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## REF: Tools - 117

# Mainshaft

## Mainshaft Bearing Press



**Mainshaft Bearing Press** <sup>1)</sup>

# Countershaft

This is a mock setup for checking countershaft endplay. The bent wire is used to push and pull on the countershaft. You can read the endplay directly from the dial indicator which is mounted on the alloy spacer with the bolt through it. The bolt screws into the bottom tranny case mount hole on the left case half with the tranny sitting correctly in the engine.



Dial Indicator for checking Countershaft Endplay <sup>2)</sup>

## Countershaft Low Gear Bushing Installation

- Found out the hard way not to hand ream this bushing after fitting. Set it up in a lathe and bore it true with a steel ring to hold the gear in the lathe.  
The 17 tooth gear won't sit in a three jaw chuck evenly. <sup>3)</sup>



Countershaft low gear bushing jig for use in a 3 jaw chuck lathe <sup>4)</sup>



A pair of sockets and a 3/8" bolt for extraction, a stepped collar on a 9/16 bolt to install. <sup>5)</sup>

## Transmission Countershaft Needle Roller Bearing Drift

- The two needle roller bearings on the counter shaft I replaced, heating the cases and trapdoor gently with a propane torch and gently tapping them out/in with a stepped drift I turned up on a mate's lathe. <sup>6)</sup>
  - They are two different size bearings so each end of the drift is different. The one for the trapdoor end includes a step on it the right thickness to locate the bearing the correct amount in from the surface, as specified in the manual.
  - Be sure to make the drift a few thou smaller than both the inner and outer diameters of the bearing so you can get it out after tapping the bearing in.
  - The propane torch needs to have the big burner head to get enough heat happening. Heat the cases until you can spit on them and the spit boils and sizzles - 212 degrees F - and no hotter.

- It will not distort the cases if done gently and you keep the torch moving in circles all the time. Do not use oxy acetylene, it is too hot and can cause war-page.
- I also found an electric heat gun will do the job, just takes longer.
- Like all bearings, they can be changed cold but all you are doing is tearing the hell out of the aluminium and setting it up for the bearing to spin the housing due to the resulting loose fit, specially if the job has been done once or twice before.



**Drift for the transmission countershaft needle roller bearings <sup>7)</sup>**

## Retaining Ring Removal

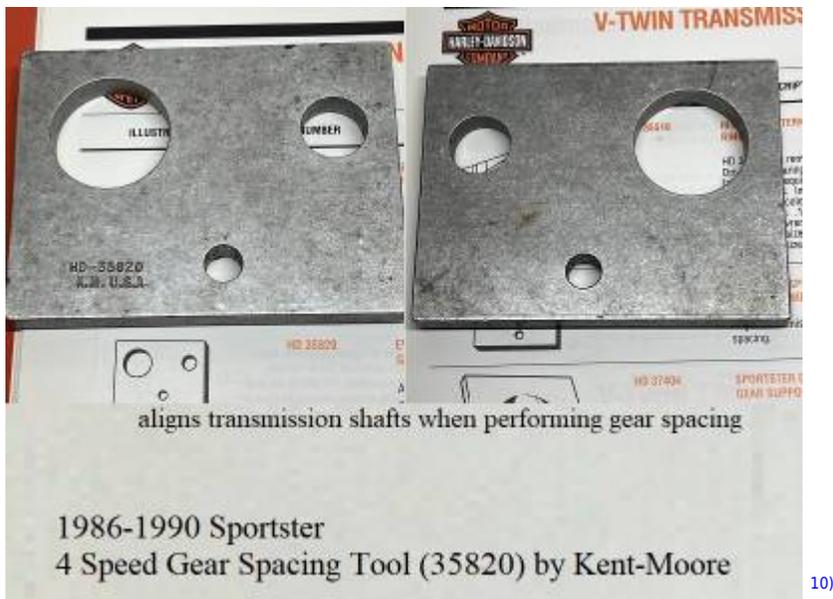


**Retaining ring pliers <sup>8)</sup>**



# Shaft Alignment

Tool (35820) to align the shafts on 1986-1990 Sportsters when setting gear spacing.



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1)

photo by sc72

<https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-era-specific-and-model-specific/ironhead-sportster-motorcycle-talk-1957-1985/160106-where-to-go-from-here/page16?t=1717592&highlight=engine+sprocket&page=16>

2)

Photos and article by Ferrous Head of the XLFORUM

<https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-era-specific-and-model-s>

[pecific/ironhead-sportster-motorcycle-talk-1957-1985/63858-special-tools/page6?t=395586&page=6](https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-era-specific-and-model-specific/ironhead-sportster-motorcycle-talk-1957-1985/63858-special-tools/page6?t=395586&page=6)

3) 6)

Hopper of the XLFORUM

<https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-era-specific-and-model-specific/ironhead-sportster-motorcycle-talk-1957-1985/63858-special-tools?t=395586>

4) 5) 7)

photo by Hopper of the XLFORUM

<https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-era-specific-and-model-specific/ironhead-sportster-motorcycle-talk-1957-1985/63858-special-tools?t=395586>

8)

photos by Dr Dick of the XLFORUM

<https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-era-specific-and-model-specific/ironhead-sportster-motorcycle-talk-1957-1985/125248-about-the-trans?t=1257259>

9)

photos by Hippysmack

10)

photo courtesy of Ebay seller, Robison Motorcycles [Link to Ebay Store](#)

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Last update: **2024/01/23 21:18**

