Procedure made by Erkka Vilhuen, published on Rennlist

http://forums.rennlist.com/rennforums/928/385043-torque-tube-rebuild-pictures-and-tools.html

Torque tube rebuild pictures and tools

Tools made out of common hardware store supplies are ready and dismantling of '78 5sp tube has been started. Will add more details and better pictures of the tools including pics of mysterious bearing fishing gismo into this thread as work progresses. Just quick update for now, it has been long day. This first post is divided to several parts as number of pictures in one posting seems to be limited to rather small number.

Longer '78 5sp manual tube at front and shorter '92 GTS 5sp tube at the back. Difference in lenght is 30 mm. 1446 mm against 1416 mm. these are of course not totally accurate but measurement error should be within 2-3 mm or thereabouts.



Tubes front mounting plates. Left is '78, right '92. '78's end plate is made out of sheet metal when '92 has cast piece joined to outer tube. On '78 center shaft has moved forward about 5 mm making it impossible to remove clamps rear bolt. Reason for this was loose gearbox input shaft clamp. Shaft 1 (clutch shaft) was pushing firmly against pilot bearing. I think there should be some mm space between pilot bearing inner race and shaft 1's thicker portion to allow shaft 1 & TT shaft package to move slightly forward then heat expands them. They can't move backwards because of gearbox input shaft bearing and other gearbox internals.





TT rear mounting surfaces. '92 on left and '78 on right. Front mounting surfaces are even.

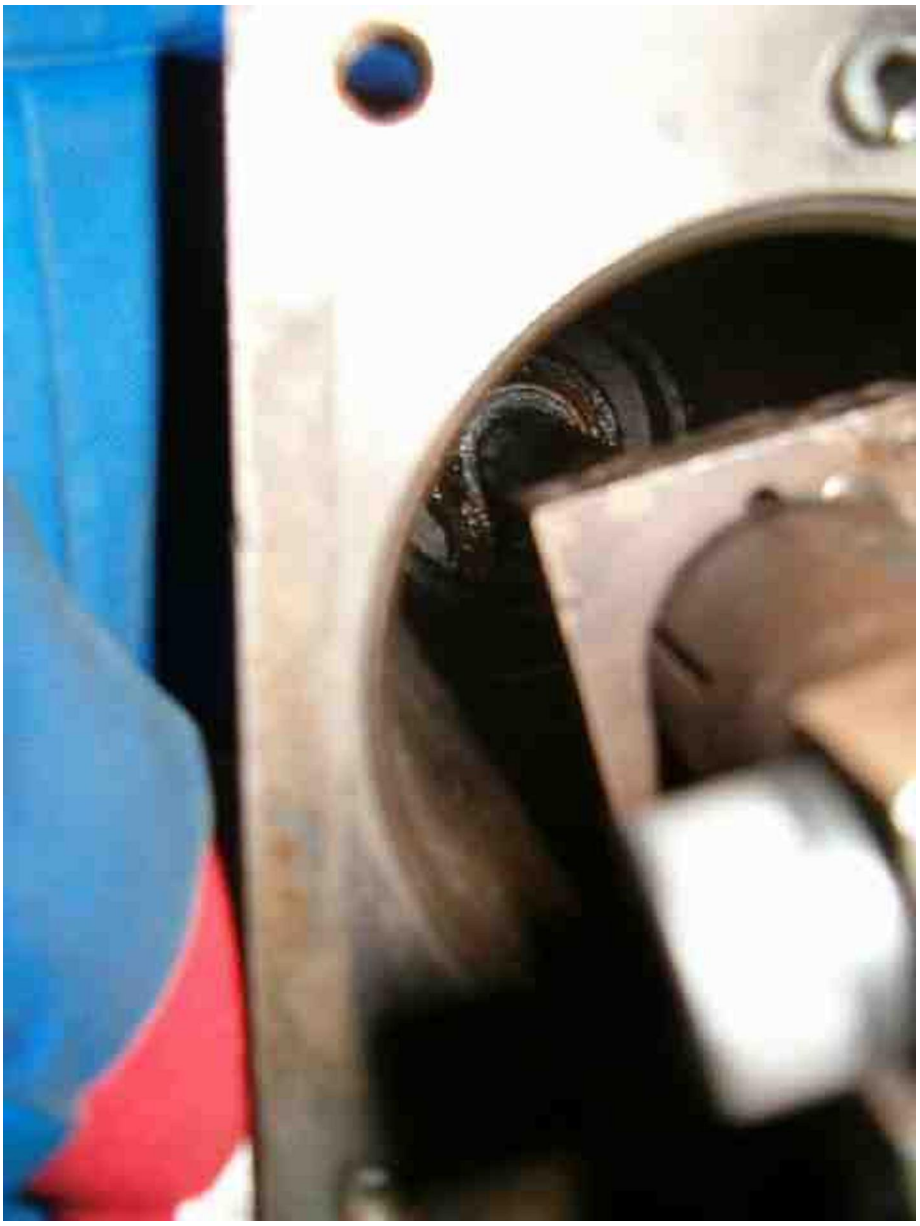




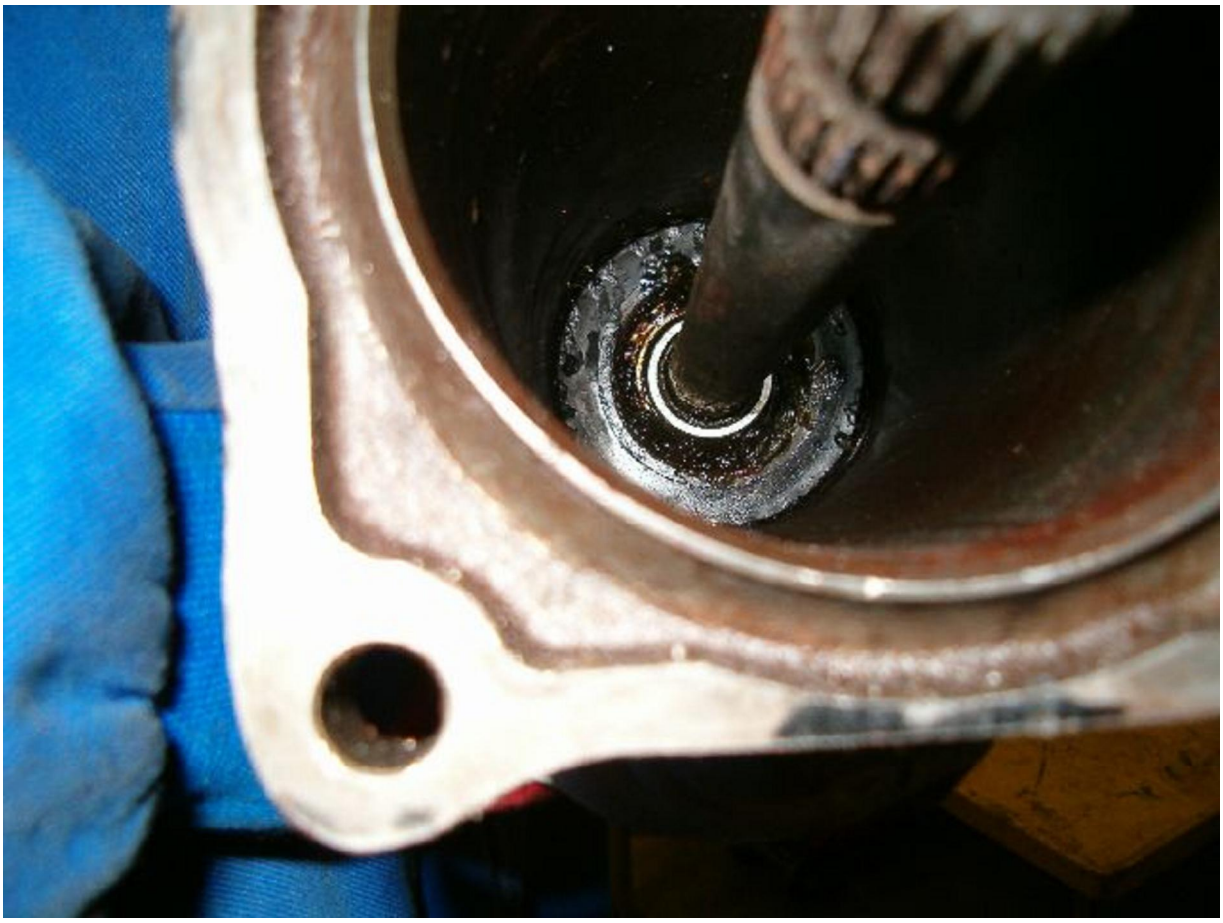


'78 front bearing support inside TT. Clamp is effectively blocking view. Bearing support has it's flat side towards rear making groove (I'll call channel in bearing outer support that for lack of better word) visible towards front. Between bearings inner race and shaft there is thin black plastic pipe. This pipe has other (not visible until removed from torque tube) end larger than bearings inner race so that it will go through bearing only one way and not go throught completely. When sliding center shaft in and out of torque tube this notch holds plastic pipe in place inside bearing as long as center shaft is pushed only one way, from notch side towards smaller side.





