



INSTRUCTIONS

-J04863

REV. 2008-10-22

TWIN CAM CAMSHAFT REMOVER AND INSTALLER

GENERAL

Kit Number

94085-09

Models

Use on all Twin Cam® 1999 to early 2000 to remove and install camshafts and bearings.

Use on all Late 2000-06 FXST, FL and Late 2000-05 FXD to remove and install camshafts only.

Loctite® 242 (P/N

Additional Parts Required

Cam Chain Tensioner Unloader (P/N 94075-09)

Twin Cam Inner Cam Bearing Remover Tool (P/N 94078-09)

⚠ WARNING

The rider's safety depends upon the correct installation of this kit. Use the appropriate service manual procedures. If the procedure is not within your capabilities or you do not have the correct tools, have a Harley-Davidson dealer perform the installation. Improper installation of this kit could result in death or serious injury. (00333a)

NOTE

This instruction sheet references Service Manual information. A Service Manual for your model motorcycle is required for this installation and is available from a Harley-Davidson Dealer.

Kit Contents

See Figure 4 and Table 1.

Replacement parts for this kit are available directly from the vendor. If replacement parts are needed contact JIMS® at 805-482-6913 or www.jimsusa.com.

REMOVAL

1. Use the Cam Chain Tensioner Unloader (P/N 94075-09) to unload the secondary chain tensioner. Use the instructions included with the tool.

NOTE

Secure the cam support plate in vise using soft jaws to prevent damage to the plate.

⚠ WARNING

Wear safety glasses or goggles when removing or installing retaining rings. Retaining rings can slip from the pliers and could be propelled with enough force to cause serious eye injury. (00312a)

2. Remove the retaining ring from the end of the camshaft.

3. Remove the four TORX® screws (T20) that secure the bearing retainer plate from the inside of the cam support plate.

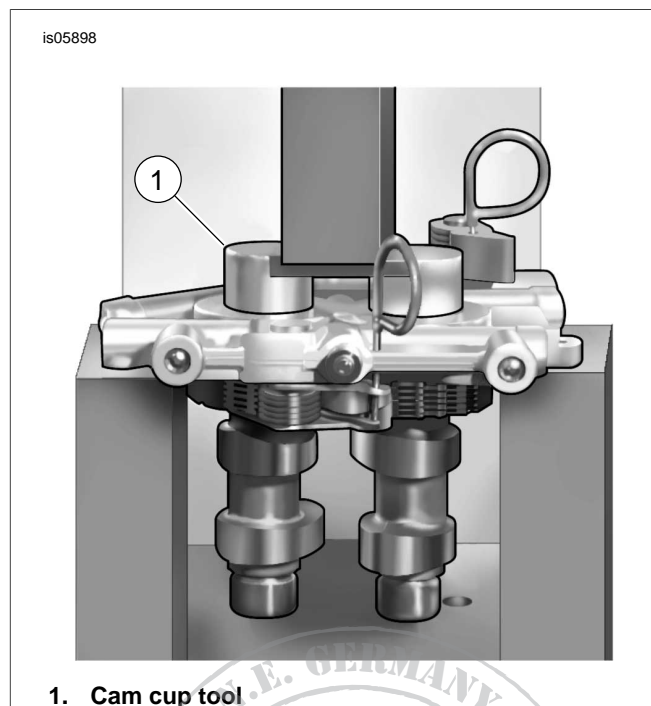
NOTE

Mark the secondary cam chain with a felt marker to indicate the original direction of rotation for reassembly.

4. Support the cam support plate in an arbor or hydraulic press with the primary chain side facing up. Use parallel blocks and place parallels as close to the chain as possible.

NOTE

In the following step do not try to press the camshafts out without the bearings or the support plate will be damaged.



1. Cam cup tool

Figure 1. Removing Camshafts and Bearings

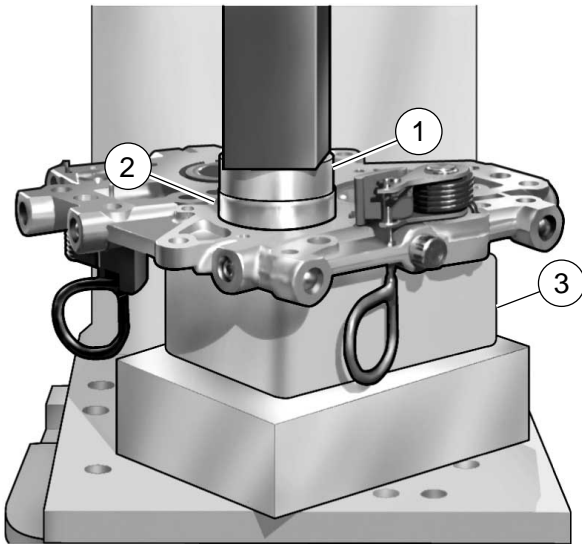
5. See Figure 1. Place the cam cup tool (1277-2) over the ends of the camshafts. Align the cups so they can center and contact the inner bearing races. Then center the cam cup tool under the press ram between the camshafts. Apply pressure and press both camshafts (with bearings attached) from the cam support plate.
6. Remove the secondary cam chain from the cam sprockets.

