

THREE WHEELS *DOWN UNDER*



Andrew Hutchison of Tri Pod Cars in Australia is interviewed to find out how and why he developed a motorbike engine reverse trike as a kit

Based along the Sunshine Coast in Queensland Australia, Andrew Hutchison runs Tri Pod cars and has created a stunning looking three-wheeler. We put the following questions to Andrew concerning how and why he decided to produce such a kit car. Here's what he had to say.

WHY DID YOU DECIDE TO DESIGN YOUR OWN TRIKE?

Come 2006 (55 road cars and 8 race cars later) time allowed for the thought of building my own car. I sort of jumped from modifying road cars into race cars to a scratch build of my own design. I had formed a firm idea of what the priorities in a car were for me. I liked the idea of taking the lightweight concept closer to that of a kart, building a wide and very low car, an open topped car for fun and a bike engine for thrills (and the accompanying lack of mass). The Government didn't agree though as they, via emissions rules, made it impossible to register a road car with a motorcycle engine. A three wheeler though as in most countries comes under a



Essentials

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Stopping off west of Sydney at the famous Bathurst race circuit



motorcycle category and in Australia there are no emissions standards for motorcycles. Discussions with a local engineer confirmed this and my old interest in a performance trike came to the fore.

HOW DID YOU MAKE THE CHASSIS?

The chassis is old school clubman style construction of 25mm x 25mm x 1.6mm RHS with aluminium cladding here and there. Much triangulation is used to make it quite stiff. Heavier steel is employed in a few places for local strength and durability. In the initial design stages, much thought went into weight distribution with the thought being that two thirds of the mass should be over the front axle line with equal weight on each wheel being an ideal. This is not really possible, but with careful placement of all movable components, I achieved 62/38 balance to the front.

AND WHAT ABOUT THE BODYWORK?

The bodywork was a labour of love in MDF, sheet steel, foam and lots of plaster. I used plaster for the final shape rather than automotive filler or clay because of cost and ease of sanding. The catch though is that you end up with a workshop full of dust and a plug that cannot be reused (it breaks apart in the de-moulding process). Of course, once the final sanding is done the plugs need to be painted and finished to a high standard for the making of moulds over the plugs. It was during all of this work (stretching over two years) that I had my first thoughts of both where I was going to drive this machine when it was completed and whether I could sell the panels to other builders as damn this was taking a long time!

WHICH DONOR MOTORBIKES DID YOU CONSIDER AND WHICH ONE DID YOU CHOOSE?

The original donor choice was a bit of toss up between the two wrecked bikes I had bought and had sitting in the shed. A VTR1000F Honda Firestorm and a Honda CB1300. I liked the idea of the fat midrange and sound of the vee-twin and its single shock rear suspension. I loved the big four in the CB1300, but the twin shock rear end presented some issues and I could sell the CB1300 for an amount of money that would kick the whole project along, so a decision was made and one that I don't regret. We have

since designed two versions for four cylinder engines in the form of the Suzuki Bandit 1250 and the Honda Blackbird. Both have single shock rear suspension and huge performance. I still like my original vee-twin version though for its raw edge and sound.

DID YOU ENCOUNTER ANY PROBLEMS WITH THE CHOICE OF BIKE ENGINE?

Perhaps the only real problem with the use of the VTR1000F was the hopeless carb set up that Honda had fitted, which does not at all like a revised airflow around the airbox, creating turbulence, which we of course suffered by putting the engine in the back of the trike. I have since designed and fitted an EFI system to our prototype using throttle bodies from the later Honda vee-twin SP1 and a Microsquirt ECU. It fuels beautifully and uses less of the stuff. Sounds very tough too!

DO YOU THINK YOU CHOSE THE RIGHT DONOR BIKE?

There are many questions to ask and think through when choosing a donor for a reverse trike. Personally I like to use a less stressed, somewhat over engineered donor such as a sports tourer rather than the sports bikes that some use. Superbikes are built down to the last gram and most likely have little engineering headroom for dragging around an extra 150 odd kilos. Sports tourers are designed to be loaded up and ridden long distances with less regard for outright speed and more interest in comfort and longevity. I am also interested in bikes with chain drive, high levels of build quality, single shock rear ends, water cooling, torquier engines and fuel injection. When you apply these guidelines to the market many seemingly good choices fall by the wayside.