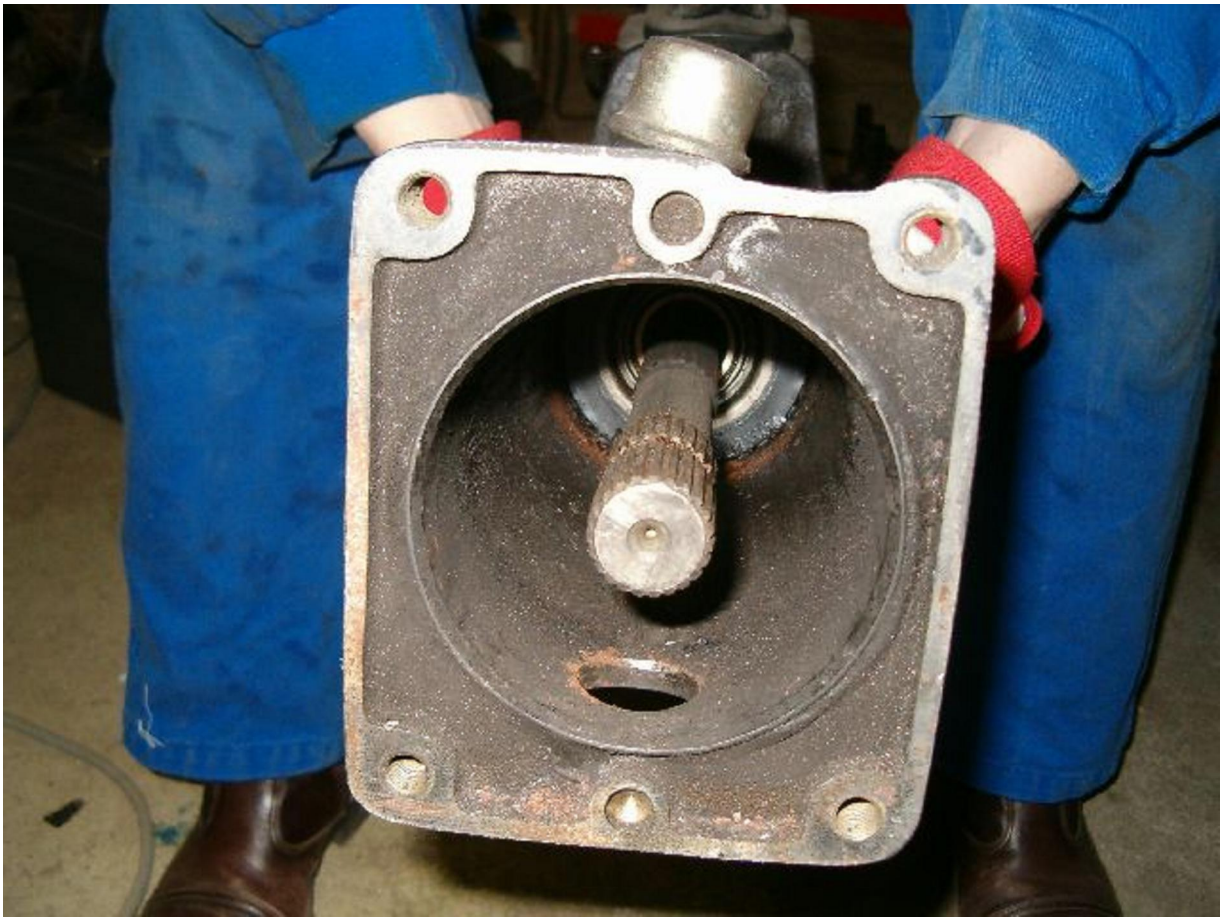
'78 rearmost bearing support inside TT. Black plastic pipe looks thicker than on front bearing. This determines that center shaft needs to be pushed out towards the front. Black stuff around bearing itself is grease added there when TT was on hand last time some two thousand miles ago. Front bearing has it also. It was sorry attempt to increase their service life. Possibly it worked as center bearing is one that's making ugly noicees now and there was no way of adding grease to it back then.





'92 front bearing support inside TT. What is interesting is that bearing support is other way around compared to '78. Groove is towards rear. Luckily plastic pipe seems to be same way as

in '78 though. Meaning center shaft needs to be pushed towards front also to keep pipes moving through bearings. This saves some work on making custom tool as exact same tool works on both TT's. No need to make different mounting holes for mounting support irons to front end of TT.

