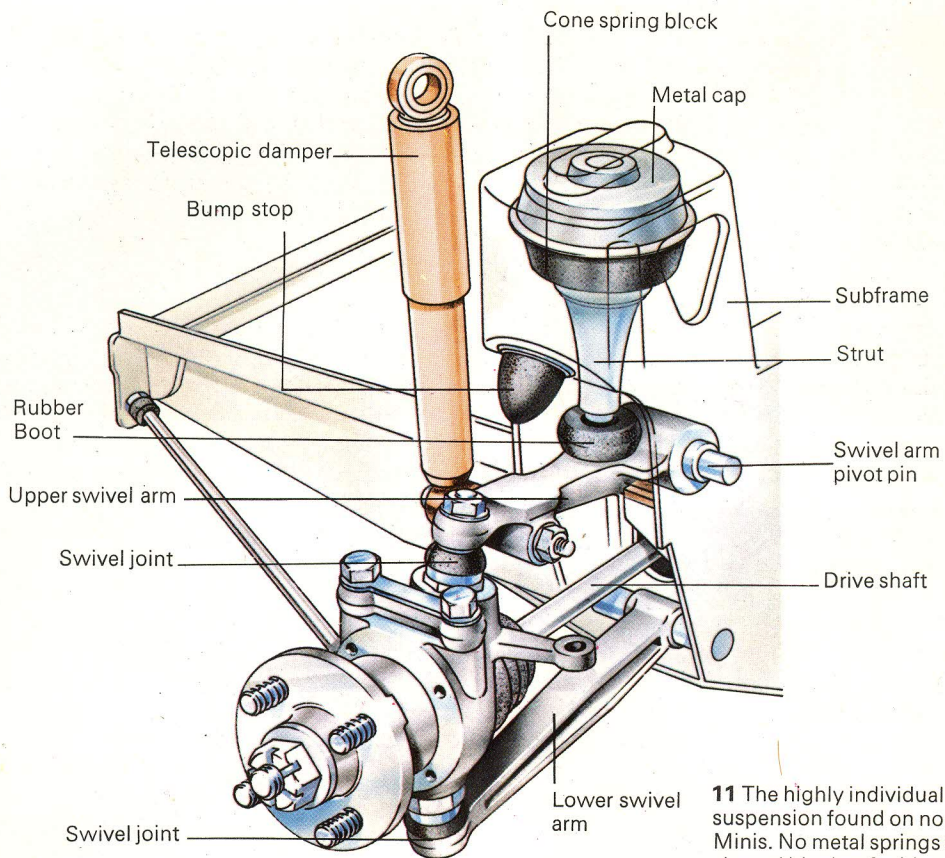
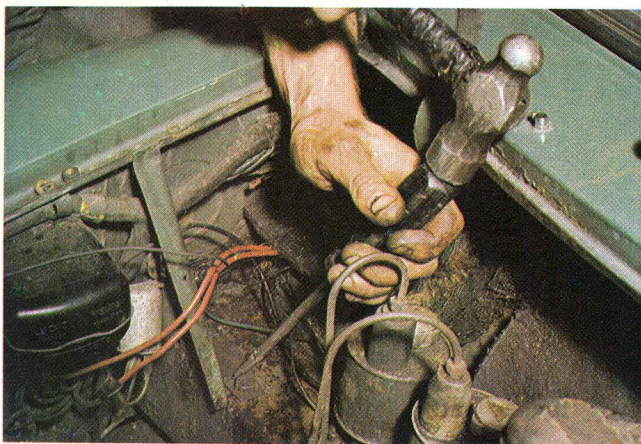


