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SILENT BLOCS FOR TRACTIONS

In the rush to get the Traction built certain parts had serious engineering flaws that were not addressed during its 23 year production life and the design of the silent bloc type suspension system is a good example of this. These sort of flaws would not be tolerated nowadays but in the forties and fifties it seemed everyone was just thankful to have a car.

The principle of the design for the Normale/Legere type cars is that a splined pin connects the bottom suspension arm to the front and rear silent blocs that are bolted to the cradle. The splines in the broached tube that are 'rubbered' into the silent bloc housing and those in the bottom suspension arm are parallel but the splined connecting pin is tapered. The splined connecting pin is knocked in from the rear and gets successively tighter as it passes through the bottom suspension arm and into the front silent bloc. The original splined connecting pins were splined over their full length but later, I am guessing as an economy measure, there was an undercut section of approx 50mm with no splines where it passed through the bottom suspension arm. This reduced the engagement in the bottom arm by 60% and caused the broaching at the outer edges of the bottom suspension arm to 'bellmouth'. The torsion bar is fed into the rear silent bloc and anchored via a long bolt through the splined connecting pin.

Fig 1 shows diagrammatically the arrangement for the Normale/Legere type cars.

NORMALE/LEGERE SILENT BLOC SYSTEM

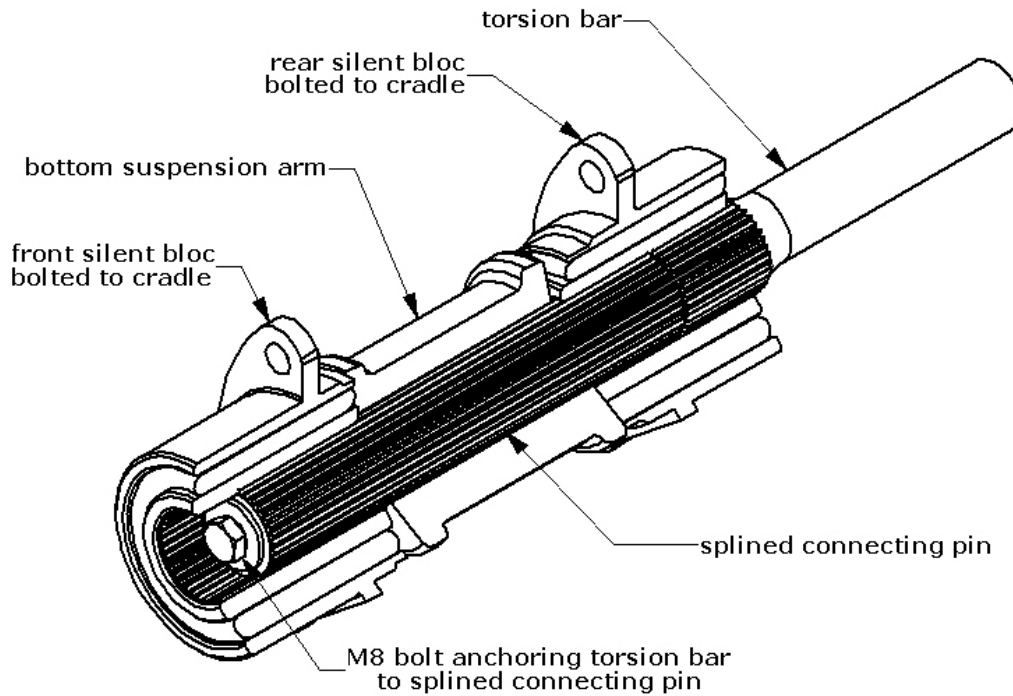


Figure 1
Diagrammatic representation of silent bloc
system for Normale/Legere type cars

If you have ever assembled a front cradle you notice how loose the splined connecting pin is as it enters the rear silent bloc yet how tight it is to get it into its final position. That looseness seen in the rear silent bloc is what it is like in the front silent bloc. This is a major design flaw and results in the splines in the front silent bloc and their mating ones on the connecting pin wearing badly - see Fig 2.