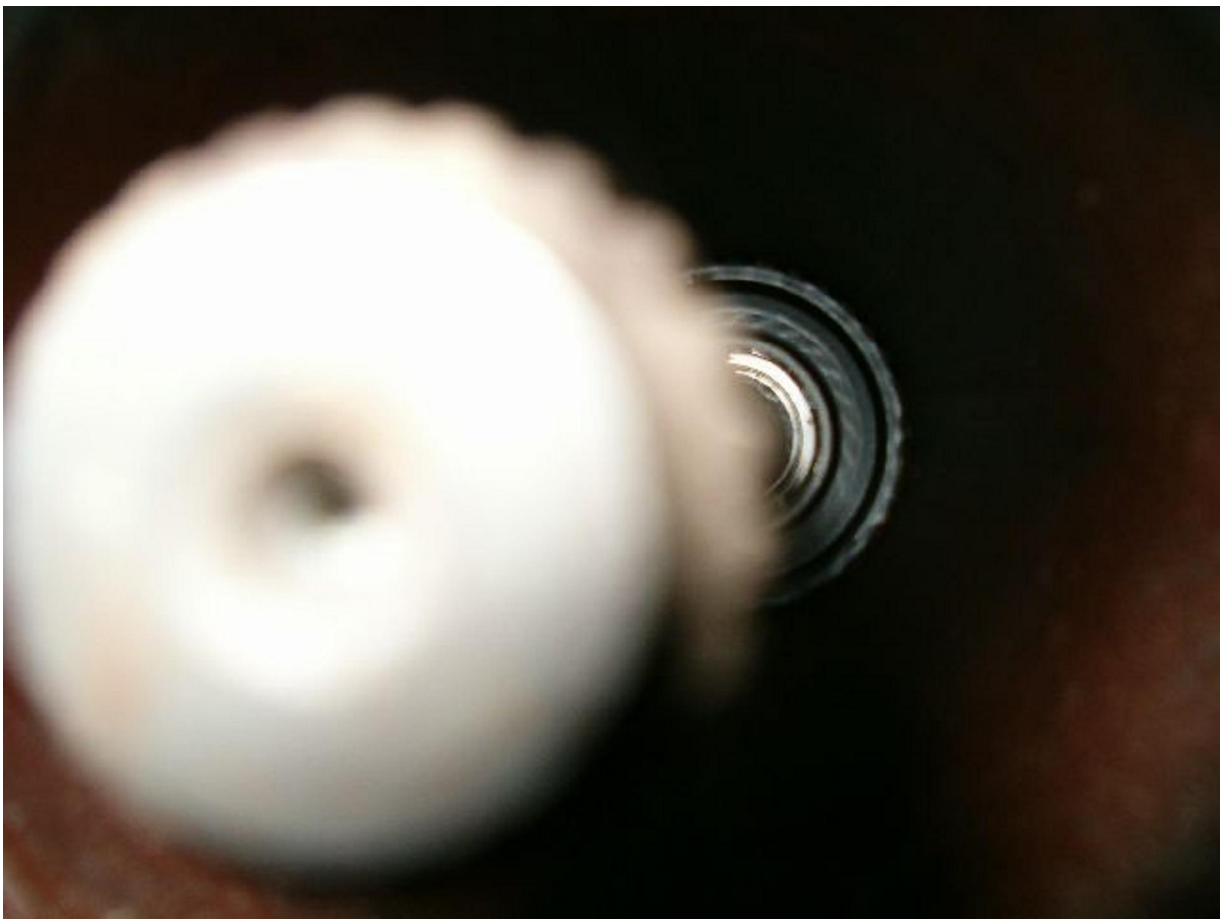




'92 rearmost bearing support inside TT. This support is also other way around compared to '78. Plastic's thicker end is visible meaning both front and rear plastic's point to same direction like they should if one wants to push center shaft through them and not have them move out of bearings.





