

# Elan Steering Rack



**D**oes your Elan have an Elan steering rack... or, steering racks, they may look the same!

The ubiquitous Triumph steering rack is a superb rack which is why, with its related super suspension vertical link it was so popular. In addition to several Lotus cars it was the favourite choice for many other small car manufacturers. Did you know that the rack of the Lotus 25, that icon of racing car design, was a modified Triumph rack and then only modified for the central pinion position of a single seat racing car. Colin probably nipped down to his Elan stores and 'pinched' one... The design of the original rack allowed for a large wheel lock which gave the Triumph cars a very tight turning circle. The design of the Lotus suspension required the wheel lock to be restricted on the Elan and other Lotus models where the rack was also used, to prevent the tyre hitting the anti roll bar. This is accomplished by spacers, technically called lock restrictors, that are installed on the rack. With the

rubber bellows fitted over the top of the spacers, the racks look exactly the same in every instance but due to these - now hidden - different spacers the racks are very different. Installing the wrong rack to a car without knowing it is, as I am sure I do not have to tell you, extremely dangerous. When stripping Elans for rebuilding I have come across this problem time and time again. This confusion is compounded by Lotus who have dimensioned the locknut on their various manual drawings instead of the spacer on the pinion side. There is also the confusion of suppliers and rack restorers so it is no wonder that the poor owner is sometimes left with a problem. I thought it would be a good idea to give details of the racks fitted to Lotuses in the hope that this will bring to light any problems with member's cars. I am indebted to Lotus themselves, Spyder Cars and Redline Components (Lotus 7) for their help in the preparation of this article.

Most of the time a car is driving in a straight line with the rack cen-

tral, so it is no surprise to find, therefore, that this is where a rack wears. Any wear here can be shimmed out which is one job that rack restorers do. However as there is no wear on the extremities of the rack there is a limit on how much wear can be taken up by shimming before the rack becomes impossibly tight away from the central position. I have seen racks fitted to Elans that have no right to be anywhere but in the bottom of a scrap bin!!

When fitting a rack it is an essential part of the job to check that the tyre is clear of all body / chassis / suspension items lock to lock at the completion of the job. Lotus are renowned for keeping design clearances to a minimum, a further problem may occur therefore, if your car has been fitted with wider tyres. You may have the correct rack for your car model but you may still have a problem on the extremes of wheel lock. So jack the front end and check that on full lock the wheels are not touching anything they shouldn't. This should be

done by MoT inspectors but I find because they do not come across these 'funny' little cars every day, important inspections are often missed.

The pinion side spacer is welded to the standard locknut whilst the passenger side restricter is a continuation of the rack tube and just floats on the rack. With the correct spacers the Triumph rack can be modified to any required Lotus rack. However, you MUST know what you are doing, the consequences of incorrect assembly do not bear thinking about. I have also indicated in the Data Table the difference of the track rods that Lotus used. The Elan track rod is a Lotus only manufactured part which does surprise owners. It cannot be made by cutting down a Triumph rod and extending the thread because the original was a rolled thread not cut. This practice has happened in the past and is extremely dangerous.

You know where I am for help.  
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ELAN S4 AND SPRINT LOCK RESTRICTORS. YOU CAN CLEARLY SEE THE LOCKNUT WELDED TO THE SPACER FOR THE PINION SIDE. THE PASSENGER SIDE IS A MACHINED TUBE WHICH EXACTLY MATCHES THE RACK TUBE AND JUST FLOATS ON THE RACK

Model	Pinion spacer	Passenger side spacer	Track Rod
Elan S1, S2 and S3	0.28 inches	1.75 inches	6 inch Lotus only
Elan S4 and Sprint	0.53 inches	2.0 inches	6 inch Lotus only
Elan Plus 2	0.1 inches	1.75 inches	6 inch Lotus only plus extension
Europa all models	1.0 inches	1.55 inches	Triumph 7 inch
Lotus 7 S1	Morris minor LHD rack fitted upside down		
Lotus 7 S2 & S3	1.0 inches	1.0 inches	Triumph 7 inch
Lotus 7 S4	Ford Twin Cam Escort rack		