# OneWay live centre bearing replacement

**Why replace the bearings**

My OneWay live centre had a rough feeling when rotated by hand. This is often an indication of a bearing having worn out. I was not getting whining or vibration. I did hear a low growling sound when the live centre was under load from the tailstock.

I looked online expecting to find many articles or forum threads on how to replace the bearings. I did not find many.

One forum post said to send the live centre back to OneWay. There was some mention of $60 quote from OneWay at the time. Also since Oneway is in Canada, it is a hassle and expensive to ship since International USPS rates apply.

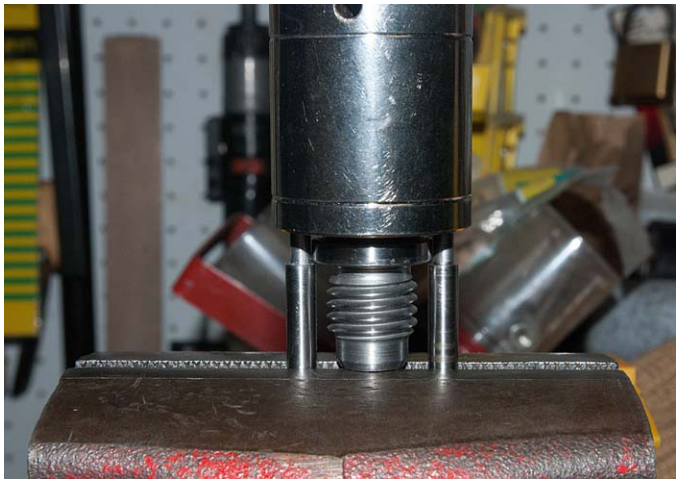
I decided to try and replace the bearings myself before the live centre failed.

**Start with dis-assembly**.

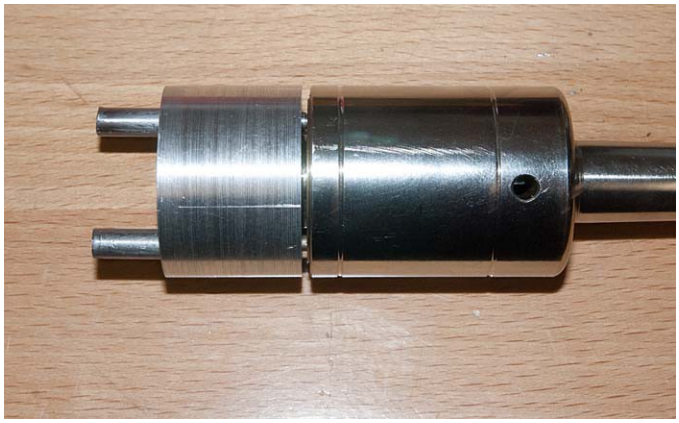
From the few threads I read, this was supposed to be easy. Most threads stated to simply use a pair of snap ring pliers to unscrew the brass cover.

I did not have a pair of snap ring pliers. The inexpensive ones are designed for grinder wheels and the pins are too big and the arms too wide. I made a pair of pins to be a snug fit in the holes in the brass cover.

My first attempt to use these failed to get the cover off.  It was on far tighter than I expected.



I then made a bushing to go over the threaded section of the shaft and hold the pins.



I mounted the taper in the tailstock, then  used a very large wrench to grasp the pins while using a spanner wrench in the hole on the body.  I eventually got the cover loose by hitting the spanner wrench with a mallet while my friend held the large wrench.

The bent pins in this picture gives an indication on the amount of force which I had to apply to get the cover loose.

The next surprise is that the brass cover did not completely unscrew. It unscrewed until it reached the back of the flange.

The few threads stated that at this point "*the bearing assembly would come out without any strong language*". Another said it should "*just pop out*".

The bearing assembly does need to start to come out of the housing in order to get the brass cover removed.

The brass cover has to be completely removed in order to get the bearing assembly out of the housing.

I think a normal live centre will allow the brass cover being unscrewed against the flange to apply enough pressure to free the bearing assembly.

My live centre was not normal. I was able to get the brass cover to exert enough force with my busing and pins to get the bearing assembly starting to move. I could only move this a fraction of an inch.

I needed to make another busihng, this one to fit over the flange and engage the shoulders of the housing.  I then used a steel plate and a 3/4in x 10 tpi nut.

