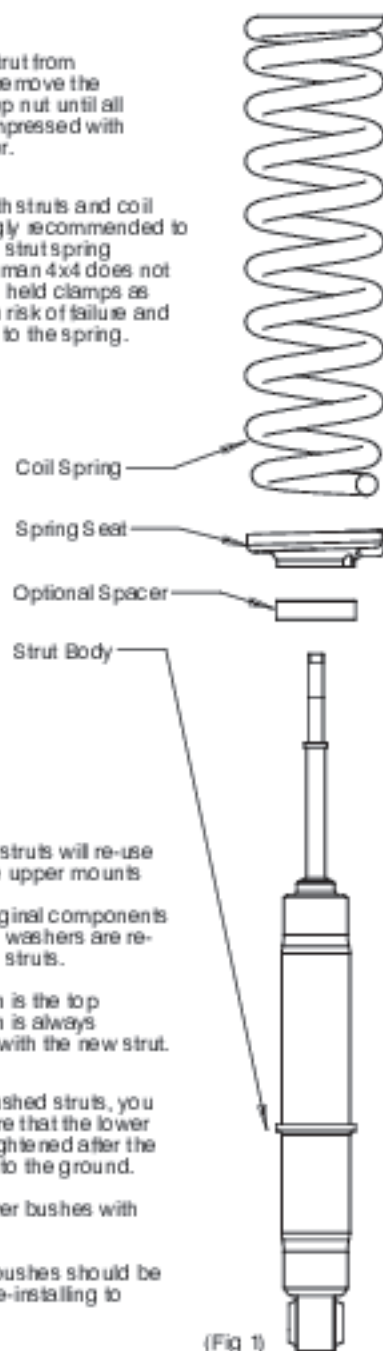




STRUT & SPACER INSTALLATION GUIDE

When removing strut from vehicle, DO NOT remove the centre retaining top nut until all spring load is compressed with spring compressor.

When working with struts and coil springs, it is strongly recommended to use a high quality strut/spring compressor. Ironman 4x4 does not recommend hand held clamps as these pose a high risk of failure and potential damage to the spring.



(Fig 1)

Most Ironman 4x4 struts will re-use the original vehicle upper mounts and bushes. It is vital that all original components especially locating washers are re-used with Ironman struts.

The only exception is the top retaining nut which is always renewed together with the new strut.

When installing bushed struts, you must always ensure that the lower bushes are only tightened after the vehicle is lowered to the ground.

Do not tighten lower bushes with wheels hanging.

Upper strut plate bushes should be tightened before re-installing to vehicle.

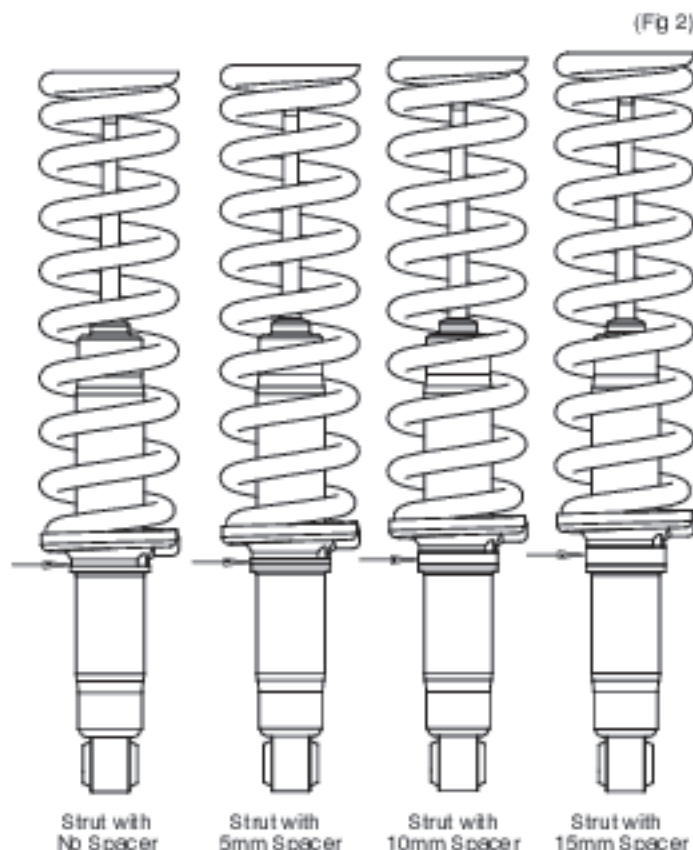
Ironman 4x4 struts feature a simple and effective height adjustable system.

