

# MGB Kingpins & Front Suspension

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All 63-80 MGBs use an identical front suspension. The kingpin type front suspension used on the MGB is a good design, but it can and does wear out. Rebuilding the front end is a rewarding, yet somewhat challenging job for the 'home mechanic'. It will take the average enthusiast several days to do a really first class job.

## How do I know that my suspension is worn out & requires service?

### Symptoms

- Hard Steering-greater than normal effort required to turn the steering wheel, particularly at low speed. This can be difficult to determine since the problem often develops very slowly, over a long period of time.
- Excess wheel squat. Do the front wheels appear to camber out? If you look straight at the front wheels from in front of the car, the wheels should appear to be straight up & down. If the tops of the tires are closer together than the bottom, the kingpins are probably worn out.
- Excess tire squealing while cornering at moderate speed.
- Excess vibration in the steering wheel. Note: tire imbalance or a bent wheel can also cause this. In fact we have seen this attributable to bad driveshaft U-joints in rare instances!

### Potential Wear Points In The front Suspension

- Kingpins & their supporting stub axle bushes. Failure to grease kingpins regularly will cause the stub axle bushes to wear badly where they contact the kingpins.
- Lower trunion steel sleeve & lower trunion bush. Regular lubrication is critical here! Failure to lubricate this point always results in disaster. The lower trunion bush wears. The trunion bolt seizes to its steel sleeve. This causes the kingpin assembly to pivot on its mounting bolt rather than the sleeve and trunion bush as designed. This quickly "trashes" the lower control arms by elongating their kingpin retaining bolt holes.
- Lower control arm rubber bushes. These bushes fail over a short period of time & cause excess wheel camber. The original bush design is soft rubber. Deterioration of the rubber causes the bushes to break apart and fall out of position between the fulcrum pin and lower control arms. A much stronger & longer lasting bush with a steel insert for improved durability is available from Obsolete Automotive.



The fulcrum bush in the bottom of the kingpin shown here is almost worn right through on the lower left hand side. The bush has become oval shaped, instead of round, as it should be.

It just goes to show you how important it is to grease that bottom 'Zerk' fitting on the kingpin once in a while!

Look how badly the bearing surface for the lower stub axle bush is worn on the bottom kingpin. Compare it against the same area on the new kingpin above it.

This will cause significant tire wear and poor driveability!



## Doing the job

The front end of the car must be jacked up. Support the car on proper safety stands. Unbolt & remove both front wheels.

Unbolt both brake calipers and support them out of the way. This can be done with wire. Do this in a fashion that will not allow the calipers to strain their fluid hoses.

Unbolt and remove both outer tie rod ends from their steering arms.

Support the lower control arm with a jack or stand. Remove the castellated nut & cotter pin, which secures the upper trunion, to shock arm bolt. If you are lucky it will be possible to pound (or should we say tap) this special bolt out. If it moves continue to hammer it until the threaded end is flush with the shock arm. Use a large pin punch to completely remove this bolt.

If you are unlucky and the bolt will not move go to plan 'B' and here it is:

Use a hacksaw to cut the bolt. It will be necessary to carefully saw down in the narrow gap between the upper trunion and the shock arm. It will be necessary to saw through the bolt twice, once on each side.

After removal of the bolt by either method, the suspension assembly will drop a few inches under the force of spring pressure. Once this occurs, spring tension will be minimal, negating danger inherent in compressed coil springs. Put simply, once this happens there will be no safety hazard from the coil spring!

It is now time for your next challenge.

Remove the castellated nut & cotter pin (split pin if you will) from the lower trunion bolt. This is the large bolt that secures the bottom end of the kingpin assembly to the ends of the lower control arm.

Using a BFH (large hammer), attempt to pound the bolt out. If you are lucky it will slide right out. This is usually not the case. On most cars the bolt seizes solidly to the steel sleeve that it passes through. Since the control arm bolt holes are not large enough for the sleeve to pass through, the whole assembly presents a big problem to take apart.

This is where the operation becomes rather messy. If you have a cutting torch you can cut the old kingpin into several pieces. If you cut the lower trunion area, cutting close up to the control arms, the bolt and sleeve will disintegrate and fall out of the way.

If you are not so fortunate and do not have a torch you can still get things apart. Use a hacksaw or angle grinder to cut the outer ends of the control arms off, where the trunion bolt passes through them. Obviously this will destroy the control arms but they are probably worn beyond reuse anyhow.