I applied a penetrating oil product, Kroil and allowed to sit overnight.

I used a 1/8in long punch in the knockout hole to prevent the bearing assembly from rotating while slowly applying pressure with a wrench on the nut.

I was able to slowly get the bearing assembly to move.  A bit of a groan from inside indicated the bearings were a very tight fit.

A few interations of screwing out the bearing until  it contacted the brass cover, loosen the brass cover until it contacts the underside of the flange, screw out the bearing again.

Eventually I was able to remove the assembly.

Next step was to remove the bearings from the shaft.  First remove the retaining ring at the end of the assembly with a pair of snap ring pliers.  One of the few steps which was easy on my repair.

I tried placing the assembly on a metal vise jaws and hitting with a mallet, but this did not budge the bearings.  I needed to go to a friend and use his arbor press, they are on tight.  Not difficult to remove with the arbor press.

This is the live centre now completely taken apart.

Two bearings of deep groove design.  I was hoping at least one would be a thrust bearing, but both are Nachi 6202 NKE deep groove bearings.  Good for radial load, but not as good for thrust loads.

Two spacers between the bearings.  One to engage on the inner races and the other to engage on the outer races.

I looked online for replacement bearings.  The 6202 is a very common bearing.  Many places sell versions of these which vary by lubrication, shield design and material, etc.

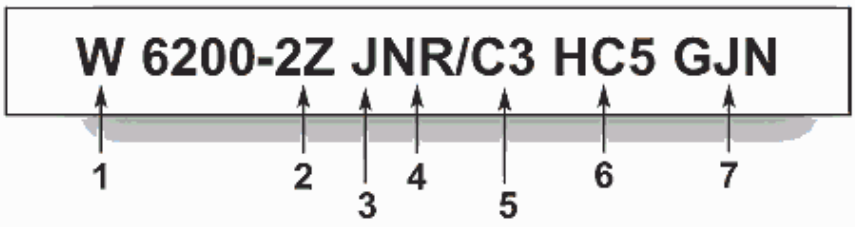
I decided to purchase these locally at Bearings and Drives Unlimited.  For Lehigh Valley residents, the closest store is on 29th and Mitchell street, just off Emmaus Ave.

Bearings and Drives Unlimited store locations

The had Nachi and SKF brands in stock.  I decided to go with SKF.  The new bearings code is 6202 2RS JEM.  I had to look up the meaning of the code.  2RS means 2 rubber faced shields.  JEM is a specification of the cage design.

I found this useful picture of the SKF code designations in a thread on a machining forum.

# Deep Groove Ball Bearings




## 1. Prefix

| | |
|---|---|
| **R** | MRC inch series |
| **W** | Stainless |

## 2. Seals Shields

| | |
|---|---|
| **FF** | MRC shield designation SKF Z Metal backed one side of bearing (also SKF 2Z) |
| **RS2** | As RS1 but of Fluorocarbon rubber for higher temperatures (also 2RS2) |
| **RSL** | As RZ, new design, (also 2RSL) |
| **RSH** | As RS1 new design, (Also 2 RSH) for bearings of 60, 62 and 63 series up to 52mm o/d. |
| **RZ** | Metal backed non-contact seal on one side (Also 2RZ) |
| **Z** | Metal plate |
| **ZZ** | MRC seal designation (SKF 2RS1) |
| **2Z** | Steel plate on 2 sides |

## 3. Cage Design

| | |
|---|---|
| **J** | Pressed steel cage, rolling element guided |
| **JEM** | Steel cage (J), quiet running, C3 clearance (not marked on bearing)** |
| **M** | Machined brass cage, rolling element guided |
| **MA** | Machined brass cage, outer |
| **TN** | Polyamide cage |
| **TN9** | Fibreglass reinforced Polyamide |
| **Y** | Pressed Brass cage, ball guided |

## 4. Modification

| | |
|---|---|
| **C** | MRC designation for Cartridge type bearing |
| **N** | Snap ring groove |
| **NR** | Snap ring & groove |
| **N1,N2** | 1 or 2 locating notches |
| **S** | MRC Conrad type |
| **VL0241** | Electrical insulation of outer ring |
| **VL2071** | Electrical insulation of inner ring |

