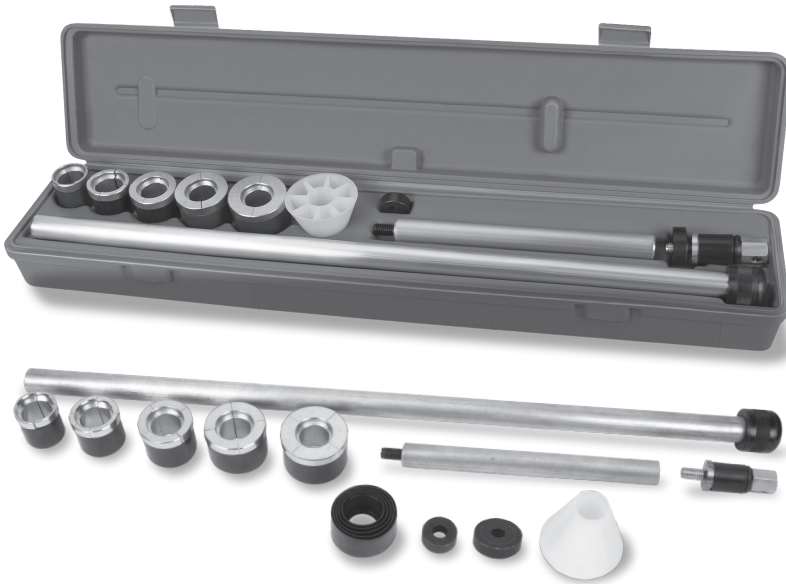


CAMSHAFT BEARING TOOL

Item Number W89220

OWNER'S MANUAL



Performance Tool®

▲WARNING!

READ, UNDERSTAND AND FOLLOW ALL INSTRUCTIONS AND WARNINGS BEFORE OPERATING THIS TOOL. FAILURE TO DO SO MAY RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE AND WILL VOID WARRANTY.

If you encounter any problems or difficulties, please contact our customer service department at: 1-800-426-1262 between 6:30 a.m. and 4:30 p.m. Pacific time.

SAFETY GUIDELINES / DEFINITIONS

PRIOR TO USING THIS PRODUCT, READ AND UNDERSTAND ALL INSTRUCTIONS AND SAFETY PRECAUTIONS AS OUTLINED IN THE VEHICLE MANUFACTURER'S MANUAL AND ENGINE DIAGNOSTIC/REPAIR MANUALS. This instruction manual is intended for your benefit. Please read and follow the safety, installation, maintenance and troubleshooting steps described within to ensure your safety and satisfaction. The contents of this instruction manual are based upon the latest product information available at the time of publication. The manufacturer reserves the right to make product changes at any time without notice.

▲WARNING: Read and understand this entire instruction manual before attempting to assemble, install, operate or maintain this product. Failure to comply with the instructions may result in serious personal injury and/or property damage!

The following signal words are used to emphasize safety warnings that must be followed when using this product:

▲DANGER Indicates an imminently hazardous situation that, if not avoided, WILL result in death or serious injury.

▲WARNING Indicates a potentially hazardous situation that, if not avoided, COULD result in death or serious injury.

▲WARNING DO NOT operate this product if damaged during shipment, handling or misuse. Before each use, inspect the general condition of the tool. Check for cracks, breaks, or bends in the equipment and any other condition that may affect its safe operation. If a problem occurs with the equipment, immediately discontinue its use and have the problem corrected before further use. Do not use damaged equipment. If you have any questions, or require assistance with damaged or missing parts, please contact our factory customer service department at: 1-800-426-1262.

▲CAUTION Indicates a potentially hazardous situation that, if not avoided, MAY result in minor or moderate injury.

▲NOTICE Indicates important information, which if not followed, MAY cause damage to equipment.

Please have the serial number, model number, and date of purchase available for reference when calling.

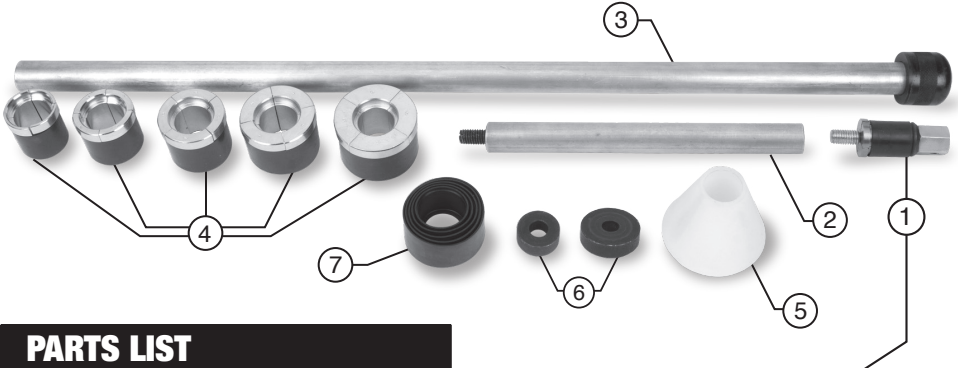
IMPORTANT SAFETY INFORMATION

▲WARNING

READ, UNDERSTAND AND FOLLOW ALL INSTRUCTIONS AND WARNINGS BEFORE OPERATING THIS PRODUCT. FAILURE TO DO SO MAY RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE AND WILL VOID WARRANTY.

