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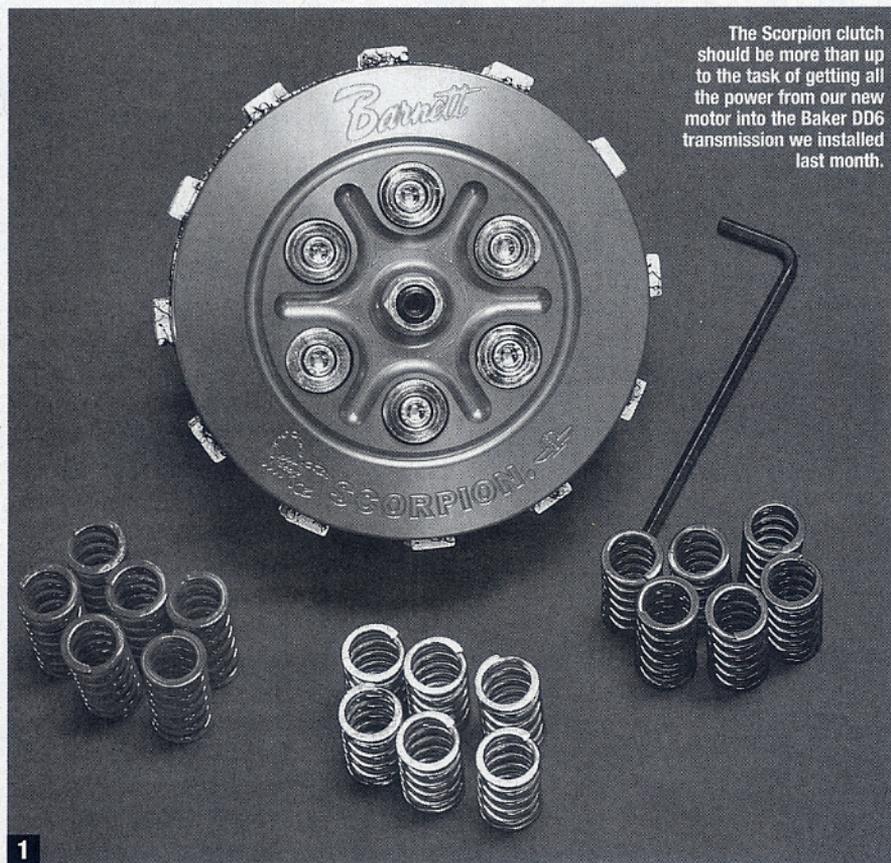
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VOLUME 38, NO. 11, 2006



# BARNETT'S SCORPION CLUTCH

GET A GRIP

BY STEVE BOHN ■ PHOTOGRAPHY: STEVE BOHN



The Scorpion clutch should be more than up to the task of getting all the power from our new motor into the Baker DD6 transmission we installed last month.

**1**

Dictionary.com describes a "clutch" as

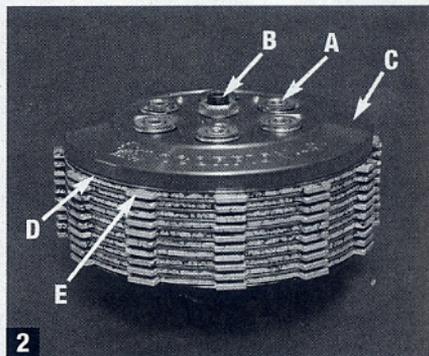
- 1 A device for gripping and holding.
- 2a Any of various devices for engaging and disengaging two working parts of a shaft and driving mechanism.
- 2b The apparatus, such as a lever or pedal, that activates one of these devices.

Ever since man began building mechanical devices, he's had the need to control the movement or force created by those devices. This simple concept has seen many different forms over the years, as it has been incorporated into so many items we use every day—everything from portable electric drills to heavy construction equipment, cars, trucks, conveyors, machining equipment, and, in our case, motorcycles. Basically, if there's a piece of equipment that generates a force—such as a motor or an engine—there's a pretty good chance that some sort of clutch mechanism is employed to deliver this force to its final destination, wherever that may be.

While clutches in the Sportster and Buell line differ from the Motor Company's Big-Twins, they all perform the same basic function: allowing the rider the ability to safely and predictably (in the case of a properly adjusted clutch in good working condition) deliver the power produced by the engine to the transmission. While Harley's designs work quite well in stock applications, they begin to show signs of diminished performance when placed in high-horsepower, high-torque applications. The lack of a clutch's effectiveness will normally show up as slippage, i.e., the lack of ability to deliver all the power an engine has produced to the transmission.

