

BMW REAR WHEEL BEARING KIT
 INSTRUCTIONS FOR MODEL NO: **VS4502**
 & ASSOCIATED TOOL MODEL NO: **VS4503**
BMW SLIDE HAMMER/HUB PULLER

Thank you for purchasing a Sealey product. Manufactured to a high standard this product will, if used according to these instructions and properly maintained, give you years of trouble free performance.

! IMPORTANT: PLEASE READ THESE INSTRUCTIONS CAREFULLY. NOTE THE SAFE OPERATIONAL REQUIREMENTS, WARNINGS AND CAUTIONS. USE THE PRODUCT CORRECTLY AND WITH CARE FOR THE PURPOSE FOR WHICH IT IS INTENDED. FAILURE TO DO SO MAY CAUSE DAMAGE AND/OR PERSONAL INJURY AND WILL INVALIDATE THE WARRANTY. PLEASE KEEP INSTRUCTIONS SAFE FOR FUTURE USE.

1. SAFETY INSTRUCTIONS

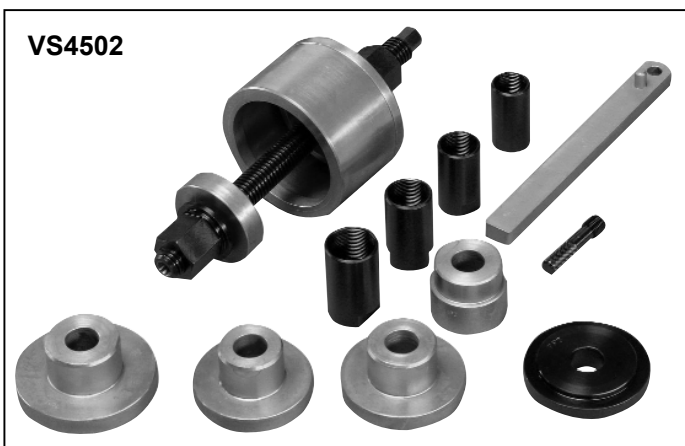
! WARNING! Ensure Health and Safety, local authority and general workshop practice regulations are adhered to when using tools.

- X DO NOT** use the kit if any parts are missing or damaged.
- X DO NOT** use the subframe bush replacement tool for any purpose other than that for which it is designed.
- ✓ Maintain the tool components in good and clean condition for best and safest performance.
- ✓ Ensure that a vehicle which has been jacked up is adequately supported with axle stands.
- ✓ Wear approved eye protection. A full range of personal safety equipment is available from your Sealey dealer.
- ✓ Wear suitable clothing to avoid snagging. Do not wear jewellery and tie back long hair.
- ✓ Keep children and other unauthorised persons away from the working area.
- ✓ Ensure there is adequate lighting prior to using the subframe bush replacement tool.

IMPORTANT: Always refer to the vehicle manufacturer's service instructions, or proprietary manual, to establish the current procedures and data. These instructions detail applications and use of the tools, with any general instructions provided as a guide only.

2. APPLICATIONS

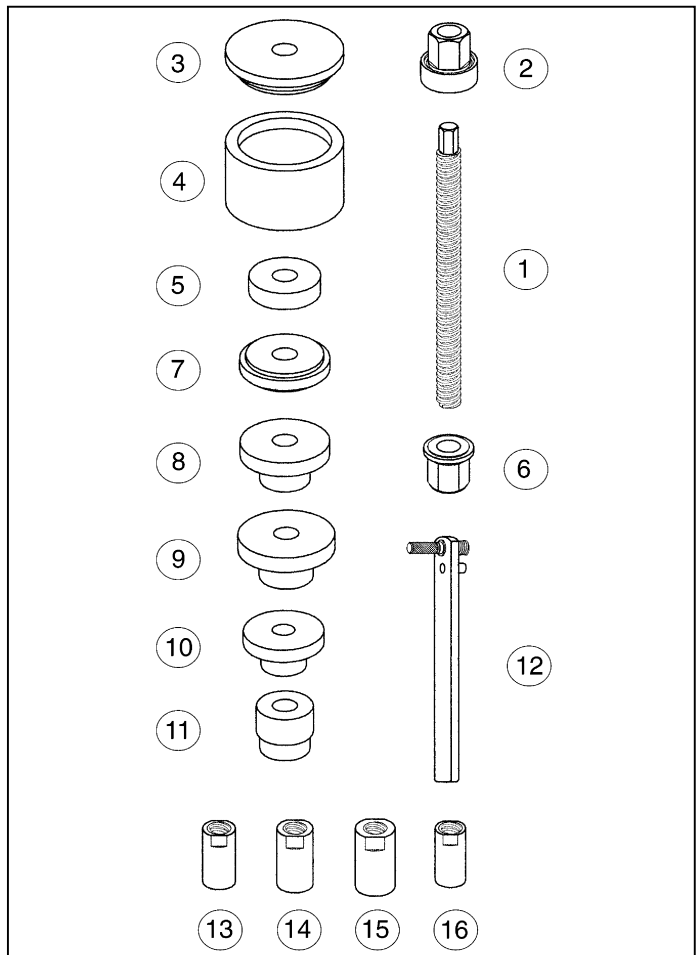
BMW Rear Wheel Bearings / Hubs
 E30 / E36 / E46
 M3 / Z3
 E23 / E32 / E38
 E31
 Rear drum & disk brakes



