

Warning: The brake system of 4cylinder Tractions should only be worked on by persons with in-depth knowledge of the marque! This also applies to a certain extent to the 6cylinder version Daniel Eberli, www.oldtimer-taxi.ch

For the same topic, see the chapter 'Brakes' in the manual 'Citroën Traction Avant 11 & 15CV for Beginners'. www.tractionavant.ch/Shop/RepbrochureE/RepbookE.php

Here is a synopsis of the most important points:

- ✂ Change the brake fluid regularly and check the brake cylinders.
- ✂ Only work on the brakes yourself if you have the necessary knowledge and tools. Otherwise find yourself a Traction specialist.
- ✂ Understand the sense of rotation of the 38mm nut on the drive shaft. There should be a right hand thread on the left side and a left hand thread on the right side.
- ✂ Always use the correct brake drum puller or have it shown to you by the mechanic who does the job. By no means accept the statement from your mechanic that 'it will work with a different tool too'!
- ✂ Have new brake linings adapted to the curve of the brake drums, but allow the brake drums to be lathed out only

as a last resort! Chamfer the leading and trailing edges of the linings.

- ✂ Neatly centre the brake pads using the lower eccentric bolts.
- ✂ Apply brake cylinder paste [e.g. from ATE] to the pistons



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and the inside of the brake cylinders.

- ✂ Before assembling the front brake drums check the cones carefully and de-grease cleanly.
- ✂ In case of replacing a woodruff key, ensure that it is not too thick.
- ✂ Front: Ensure that the brake drum is not blocked by the wheel bearing and there is enough free thread on the drive shaft for the 38mm nut.
- ✂ Tighten the 38mm nut sufficiently: see workshop manual ~ 250ftlb [339NM].
- ✂ When bleeding the brake system, do not push the brake pedal fully to the floor.

If you think this is not for you, at least make sure your horn is working and that you have a sympathetic insurance company!!

THE DETAILS

In the past six months I have been confronted all too often with examples of dangerous tinkering with the brakes of Tractions. Common to all cases was the fact that it was not the owner of the car who had repaired the brakes, but that he had taken his car to

a garage dealing with modern cars, assuming that they would be equally competent to deal with his [or her] classic. Unfortunately most garages do not think it necessary to acquaint themselves by either reading the workshop

It is important that a Traction's brakes are maintained regularly. Just because the brakes work, this doesn't mean everything is okay since by the time the brakes work unevenly or poorly expensive damage has already been done. This

is especially the case when only a few miles are driven each year.

Of course the brake linings are only worn a little, but the brake fluid absorbs water when the car is unused. Water in the brake fluid lowers the boiling point so when much is demanded of them, for example during a journey across steep hills or passes, they may be partially or even totally ineffective.

Now those who drive their Traction's infrequently may say, quite correctly, that they do not drive in hilly areas and across mountainous passes. Correct, but water is heavier than brake fluid. It collects at the lowest part of the brake system, which means in the brake cylinders. There the pistons will rust solid, especially if left standing for a long time. Heavy braking may free the pistons, but the surface quality of the cylinders will have suffered. The rubber parts will no longer seal properly and the brake fluid will gradually get into the dust boots. Then it's just a matter of time until the liquid drips into the brake drum and is distributed from there to the brake pads. These will become glassy and the effectiveness decreases. Since this does not

generally happen symmetrically, the brakes will pull to one side, and only then will the driver notice that something is not right. By then the pads ~ and often all the wheel cylinders ~ will need to be replaced and that is expensive.

For this reason I recommend changing the brake fluid every two years, and take the opportunity to check the condition of the brake pads and the wheel cylinders. If

you cannot do this by yourself, go to somebody who is familiar with the Traction and has the correct tools. The VW, Vauxhall, Volvo, or whatever workshop unfortunately often does more harm than good. Unfortunately, this also applies to Citroën workshops, unless they have an employee who still knows the old cars ~ and has the associated tools.

