Instruction 51-1205
6-8-06

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Because every industry has a leader

Installation Instructions for S&S® Spring Kit 49-0115 for Victory Freedom® Engines

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 effect 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 Victory®, Victory Freedom®, and all Victory part numbers and model designations are used for reference only.

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 authorized Victory service manual 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) These S&S parts are designed exclusively for use in Victory motorcycles. S&S shall have no warranty or liability obligation if an S&S part is used in any other application.

⚠ WARNING

The safety of the motorcycle rider is dependent of proper installation of this product. If you are not certain of your capabilities or do not have the correct tools for this installation, please consult a shop to have it done. Improper installation of this product could result in injury or death to the rider.

⚠ WARNING

Be sure to disconnect the battery of your motorcycle before starting on this procedure. Accidental starting of the motorcycle could cause injury to you or others around you during the installation.

⚠ CAUTION

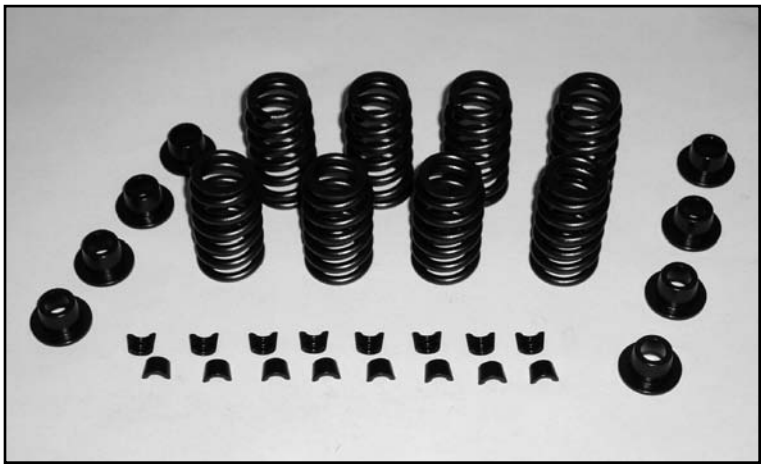
Follow the guidelines in your factory service manual when taking the valve train assemblies of your motorcycle apart.

SPECIAL TOOL REQUIREMENTS

- Digital or Dial Calipers
- Valve Spring Compressor
- Die-grinder

VALVE SPRING KIT CONTENTS (PICTURED BELOW)

- Valve Springs
- Top Collars
- Valve Stem Keepers



Valve Spring Kit PN 49-0115

S&S® valve spring and collar kit allows cam lifts up to .495". This kit is designed for use with stock length 7 mm diameter valves and accepts stock style valve guides and valve guide seals. Installation of the 49-0115 spring kit does not usually require modification for OEM heads. Kit 49-0115 spring pressures are as follows at 1.550" Installed Height: Closed valve - 75 lbf; .495" lift - 175 lbf.

NOTE: *Spring kit components are not interchangeable with those from other S&S spring kits.*

⚠ CAUTION

Mixing of valves, springs or collars between Stock Victory® and S&S high-lift kit can cause extensive engine damage not covered under warranty.

SPRING INSTALLATION PROCEDURE

1- Remove heads from engine and disassemble according to appropriate Victory service manual. If cylinder heads/valves are to be reconditioned, proceed at this time according to standard procedure. Refer to Victory service manual as necessary.

2- Using following procedure, determine installed spring height and clearance between top collar and valve guide.

   A- Lubricate valve stem and install valve in guide.

   B- Install bottom collar, valve seal, top collar, and valve keepers. Pull top collar tightly against keepers to seat keepers in collar.

C- While holding valve firmly against seat in closed position, measure installed spring height (distance between lower valve spring seating surface and outside step of top collar). **See Figure A, Dimension A**. Record measurement.

D- Measure distance between top collar keepers and top of valve seal (if applicable). **See Figure A, Dimension B**. Distance must be at least .030" greater than valve lift of cam to be used.

Dimension A:
Installed spring height must be adjusted to 1.550" ± .010".

Dimension B:
Must be .030" greater than valve lift for camshaft to be used.

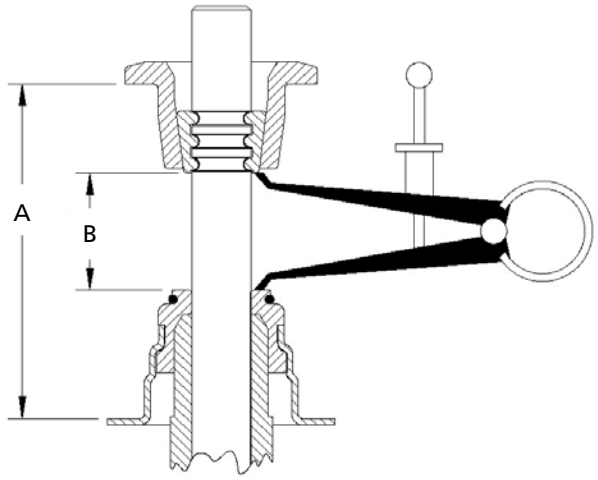


Figure A

E- Repeat Steps A-D for remaining valves and record all measurements. Be sure to keep track of all parts during assembly to assure they are installed in same location and with same valves clearances were measured with.