WHY DIDN'T YOU CHOOSE THE POPULAR 'BUSA OR ZX14?

Everyone asks for a Hayabusa or ZX14 and as much as these would be wonderful donors, they are now very much in demand and for me the very slightly less powerful Honda Blackbird is a better value for money choice. The Bandit of course is the sensible choice with oodles of low down

The Tri Pod made it to the northernmost tip of Australia, enduring 1400kms of dirt roads



torque for ease of getting off the line and great fuel economy (4.5 litres per 100km). A Triumph ST1050 version is on the drawing board as is a VFR800 powered version. The VFR may be a bit short on torque, but they are a plentiful donor and have superb engineering and an interesting sound. Shaft and belt drive donors present all sorts of design issues with gearing and reverse mechanism. Many also have rather spindly swing arms that are not suitable with the different loads that are applied to it in a non-tilting car application. Cost and simplicity are always at the front of my mind when thinking through donor possibilities.

DID THE DEVELOPMENT OF THE TRIKE PROGRESS WELL?

The seeming simplicity of inserting a motorcycle in the rear of a light spaceframe chassis had its attractions. Life had gotten in the way of making a start though. This all changed though in early 2006 with the purchase of a welder and the time to think through all the permutations. I felt strongly that if a reverse style trike was wide enough and low enough and was helped along by correct mass distribution, decent suspension and the right front end geometry it could conceivably handle rather well. There was only one way to find out though and that was to build it. Well at least a basic runner and if it was an okay thing to drive I would develop the bodywork then, I thought. A simple naked bike style look was in the back of my mind. Like a lot of scratch builds I started with a flourish and was then distracted by the need to work. Work got in the way for 12 months or more, but a decision was made around October 2007 that a great Christmas present to myself and a bit of fun at the work Christmas party would be to get the thing driving!

SO WHEN WAS THE FIRST TEST DRIVE?

Various non-functioning parts of the car were hastily boded and on the 21st of December 2007 the first drive took place. Some handling anomalies were discovered, adrenalin flowed, rubber was burnt and it

definitely passed the test of whether to bother building some bodywork for it. However, it was fantastic fun and it always creates a bit of a circus everywhere you go.

HOW LONG DID IT TAKE TO CREATE THE BODYWORK?

In the two long years I spent developing the bodywork, I occasionally dared to wonder whether some others might like to use this bodywork as it was taking a very long time to get it right. I didn't spend too long wondering though as I wasn't even 100% sure I would ever get it completed. By September 2012 though, 6.5 years after starting with an Escort rack and a pile of RHS, finally my one off creation was completed, test driven, largely debugged and engineered for road use.

WAS THERE ANY DIFFICULTY WITH GETTING THE TRIKE REGISTERED FOR ROAD USE?

The brake test went well and it passed easily. Engineering went less well with a number of minor issues to be resolved. A chain guard, a mild change of one or two light positions, cover a few hard edges in the cockpit, and all was good. By late October 2012, the department had finally seen fit to give me registration plates and I was off on the first of many treks around the country in search of great roads and the challenge of getting my own design back home in one piece.

WHERE HAVE YOU DRIVEN TO IN AUSTRALIA?

Two days after the Tri Pod was registered, I jumped in with a few bags and headed off into the unknown. Who knew what would happen? Would it make it to Sydney 1200kms away for a drive over the harbour bridge or would it have some fundamental design flaw that would see it returning broken down on a tow truck hours after I had left? It's very hard to describe both the excitement of heading off in your own design, completely unproven and the concern for maximum embarrassment if it

Below, left to right, clockwise: The rear components from a VTR1000F Honda Firestorm installed in the Tri Pod chassis. Springs and damper units trial fitted for the front suspension. Units are from a CB1300. Rolling chassis with the VTR1000F Honda Firestorm donor parts fitted at the rear. Steering components and engine ancillaries fitted, almost ready for a first test drive