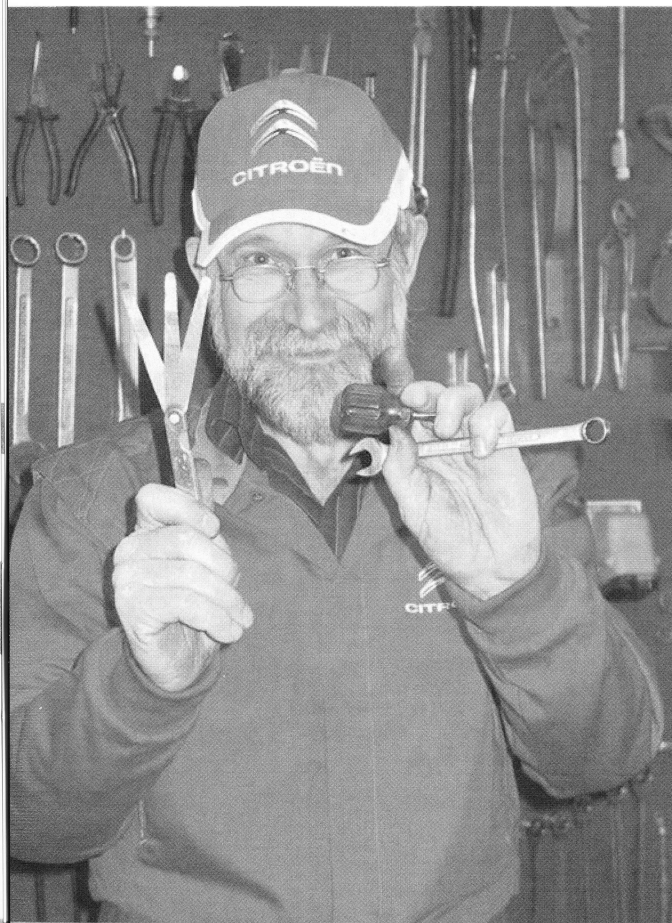
The first difficulties arise when

Illustration 1:
The nut on the left has a left-hand thread and is marked correspondingly; the nut on the right side has no markings and thus an 'ordinary' thread.

Illustration 2:
To remove the front brake drums of the 4cylinder models you must use the Citroën tool 1750-T. The heavy tool comprises two half shells which hold the neck of the brake drums tightly and are prevented from slipping off by a ring.

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manual or checking the internet. They do not want to lose face and are convinced that they are able to solve the problem.



unlocking the 38mm nut which holds the brake drum on the drive shaft. Assuming that the drive shafts have been mounted correctly, the nut on the left side has a [normal] right-hand thread; the right drive shaft has a left-hand

threads on both sides, a right-hand thread on the right and a left-hand thread on the left side, probably because in earlier days it was common to have a left-hand thread on the wheel bolts of the left side. It appears unlikely that

the average mechanic will know that nuts with left-hand thread

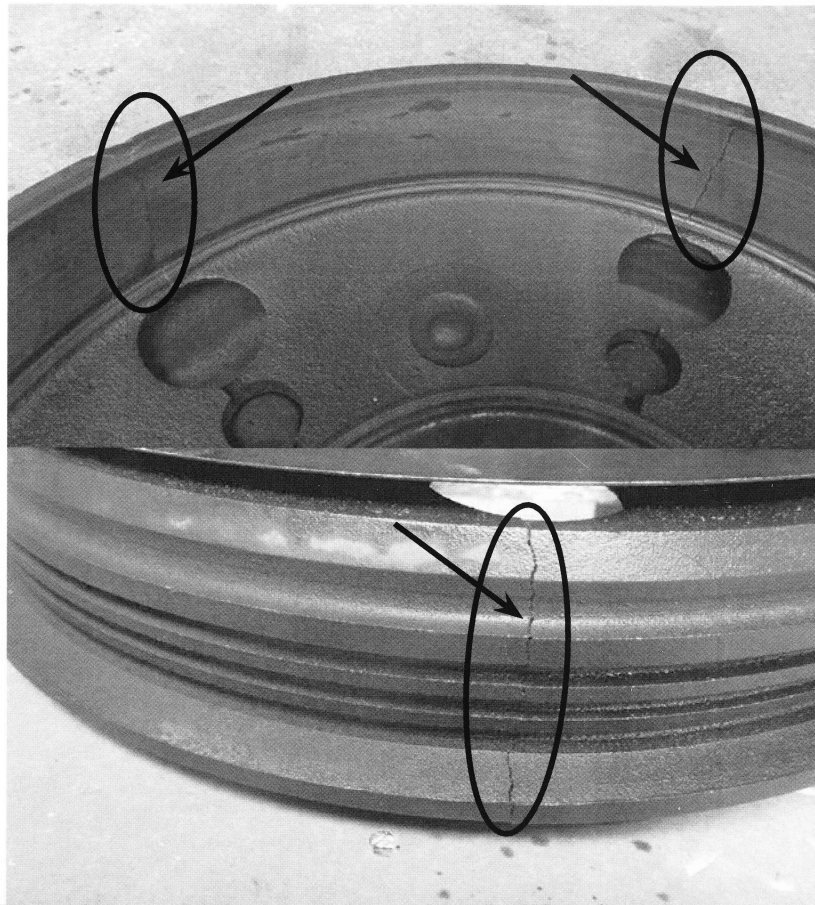
thread. However it might pay to look closely at the nut and the shaft stub. I've seen cars that had right-hand threads or left-hand

