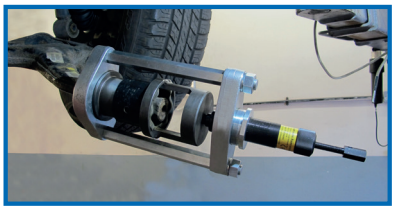
# 18777000 - Land Rover Discovery 3 & 4 Suspension Bush Master Kit

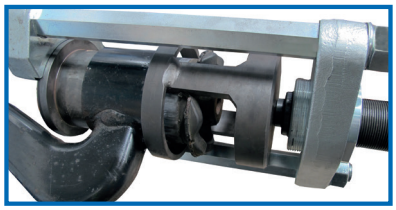
The Sykes-Pickavant 18777000 master kit is a complete solution which allows the removal and replacement of all the suspension wishbone bushes fitted onto Land Rover Discovery 3, 4 & Range Rover Sport vehicles.

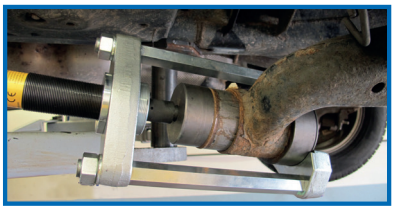
The kit allows for **on-vehicle** removal and replacement of all lower wishbone suspension bushes.

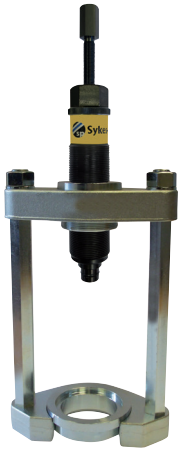
Upper wishbone suspension arms have to be detached from vehicle for removal and replacement of the wishbone suspension bushes.

The kit is designed to be used in a Sykes-Pickavant 187 series press frame with the powerful SP 12 tonne hydraulic ram, as great force is often required to move tight and often corroded bushes. The tools can also be used in a workshop press









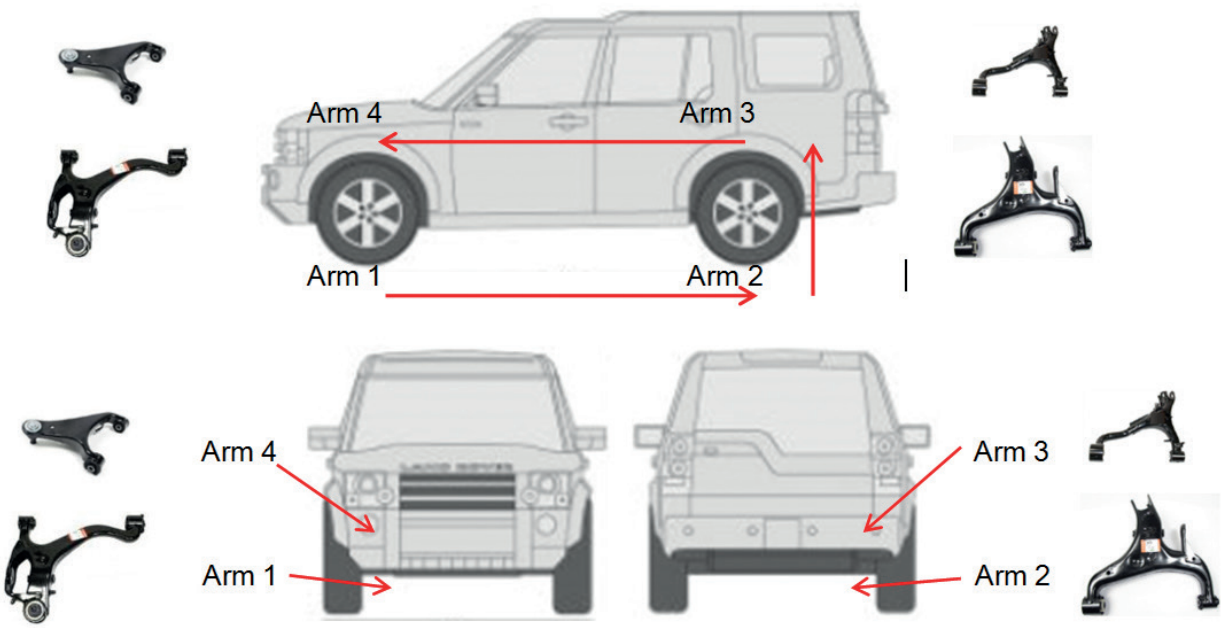
**187000V2 - Universal Press Frame c/w 12 tonne Hydraulic Ram**