3. CONTENTS & ASSOCIATED TOOLS

3.1 CONTENTS - VS4502

- 1 VS4502.01 Force Screw
- 2 VS4502.02 Force Nut Assembly
- 3 VS4502.03 Removal Plate
- 4 VS4502.04 Removal Sleeve
- 5 VS4502.05 Removal/Installer Plate
- 6 VS4502.06 Retaining Nut
- 7 VS4502.07 Installer Plate
- 8 VS4502.08 Bearing Installer (42mm i.d.)
- 9 VS4502.09 Bearing Installer (45mm i.d.)
- 10 VS4502.10 Bearing Installer (39mm i.d.)
- 11 VS4502.11 Drive Flange Installer
- 12 VS4502.12 Flange Holding Lever
- 13 VS4502.13 Output Shaft Adaptor M24x1.5P
- 14 VS4502.14 Output Shaft Adaptor M27x1.5P
- 15 VS4502.15 Output Shaft Adaptor M30 x1.5P
- 16 VS4502.16 Output Shaft Adaptor M 22x1.5P
- VS4502.84 Case + Insert





3.2 CONTENTS - ASSOCIATED TOOL VS4503

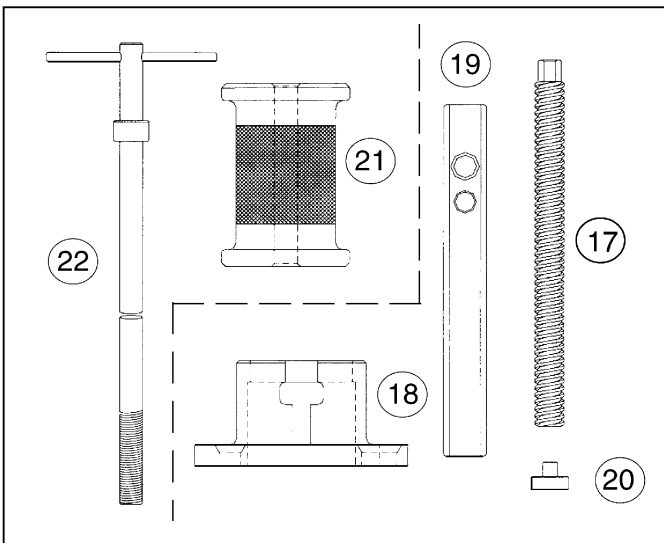
VS4503 Set comprises:-

VS4504 Hub Puller - Items 17 - 20

- 17 VS4502.01 Force Screw
- 18 VS4504.01 Hub Puller Plate
- 19 VS4504.02 Handle
- 20 VS4504.03 Force Pad

VS4466 Slide Hammer Assembly - Items 21 & 22

- 21 VS4466.01 Slide Hammer Weight
- 22 VS3028.01 Slide Hammer Shaft



4. CONSTRUCTION & PARTS IDENTIFICATION

4.1 - VS4502

VS4502 Rear Wheel Bearing Remover & Installer Kit comprises:

- * Force Screw
- * Output Shaft Installers (4 sizes)
- * Installer Plate
- * Force Nut Assembly
- * Bearing Installers (3 sizes)
- * Removal Plate
- * Drive Flange Installer
- * Removal Sleeve (reversible)
- * Flange Holding Lever
- * Removal/Installer Plate and Retaining Nut

Kit VS4502 provides all the adaptors necessary to (1)remove and install the hub bearing, (2)install the drive flange and (3)install the spline end of the output shaft into the hub assembly.