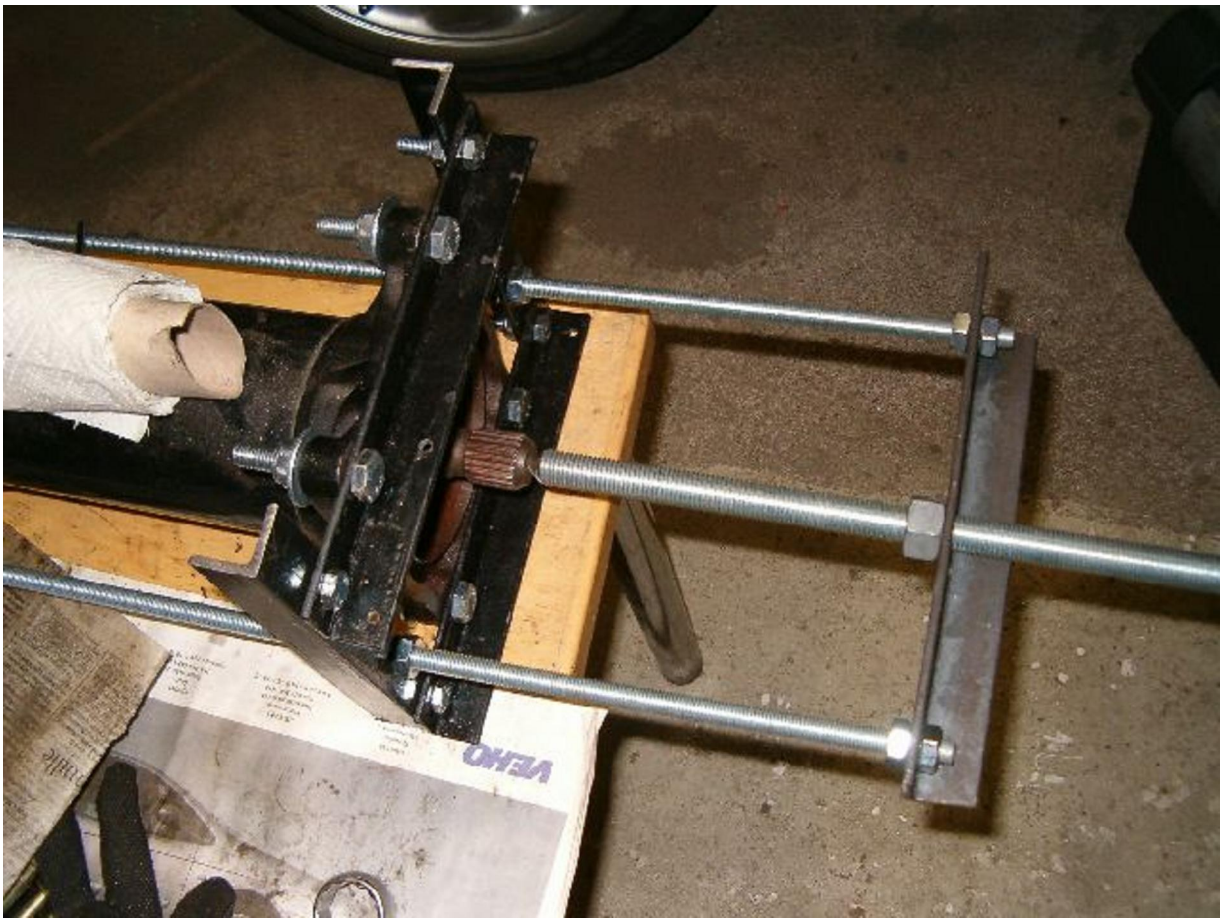


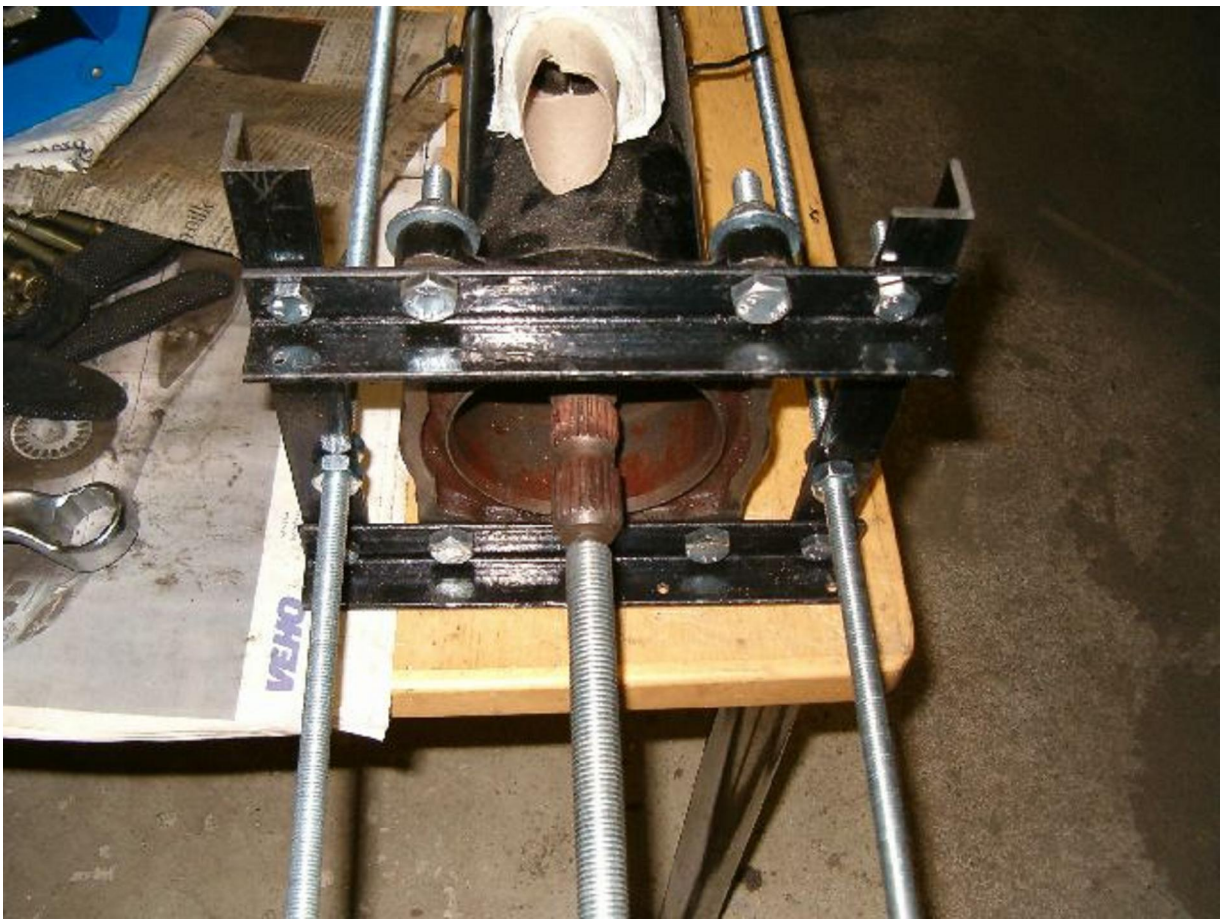


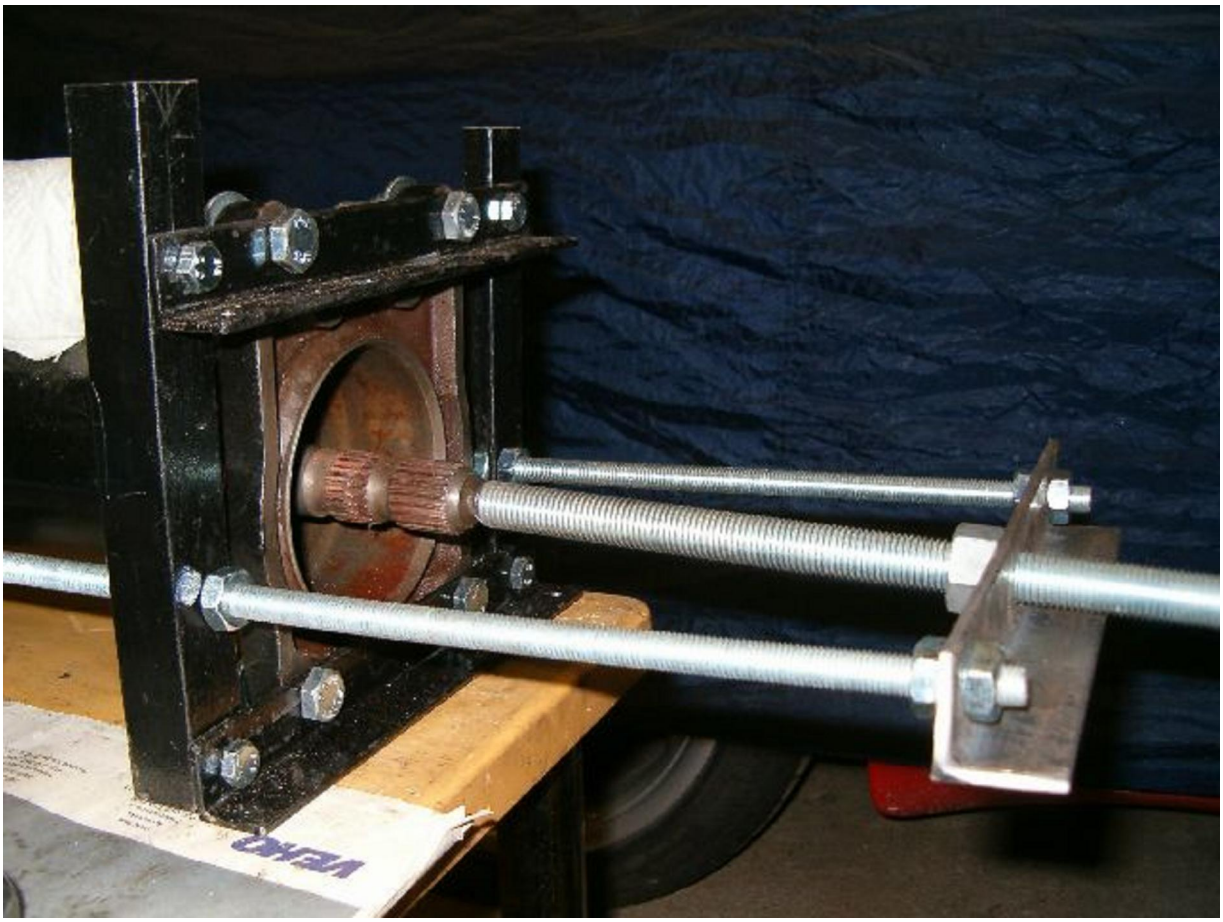
It would be interesting to hear if there is pattern to bearing support mounting direction. Grooves towards the front or rear of TT? Maybe it was changed for some reason or this is just coincidence that we happen to have them like they are.
Tool for pushing out center shaft made out of commonl a ailable materials. All that is needed is some flat and/or angle iron, threaded bar, bolts, nuts and washers. In this case we used M16 sized bar as pushing bar and M10 as side supports. M20 as center bar works also and would be better but it's more difficult to join two bars end to end for extending tool longer if needed. Tool in pictures is by no means best possible solution for the job, it's just what I could come up. M16 bars one end is sharpened so that it goes to dimple in center shaft keeping bar centered when pushing. This guarantees bar doesn't start pushing bearing instead as long as pointy end is not allowed to come out of dimple.

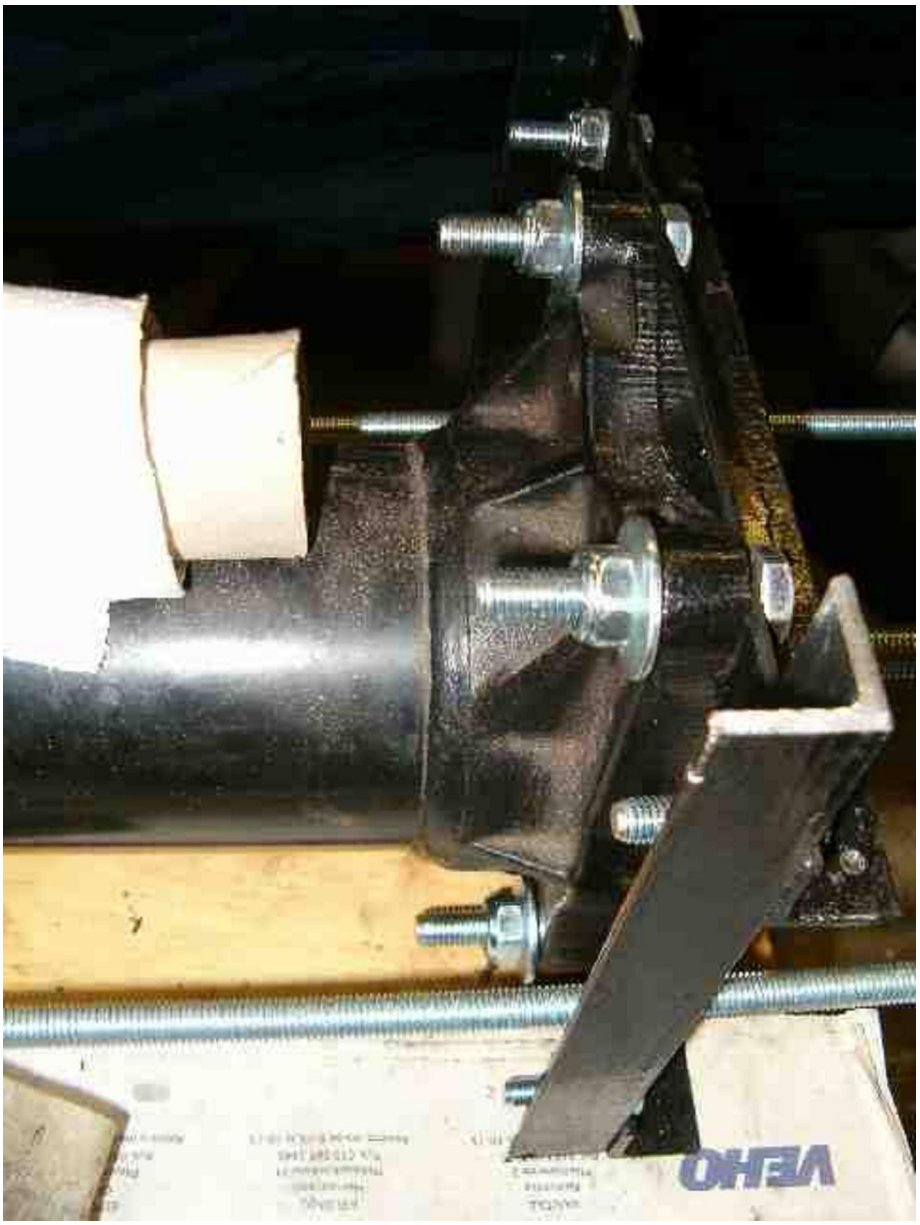
Only nut on large M16 bar needs to be rotated to push center shaft out from other end of torque tube. Other way of doing it is by holding nut and rotating threaded bar. We want to do just about everything the hard way and desided not to rotate the bar. When it is rotated while nut pushes it into center shaft this rotates shaft also. I think when center shaft is stationary bearing supports are less likely to start moving inside torque tube. Not sure if this is the case in real life and it doesn't even matter that much as they are coming out anyway.

