

# sonnax®

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## TORQUE CONVERTER COMPONENTS



### FS-WS-1

#### Retainer Repair Ring

#### Applications:

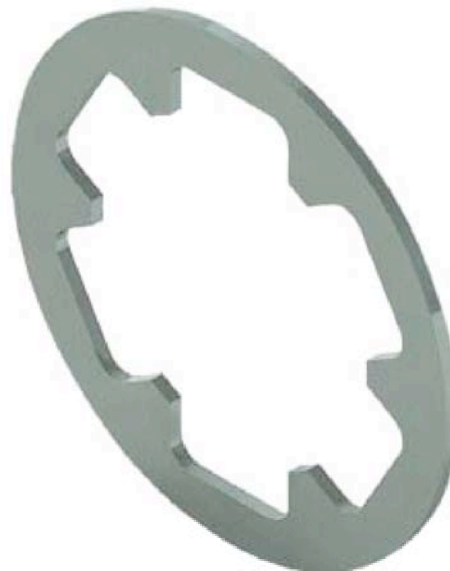
- Fichtel & Sachs Captive Clutch Units:  
ZF5HP19 & ZF5HP24

#### Details:

- Weld-in metal plate
- 90.33mm (3.556") O.D.
- 57.02mm (2.245") I.D.
- 2.54mm (.100") Thickness

#### Associated Parts:

- **FS-O-2V** O-ring
- **FS-O-27V** Radial Lip Seal



### FS-WS-1

#### Retainer Repair Ring

Prepackaged Quantity: 5 Units



Sonnax **FS-WS-1** is used to simplify the rebuild procedure for Fichtel & Sachs "Captive Clutch Units", ZF5HP19 & ZF5HP24 torque converters. The Retainer Repair Ring allows the rebuilder to keep the damaging heat of the re-weld process away from the seal area. It will also simplify the process of adjusting the clutch release clearance which is very critical on these units.

The **FS-WS-1** may also be used to salvage an early crimped style captive clutch with the crimped area damaged, if you modify it by removing about .040" from the I.D. to match the O.D. of the cover tower, and by machining excess material off the staking tabs that extend above the thickness of original retainer.

*Please refer to our*

**TORQUE CONVERTER PART CATALOG VOLUME 6 & ONLINE CATALOG AT [WWW.SONNAX.COM](http://WWW.SONNAX.COM)**

#### FS-WS-1 is:

The Retainer Repair Ring for ZF5HP19 on page 148 and ZF5HP24 on page 146.

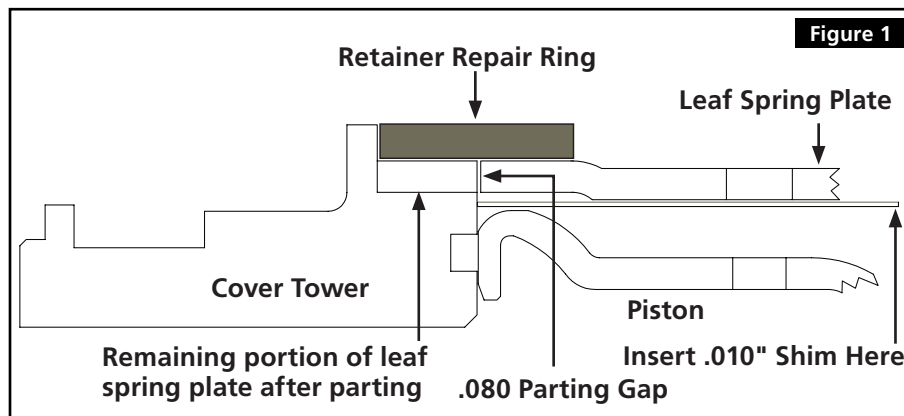
# TORQUE CONVERTER COMPONENTS

**FS-WS-1**

## INSTRUCTIONS

## Retainer Repair Ring

The OEM clutch release clearance is about .010", and must be maintained as closely as possible. To get the correct clutch release clearance, insert pieces of .010" brass shim stock into each of the 6 spring cavities between the piston and leaf spring plate. Note that any material may be used for shim stock, but brass is the best choice because weld will not stick to it (*Figure 1*).