are provided with a marking on the edges.

The nut on the left in the picture [illustration 1] has a left-hand

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Illustrations 3 & 4: A drum which has been torn off by a 'professional' mechanic who used the wrong puller. Initially, he was not successful until he heated the drum in the centre with a torch. Finally the drum let go ~ and is now cracked in two places! The mechanic even welded one crack ~ maybe he did not even see the second one



thread and is marked correspondingly; the nut on the right side has no markings and thus an 'ordinary' thread.

To remove the front brake drums of the 4cylinder models you must use the Citroën tool 1750-T. The heavy tool at the top of the picture [illustration 2] comprises two half shells which hold the neck of the brake drums tightly and are prevented from slipping off by a ring. If the drums are not sitting too tightly it is possible to work with a 'light version' as shown at the bottom of the picture. I carry the light version in my toolbox on journeys, to be able to help if anyone should have problems with the brakes.

You must use a tool which seizes the brake drum at the groove in the hub area. Any 'ordinary', commercially available puller which pulls at the wheel bolts or at the outer edge of the drum will destroy the brake drum. I recently received a sample drum [illustrations 3 and 4] from one of the participants in my courses, which had been torn off [any other term would be incorrect!] by a 'professional' mechanic who used the wrong puller. Initially, he was not successful until he heated the drum in the centre with a torch. Finally the drum let go ~ and is now cracked in two places! The mechanic even welded one crack ~ maybe he did not even see the second one...

Clearly this drum cannot be used anymore on a vehicle and

now only serves as a demonstration model. Therefore I have cut out one quarter with a cutting disc.

Looking at the illustrations 5 and 6, it is recognizable that the brake drum rests on the cone only on the outermost and innermost

