Instruction 7-7100 Rev 07.23

Rocket Performance Garage

Installation Instructions: Rocket Cam Support & Oil Pump Kit

fits 2017 Later Harley-Davidson® M8 Engines

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 Performance Garage LLC (RPG) parts are designed for high performance, closed course, racing applications and are intended for the very experienced rider only. The installation of RPG 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 Performance Garage LLC is not associated with Harley-Davidson, Inc.

WARRANTY:

All RPG 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 RPGs' 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 RPG 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 RPG to make an evaluation to determine whether the part was defective, a return authorization number must be obtained from RPG. The parts must be packaged properly so as to not cause further damage and be returned prepaid to RPG 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 RPG and the part was found to be defective, repair, replacement or refund will be granted.

ADDITIONAL WARRANTY PROVISIONS:

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

(2) RPG shall have no obligation if a RPG 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 RPG part.

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

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

SAFE INSTALLATION AND OPERATION RULES:

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

Technical Service Phone: 559-233-1651
Technical Service Email: sales@rocketcams.com
Website: www.rocketcams.com

NOTES:

The Rocket Performance Garage M8 cam support plate & oil pump kit is machined from high strength billet aluminum. This material and manufacturing method provide strength and dimensional stability over aluminum castings. In addition, billet aluminum does not have voids, inclusions and other structural defects associated with aluminum castings. Possible failure may result if thread locking compound is not applied to the cam drive sprocket flange bolts. Always prepare threads according to the instructions on the container.

All reference to Harley-Davidson® part numbers is for identification purposes only. In no way is it implied that any Rocket products are original equipment parts or that they are equivalent to corresponding Harley-Davidson® part numbers.

Installation of the Rocket cam support plate requires the use of special tools and repair manuals for the model of bike you will be working on. Attempting the installation without the proper tools and manuals will be difficult. Damage can result which will not be covered under warranty.

SPECIAL TOOLS REQUIRED *(only needed if inner cam bearing will be replaced)*

Camshaft Needle Bearing Remover/ Installer, HD® Part Number: 42325-4. Crankshaft/Camshaft Sprocket Locking Tool, HD Part Number 42314

Pre-Cautions:

Clean and flush the oil pan and oil lines to prevent foreign material from being sucked through the oil pump and through the new cam support plate. The oil filter should also be changed when installation is complete.

NOTE: *If debris is suspected in the oil pan, it is highly recommended to replace it with a new one.*

Installation

1. Unpackage the cam support plate kit and verify the all the threaded plugs have been installed. Confirm the kit contains a new O-ring.

2. Prepare the cam support plate for assembly by cleaning the plate with soap and water or parts cleaner. Be sure to thoroughly dry the internal passages.

3. Before starting work on the motorcycle, disconnect the negative terminal of the battery to eliminate the potential for sparks and inadvertent engagement of the starter while working on the motorcycle.

4. Refer to the HD® service manual for the model of bike you will be working on for proper removal of all components. Save the original fasteners to be reused when the Rocket cam support plate is installed.

5. Remove the cam support plate and oil pump from the engine according to the HD® service manual and measure flywheel pinion shaft run out. Refer to the manual for proper procedure. Rocket recommends no more than 0.005" of total indicated runout on the pinion shaft while checked in the cases.

6. Inspect the inner cam bearing, now is the time to replace this bearing while the engine is apart. It is highly recommended to replace the bearing with a full complement bearing. Refer to the service manual for proper procedure to replace this bearing.

Oil Pump Installation

1. **Make sure you have the proper oil pump for your engine.** Rocket offers two styles of oil pumps, each specific to the engine type. Twin Cooled engines will use the 7-7102. This pump is easily identified by a "W" machined into the front surface of the main pump body. For the oil cooled engines, the Rocket part number is 7-7101. This pump is easily identified by an "O" machined into the front surface of the main pump body.

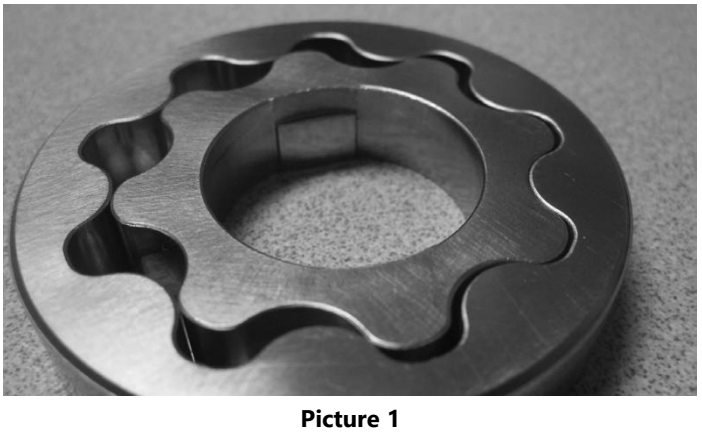
2. **Important:** *If the oil pump is disassembled for cleaning, do not remove the pressure relieve valve assembly. This has been preset at the factory.* Disassemble and wash all components of the oil pump. Make sure the pipe plug is installed and is flush or below the adjacent pump body surface.

3. The oil pump can be assembled into the cam chest one section at a time or as a complete unit, either method is acceptable as long as the mating sections fit tightly together.

4. **Individual section assembly method -** Install the flywheel scavenge port O-ring into the case (do not install the O-ring onto the pump). Put some assembly lube on the O-ring in order to make installing the return side pump housing easier.

5. Install the return side pump housing. Place your thumb on the lower left corner of the pump housing and push the housing into the O-ring.

