



## How To

# Rack Your Cortina

We get the gen on one of the most widely-awaited kits for the Mk1 Cortina — a rack-and-pinion steering conversion kit that needs no welding.

Everyone knows what a benchmark the Escort set — prior to this model virtually everything Ford was still in the land of the old car. And there's nothing that says that more than a steering box — drive one and it can feel very vague.

There's much you can do to improve the feel, but there's no denying, rack and pinion is superior. There have been lots of ways to do the switch, but the ultimate quest has been a kit that bolts straight on and doesn't alter the shell.

It's been a long time coming on the Mk1 Cortina. With previous conversions, the traditional route was to use Escort/Capri struts, an Escort crossmember and modified TCAs. But it was a compromise — the struts are a different angle compared to a Mk1 Cortina's and so the top mounts need modifying. With good shells now

### Info

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worth an fortune, the onus is on minimal shell alteration.

It's taken a lot of R&D to sort, but Retro Ford has just launched a complete kit to bolt-in rack and pinion steering using Mk1 Cortina disc brake struts into your car. Naturally, Retro Ford's Dave Colledge was keen to show us how it all works. It's a comprehensive kit — you get every nut and bolt — and it's fantastic quality.

### The concept

This is a kit based around Dave's business, which is to simplify the installation of Zetec and Duratec engines in classic Fords, although it does apply to Kent-engined cars, too.

However, it is based around a modified Escort front crossmember, which dictates a rear-bowl sump. The kit can be used with Kent engines, but

you will need to swap to a rear-bowl sump (as in the Escort 711M type).

This will push the engine further back, and new mounts will need to be made, but these are in the pipeline.

The Cortina we're using originated as a left-hand-drive car, which Dave has converted to right-hand-drive. This is straightforward as the basic shell pressings are identical side to side. In addition, Dave's added one of his bias pedal boxes. This bolts in and is almost essential because it puts the master cylinders inside the car, so the induction doesn't clout them. Dave's also strengthened the area where the pedal box mounts — he stresses that the unit is normally designed to triangulate with the steering column and dash, which he deems strong enough, although it's advisable to strengthen the bulkhead area, too.





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This stripped-out shell is ready for the kit to be bolted in. This is an early left-hand-drive shell that's been converted to right-hand-drive.

2



This pressing in the floor was originally intended for the steering box to pass through. The pressing is identical left and right — it's a simple matter of cutting it open when swapping the steering from left to right...

3



...While the other side's plated over, and finished so that it looks factory.

4



Under the dash is a Retro Ford bias pedal box, ready-fitted, which bolts straight in.

5



Although Dave's added additional strength to the area, as it can flex under extreme braking!

6



The new hole's blocked up with this cover plate, which fits from inside the car and additionally carries foam insulation.

7



Once installed in the new pressing, there's a hole for the steering column shaft to pass through.

8



### Preparation

This is a ready stripped-out shell, which is otherwise completely standard. The original steering box system including the crossmember is completely removed — and an all-new one-piece steering column is included in the kit. No need for exchange parts!

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Dave's system is designed so it picks up on many of the original fixings and indeed uses several of the original bolts — Dave stresses that, although it's advisable to run a tap through lots of the threads, they are UNF and several are also Heli-coiled, so you need to be extra careful as you can remove that insert.

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### Installation

The kit is based around an Escort front crossmember although these are brand new units — not exchange. Retro Ford make them especially for this conversion.

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The mounts are tapered to match those of the Cortina's chassis rails, so it's not simply an Escort crossmember bolted in! Mounts are the more heavy-duty World Cup type to correspond with Dave's Zetec and Duratec conversion mounts — Kent-derived units will be available soon.

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First job then: fit the crossmember into the car.





This is pretty straightforward — where the units bolt to the car, you use the original 3/8 inch UNF Ford bolts where possible. The crossmember is designed to pick up on the original Cortina mounts in the chassis rails.



You'll need to set an approximate width on the arms, which is 305 mm from end to end as a starting point — they're adjustable so the camber can be sorted once the system's installed.



Dave slides these into the crossmember and slots the new bolt through, which is locked up with a Nyloc nut.



First off are the main ARB poly-bushes — Dave recommends you heat them in hot water to slide them onto the bar. You can cut them but he'd rather you didn't as it can compromise structural integrity.



Once the adapter plate is fitted, the poly bush is fitted to it and the plated saddle clamp over the top of that. Note that there is a cut-out in the adapter bracket and a corresponding tongue in the bush, which fits in to it.



The back mount uses one of the original steering box holes, and the idler mount on the other side. This however, is a through-bolt — the mount is sleeved, so you could use a new Metric bolt with a Nyloc nut on the other side.



There's a right and wrong way to fit the Rose joints — although all the fittings are supplied. Note the two stepped bushes.



TCA anti-roll bar bushes next and it's important to get the bushes in the right way round! They are in two-parts; the tapered face goes to the outside, while the stainless steel tube fits through the middle of the two bushes.



The ARB fits on with wide saddle clamps. These are mounted using Retro Ford's special brackets offset to move the ARB back to give the correct castor, and designed to mate with the...



The last ARB part is to fit the threaded end into the TCAs — this is always a bit tricky as it's a sprung component. The usual method of using a ratchet strap can be utilised although most people have their own ways!



The track control arms (TCAs) are next — these are adjustable, although they are the Rose-jointed type and note they are also handed.