Illustration 5

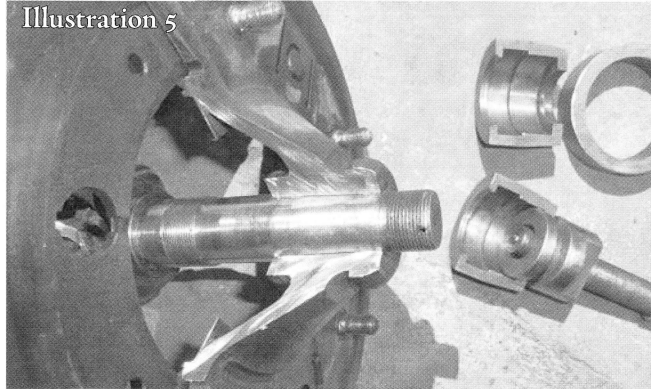


Illustration 6

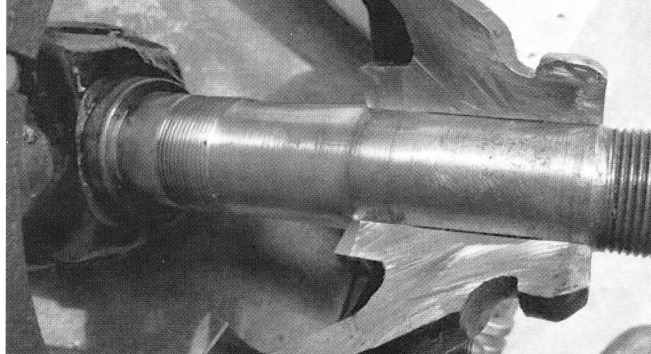
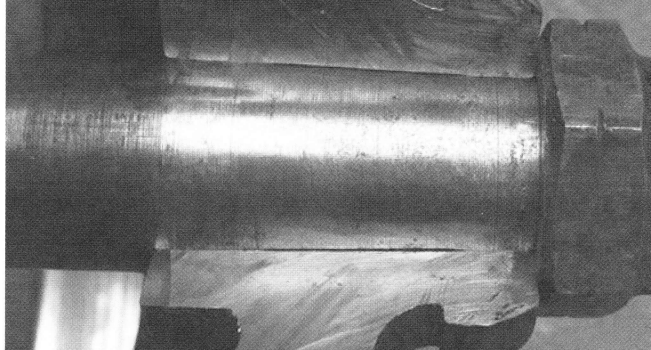


Illustration 7



½inches. This is deliberately so designed. In the next image [illustration 7] I screwed on the 38mm nut. As you can see, this is a nut with left-hand thread, and therefore it must be a drive shaft from the right side of the car.

shaft slides through. This leads to damage to both parts, to the drive shaft as well as to the brake drum, and both parts have to be replaced. Expensive!

Additionally new Woodruff keys are often too thick. This does not allow the brake drum to rest on the cone all around but on the Woodruff key instead.

The drum is then mounted slightly off-centre, power transmission is no longer guaranteed and the Woodruff key shears off when a load is applied. If the key is too thick it needs reducing to the correct thickness before assembly in order to leave some space above.

Other difficulties arise when the cone is a bit worn [e.g. when it has been tampered with after it was able to slip] or the tapered hole in the brake drum is slightly too big for the same reasons. Then a safe seat of the brake drum can be prevented in two different ways:

✂ The brake drum slips so far on the cone that the inner end touches the [outer] wheel bearing and the cone does not come to fruition. Skimming 1 or 2mm off the brake drum with a lathe in the area of the wheel bearing [illustration 9] would help. However, now there is a danger that the drum touches the brake plate. You would have to skim off 1 or 2mm of the outer edge of the drum also [illustration 10]. However, I do not like such measures and

It is essential that both the surface of the cone of the drive shaft and the inner surface of the cone of the brake drum are in good condition. The transmission of the driving force [torque] occurs only through the clamping of the cone connection. There is a Woodruff key, [illustration 8] but it cannot resist the torque. It serves only to ensure that the brake drum is mounted in the same position every time. If the cone connection is not sufficiently firm, the key is quickly sheared off and the drive

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Illustration 8: The Woodruff key serves to ensure that the brake drum is mounted in the same position every time.

