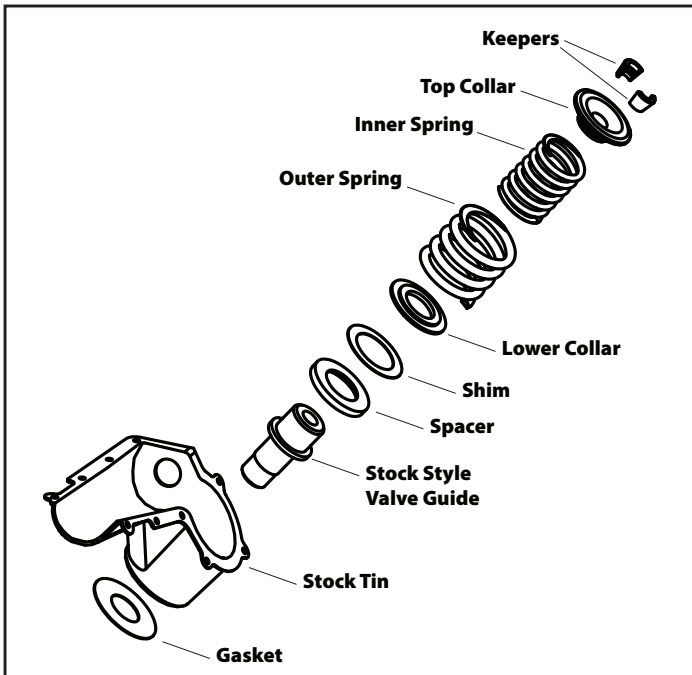


Figure 4

NOTE: If valve guide holes in cylinder heads are damaged, S&S has oversized guides available. Ream hole to the next oversize.

b. Confirm and Adjust Spring Installed Height

- i. Temporarily install valve, bottom collar spacer, bottom collar, top collar and top collar keepers. Do not install springs. See Figure 4. Pull the top collar tightly against keepers to seat them in top collar.
 - ii. Measure the distance between the top of the valve guide and the bottom of the top collar. This distance must be .060" more than the valve lift of the camshaft to be used. See Figure 3
 - iii. Measure the distance between the top spring seating surface of the bottom collar the bottom spring seating surface of the top collar. See Figure 3.
 - iv. Refer to the Valve Spring Specification Chart. If installed height is more than 1.320" place a shim under the bottom collar to reduce installed height. If installed height is less than 1.310", valve seat must be ground to increase valve stem protrusion.
 - v. Normally the intake valve will not require a shim, and the exhaust valve will require one.
- c. Once spring height is confirmed, reassemble with springs as shown in Figure 4.