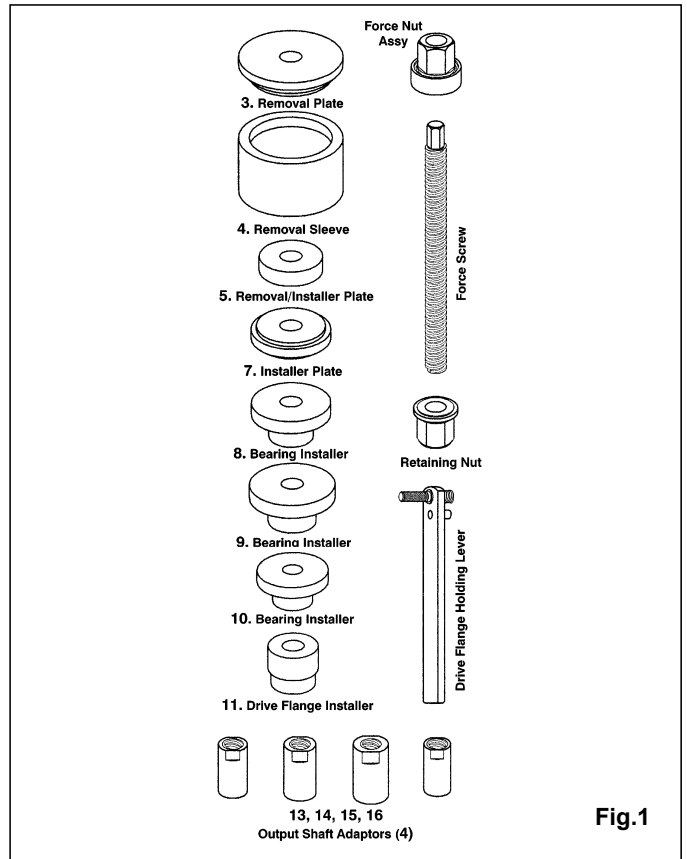


Fig.1

VS4502 Plate/adaptor identification guide. Fig1.

All Plates/Adaptors are marked/identified with numbers 3, 4, 5, 7, 8, 9, 10, 11, Fig. 1

The kit includes a range of output shaft adaptors to install the spline end of the output shaft into the drive flange.

Output Shaft Installers are marked 13, 14, 15, 16.

4.2 - VS4503

VS4503 Hub Puller/Slide Hammer Set comprises
 * Force Screw * Handle * Force Pad * Hub Puller Plate (Assembly Ref VS4504)

* Slide Hammer Assembly (Ref:VS4466 Shaft + Weight)

Set VS4503 provides the Hub Puller and Slide Hammer necessary to (1) Push out the output shaft from the hub assembly and (2) Remove the drive flange

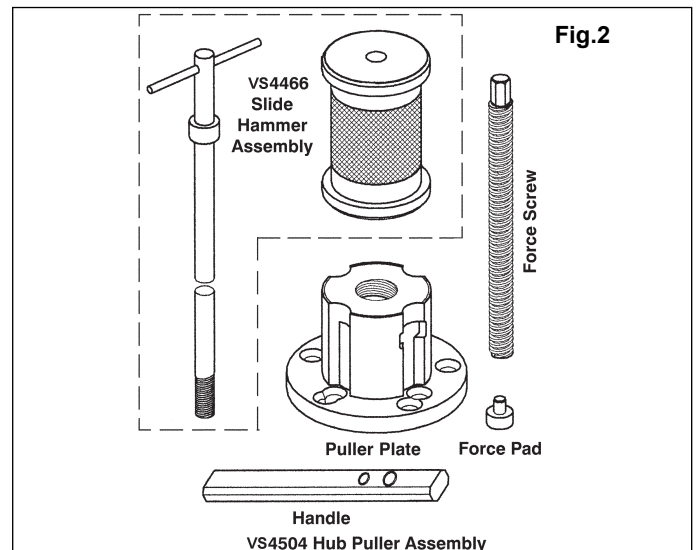


Fig.2

VS4503 Hub Puller/Slide hammer part identification guide. Fig.2

NOTE: In some cases considerable force may be required to remove the output shaft and the drive flange. If the workshop already possess a slide hammer and have purchased VS4504 Hub Puller only, it should be noted that we recommend that a slide hammer with a minimum weight of 4kgs.(9lbs.) is used for this application. The shaft end thread should be M16x1.5 to suit the puller.

