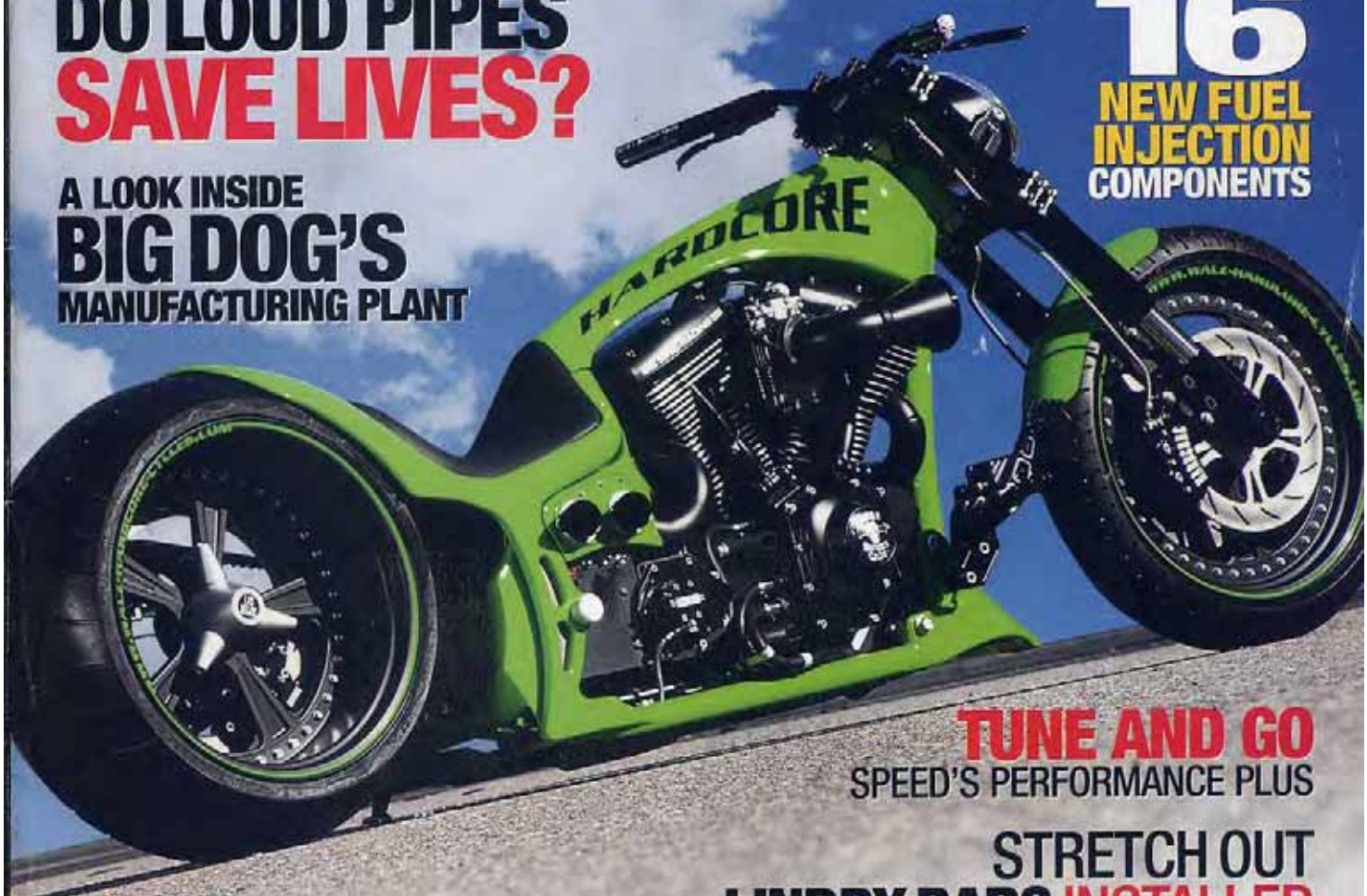
124-INCH BAGGER BUILD **MATT HOTCH** TEAMS WITH S&S

HOT BIKE

DO LOUD PIPES SAVE LIVES?