1. **KEEP WORK AREA CLEAN AND DRY.** Cluttered, or wet work areas invite injuries.
2. **KEEP CHILDREN CLEAR OF WORK AREA.** Do not allow children to handle this product.
3. **STORE IDLE EQUIPMENT.** When not in use, tools and equipment should be stored in a dry location to inhibit rust.
4. **DO NOT USE THIS PRODUCT IF UNDER THE INFLUENCE OF ALCOHOL OR DRUGS.** Read warning labels on prescriptions to determine if your judgment or reflexes are impaired while taking drugs. If there is any doubt, do not attempt to use this product.
5. **USE EYE PROTECTION.** Wear ANSI approved safety glasses when using this or any other testing equipment.
6. **DRESS SAFELY.** Non-skid footwear or safety shoes should be worn. Do not wear loose clothing or jewelry as they can become caught in moving parts. Wear a protective hair covering to prevent long hair from becoming caught in moving parts.
7. **DO NOT OVERREACH.** Keep proper footing and balance at all times to prevent injury.
8. **STAY ALERT.** Use common sense and watch what you're doing at all times. Do not use this product when you are tired or distracted from the job at hand.
9. **CHECK FOR DAMAGED PARTS.** Before using this product, check for damaged parts and any other conditions that may affect the operation of this product. Insure that it will operate properly and perform its intended function. Replace or repair damaged or worn parts immediately.
10. **MAINTAIN THIS PRODUCT WITH CARE.** Keep this tool clean and dry after each use for better and safer performance.
11. **USE THE RIGHT PRODUCT FOR THE RIGHT JOB.** There are certain applications for which this product was designed. Do not use small equipment, tools or attachment to do the work of larger industrial equipment, tools or attachments. Do not use this product for a purpose for which it was not intended.

PARTS LIST



PARTS LIST

No.	Description	Qty.
1	Expander Assembly.....	7
2	Short Driver Shaft.....	1
3	Driver Shaft Extension.....	1
4	Expanding Bearing Drivers.....	5
5	Nylon Centering Cone.....	1
6	Driver Washers.....	2
7	Replacement Rubber Sleeves..	5

Expander Components



OPERATION

1. Choose the correct expanding driver (4) from the listing below.
2. Place the expanding driver (4) onto the expander assembly (1). See Fig. 1.
3. Be sure to line up the segments of the driver with the segments on the expanding bearing drivers (4). See Fig. 2.

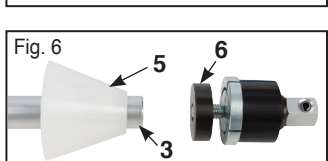
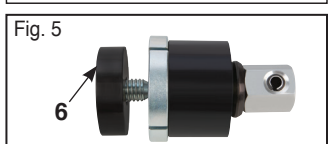
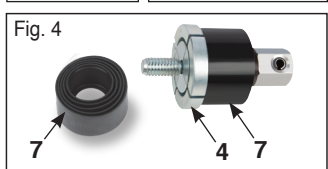
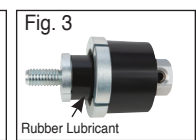
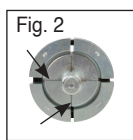
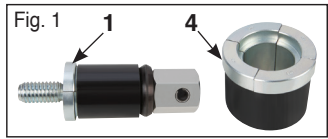
▲NOTICE: Place a small amount of rubber lubricant on the rubber sleeve of the expander assembly (1). See Fig. 3. This will help with putting the expanding bearing drivers (4) onto the expander assembly.

▲NOTICE: There are two different sets of rubber sleeves (7) supplied for the expanding drivers (4). See Fig. 4. The black, most common, sleeves should be used when driving thick wall bearing 2.29 mm (.090). The brown sleeves are used when driving thin wall bearings 1.65 mm (.065).

4. Select the appropriate driver washer (6) and place on the expander assembly. See Fig. 5.
5. Place the nylon centering cone (5) over the driver shaft (3), be sure the small tapered end is towards the expander assembly (1). See Fig. 6.
6. Screw the expander assembly (1) and driver washer (6) on to the driver shaft (3). The kit comes with a driver shaft extension (2); this may be needed for removal of the rear camshaft bearings.

▲NOTICE: It's critical to use the proper driver washer (6) to prevent breaking the expander jaws of the expander assembly (1).