VS4504 Hub Puller is provided with a Force Screw but is also designed to accept Hydraulic Ram PS990 to give hydraulic assistance for removal of really stubborn shafts.

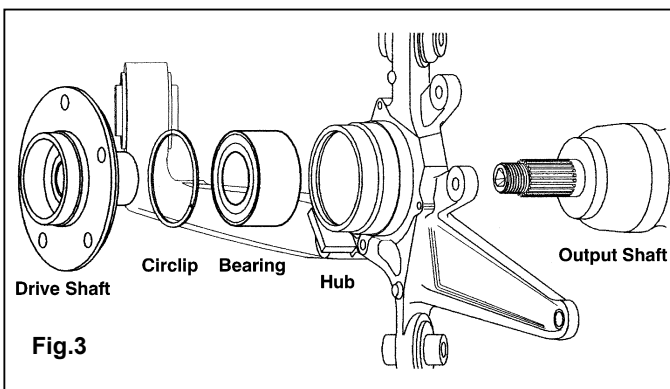
5. INSTRUCTIONS

(General procedure - rear wheel bearing removal and installation)

The removal and installation of the rear hub bearing (angular contact ball bearing), requires the sequence of operations, detailed below, and VS4502 and VS4503 specialised service tools to carry out the work correctly and safely.

- 5.1 Withdrawal of the **output shaft** from the hub assembly
- 5.2 Removal of the **drive flange** from the hub assembly
- 5.3 Removal of the **existing bearing** from its housing
- 5.4 Installation of the **new bearing and circlip** into housing
- 5.5 Installation of the **drive flange**
- 5.6 Installation of the **output shaft**

These instructions detail the use of Sealey specialised tools in the above same sequence of operation.



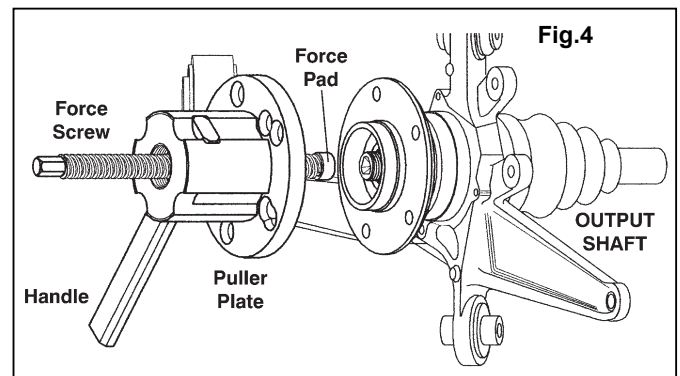
WARNING: The hub assembly/bearing (Fig.3) should not be removed unless the bearing is being replaced with a new bearing. All parts are press-fit and damage will result to the existing bearing during removal. A new bearing MUST be used for replacement.

Position the vehicle on a suitable lift at an appropriate working height and remove road wheel and hub nut. Release the anti-roll bar and remove to avoid obstruction. It may be necessary to lower or remove exhaust (rear box)

Release the output shaft at the differential end (6 flange bolts) and pull it downwards to allow clear backward movement when it's spline end is pushed out of the hub assembly.

Carefully remove the brake wear sensor connector. Remove brake assembly - caliper/ disc or drum.

WARNING: Once the above preparation has been completed it is advisable to adjust the lift to a lower working height, bearing in mind that the future operations will involve the use of heavy slide hammer action and the application of force to release of components.



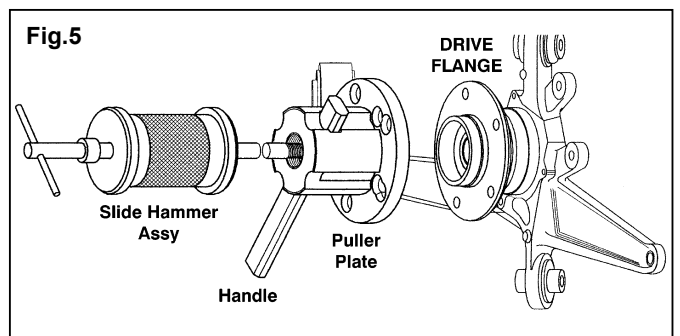
Removal of output shaft-parts assembly Fig.4

5.1 Removal of the output shaft - using VS4503 Set. (Fig.4)

Sub assemble the parts of VS4504 Hub Puller by inserting the Handle into the Hub Puller Plate so that the threaded hole nearest to the end of the Handle (course thread) is positioned in the centre of the large threaded hole in the Puller Plate.

