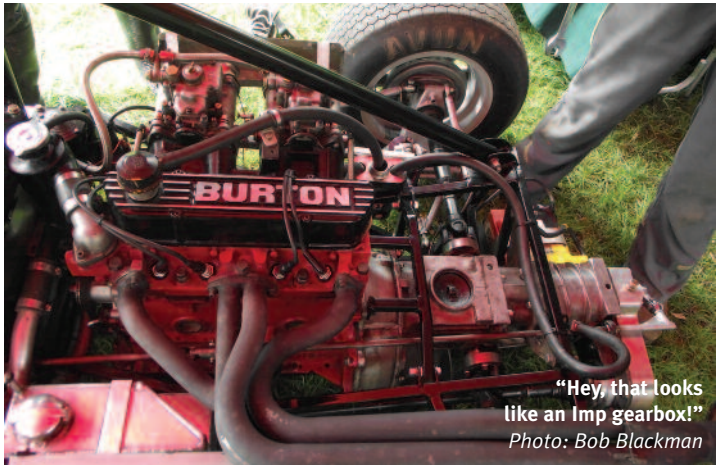
Raven 4WD – not Imp powered but Imp transmitted...

Bob Blackman, Liskeard, Cornwall

Last year I was strolling nonchalantly round the paddock at Wiscombe... No, that's not right. Let's start again.

I was running round the paddock at Wiscombe in an over-stimulated state of febrile excitement caused by all the amazing rolling sculpture when something stopped me dead in my tracks: *a Hillman Imp gearbox*. Not only that, it was upside down and attached to some wheels. This could mean only one thing – it must be in some sort of mid-engined device.



"Hey, that looks like an Imp gearbox!"
Photo: Bob Blackman

As my senses struggled to take in what they were experiencing, my eyesight in particular, I realised it was not connected to a Hillman Imp engine, so it wasn't a Vixen Formula 4 racer. Instead, there was a crossflow Ford running twin Webers in front of it. Then things started to get really weird. There was an extra alloy case on the back of the Imp 'box that ran to the nearside and sprouted a shaft that ran forward.

"4WD? Four-wheel-drive? Surely not..."
Photo: Bob Blackman

My mate Pete Low was quicker on the uptake than I was. "It's got four-wheel-drive," he said. "Look, it says so on the air-box: Raven 4WD!" In all the excitement it seems that I'd forgotten how to read.

Unfortunately there wasn't anyone around to ask about it on that occasion but I hoped and hoped and hoped that it would be at Wiscombe this year and that I would have the chance to speak to its owner/driver/creator.

It was and I did!

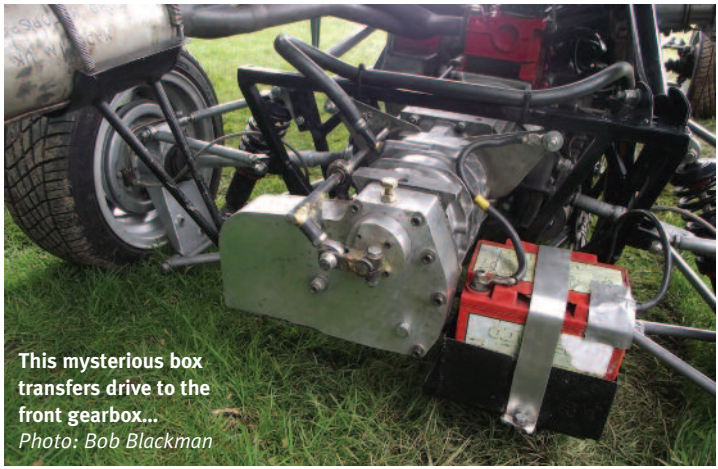
Purposeful yet neat. The Raven 4WD
Photo: Bob Blackman

James Dean (no not that one!) campaigns the Raven 4WD these days but it was built by his father, David Dean, in 1970 for use on their local hillclimb: Gurston Down. The Raven 4WD was put away in 1973 with a jammed drivetrain and left for many years. By the time James was in a position to revive it, some parts had gone missing and his father had passed away. Consequently, some technical details on the heirloom were sadly lacking but it was essentially as we saw it with a square-tube frame, home-made suspension and the aforementioned 1600 cc crossflow Ford sporting a pair of DCOE Webers.

James told me that the original layout was front-engined and two-wheel-drive before becoming mid-engined with two driven wheels at the back. The current four-wheel-drive required a radical re-work and a whole new range of development issues. I asked him to take me on a guided tour through the drivetrain and he obliged...

The Ford bellhousing is mated to the inverted Imp gearbox that initially attracted my attention last year. Drive is taken from the back of this box via a transfer case that powers a propshaft that runs forward along the left-hand side of the powerplant and cockpit. This connects to a second Imp box at the front that drives unequal length driveshafts, as a consequence of the box's offset positioning. Mini hubs and discs are mounted on home-made suspension arms featuring inboard dampers.

James found the transfer case on Imp box number one contained out-of-mesh gears and described the original sheet steel affair as a 'biscuit tin'! The extra casing simply wasn't rigid enough so he made a new one out of solid alloy and new 1:1 gears to live in it. He also had to get a special final drive ratio sorted out for the front gearbox. When he dragged it out of its resting place, the Raven 4WD had smaller Mini wheels at the front but it now sports the same sized wheels all round which ensures that all wheels turn at the same speed – James discovered that



This mysterious box transfers drive to the front gearbox...
Photo: Bob Blackman

initially the front wheels turned more quickly than the rears. Now that the same sized wheels all turn at the same speed, the handling is much better.

Another improvement was to remake the adapter plate between the Ford engine and the Imp 'box. James discovered that the old plate put the engine and box out of alignment which caused copious tears of EP80 to flow. A new plate that lowered the input shaft for the inverted Imp 'box got the alignment right and cured the leak.

The front box still retains synchro so James can select four-wheel-drive on the move if he so wishes but on a hillclimb there's usually enough entertainment in the cockpit of the Raven so, depending on conditions, he usually chooses one mode or the other before setting off. Running in just two-wheel-drive yields 15 bhp more than when in 4WD, presumably due to the friction of the second box's extra gears and oil.

At the front Imp rubber couplings provide drive and articulation, whereas the rear ones are conventional UJs. His latest mod is stronger rear driveshafts. In 4WD, the old ones behaved but in rear wheel drive only they span within their collars – although not enough for any serendipitous friction welding. Under power, the propshaft flexes and touches the clutch bellhousing but only slightly and not enough to worry about.

For me, it was fascination at first sight with the Raven. The rear Imp 'box surprisingly hasn't wilted under the strain and the car must take a certain amount of technique to drive effectively.

So perhaps now you can understand why I was 'raven' about the car as soon as I saw it!

...which resides in the nose of the car
Photo: Bob Blackman