



INSTRUCTIONS

-J00044

REV. 4-1-96

Kit Number 25647-91

HIGH PERFORMANCE VALVE TRAIN KIT (FOR 1991 AND LATER SPORTSTER ENGINES)

General

This kit is designed for use on the 1991 Sportster V2 Evolution 883 and 1200cc engines.

CAUTION

Do not install this cam set in 1990 and earlier Sportster engines. This cam set will cause severe engine damage if installed in pre-1991 engines.

Harley-Davidson motorcycles equipped with Screamin' Eagle high performance engine parts may not be used on public roads and, in some cases, must be restricted to closed course competition because these parts may impair the vehicles emissions system performance and/or increase its noise level. Installation of Screamin' Eagle parts could also void any new vehicle warranty. Engine related performance parts are intended for **THE EXPERIENCED RIDER ONLY**.

Kit Contents

This kit contains the following items:

ITEM	QTY	DESCRIPTION
1	4	Camshaft
2	1	Valve spring and collar kit (kit contains Items 3, 4, 5, and 6)
3	8	Valve spring collar keys
4	4	Valve spring upper collar (titanium)
5	4	Valve spring unit (inner & outer springs)
6	4	Valve spring lower collar (titanium)
7	1	Valve guide seal installation tool

Required Gaskets

Installation of this kit will require the following gaskets available from your Harley-Davidson dealer:

1	17032-86B	Gasket kit, top overhaul
1	25263-86	Camgear cover gasket

Installation

To properly install the kit, you must have a Service Manual that covers the 1991 and later V2 Evolution 883 and 1200 engines. Service Manuals covering the Evolution engines are available from your Harley-Davidson dealer.

Valve Spring and Collar

1. Refer to the Service Manual procedure that covers stripping the motorcycle for engine repair.
2. Remove the cylinder heads.
3. Compress valve springs, remove upper collar retainers (keepers), upper collars, seals, and lower collars. Clean and inspect the cylinder heads.

NOTE

Mark valves so they will be returned to their original locations.

4. See Figure 1. Assemble each valve in the cylinder head with the upper titanium valve spring collars and keepers from this kit in place without valve springs. Check valve movement for free travel. Free travel is the distance the valve can move off the valve seat until the underside of the upper valve spring collar strikes the upper end of the valve guide. Measure the free travel of the four valves and record the measurements.

XL 883 AND 1200cc ENGINE

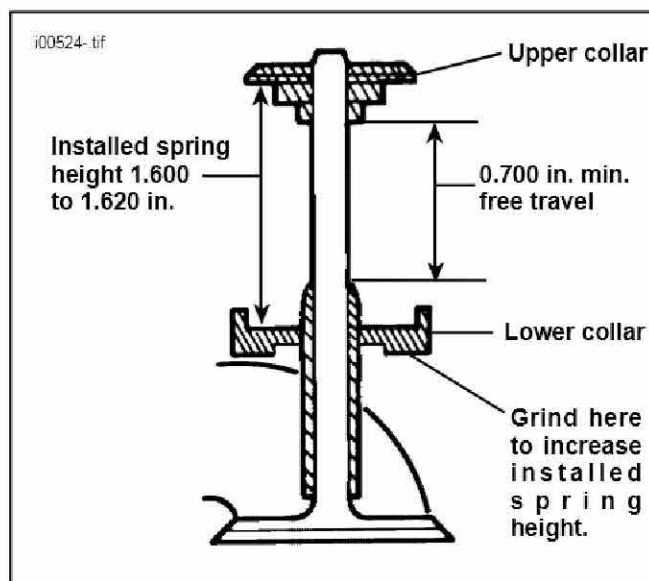


Figure 1. Valve Free Travel Check and Installed Valve Spring Height

5. Remove upper collars and keepers.
6. Measure valve stem protrusion following the instructions in the Service Manual. Record the measurements.

7. Install, from this kit, the lower and upper titanium valve spring collars and keepers. Measure the distance from outer valve spring seat on lower collar to underside of upper valve spring collar with valve on its seat. Record the measurements.
8. Compare the measurements recorded in Steps 4, 6, and 7 with the following:

Free travel.....0.700in. minimum
 Valve stem protrusion.....2.014in. maximum
 Installed spring height.....1.600-1.620 in.

9. If all measurements are within the dimensions given above, proceed to Step 15. If any measurements are outside the dimensions given above, go to Steps 10 through 13. These steps give procedures for obtaining the required valve stem protrusion, spring height and free travel.
10. If valve stem protrusion is greater than 2.014 in., the valve seat insert or cylinder head must be replaced.
11. If the installed spring height or the distance between collars is less than 1.600 in., remove lower collar and grind the surface shown in Figure 1 to obtain the 1.600 to 1.620 in. dimension.
12. If the installed spring height measured is greater than 1.620 in., install one or more of the following shims under the lower collar to achieve the 1.600 to 1.620 in. dimension.