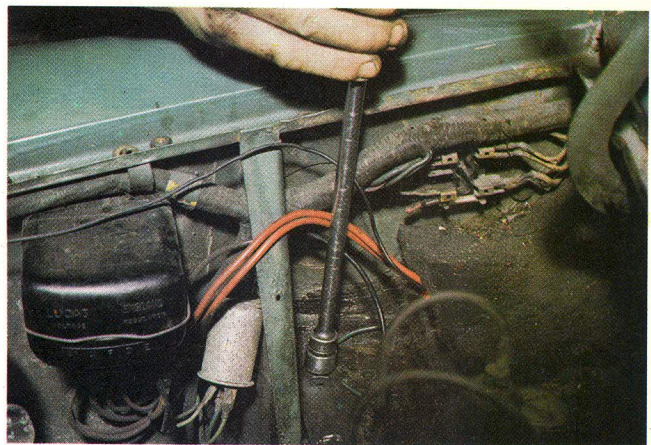
Chris Gillings



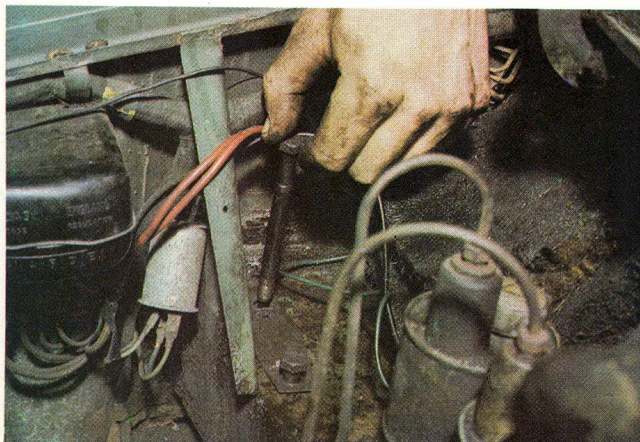
11 The highly individual independent front suspension found on non-Hydralastic Minis. No metal springs are used but cone-shaped blocks of rubber material fulfil a spring function by providing a cushioning effect



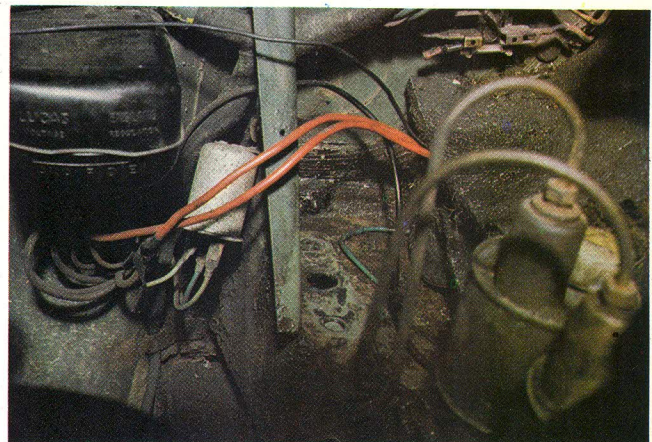
12 To remove a cone spring block from a Mini first bend back the securing tabs on the retaining bolts just forward of the bulkhead



13 Use a socket spanner to slacken the two retaining bolts. Take care not to pull any wires from their connections on the fuse box



14 Carefully withdraw the retaining bolts from the cone block. A small plate held in position by the bolts will then come free



15 As the plate is removed a hole between the two bolt holes is revealed. This is an access hole for a spring compressor tool

Next, remove the tapered ball joint pin. This requires the use of another special tool, a claw clamp. Fit the clamp on the tapered pin, then strike the end of the long handle on the tool downwards to release the pin. Next, loosen the bolts that hold the "Y" projections of the lower wishbone to the cross-member, but do not remove them. There is a safety strap under this wishbone. Release it and remove the nuts and bolts securing the fulcrum shaft to the cross-member. Carefully release the spring tensioner and lift up the lower wishbone where it is still connected to the spring by a nut and bolt. Undo this nut and bolt and lift out the lower wishbone placing it carefully to one side.

Repeat the procedure for the other side of the car to free the spring completely. You can now lift the spring out of the car and prepare to fit a new spring.