## 5. Clearance/Tolerances

| | |
|---|---|
| **C1** | Clearance < C2 |
| **C2** | Clearance < Normal |
| **C0,CN** | Normal not shown |
| **C3** | Clearance > C0 or CN |
| **C4** | Clearance > C3 |
| **C78** | P5 or ABEC 5 tolerance |
| **C782** | C78 + C2 |
| **C783** | C78 + C3 |
| **P5** | Tolerance to IS0 class 5 or |

## 6. Special offerings

| | |
|---|---|
| **HC4** | Full Ceramic bearing |
| **HC5** | Ceramic ball set |
| **HYB** | MRC hybrid bearing |
| **VA201** | Special specification for kiln trucks |
| **VA 208** | Graphite segment cage for hi- temp applications |
| **VA 228** | Graphite cage for hi-temp applications |

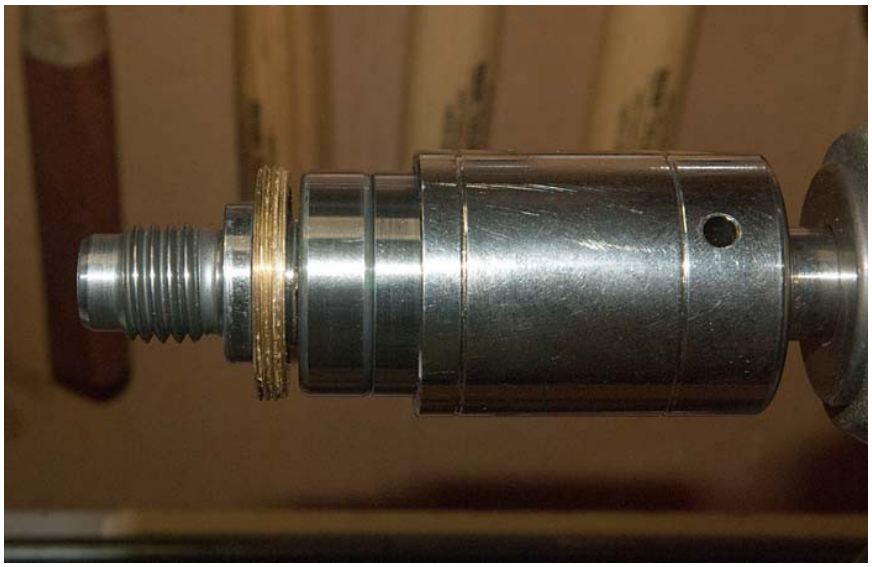
## 7. Lubrication

| | |
|---|---|
| **GJN** | Di-urea, Hi-temp.115 cSt @ 40°C, range -40°C to + 150°C |
| **GMB** | Lithium, Medium temp.120 cSt @ 40°C, -30°C to + 110°C |
| **HT 51** | Polyurea hi-temp, 110 cSt @ 40°C, -30°C to + 140°C |
| **LHT 23** | Lithium,Wide range, 26 cSt @ 40°C, -50°C to + 140°C |
| **LHT 30** | Lithium, Wide range, 74 cSt at 40°C, -40°C to +180°C |
| **LHT 64** | Clay, Wide range,13 cSt @ 40°C, -73°C to + 149°C |
| **MT33*** | Lithium, Medium temp. 74 cSt @ 40°C, -30°C to + 120°C |
| **MT47*** | Lithium, Medium temp. 70 cSt @ 40°C, -30°C to + 110°C |
| **W64** | Solid oil, various types |

