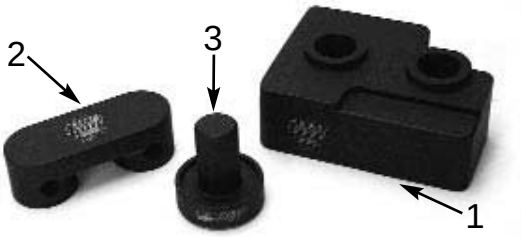
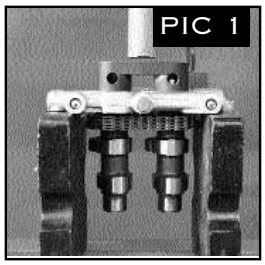
# Instruction Sheet For Tool No.1277

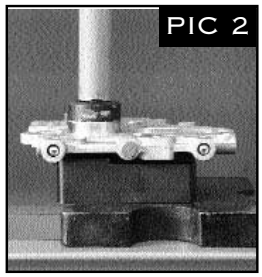


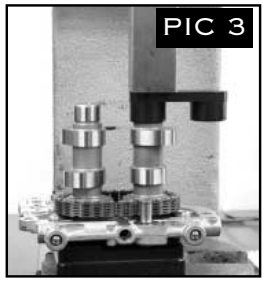

## Cam Shaft Remover and Installer

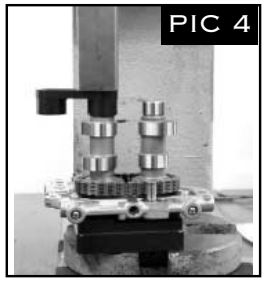
### Use on all Twin Cam 88™ Models

***This multi-function tool will remove and replace front and rear camshafts and the ball bearings in the new twin cam 88™. It provides the precision alignment of the camshaft to insure a smooth press in and out of the support plate.***




* Refer to H-D service manual for specifications*

(Note: Read all before performing work) WARNING: Always wear eye protection and always disconnect the battery.

**TO REMOVE:**

1. Use JIMS tool No. 1283 to unload the secondary chain tensioner. Follow the instructions included with the tool.
2. **(CAUTION) Secure cam support plate in vise using soft jaws to prevent damage to plate.**
3. Remove retaining ring from end of the front cam shaft. (Wear safety glasses)
4. From inside of cam support plate, remove the 4 torx screws(T20) that secure the bearing retainer plate.
5. **(NOTE) Mark the secondary cam chain with a felt marker to indicate the original direction of rotation for reassembly.**
6. 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. See picture No. 1
7. Place the cup tool No. 1277-2 over the ends of the cam shafts. Align the cups so they can center and contact the inner bearing races. Then center cup tool under ram of press between the cams apply pressure and press both cams (with bearings attached) from cam support plate. (Caution: Do not try to press the cams out without the bearings or you will damage the support plate.)
8. Remove secondary cam chain from cam sprockets.
9. To remove the bearings off of camshafts use JIMS tool No. 1280. Follow instructions supplied with tool.

**TO INSTALL BEARINGS AND CAMS:**

1. Position cam support plate (secondary cam chain side facing up) over support block No. 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. **Note:** ***Bearings are not interchangable: rear cam - roller type, front cam - ball type.*** Position bearing (letter side up) over bearing bore. Slip pilot installer No. 1277-3 through bearing into hole of support block. See picture No. 2
3. Position ram of press over pilot installer No. 1277-3. Press on installer until bearing makes contact with bottom of bore in cam support plate. Repeat steps for other bearing.
4. Install the bearing retainer plate with the (4) plate torx screws, use Loctite medium strength thread locker 242. Tighten screws to 20-30 IN-LBS. in a crosswise pattern use a T20 torx driver. Make sure the oil hole in the retaining plate aligns with secondary cam chain oiler.
5. Place cam support plate back on support tool block No. 1277-1 to support inner races as cams are being installed.
6. 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 cams when they are pressed in.
7. Install the secondary chain in the cam sprocket of both cams. Remember to install in the original direction of rotation using the mark on the chain during disassembly. Also apply a small amount of press fit lube to camshaft and bearing bore.
8. With the secondary chain installed on the cam sprockets and the marks aligned, place the sprocket ends of the cam shafts into the bearings.
9. **Note: Do not mix 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.**
10. Place cup of camshaft driver (2) over the end of the front camshaft **only.**
11. 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.
12. Be sure 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.
13. Center the end of the front camshaft under the ram and slowly apply pressure to the driver (2) just enough to start the front camshaft into the bearing ID.
14. 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.
15. Slowly apply pressure to the front camshaft side of the driver (See Fig.3) while wiggling the rear camshaft as necessary to guide the inner race between the bearing rollers.
16. 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 insure that the assembly remains square and that the inner race moves to the installed position in the roller bearing.
17. (See Fig 4) 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).

***PARTS AVAILABLE SEPARATELY***

| No. | Qty. | Description | Part No. |
|---|---|---|---|
| 1 | 1 | SUPPORT BLOCK | 1277-1 |
| 2 | 1 | TWIN CAM CUP | 1277-2 |
| 3 | 1 | PILOT, INSTALLER | 1277-3 |
| 4 | 1 | INSTRUCTION SHEET | 1277-IS |





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