Fig 2

**Splined connecting pin for Legere
*Note how badly worn the splines at the front
are and how little engagement there is in the
bottom suspension arm at the front.***

As well as the splined connection having to be good the system also relies on the integrity of the rubber connecting the broached tube to the silent bloc housing. It can be seen from the silent bloc shown in Fig 3 that the rubber is well past its 'sell by date'. Remember that the whole suspension geometry relies on the silent bloc assembly being 'tight' and that all the forces created during braking and steering are transferred to the car body via the cradle, silent blocs, bottom suspension arm and the splined connecting pin. When MOTs were mandatory it seemed that most MOT test stations took the approach that it was an old car, not driven very far or fast and that they would be alright. Any similar play in a modern car and it would be failed! And now you do not even have to have an MOT! The badly worn splines/decayed rubbering shown in Figs 2 & 3 came from a car with a current MOT!



Fig 3

**Front silent bloc housing for Legere
*Note how worn the splines are in the broached
tube and the decayed nature of the rubber.***

Of all the routine jobs on a Traction I would say the replacement of the silent blocs is one of the most awkward. The engine/gearbox has to come out and the grille and front wings removed and the body has to be safely supported to enable the front cradle to be pulled off. For most people this makes the car totally immovable until the cradle has been replaced.

Be under no illusion that any existing silent bloc system, which will be at least 50 years old, may appear to be in good condition on the outside but closer inspection will invariably find it to have failed. Rubber, even with anti ageing additives, has a finite life that is considerably less than 50 years.

Mike Tennant has, for many years and still does, 're-rubbering' of the original silent bloc system at an extremely reasonable price. I am sure he will confirm that virtually all the silent blocs he has re-rubbed had failed in some way or other and were in dire need of renewing.

It is impossible to bond the broached tube concentrically in the silent bloc housing and as a result extra stresses are incurred on assembly. The longitudinal position of the broached tube in the silent bloc housing can also vary and this is why the original system used packing shims to get the bottom arms in correct alignment and provide the correct 'nip' between the silent blocs and the bottom suspension arm. Because of the variation in the relative positions of the components in the silent bloc it can often happen that the cradle cannot be assembled to give the correct alignment/nip/etc by use of the available shims. The stripping or assembly of the silent bloc system into a cradle requires the careful use of a series of supporting plates/tubes and a powerful press or a lot of brute force with a sledgehammer. I think it unlikely that when the cradles were originally assembled, either in the factory or as a repair in a garage, that they were stripped down if the shims gave the wrong alignment.

There are many repair jobs on the Traction where the cost of the replacement part is a small proportion of the total cost. The fitting and/or adjusting of a new part can be time consuming and hence expensive if you do not do it yourself and in a lot of cases it can be technically difficult often requiring specialist tools. A fully machined part that just has to be fitted is usually a much easier and, in many cases, can be a more economical option.

There are new silent bloc systems that eliminate the problems of the original ones but being made from all new parts are expensive - see Fig 4. There is no exchange and they are compatible with the Normale/Legere cradle and bottom suspension arms.

Advantages are that:

- a heavy press is not required to assemble them - it can be done by a single person with a 7lb copper hammer**
- they dispense with packing shims yet give the correct alignment and 'nip' to the bottom suspension arm**
- gives full and even contact between the splined connecting pin, the broached tube in the silent bloc and bottom suspension arm**

- the splined tube is concentric with the housing and hence no additional stresses are induced during assembly

The current stock of the above type silent blocs/splined connecting pins for the Legere/Normale type cars have all been sold and there are no plans for further production unless there is sufficient demand to commission another batch.



Fig 4

New silent blocs set.

The silent bloc housings are machined from a solid billet of steel, the broached tube is concentric with the silent bloc housing and the connecting pin is splined over its full length

Although similar in principle there is a significant difference in the system adopted for the Big 6 & 15/6 type cars. There is a variation for the Big 6H but the principle is again broadly the same. Figure 5 below shows diagrammatically the layout for the Big 6 & 15/6 cars. The problems of assembly with shims to give the correct alignment/nip/etc is similar to that of the Normale/Legere but easier because the splined connecting pins are not tapered.

