

**CAN THE GOV'T KILL MOTORCYCLING?**

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# FLOW AND GO

## Feuling Oiling System and Reaper Cam Install

On some Twin Cam engines, misaligned oil pumps have a way of making trouble for an otherwise great running motor. Other Twin Cammers have found that significant parts wear, hardened oil seals, and even an incorrectly installed O-ring on the oil pump mating surface can wreak havoc on an engine. The Twin Cam's oiling system has many functions including maintaining proper oil pressure and oil volume, and helping keep internal components from generating excessive heat or noise. Another key function is to avoid wet-sumping. Wet-sumping is when the scavenging section of the oil pump cannot keep up with the task of removing the residual oil from the crankcase fast enough, resulting in oil building up in the crankcase and cam gearcase. This can cause friction and power loss. With excess oil in the crankcase another problem can arise, oil aeration. In this situation oil is whipped up in a froth of oil and air which can impede scavenging and oil returning from the rocker box area. This can lead to several problems such as oil forced out the head breathers, oil filter contamination, loss of oil supply, lifter clatter, and much worse. Our friend's '07 Street Glide was going to be getting a bump up in displacement, and while he hadn't been experiencing any issues with the oiling system, he thought it would be a good idea to upgrade the lower end before bumping up the top end. We decided to give the oiling specialists at Feuling a call. After speaking with them at length regarding our needs, they suggested we install one of their Oiling System Combo Kits (\$859).



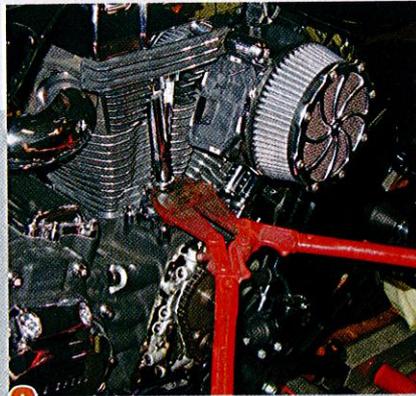
Feuling's kit is a combination of a billet high-volume oil pump, a hard-anodized CNC-machined cam plate, hydraulic roller lifters, and a gasket set. Feuling states that this kit increases oil pressure, oil volume, oil flow, and will help maintain sufficient oil scavenging to eliminate wet-sumping. Feuling said its tests also showed a decrease of engine temperatures up to 35 degrees as well as an increase of 3 hp and 4 lb-ft of torque to the rear wheel.

Since we would have the cam plate off the bike, we thought it would also be a good time to upgrade the cams to something a bit healthier. After discussing this with Feuling, we went with a set of its 574 Reaper cams (\$339). These cams are great all-around camshafts with good low-end performance and some ripping mid- and top-end power. Plus there will be room to grow with performance upgrades. Feuling also suggested that we go with a set of its HP+ Fast Install adjustable 7/16-inch chromoly pushrods (\$239). These pushrods use a minimal adjustment surface which eliminates the flex associated with other adjustable pushrods. Feuling now makes this in an all-in-one kit called the Feuling Complete Camchest Kit, which includes everything you see here in one easy-to-buy package.

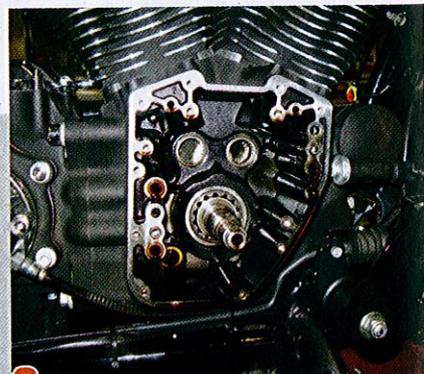
Once we got the big box o' parts from Feuling, we trucked over to Freedom Cycles and followed along as they installed the parts. Here's how it all went. **HB**



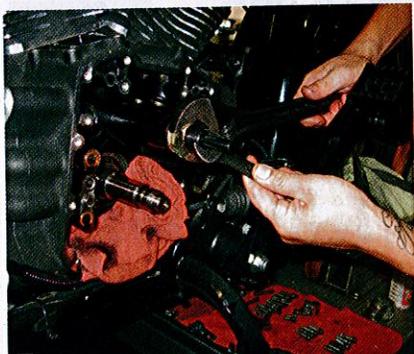
**1** To gain access to the cams, cam plate, and oil pump, we removed the cam cover from the engine.