Pictures aren't very good at all. Will get better ones later on. What's not showing in pics is that there is two nuts at other end of threaded bar counterlocked against each other. This provides means of keeping bar stationary when single nut next to support iron is turned. Other, and easier, way would be to keep nut next to iron stationary and turn two at the end.



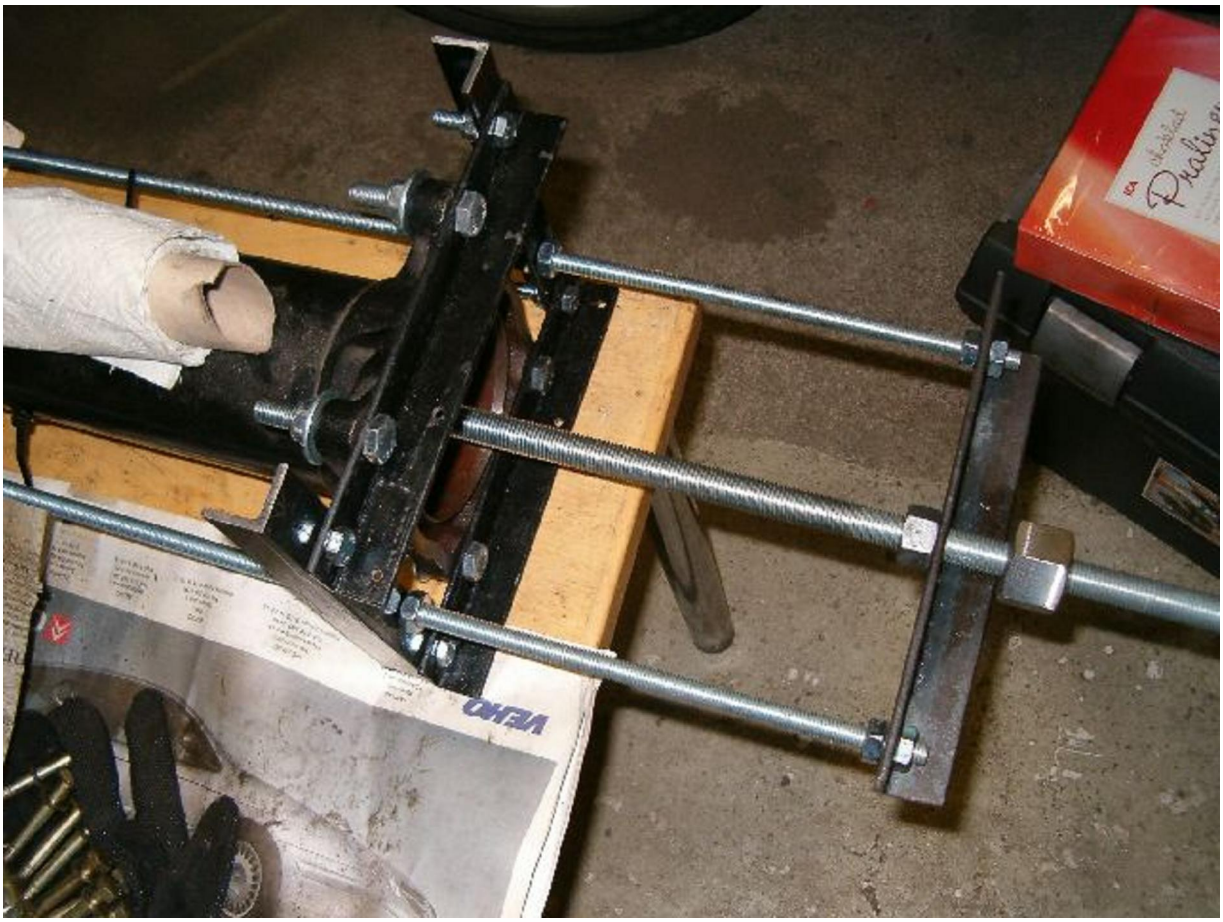








Here's status as of now. Large nut on other side of support iron isn't there for any other reason that that it was left there unintentionately. It's coming out first thing next nut turning session.







Thinner part of shaft is needed to make room for clamp to move back when removing shaft 1 as part of clutch removal. AFAIk this is the place that twists and snaps when center shaft fails. Brown stuff on part of shaft is just grease from front bearings side that shaft has picked up.







That's if for tonight.

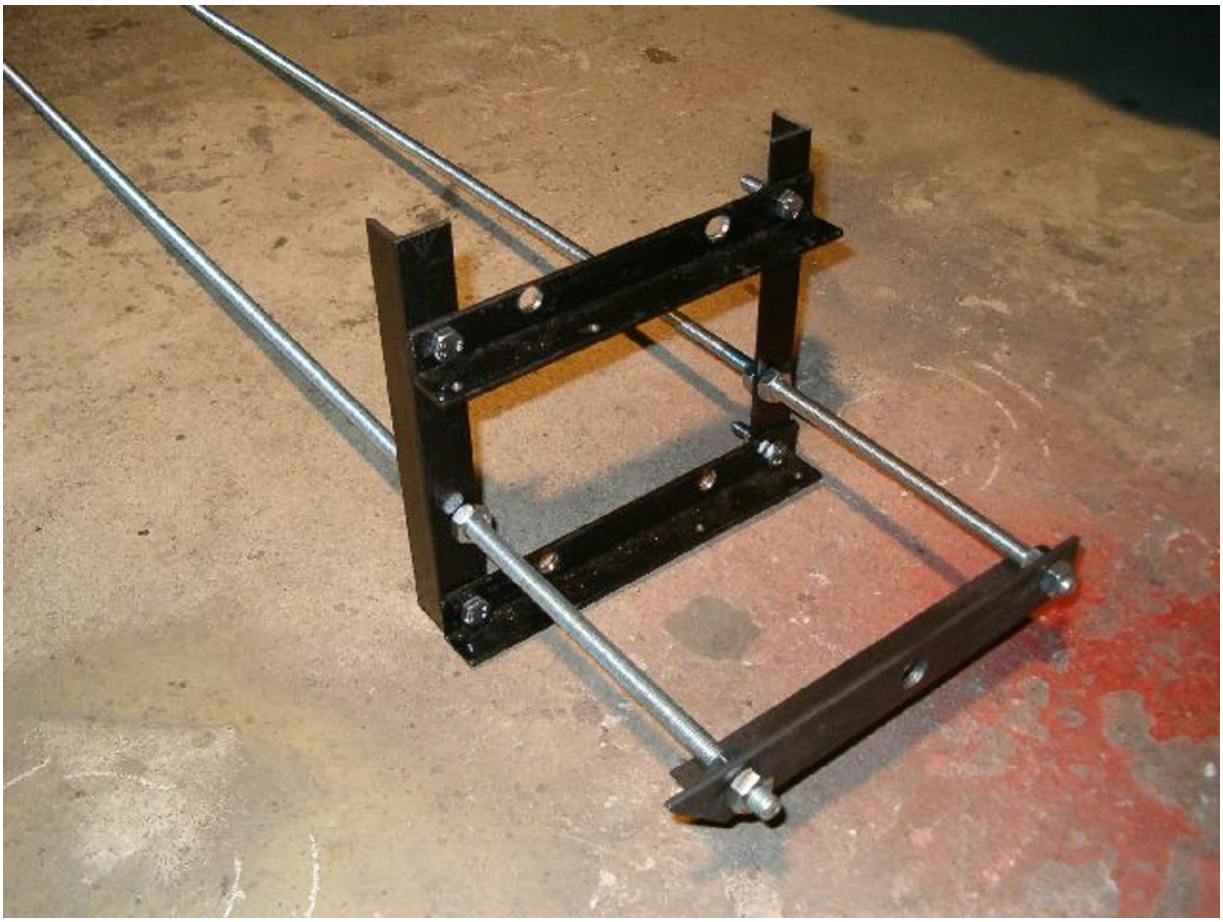
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Pushing the shaft thru... I used a standard bearing puller and added socket wrench extensions and wooden dowl as it went deeper.

