

Rear Axle (worm or screw type) Repair

By Francis on [Wednesday](#), August 18 2010, 18:27 -

[1st model Axle](#)

For this repair I use the Peugeot Tool Box 8 0505 Z and I will try to give another parallel repair method using other tools besides the manufacturers. Here, I only deal with the disassembly and the removal under conditions which pose no particular problems. It is very similar in fact to a gearbox removal.

After cleaning, this is what a rear worm axle looks like.

An axle of this kind rarely breaks. Most often it will become noisy and will jerk during decelerations and accelerations due to differential wear especially on the crown. The housing is held in place after removal by spacers (or wider nuts) retained by the pillar bolts.



Removing the cover after removing spacers.



Remove the four bolts on the cover plate.



Then remove the support plate and retrieve the adjustment washers.



Important: If you aren't use Peugeot tools. I advise not to disassemble the washers and the bearing plate and to note the right or left installation side (in order to remount the already centered crown wheel). Removal of the differential discussed later.



Remove the rear screw cap or plate after removing the four nuts. In order to remove, one can use of a plastic mallet and delicately strike on the edge of the lid (because its often glued on with a sealer). Do not pry with a screwdriver as you will damage the joint and create oil leaks.



We can see the screw drive and observe the copper-colored glitter in the housing. Those are pieces of the Bronze crown.



The shaded black traces on the crown are not stains or residues, but actually the lack of bronze. This wheel did not like something (wear, lack of lubrication, jerk-related play can all play a part).



One then passes to the front of the axle, the fluted side of the screw. The front bearing (circular part) and its O-ring are removed.



And the front right seal, also referred to as the mechanical seal or rotary joint, is extracted (this is the same type of seal used on hydraulic pumps). On the left is the new one and on the right the old one. You can find these available for 13,34 € excluding tax.



Afterwards the screw equipped with its two bearings is removed. To do this, the crankcase is immersed in boiling water (aluminum has a higher coefficient of expansion than steel, the negative clearance between the crankcase and bearing will decrease and the screw will be easier to extract). Leave it for a few minutes and then extract the screw by striking with a mallet and a block on the rear end of the screw. The screw comes out from the front of the housing.



Only the outer ring of the left differential bearing remains in the housing. Chase it out with a dowel. Since the casing was also carefully immersed in the boiling water, its outer ring for the right differential bearing was loosened. Now the housing is empty, I neatly store all the bolts and washers to be able to reassemble them tightly (this in order to avoid oil leaks).

Disassembly of the differential.

Remove nuts and washers.



Removing the casing shell.



Recovery of the 'celery' washer.



Removing the gear. One sees the two satellite gears mounted in the axis held by two shims (small parallelograms in steel color) housed in the crown. This little gear is easily removed (simply nested in one another).



Then the crown can be removed. All that remains is the second casing shell with its gear and its celery washer. In this case, the washer is in tiny pieces and the gear did not like it given the traces of wear on its surface from friction (gear to the left in the picture).



Removing differential bearings.

Removal of the bearing on the shell casing using a roller stripper and press (interposition of a shim with a diameter less than that of the bearing). Same treatment for the other casing.



Removing the front and rear bearings from the screw



Differential assembly in the crown wheel.

The old crown wheel will be changed out and replaced with a new one. The screw will be kept because it looks ok upon visual inspection and the wear is less pronounced than the steel wheel.

Reassembling the differential.

The differential will also be changed with a new one. So I opt for a repair kit including gears, axle, shims, planetary gears and celery washers).



Bath of solvent to remove all traces of storage wax (except of course on celery washers).



We will not forget to oil all the parts we're reassembling with the ricine or castor oil. Oil bath for all the small differential parts. Note the bronze crown does not like the traditional transmission oil of type SAE 90 so only castor oil is used.



The different parts of the kit except for the adjustment shims.



The differential can then be reassembled. Place the housing in the vice, then an oiled celery washer and an oiled gear;



The wheel is then placed on the casing. I hold the assembly screws to center the holes between casing and wheel.