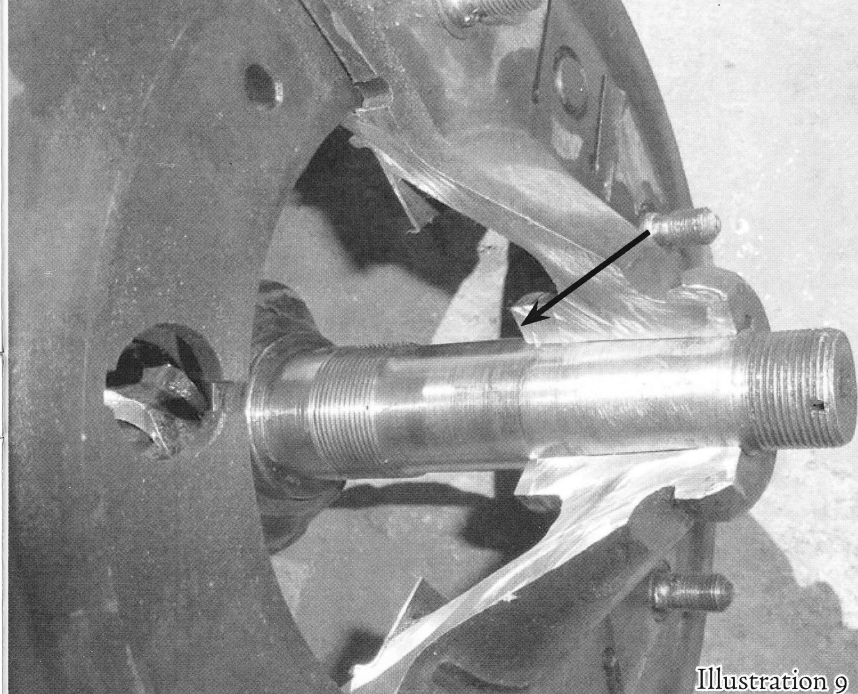
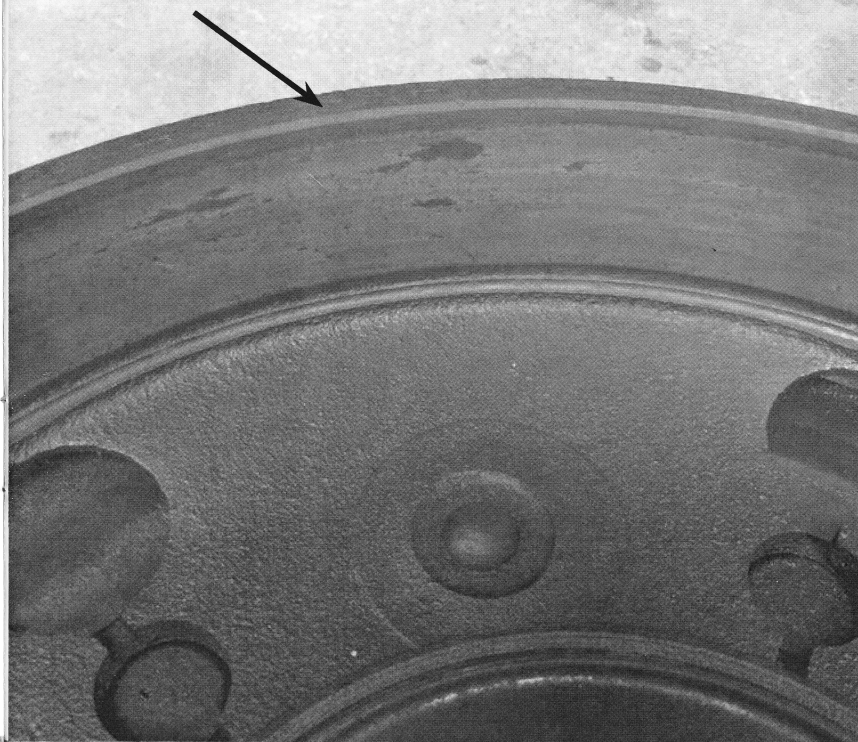


Illustration 9

Illustration 10



Illustrations 9 & 10: The brake drum slips so far on the cone that the inner end touches the [outer] wheel bearing and the cone does not come to fruition. Skimming 1 or 2mm off the brake drum with a lathe in the area of the wheel bearing [illustration 9] would help. However, now there is a danger that the drum touches the brake plate. You would have to skim off 1 or 2mm of the outer edge of the drum also [illustration 10].

would recommend replacing the drum and/or the drive shaft.

✂ The 38mm nut is blocked by the end of the thread on the drive shaft and cannot exert enough force on the brake drum, even

I soon realized that he had only managed to remove the front brake with great difficulty. Becoming clever, he wanted to make sure that 'next time' it would be easier. Therefore he greased the cones generously [illustration 11]. It