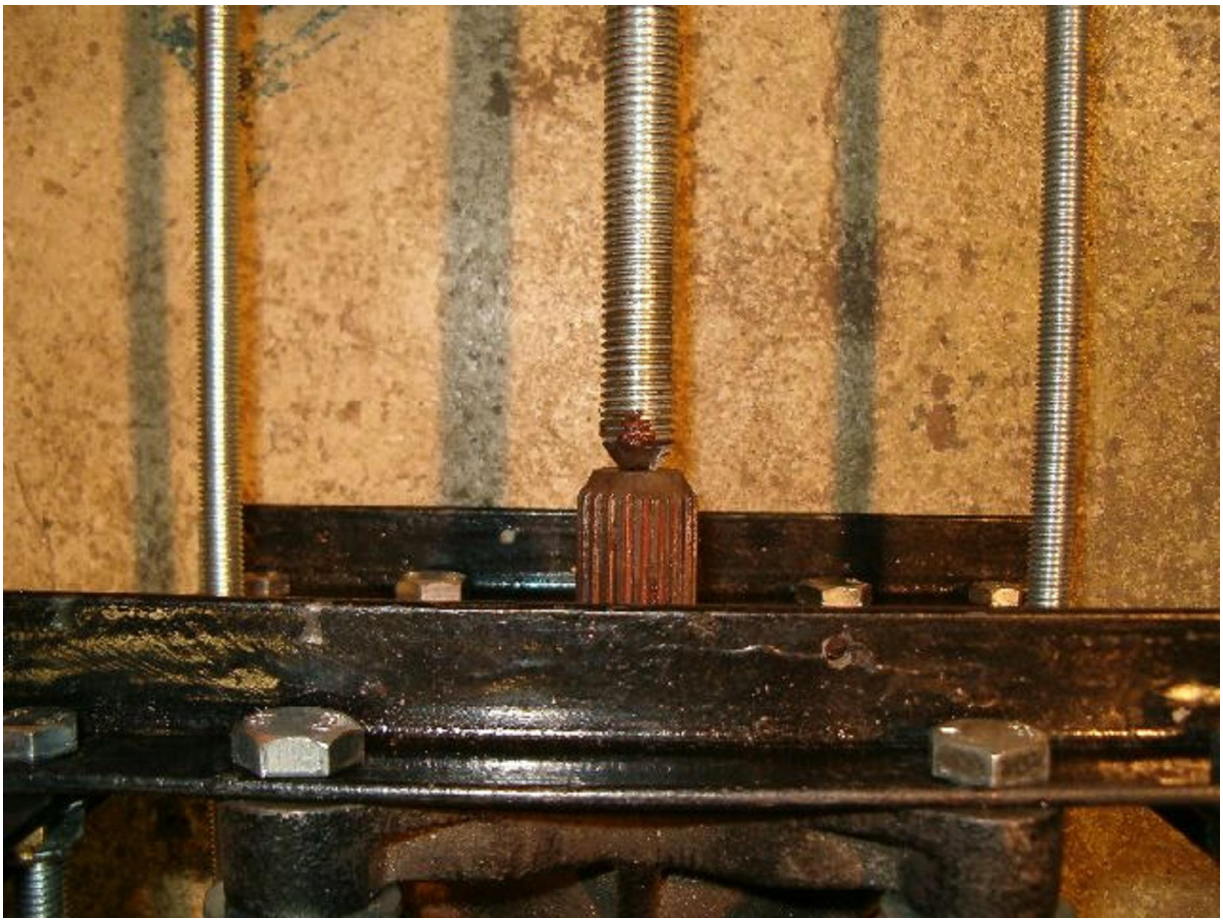
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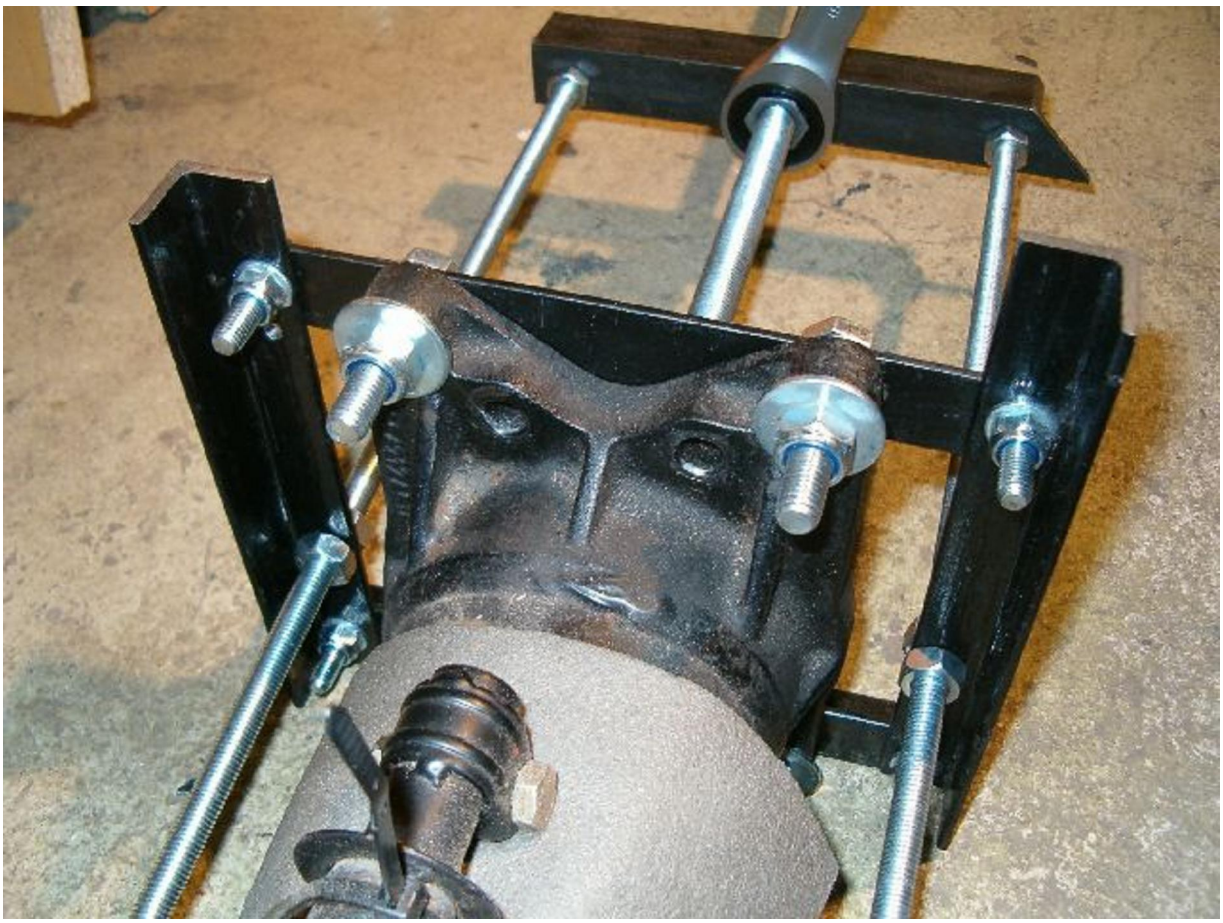
Justin and Scott, '78 shifter wasn't vibrating noticeably at any particular rpm range. Center bearing is noisy and all three are original. Now is good time to change them when gearbox is out. As for '92, I don't know. Haven't ever driven it, bought it with broken engine and now slowly rebuilding almost entire car. Bearings sound and feel fine when rotating center shaft and 3rd bearings (have it out now) inner race. They are 13 years old already and I don't feel like taking TT out ever again when this rebuild is over. Total time and cost of the job is very small compared to overall work needed. IMHO it would be stupid not to change bearings.