16 NEW FUEL INJECTION COMPONENTS

A LOOK INSIDE
BIG DOG'S MANUFACTURING PLANT



TUNE AND GO
SPEED'S PERFORMANCE PLUS

STRETCH OUT
LINDBY BARS INSTALLED

ROAD TESTS:
BMC BOBBER
COVINGTON SPEEDSTER

JIMS HELPS US STROKE OUR EVO
96-INCH BOTTOM-END BUILD

VOLUME 38, NO. 4

HB TECH

THE HEART OF THE BEAST

JIMS Stroker Flywheels

BY STEVE BOHN ■ PHOTOGRAPHY: STEVE BOHN

In the March '06 issue of *HOT BIKE* we began a motor build project. Things got started with Eric Bennett pulling the stock 80-inch Harley motor out of our '99 Fat Boy. Once the motor was disassembled, the empty cases were bolted back together and fitted in a JIMS case-boring jig to allow the spigot bores to be opened up in order to accept a set of 3-5/8-inch-bore Axtell iron cylinders. This month we will be concentrating on the features of the new JIMS flywheels, as well as how they are installed in the case.

Plans for the motor call for 96 inches of displacement. To attain that figure, we will be increasing the bore and stroke from 3-1/2 x 4-1/4 to 3-5/8 x 4-5/8. The new flywheel assembly (MSRP: $1,032.25) will be the means of increasing the stroke a total of 3/8 inch. Since the piston moves both up and down, the crank pin on the new flywheel is located 3/16-inch farther outward than the stock crank pin (3/16 + 3/16 = 3/8).

Prior to beginning assembly of the motor, we sent the cases, cylinders, heads, and inner primary to Concept Powder Coating Inc. in Rancho Cucamonga, CA, for a fresh coat of black wrinkle-finish powdercoat. Even though the new Axtell cylinders and STD heads looked really good when we received them, we wanted to be certain all the different pieces of the motor matched one another once they were assembled. Since the process of applying powdercoat involves heating up the part to be coated (melting the powder to attain the final finish), many folks are concerned that the powdercoat might have problems once the motor is up to operating temperatures. Don't sweat it—the finish should come through with flying colors. Mike at Concept did tell us that certain colors—particularly candies—may have problems with heat retention, so check with your powdercoater to be sure. HB

1

Before beginning, we inspected the cases and were impressed by the care taken at Concept Powder Coating to meticulously mask off all the areas where the washers would sit under the case bolts.

2

Further inspection showed that the same care had been taken in the oil-pump mounting area, as well as in the other surfaces.

3

The sprocket shaft could be considered the business end of the flywheels, since it protrudes through the left case half and into the primary as it drives the compensator, sprocket, primary chain, and clutch. ▶

4

This area machined into the 4140 American-made forged-steel blanks is specifically designed to remove oil from the flywheel as it spins. This design makes for less drag on the wheels, while at the same time helping the oil cool at a faster rate.

5

The circumferences of the 8-1/2-inch wheels have grooves machined in them to aid in aerodynamics.

6

The flywheel assembly is made up of five major components: two wheels (a right and a left), a sprocket shaft, a pinion shaft, and the 1.250-inch crank pin (*shown here*), which not only holds the wheels together and in position but is also used to anchor the connecting rods.

7

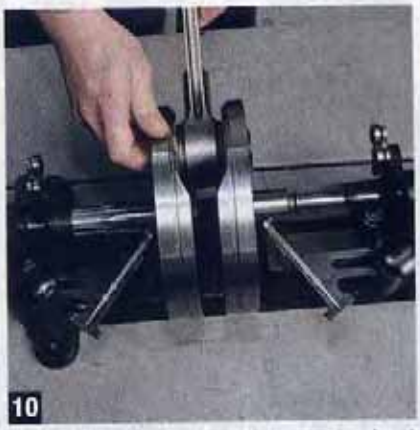
JIMS begins with blanks made of 4340 chrome-moly steel for its sturdy connecting rods. By the time the H-beam rods are complete, they have been milled, heat-treated, Magnafluxed, shot-peened, hardness-checked, and then milled again. The lengths of the rods for our application are 7.440 inches.

