

# Rocket Cams Inc.

## Installation Instructions: Rocket Cams EZ Pushrods fits 1984-2018 Harley-Davidson® Big Twin Engines

### 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.*

Rocket Cams recommends you take special notice of these items.

### DISCLAIMER:

Rocket Cams Inc. parts are designed for high performance, closed course, racing applications and are intended for the very experienced rider only. The installation of Rocket Cams 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. Rocket Cams is not associated with Harley-Davidson, Inc.

### WARRANTY:

All Rocket Cams parts are guaranteed to the original purchaser to be free of manufacturing defects in materials and workmanship for a period of 90 days from the date of purchase. Merchandise that fails to conform to these conditions will be repaired or replaced at Rocket Cams' option if the parts are returned to us by the purchaser within the 90 day warranty period or within 10 days thereafter.

In the event warranty service is required, the original purchaser must call or write Rocket Cams 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 Rocket Cams. If it is deemed necessary for Rocket Cams to make an evaluation to determine whether the part was defective, a return authorization number must be obtained from Rocket Cams. The parts must be packaged properly so as to not cause further damage and be returned prepaid to Rocket Cams 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 Rocket Cams and the

part was found to be defective, repair, replacement or refund will be granted.

### ADDITIONAL WARRANTY PROVISIONS:

(1) Rocket Cams shall have no obligation in the event a Rocket Cams part is modified by any other person or organization.

(2) Rocket Cams shall have no obligation if a Rocket Cams 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 Rocket Cams part.

(3) Rocket Cams shall not be liable for any consequential or incidental damages resulting from the failure of a Rocket Cams 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 Rocket Cams and a customer.

(4) Rocket Cams parts are designed exclusively for use in Harley-Davidson® and other American v-twin motorcycles. Rocket Cams shall have no warranty or liability obligation if a Rocket Cams part is used in any other application.

### SAFE INSTALLATION AND OPERATION RULES:

Before installing your new Rocket Cams 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 Rocket Cams with any questions you may have if any steps are unclear or any abnormalities occur during installation or operation of motorcycle with a Rocket Cams 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.

## READ INSTRUCTIONS CAREFULLY BEFORE STARTING INSTALLATION

### NOTES:

*EZ Pushrod kits fit 1984-1999 Evolution engines and 1999-2017 Twin Cam 88, 96, 103 and 110 engines as well as Milwaukee 8, 107, 114 and 117™ engines. These engines combinations will use adjustable pushrods of same lengths due to the different camshaft base circles. EZ Pushrods for 1999-later big twins are compatible with stock pushrod covers.*

*Due to the larger O.D. of EZ Pushrods, there may be an interference problem with some aftermarket pushrod covers.*

*Installation And Adjustment For Engines With Standard Hydraulic Tappets*

1. Remove pushrod cover clips and lift cover assemblies to view lifters.
2. Remove spark plugs and rotate engine until front piston is at the top of its stroke, with both front lifters at their lowest position (TDCC— top dead center compression). If engine is equipped with Rocket Cams Easy Start cams turn the engine until the exhaust tappet rises slightly (about .030") and goes back down. This ensures that the tappet is on the heel of the cam but not on the Easy Start trigger.

**NOTE:** *To ensure that the piston is at the correct position to remove pushrods for a specific cylinder, rotate the engine forward and watch the intake pushrod. The intake pushrods are the two closest to the center of the engine. Watch the intake pushrod rise and fall as the engine is rotated. When the intake pushrod is at its lowest position, the piston in that cylinder is on its compression stroke. Check to see if the piston is at TDC. If it isn't, rotate the engine a few more degrees to bring the piston to the top of the cylinder.*

1. Remove front pushrods. Disassemble the rocker cover and rocker arm assembly, as per the appropriate service manual if stock pushrods are to be saved. Pushrods may be cut out with a bolt cutter to save time. See NOTE, CAUTION, and WARNING below.

**NOTE:** *Since Rocket Cams EZ pushrods do not require rocker arm disassembly for installation, stock pushrods may be cut out of the engine to save time. Rocket Cams recommends that they be cut with a bolt cutter.*

**CAUTION** *If pushrods are cut with a saw, metal chips may enter engine and cause extensive damage not covered by warranty.*

**WARNING** *Make sure tappet is at lowest point of travel and pushrod is not under valve spring pressure before cutting pushrods. Sudden release of valve spring pressure may cause cut pushrods to fly out of motor, potentially causing serious injury.*

1. Clean and inspect the pushrod tubes. Replace all O-rings. Apply a light coat of engine oil to the O-rings.
2. Reinstall rocker assemblies according to appropriate service manual procedures if they were removed.
3. Insert new pushrods through tube assemblies and install in appropriate positions.

4. Holding intake pushrod so the top ball end is in the rocker arm cup, extend adjusting screw until the bottom ball end just contacts the tappet cup. Holding the hex on the pushrod tube with a 1/2" wrench, use a 5/16" wrench to turn the adjusting screw, to compress hydraulic piston of intake tappet an additional 2 1/2 complete turns (15 flats).
5. While holding the pushrod tube hex with a 1/2" wrench, and the adjusting screw with the 5/16" wrench, use an additional 1/2" wrench to tighten locknut against the pushrod tube hex. Take care not to damage the threads of the adjuster screw.
6. Allow sufficient time for lifter to bleed down (15 to 20 minutes) before adjusting front exhaust pushrod in the same manner. Pushrods will spin freely with fingers when tappet is fully bled down.

**CAUTION** *Failure to allow hydraulic unit to bleed down before rotating engine or adjusting the other pushrod could result in valve-to-valve contact and serious valve train damage. Lifters are bled down when pushrod can be turned with fingertips.*

1. Repeat above procedures for rear cylinder, this time bringing rear cylinder to TDCC (top dead center compression).
2. Replace pushrod tube clips. With spark plugs still removed and plug wires grounded, crank engine until oil pressure light goes out.
3. Replace spark plugs and start motorcycle and check for leaks.

### NOTES:

*Perform this operation on one cylinder at a time. Do not turn engine until pushrod adjustment is complete, and pushrods can be spun with fingers.*

*Valve train may be noisy on initial startup after adjusting pushrods, particularly if all oil was removed from tappets during installation. It may take several minutes for tappets to pump up and become quiet.*