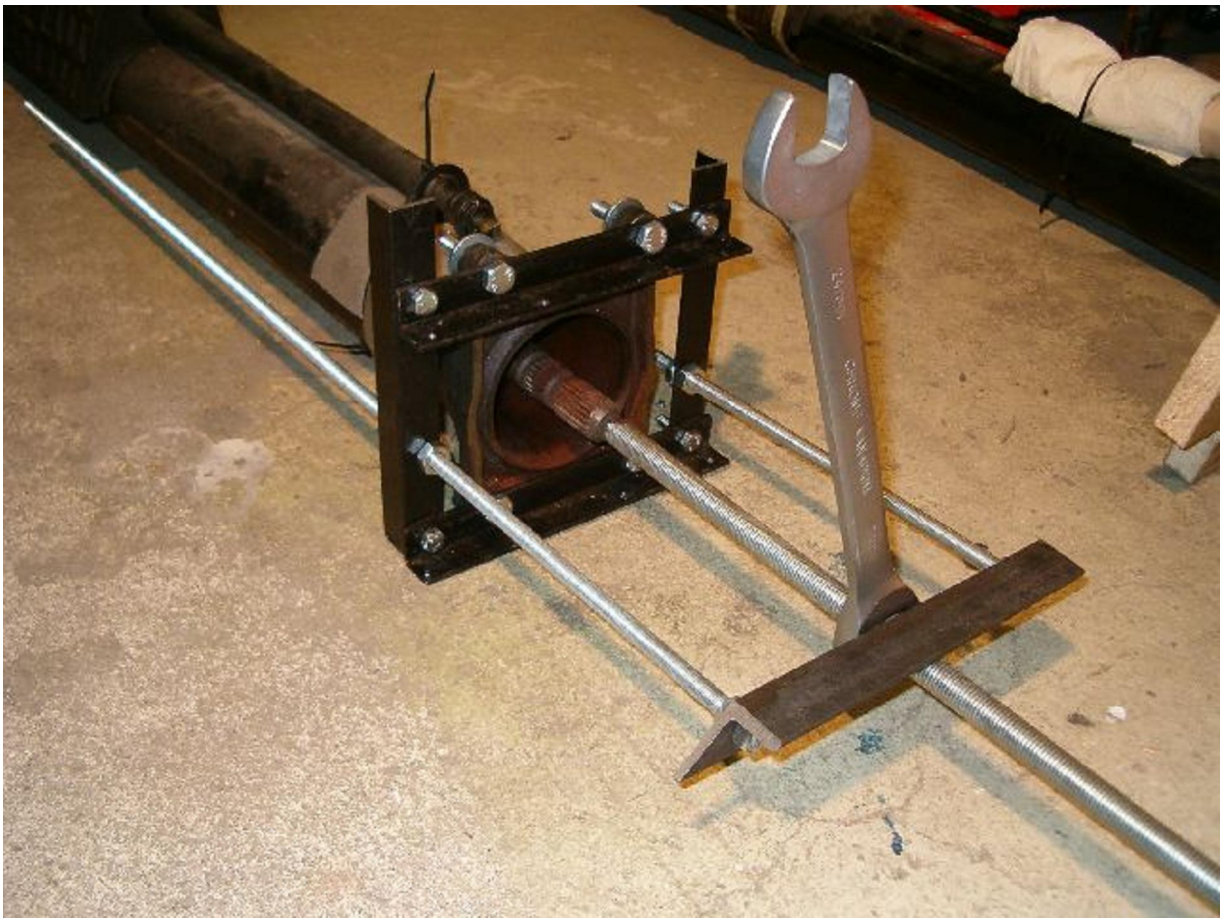
Here's few more more pictures of support structure just for Dave while it's been used on '92 center shaft.



I was before we started and still am fully aware all that could be replaced by just one flat iron twisted to U shape plus U's ends made to small hooks for making them grap behind/against TT end plate. Whole point of this exercise is (for me at least) fact that it's possible to take out tube internals and put them back together without using sledgehammer. Not competition who can make needed tools with least amount of materials. More generally, goal is to do rebuild without force and violence towards the parts.

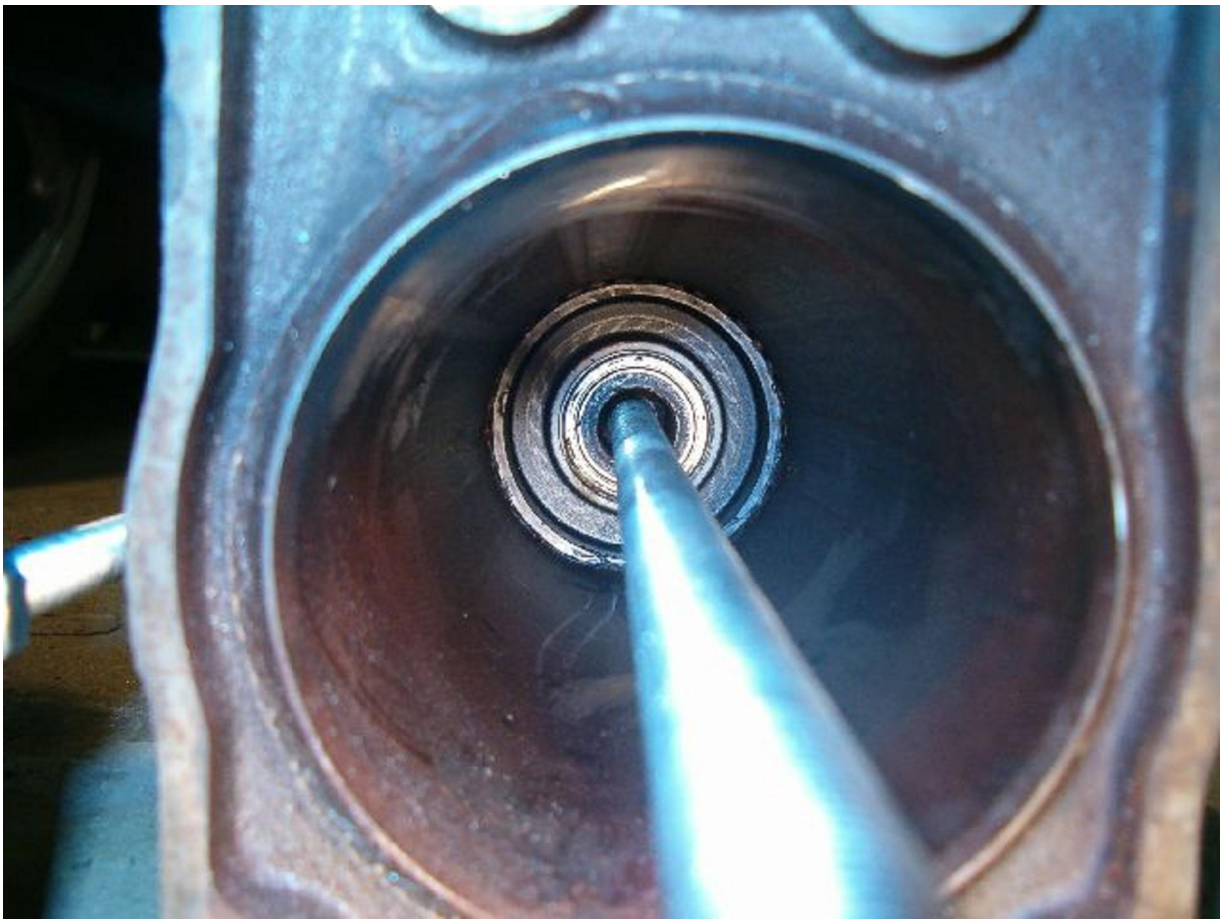








Shaft passing through 3rd bearing.