NOTE: Handle VS4504.02 has two threaded holes. The hole nearest the end has a course thread to accept the Force Screw. The inner hole, having a finer thread, is to attach the slide hammer assembly.

Screw the Force Screw into the threaded hole in the Handle and insert the Force Pad into the protruding end of the Force Screw, (Refer to Fig.4) Attach the Puller Plate securely to the drive flange using the original wheel studs. Carefully screw in the Force Screw/Force Pad to contact the end of the output shaft and, using a spanner, apply required force by turning the Force Screw, to push the output shaft out of the hub/bearing assembly, whilst using the Handle to prevent the Hub Puller from rotating.



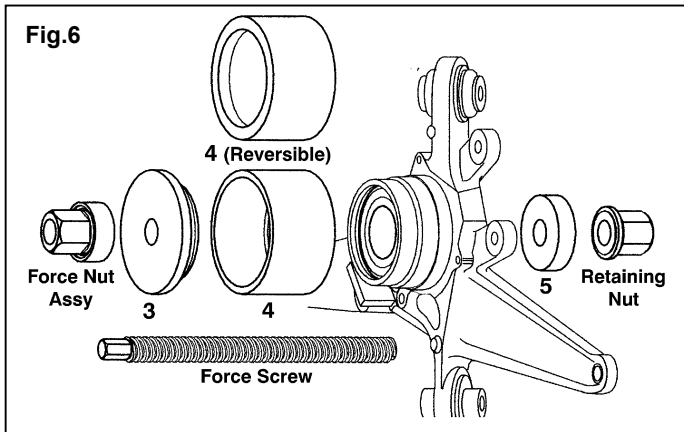
Removal of drive flange parts assembly Fig.5

5.2 Removal of the drive flange - using VS4503 Set. (Fig. 5)

With the Hub Puller Plate remaining attached to the drive flange, unscrew the Force Screw (removing the Force Pad), out of the Handle.

Re-position the Handle by moving it along so that the second threaded hole (finer thread) is positioned in the centre of the large threaded hole in the Puller Plate. Attach VS4466 Slide Hammer Assembly by screwing the shaft into this threaded hole. Using the hammer weight, apply impact to remove the drive flange, (Refer to Fig.5). NOTE: Part of the inner race will remain attached to the drive flange and must be removed before the flange is installed into the new bearing.

IMPORTANT: Remove the inner circlip from the old bearing.



Removal of bearing parts assembly Fig.6

5.3 Removal of the bearing - using VS4502 Kit. (Fig.6)

The adaptors/parts used from VS4502 Kit to remove the bearings are the same for all models listed. The inner race and the outer bearing are being removed in this operation

Use Removal Plate 3, Removal Sleeve 4, Removal/Installer Plate 5, plus Force Screw, Force Nut Assembly and Retaining Nut, (Refer to Fig.6).

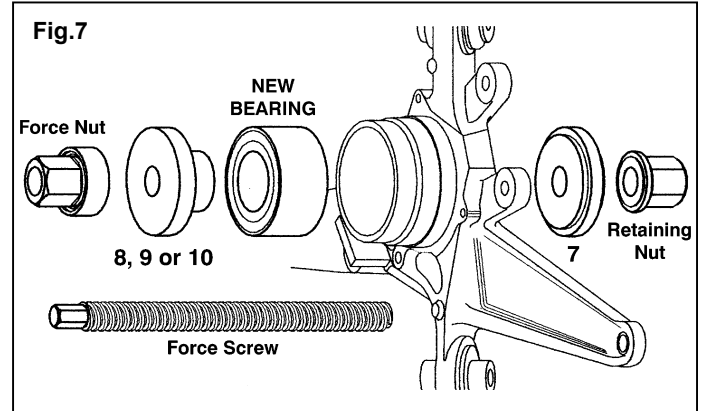
IMPORTANT: Although these parts are common to all removal applications, the Removal Sleeve 4, is reversible with a large inside diameter at one end and a smaller diameter at the other end. Dependent upon the bearing size and hub housing diameter, the large diameter or small diameter end of Sleeve 4 is abutted to the face of the hub (bearing housing) to accept the bearing as it is extracted out of its housing.