Individual kits are also available for suspension positions: Front Lower, Front Upper, Rear Lower & Rear Upper. These instructions cover all options.

| Kit Part No. | Description | Pieces in Kit (Less ram & 187 press frame) |
|---|---|---|
| 18777000 | Master Kit | 22 |
| 18777100 | Front Lower Arm | 9 |
| 18777200 | Front Upper Arm | 4 |
| 18777300 | Rear Lower Arm | 8 |
| 18777400 | Rear Upper Arm | 7 |

*Note: Master Kit rationalises the contents of all 4 separate kits, to provide only the tools required for all tasks without repeating items contents - where common parts are shared across numerous kit options.*

**Sykes-Pickavant designation of individual suspension wishbones as referred to in this document**



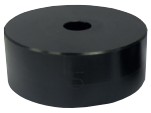
# Index



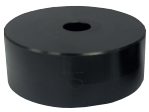
# Identifier Chart

| Arm / Kit No. | Arm Location | | | |
|---|---|---|---|---|
| 1 | **Front Lower** | | | |
| | Large Bush Removal | 1A, 1B & 1B spacer | Large Bush Insertion | 1B reversed, 5 & 50mm ram ext |
| | Small Bush Removal | 1C, 1D & 1D spacer | Small Bush Insertion | 1D reversed, 5 & 50mm ram ext |
| **Arm / Kit No.** | **Arm Location** | | | |
| 2 | **Rear Lower** | | | |
| | Large Bush Removal | 2C & 2D | Large Bush Insertion | 2D reversed, 5 & 50mm ram ext |
| | Small Bush Removal | 2A, 2B & 2B spacer | Small Bush Insertion | 2B reversed & 5 |
| **Arm / Kit No.** | **Arm Location** | | | |
| 3 | **Rear Upper** | | | |
| | Large Bush Removal | 3A, 3B & 50mm ram ext | Large Bush Insertion | 3B reversed & 5 |
| | Small Bush Removal | 3C & 3D | Small Bush Insertion | 3D reversed & 5 |
| **Arm / Kit No.** | **Arm Location** | | | |
| 4 | **Front Upper** | | | |
| | Bush Removal | 4A & 4B | Bush Insertion | 4B reversed & 5 |

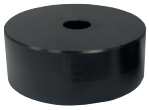
# Kit 1 Contents - Front Lower Wishbone (18777100)

| Part Number | Description | Image |
|---|---|---|
| 187770-1A | Large bush remover void piece – The SP hydraulic ram mounts into the top of this piece and the base end mounts over the bush. The shape of the bush and the tool ensures it mounts in line. |  |
| 187770-1B | Large bush removing piece – The tool mounts in the press frame and pushes the bush out of the wishbone into void piece 1A. Tool also mounts backwards in the frame for bush insertion – it is shaped to mount in-line on the wishbone. |  |
| 187770-1BS | 2nd stage spacer that allows piece 1B to fully withdraw the large bush. There isn't room for piece 1B to be any longer – so the spacer is needed for full extraction. |  |
| 187770-1C | Small bush remover void piece – The SP hydraulic ram mounts into the top of this piece and the base end mounts over the bush. The shape of the bush and the tool ensures it mounts in line. |  |
| 187770-1D | Small bush removing piece – The tool mounts in the press frame and pushes the bush out of the wishbone into void piece 1A. Tool also mounts backwards in the frame for bush insertion – it is shaped to mount in-line on the wishbone. |  |
| 187770-1DS | 2nd stage spacer that allows piece 1D to fully withdraw the large bush. There isn't room for piece 1D to be any longer – so the spacer is needed for full extraction. |  |
| 187770-05 | Bush mounting piece - The SP hydraulic ram mounts into the top of this tool; all bushes locate inside its recess. The wide profile ensures bushes are inserted to the correct depth. |  |
| 15242200 | 50mm ram extension piece |  |

