

## Installation tips for fitting gearshift improvement kit 1.

- The gearshift linkage can be accessed from either the top, by removing the boot (trunk) compartment floor, or from underneath after the under shield is removed (if fitted). Unless you have access to a vehicle lift or a pit then I would recommend tackling the job from the top with the floor removed.



- Start by identifying the components that are going to be replaced and giving the area a quick clean up. The Shift cable rod ends and the translator assemblies are located near the rear of the gearbox, on the LH side on models up to '93 and on the RH side from '93 onwards.
- After cleaning up the rod ends on the end of the shift cables, make a mark on the cable ends using paint, tape or tipex behind the locknuts so that when the rod ends and locknuts are removed you can position the new parts in exactly the same place.
- Now remove all the effected components. Start by removing the tie rod assembly by undoing the M6 nuts on the translator body and at the other end, on the exhaust mounting bracket. Do not slacken off the adjuster nuts or the rod ends on the tie rod. This assembly needs to be left in its original condition so that it can be used to set the length of the new tie rod assembly.
- Now loosen off the lock nuts by just a fraction of a turn from the cable ends. Remove the fixing nuts from the rod ends on the lower part of the translator. You may need to remove the shift cable clamp plate from the exhaust mounting bracket at this point so you have enough freedom of movement in the cables to allow you to remove the rod ends from the translator body. Once free of the translator body unscrew the old rod ends and their fixing nuts.
- You can now fit the new fixing nuts followed by the new rod ends on to the shift cables. Assuming all the old parts that came off are of the same dimensions as the new parts (the original Lotus parts where to the same dimensions as the new parts in the kit), then you can just screw the lock nuts on to the point you marked on the shift cables. The rod ends should then be screwed up to the lock nuts.
- Turning attention to the translator assembly. Its best to remove this completely from the gearbox cross shaft to allow easily disassembly and re-build. Remove the pinch bolt from the top of the translator centre shaft so that the translator can be withdrawn from the cross shaft. Now fix the translator in a vice and unscrew the M8 nut on the bottom. The centre shaft can now be withdrawn from the translator body. Retain the thick washer from behind the M8 nut since this will be re-used.
- Using a suitable drift, knock out the bearings from the top and bottom of the translator assembly and recover the aluminium tube that separates the bearings. A useful tip is to first knock the spacer tube to

one side a little since this will then expose the edge of the inner bearing race hence giving you something to drift against.



- Once the translator body has been thoroughly cleaned its time to prepare to re-assemble with new bearings. First step is, using a 6.5mm HSS drill, open out the holes to take the rod end studs. DON'T drill all the way through the existing holes, just drill to a depth of 1 or 2mm. This is to accommodate the short length of stud that is not threaded at the base of the rod end stud and makes sure the stud engages fully into the translator arms.
- Now take the 2 new bearings and, with the assistance of a block of wood and a small hammer, tap these into the ends of the translator assembly. Make sure you remember to fit the spacer tube again before fitting the second bearing. Also, use the central shaft to ensure the bearings are aligned in parallel before tapping the bearings fully home. You can tell when the bearings are fully seated since the spacer tube will no longer rattle against the central shaft since it will be locked in place by the contact of the inner race of the top and bottom bearings.



- With the central shaft in place, slip the large dia washer over the threaded end of the shaft, followed by the original thick washer. The new large dia washer helps keep muck away from the bearings for longer. Finally fix the new nylock M8 nut onto the shaft and tighten until its snug against the washer. The central shaft should now rotate freely on the new bearings without any slop or rough motion.



- Now re-fit the translator assembly to the gearbox cross shaft such that with the gearbox in neutral the translator body hangs down vertically, as it did when you removed it. There should be a woodruff key in the translator body that ensures the translator body is aligned on the cross shaft correctly. Its not unknown for this to be missing though. Tighten the pinch bolt well so that it does not allow the translator to slip on the cross shaft.
- Re-attach the cable rod ends to the translator assembly using the provided nylock M6 nuts.
- Assemble 2 lock nuts onto the new tie rod, followed by the remaining 2 rod ends. Adjust the assembly such that the overall length matches that of the original tie rod assembly. If the tie rod is a little too long to achieve the length of the original part, carefully cut a few mm off the end using a hack saw and then re-assemble.



