

**Instruction 51-1162
5-5-06**

Copyright © 2005, 2006
by S&S Cycle, Inc.

All rights reserved.
Printed in the U.S.A.

S&S® Cycle, Inc.

235 Causeway Blvd.
La Crosse, Wisconsin 54603
Phone: 608-627-1497 • Fax: 608-627-1488
Technical Service Phone: 608-627-TECH (8324)
Technical Service Email: sstech@sscycle.com
Website: www.sscycle.com



Because every industry has a leader

Installation Instructions: S&S® Prostock Racing Camshafts

S&S Part 33-5085

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 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.

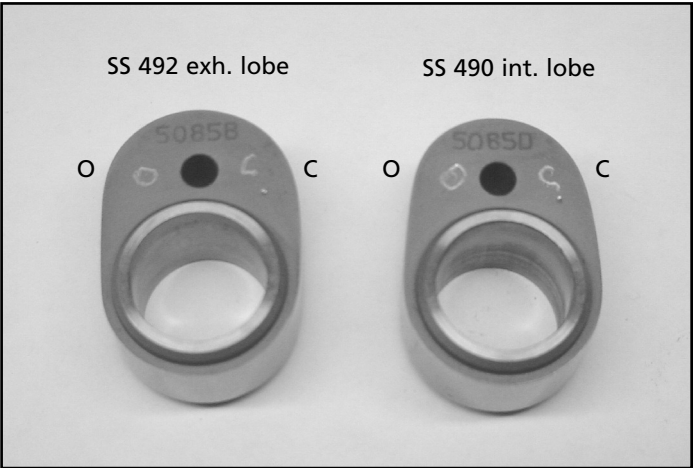
INTRODUCTION AND SPECIFICATIONS

The S&S® Prostock cams are designed so that the position of the cam lobes can be adjusted on the shaft, allowing the engine builder to customize the timing of the cams. Lobes are meant to be welded in place when set to the desired position. Typical intake center line angle range is 105° to 116°. Typical exhaust centerline angle range is 110° to 116°. Prostock camshafts are available for 1986-'90 (four-speed) cam geometry only.

S&S® Prostock Camshaft Specifications		
	Intake	Exhaust
Valve Timing Open/Close	Adjustable	Adjustable
Valve Duration	279°	298°
Valve Lift with 1.625:1 Rocker Ratio - .800"		
Centerline	Adjustable	Adjustable
Lift @ TDC	Adjustable	Adjustable

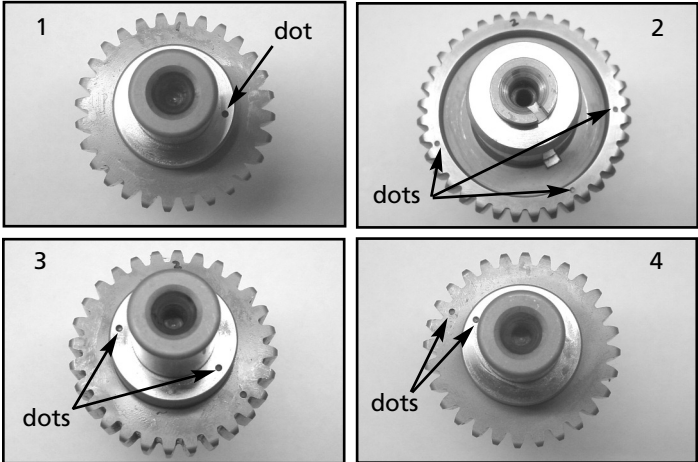
1. Camshaft Component Identification

- A. Identify camshaft lobes. There are two identical exhaust lobes, marked 5085B or SS492 and two identical intake lobes, marked 5085D or SS490. The valve Opening and Closing sides are marked O and C. See Picture 1.



Picture 1

- B. Identify cam shafts and gears. Note the timing dots stamped into each gear. See Picture 2.