# Kit 2 Contents - Rear Lower Wishbone (18777300)

| Part Number | Description | Image |
|---|---|---|
| 187770-2A | Small bush remover void piece – The SP hydraulic ram mounts into the top of this piece and the base end mounts over the bush. The shape of the bush and the tool ensures it mounts in line. |  |
| 187770-2B | Small bush removing piece – the tool mounts in the press frame and pushes the bush out of the wishbone into void piece 2A. Tool also mounts backwards in the frame for bush insertion – it is shaped to mount in-line on the wishbone. |  |
| 187770-2BS | 2nd stage spacer that allows piece 2B to fully withdraw the large bush. There isn't room for piece 2B to be any longer – so the spacer is needed for full extraction. |  |
| 187770-2C | Large bush remover piece – the SP hydraulic ram mounts into the top of this piece and the tool pushes the bush out of the arm and into piece 2D. |  |
| 187770-2D | Large bush piece – the tool mounts in the press frame (O' ring side inserted) to remove the bush. The tool also mounts backwards in the frame for bush insertion – it is shaped to mount in-line on the wishbone. |  |
| 187770-05 | Bush mounting piece - The SP hydraulic ram mounts into the top of this tool; all bushes locate inside its recess. The wide profile ensures bushes are inserted to the correct depth. |  |
| 15242200 | 50mm ram extension piece |  |

# Kit 3 Contents - Rear Upper Wishbone (18777400)

| Part Number | Description | Image |
|---|---|---|
| 187770-3A | Bush remover pushing piece – the SP hydraulic ram mounts into the top of this piece and the base end mounts into the bush. The shape of the bush and the tool ensures it mounts in line. |  |
| 187770-3B | Bush removing void piece – the tool mounts in the press frame and the bush is pushed out of the wishbone through this piece. Tool also mounts backwards in the frame for bush insertion – it is shaped to mount in-line on the wishbone. |  |
| 187770-3C | Bush removing piece – the tool mounts in the press frame and pushes the bush out of the wishbone into void piece 2C. Tool also mounts backwards in the frame for bush insertion – it is shaped to fit precisely onto the wishbone. |  |
| 187770-3D | Bush removing void piece – the tool mounts in the press frame and the bush is pushed out of the wishbone through this piece. Tool also mounts backwards in the frame for bush insertion – it is shaped to fit precisely onto the wishbone. |  |
| 187770-05 | Bush mounting piece - The SP hydraulic ram mounts into the top of this tool; all bushes locate inside its recess. The wide profile ensures bushes are inserted to the correct depth. |  |
| 15242200 | 50mm ram extension piece |  |

# Kit 4 Contents - Front Upper Wishbone (18777200)

| Part Number | Description | Image |
|---|---|---|
| 187770-4A | Bush remover void piece – the SP hydraulic ram mounts into the top of this piece and the base end mounts over the bush. The shape of the bush and the tool ensures it mounts in line. |  |
| 187770-4B | Bush removal and insertion piece, the tool mounts into the press frame with the longer section used for bush removal & the shorter section for bush insertion. |  |
| 187770-05 | Bush mounting piece - The SP hydraulic ram mounts into the top of this tool; all bushes locate inside its recess. The wide profile ensures bushes are inserted to the correct depth. |  |

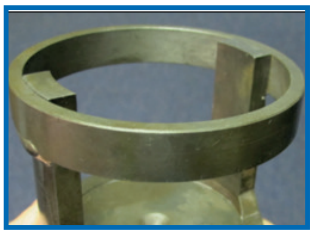
## Ram Input Hex Drive Screw

All kits include a ram input hex drive screw to replace the existing ram screw in the 12T hydraulic ram (18000000). This allows a ratcheting spanner to be used in areas of limited access, where the original t-bar and screw would foul on the body / suspension arm.