would only have been a matter of time until one of the woodruff

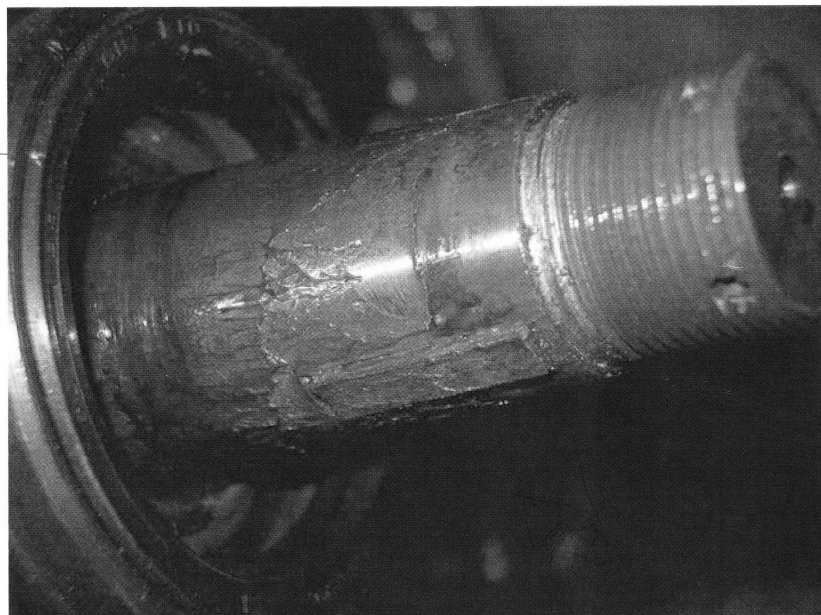
keys sheared off and the drive shaft would have slipped in the brake drum. Moreover, since both drive shafts were mounted with left-hand threads, in the worst case this might have led to unscrewing one of the 38mm nuts, and then one of front wheels would have gone 'a different way'...

The cause of the difference in the brake forces, however, was found elsewhere: Obviously, the mechanic did not notice that the

when tightened by the proper torque. [In the pictures of the cut-off brake drum, the wheel bearing is missing, so the problem cannot be seen.] A several millimetre thick washer between the nut and brake drum might help.

Another vehicle came to me because the mechanic failed to minimise the difference between the left and right rear brakes to a level which was accepted to pass the MOT.

Illustration 11: Greasing the cones as shown may make removing the front brake easier, but it is only a matter of time before one of the woodruff keys will shear off.



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brake shoes at the pivot points are fitted with eccentrics, which allow for [but also make necessary...] adjusting the brake shoes before the brake drums are mounted. Since the brake linings were not in contact with the brake drums over the whole surface, the braking effect was different on the right and left sides.

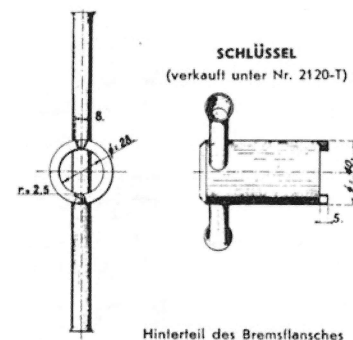
To adjust the brake shoes a special round Citroën tool exists. If you do not have access to this tool you may draw chalk lines across your brake pads, remount

the brake drum, bring the brake shoes in contact with the drum by the help of the top eccentrics, rotate the drum and then remove the drum again. You will then see where the brake pad is touching the drum and can correct the position accordingly by the lower eccentrics ~ a time consuming, but quite practical method.

Illustration 12 shows a right rear brake, which serves as a demonstration model for my courses. The nuts covering the lower eccentrics are highlighted in yellow

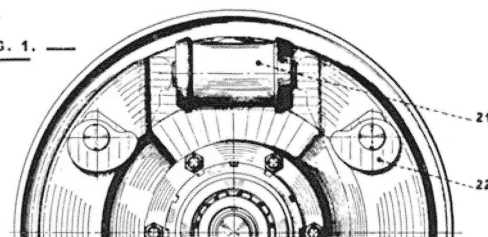
Illustration 13: Only at the very end do you put the brake pads as close as possible to the drums on the outside by the [upper] eccentrics, [No. 22 and 71], to keep pedal travel to a minimum

BREMSFLANSCH



Trommelseite des Bremsflansches (ohne Bremsbacken)

Fig. 1.



Kompletter Bremsflansch (mit Backen)

Fig. 2.