In any event the kingpin, stub axle assembly, and brake disc will be separated from the car and can be taken to the bench.

Remove the grease cap, cotter pin, and castellated nut from the stub axle. Lift the brake disc complete with hub & bearings off the stub axle and set aside.

Clamp the bottom of the kingpin in a vice. Remove the top nut off the kingpin. It may be very tight requiring an impact gun or heat. If necessary cut it off since kingpins will require renewing.

The upper trunion must now be removed from the top end of the kingpin to allow further disassembly. Insert a stout steel bar through the hole in the side of the trunion. With the kingpin tightly clamped in the vice, attempt to wiggle the trunion back and forth until it breaks free of the kingpin. Eventually it will be possible to slide the upper trunion up and off the kingpin.

If the components are solidly locked together, the judicious application of heat from the torch will help loosen things up.

After the upper trunion is removed, the stub axle assembly can be slid up and off the exposed end of the kingpin.

The kingpin is of no further use and should be put in the garbage (or recycling facility).

Squeeze together the halves of the stub axle-sealing tubes and carefully pry it out of the back of the stub axle. It consists of two steel tubes that slide inside each other, held apart by a coil spring. The seal generally is reused after thorough cleaning. Be careful not to damage it by careless prying during disassembly. It is very expensive considering what it is. Further, it is not included in the suspension rebuild kit.

Using a press, remove the two stub axle bushes. These are steel bushes pressed into the two stub axle holes, which support the kingpin. New bushes are included in the rebuild kit.

It is now time to begin cleaning parts. Thoroughly clean the stub axle assembly in solvent. Remove all traces of grease dirt, and rust. If facilities exist the stub axle can be abrasive cleaned (sandblast, bead blast, or media blasted). If the stub axle is to be abrasive cleaned it is imperative that the wheelbearing surface is first protected to avoid pitting.

Once the stub axle has been scrupulously cleaned it must be inspected. Check for any sign of cracking, collision damage, damaged or stripped threads, or wear in the wheel bearing area. Damaged threads can be repaired by a competent machine shop. Other damage requires that the stub axle be scrapped and replaced by another.

After cleaning we suggest a good coating of black enamel. Painting will be one step on the way to making your car concourse or suitable for showing. Painted suspension components will rust far less than bare ones.

Assuming that you have purchased a front suspension rebuild kit it is now time to dig out the new stub axle bushes. Each stub axle has a larger lower and smaller upper bush. These must be carefully installed using a press. Press the new bushes into position in the stub axle. Pay close attention that the lubrication holes in the bushes match the grease holes in the stub axles. Failure to do this will make lubrication impossible! They are a light interference fit. This is required so that they are held solidly in position.

After installation, the stub axle bushes must be reamed or honed to fit the new kingpins. People often ask why this is necessary. The question often asked is why the bushes are not pre-sized to fit the kingpins properly by the manufacturers.

There are a couple of good reasons for this:

Remember that a good, tight, suspension will require a maximum of only a couple of thousandths of an inch (and preferably less!) of clearance between the kingpins and their stub axle bushes. Any extra play here will literally make for loose front wheels! When the stub axle bushes are pressed into the stub axle casting, they crush slightly. In fact the inside diameter of the bushes will decrease a small amount as the bush is forced into the stub axle. The holes for the bushes can vary slightly in size which means that the amount of crush also varies.

Even the bushes themselves have a production tolerance that allows their size to vary slightly during manufacture.

After installation, there are two ways to properly 'size' the stub axle bushes. The preferred method involves running a special kingpin reamer down through the stub axle. This reamer tool is specifically designed for sizing the bushes in an MGB stub axle.

The alternative method of sizing stub axle bushes involves using an adjustable reamer or hone. The bushes must be machined in small increments while continually testing the fit with a new kingpin.

This alternative method is a definite second choice as it is difficult to keep the bushes concentric with each other. Using the correct MGB kingpin reamer assures concentricity of bushes and exactly correct bush diameter since the reamer tool incorporates a pilot and has reaming flutes of predetermined size.

Once reaming has been completed, the stub axle must then be washed thoroughly in clean solvent to remove any 'swarf' from the reaming operation. The spring-loaded seal must then be installed and seated in position in the back of the stub axle casting. It must be fully seated to ensure that dirt will not enter the bushing area.

After installing the lower stub axle seal, the new kingpin can be inserted up into the refurbished stub axle.