Afterwards, the gears and the and shims can be assembled on the axle and the assembly in the wheel as well.



Continue with the second shell. Place the planetary gear in the shell by interposing the celery ring between the two.



One can place this assembled shell (keeping the planetary gear in center) on the the differential prepared previously in the vice. The bolts (heads oriented on the side of the wheel mark) are installed. I put a brake drop on each thread, seal the nuts and tighten them to the torque of 8.5 m.kg (torque for 12 screws).



Once the differential is assembled I pass to the installation of the bearings on the casing.

On this type of bearing, the path is not an integral part of the bearing (two-part bearing). So to avoid unpacking I put it in its box and mark it E which means "bearing placed on casing side with bolt clamping".



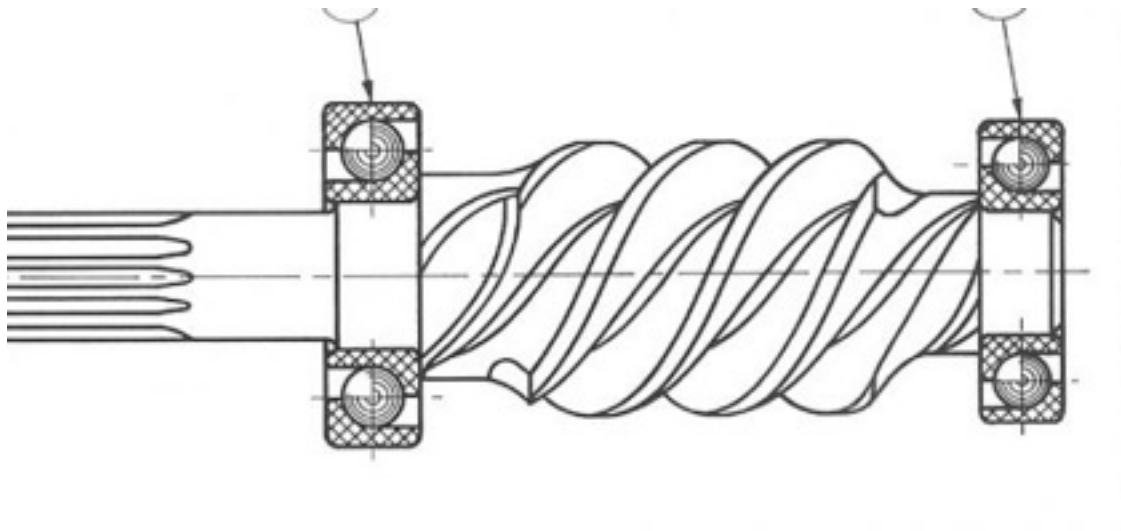
Installation using a press with support on the inner ring to avoid marking of the rolling path.



Install the screw bearings.

The screw bearings have oblique contacts referenced 7306 and 7305. The references 6305 and 6306 have the same dimensions but are not with oblique contacts therefore not good.

The bearings have a certain required direction for installation. The larger shoulder of the inner ring of the bearing will be against the shoulder of the screw and not towards the outside of the screw.



Face of the two bearings on the external side of the screw.



Face of the two bearings external sides of the screw.



Mount the bearings on the screw using a press. Note that the pressing force will be exerted only on the inner cage of the bearings in order to avoid marking the ball tracks.



Let us proceed to the reassembly of the screw once equipped with its bearings in the housing.

Immerse the housing and casing in boiling water for a few minutes.



Once the temperature is balanced, insert the screw from the front into the housing.



Fit the front bearing (round plate) without its O-ring. To secure this bearing use the positioning plates for the gear box (those to immobilize the engine sleeves also work very well) or any other suitable means.



Turn the housing upside down and gently strike the bearing cage to bring the screw into contact with the front stop. I use a wrench to disassemble the gearbox shaft bearing (good diameter).



The outer rings of the differential bearings can then be installed. One in the housing and the other in the cover in the right direction obviously and 1mm from the outside face of the joint plane. The brown chatterton indicating the mm when the edge arrives at the level of the joint plane.