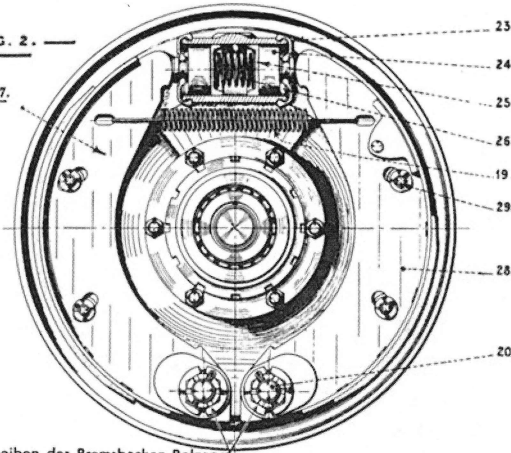
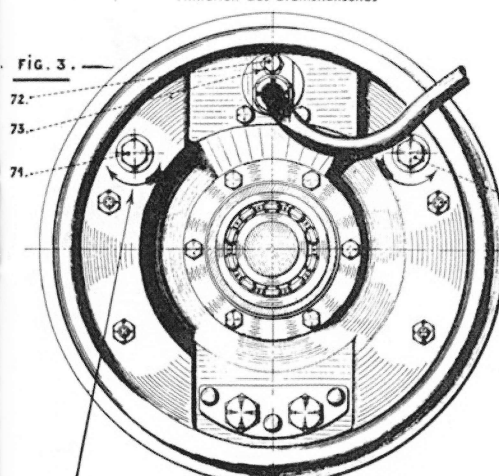


Fig. 3.



Drehrichtung der Bolzen: 71. zum Öffnen der Bremsbacken 27 und 28.

Einlegen der Bremsbacken-Bolzen (mittels Schlüssel 2120-T verstellen)

green. [Colour being an important component of this image you will find it on page 23. Ed.]

Well known parts dealers have rivet-on brake pads in their catalogues. However, I find it better to have the pads glued to the shoes by

the brake pads at the leading and trailing edges. I do this after purchase with a file or grinder, because I am convinced that by doing this the tendency of the brakes to shudder may be reduced.

By the way: if you replace the rear brake pads do not forget to lengthen the handbrake cables.

Otherwise, these act as if the hand brake is tightened ~ and then it is not possible to mount the brake drums...

Only at the very end do you put the brake pads as close as possible to the drums on the outside by the [upper] eccentrics, [No. 22 and 71 on the sketch illustration 13], to keep pedal travel to a minimum.

When bleeding the brakes, make sure that the brake pedal is moved only in the 'normal range'. If you press it to the floor plate, the rubber parts inside the cyl-

inder may be moved to an area that could have traces of rust on the surface. This would lead to damage to the fine rubber lips and they would no longer seal properly. This might lead to a reduction in pedal effect as well as to the loss of liquid.

On page 20 [illustration 14] there is a cut-away brake master cylinder

Brake pipes age. The old metal brake lines of our Tractions had a high iron content and are prone to rust. Regular visual inspection is therefore recommended.

Rubber hoses become brittle and crack. It takes a very long time until such cracks cause a loss of brake fluid. However be aware that the rubber may swell, as seen in the picture. The opening for the liquid is almost blocked. [Illustration 15] While it is still possible brake

fluid can be injected through it by the pedal force and thus achieve a braking effect, the force of the springs to pull the brake shoes back is too low, so the brakes will not release properly. The brakes then heat up, which may cause damage to the brakes. It is even possible to have a tyre blown by the heat.

Unfortunately I know that some of the traders have a replacement hose in their catalogues for connection to the rear axle which is too long. This means it will be bent, which has the same effect as described above...

In the forum <http://autos.groups.yahoo.com/group/TA-L/> recently there was a long discussion on the topic 'Wheel fell off'. It is known there are cases of breaking drive shafts on 4cylinder Tractions. Based on the observa-

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a firm specialising in brakes and clutches. If you do this, take the brake drums in too and have the pads ground to the radius of the brake drums.

However it is very important to insist that the drums are not to be skimmed out. In general, it is sufficient to rub it with emery paper. With each skimming the wall thickness decreases and thus the likelihood of the drum warping increases.