**2** The stock pushrods were cut out since they were to be upgraded with new units from Feuling.



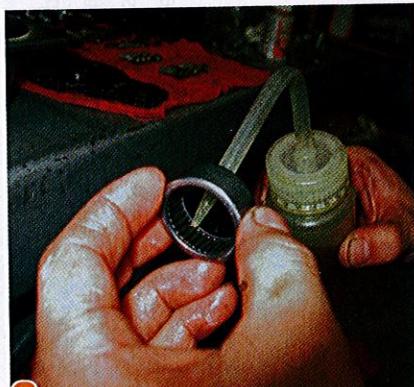
**3** The stock cam plate, cams, and oil pump were removed, and the cam chest was thoroughly cleaned. We also checked the crankshaft run out and for any wear.



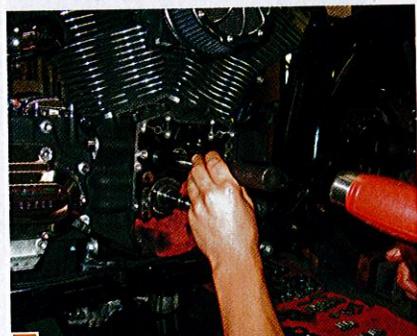
**4** We pulled the stock inner cam bearings from the case since we would be replacing them with new Timken units.



**5** The Timken bearing on the left has double the bearings as the stock H-D bearings. This aids in smoothness and longevity of the bearing itself.



**6** The Timken bearings were pre-lubed with motor oil before insertion. This keeps the bearing from undergoing any sort of premature wear.



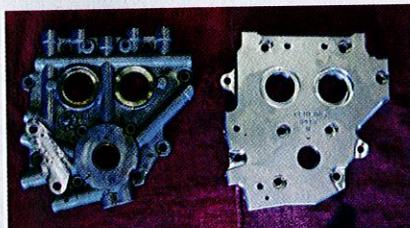
**7** Using the proper tool for the job, an H-D cam bearing press, we installed the new Timken inner cam bearings without any issues.



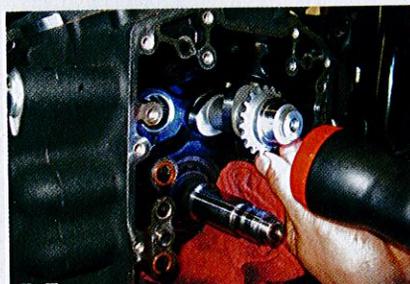
**8** The stock cams and cam plate were separated so we could gain access to the cam drive chain, which we would be using with the new parts.



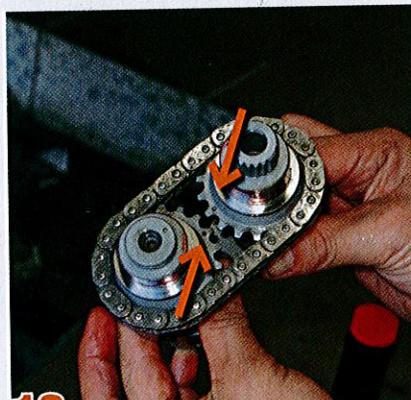
**9** The Feuling Reaper cams on the right give this bike some more torque due to their larger lift (574 intake/574 exhaust) and duration (240 intake/255 exhaust) over the stock units on the left.



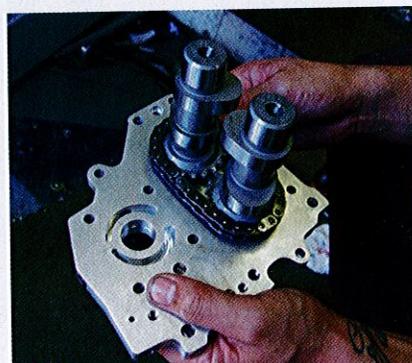
**10** The Feuling CNC Billet Cam Plate (right) increases oil flow by enlarging the critical oil passages and reservoirs compared to the stock H-D unit.



**11** Before installing the cams in the cam plate, we checked to see if there was any interference between the cam lobes and the engine case, which there wasn't.