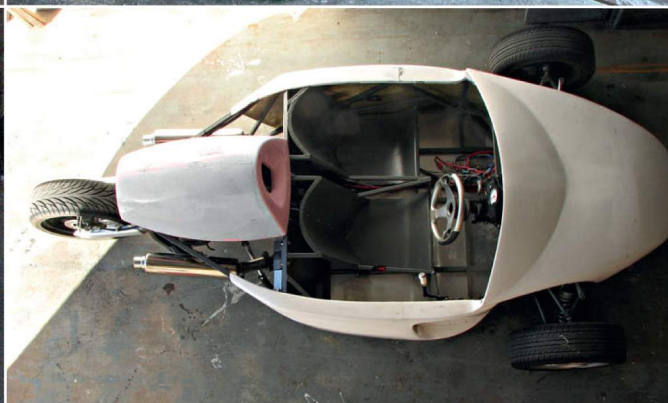
completely fails. Either way as I drove through the foothills surrounding the area where I live and onto flatter lands and the first fuel stop, my confidence was growing as was the scale of the smile on my face as I started to realise that not only was the orange thing still running, it was surprisingly comfortable. What a day! 700kms down the road I pulled into Tamworth for the night and shouted myself a beer. The carbs had given me a slight amount of concern as the 4500 feet height of the Great Dividing Range had the fuelling very rich and the VTR engine coughing and spluttering now and then just to keep me on edge. The drive down off the range into Tamworth had the vee-twin running sweetly again and my nerves calmed. It felt very odd parking my little baby out in the open for the night in front of a motel room, but I was looking forward to the next day and the trip into Australia's largest city. The drive south went smoothly but just as I was feeling comfortable and having a ball negotiating the curves of the Putty Road into the west of Sydney, the front left mudguard bracket failed. I admit to throwing the mudguard brackets together rather hastily for registration purposes and so initially blamed shoddy design, but in the years to follow came to realise that the hardest thing to get to stay on the car was going to be the bloody mudguards. So I packed the now spare guard into the passenger seat and continued.

After at least two hours of hacking through Sydney, I arrived at my friend's joint for the night with a still running car and a fair degree of confidence that it was going to get me home again in a couple of days. The return trip saw nothing go wrong other than the drive chain give out, which had sat around for seven years or so and needed constant adjustment. The coast road north has no elevation changes, so the fuelling remained quite good and I managed to get to the Gold Coast (to another friend) 900kms from Sans Souci in Sydney in one day.

HOW DID YOU MANAGE TO DRIVE ON DIRT ROADS TO THE NORTHERNMOST POINT IN AUSTRALIA AT CAPE YORK?

The problem with any real detailed planning and prep for this trip was the unknown state of the gravel road to the tip that makes up 1400kms of the 5500km round trip. In mid-September 2013 I headed north, excited and somewhat concerned how a little three wheeled sports car was going to handle a 4WD only road, which is 1400kms long. Many people said I was mad and there was no way that they would drive up that road in such a machine. The contrast between the perfect modern road and the gravelly, heavily corrugated, dust bowl that you drop off into at Laura is very hard to describe. After 5 minutes of this hellish surface I pulled over, waited for my support crew (the old man in his Ford Ranger) to catch up and discussed whether maybe we had both taken on too much. The hideous nature of the surface, having to man handle the steering wheel constantly at probably no more than 30km/h for fear of the vehicle just breaking in half for another 1395kms was a bit of a shock. We continued on the basis that it couldn't get worse... and it didn't. After about 20 odd kms it got better and when we stopped after another 100kms for the night we discussed the fact that probably quite a few folk turn around not long after we discussed it, not being able to face that length of diabolical road. On the third day of the dirt road section of the trek north, the left front mudguard bracket failed. This and the constant need to bash out the air filter and re-lube the chain due to the talcum like red dust were the only issues. Once I packed the failed mudguard into its usual position, I continued with only the annoyance at the never ending nature of the corrugations concerning me. In the early afternoon of the fifth day on the road and 2700kms covered, we rolled (literally, I had run out of fuel) into Bamaga at the very top of Australia. We refuelled immediately at \$2.55 per litre (double the price of fuel in civilisation) and headed north east to the very tip and parked on the beach. As much as I was well pleased to have made it, we were only halfway there as the now thoroughly flogged trike had to be coaxed back home another 2750kms away. A rest day at the top saw me head south with a final 1100km day to get me home in four days. I have to admit that the other mudguard fell off, the rear became a bit dodgy, the electric reverse