- Now fit the new tie rod assembly to the translator body and exhaust mounting bracket. Use the provided M6 nylock nuts to fix the rod ends in place.



- The black nut covers can no be fitted over the 4 M6 nylock nuts in order to keep muck away from the threads and improve the appearance.

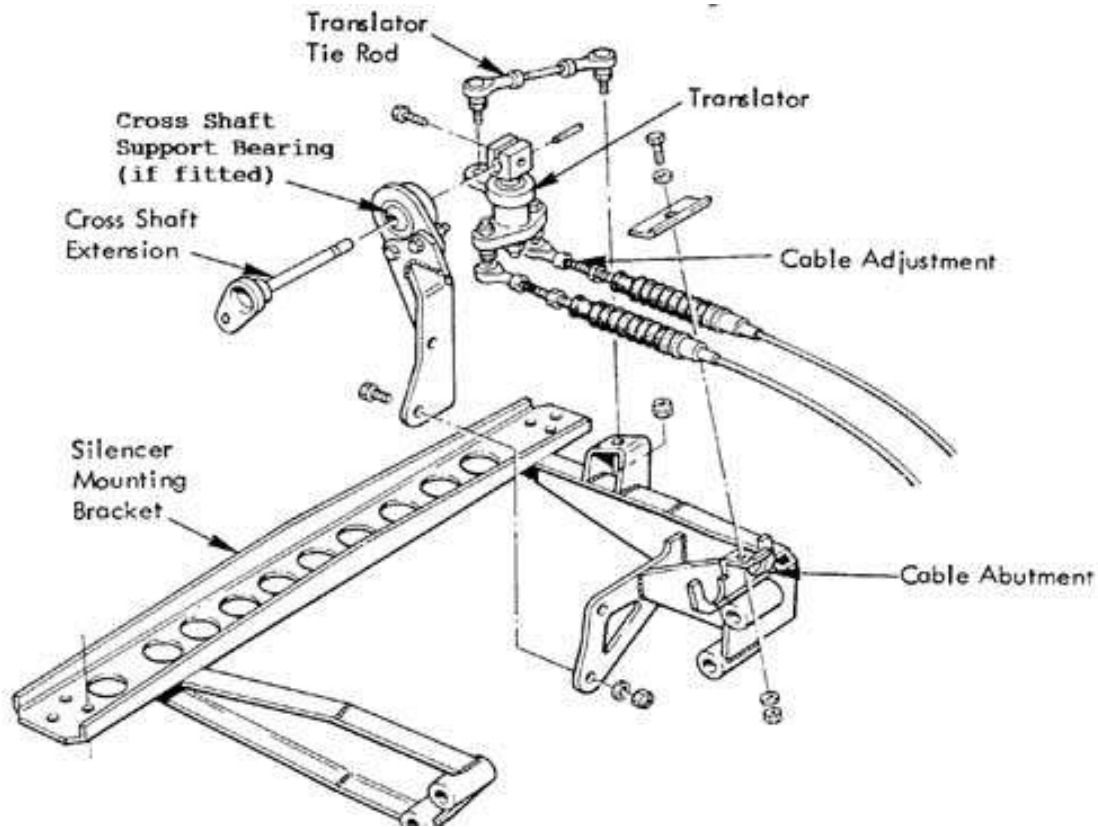


- The job is now nearly done. Check that all gears can be selected. If there are any problems selecting reverse or 5<sup>th</sup> gear then the chances are you will need to make a small adjustment to the tie rod length. The alignment directions provide by Lotus are attached to help with any fine tuning required.

Lotus alignment notes.

### Gearchange mechanism adjustment

A two cable mechanism is used to connect the gearchange lever to the gearbox cross-shaft. The gearchange lever assembly is arranged to provide a pull or push equally to both cables when moved in the fore/aft plane. When the lever is moved side to side (crossgate), the mechanism provides a pull to one cable and a push to the other. At the gearbox end this cable movement is converted via a 'translator' into rotational or axial movement of the gearbox cross shaft.