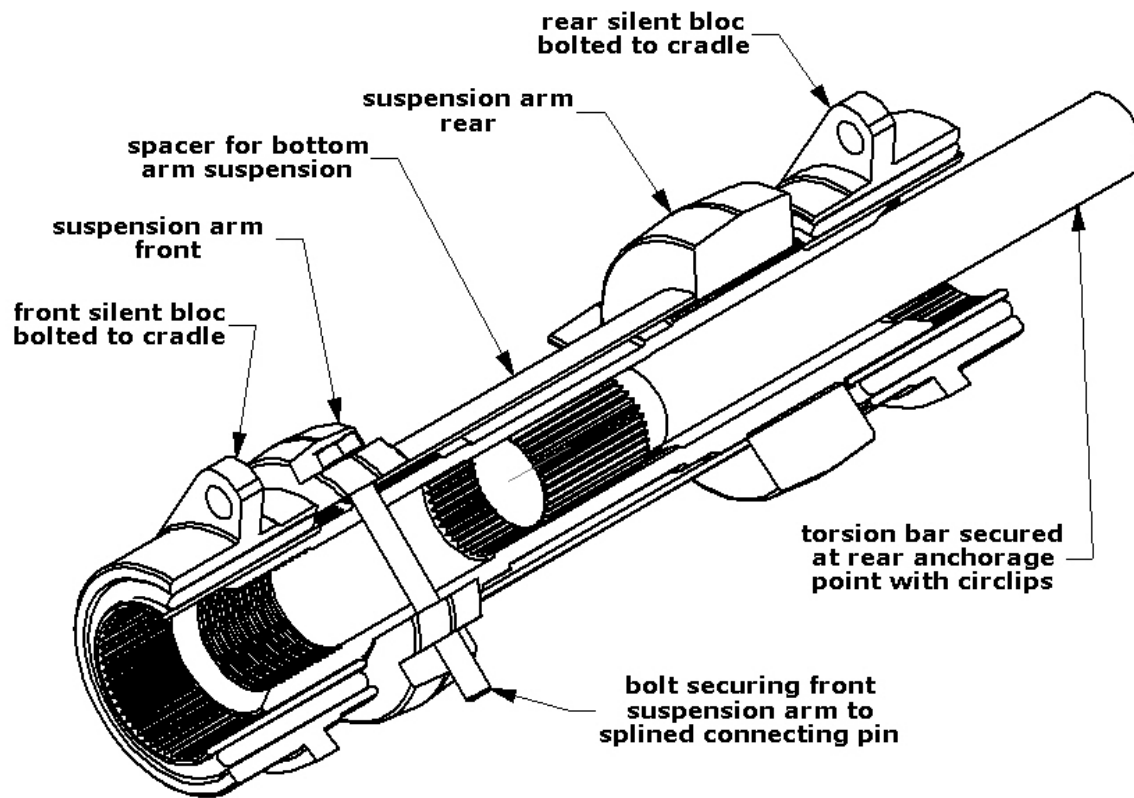


Figure 5
diagrammatic representation of silent bloc
system for Big 6 & 15/6 type cars

It was recognised that the torsion bar and the splined connecting pin had to be restrained and for the Normale/Legere this relied on the interference fit of the splined connecting pin in the silent blocs anchoring the torsion bar via a long bolt. The improvement for the Big 6 & 15/6 was that the torsion bar was independently restrained by circlips where it was anchored to the body. The front suspension arm is bolted to the splined connecting pin and with a spacing tube and the rear suspension arm is sandwiched between the inner faces of the cradle.

Again all the original silent bloc systems for the Big 6 & 15/6 are well over fifty years old and you can see the problems currently being experienced with decaying rubber in the silent blocs, Fig 6, and distortion in the splined connecting tube, Fig 7.