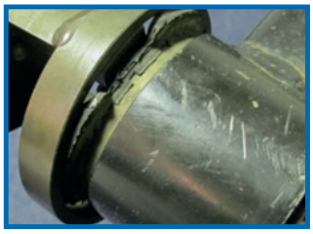
## NOTE: DO NOT USE AIR TOOLS ON THIS SCREW

## Precision Fit Bush Remover Pieces

The images to the right show the way tool pieces 1A, 1C, 2A, & 4A mount onto wishbones 1, 2 & 4 to remove bushes.



The Bush in this image is partly removed to better show the tool fitting over the 2 cut-outs in the old bush.
The bush then freely passes the edges of the tool.



## Packaging

The 18777000 master kit is packed in a rugged metal box with 4 separate kits in this. Each kit inside the box is in clearly marked poly-cases to aid with storage and identification of correct tools. Individual kits come packed inside a tough poly-case.


## Safety

Before using the 18777000 kit, ensure vehicle is safe to work upon – if no ramp is available then ensure the ground is firm and level, the parking brake fully applied, vehicle ignition keys removed and the wheels blocked. Raise vehicle via a jack but do not undertake any work with the vehicle still supported on a jack - always lower the vehicle onto suitable supports.

**Sykes-Pickavant will not be held responsible for any failure to follow best practice in safe working when using the 18777000 kit.**

**Before using the tool:**
Lift the wheels clear of the ground and proceed to remove any components that restrict access to each wishbone being worked upon. Take care to clean off dirt and debris deposits from the wishbone securing bolts, apply a penetrating fluid or de-seizing agent and allow a few minutes to work before using the tools.

Always lubricate the ram thread spindles and ram input hex drive screw before each use with grease, apply a film of an anti-rust lubricant such as copper-slip or similar to ease new bushes in.

**After using the tool:**
Be sure to check fitting and security of all disturbed and replaced components upon completion of suspension reassembly. Ensure all fixing components (and wheels where removed) are set to their correct torque settings, test operation of the suspension for correct operation.

These instructions describe the full use of Master kit part number 18777000 but in cases where a customer chooses to purchase only an individual kit they also cover options 18777100 for the front lower, 18777200 for the front upper, 18777300 for the rear lower and 18777400 for the rear upper bush tools.

## Suspension Geometry Recommendations – All bush kits

Where possible, mark adjustable suspension washers prior to loosening them, as returning the suspension to these points after repairs will be a good point from which to re-set the suspension alignment.

**Not marking these points in advance may result in more work to reset the vehicle geometry.**

These eccentric washers sit against a ridge in the vehicle chassis – Adjustment is achieved by rotating them which moves the wishbone position in the slotted mounting.

These bolts may be seized tight inside the metal sleeves of the bush, so to remove them easily and quickly we recommend using the SP Induction Heater+ (96020000) to warm up the hex head and the exposed stud end. Heat both ends well to let the heat transfer to the bolt center, allow to cool and then drive the bolt out with the Vibro-Impact Hammer (90206000).