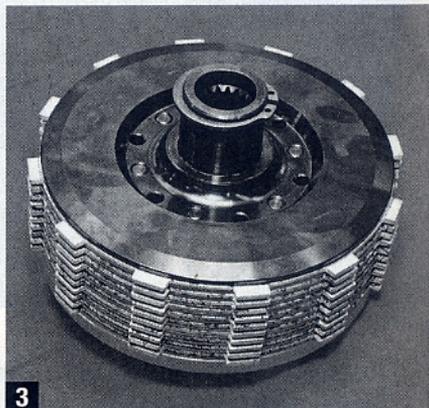
That's where Barnett Performance Products comes in. The family-owned and -operated company got its start as Barnett Tool & Engineering in 1948, when brothers Afton and Charlie Barnett began manufacturing motorcycle cables. Still owned by daughter Colleen and husband Mike Taylor, the pair has continued to produce some of the highest-quality components for the motorcycle industry available anywhere.

When it came time to assemble the driveline for our '99 Fat Boy, we knew the stock clutch just wasn't up to the task of handling all the power put out by our freshly assembled 96-inch Evo motor. So we got on the phone with Xavier Romero to see what Barnett had that would fit the bill. We chose a Scorpion Clutch Assembly (part No. 38520; MSRP: \$550). The kit includes a 4130 chrome-moly hub complete with studs, organic friction rings, steel drive plates, a 6061 T-6 billet pressure plate, and an assortment of springs that will allow you to fine-tune the clutch for optimum performance. Also included in the kit were various fasteners and a 5mm hex wrench for clutch adjustment. Barnett offers friction rings made from Kevlar for street use, organic for street and strip (the vast majority of what the company sells), and carbon fiber (for racing applications). Both the Kevlar and carbon-fiber versions are special-order items. **HB**



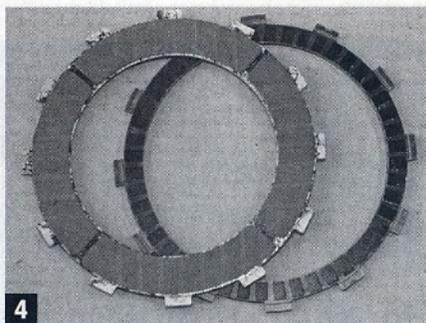
**2**

The clutch kit ships from Barnett assembled. Here you can see how all the components interface with one another. Starting at the top are (A) six springs, (B) clutch adjuster, (C) orange-anodized pressure plate, (D) 10 steel drive rings, and (E) 10 friction rings.

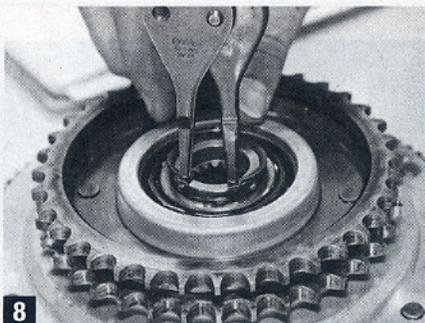


**3**

The backside of the assembly reveals the splined bore that will interface with the transmission's main shaft.



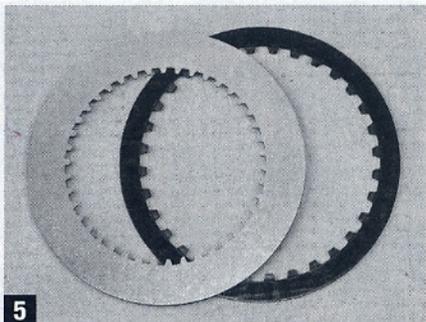
**4** It doesn't take a rocket scientist to see that Barnett's friction rings (left) have far more surface area than H-D's stock rings (right).



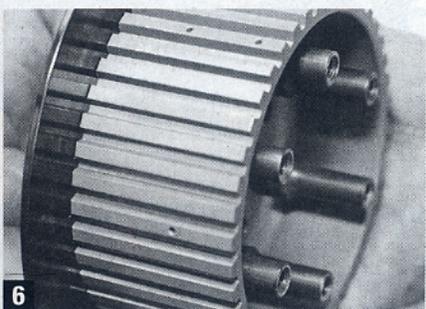
**8** He then removed the snap ring from the stock clutch hub on the backside of the clutch basket.



