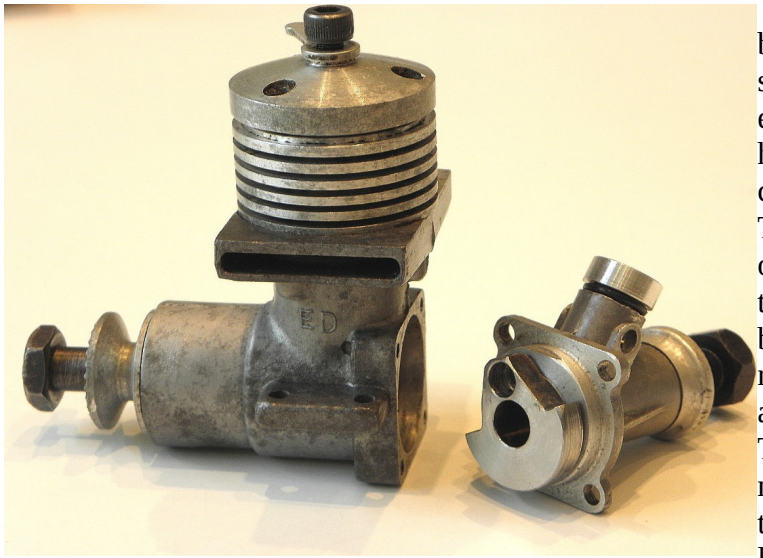
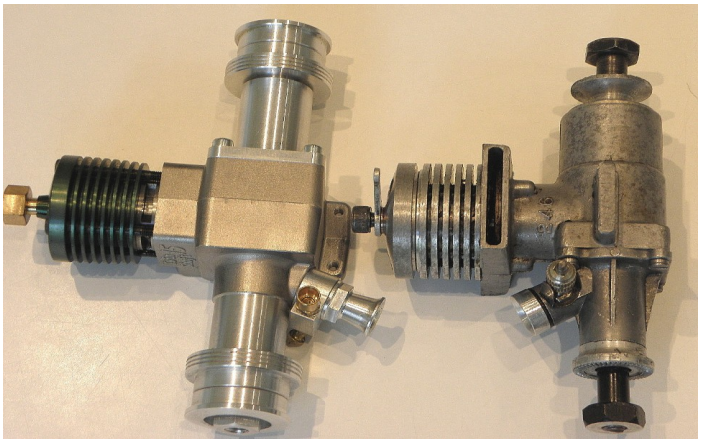
ED RACER CONVERSION TO TWINSHAFT CAR ENGINE.

With the current supply situation and uncertain outlook on new twinshaft 2.5cc diesel engines for our tethered cars, it is timely to resurrect an article written by Peter Hill, Secretary of the Retro Racing Club and published in the RRC Newsletter many years ago. As he succinctly put it, it can be summarised as “stick the front of an Enya 19 on the back of a Racer”. You will need a Mk 3, 4 or 5 Racer with the parallel front crankshaft housing ideally by the way, as this facilitates mounting to a car’s baseplate or lower pan with a split clamp if desired, and do pick an engine with good compression. You will need access to a small lathe and a drill press for a couple of the modifications, and some basic but careful model engineering skills to use it (or get your oily mate to do it). Peter’s wise words follow, with minor amendments, additions and photos (and no longer presented all in upper case characters typed on an old ribbon typewriter) for clarity:



Take your ED 2.46cc Racer and remove the backplate and rotary disc assembly, and put it in a safe place in case you ever want to convert your engine back to aircraft operation. Take the front housing, with front induction carb, nva and crankshaft assembly from an Enya.19 glow engine. These are fairly readily available at swapmeets and on eBay at reasonable price, just make sure that the shaft bearing is good, smooth and not worn, but the rest of the engine is not important or required. Remove the crankshaft from its housing and offer the housing up to the rear of the Racer. The four mounting holes should line up, but the mounting diameter of the housing will not fit into the Racer case and will need reducing slightly at a later stage.

Take the Enya crankshaft and remove the crank pin by hacksawing it off and neatening up the area of the crankweb it came from, most conveniently done by skimming it in a lathe. Always protect the shaft bearing surface when gripping in the chuck, of course.



Decide at this point whether you want the carb to face in the same direction as the cylinder, like my example shown here, or in the opposite direction as for an Oliver Tiger or Redfin twinshaft engine also shown. If the former, the hole or slot to be made in the Enya’s crankweb needs to be in exactly the same position as the crankpin which has just been removed, and if the latter, at 180 degrees from this position. Exactly is the word here by the way, it is very difficult to mark out and drill in the precise position, then ream and smoothen the inside and edges of a hole, mine wound up a bit oversized which makes for a small amount of play when the drive shaft is rocked in it, but is good when running. A slot is easier, but the Oliver style carb direction would be better to use here as there would not be much metal “meat” left if the slot was in the crankpin position, because of the counterbalancing cut outs in the Enya crankweb, as can be seen. I have marked the position and shape for a slot in black here, 180 degrees opposed to the hole. Now, Peter recommended rebalancing the Enya shaft by removing metal from the crankweb as needed, which is a bit of a specialist job, though I skipped this and my engine runs well without it.

Next job is to check the distance from the rear face of the Racer’s crankweb to the backplate mounting face of the crankcase, this can vary. Having fitted the

Enya shaft and front housing back together, measure the distance that the housing will need to be turned down, and if any material does need to be removed, allow for the thickness of a paper gasket too if you are going to fit one. I made an 11.0mm diameter mandrel (the crankshaft diameter) on which to grip and securely mount the front housing casting for turning down its mating face by the measured amount, and also skim down the part on it which fits into the Racer case just enough for a nice tight, sliding fit, this will only be a few thou. Clean and oil all parts, then reassemble the Enya shaft and housing onto the rear of the Racer and fix with the original four 6BA backplate screws and Locktite into place. The job is then hopefully a good ‘un.

The beam mount on a Racer is not so easy to rigidly mount in a car chassis pan as is the flat mounting base of a Redfin or Oliver twinshaft engine of course, but various approaches can accommodate this satisfactorily. Also, the distance between the prop driver faces is smaller on the ED at 85mm versus about 104mm on the Redfin, leading to a narrower drive wheel track, but still sufficient for a stable car. The Enya crankshaft has a taper turned on it for attaching the prop driver, and if you can manage the extra bit of turning work, it would be a better arrangement to fix your wheel hub to this with a matching taper. It is good practice to mount inner wheel hubs on a taper, or a brass split taper collet on a plain crankshaft butting up to the front shaft bearing by the way, but the aero type prop drivers shown will be satisfactory if the wheel retaining nuts or studs are properly tightened using Locktite.

I really hope that this provides the inspiration to bring some ED Racer powered cars into being and to be run on the Buckminster track, and your SAM 35 Tethered Car Interest Group look forward to seeing you there next season. Many thanks to Peter Hill for his kind permission to use his old RRC article as the basis for this article.

STEVE BETNEY.