These are fitted so the smaller step is up against the flat face of the spherical ball fitted inside the rod end.



We need to install the anti-roll bar (ARB) next, which isn't necessarily supplied with the kit as it's an Escort item, which can be either reused or Dave can supply one. However, none of the original Cortina or Escort brackets are used since they'll all upset the geometry.



...Cortina's original ARB mounting plates, which are welded to the car and use UNC captive nuts. However, these were originally used with tab washers, which you now can't get to. Dave advises that you bolt it up using thread lock instead.



Once through the bush, the wide washers are fitted to the back of the bush followed by the castle nut.



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However, before you start, you need to pay attention to the way the ARB fits as it is shaped — get it wrong and you'll have a serious fight on your hands trying to get it all lined up!



The struts will be bolted into the shell using standard Cortina roller top mounts.



...Where they fit into completely unmodified Cortina strut mounts and fixed with Metric (M8) bolts supplied. There's more on this later, but for now, the first threaded bolt holes are used, which will give standard Cortina geometry.



While on that side there is a chamfer, which corresponds with the opposite side to the inside disc-face.



It is easy to get the steering arms on the wrong way round, but you'll know because the gap between disc and steering arm eye is massive.



### The Struts

Our next job is to fit the struts. GAZ have turned them into adjustable platform coil-over units. Note too that they are based on 1500 disc-brake Cortina struts, swapped side to side so that the callipers trail, otherwise they will foul the steering arms.



However, we're using GAZ concentric mounts. Shown are prototypes that Dave's modified using three new tapped pick-up points, which allows the camber to be further adjusted another 1.5 degrees. Bespoke, bolt-in mounts will be available soon.



We need to fit the steering arms next, which of course needs some explanation!



They bolt onto the end of the TCA first, using a supplied Nyloc nut. This will sit inside the assembly and can't be seen once the strut's fitted.



It should be pretty close like this!



Adapting them into the car are Retro Ford-designed and CNC-fabricated, steel billet bottom steering arms. These are handed.



With the struts assembled, Dave feeds them up into the car...



For starters, they are handed — note there's less material on one side than the other.



Then they bolt up onto the underside of the strut using supplied fixings — although they will probably need some assistance from a jack as the anti-roll bar is spring-loaded, of course.



### Steering Rack

The next job is to prepare the rack for loading it into the crossmember.





We need to set the track rod ends, fitted with a maximum 31 mm of thread between the fixing nut and thread end. This may vary according to the rack manufacturer you use, though. The tracking and castor will then need to be set once the car is back on the floor with the engine it.



The rack's fitted with normal saddle clamps and poly bushes; again supplied.



It can then be mounted onto the front of the Retro Ford crossmember.



The track rod ends are then bolted into the steering arms although, again we need to point out that...



...These are very close to the disc if you have vented discs fitted — done to create the all-important, correct Ackermann angle.



## Hubs And Discs

Before we go onto hooking up the steering and column, we need to look at the hubs because we can't use standard Cortina ones with vented discs if running coil-overs.



The kit is engineered around special alloy hubs, which have a different offset, coupled with Capri 2.8i vented discs.



You can see the difference in offset with the two side by side — the alloy ones push the wheel out away from the strut, which is a common trait when you fit alloy wheels to a Cortina.



Generally, the 2.8i discs will bind on the coil spring if you run 2.25 inch coil-overs, meaning you need to use the wider Retro Ford alloy hubs.



## Steering Linkage And Column

To connect the rack to the steering column, Retro Ford has have engineered a link shaft with universal joints on either end.



The splined end goes onto the rack...



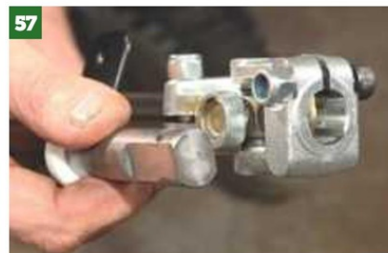
...While the Double D end connects with the shaft — this needs setting up.



There's some adjustment to allow for shell tolerances, but the end of the shaft shouldn't protrude too much into the universal joint otherwise it'll interfere with its working — as shown.



It should be more like this.



Moving to the other end of the shaft, there are two of the same type fittings on another universal joint — Double-Ds.



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One fits on the shaft, the other connects with the bottom of the new steering column....



...Which has a corresponding flat on one side, forming the D-shape.



With that lot explained, Dave tightens the links up at the rack end and feeds the connecting shaft through the bulkhead access panel in picture 7.



The column can then be fitted onto it from inside the car — loosely for now. Grease the shaft where it passes through the grommet.



Again, it's engineered to use the original fixings built into the car — this Cortina clamp fits around the column and fixes to the underside of the dash...



...Then to the alloy block that forms the secondary fixing if you're using the Retro Ford bias pedal box.



And finally to right-hand side (from inside the car) of the cast-in mount in the pedal box.



Once that lot's bolted up, Dave then finally tightens the universal joint fixing at the bottom of the column.



The final bit in the floor is the cover plate, which we fitted in step 6.



This simply screws to the floor with self-tapping screws, picking up in the original holes on a right-hand-drive car.



The last bit is the steering column shroud, which picks up on the original column mounts...



...Followed by the steering wheel. All done! This is a right-hand-drive Pre-Aeroflow car which has a slightly longer column, but Dave can supply kits for the later Aeroflow, as well as left-hand-drive cars, too. **CF**