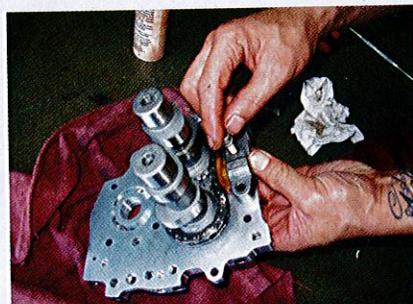
**12** The cams were installed onto the chain as per Feuling's directions with the timing marks (arrows) facing one another.



**13** The cams were then slid into the cam plate and checked for any binding.



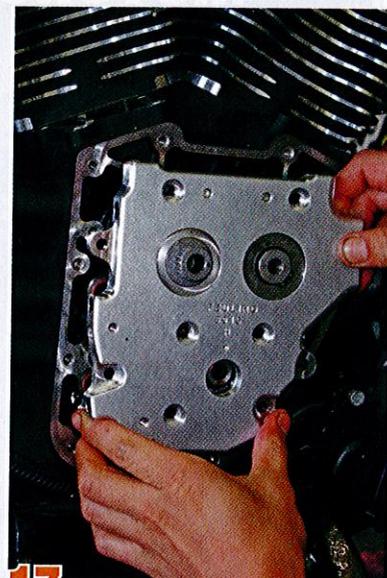
**14** The single retaining circlip was installed on the cam to keep them securely in place.



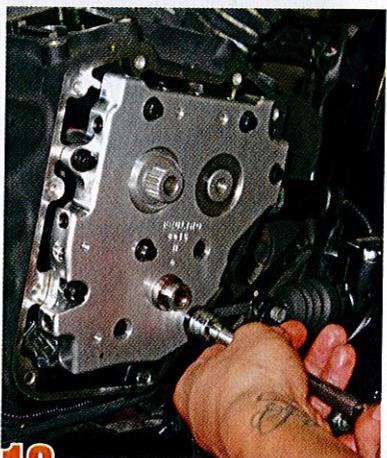
**15** The cam chain tensioner was reinstalled using thread-locking compound.



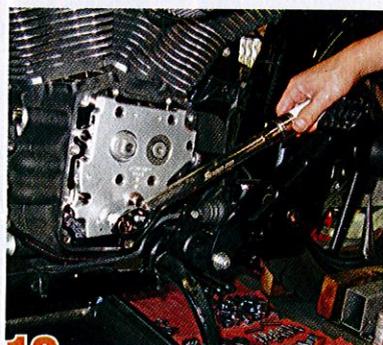
**16** The new high-volume oil pump was assembled as per Feuling's instructions, then we installed it into the cam chest.



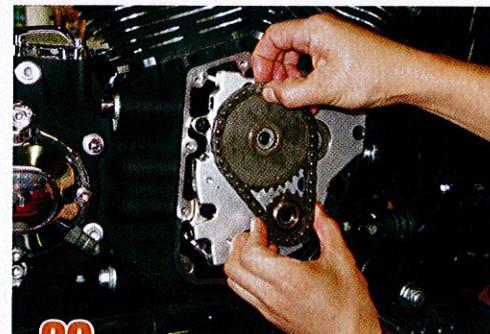
**17** The cams and cam plate were slid into the cam chest and onto the oil pump as a complete assembly.



**18** The cam plate and oil pump bolts were snugged up and the engine rotated by moving the rear wheel by hand several times. This action properly centers the cam plate, oil pump, and gears on the crankshaft.



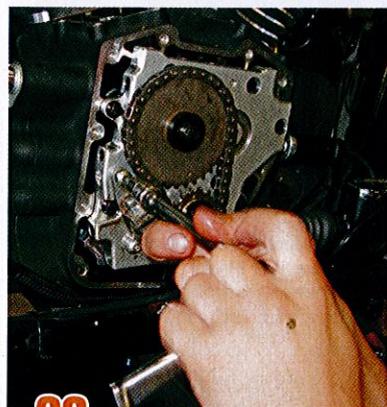
**19** After everything checked out to be aligned properly, the oil pump and cam plate bolts were finally torqued to 110 lb-in as per Feuling's instructions.



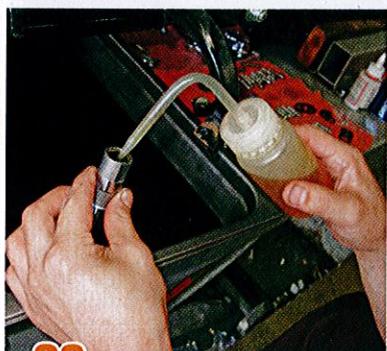
**20** The crank and primary cam sprockets, as well as the chain, were slid onto the new cams.