The thickness of the shims to be inserted is determined between the rear cap and the rear bearing of the screw either by using the caliber N
This gauge is supported on the rear face of the deck casing. Its pin is supported on the outer ring of the bearing and it is locked with the roller.



Without unblocking the gauge, place the gauge on the rear cap and accurately determine the thickness of the shims so that the gauge rests on the edge of the grommet.



Check the thickness of the shims.



Without the tooling it is possible to determine the thickness of the wedges to be interposed by means of a depth gauge. Place the dipstick on the cap (see photo), position the tappet on the edge of the cap and set the reading to zero.



Then place the dipstick on the rear sealing plane and place the treadle on the outer bearing cage. Read the value that corresponds to the dimension between the bearing's outer cage and the cap. Here the value is 0.75mm. The same value as before.



To this value it is added between 0.05 and 0.075mm (depending on the shims available) to obtain the prestressing of the bearings. The shims are placed on the bearing. The seal face of Loctite 5923 is coated and the rear cover can be mounted with the slot facing to the right. The screw should provide a slight resistance with rotation.



I use "Loctite" but Hermétic is also suitable as the joint paste used for assembly of crankcase without seal paper.



The housing is then turned over, the fastening/securing flanges are removed from the bearing, and the latter is removed. The new gasket is installed. The friction surface of the gasket will be against the internal face of the bearing.



The O-ring is placed on the bearing, the seal is greased slightly and the bearing can be put back by orienting its slot to the left.

