



ROCK AND ROLLERS

Rob Butler's new XTC challenge buggy is coming together apace in the Off Road Armoury workshop. This month, the axles have been fitted and the vehicle is now a roller – which opens up all sorts of intriguing possibilities for games you can play with a fork-lift truck

LAST MONTH'S instalment in our coverage of the Off Road Armoury's new competition vehicle concentrated mainly on the vehicle's axles. These are a prototype design; called T-8, they use custom housings designed to accept Toyota's 8" diffs and hubs as found on the early Hi-Lux and 70/78-Series Land Cruiser.

That was then, though, and this is now, and those axles are now in place – meaning the vehicle is now a roller. As you'll see in this month's photos, that's allowed Rob and his team to nose it up to his previous competition car, perfectly illustrating the differences between the two, as well as using a friendly fork-lift to test its clearances at full articulation. With just an inch shy of four feet under any one wheel when the axles are fully twisted, this is a vehicle that should definitely be as good at crawling as it is at just bashing on regardless.

Of course, the XTC time challenge events for which the vehicle is being built are all about bashing on – if not regardless, then certainly not with too much caution. The new discipline combines the extreme terrain of winch events with the speed of comp safaris; just as the first triallers people first used in them, you can be sure that a dedicated challenge motor will be taken right out of its comfort zone by the sort of speeds the new format will demand.

One of the most fundamental differences between a trialler and a comper is that all things being equal, the latter will be built with a longer wheelbase. Thus it won't have disappointed Rob Butler, owner of the Off Road Armoury, to find that his original projections for the vehicle were in fact a little pessimistic. With the axles mounted, using a three-link plus panhard rod set-up front and rear, and the vehicle sat at its final ride height, its wheelbase measured out at 95 inches.

Depending on who you ask, conventional wisdom in comp circles says that 106 inches is the perfect length for a full-on racer. XTC vehicles are unlikely to reach quite the same speeds, at least not for such prolonged periods, so while flat-out stability is still very important it needs to be tempered with thoughts towards manoeuvrability over very extreme terrain. Famously, when Land Rover designed the 90 it started by building prototypes whose wheelbase was exactly 90 inches, but it pitched too much – hence the final production wheelbase of 92.9. As Rob's new machine has a lower centre of gravity and much smaller overhangs (the future addition of front and rear winches notwithstanding), a length of 95 inches should be more than enough to keep it very stable indeed.

As always, of course, the proof of the pudding will be in the eating. As the vehicle starts looking more and more like a car, however, the anticipation is certainly building.



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1] This is the vehicle in rolling form and at final ride height. As you can see, the suspension units are on – this is simply for position at this stage, as shock tuning will be done later on once the vehicle is at full weight and is actually up and running

2] The location of the front axle can be seen here in its more or less final form. This view shows the high-drop panhard rod and rose-jointed third link mounting to the top of the diff casing on the prototype T-8 axle. As you can see, however, there's still plenty to do – the propshafts are yet to go on, for example, as is the hydraulic steering

3] Here's a close up of that third link mount, with the panhard rod mount also just about visible. Dimple dies have been used to save weight by cutting out unnecessary metal

4] Latest stage in the T-8's axle's development is the addition of a CNC machined hub carrier. With this in place, a front Hi-Lux stub axle can be bolted straight on. Custom halfshafts to go inside the axles are being manufactured for Rob by Milner Off-Road



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5] Another Milner product is this CNC machined throttle pedal – 'perfect for this kind of application,' in Rob's words. This is seen here in its final position; it may look as if it's bolted on at an odd angle, but in fact it's tuned perfectly to suit Rob's right foot when it's at rest with his heel in the recess below

6] An important but easily forgotten part of a vehicle build is to make sure the driver and navigator can actually fit inside the vehicle. Here, the harness mounts have all been fabricated, and the position for the fiddle brakes is being assessed. At the same time, the gear levers' final home will be decided, as will those of all the other controls. Ergonomics is a word you normally associate with Mercs and Jaguars, but it's arguably more important still on a competition car

7] Fox suspension units are fitted using these upper shock hoops, whose bracing doesn't leave a whole lot of room for weakness

8] Lower mounts for the front suspension units are fabricated off-centre so as to give a little more shock clearance



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1) Rear shocks mount to the frame using brackets made from two of the Off Road Armoury's own laser-cut tabs. These are unequal in length to suit the slope of the member to which they're welded; as you can see here, they fit perfectly

2) Here's another view of the front axle's location, with the mounts for the three lateral links and panhard rod all clearly visible. Seeing it like this, you can start imagining how it's going to flex when the axles start articulating

3) In goes the fork lift, and up goes a rear wheel. Testing articulation like this is about more than just showing off (though it's very good for that) – the aim of the exercise here is to look for any unexpected clearance issues with the links, shocks and tyres. Happily, in this case there were none

4) This view shows just how far the axles are willing to twist. Rob says this exercise showed that the vehicle has 47 inches clear under any one wheel at full articulation

5) Rolling will be an almost inevitable occurrence in the sort of competition the vehicle's being built for. A bomb-proof cage structure is of course mandatory, but that's no use if a rock comes in through it when you go over. Add a 3mm aluminium roof panel, however, and you're about as well protected as you can be

6) The panel is fitted using Off Road Armoury weld tabs and M6 nutserts. The same is the case for the 4mm polycarbonate body panels – as you may have noticed from an earlier picture, these were until very recently held on using masking tape

7) The cross-bracing in the rear hoop has been altered since the frame was first built. Now, a V in the upper part meets with smaller diagonals, effectively creating a full X-shape. Note here that the centre console section is mounted off-centre – this was done deliberately, to give the driver more room and line up better with boxing in the transmission

8) The vehicle was designed to have a completely flush bottom to its chassis. This will ultimately be covered off with a sheet of 10mm polycarbonate, allowing it to be hammered over rocks and boulders without fear of component damage



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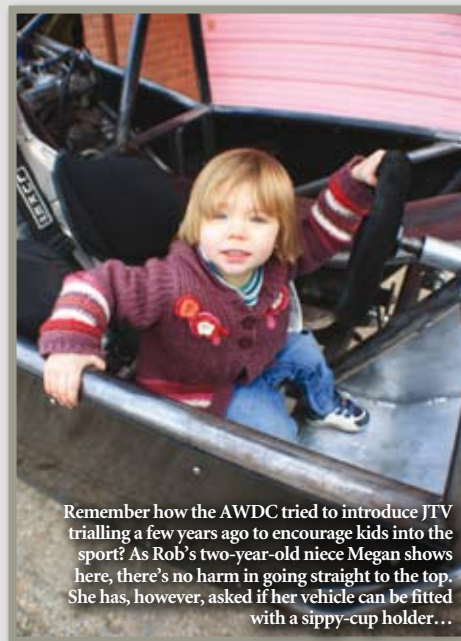


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9) Looking at Rob's 2009 and 2010 competition cars, the differences are obvious. Note how the new vehicle combines greater ground clearance with lower overall height – something the speed element in the new XTC discipline makes very desirable. Further obvious differences include the size of the tyres and the location of the engine; note also that whereas the traditional challenge vehicle had opening doors, the XTC car is fully braced along its waistline



Remember how the AWDC tried to introduce JTV trialling a few years ago to encourage kids into the sport? As Rob's two-year-old niece Megan shows here, there's no harm in going straight to the top. She has, however, asked if her vehicle can be fitted with a sippy-cup holder...