

**BMC/Moulton Suspension - design problems**  
(Rubber, Hydrolastic, Hydragas)  
**Death through dehydration**

by

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Moulton suspension systems are generally considered to stop at the spring design. However BMC, its subsidiaries, heirs and successors, employed common themes to the remaining components of Moulton equipped vehicles. Several vehicles share a common suspension design and in some cases, the same critical components. Hence they all share common faults, most of which are ignored by owner and repairer alike.

Predominantly;

- Mini (not Bini),
- Moke,
- Metro, and
- MG-F.

But the list can be extended to encompass;

- 1800,
- Maxi, and
- Allegro.

This common design dates back to 1959. The accompanying lubrication system is easily pre-war and was never improved upon. Despite the original concept being listed as requiring lubrication every 3000 miles or 3 months (and barely achieving this), service intervals would gradually be extended. This would culminate in the advertised 'annual service' of some UK home market products from the 1980s. Undoubtedly not a concern for the first owners or the warranty claims department. Beyond this, problems start to arise.

Some readers will instantly retort that lubricants have improved since 1959. Well oils may have and in particular engine oils. Grease however has not. The choices were and still are; multi-purpose, high temperature bearing or Molybdenum disulphide. In reality, what you have or will ever receive is whatever your repairer has loaded into their grease gun. This will most probably be what was cheapest or happened to be lying around, the last time the gun ran out.

For the first group of vehicles, suspension arms have a 'total loss lubrication system'. Resistance to flow and rubber dust rings are all that retain grease in the arm. Arms rotate on needle rollers and hardened steel pins. Original Mini rear arms utilised two bronze bushes but this was soon changed to one bush and one bearing in order to extended service life. Big wheel Moke would replace the remaining bush with another bearing. However another issue would arise in the form of pin failure. Extra stresses applied through the new arm caused the pin to bend at its ends and eventually fracture. No factory answer was forthcoming.

Metro would continue with the Moke concept and not surprisingly arrive at the same fault. A revised pin was introduced which relieved the problem. However arm failure from lack of lubrication prevailed. A variety of UK companies would offer exchange rear arms. Such parts were combined with stringent exchange policies detailing condition of the core unit. However, this still addressed the symptom and not the cause; lack of lubrication!

Rover 100 and MG-F are unusual for popular small cars. Despite being produced in the 1990s and early 2000s, they still have grease points. Virtually all their competitors had 'sealed

for life' systems. Therefore industry and public attitudes had already moved away from physically lubricating any vehicle. The result of course is obvious. As both models continue to use the same design of pivot pin as the others, the same problems can be expected.

Lack of lubrication results in;

- premature wear to bearings (bushes),
- pivot pin wear,
- thrust face erosion at the end of each arm, and
- after prolonged periods, erosion of the arm's internal faces to which the bearings mount.

This may present itself as noise, excess free play, seizure or collapse (catastrophic failure). Even with the most fastidiously assembled arms, lubricant flow can be haphazard. Countless arms can be found where lubricant will only move to one end. Despite the vast array of non-genuine pins (with their wildly varying tolerances), none have improved the lubrication system. A simple alternative for rear units would be to introduce another nipple and drilling at the pin's inner end. This would of course increase the chance of adequate grease distribution.

Front arms fair no better but are not serviced on an exchange basis. Applied load tends to mask problems such as free play. Ignorance and avoidance of the problem creates lack of demand, hence lack of supply.

Unlike many other suspension components, there are no aftermarket reproduction arms. The possible exception being the mystery brand Chinese made rears for 13" Moke. However these at best 'resemble' the genuine part. Choke (Chinese-Moke) parts are manufactured to No accepted International Standard. Sellers and stockists of course recommend their product but buyers tend to be limited to the extremely tight-fisted. 'Cheap' Moke owners are an acknowledged social phenomenon.

The only effective answer is to attentively lubricate the original factory system. Ideally this would occur every 1000 miles with an extreme outside limit of 3000 (1500 > 5000 Km). A well serviced Mini can be easily expected to be on its original rear pins and arms after forty years. If not for pin failure, Big wheel Moke could match this. Though finding a well serviced example of either car can be extremely difficult. If not for the following problem, front arms could be well expected to outlast the vehicle. However the service and repair of this next component is beyond that of the owner/driver.

A second area of concern is the knuckle joint. This comprises a steel pin with ball end that relies on a thin layer of nylon and a drop of grease to prevent its destruction. The basic design is common throughout both vehicle groups. All the suspension forces are transmitted through this small part. These units are essentially sealed for life. Very few repairers bother to inspect and add extra grease before installing the component. Even fewer bother to inspect the matching seat in the arm. If the previous joint has worn through the nylon cup and into the arm, valuable metal is lost. This equates to increased squeaks and decreased ride height. Such faults are not repairable. Arm replacement is the only option. This fault is generally predictable. However it cannot be confirmed until the suspension is stripped and cleaned.

There is little the owner can do to extend joint life. Acknowledging the problem and identifying the symptoms of failure can prevent the arm becoming a sacrificial component. If at any time the spring unit or arm has to be disturbed, replace the nylon cup. Allowing for the repairer not being deaf, dumb or stupid, this should force the seat (inside the arm) to be inspected. No wear, no problems. A lesser issue is that the entire mating surface for the cup (inside the arm) is raw (unprotected) metal from new. Corrosion can occur, which may make the old cup difficult to dislodge. Corrosion can be removed with some effort and will normally leave a serviceable arm behind. A simple smear of grease will prevent this being a problem next time. Unblocking the vent hole at the apex of the taper also helps. Alternately, during arm

overhaul, a light coat of paint will protect the surface. Combining with the smear of grease will greatly extend life for years to come. If you choose to powder-coat the arms, specify that the joint's hole remain unpainted after sand blasting. Otherwise the new cup won't fit in the hole and the very tedious job of removing the powder paint ensues.

Some of the problems associated with mystery brand parts have already been mentioned. Others include;

- Generic tie rod end boots, in place of the correct design for knuckle joints. These cheap boots tend to perish inside six months, so you get to do the entire repair again.
- Replacement arm bearings with a cage in place of every second needle roller.
- Light duty sundry fittings in place of heavy.
- Thrust washers with undersized lubricating flutes.

As an owner-repairer; unless you are willing to perform all the required research into which aftermarket parts are useable, which are not and how to identify them, then insist on genuine, genuine or genuine parts. Any nonsense from your supplier, then go somewhere else.

Like ALL suspension systems, Moulton has a few quirks. However, if maintained correctly it is extremely durable and reliable. As per the old advertisement; 'Moking isn't a wealth hazard'. For want of a grease gun, there is no need to let it become one.

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