**21** The crank cam sprocket bolt was treated with red thread-locking compound and torqued to 15 lb-ft.

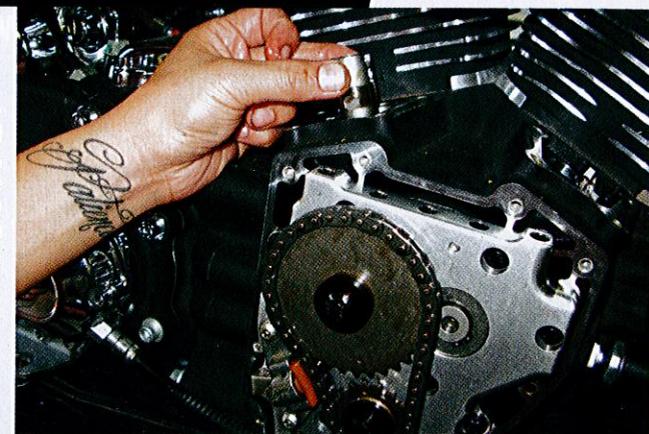


**22** The primary cam was also thread locked and torqued to 15 lb-ft.



**23** The new Feuling hydraulic lifters were filled with engine oil to keep them lubed on their initial startup.

**24** With the lifters externally coated with assembly lube, they were carefully inserted as to not damage the cam lobes.



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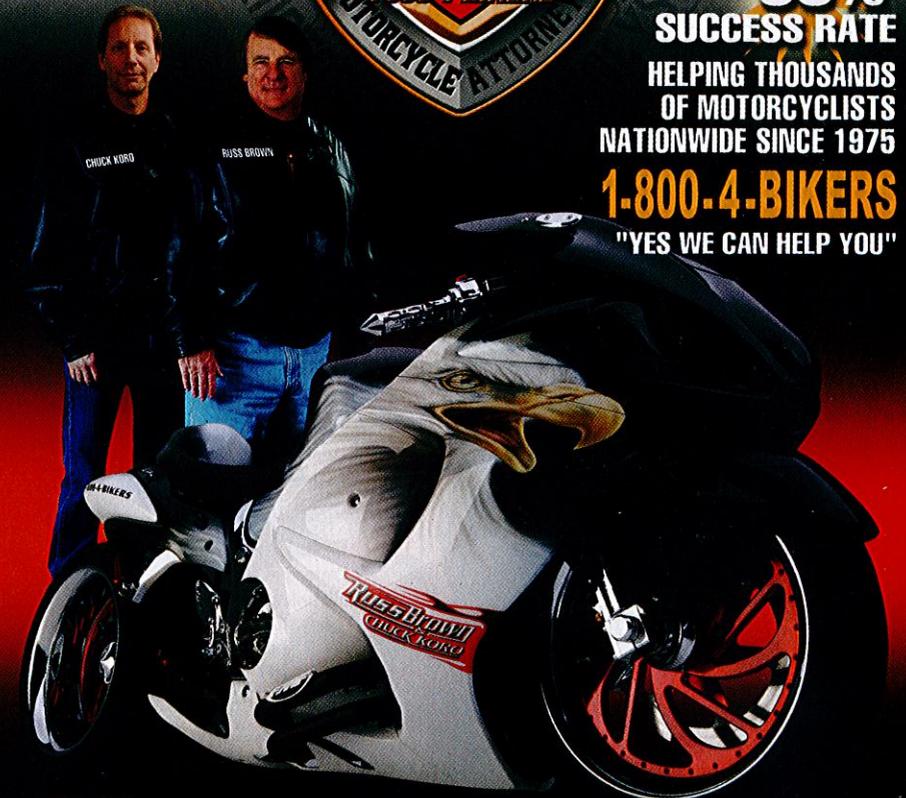
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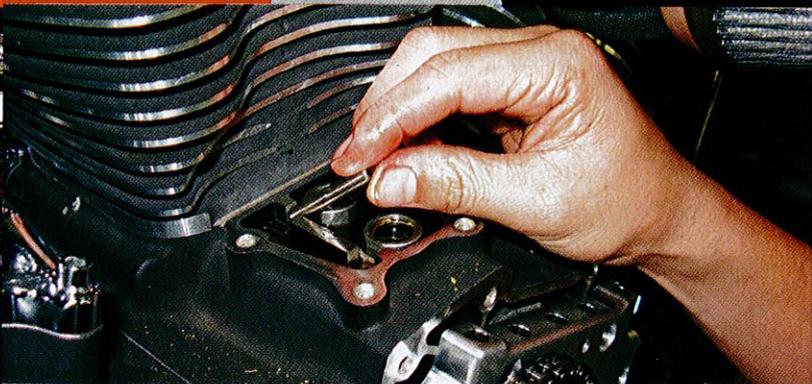
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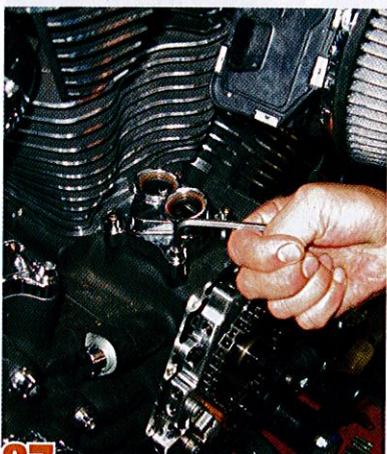
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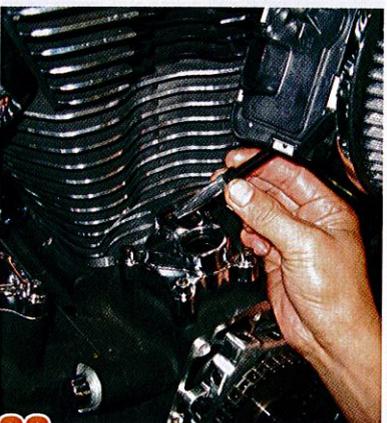
**25** Once the lifter-to-camshaft lobe clearance was checked, the roll pin was reinstalled.