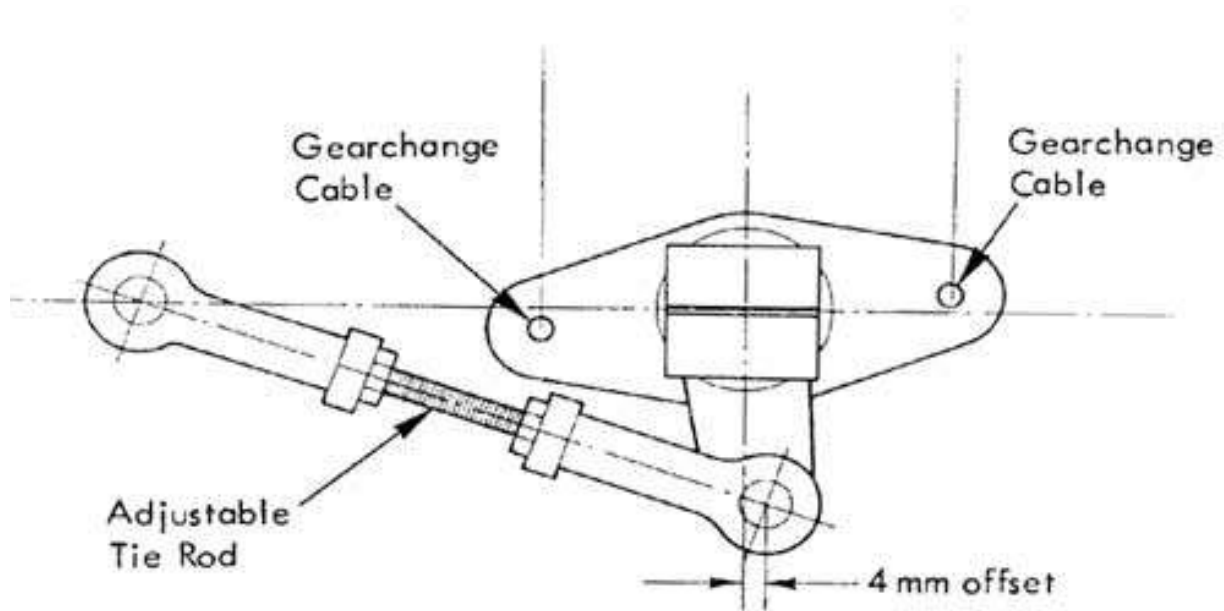
The translator consists of two parts: a swivel 'tree' and a pivot pin, the pivot pin hangs from a splined clamp which is secured to the cross shaft extension. The swivel tree which pivots on this pin via two ball bearing races, has two diametrically opposed arms at its lower end and a single arm disposed at 90° to the others, at its top end.

When the two gearchange cables pull or push together, the lower end of the translator is pulled or pushed, and a rotation imparted to the cross shaft. When one cable pulls and the other pushes, the translator is rotated about its vertical axis, but since the top arm of the translator is connected by a tie rod to a fixed bracket, the translator itself must pivot around the outer end of its top arm, thus imparting an axial (lateral) movement to the cross shaft.

### Gearchange Cable Adjustment Procedure

Adjustment of the gearchange cables can only be checked after disconnecting the ball joint on the rear end of each cable from the translator.

1. Disconnect both cable ball joints from the translator.
2. With the transmission in neutral, the gearbox cross shaft is spring loaded axially to the 3rd/4th gear plane. If necessary, adjust the translator tie rod so that the tie rod fixing hole in the translator upper arm is offset 4mm inboard of a fore/aft datum line passing through the centre of the translator clamp.



3. The gearchange lever is independently spring loaded to the 3rd/4th gear plane. With the aid of an assistant, hold the gear lever leaning backwards approximately  $7.5^\circ$  in this crossgate plane.



4. If necessary, adjust the length of the two cables at their rear end ball joints so that they can be connected to the translocator without preload. Note that both gearchange cables are identical and that the right hand cable at the gearlever end is fitted to the left hand side of the gearbox end. As a check, move the gear lever across the gate from right to left and observe cable movement at the rear end. The cable that moves forward is fitted to the left hand side at the gearbox.