NOTES

- *For race and similar applications, experienced engine builders may elect to shim valve spring assembly to installed height less than 1.550" if cam with less than .495" valve lift is used. In such cases, installed height should not be less than 1.055" + valve lift ± .010." For example, with .400 lift cam, installed height could be shimmed to 1.055" + .400", or 1.455" ± .010". In such cases, spring pressure and valvetrain wear will increase significantly. Engine builder assumes all responsibility for installing springs at height other than 1.550" ± .010".*

⚠ CAUTION

- **Installing springs at height less than recommended dimension will cause rapid spring fatigue resulting in possible engine damage. Engine should be frequently disassembled for spring tension measurement.**
- **Installing springs at height above recommended dimension will decrease spring tension resulting in possible valve float and engine damage.**
- **Failure to establish required clearances may cause valve seal failure and other, more extensive engine damage not covered under warranty.**

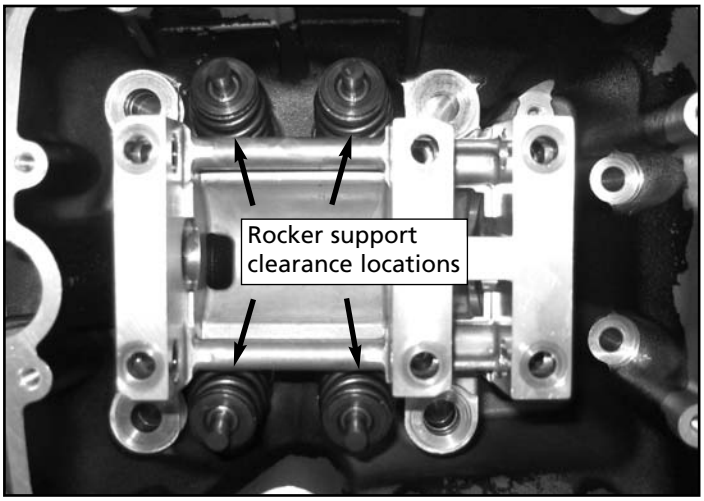
⚠ WARNING

Valve spring assembly is under considerable tension when compressed and is potentially dangerous. Wear eye protection and take due caution when checking for coil bind and during installation. After assembly, carefully strike tip of valve stem with plastic hammer to insure that keepers are seated. Direct spring assembly away from face and body during this procedure.

3- Observing previous warning, check for a minimum of .050" travel to coil bind as follows:
   A- Place spring in a vise using soft jaws or spring checking device and carefully compress to coil bind and record spring height.
   B- Determine distance to coil bind by subtracting coil bind height from installed height. If coil bind was .990", for example, and installed height is 1.550, then 1.550"- .990" yields .560" travel to coil bind. Subtracting .050" from the .560" travel will allow a .510" lift cam to be installed with acceptable clearance to coil bind.
   C- Repeat procedure for each spring assembly.
4- Install valves and valve springs in heads. Be sure valve guide seals are in place. Install all S&S® springs with smaller OD toward top collar. Install each spring followed by top collar and keepers.

NOTE: *Installed height should be the same for each spring assembly.*

5- Confirm valve spring to rocker support clearance.
   A- Mock install rocker supports without cam or rocker arms. Note valve spring-to-rocker support interference in four locations **(See Picture 1).** Clearance can be checked using feeler gauges or lead solder. Minimum spring to rocker support clearance to be .060".



Picture 1

⚠ CAUTION

Small metal chips and pieces can damage machined surfaces and block passageways. Be sure to thoroughly clean all metal chips and pieces to prevent this.

⚠ WARNING

Always wear eye protection while grinding and cleaning surfaces.

   B- Determine and mark each location for clearance operation with a permanent marker, remove the rocker support and perform clearance operation with a die grinder.
   C- Recheck spring to rocker support clearance to achieve a minimum of .060" clearance. Repeat step B if necessary.

NOTE: *Remove minimum amount of material needed to obtain .060" clearance. Care must be taken not to break through rocker supports or affect heat treatment by overheating while grinding. Oil is supplied to Victory® top end through rocker support, so it is also important not to disturb oil passages.*

6- Assemble heads to engine according to appropriate Victory service manual.