The brass thrust washer and an adequate number of steel adjustment washers (from the suspension kit) should be placed onto the kingpin, above the stub axle. The upper trunion should be prepared the same as the stub axle was. It should be cleaned and painted. When ready it can be pushed down over the top of the kingpin. You may need to experiment with differing numbers of shims underneath the upper trunion to bring the 'end float' between the stub axle and kingpin into correct specification. This operation is tricky because the ideal amount of end float on the kingpin assembly should be almost zero. The stub axle should rotate freely on the kingpin, but with no perceptible end-float.

The self-locking nut can be installed to lock the assembly together.

The kingpin assembly should now be set aside in clean storage while the rest of the suspension is prepared.

### **Lower Control Arms & Fulcrum Pins**

At this time the lower control arms and coil springs should be removed from the car. Pushing the outboard ends of the lower control arms down with your foot will usually allow the coil springs to be pulled out by hand. If necessary, pry them with a crow bar.

Remove the two bolts retaining each control arm half to the spring pan. On cars with front sway bars it is also necessary to unbolt and remove the sway bar end links.

The spring pan will now drop out leaving only the control arm halves attached to the cross member mounted fulcrum pin.

Carefully remove the castellated nut off each end of the fulcrum pin. Great care must be used. The threaded ends of the fulcrum pin are easily broken off if the nuts are seized and you work too violently with a wrench. If the nuts are seized it is possible to remove them by grinding them almost all the way through and then breaking them with a sharp chisel. The threads can then be cleaned up with a die.

New fulcrum pins are extremely expensive, in fact new fulcrum pins are more than \$150 each. More reasonable priced ones are available from Obsolete Automotive if required.

After removal of the fulcrum pin nuts, the control arm sections can be rotated and slid off the ends of the fulcrum pins.

Remove the control arm rubber bushes. As you will see they are usually quite badly deteriorated.

Inspect fulcrum pins before reuse. If the control arm bush surface is extremely rusted or the threads are badly mangled, install new or good used fulcrum pins.

Check the control arm sections. Damage is usually limited to elongated kingpin retaining bolt holes. If the holes are oversize or no longer round, purchase and install new control arms. Also check the large hole in the inner ends, where the control arm bushes go. If the bushes are missing, sometimes these holes get badly worn. Replace as necessary. If the old control arms are suitable for reuse we recommend thorough cleaning and painting prior to reassembly.

### **Shock Absorbers**

Prior to reassembly of the suspension, the shock absorbers must be assessed to determine their condition.

Grasp the shock arm with your hand and move the shock up and down to the full extent of its travel. It should move smoothly but with firm resistance all the way. If there are spots where it becomes 'limp' or where it seizes during the stroke, it should be replaced by either a new or rebuilt unit. Both front shocks must be tested in this fashion.

If shocks exhibit any signs of serious leakage they must be replaced. Slight wetness is not unusual.

It is possible to refill a shock with oil. Generally speaking though, this will not cure a dead shock.

A shock that needs oil obviously has bad seals. Since installing new seals is all but impossible (unless you own your own machine shop), leaking shocks warrant replacement.

Installation of replacement shock absorbers at this time is simple. Removal of four 3/8 fine threaded bolts from the shock absorber mounting flange will allow you to lift the shock off of the cross member and installation of a replacement can be accomplished by the reverse of this procedure.

Front shocks are not handed and fit LH or RH.

### **Reassembly of the Front Suspension**

Please note: The front suspension overhaul kit contains a number of 'Nyloc' type self-locking nuts. These are a modern replacement for the castellated nuts & cotter pins originally installed in the MGB front suspension.

Install lower control arm bushes into the lower control arm halves. Standard rubber bushes can simply be pushed into position with the fingers. Two bushes are pushed into each control arm section, one in each side.

If you are installing 'V8' bushes (and we strongly recommend it), you will need either a small hand press, a vice, or some washers & a piece of threaded rod.

In either case, start the installation procedure by lubricating the bushes with soap or silicone. This will aid greatly in pressing the V8 bushes into the control arm.

If you are pressing the bushes into position with a vice or press, simply press the bushes in until there is an equal amount of bush protruding from each end of the control arm. This may require a spacer tube or socket to be placed over one side of the control arm to allow the bush to protrude slightly.

It is possible to install V8 bushes using a 3/8" threaded rod with two matching nuts and some large washers.