Bearing Inside Diameter	Use Bearing Driver #	Use Driver Washer
1.125 to 1.475	Expander Only	Small 1-1/4 in.
1.475 to 1.700	No. 1	Small 1-1/4 in.
1.700 to 1.925	No. 2	Large 1-3/4 in.
1.925 to 2.150	No. 3	Large 1-3/4 in.
2.150 to 2.375	No. 4	Large 1-3/4 in.
2.375 to 2.690	No. 5	Large 1-3/4 in.



INSTALLATION INSTRUCTIONS

▲NOTICE: Check the bores prior to installing new bearings. Bores can become out of round or alignment due to the blocks age. If needed have the bearing bores ground by align boring at a qualified machine shop. New bearings installed in an untrue block could make the camshaft difficult or impossible to install properly, and could damage the bearings.

1. Start with the expander assembly (1), proper expanding bearing driver (4), and driver washer (6) reduced for the new bearing. Again, be sure the segments line up on both expander and driver. Insert the assembled tool through the camshaft bore in the front of the block. Use the nylon centering cone (5) to help center the tool as it passes through each bearing housing. Continue insertion until the driver assembly is in front of the rear bearing housing. Use the short driver extension (2) if needed.
2. Inspect the new bearings for damage and identify which bearing housing they go into. Install the rear bearing onto the expanding driver assembly (1) with the proper driver washer (6) in place. Tighten until firmly in place, do not over tighten as you could expand the bearing. **Important:** Refer to the manufacturer's specification or shop manual for the oil galley holes. Each bearing will have at least one oil hole to feed lubrication to the camshaft. Each bearing housing will have a matching hole that feeds oil from the oil galleries. It's critical that these match up or you could damage or spin a bearing. Line the holes up prior to driving the bearing in place. Also be cautious not to over drive the bearing, it should set centered in the bearing housing.
3. Hold the nylon centering cone (5) firmly in the outside the number one bearing housing. Position the new bearing in place using caution to line up the oil holes. Drive the bearing in place, use caution not to over drive the bearing. Loosen driver assembly to relieve pressure and pull tool back through for the next bearing to be driven in.
4. Repeat the above steps until all the bearing are seated in the correct bearing housings. To drive the number one bearing, operate from the rear of the engine using the nylon centering cone (5) in the outside rear housing. On some blocks there is only one opening for the camshaft, it's inaccessible except from either end. In this case you must install the number one bearing with caution to keep the driving shaft (3) straight and level.

1 YEAR WARRANTY

PERFORMANCE TOOL® extends only the following warranties, and only to original retail purchasers. These warranties give specific legal rights. Except where prohibited by local law, the law of the State of Washington governs all warranties and all exclusions and limitations of warranties and remedies. There may be other rights which vary from state to state.

PERFORMANCE TOOL® warrants the product to be free from defects in materials and workmanship under normal use and service. A defective product may be returned for a free replacement within 90 days from the date of purchase, provided that product is returned to place of purchase immediately after discovery of defect. After 90 days and up to one year from date of purchase, PERFORMANCE TOOL® will replace at no charge any parts which our examination shall disclose to be defective and under warranty. These warranties shall be valid only when a sales receipt showing the date of purchase accompanies the defective product or defective part (s) being returned. For part (s) after 90 days, please remit your request, postage prepaid to:

PERFORMANCE TOOL, P.O. Box 88259 Tukwila, WA 98138

These warranties exclude blades, bits, punches, dies, bulbs, fuses, hoses, and other consumables which must be replaced under normal use and service. These warranties shall not apply to any product or part which is used for a purpose for which it is not designed, or which has been repaired or altered in any way so as to affect adversely its performance or reliability, nor shall these warranties apply to any product or part which has been subject to misuse, neglect, accident or wear and tear incident to normal use and service.

PERFORMANCE TOOL® does not authorize any other person to make any warranty or to assume any liability in connection with its products.

Except for warranties of title and the limited express warranties set forth above, PERFORMANCE TOOL® makes no express or implied warranties of any kind with respect to its products. In particular, PERFORMANCE TOOL® makes no implied warranty of merchantability and no implied warranty of fitness for any particular purpose, except that for goods purchased primarily for personal, family or household use and not for commercial or business use, PERFORMANCE TOOL® makes an implied warranty of merchantability (and, if otherwise applicable, an implied warranty of fitness for a particular purpose), but only for the particular qualities or characteristics, and for the duration, expressly warranted above.

The laws on limitation of implied warranties may differ from state to state, so the above limitations may not apply in all cases.

PERFORMANCE TOOL® shall not be liable for consequential, incidental or special damages resulting from or in any manner related to any product, or to the design, use, or any inability to use the product. The sole and exclusive remedy for a defective product or part shall be the repair, or replacement thereof as provided above. The laws on limitation of remedies or on consequential, incidental or special damages may vary from state to state, so the above limitations may not apply in all cases.

© Copyright 2021 WILMAR CORPORATION, P.O. Box 88259 Tukwila, WA 98138