6. Apply a liberal amount of assembly lube to the inner return rotor set and assemble into the return side pump housing. Make sure the relief cut side of the inner rotor goes toward the engine. **See Picture 1.**



Picture 1

7. Install two 1/8" x 3/4" dowels into the return side pump housing.

8. Install divider plate over the dowel pins.

9. Locate the second return rotor set. Apply a liberal amount of assembly lube to the second return rotor set and place gear set into supply side pump body. Make sure the debris screen is firmly secured by the retaining clip. Carefully install the supply side pump into the cam chest and mated to the return side pump housing.

NOTE: *Use as much of the provided assembly lube as possible on all of the oil pump rotors during assembly. This will aid in priming the oil pump upon start up.*

10. Install a new O-ring on the flywheel cavity suction side of the oil pump and re-install the pump into the cam chest. Use a straight edge to confirm that the outer face of the oil pump is recessed slightly from the cam plate mounting surface. **(See Picture 2).** This is done to ensure that there will be no binding in the oil pump when it is tightened to the cam plate.

Picture 2

11. Install a new O-ring into the oil supply port of the engine case. **See Picture 3.**

Picture 3

12. Apply assembly lube to the rollers of the inner cam bearing and to the cam bearing surface and lobes of the camshaft. Insert the camshaft into the inner cam bearing.

13. Apply assembly lube to the outer cam bearing surface of the camshaft and to the pinion shaft.

Install the cam support plate onto the pinion shaft and camshaft. Make sure the support plate fully contacts the mounting surfaces of the engine case and the dowel is engaged into the mounting hole.

NOTE: *The oil supply passage O-ring will hold the plate slightly off the mounting surface until the support plates screws are fully tightened.*

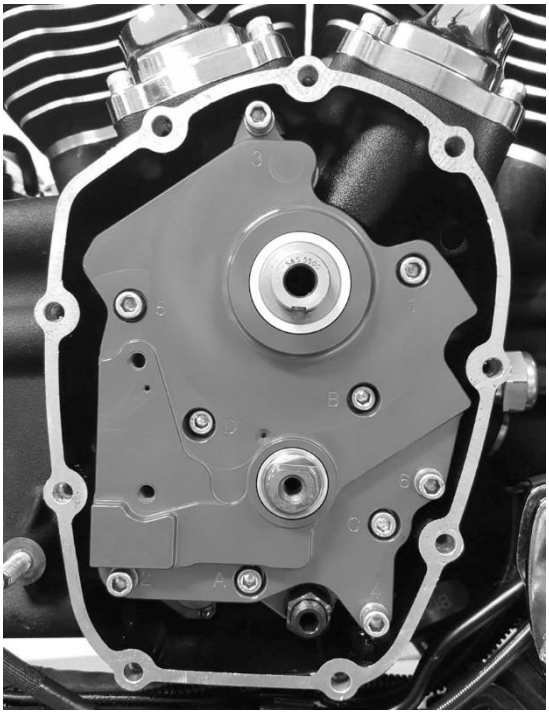
13. Turn the crankshaft so that the flat on the pinion shaft is facing straight up (12 o'clock position).

14. Apply a small amount of blue Loctite® to the cam support screws and the new oil pump screws. Make sure the flat washers are installed on the oil pump screws.

15. **Steps 16 thru 22 are critical to proper final assembly.**

16. Make sure the flat on the pinion shaft is facing straight up. **See Picture 4** for correct orientation of pinion shaft.

17. Loosely install all cam.



Picture 4

18. Snug the oil pump screws A, B, C and D but do not torque.

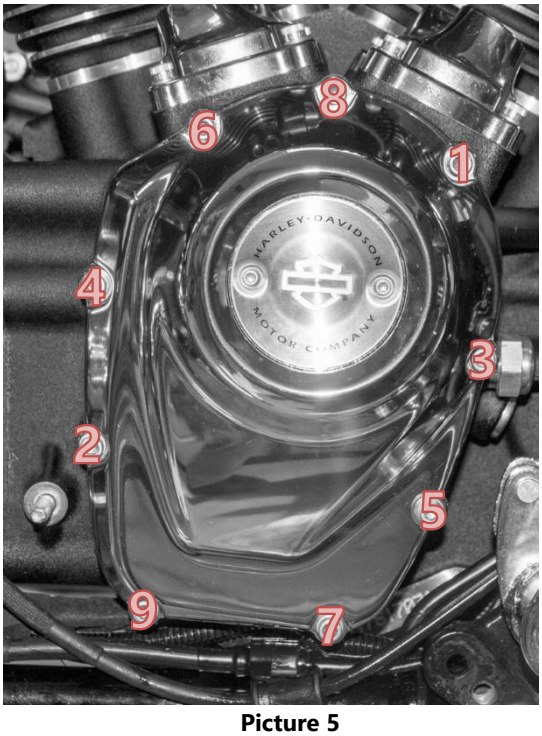
19. Snug the cam support plate screws 1, 2, 3, 4, 5, and 6 but do not torque.

20. Torque screws 1, 2, 3, 4, 5, and 6 in order to 90-120 in*lbs. **See picture 4.**

21. Rotate the crankshaft two complete revolutions with the flat on the pinion shaft facing straight up (12 o'clock position) when done.

22. Torque the oil pump screws A, B, C, and D in that order to 90-120 in-lbs.
23. Rotate the crankshaft to make sure binding does not occur in the oil pump. If binding occurs, loosen the oil pump and cam support plate screws and go through the installation procedure starting at step 17.

24. Install the cam drive components (chain or gear) according to the manufacturer's installation procedures.
25. Apply blue thread locker to the cam cover screws, install the cam cover, gasket and screws. Tighten the cam cover screws to 120 in-lbs. in the sequence shown **(See Picture 5).**



Picture 5

26. Reinstall the pushrods according to the manufacturer's installation procedure.

27. Reinstall exhaust system and right-side floor board or foot peg.