Unfortunately in recent years most companies gave up ~ probably for cost reasons ~ bevelling

Illustration 14:
A cut-away
brake master
cylinder

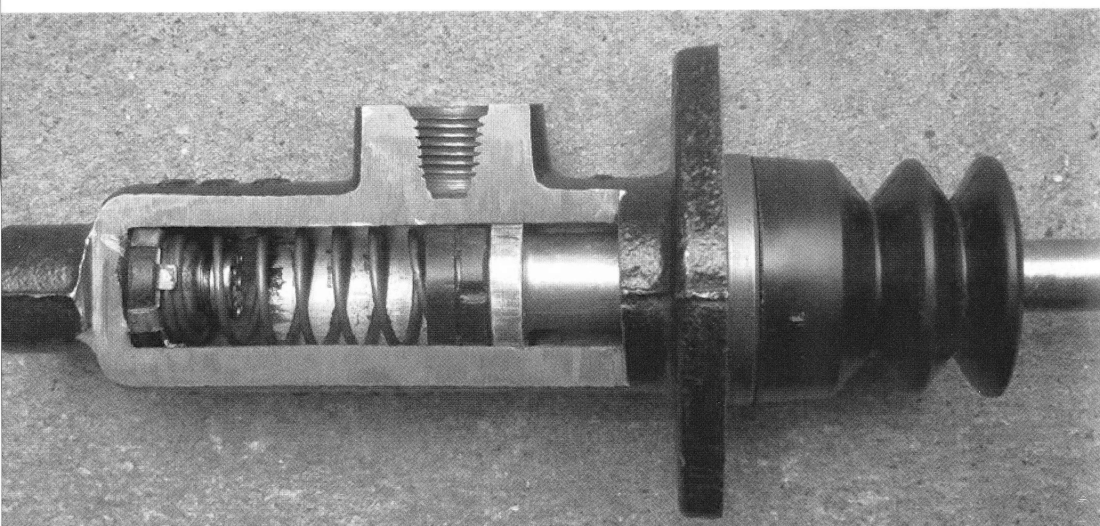
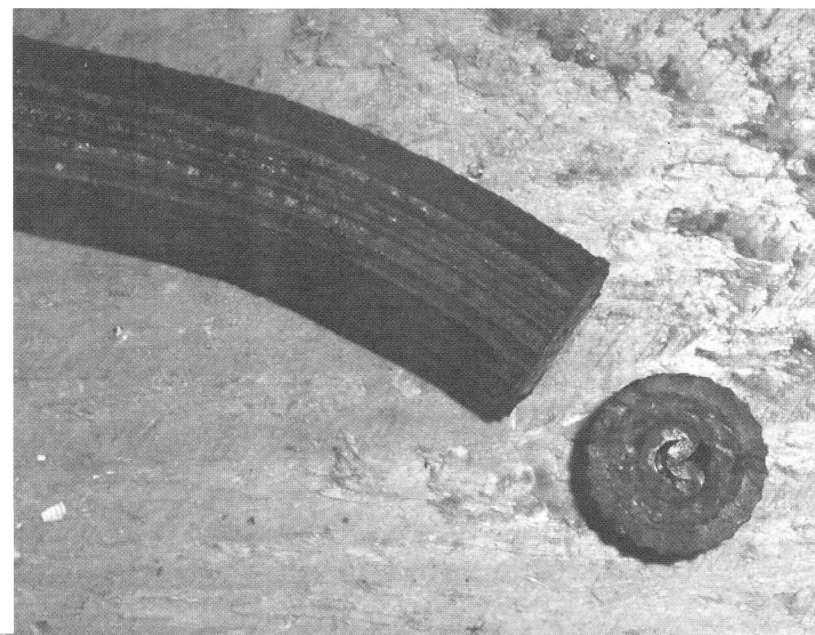


Illustration 15:
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tions which I have mentioned in this article, I have come to the conclusion that in most cases the cause is not to be found in the drive shafts. I suspect the cause is in the brake drums ~ and using the wrong pullers. I assume that by working with a wrong puller, the inner ring of the brake drum, which rests on the tapered shaft, is widened. This results in a reduced contact force, which causes a bending moment acting on the drive shaft which leads to metal fatigue and finally breaking of the shaft

in the section of the outer bearing ring of the brake drum.

The Swiss Hans Georg Koch [HansGeorg.Koch@centralnet.ch], editor of the CTAC magazine, is collecting cases and reports of drive shaft fractures. He would

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like to get to the bottom of the problem. Kurt Gasser [kuga@bluewin.ch] has already dealt with the same issue.

Daniel Eberli

