

## **Shafer** |||

*swaging tool*

The Shafer Tri-Roller Swaging Tool is designed to Eliminate bearing installation problems. In addition to the standard line of swaging tools, Rexnord has designed many special tools. For engineering assistance in selecting the right Shafer Swaging Tool, contact your Rexnord sales engineer or Shafer Bearings.

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*swaging tool*

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## SHAFER TRI-ROLLER SWAGING TOOL

### FOR QUALITY INSTALLATION OF GROOVED SPHERICAL BEARINGS

Buying high quality bearing products is only the first step toward achieving complete satisfaction on bearing applications. Installation is the crucial step that allows bearing design capabilities to be transformed into in-service performance by the user.

For many years Rexnord had used conventional installation tools to secure bearings into housings. However, lack of repeatability and other installation problems led Rexnord to develop its own tools to eliminate these problems.

The successful design and use of these tools within our own plant led many of our customers to standardize on this type of tool wherever possible. Rexnord offers a complete line of standard tools to swage all MS grooved series, Teflon\*-lined, metal-to-metal bearings and Rexnord's new line of roller bearings. In addition, Rexnord has designed and will design special installation tools for almost any grooved bearing configuration.

Since swaging inconsistency can be a major cause for rejects and expensive bearing replacements, Rexnord designed the tool to be easy to use even by inexperienced personnel. Equipment requirements are minimum and the tools are particularly suited to usage at all levels of maintenance and overhaul, as well as at airframe manufacturers and their subcontractors.

#### INSTALLATION BENEFITS:

- Simplicity of operation.
- Complete operator control during swaging.
- Adaptability to existing shop and field equipment.
- Eliminates ruining bearings during installation.
- Minimizes internal free play or preload torque effects.
- Provides repeatable swaging quality.

#### APPLICATION BENEFITS:

- Develops full thrust capacity of the swaged lip.
- Minimizes outer ring distortion.
- Ensures uniform swage around entire bearing circumference.
- Improves control of preload torque or clearance.



ROLLER FIXTURE



BEARING



LOCATING FIXTURE

\*TEFLON is a registered trademark of E.I. du Pont de Nemours & Co., Inc.

## INSTALLATION PROCEDURE

Prior to bearing installation, clean the housing bore and bearing as necessary to remove all foreign particles and contamination. Apply the proper corrosion-protection coating to the housing bore and/or bearing as required.

Insert the bearing into the housing. If an interference fit exists between the bearing and the housing bore, take extreme care in aligning the bearing with the housing bore prior to pressing it into the housing. Apply force only to the outer ring face when inserting the bearing.

The swaging operation involves positioning the housing and bearing on the locating fixture, then guiding the pilot of the roller fixture into the bearing bore. Light initial swaging pressure, which allows the rollers to position in the bearing groove, is followed by increased pressure to swage the lip against the housing chamfer. After the process is completed on one side, the bearing and housing are turned over and the opposite side swaged in a similar manner.

The initial bearings should be trial swaged at a speed of approximately 100 RPM. Speed may be increased when proper operator proficiency is attained, to a spindle speed of 225 MAX. RPM. Variations in outer race materials, types of equipment, and operator skill may require a change in spindle speed to achieve the most efficient use of these tools.

An extension on the drill press handle is recommended in order to lower the operator force needed, and to obtain a 'feel' for the amount of pressure necessary to complete the swaging operation without overswaging.

## INSPECTION OF SWAGED LIP

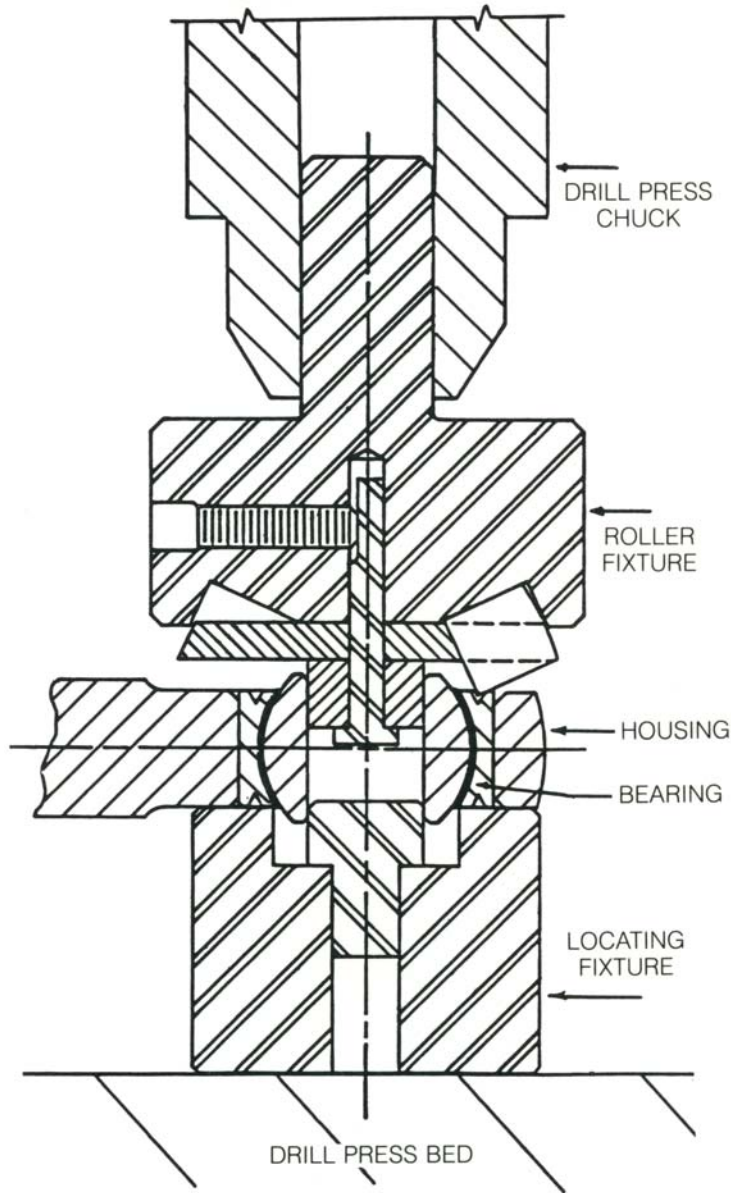
The swaged lip should show no evidence of cracks, smearing or galling, and should be tight against the housing chamfer. A .005" thick wire gauge is recommended to inspect for clearance between the swaged lip and housing chamfer and a magnifying glass is helpful in checking general lip condition. If the wire gauge fits between the swaged lip and the housing chamfer, the bearings should be reswaged.