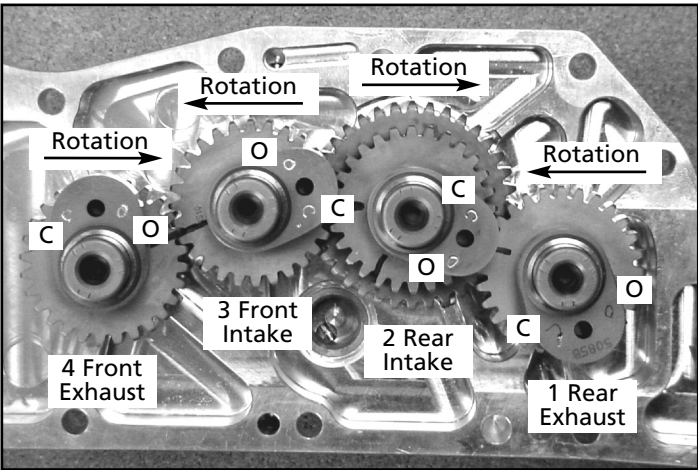


Picture 2

2. Initial Lobe Positioning And Press

NOTE: Clean all parts thoroughly with an evaporative solvent before assembly.

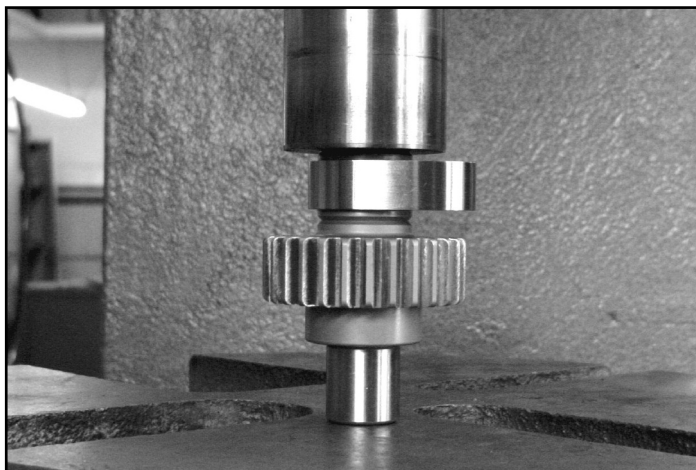
- A. Place the lobes finger tight on their respective shafts with the opening and closing sides correctly positioned. See Picture 3.



Picture 3

NOTE: The initial positioning does not have to be exact, but should match the cam lobe positions in picture 3 within a few degrees either way.

- B. After establishing the initial lobe positions, remove cams from cam cover, then use a suitable press and mandrel to press the lobe onto the shaft. It is a light press fit - an arbor press works well. Press the lobe down completely until it is fully seated with no gap between the lobe and the gear shoulder. See Picture 4.



Picture 4

3. Degree Cam Lobes and Adjusting Lobe Positions

After the initial positioning and pressing on of the lobes, per section "C" position the cams in the engine and perform the degree operation.

A cam degree worksheet has been included for convenience.

NOTES:

- Installation of S&S® Prostock cams should only be attempted by an experienced engine builder
- It is up to the installing mechanic to determine the desired intake or exhaust valve opening degree point for all lobes. See the Notes section of the included cam degree worksheet for formulas to assist in calculations.
- Use .053" lift off of the base circle as the degree reference point.
- S&S recommends that cams be set-up and used in the same engine case.
- Use only light checking springs to check valve train clearances before cam lobes are welded.

⚠ CAUTION

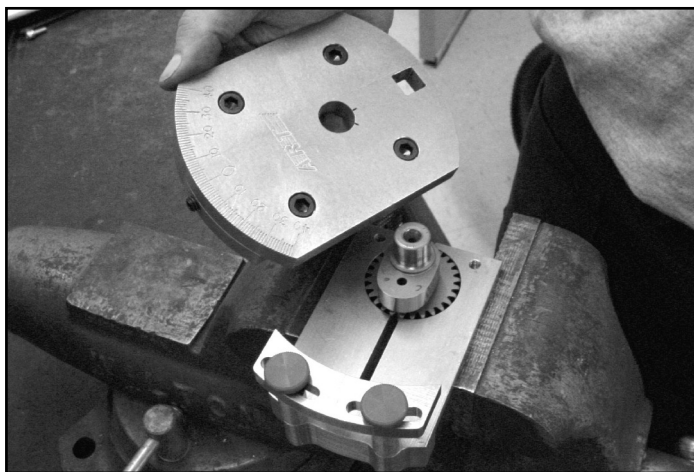
- Do not install heavy valve springs until the cams have been welded.
- It is the installing mechanic's responsibility to ensure there will be no piston to valve or valve to valve contact.