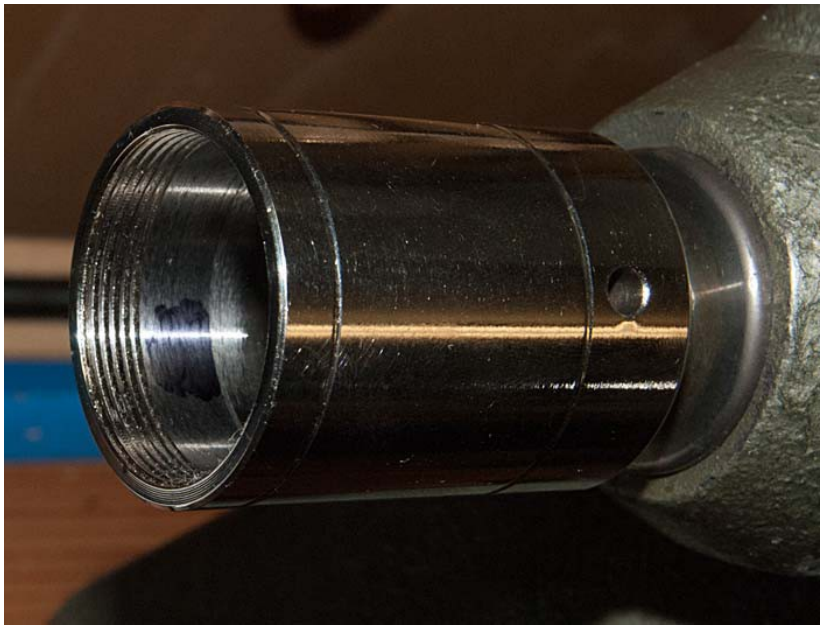
Now to test the fit of the new bearings.  In the few threads I read on-line, most people are able to easily insert the bearing assembly.

This is not the case for my OneWay live centre, so showing the gory details of the steps I had to go through in case of use for someone else.

The bearings would not go in far.  I am using hand pressure, not trying to force this in place, just see how far I can get this easily.



I marked a small area of the housing and also the leading edge of the bearing with a Sharpie.

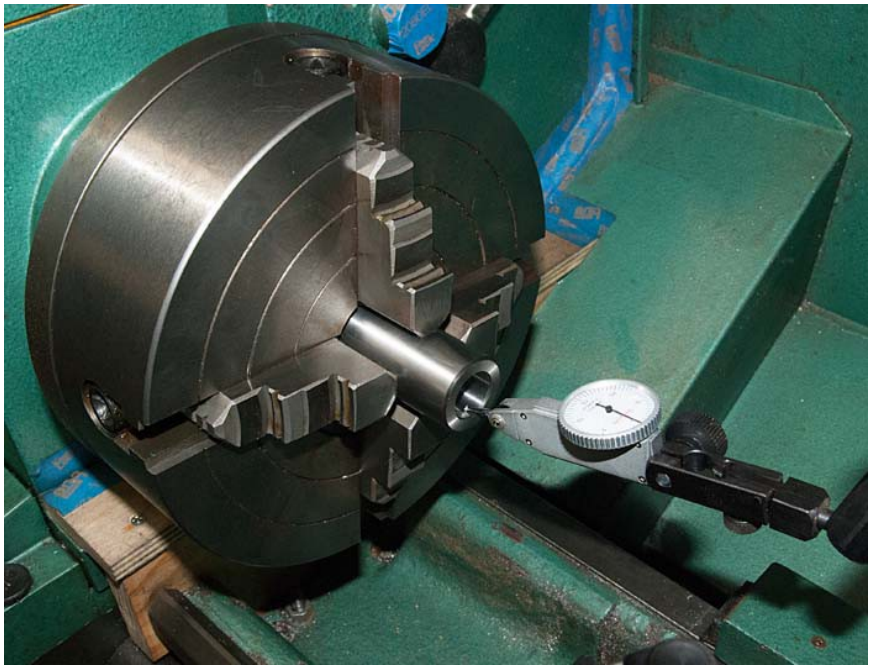


The assembly after the test fit.  I can see where the ink was removed, mostly at the end of the first machined area.

The assembly after the test fit.  The left edge of the bearing has no ink which means it was rubbing on the housing.

I decide to measure the housing on my metal lathe.

I mount an MT2 taper extension in a 4 jaw chuck and then adjust so the inside of the taper is running true.