Determine the proper proof load if required for inspection, and apply to each side of the swaged bearing's outer race.

Under no condition should the proof load be applied to the inner race as the bearing may be ruined.

## SWAGING TOOL MAINTENANCE

Shafer swaging tools require little maintenance. They should be kept clean and lightly oiled to prevent corrosion and provide for lubrication of the rollers. The tool may be cleaned by loosening the set screw in the roller fixture and removing the retainer, rollers, bushing and pin. Clean all foreign contaminants from the parts, lightly oil the roller fixture, and reassemble the parts, making sure that the spherical ends of the rollers are toward the outside of the roller fixture. Retighten the set screw against the milled side of the pin. The rollers, retainer, and bushing should be free to rotate without binding.

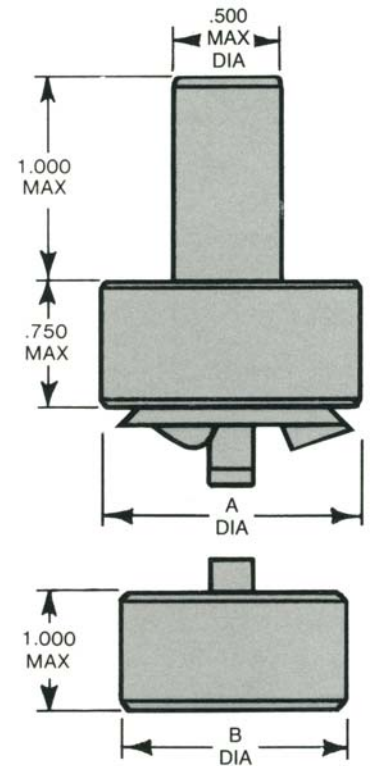


INSTALLATION SET UP  
Figure 1

Shafer tri-roller swaging tools provide simplicity of operation and adaptability to typical shop equipment. A small hand-fed drill press is recommended to install grooved bearings into housings. The roller fixture is inserted into the drill press chuck, and the locating fixture is placed on the drill press bed (Fig. 1). Normally, guide bars or other fixtures are used to position the locating fixture for ease and accuracy of repetitive bearing swaging.



# SHAFER TRI-ROLLER SWAGING TOOL



Tool Model No.	Bearing Model No.	A Max.	B Max.
RST 1050	DAS4-16AG	1.750	1.312
RST 1051	DAS5-20AG	2.000	1.562
RST 1052	DAS6-23AG	2.125	1.750
RST 1053	DAS8-27AG	2.375	2.000
RST 1054	DAS10-31AG	2.625	2.250
RST 1055	DAS12-31AG	2.625	2.250
RST 1056*	DAS14-48AG	4.250	3.500
RST 1057*	DAS16-40AG	3.750	3.000

RST 1056 & RST 1057 have a stepped shank design with a 1.000 in. dia. Shank by 1.750 in. long.

Tool Model No.	Used to Swage Bearings				A Max.	B Max.	
	MIL-B-81936 Part No.	MIL-B-8976 Part No.	Mil-B-8942 Part No.	MIL-B-81820 Part No.			
RST1000	—	MS21154-3	—	MS14101-3	1.250	1.062	
RST1001	—	—	MS21230-3	MS14103-3			
RST1002	—	—	MS21230-4	MS14103-4	1.375		
RST1003	M81936/1-4	MS21154-4	MS21232-4	MS14101-4			
RST1004	—	—	MS21230-5	MS14103-5			
RST1005	M81936/1-5	MS21154-5	MS21232-5	MS14101-5	1.625		1.312
RST1006	M81936/1-6	MS21154-6	MS21232-6	MS14101-6			
RST1007	M81936/1-7	MS21154-7	MS21232-7	MS14101-7	1.875		1.500
RST1008	—	—	MS21230-7	MS14103-7			
RST1009	M81936/1-8	MS21154-8	MS21232-8	MS14101-8	2.125		1.875
RST1010	—	—	MS21230-8	MS14103-8			
RST1011	M81936/1-9	MS21154-9	MS21232-9	MS14101-9			
RST1012	—	—	MS21230-9	MS14103-9	2.375	2.062	
RST1013	M81936/1-10	MS21154-10	MS21232-10	MS14101-10			
RST1014	—	—	MS21230-10	MS14103-10	2.875	2.437	
RST1015	—	—	MS21230-12	MS14103-12			
RST1016	M81936/1-12	MS21154-12	MS21232-12	MS14101-12	2.000	1.750	
RST1017	—	MS21154-14	MS21232-14	MS14101-14			
RST1018	—	—	MS21230-14	MS14103-14	2.250	2.000	
RST1019	—	MS21154-16	MS21232-16	MS14101-16			
RST1020	—	—	MS21230-16	MS14103-16	2.625	2.250	