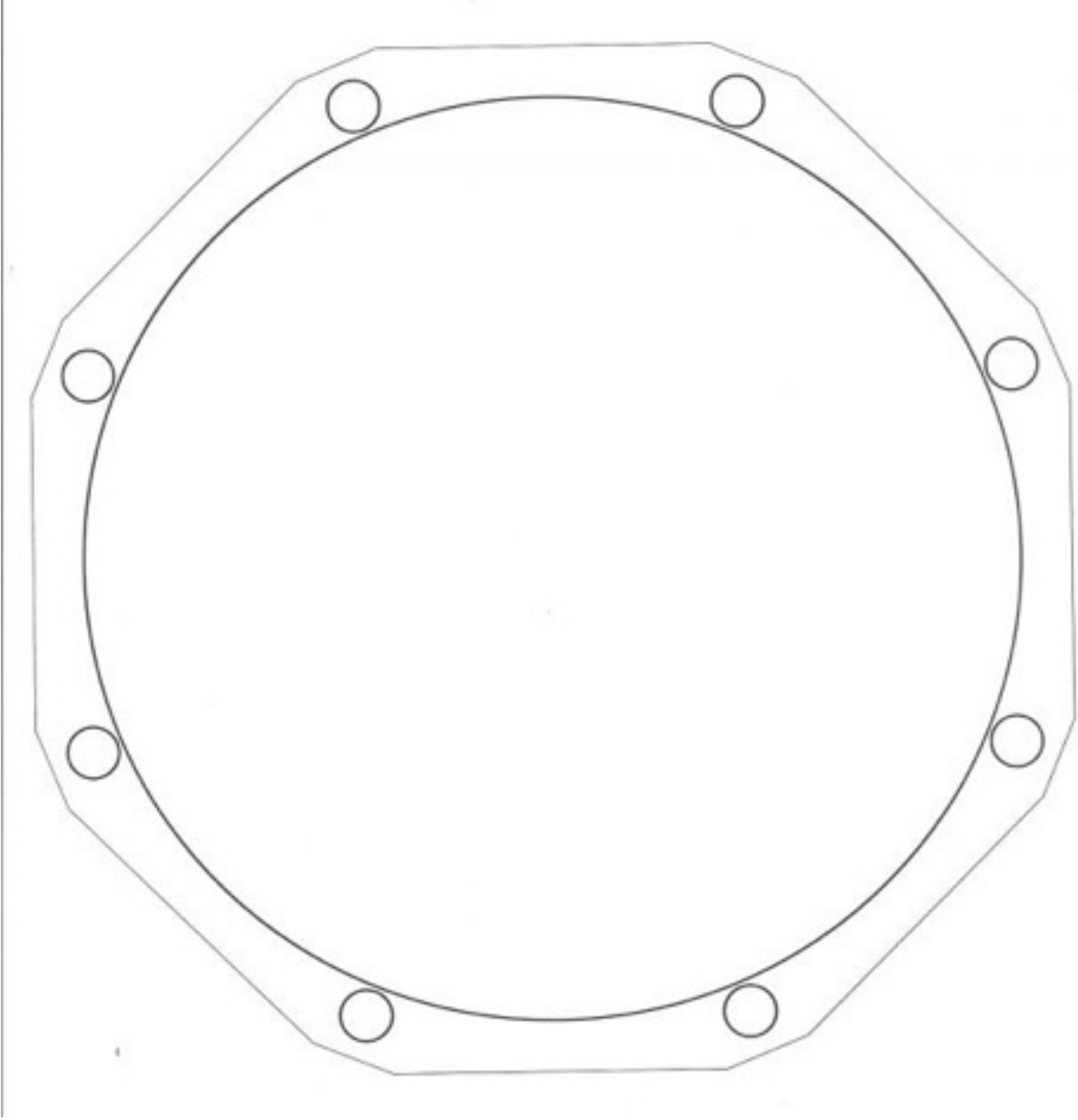


Here the screw is set and adjusted.

Then put the differential into the crankcase, marked side of the wheel facing to the right (cover side). Note that it is possible to turn the wheel in the other direction if used wheel, the play will be more or less "caught" in forward as you go.



Put a new paper seal coated with spray sealant (Loctite red) on the cover. This joint is practically not found for this model of axle so it will be necessary to make it by cutting with the aid of a template or tracing.



Place the lid by pointing the oil passageways vertically and positioning the boss of the lid towards the oil drain hole of the deck (not as in the picture, since the lid has made a 180 °). Fit the spacers (or larger nuts) and secure the cover.



At this point I will describe the method of adjusting the wheel with the Peugeot tool and I would finish on another method using "conventional" tooling.

Turn the assembly over. Prepare the bridge support K by screwing the Q keys as the 43mm wheel.



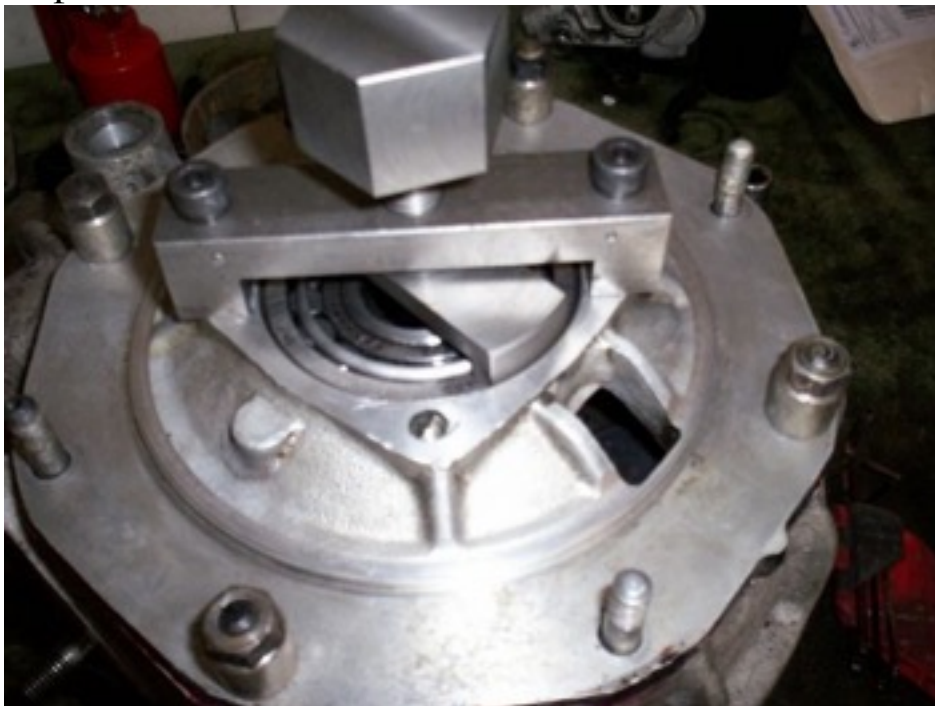
Rotate the wheel with the screw by hand and position the holes of the differential casing in front of the crankcase lights (see photo). On the picture we can distinguish the differential tightening nut in bronze: the wheel, in dark gray: the shell and its hole about 5 mm).