Part No.	Shim Thickness (in.)
18245-67R	0.007
18246-67R	0.015
18247-67R	0.036

13. If free travel is less than 0.700, the valve guide must be shortened using the following cutting tool:

Source: K-Line Industries, Inc.
 315 Garden Avenue
 Holland, Michigan 49423

Part No.: KL1435, valve guide machining tool. This tool will shorten and machine outside diameter of guide.

NOTE

Do not shorten guide more than required, as accelerated wear of the valve and guide may result.

14. After correct free travel, valve stem protrusion and installed spring height have been obtained, go to Step 15.

CAUTION

If this kit is being installed in a 1200cc engine, bevel the intake and exhaust valves at this time. See Figure 3 for the grind angle and minimum margin.

15. Install valves in their original locations.

CAUTION

Lower collars must be installed before installing valve guide seals. Lower collar inside diameter is smaller than outside diameter of seal; therefore, collar will not fit over seal.

16. Install lower collars from this kit.

17. Place a protective sleeve over the valve stem keeper grooves. Coat the sleeve with oil and place a new seal over the valve stem.

CAUTION

If the seal is installed without using the protective sleeve, the seal will be damaged.

18. Tap the seal onto the guide using the VALVE SEAL INSTALLATION TOOL included with this kit. The seal is completely installed when it bottoms on the top of the valve guide.

CAUTION

If valves are removed after seals are installed, the sharp edges on the keeper groove will cut and ruin seals.

19. Assemble cylinder heads following Service Manual procedures, but, using the valve springs, upper collars, and keys (keepers) from this kit. Do not install cylinder heads on cylinders at this time. Proceed to Camshaft Installation.

Camshaft Installation

Camshaft installation requires the removal of the gear case cover. The cams in this kit may be used with the stock hydraulic tappets.

Follow the Service Manual procedures to perform the following:

1. Remove ignition components from gear cover and the two bolts that retain the oil filter housing.
2. Remove the gear cover screws and gear cover.

NOTE

It is not necessary to remove pinion gear, oil pump gear or oil pump.

3. See Figure 2. Rotate engine to align timing marks. Cams are numbered 1 to 4 from the rear exhaust (1) to the front exhaust (4). Remove camshaft 2. One at a time remove camshaft 1, 3, and 4, and replace with the appropriate camshaft from this kit. Be careful to maintain timing mark alignment. Install camshaft 2 from this kit last. Carefully check alignment of all timing marks.