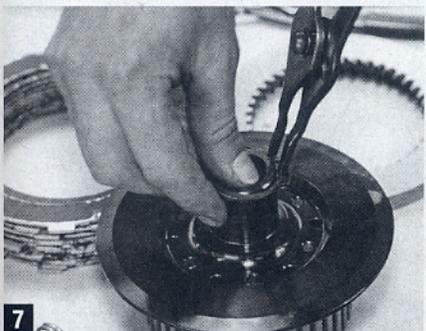
The stock hub was then carefully pressed out of the clutch basket with the help of a hydraulic press. ▶



**5** The same goes for the steel drive plates. All told, the Scorpion will give you approximately 100-percent more gripping surface than the stock clutch. This extra area allows for the use of lighter clutch springs without the fear of slippage.



**6** Barnett's clutch-disk spline is drilled in various places with 1/16-inch holes. These holes allow primary fluid to flow between the plates and steel, allowing for better cooling.



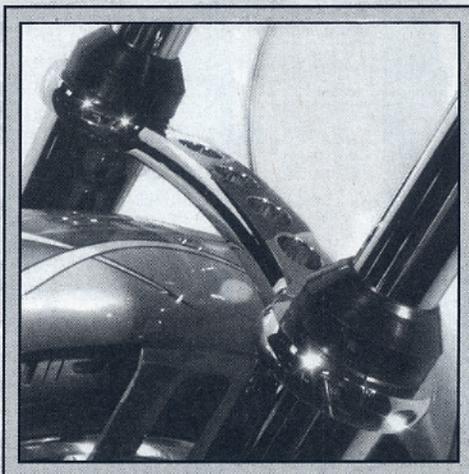
**7** Since we were reusing the stock Harley clutch basket, Eric Bennett disassembled the clutch assembly, making sure to remove the new snap ring installed on the hub.

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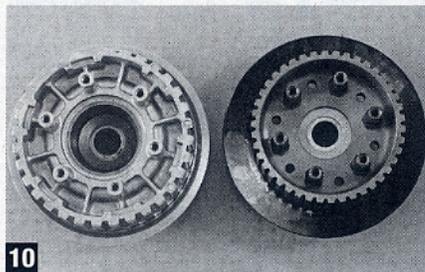
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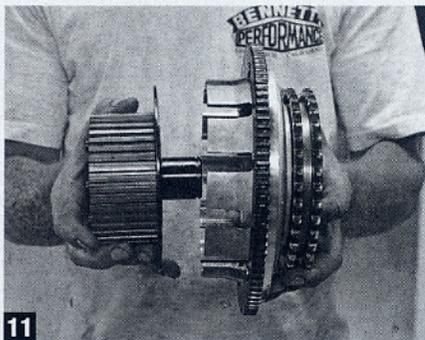
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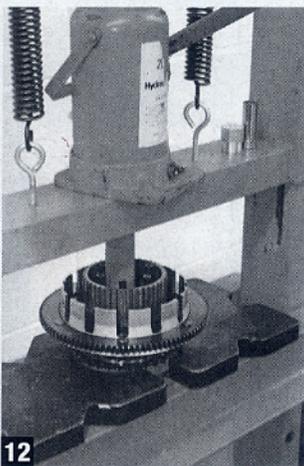
**10**

Here's a good look at Barnett's hub on the right, and the stock cast hub on the left. Barnett uses steel components, while the piece from Harley is made primarily from an aluminum casting. If you should encounter a problem with a stud on the Barnett piece, it can be replaced, while the stock hub is non-serviceable.



**11**

Installation of the new clutch hub is a simple matter of centering it in the clutch basket...



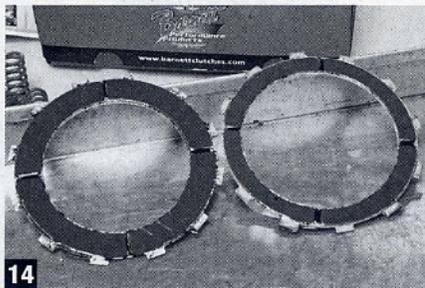
**12**

...and pressing it into place.



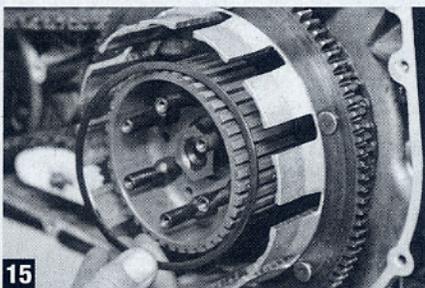
**13**

It's a good idea to soak the new friction rings in fresh primary fluid prior to interleaving the friction rings and the steel drive plates. This will ensure they are properly coated with fluid the first time the clutch is operated.