Place the mounting K. Make sure that the Q keys are in the holes of the shells resting on the wheel. Secure the mounting using flange L.



Turn the assembly over. The axle now rests on the base of mount K. Mount the flange M, press the outer race of the bearing onto the roller ring without forcing. The axle wheel is in place in the correct axis with respect to the screw.



The thickness of the shims between the bearing plate and the bearing is then determined either with the aid of the gauge N of the tooling (same principle as for the screw)



Or by using the depth gauge (same as for screws).
Reset of the gauge button on the support surface.



Measurement of the thickness between bearing plate and outer cage of the bearing.



Once the thickness is determined it is enough to add to this rib 0.1 mm to have the thickness of the wedges to be added. This 0.1 mm corresponds to the preload of the bearing. Install the shims, the bearing plate.



And tighten the bolts (brake tight) without forcing (torque 1.25m.kg).



Let's go to the other side. Turn the assembly upside down to rest on the lid. Remove flange L and mounting K. Mount the flange as on the other side. Press the outer race of the bearing onto the roller ring by tightening moderately without forcing the flange screw.



And using the gauge N, determine as before the thickness between the outer ring and the bearing plate.



Same with depth gauge.

Once the thickness has been determined, 0.1 mm is added for the prestressing on this side and also 0.1 mm more for the preload of the bearing on the other side (which, when removing the assembly K, had been canceled. Made 0.2mm to add to the coast.

Place the flange, place the wedges, the flange and screw like the other. Now without the specific Peugeot tooling.

Let us try to understand the purpose.

The teeth of the wheel in relation to the screw must be positioned very accurately. On this axle the center distance is 101.6 mm (distance between the axis of the wheel and that of the screw). It is given by the machining of the bearing housings in the casing and therefore can not be varied (which means that if the wheel is worn, there is no possibility of taking up the play. This would be of no use since the teeth must attack the Screw only in one way to avoid noises and jerks). The only adjustment to be made and the positioning of the wheel (left or right) "hair line" above the screw. The positioning too much left or right thus generates a bad attack of the screw and causes noises, wear and tear ... In practice with the Peugeot tooling the wheel is positioned by resting it on keys of calibrated length.