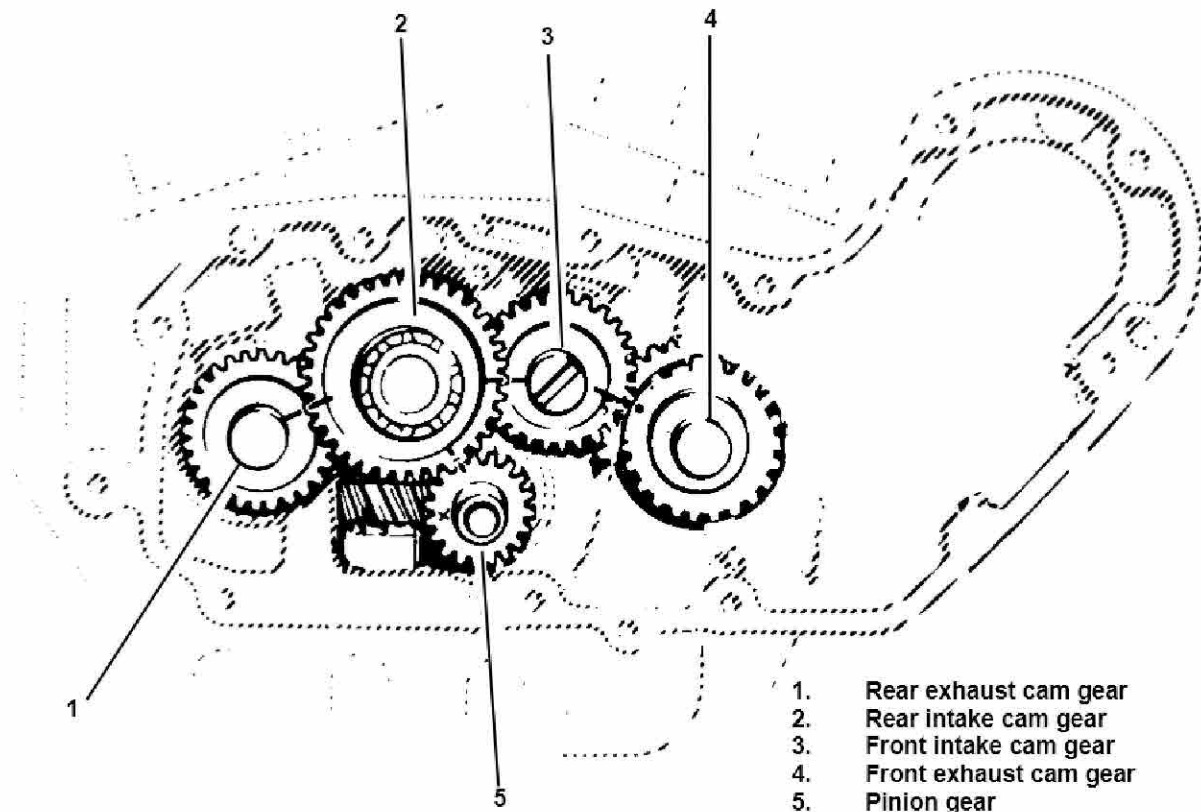


Figure 2. Proper Alignment of Camshaft Timing Marks

4. Following Service Manual instructions, assemble gear case cover and check that minimum camshaft end play is present. After final assembly, torque cover screws to 80-110 in-lbs.
5. Install ignition components.
6. Place modeling clay on the piston valve reliefs. Clay must be about 1/8 in. thick.
7. Following Service Manual procedures, install cylinder heads using old head gaskets. Tighten cylinder head screws to 7 ft-lbs following the pattern in the Service Manual.
8. Install push rods.
9. Carefully turn the engine through two full revolutions by hand. (This will open the valves and compress the clay in the valve reliefs on the pistons. Clay thickness will be measured when heads are removed later.)
10. Rotate engine so that both valves of the front cylinder are partially open. Shine a light through the exhaust port and look through the spark plug hole. Turn engine, if required, to the point where the exhaust and intake valve heads cross.

There should be 0.040 in. clearance between the two valve heads. See Figure 3. A wire gauge may be used to make this measurement. If insufficient clearance exists on 883 cc engines, the edges of both the intake and exhaust valves may be ground at a 45° angle as shown in Figure 3.

CAUTION

Wait ten minutes before turning engine after installing push rods. This wait allows tappets to bleed down and prevents bending push rods or valves.

NOTE

Exhaust and intake valves from 1200cc engine should have been beveled prior to assembling them into head.

Do not reduce the valve margin to less than 0.031 in. On 1200cc engines grind the valve seats deeper into the head to obtain the 0.040 in. clearance between valve heads.

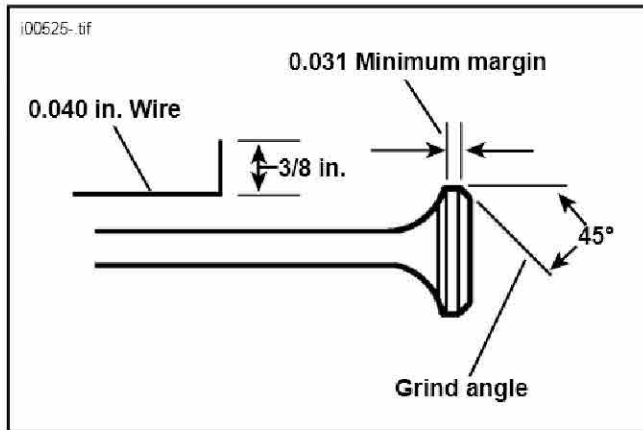


Figure 3. Beveling Valve Heads

NOTE

Do not remove heads to bevel valves on 883cc engines or grind valve seats deeper on 1200cc engines at this time — continue with the remaining checks.

11. Repeat Step 10 for the rear cylinder.
12. Rotate engine so that both valves of the front cylinder are fully closed. Check for clearance between the top of the upper spring collar and the bottom of the rocker arm. If less than 0.010 in., mark the offending area of the rocker arm. Remove the rocker arm and carefully grind or file to establish the correct clearance. The area must be polished to remove all tool marks after grinding or filing.

CAUTION

Failure to polish the rocker arm could result in a fatigue failure of the rocker arm.

13. Repeat Step 12 for the rear cylinder.
14. Remove the heads and perform the following:

- A. Measure the clay thickness in the valve reliefs on the pistons at its thinnest point. This measurement must be at least 0.080 in. If 0.080 in. clearance is not present, the valve reliefs must be machined deeper to obtain the 0.080 in. clearance.

CAUTION

Do not deepen valve reliefs more than 0.020 in. or piston will be ruined.

- B. If 0.040 in. clearance was not present when checked in Step 10, remove and bevel the intake and exhaust valves on 883cc engines. If 0.040 in. clearance is not present on 1200cc engines, the valve seats must be ground deeper to obtain the clearance. After grinding valve seats, assemble the engine and recheck the valve head clearance per Step 10.

NOTE

If valve seats are ground, recheck valve stem protrusion and distance between valve spring collars. Free travel will be increased and need not be rechecked. Install new valve guide seals if valves were removed.

15. Following Service Manual procedures, assemble the engine using new gaskets.
16. Check ignition timing following Service Manual procedures.