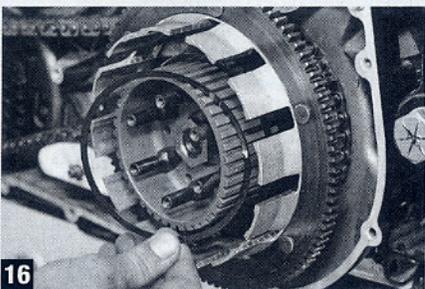
**14**

Barnett ships the kit with 10 friction rings. Nine of them are like the one seen on the left. The single ring on the right has a larger hole in the center; this ring is designed to be installed on the clutch hub first. The larger hole allows room for the flat steel ring and the damper dished spring, which will be installed prior to the first friction ring.



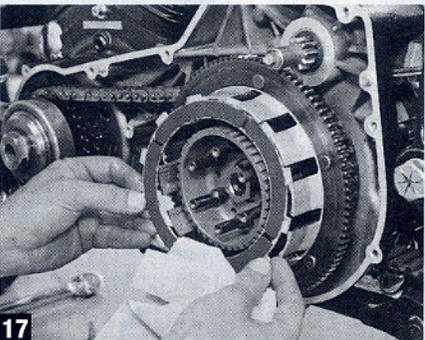
**15**

Our stock clutch basket, with pressed-in Barnett clutch hub, was installed previously with the new transmission. Here, Eric begins by installing the small flat steel ring...



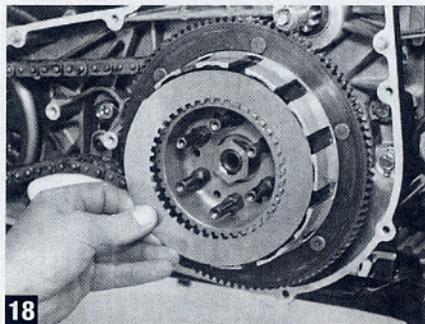
**16**

...followed by the damper dished spring, which was designed to help separate the rings and plates while reducing chatter. When doing this, it is important to place the ring with the white dot facing out.



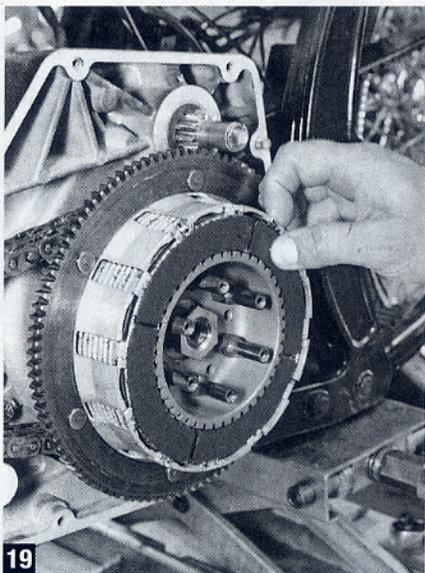
**17**

Next, the single friction ring with the larger center hole was put in place.



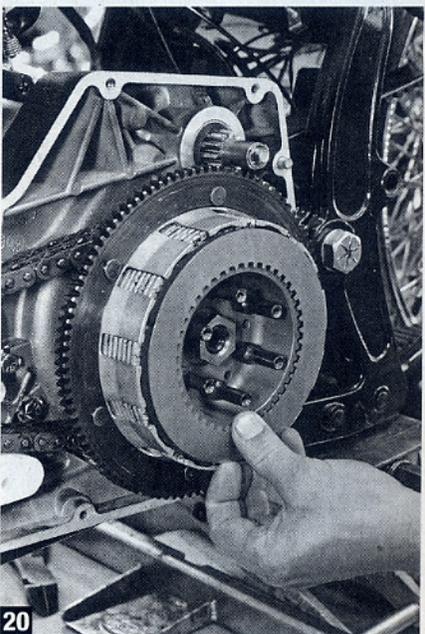
**18**

Then Eric installed the first of 10 steel drive plates.



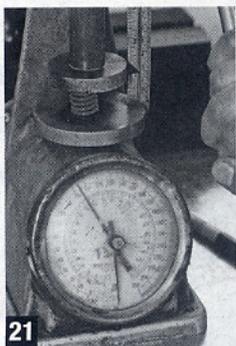
**19**

The remaining friction rings and drive plates were then alternately installed until they were all in place.