In most cases a spacer is not required. An Ironman spring when selected correctly is designed to utilise the maximum lift potential of the suspension system. In certain cases, eg. Where extra weight has been added to the vehicle, a spacer may be considered.

Different thickness spacers are available and can be installed to raise the spring seat height, which increases vehicle ride height. (Fig 2)

The spacer must be installed with the strut removed from the vehicle before installing the spring seat and coil.

HILFR05 / HILFR05 F = 5mm Thickness
HILFR10 / HILFR10 F = 10mm Thickness
HILFR15 / HILFR15 F = 15mm Thickness



(Fig 2)

127 10GR & 247 10FE when used in Toyota Hilux are the only Ironman struts which use a spacer as standard fitment. All Hilux installations must install the supplied 15mm spacer for correct spring seat location. The spacer is considered optional for these same part numbers when used in other vehicle models.

When considering to install a spacer into an Ironman strut, first you must determine the amount of lift potential available.

Most independent suspension systems must retain a minimum of 60mm downward suspension travel.

The downward suspension travel is measured by the following:

- 1) Measure and record distance from Wheel Rim to Guard when vehicle is resting on flat level ground.
- 2) Raise front of vehicle with wheels fully hanging.
- 3) Measure and record distance from Wheel Rim to Guard again when vehicle is raised.
- 4) Subtract (Step 1) distance from (Step 3):

(Sample)
(Step 1) 770mm. (Step 3) 830mm.
830mm - 770mm = 60mm.

This means the wheel has 60mm downward travel available.

The higher the ride height is to start with, the smaller this measurement will be.

It is also important to understand Motion Ratio (MR), a term referring to the leverage effect involved in most independent suspension systems.

Most 4x4 suspension struts operate on 1:2 or 1:1.6 Motion Ratio.

For Example: For every 1mm of lift applied to the strut body, 1.6mm or 2mm will result when measured from the wheel. (See Fig 3)

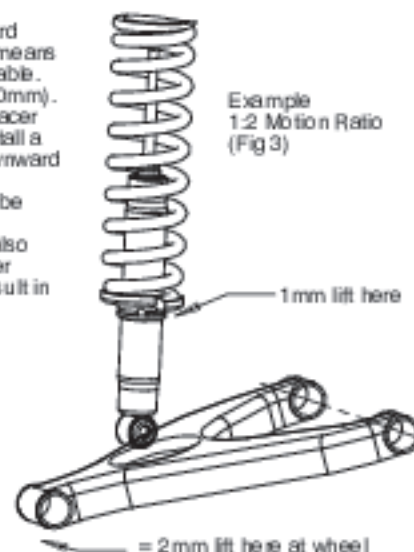
(MR) 1:2 Example: A 10mm spacer, results in +20mm ride height increase when measured at the wheel.

(MR) 1:1.6 Example: A 10mm spacer, results in +16mm ride height increase when measured at the wheel.

Once the above is determined and understood, you can calculate the spacer thickness required.

For example if your original downward suspension travel was 80mm. This means you have 20mm of lift potential available. (before you reach the minimum of 60mm). Considering the motion ratio and spacer thickness, in this case you could install a 10mm spacer, and the resulting downward travel would be 60mm. Of course a 5mm spacer could also be used as this would result in a final downward travel of 70mm which is also acceptable. However a 15mm spacer should not be used as this would result in only 50mm which is not sufficient.

Failure to adhere to these guidelines may lead to damage of the vehicle or components. If you have any further questions, please contact Ironman 4x4.



Example
1:2 Motion Ratio
(Fig 3)