Below, left to right, clockwise: Andrew was going to become a master metalworker but this became the plug for a fibreglass mould. Creating a symmetrical shape isn't as easy as it looks and months were spent sanding and measuring. Starting to take shape with the floor, sides, nose cone and engine cover designed. All the plug panels for making the mould would be destroyed in the process





Top: The trip to Cape York is usually completed in an off roader, not a three wheel kit car. Below: Yes, there is snow in Australia: the first major test for the Tri Pod included a climb to over 4500 feet

actuator's limit switches failed from the dust, a rear suspension linkage roller bearing half-failed, the drive chain was worn out from no lube and too much dust and the engine really had consumed way too much red dust, but it made it back and still drove rather well.

HOW MANY MILES HAVE YOU COVERED IN THAT FIRST ORANGE TRI POD?

In total the orange original has now covered over 40,000kms with another big trip coming up later this year, plus the almost daily use it receives around here doing test drives and getting to and from work.

HAVE YOU SOLD ANY KITS?

The confidence inspiring start to my travels in the orange prototype triggered many ideas about where I could go in it. Very quickly though I became somewhat bogged down in productionising my car as a kit as I took two deposits before Christmas 2012. We also have a number of other Firestorm, Bandit and Blackbird builds going on around the country. The dozen factory kit builds underway are rounded out by some one-off examples as well, such as a FZ1 Yamaha in Denver, Colorado, USA (Brian Ball Motorsports, our US distributor's demo car), an early model Fireblade, a BMW boxer and a hybrid employing a 400cc scooter and electric power. Another customer in the US (Budd in North Carolina) is also using our tub and suspension design, but joining it to his much loved older FZ1 frame and being an already registered bike makes for simple registration in many US states. He is using our body panels to create what we call the Tri Pod USA.

HOW SUCCESSFUL HAVE CUSTOMER BUILDS BEEN TO DATE?

The silver one in the photos is owned by a 22 year old guy, Jesse, who built it on our premises with some help from us. It is powered by a Bandit 1250cc engine and as per our philosophy, uses the donor bike's swing

arm, rear suspension linkage and shock, instruments and wiring loom from the late model Suzuki Bandit. It was built over a 12 month period and was registered for road use in the last half of 2014 and has now covered 5000kms. It is a significant improvement over the prototype with the main tweaks being in front end geometry, chassis design (mainly in the rear end with much improved stiffness), and the seat design with the use of a fibreglass moulded panel that fits into the chassis saving weight and money.

The red one is our first Blackbird engined kit. Greg the owner has built it himself in his own shed in double quick time. It was in the workshop for development and fitting of the rear caliper and electric reverse kit. Naturally I had to give it a quick test drive... The extra 60 bhp over and above the Bandit 1250 is very impressive. Even with standard gearing and with peak torque of the Honda engine being quite a bit further up the rev range than the slightly larger capacity Suzuki, the Blackbird is very eager down low and as the donk comes onto the cams it literally throws the 400kg mass of the Tri Pod up the road with a surprising lack of wheel spin. Having experienced this performance for real rather than just in calculations I can fully understand why Greg is in a rush to get it on the road.

WHAT DEVELOPMENT DO YOU HAVE PLANNED FOR THE FUTURE?

Development of course continues to this day and will continue forever I suppose. The first generation two of the Tri Pod 1 chassis is now completed and should be on the road by late this year. It is a slightly simpler design, more suitable for production and uses many more CNC laser cut plates to improve consistency and shorten build time. It is the same size as the original Tri Pod 1 design and uses the same panels. In the future there will be a Tri Pod 2 with a larger cockpit, traditional seating, a fatter rear wheel and maybe even a radio. ■