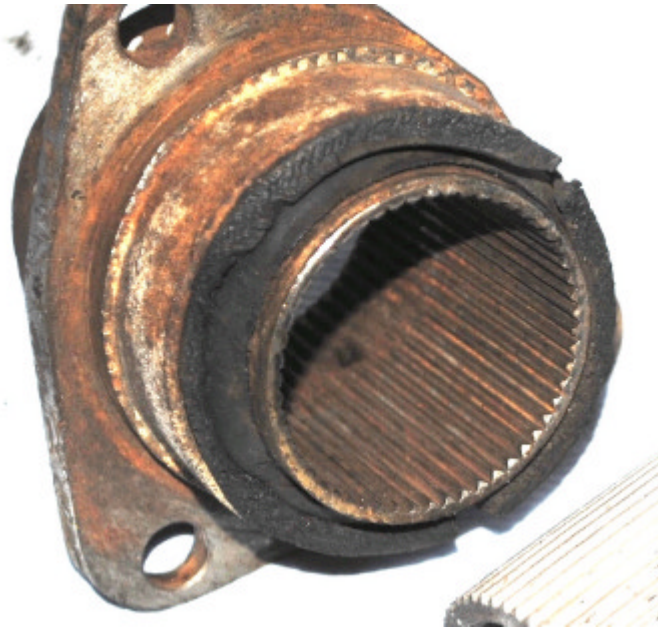


Fig 6
Badly decayed rubber and distortion to the broached tube, although difficult to see in the picture are there.

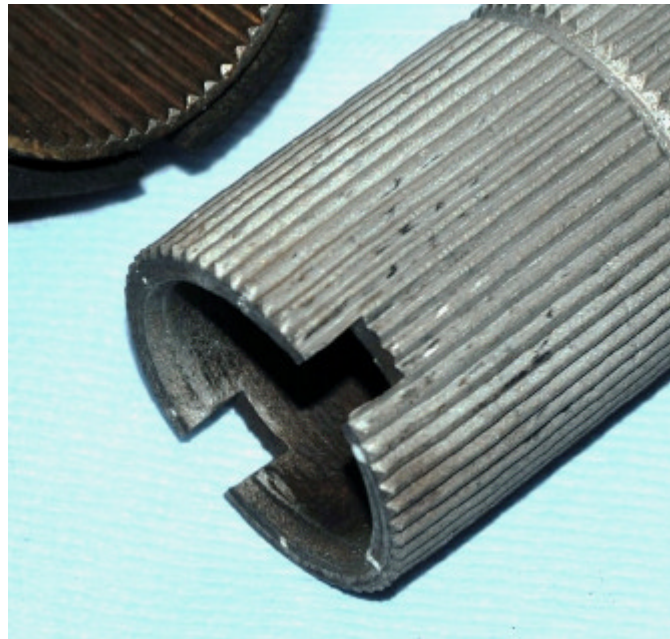


Fig 7
You can just see the distortion to the splined tube at the slot - this causes damage to the broached tube in the silent bloc during both assembly and dismantling.

If the Big 6 Tractions are to be driven safely this crucial component has to be manufactured as the supply of original silent blocs suitable for 're-rubbering' has virtually disappeared. The splined connecting pins also have a high mortality rate and there are very few, if any, suitable ones available. Unfortunately the Big 6 system is significantly more expensive to manufacture than the Legere/Normale but it can be done on the same principles to make assembly easier. With the silent blocs machined there will not be any induced stresses during assembly and no need for packing shims to achieve the correct alignment and 'nip'. There are much fewer of these cars about so demand is lower and hence unit cost higher.

It is understandable that the commercial firms producing parts for Tractions are not interested in making replacements for the Big 6 silent bloc system because of the cost and complexity. However someone has decided that it is important enough to have properly engineered silent bloc replacements for his Big 6s and has commissioned a limited production but this is a 'one off' and will not be repeated. One has to wonder if the thousands of pounds the TOC has in the bank would not be better employed in funding the manufacture of essential parts for the Traction.

Fig 8 shows these newly manufactured silent blocs as supplied and Fig 9 as fitted to a cradle.



Fig 8
New silent blocs with their splined connecting pins



Fig 9
Silent blocs fitted to cradle