With mine

When installing: B1: Distance between edge of wheel and lid seal plane

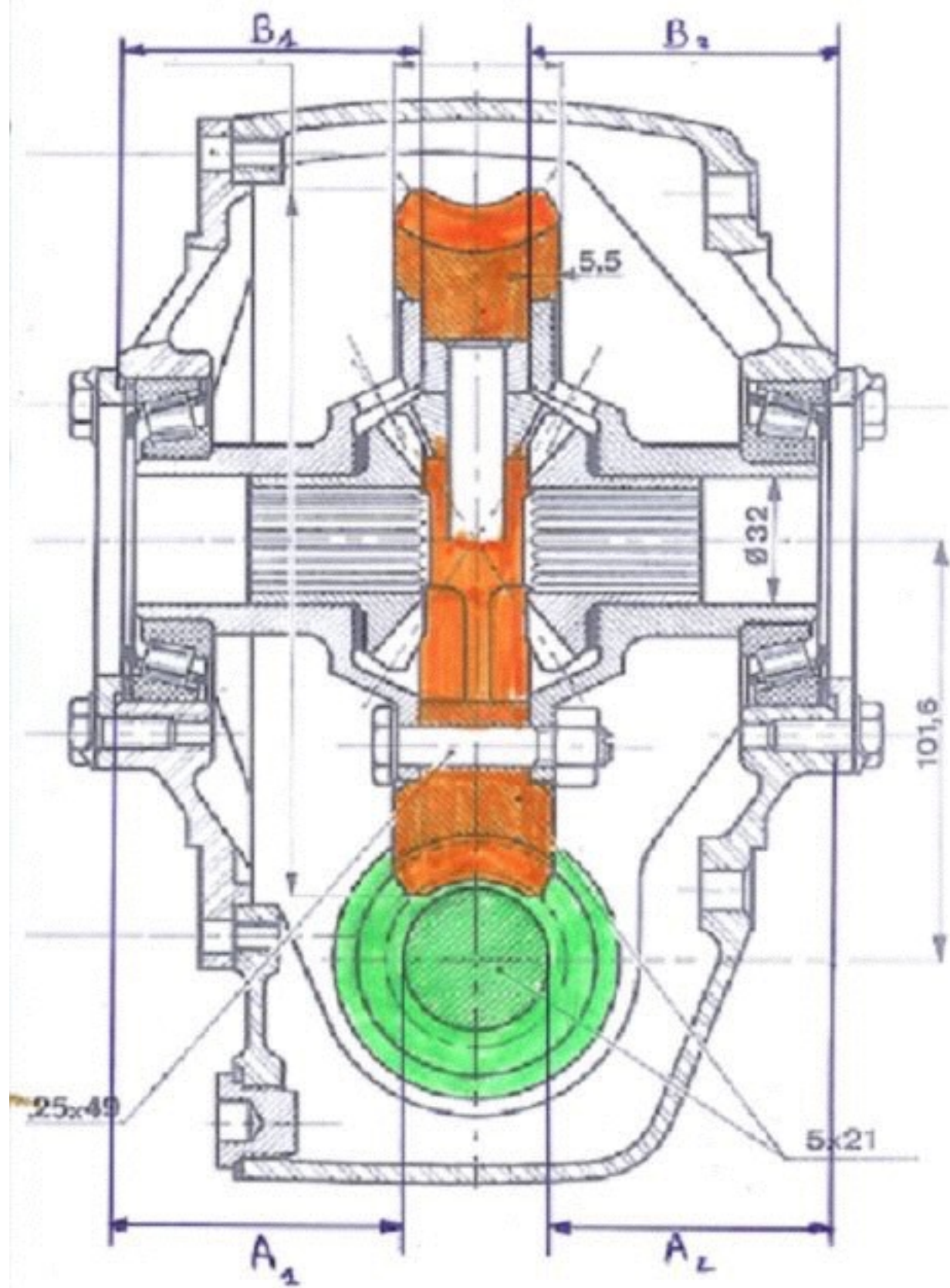
B2: Distance between edge of wheel and housing sealing plane A1:

Distance between screw edge and cover seal plane A2: Distance

Between the screw edge and the housing sealing plane

The equation for a centered wheel is determined:

$$A1-B1 = A2-B2$$



Practically.

Reassemble the shims and support plates (carefully retained when disassembling) on one side.

And, using the previous method determine the distance between outer ring and bearing plate on the other side. Add the pre-stress of 0,2mm and raise "blank".

Once the assembly up. Take the measurements A1, A2, B1 and B2 and set the equations:

$A1-B1$ and $A2-B2$

If you find a difference between the two results. Divide the difference by two Add this value on one side and subtract it

Example $A1 = 72.89$ $A2 = 72.71$ $B1 = 66.85$ $B2 = 68.26$

Place equations $A1-B1 = 72.89-66.86 = 4.38$ $A2-B2 = 72.71-68.26 = 4.89$

The difference between the two results is: $4.89-4.38 = 0.51$

So just add 0.25mm on the A1 / B1 side and remove 0.25mm from the A2 / B2 side

And your wheel and then centered properly in relation to the screw.

Now we will control according to this method our assembly made with Peugeot tooling.