Fitting a new spring

Fitting a new transverse leaf spring is basically the reverse of removal but remember the following point in order to make the job easier and quicker.

When fitting the rubber bushes into the spring eyes, fit them so that the flats in the bushes will be vertical when the spring is fully fitted. The bushes may be easier to fit in the elongated eyes of the spring if you first soak them in soapy water. Do not try to use oil; this will damage them.



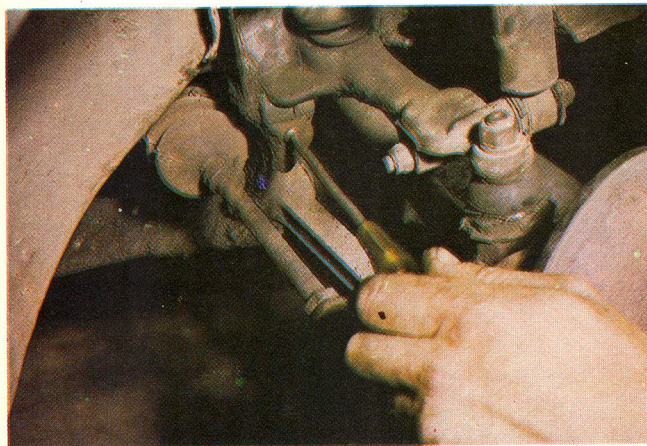
16 The spring compressor tool. It consists of a threaded bar and tube. The bar turns inside the outer tube



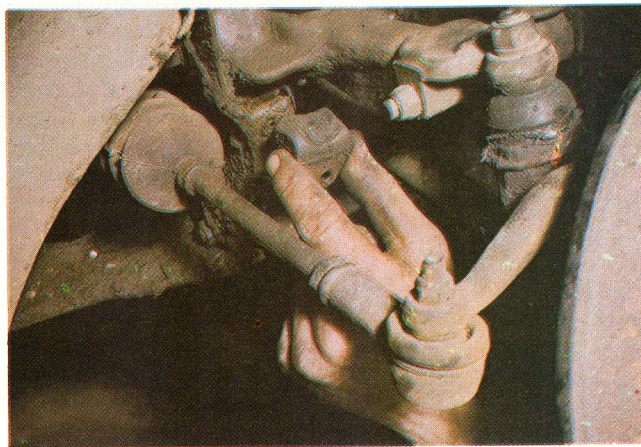
17 Locate the tool in the hole and turn the top tommy bar to screw the inner bar into the cone block



18 When the bar is properly located in the cone block, turn the lower tommy bar. This draws the spring upwards and compresses it



19 With the spring compressed, remove the wheel and undo the screw holding the cushion rubber under the upper swivel arm pivot



20 Pull the cushion rubber out with your fingers. The swivel arm will now be free to drop down to allow removal of the cone strut

Mini cone and strut system

Early versions of the Leyland Mini incorporated a rubber cone and strut suspension system which is exclusive to this car. In 1964 the system was replaced by the Hydrolastic suspension system (described in the third article in this series) but the Hydrolastic system proved unsatisfactory on such a small car and in 1971 the rubber cone and strut system was re-introduced. It was still in use up to 1978.

At the front of the car, conventional upper and lower suspension arms exert an upward force on a cone-shaped strut above them (fig. 11). This in turn compresses a hollow rubber spring which is mounted on the front sub-frame. The system still uses conventional dampers (see page 435).

Replacing faulty rubber cones

To remove the highly individual Mini cone and strut front suspension system, you will need special spring compressors. Hire, borrow or buy these before starting work.