Please visit the sykes-pickavant website: www.sykes-pickavant.com to watch a video of this in action

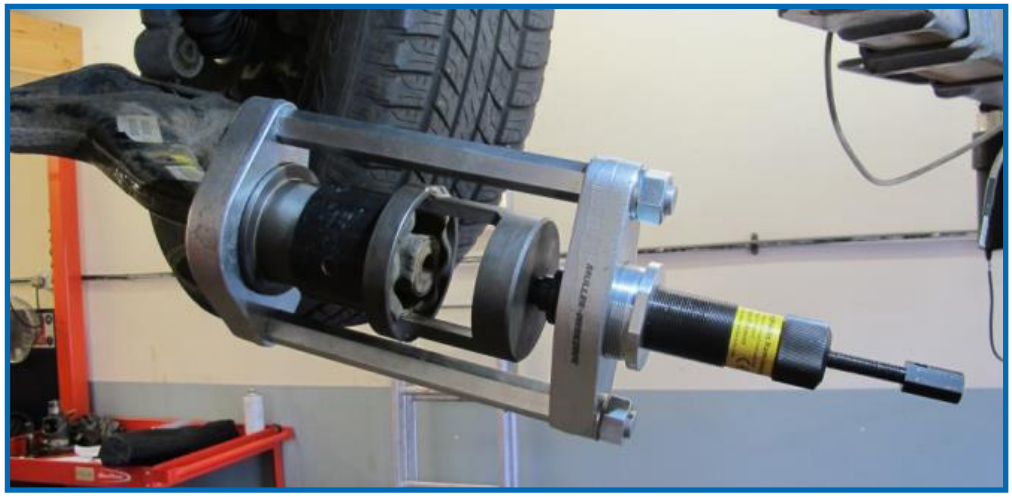
Whilst the job of replacing bushes may not alter the settings far from their original position if all eccentric washers are set to their original marks; there is no guarantee that this will result in perfect suspension geometry.

The only certainty is to fully re-align the vehicle after working on it and always set vehicle in line with the manufacturers recommendations.

## Front Lower Wishbone (Arm 1)

## Tool Kit 1: (18777100)

Both front and rear bushes can be changed on the vehicle; there is no need to remove it.
Rear / Large bush removal (Mark orientation of original bush & fit new bush in the same position)



Pieces 1A and 1B used as above and then with 1B spacer for 2nd stage movement for complete bush removal.

Piece 1A mounts onto the hydraulic ram and locates precisely over the bush to be removed; the bush has 2 gaps in its outer edge – over which the pushing faces of the tool mount onto; Due to tight clearances it will be necessary to almost fully wind the ram back in the press frame and also spin the threaded adaptor to ensure the tool can mount fully – as shown in the above right image.

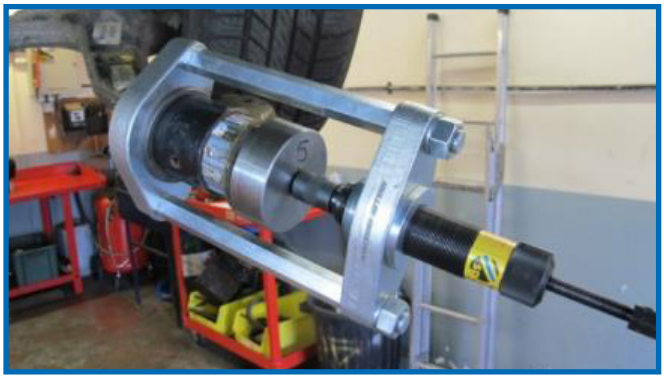
Piece 1B mounts into the bottom of the press-frame and is held securely with an O-ring, the shaped section of piece 1B is shaped to locate on the end of the bush so that the whole assembly is secure when put together.

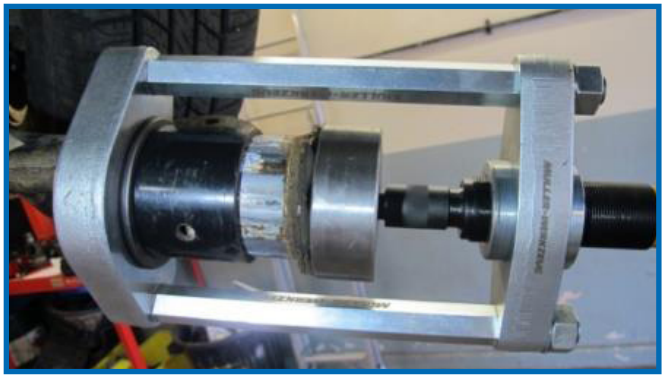
Due to clearance limitations, piece 1B is not able to remove the bush in one movement – so instead when it reaches full travel, the ram should be wound back, 1B spacer inserted into the bush housing in-front of piece 1B and then reset the assembly to fully remove the bush.