Install the rod through the hole in the V8 bush and the control arm hole. Put a large heavy flat washer over the end of the bush, followed by a nut.

Slide a large size socket (probably 1-1 3/8") over the end of the control arm, opposite the control arm bush. The socket must face inwards, towards the control arm. The open end of the socket must be

positioned so that the V8 bush will be able to enter its open end when the bushing is pulled into the control arm hole.

Place a small flat washer followed by the other nut on this end of the rod.

Tighten the nut and the control arm bush will be squeezed into position. It may be necessary to play around a bit to get the bush started in straight.

As with the other methods, install the bush so that there is an equal amount protruding from both ends of the control arm.

The lower fulcrum pins must be made ready. If the threaded ends of the fulcrum pins are intact they may be reused. Run a fine thread die over the threads to clean them up. Using a small pin punch knock out any remains of the cotter pins that may still be in the holes. Wire brush any rust accumulation on the control arm bush area of the pins.

If the fulcrum pins are not satisfactory for reuse by virtue of damaged or broken threads or excess rust, they can be removed from the cross member by removing four bolts. Installation of new fulcrum pins is a reverse of this procedure.

The control arms can now be slid onto the ends of the fulcrum pins. Install the fulcrum pin washers and nuts, but do not tighten until the wheels are on the ground.

If new shocks are to be installed this should be done now.

The stub axle & kingpin assemblies, as previously assembled, must be prepared for installation.

Install the upper trunion bushes. They are tapered rubber bushes with steel cores. These can be pushed into the recesses in the upper trunion by hand. One bush goes in each side of each trunion.

Next the lower end of the kingpin must be prepared. Insert the steel trunion sleeve through the lower trunion (bottom of the kingpin). Assemble the "Top Hat" shaped washers with their rubber seals. These will slide over the lower trunion ends of the kingpin.

Offer up the stub axle/kingpin assembly in position on the car. Carefully insert the special upper trunion to shock arm bolt. Push the bolt fully in place. The round head of the bolt should be almost flush with the shock arm. Start the nut onto the other end of this bolt but do not fully tighten.

Position the lower end of the kingpin between the lower control arm sections. Make certain than the steel tube and sealing washers are in position.

Insert the lower control arm/kingpin bolt and handtighten the nut.

The coil springs and their spring pans can now be installed. In the interests of safety it is strongly recommended that a proper coil spring compressor be used.

Install the coil springs up from underneath and compress with the compressor tool. Bolt the spring pans in position between the control arm halves. Two 5/16" bolts are used per side. Fully tighten the spring pan to control arm bolts & nuts.

Release the spring compressor allowing the springs to expand.

Prepare the front hub & wheel bearings. We recommend servicing the hub, wheel bearings, brake rotor, and hub seals all at the same time since they are all bolted together onto the stub axle.

Examine the brake rotors. If they are rusted, scored, or pitted, they probably should be replaced. It is sometimes possible to have rotors machined and reused. In the majority of cases this is not possible with the MGB. The reason is twofold.

Rotors have generally been machined at least once in the past. This is likely owing to the age of an MGB. The newest one was built in 1980. The other reason is that the MGB brake rotor is quite thin to begin with. Excessive machining of brake rotors is extremely dangerous. A rotor that is too thin may easily fail during hard braking. The results of this happening could be fatal!

Enough said I think.

Remove the inner & outer wheel bearings from the hub. The outer bearing along with its washer will pull straight out. The inner bearing will come out easily after popping out the grease seal with a screwdriver. The seal should be disposed of and renewed. Wash all grease and dirt out of the inside of the hub with solvent. Carefully dry it off and inspect the inner & outer wheel bearing races. Any rust, scoring, or discoloration indicates that new bearings will be required.

Wash the bearings in solvent, cleaning them thoroughly. Dry them with a clean, lint free rag.

The bearing rollers must be inspected for pitting or wear marks. If any are evident, purchase and install new ones.

Carefully remove the cast iron bearing spacer (located between the inner & outer wheel bearings) from inside the hub. Be sure to salvage the spacer complete with shims for reuse. Clean all the 'gunk' off of the spacer with solvent for reuse. Often new wheel bearings can be installed utilizing the bearing spacers with their existing shim assortment.

After completing all assembly work, lower the car on to the ground and finally tighten the lower control arm retaining nuts, lower control arm/kingpin nuts & bolts, and any other threaded fasteners not previously tightened.

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