A. Degree Cam Lobes- The procedure is repeated for each cylinder.

1. Position a degree wheel on the crankshaft and locate the top dead center point using a positive piston stop. After locating TDC, set the degree wheel so that the pointer is set to 0.
2. For either the intake or exhaust lobe, rotate the crankshaft and note the degree mark pointed to on the wheel at .053" lobe lift on the opening side of the lobe.
3. The difference in degrees between the indicated opening point at .053" lift and the desired opening point at .053 lift is how many degrees the lobe needs to be moved, either forward or back to place the lobe at the desired opening point. (Opening point for each lobe is determined by installing mechanic, see NOTE.)

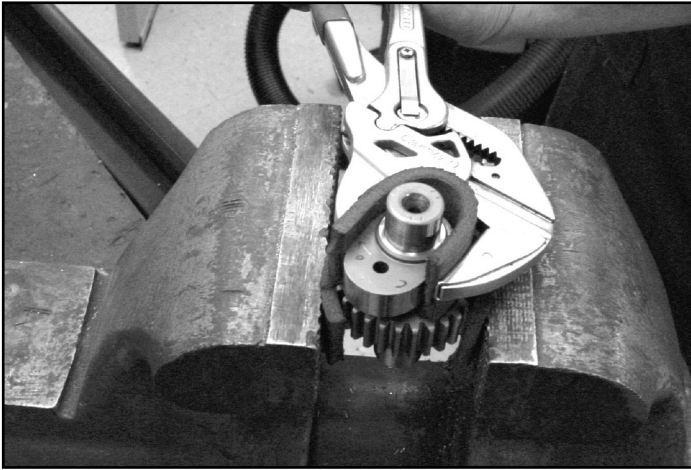
B. Adjusting Lobe Positions

1. After determining how many degrees the lobe must be moved either forward or back, remove the cam from the engine and adjust the position of the the lobe. The preferred method is to use a special tool such as the A.R.T. Sportster® and XR 750 Cam Lobe Degree Tool. See Picture 5.



Picture 5

2. For additional information, Contact Advanced Racing Technology, Inc. Route 360 Box 247, Burgess, VA 22432 Ph. 804-453-3357. An alternative trial and error method is to use heavy leather strips to protect the cam and lobe while moving the lobe with an adjustable wrench. See **Picture 6**.



Picture 6

3. Place cam back into engine and check the adjustment. Repeat the degree and lobe adjusting procedure until each valve opening is at the desired degree. After the degree procedure has been completed on both cylinders, and all four lobes have been set to their final position, the camshafts are ready to be welded.

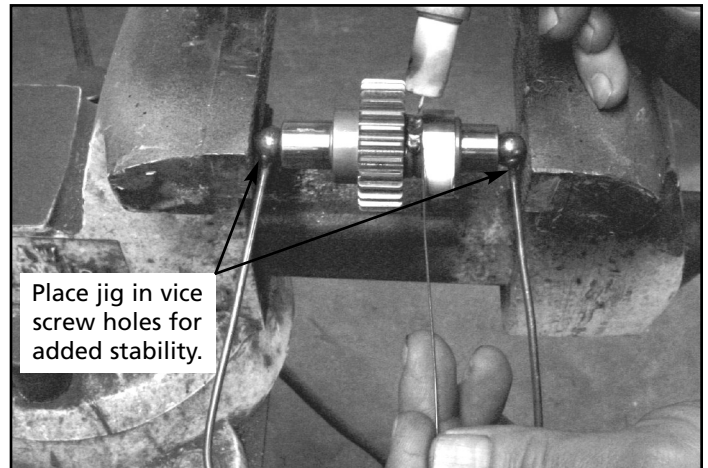
4. Welding Cam Lobes Into Position

CAUTION

Cam lobes must be welded to the camshaft before use.

NOTE: Clean all parts thoroughly with an evaporative solvent before welding. Use care not to disturb lobe position.

- A. Locate the camshaft in a suitable fixture that will allow easy access for the welder, and prevent arcing to the cam lobe surface. A homemade jig and fixture consisting of a vice, ball bearings and wire works well. See **Picture 7**.



Picture 7

- B. Weld cam lobes 180 degrees around the base circle using the TIG process. Stainless steel alloy filler rod is recommended. See **Picture 8**.



Picture 8

NOTE: The welding operation should only be performed by an experienced TIG welder. Be careful not to arc to or otherwise damage cam bearing or lobe surfaces. Welded cams cannot be returned or exchanged.