8

The pinion shaft passes through the right case half into the cam chest, where it drives the camshaft, which in turn spins the breather gear and oil pump. JIMS utilizes a two-key design similar to the one Harley used from the early '70s to the late '80s.

9

Lubrication for the crank pin makes its way through a small hole in the end of the pinion shaft and into a cross-drilled hole in the right wheel before flowing into the crank pin, on its way to the connecting-rod rollers.



10

Although the flywheels came from JIMS already set up, we placed them in a Rowe Machine truing stand to determine if they were in spec. The stand holds the wheels precisely in position as they are rotated. Indicators following the circumference of the shafts show how true the wheels are to one another.

11

Harley's spec for this is .002 inch. We recorded readings of .0007 inch on the sprocket shaft and .0006 inch on the pinion shaft—well within the specifications.

12

Eric used a propane torch to bring the temperature of this Timken bearing to just over 300 degrees F. This allowed the bearing to grow so it could be slipped easily over the sprocket shaft. ▶

Once the bearing had cooled, Eric applied some assembly lube to it prior to...

...readying the outer race snap ring for installation. The sprocket shaft will eventually pass through the outer race snap ring...

...but the snap ring must first be installed in the left-side case half with this slick little tool made by JIMS (part No. 1710). Without this tool, installation would be very difficult, and damage to the case is a distinct possibility.

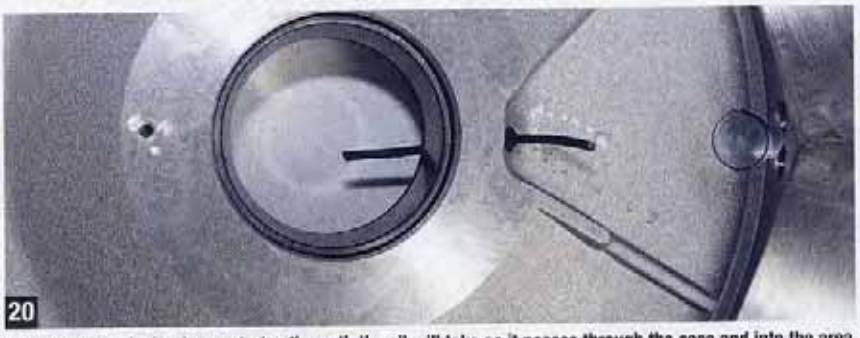
A good look at the snap ring in place with the gap positioned at the top ensures proper oil flow to the bearings. To demonstrate the direction of the oil flow, Eric inserted a pick in the oil passage drilled in the case.

Next, a pair of bearing races needed to be pressed into the left side case, sandwiching the snap ring.

This custom-made tool makes race installation a breeze. ▶

19

After a few cranks of the ratchet, Eric had both races tight to the snap ring.



20

A small piece of wire demonstrates the path the oil will take as it passes through the case and into the area between the inner and outer Timken bearings. This will ensure proper lubrication of the bearings.

21

Sitting in a jig clamped in a vise, the left case half is ready to pass over the sprocket shaft.

22

The outer Timken bearing is slipped over the splined portion of the sprocket shaft, prior to...

23

...being seated with a JIMS installation tool (part No. 97225-55).

24

A dial indicator on a magnetic base was then used to check the sprocket shaft endplay. It measured just .001 inch, well within spec. ▶

25

To finish things up on the left side, Eric used a JIMS sprocket shaft install tool (part No. 2324) to seat the main shaft seal.

26

After taking measurements of the pinion shaft and rollers from the pinion bearing, Eric consulted a chart for the proper pinion bearing to be used. The bearings are available in four different color designations that correllate to different-size rollers. Our application required a red one, giving us .0007 inch of clearance. Using a pair of snap-ring pliers, Eric seated the ring that will hold the pinion bearing in place.

27

Next, the right case half was slipped place.

28

All that was left to do was install the case bolts and studs, then pull out the torque wrench and tighten them to 22 lb-ft.

▶ SOURCE

Bennett's Performance
(562) 498-1819

Concept Powder Coating Inc.
(909) 945-2991
www.conceptpowdercoating.com

JIMS Machine
(805) 482-6913
www.jimsusa.com