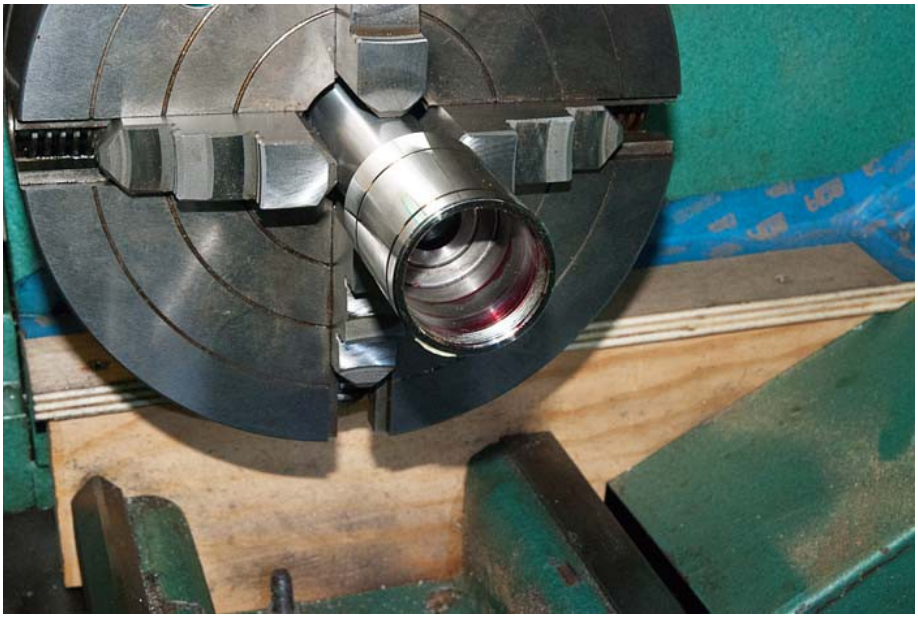


I insert the housing in the MT2 extension and take measurements of the two machined areas.  As expected some runout.  Also the rear area was smaller diameter than the front, so the rear area is likely the root cause of my bearings binding so bad.

I mark the two machined areas with layout dye, then make a first pass with a boring bar, trying to remove the smallest amount of metal.

This is the picture after the first pass.  No dye  removed from the front machined area and some dye removed from the rear.  This confirms the rear machined area is too small diameter.

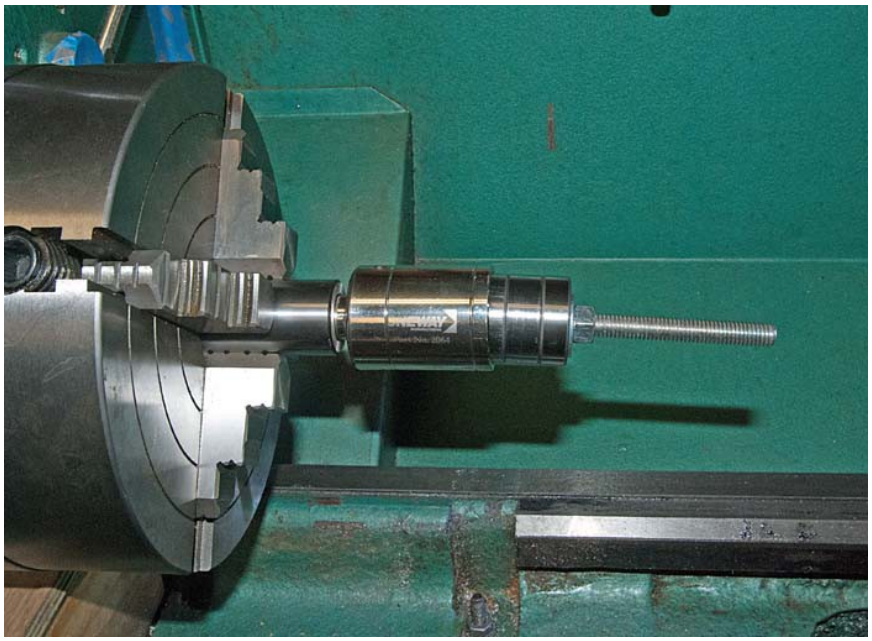
A few more passes.  Small amount of dye remaining on front machined area, no dye on rear machined area.