**26** The surface was cleaned and new Feuling lifter block gaskets were installed on the engine case.



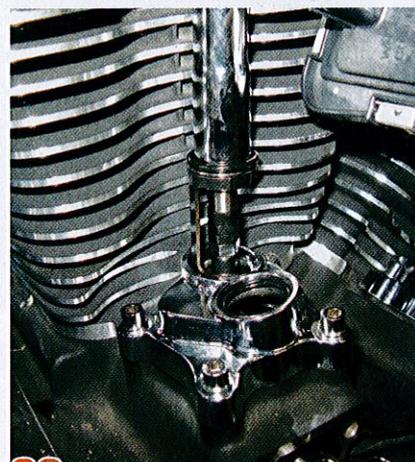
**27** The lifter blocks were reinstalled and checked for proper clearance before being torqued to factory specs.



**28** To install the Feuling adjustable pushrods, the base of the pushrods were installed into the lifter block first making sure they were sitting in the pocket of the lifters.



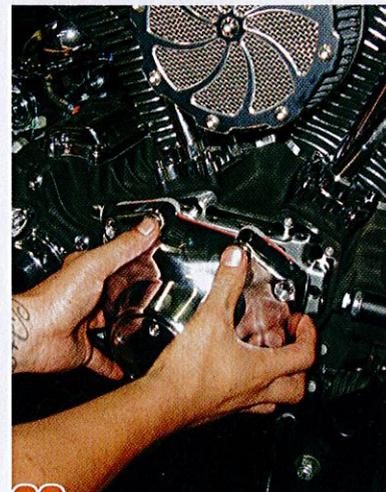
**29** We then inserted the upper part of the adjustable pushrods into the pushrod tubes.



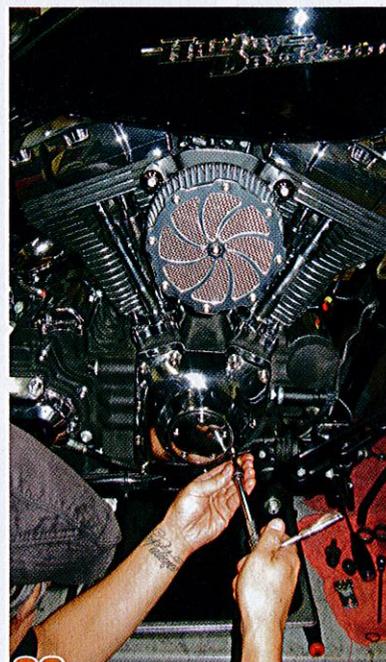
**30** Using the Feuling-supplied fixture, we were able to hold up the pushrod tube to easily assemble the upper and lower parts of the pushrods by hand.