It is imperative that Sleeve 4 is positioned concentric to the bearing housing during the removal procedure in order that the bearing does not foul against the Sleeve as it is extracted.

Place Removal/Installer Plate 5 at the rear of the hub/bearing assembly and pass the Force Screw through the bearing (from the front), and through Plate 5. Screw the Retaining Nut onto the back of the Force Screw where it protrudes through Plate 5. Assemble Removal Plate 3 and Removal Sleeve 4, onto the Force Screw ensuring that the appropriate end of Sleeve 4 is towards the face of the bearing housing. Locate this assembly onto the front face of the bearing housing.

Screw the Force Nut Assembly onto the Force Screw and tighten by hand to 'clamp,' the assembly together.

IMPORTANT: Ensure the assembly is squarely aligned and particularly that Sleeve 4 is concentric to the bearing housing, allowing unrestricted extraction of the bearing. Hold the Retaining Nut with a spanner, and use another spanner to turn the Force Nut Assembly, to remove the bearing.



Installation of new bearing parts assembly Fig.7

5.4 Installation of the new bearing - using VS4502 Kit. (Fig.7)

Clean the bore of the bearing housing.

The selection of adaptors/parts from VS4502 Kit to install new bearings is dependent upon the size of bearing/application.

Use Installer Plate 7, and either 8, 9 or 10 Bearing Installers, plus Force Screw, Force Nut Assembly and Retaining Nut, (Refer to Fig. 7).

NOTE: Installer Plate 7 is a double sided stepped plate which is positioned at the rear of the bearing housing/hub. Use appropriate stepped diameter to locate into the hole in the casting. The larger diameter of the plate rests on the outer face of the casting.

Bearing Installers 8, 9 and 10 are used to install the following bearings

8 for bearings with 42mm i.d.

9 for bearings with 45mm i.d.

10 for bearings with 39mm i.d.

Place Installer Plate 7 at the rear of the hub/bearing housing choosing the stepped diameter best suited to locate **into** the hole in the casting.

Pass the Force Screw through the housing bore (from the front), and through Plate 7. Screw the Retaining Nut onto the back of the Force Screw where it protrudes through Plate 7.

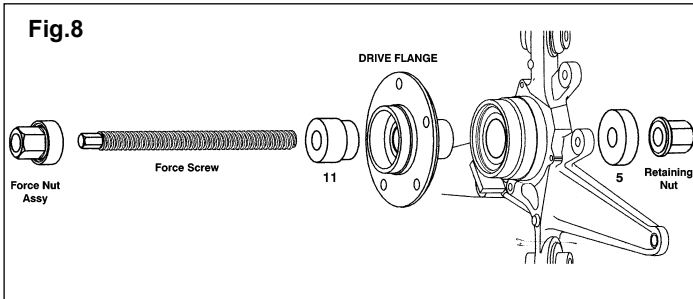
Select the appropriate Bearing Installer 8, 9 or 10 to suit the i.d. of the bearing being installed and fit it inside the bore of the bearing. Assemble the bearing Installer and bearing onto the Force Screw and position at the entrance to the housing, (Refer to Fig.7).

Screw the Force Nut Assembly onto the Force Screw and tighten by hand, to 'clamp' the assembly together.

IMPORTANT: Ensure the assembly is aligned to install the new bearing squarely into the housing. Hold the Retaining Nut with a spanner, and use another spanner to turn the Force Nut Assembly, to install the bearing. Continue to turn until bearing is fully installed.

Replace the circlip

NOTE: The circlip fitting correctly, is a good indication that the bearing is fully installed.



Installation of drive shaft parts assembly Fig.8

5.5 Installing the drive flange - using VS4502 Kit. (Fig. 8)

Installation of the drive flange requires the use of two adaptors which cover all applications listed.

Use Removal/Installer Plate 5, Drive Flange Installer 11 plus Force Screw, Force Nut Assembly and Retaining Nut, Fig. 7.

