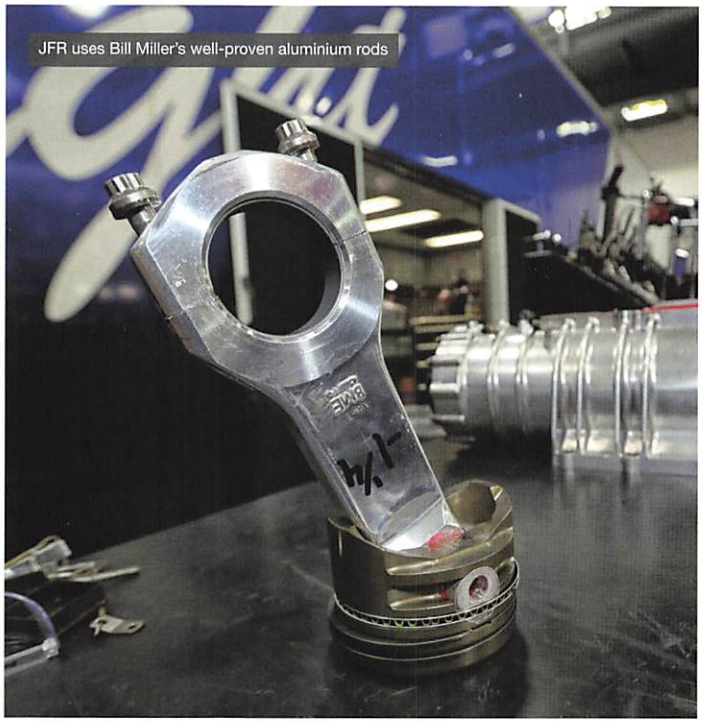
JFR uses Bill Miller's well-proven aluminium rods

The piston and rod package

The 2008 crankshaft was driven by Venolia pistons and BME piston pins and con rods, which follow the normal pattern of this type of engine. "We still use BME rods," reports Prock. "Bill has made a material change to his latest con rod, and we have had very satisfactory results with more longevity.

"Now that Venolia is closed, we run CP-Carrillo pistons. Those pistons have a different design from what we had in 2008. There has been a modest change to the cylinder clearance – we've got a little tighter – and the piston also has a little different shape. 2019 was the first year of running them, and they worked really well.

"We tested the CP pistons a couple of years ago and scuffed them the first time we ran them. The thing about this Fuel racing is that what works in a Top Fuel car might not work in a Funny Car, and then you run into differences in the various blocks – maybe how the main studs are arranged or the stud length. You have to build a custom piston to fit somebody's block and how those cylinders are moving or distorting or whatever.

"So CP had to customise stuff for us. I know our pistons are different ▶

"The pistons have a different design from what we had in 2008, with a modest change to cylinder clearance"

THE PISTONS AND RINGS

Bryan Moreland of CP-Carrillo remarks that in designing its pistons as used by JFR it has concentrated on stabilisation within the bore, and he notes that around BDC is the most problematic owing to the stroke. The key to this stabilisation is in the geometry of the piston above the skirt area; he declines to be more specific than that.

He notes that another characteristic is the relief on the corners of the ring lands, rather than leaving them as sharp edges. That helps avoid ring stick caused by transfer of material from the piston.

As usual, this piston has its pin retained by buttons that the oil control ring passes over. Moreland remarks that this type of engine doesn't need an oil control ring until the driver comes off the throttle – the oil won't come up under the pressure of combustion! He says CP-Carrillo is investigating the use of a 3 mm oil control ring. Currently the oil control ring has an axial height of 3/16th (4.76 mm). This is a standard, uncoated steel oil control ring supplied by Mahle.

Long consigned to history in most other types of racing, a Dykes-type top ring was until recently standard for Fuel motors. This is a lightweight (inverted) L-shaped ring with very low spring tension. During the intake and exhaust strokes it exerts little in the way of side force on the cylinder wall, but on the power stroke combustion gas can flow down past the increased gap around the top land and through the convoluted space between ring and piston and force the ring out against the bore.

The theory goes that friction is only apparent during the combustion stroke. However, needing a special piston with grooves to match, its asymmetric profile can make it hard to seat, leading to higher bore wear. Working with ring supplier Mahle, CP-Carrillo has developed a conventional alternative to the Dykes ring for JFR. This is a PVD-coated, barrel-faced steel ring production, which has an axial height of 1/16th (1.59 mm)

Moreland also observes that a conventional intermediate oil scraper ring is inappropriate in this environment. "You don't want to scrape too much oil off the cylinder wall," he says. Consequently, the top and intermediate rings are identical. In effect, says Moreland, the intermediate ring is simply a back-up, and CP-Carrillo is considering reducing its size.

The piston itself is a 2618-T6 aluminium alloy forging that is hard-anodised all over, primarily to the benefit of the skirt and ring lands. It features cam and barrelling of the skirt, and various compression heights are supplied, with a 40 thou maximum variance between the options. The compression height adjustment is made above the top ring (which is always the same distance from the pin axis). The bare piston weight is 850 g ±20 g.