**20**

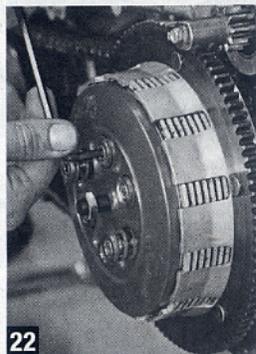
The last piece prior to the pressure plate being installed was a steel drive plate.



21

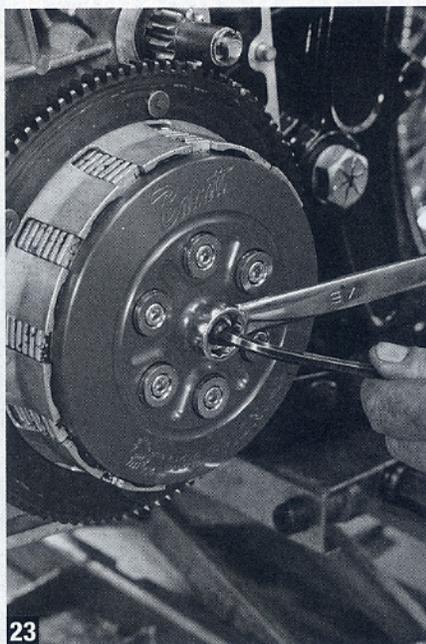
To allow for ultimate adjustment of the clutch, Barnett ships four sets of springs with the kit. The springs are color-coded based on spring rates. The colors are gold (two sets), green, and red. By swapping springs (either entire sets or portions of them), it is possible to fine-tune the clutch for virtually any motor/transmission combination. Here,

Eric checks one of the red springs in a spring scale. Based on 1 inch of compression, the springs have the following rates: Gold, 42 lbs; Gold, 58 lbs; Green, 82 lbs; and Red, 100 lbs.



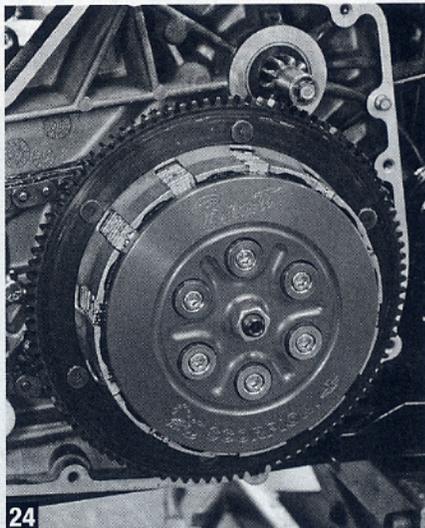
22

We decided to start off with the six green springs. This should give us plenty of clamping force. Once we get the bike up and running, we will see how the clutch feels and swap springs accordingly.



23

Adjustment of the Scorpion is the same as the stock clutch. With a loose locknut, Eric ran the clutch adjuster screw (with a 5mm hex wrench) all the way in until it bottomed out, then backed it off 3/4 of a turn and tightened the locknut.



24

All that was left to do at this point was install the primary cover and fill it with fluid.

#### ► SOURCES

**Barnett Performance Products**  
(805) 642-9435  
www.barnettclutches.com

**Bennett's Performance**  
(562) 498-1819

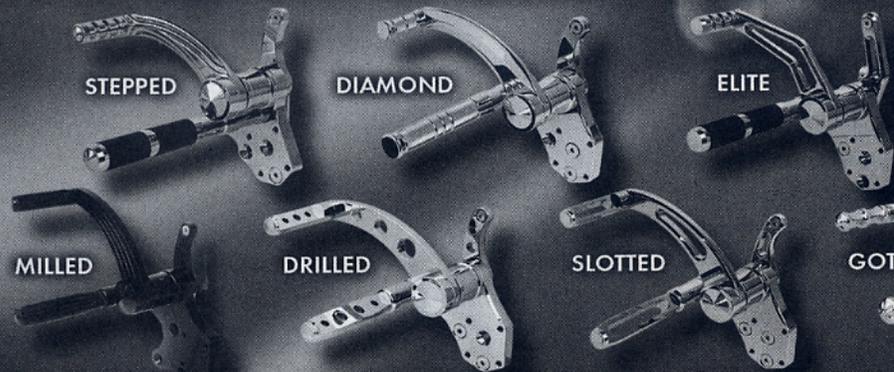
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