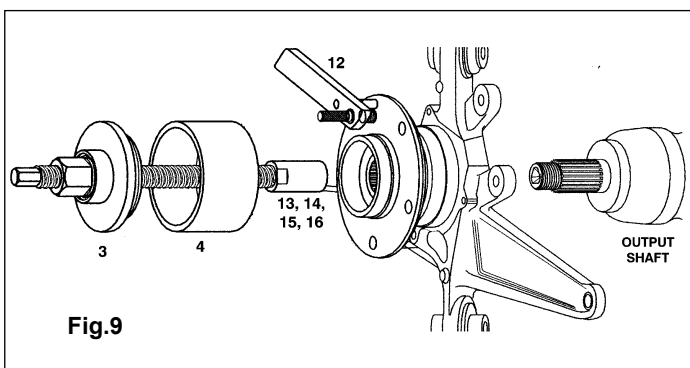
Place Removal/Installer Plate 5 at the rear of the hub to rest against the back of the bearing.

Pass the Force Screw through the bearing (from the front), and through Plate 5. Screw the Retaining Nut onto the back of the Force Screw where it protrudes through Plate 5.

Assemble the drive flange and Drive Flange Installer 11 onto the Force Screw and position at the entrance to the bearing's inner bore. Screw the Force Nut Assembly onto the Force Screw and turn, by hand, to 'clamp' the assembly together.

IMPORTANT: Check that the assembly is aligned squarely, that Plate 5 is located centrally on the back of the bearing and that the drive flange will enter the centre bore of the bearing assembly.

Hold the Retaining Nut with a spanner, and use another spanner to turn the Force Nut Assembly, to press in the drive flange until it stops and is fully installed.



Installation of output shaft - parts assembly Fig.9

5.6 Installing the output shaft - using VS4502 Kit. (Fig.9)

The VS4502 kit provides four sizes of Output Shaft Adaptor covering all known sizes of output shaft end thread.

The spline drive of the output shaft is installed into the hub assembly by attaching the Force Screw to the appropriate Output Shaft Adaptor and screwing this assembly onto the male threads at the end of the output shaft. This is then used to pull the shaft through and into the flange using additional parts from the VS4502 Kit.

- Use either **13** Output Shaft Adaptor - M24x1.5P
- 14** Output Shaft Adaptor - M27x1.5P
- 15** Output Shaft Adaptor - M30x1.5P
- 16** Output Shaft Adaptor - M22x1.5P

together with Removal Plate **3**, Removal Sleeve **4**, Drive Flange Holding Lever **12** plus Force Screw and Force Nut Assembly. (Refer to Fig.9)

Ensure the external splines of the output shaft and matching internal splines of the drive flange, are clean and free of rust/contamination.

NOTE: When splines are in good condition only a limited amount of force will be required to install the output shaft. Establish which is the appropriate Output Shaft Adaptor to suit thread and screw this onto the end of the Force Screw.

Position the output shaft at the rear of the drive flange and align it with the centre bore of the flange. Insert the Force Screw/Output Shaft Adaptor through the centre bore of the flange (from the front) and screw it onto the output shaft.

Pull the Force Screw out to engage the splines of the output shaft with the splines of the drive flange.

IMPORTANT: Ensure the splines align and engage correctly.

Assemble Removal Sleeve **4** and Removal Plate **3** onto the Force Screw with Removal Sleeve **4** resting against the face of the drive flange.

Screw the Force Nut Assembly onto the Force Screw and tighten, by hand, to 'clamp' the assembly together.

Fix the Drive Flange Holding Lever **12**, onto a suitable stud hole in the drive flange to provide a counter-holding lever to prevent the flange from rotating as the Force Nut is turned.

IMPORTANT: As the Force Nut is turned ensure the shaft and flange splines are engaging correctly. Only a slight resistance should be felt. If the Force Nut does not turn easily and smoothly, check spline engagement immediately.

Turn the Force Nut Assembly until the output shaft is fully engaged in the drive flange.

Re-assembly - Re-fit the output shaft, hub nut, brake assembly, exhaust, anti-roll bar etc.



NOTE: It is our policy to continually improve products and as such we reserve the right to alter data, specifications and component parts without prior notice.

IMPORTANT: No liability is accepted for incorrect use of this product.

WARRANTY: Guarantee is 12 months from purchase date, proof of which will be required for any claim.

INFORMATION: For a copy of our latest catalogue and promotions call us on 01284 757525 and leave your full name and address, including postcode.

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