INSTALLATION

NOTE

Cam bearings are not interchangeable: rear cam - roller type, front cam - ball type.

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1. Pilot installer
2. Bearing
3. Support block

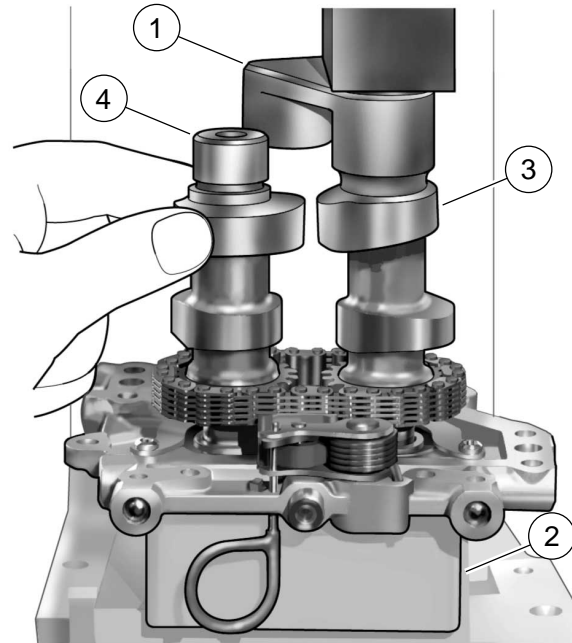
Figure 2. Bearing Pilot Installer

1. See Figure 2. Position cam support plate (secondary cam chain side facing up) over support block (1277-1). Make sure the outer races of bearing's bores are properly supported. Apply a small amount of press fit lube to bearing O.D. and bearing bore. Position bearing (letter side up) over bearing bore. Slip pilot installer (1277-3) through the bearing into the hole of the support block.
2. Position the press ram over the pilot installer (1277-3). Press on the installer until the bearing makes contact with the bottom of the bore in the cam support plate. Repeat this step for the other bearing.
3. Place Loctite 242 on the four plate torque screws and install the bearing retainer plate. Tighten screws to 20-30 **in-lbs** (2.6-3.4 Nm). Make sure the oil hole in the retaining plate aligns with the secondary cam chain oiler.
4. Place the cam support plate back on the support tool block (1277-1) to support the inner races as the camshafts are being installed.
5. Align the punch marks on the teeth of the cam sprockets. Mark the locations of the punch marks on the back side of the gears using a colored marker. This marking procedure is necessary to orient the camshafts when they are pressed in.
6. Install the secondary chain in the cam sprocket of both camshafts. Remember to install them in the original rotation using the mark on the chain during disassembly. Also apply a small amount of press fit lube to the camshaft and the bearing bore.
7. See Figure 3. With the secondary chain installed on the cam sprockets and the marks aligned, place the sprocket ends of the camshafts into the bearings.

NOTE

Do not mix the camshafts during the press procedure. The rear camshaft, which can be identified by the splined shaft, must go into the roller bearing at the rear of the cam support plate.

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1. Cam cup
2. Support block
3. Front camshaft
4. Rear camshaft

Figure 3. Installing Camshafts to Cam Support Plate

8. Place the cup of the camshaft driver (1277-2) over the end of the **front camshaft only**.

NOTE

In the following step verify that the tensioner shoe is clear of the secondary cam chain during the press procedure. Contact can result in damage that requires the replacement of the tensioner assembly.

9. Verify that the splined end of the rear camshaft has been started into the support block. Damage to the camshafts and or the support block can occur if the end of the camshaft catches the top of the block during the press procedure.
10. Center the end of the front camshaft under the ram and slowly apply pressure to the driver (1277-2) just enough to start the front camshaft into the bearing I.D.

NOTE

If the rear camshaft is not properly aligned, the edge of the installed inner race can catch on the bearing rollers. Bearing damage can result if contact occurs during the press procedure.

11. Slowly apply pressure to the front camshaft side of the driver while wiggling the rear camshaft as necessary to guide the inner race between the bearing rollers.
12. Once the inner race on the rear cam has started into the roller bearing, apply pressure to the driver until the front camshaft is fully seated. If necessary, keep finger pressure at the top of the rear camshaft to make sure that the

assembly remains square and that the inner race moves to the installed position in the roller bearing.

- Since the pin stamped timing lines on the secondary sprockets cannot be observed once the camshafts are pressed into the bearings, you will need to verify the

camshaft's alignment by using a straightedge with the second set of timing lines found on the outboard ends of the shafts. If they are misaligned, the camshafts must be removed and reinstalled with a new bearing set.

SERVICE PARTS



Figure 4. Service Parts: Camshaft Remover and Installer

Table 1. Service Parts Table

Item	Description (Quantity)	Part Number
1	Support block	1277-1
2	Cam cup	1277-2
3	Pilot installer, bearing	1277-3

If replacement parts are needed contact JIMS® at 805-482-6913 or www.jimsusa.com.

