

Hard launches without wheelies or rear tire pyrotechnics were made possible by good weight distribution and tractable low-end power.



Ulrich gets the good news from Vance Breese; a 10.554 at 130.24, quickest time ever through the quarter mile for Cycle World.

Sputhe shook his head. "Then you'd have to put decals on it."

Back to the shop for teardown.

Weight and measurement time. With a half tank of gas (2 gal.) the Harley tips the scales at 347 lb. Weight distribution is 48 percent on the front wheel and 52 on the rear. Rake and trail are 27° and 3.9 in. respectively. The wheelbase is 55.5 in. In other words, the bike is about half an inch longer than a 400 Hawk but weighs 51 lb. less. It also has more horsepower.

"There are two approaches to horsepower," Breese said. "There's the electric high-speed machinegun method, and then there's the big cannon. This is a big cannon. A big engine doesn't have to work so hard to produce power, and it's usually simpler and lighter."

The Harley has been on a rear wheel dyno only once, Sputhe said. The dyno had trouble with the Harley's irregular power pulses and allowed the rear tire to slip and smoke in the rollers. They came up with corrected figures of 108 bhp at 7000 rpm and just over 100 lb.-ft. of torque, peaking at 3800 rpm. Breese thinks actual horsepower may be closer to 120, according to his speed and gearing calculations, though he hesitates to make concrete claims because of the many imaginative and inconsistent ways horsepower is measured. Like Rolls-Royce, Breese and Sputhe could probably say the Harley's horsepower is "adequate".

The bike's 290cc of extra displacement over the stock Sportster is gained by a bore increase from 3.18 in. to 3.6 in. Stroke is stock, at 3.8 in. Sputhe says most speed tuners of Harley-Davidsons have increased power and displacement by lengthening stroke, but this limits rpm because of dangerous piston speed. The Harley needs better breathing and carburetion, he says, not a longer stroke. Enter the Sputhe heads and barrels.

The heads are cast from 356-T6 alumi-

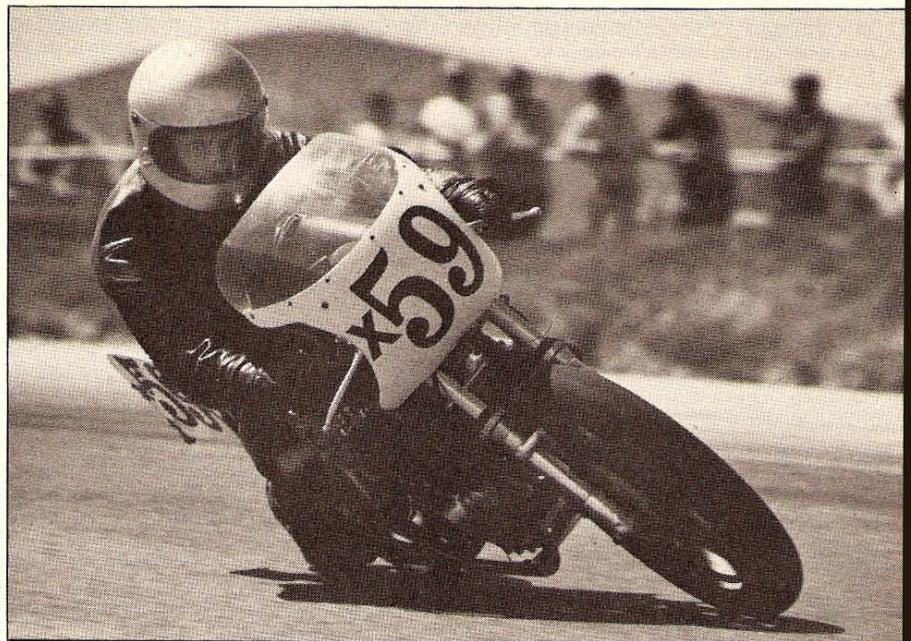
num and have stellite valve seats shrunk in. Chambers are shaped into what Sputhe half-jokingly refers to as a "polyspherical bathtub chamber". The intake valves have stock Sportster head diameter, 1.9 in., but have longer shovelhead-style stems to allow a more laid-down valve angle for better flow through the ports. The exhaust valve, at 1.75 in., is 0.115 in. larger than stock. Valve springs are from Jerry Branch.

The barrels are of the same aluminum as the heads, with manganese iron liners. The aluminum is cast around the liners and then heat-treated to assure proper bonding and good heat transfer. Sputhe has spent considerable time experimenting with cooling fin shapes and numbers to arrive at the correct operating temperature for the Harley. He says the engine never has over-

heating problems; after the Ontario race the oil temp was 150° F.

The aluminum barrels and heads provide less weight and a lower cg for the bike, as well as more horsepower. A Sputhe head on our scales weighs 8.75 lb. versus 14.5 lb. for the stock part; the cylinder barrel 8.75 instead of 12.5 lb. Taken together, a weight saving of 19 lb. The entire engine, complete with carbs, weighs only 166 lb.

Four long studs of 4130 centerless-ground steel extend from the cases up through each cylinder and head, holding it all together. Threads are rolled on, rather than cut, for improved strength. Sputhe explains that strong studs are critical because a high performance Harley with stock base bolts can—and will—blow the



Vance Breese in Turn Four at Willow; the Harley's high lean angle is well suited to Breese's tucked-in riding style.