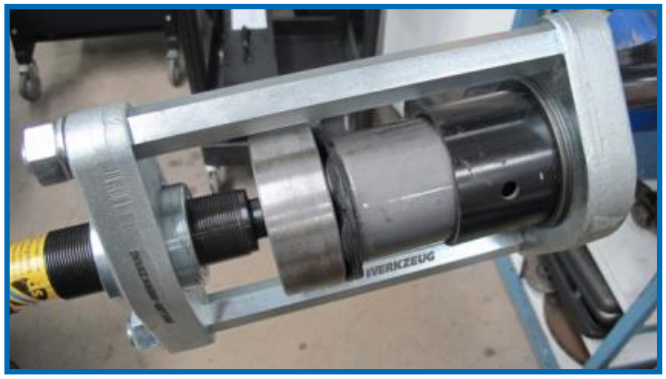
## Rear / Large bush installation

Clean inside of wishbone housing to remove all corrosion before installing a bush.

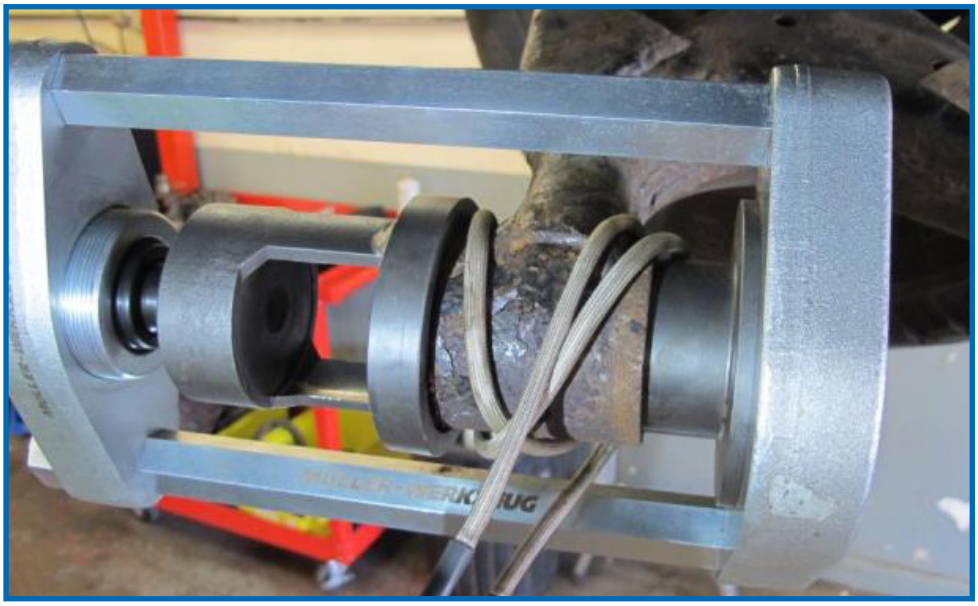
1B is mounted backwards in frame (the opposite for bush removal), with piece 5 and extension on ram side; piece 5 is shaped to ensure it cannot push the bush in too far.








## Front / Small Bush Removal (Mark orientation of original bush & fit new bush in the same position)



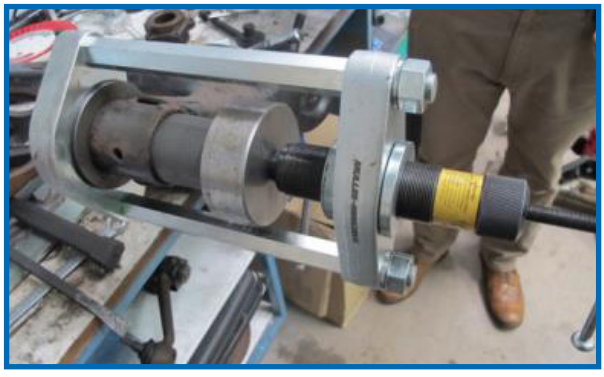
Item 1C locates onto the ram end & 1D into the press frame base. Part 1D spacer is used to push the bush out for the final range of movement.