**Figure 1**

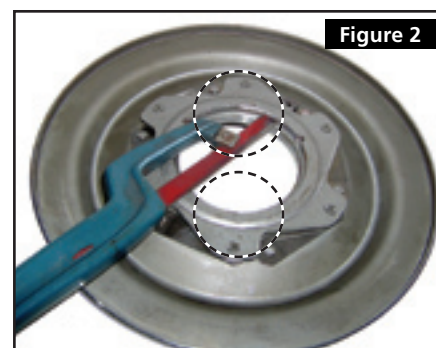
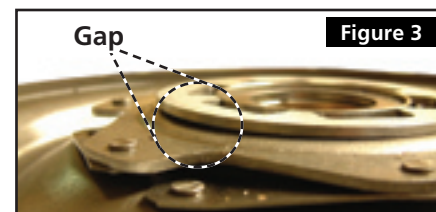
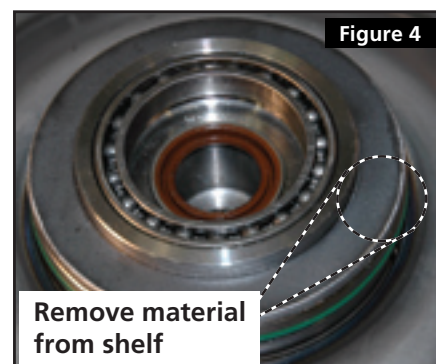
## SET UP AND INSPECT PRIOR TO WELDING

Use a regular carbide parting tool (.080") to cut away weld between the leaf spring plate and the cover tower. The I.D. of your cut should be 2.890".

Inspect for and remove any burr that is created on the underside of the leaf spring plate during the removal process. A tool similar to that shown in *Figure 2* or a machinist's deburring tool can be used for the cleanup. The burr will restrict piston movement and must be removed.

Prior to welding, put all components in place and insert the shim stock into the spring cavities. Press on the leaf spring plate and make sure there is no gap present between the O.D. of the retainer repair ring and the leaf spring plate (*Figure 3*). If there is a gap, you may remove a like amount of material from the cover tower shelf where the retainer repair ring rests to correct this condition. (*Figure 4*) This gap may be the result of machining the reaction surface of the cover and/or the piston. When the leaf spring plate is compressed down to the shim and secured by welding, it will be in the correct position so that when the shim stock is removed, the piston will have the desired clutch release travel of .010".

When you begin welding, remember to press on the leaf spring plate and not on the retainer repair ring. If you press on the retainer repair ring and it bottoms on the cover tower before the leaf spring plate contacts the shim stock, you will have too much clutch release clearance.

**Figure 2****Figure 3****Figure 4**

# TORQUE CONVERTER COMPONENTS



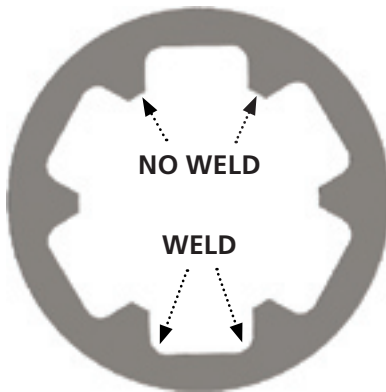
**FS-WS-1**

## INSTRUCTIONS

## Retainer Repair Ring

### WELDING

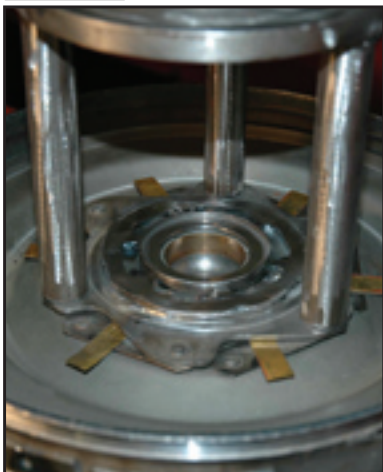
Caution: The 6 I.D. points of the FS-WS-1 retainer repair ring are used to center the retainer repair ring on the cover tower. No welding is to be done in this area because of its close proximity to the thin side wall of the top of the tower.



All welds to the I.D. of the retainer repair ring should be restricted to the side walls of the 6 cavities of the retainer repair ring and should be as close to the tower as possible. The welding of the O.D.

of the retainer repair ring to the leaf spring plate can be done with 3 small Tig welds, alternating sides.

#### Step 1



Place six .010" brass shims in the spring cavities between the piston and the leaf spring plate. Make sure the shim stock reaches all the way in and butts against the tower. Press down on at least 3 places on the leaf spring plate, not on the repair ring.

#### Step 2



Weld the O.D. of the repair ring to the leaf spring plate in 3 positions, spaced equally around the ring. Make sure the repair ring remains flat down on the leaf spring plate while welding.

#### Step 3



Weld the repair ring to the tower shelf at both ends of all six pockets around the inside of the repair ring. Do not weld where the centering points of the ring touch the tower.



Finished welding.