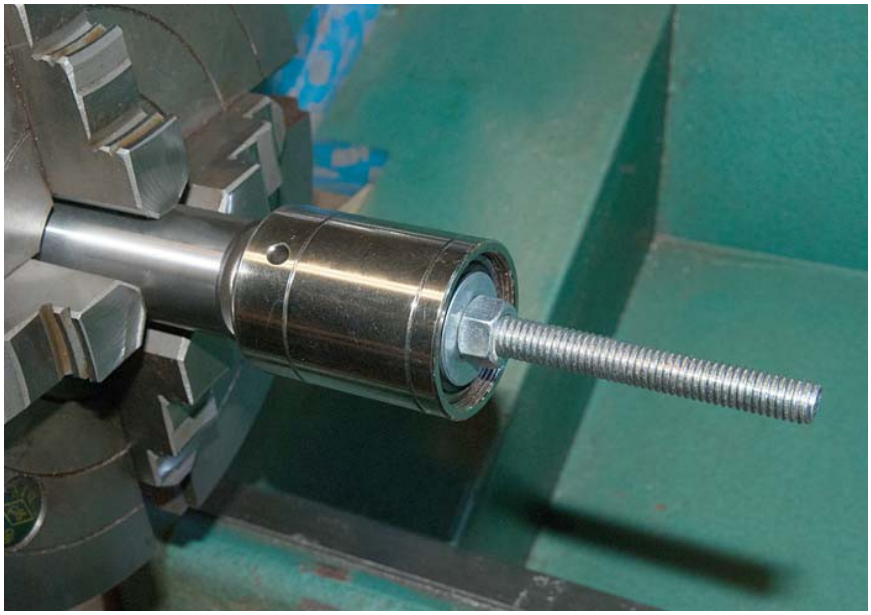
A test fit of a bearing.  Snug fit on the first area, but does not go through.

I need to remove more metal – very carefully.  I make a couple of passes and need to test the bearing fit.

I mount the two bearings and spacers on a 3/8in dia carriage bolt so that if this gets stuck, I can use the thread to release the assembly.



I am able to get the entire assembly close to the bottom of the housing.by hand fit.  I call this good-to-go.



I go to my friend to press the bearings onto the shaft.

Eagle eyed readers will see that we have pressed on the bearings WITHOUT the brass cover.  Drat, drat and double drat!!!!

We removed the bearings and included the brass cover.  PAY ATTENTION to the orientation of the brass cover.

This time everything is in correct place and orientation.

Next step is to insert the bearing assembly into the housing.  Another round of iterations.  The bearing assembly can only go so as far as the brass cover contacting the threads in the housing.

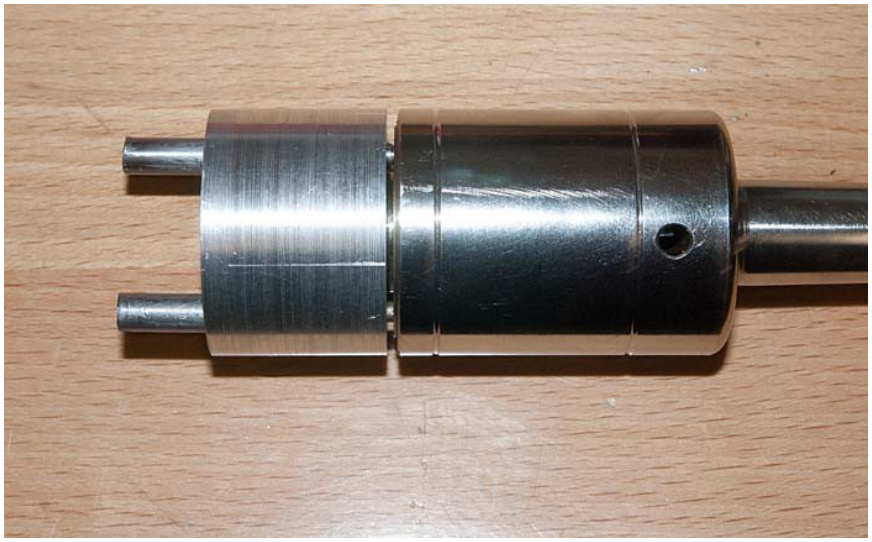
The brass cover then needs to be screwed into the housing until it contacts the bearing.

The bearing assembly then needs to be knocked deeper into the housing until the brass cover contacts the bottom of the flange on the shaft.

I think you now get the idea.

Finally the assembly is ready for final screwing into the housing.

I use the bushing and pins to hand tighten the brass cover into place.



The OneWay live centre is now ready for use.  I test with a finger rotation.  Nice smooth action, no play, no roughness, perhaps better than new.

Time to test on the lathe.

I mount an in-progress project between centres.

I turn on the lathe, run up to a high speed.  No vibration, no noise, it is silent.

A project with a happy ending.

This took a lot longer than I expected, and was much more difficult than the few threads I had read.

I am happy with the result.  I hope your bearing replacement is a lot easier.