These bushes can be very tight – even with this powerful tool and it may be easier to remove bushes if a little flameless heat is used. Shown in the image above is the SP 96020000 Induction Heater + using a 96026000 rope coil wound around the bush housing; this warms the outer case gently and evenly which then expands causing the corrosion to free and the bush is released with less force required. Heat to between 100 & 200°C

Note: Never apply a flame heat or high heat to these housings – due to their metallurgic construction this may re-shape & damage the wishbone which will then require complete replacement – Red Hot is Too Hot.

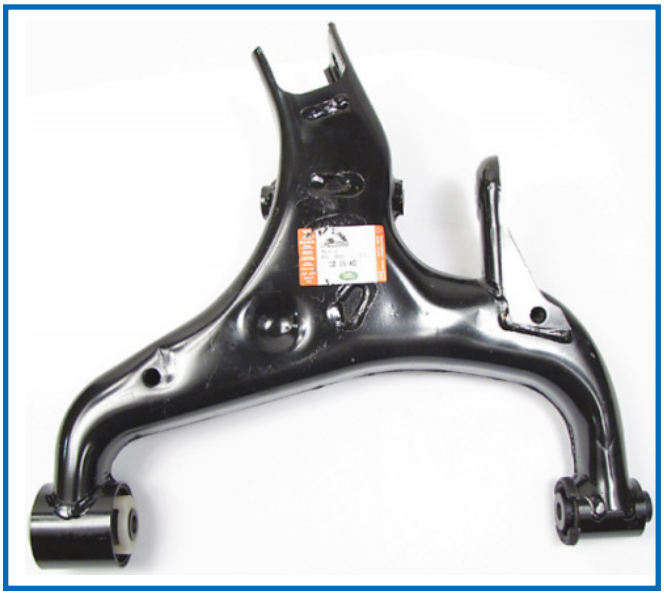
## Front / Small Bush Installation

Clean inside of wishbone housing to remove all corrosion before installing a bush.



1D is mounted backwards in frame (the opposite for bush removal), with piece 5 and extension (used for final stage of bush installation) on ram side; Piece 5 is shaped to ensure it cannot push the bush in too far.

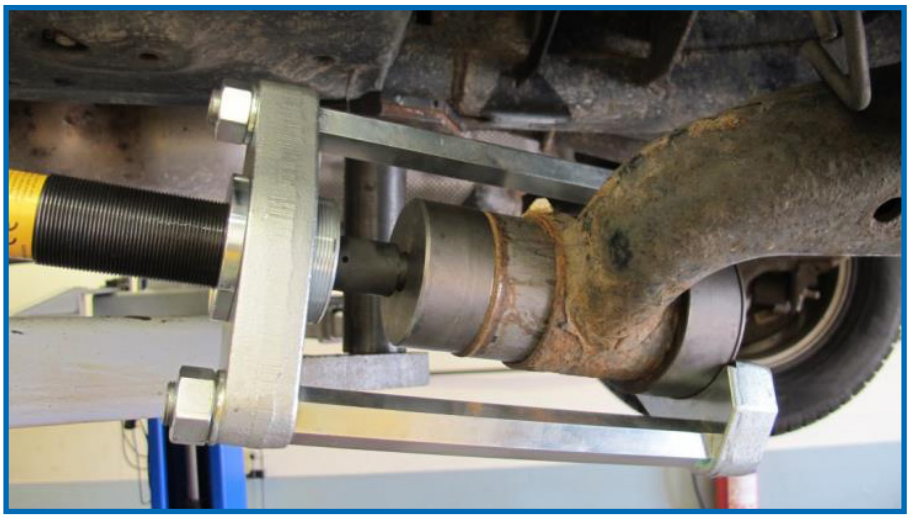
## Rear Lower Wishbone (Arm 2)