**31** With thread-locking compound setting up on the threads, we adjusted each pushrod to Feuling's specs and tightened the jam nuts.



**32** Once we checked everything out, we cleaned the mating surfaces of the engine block and reinstalled the cam cover with the new Feuling-supplied gasket.



**33** The cam cover was then installed and the lower end upgrade was done. After waiting a day for all of the thread-locking compound to dry, the owner hopped on the Street Glide and immediately noticed a seat-of-the-pants difference in power. Unfortunately, we ran out of time and didn't get a chance to put the bike on the dyno for some results. But stay tuned next time as we bump up the displacement to 110ci on this Street Glide and then throw it on the dyno.

**SOURCE:**

Feuling  
(619) 917-6222 | feulingparts.com

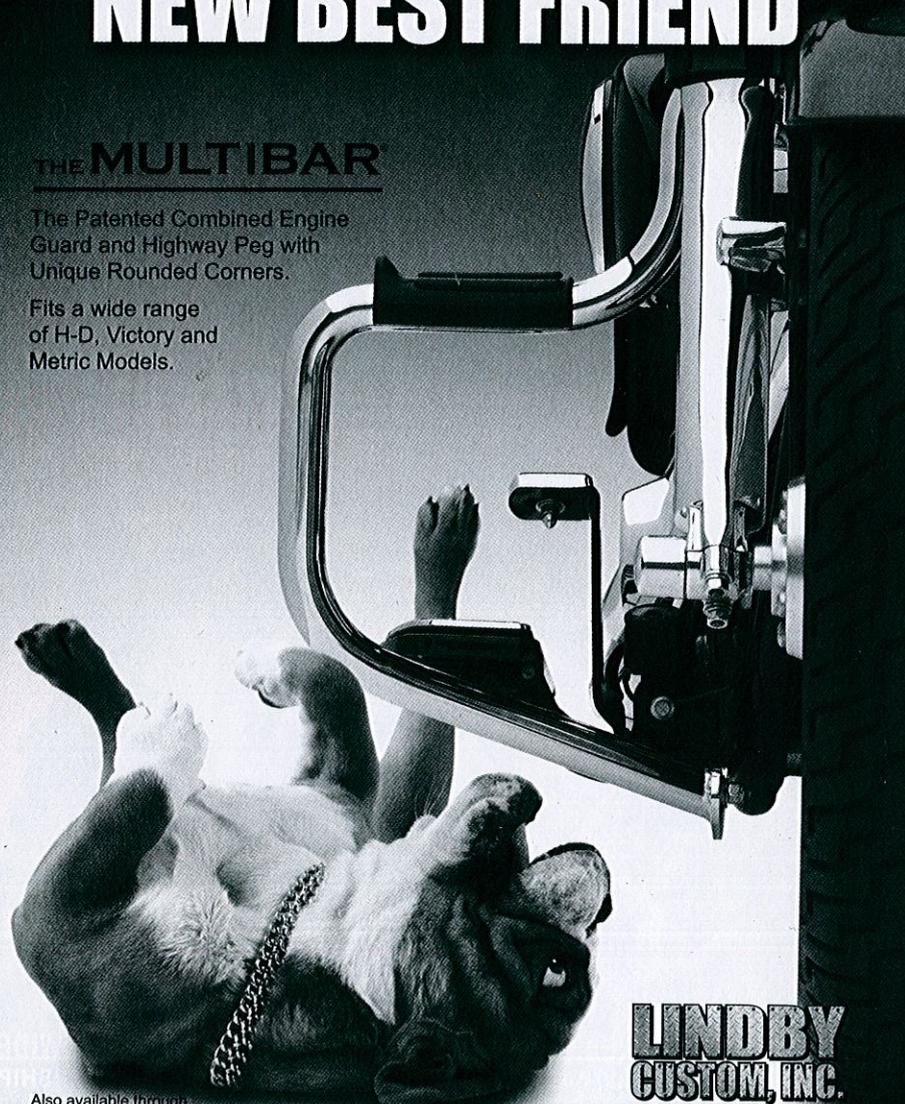
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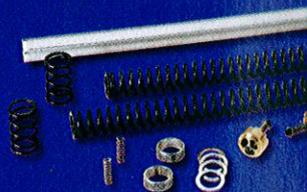
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