Measurement of A1 distance between cover plate and screw.

Laying of a ruler on a joint plane. Measure 00 from the joint plane.



Then measure between cover plate and screw. Place the gauge on the ruler (always on the joint plane) and press the screw A172,89mm.



Measurement of A2 same method as A1 distance between casing joint plane and screws. $A2 = 72.71$ Measurement of B1. Distance between wheel and lid plane. I use the depth key of a caliper (because it is narrower than that of the depth gauge). Laying the Ruler on Measurement Plate 00.



The measurement from the edge of the wheel will be taken through the hole of the differential shell (interest of the caliper as 5mm hole).



The ruler is left astride the joint plane and the caliper key is placed on the wheel through the shell hole.



Taking the measurement $B1 = 67.67\text{mm}$.

Same as the other side for measurement $B2$ (crankcase and wheel)

Measuring socket $B2 = 67,36\text{mm}$.

Laying equations. $A1-B1 = 72.89-67.67 = 5.22\text{mm}$ $A2-B2 = 72.71-67.36 = 5.35$

Deviation of 13 cents corresponding to a hold value of 6.5 cents. In my opinion negligible value.

I hope I have been clear enough.

Reviews

[1.](#) On Sunday, April 3 2011, 19:45 by thierry

Hello,

Can you tell me at which wholesaler you found the AD seal?

thank you in advance

Thierry

[2.](#) On the Sunday, April 3 2011, 22:17 by francis

Yes establishment LOUDET Industry agency Montélimar, Avignon,

Nîmes, Valence, Montpellier, Vitrolles

Tel Montpellier 0467581918

Francis

[3.](#) On Friday, June 3 2011, 04:32 by Olivier

Hello,

Deja bravo for this blog super detailed! We see more clearly about the 404!

I wanted you to ask one thing about my 66 carb coupe; I have problems "hooking" very unpleasant (when I "plays" with the accelerator pedal), at the level of the transmission.

Can we remedy this? What piece would be worn? Crown of the bridge? Cardan? ...

Apparently I'm not the only one to encounter this problem! (See Club 404)

Maybe you can bring me a clarification?

Thank you infinitely!

[4.](#) On Monday, June 20 2011, 09:17 AM by francis

thank you

The blows in the transmission on our 404 are generally related to wear of the bronze crown of the bridge

Apart from being very unpleasant to driving it is extremely rare to undergo a break

[5.](#) On the Sunday, July 10 2011, 19:29 by zirnheld vincent

Hello,

I will need to carry out a revision on my back deck on my ford granada breack 1980, could do this work or give me a contact for this revision, best regards / mr zirnheld vincent switzerland 078 XXX XX XX

[6.](#) On Sunday, July 17 2011, 12:37 by francis

Hello Vincent

It would have been a pleasure for me but unfortunately I limit myself to the 404 and fiat 1500

I think you can get closer to the brand clubs and find more targeted assistance

good revision

[7.](#) Monday, August 19 2013, 1:40 pm by dupuis andré

Hello I own a cabriolel 404 1968. After a few hundred meters of rolling a slap located at the level of the bridge is heard followed simultaneously by a brutal blocking of the right rear wheel. Each restart the problem recurs after a few meters or several hundred meters.

How do you explain this phenomenon?

Sincerely, André Dupuis

[8.](#) Monday, August 19 2013, 19:23 by francis

Hello André

In a first time before incriminating the bridge I would check the brake side especially the return springs

After removal and opening of the bridge to check the problem which could be of the differential but not easy to give a response without disassembly

[9.](#) On Friday, October 25 2013, 19:38 by mimir

Good evening Francis,

Bravo for the tutos concerning the screw bridge of our 404.

I have the same symptom as André. Moreover, the bridge heated because there was no more oil during the emptying. On the other hand, I had done the level last year but alas it was Not castor oil.

There is no leakage on the deck. It is thought that the oil would have coagulated and it would still be inside.

A diesel cleaning is required before putting back the castor oil. For the track the brake springs have checked on my next stay.

Friendship

Mimir

End #content