First, open the lock tabs and slacken the two bolts that hold the front sub-frame tower to the engine bulkhead cross-member (figs. 12 to 14). Withdraw these bolts, remove the cover-plate. This exposes the access hole for the spring compressor tool. You can now compress the spring. First insert the special tool through the access hole in the



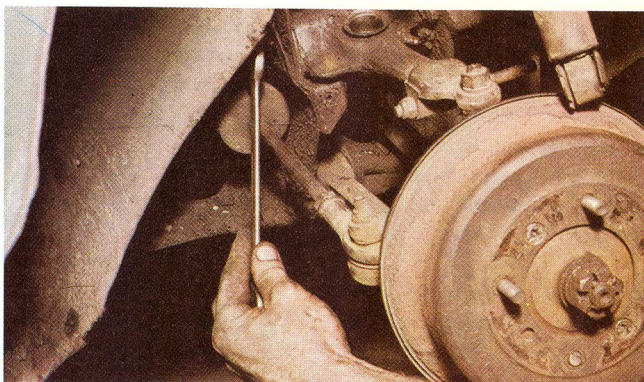
21 Before removing the strut, first disconnect the telescopic damper from its lower mounting on the upper swivel arm



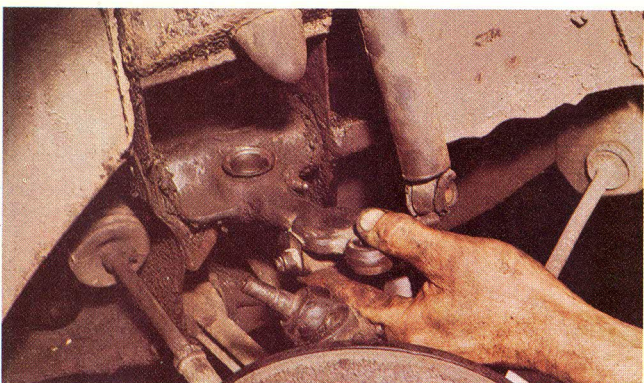
22 Pull the rubber oil seal boot from its lip over the ball end of the strut. If the ball is dry it is likely to be worn



23 To free the strut from its socket, push the suspension arms down with one hand and lift and pull the strut with the other



24 Use a spanner to remove the nuts on either end of the swivel arm pivot pin. Drift the pin out to free the arm



25 Pull the swivel arm from its mounting bracket with your hands. The cone block will now have enough room to be withdrawn



26 To remove the cone block, first release the compressor tool. The cone block should then drop out of its mounting

cross-member so that it engages on the edge of the hole. Make sure that the spindle on the tool is placed with the end in the centre screw before you turn it. Next, turn the centre screw about nine turns into the spring unit. Then operate the ratchet handle to screw the centre spindle nut down on to the body of the tool. Holding the centre nut firmly, turn the ratchet clockwise until the spring is compressed sufficiently to allow the strut to be removed from the tower, (figs. to 18). Disconnect the battery before going any further.

Slacken the wheel nuts, then jack up the car at the front and remove the wheels and bump rubbers (figs. 19 and 20). Undo the upper swivel arm retaining nut which holds the arm to the ball pin. You should then split the joint. This may be difficult and require the use of another special tool, which you should be able to hire from a good shop. When you have split the joint, you can lever out the spring strut. Finally, disconnect the swivel arm and decompress the springs (figs. 24 and 25).

The spring is now ready to be removed. First unbolt the

damper eye and extract the upper swivel arm pivot, complete with the nut on each end, the thrust collars, retaining plate, thrust washers and sealing rings. Next, turn the ratchet on the spring compressing tool anti-clockwise to release the spring pressure. Slacken the centre screw nut and remove the rubber cone spring (fig. 26).

A new spring is fitted by reversing the above method.

Non-spring suspension systems

The front wheel suspension systems described so far are all mechanical systems using either a conventional metal spring or the more unusual rubber spring. There is one more mechanical system still to be described—the torsion bar system. This system uses a metal bar which is twisted when the wheel moves either up or down. The resistance of the metal bar to the twisting action works in the same way as a metal spring. The next article in this series describes this system and also the variety of non-mechanical systems which use either fluid or gas as the spring medium.