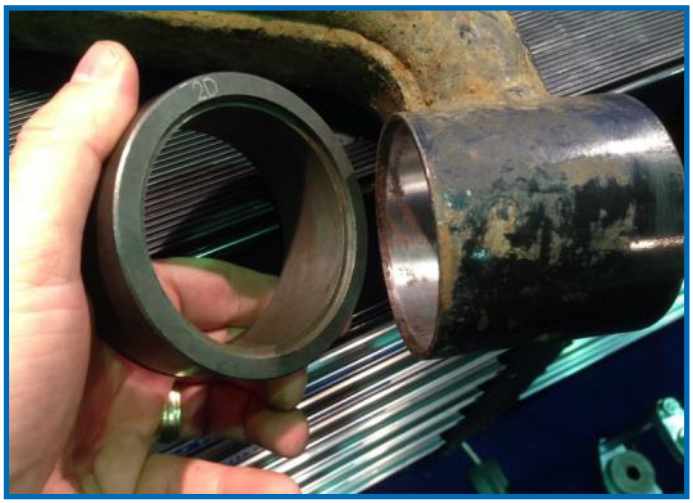
## Tool Kit 2: (18777300)

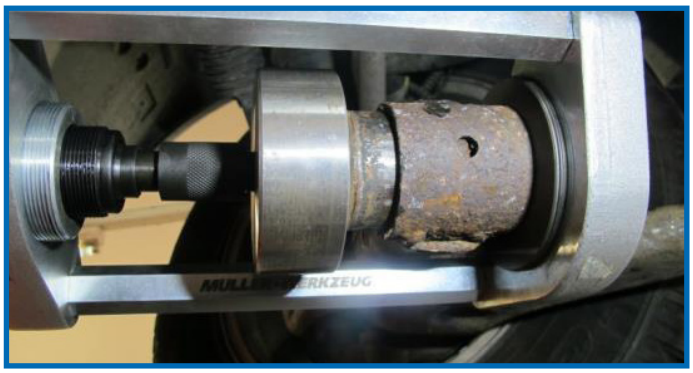
Both front and rear bushes can be changed on the vehicle; there is no need to remove it.

Front / Large bush removal: 2C in ram side & 2D into press frame



**Front / Large bush insertion: 2D reversed in press frame, 5 & then also 50mm ram extension in ram side**



**Rear / Small bush removal: 2A onto hydraulic ram, 2B & then also 2B spacer into press frame**

Rear / Small bush insertion: the process to insert this bush is much the same as the Front / Large bush. Firstly, ensure the housing is cleaned of all corrosion & piece 2B reversed in press frame & 5 into hydraulic ram. Piece 2B has a lip to sit onto the bush housing and piece 5 is shaped to push the bush home.

## Rear Upper Wishbone (Arm 3)

## Tool Kit 3: (18777400)


The bushes in this suspension wishbone cannot be replaced on the vehicle – due to the lack of room, so the wishbones need to be removed in order to remove and replace the bushes.

## Rear / Large Bush Removal

3A in ram, 3B in frame & 50mm ram extension

## Front / Small Bush Removal

3C in ram, 3D in frame

## Front Upper Wishbone (Arm 4)

## Tool Kit 4: (18777200)


The bushes in this suspension wishbone cannot be replaced on the vehicle – due to the lack of room, so the wishbones need to be removed in order to remove and replace the bushes.
The same bush is used in both apertures on the wishbone – so the tool pieces work in the same way on both.

## Bush Removal - 4A & 4B

Piece 4A mounts onto the ram nose and piece 4B into the press frame

## Bush Insertion - 4B Reversed & 5 (not shown)

Piece 5 mounts onto the ram nose and piece 4B reversed into the press frame