'78 shaft already out and '92 on the way.


Minne menná
28







Notch at rear bore of '78 was made when we installed '85 G28.10 gearbox to give room for input

shaft clamp bolt.

M sterious bearing fishing hook. This is the one in Dave's drawing. I'm not sure who came up this tool first. All I know it certainly wasn't me. Can remember mentions of such device made years ago in one of the Porsche mailing lists. This must have been way before Rennlist. PorscheFans was name of the one now long gone list I think. I sure have seen that Dave's picture before but couldn't find the link during previous conversations. Would have helped explaining how it works. This is what we did, it's not pretty.









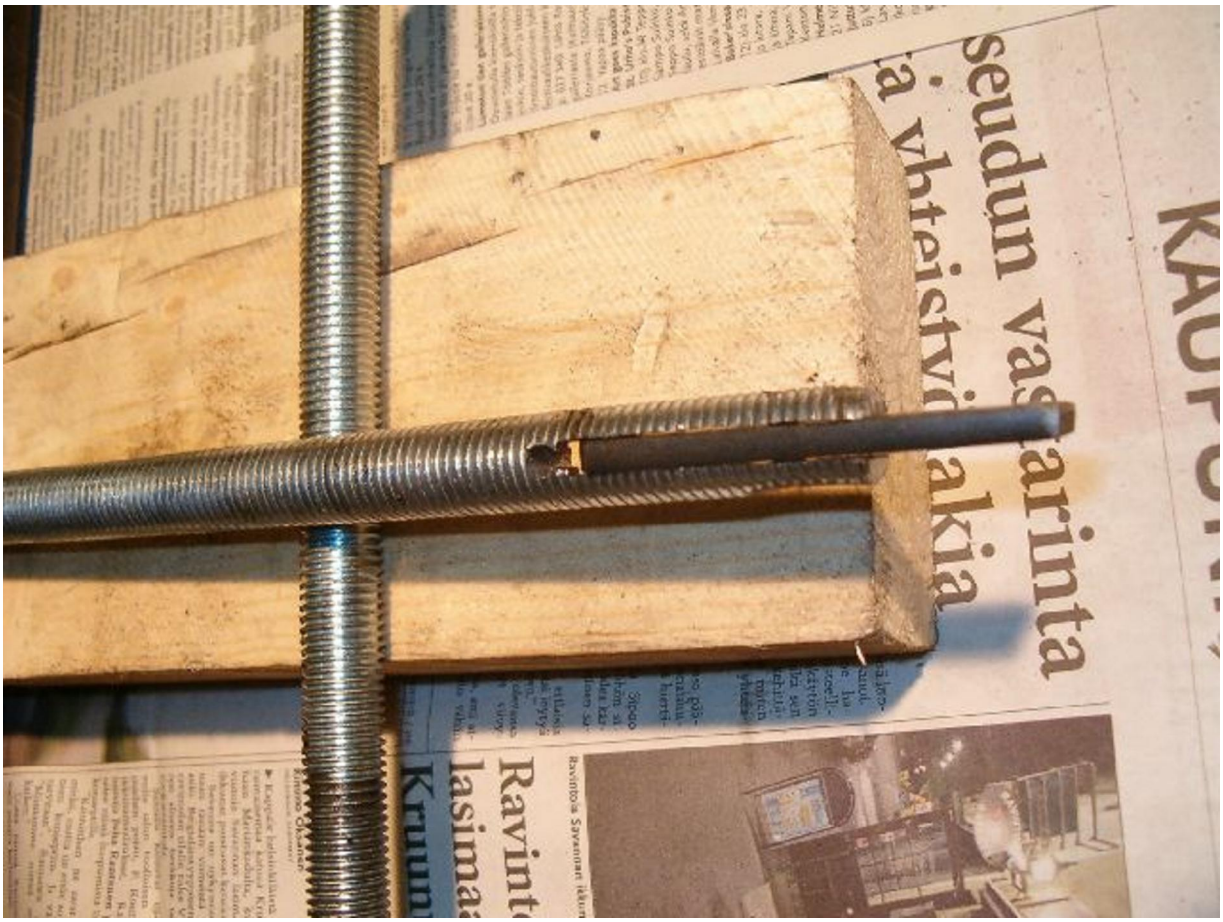









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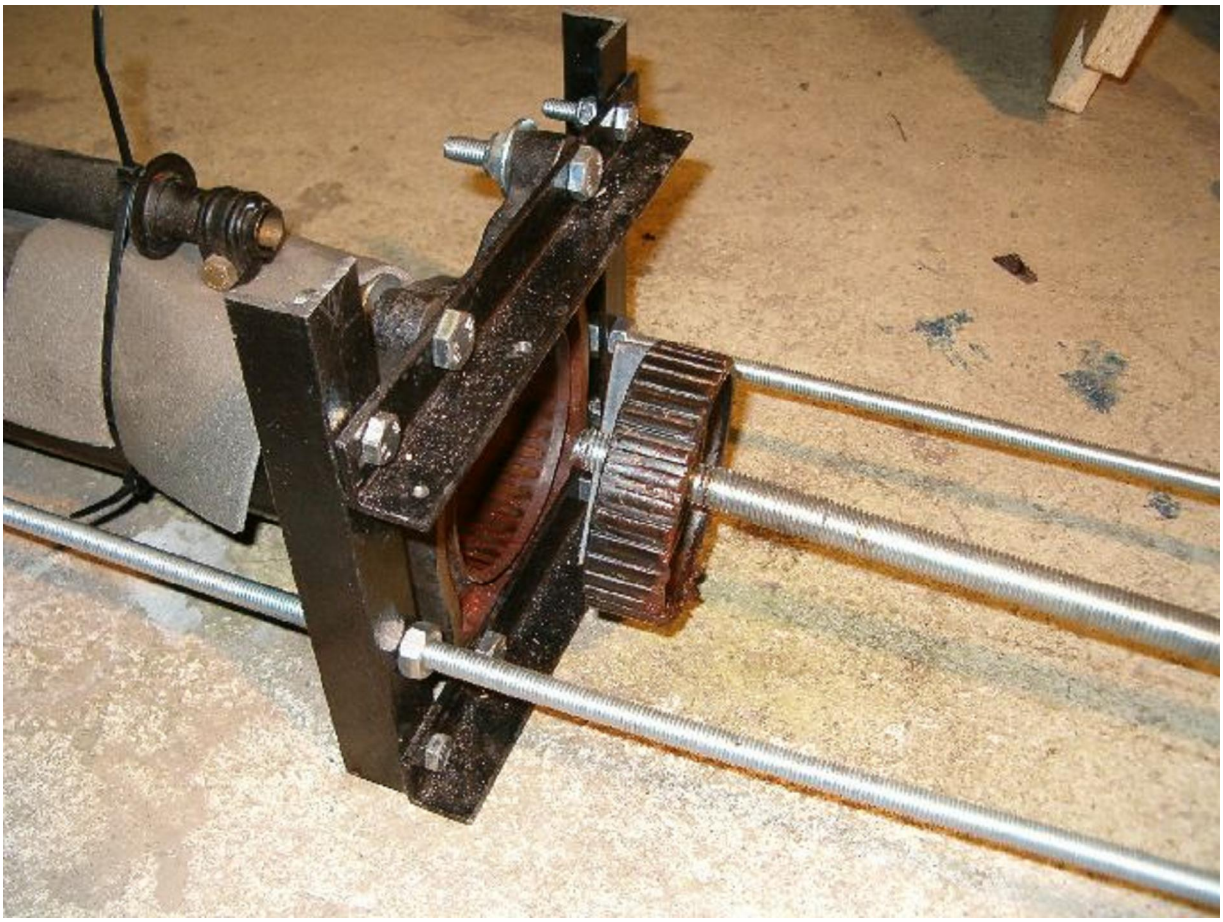


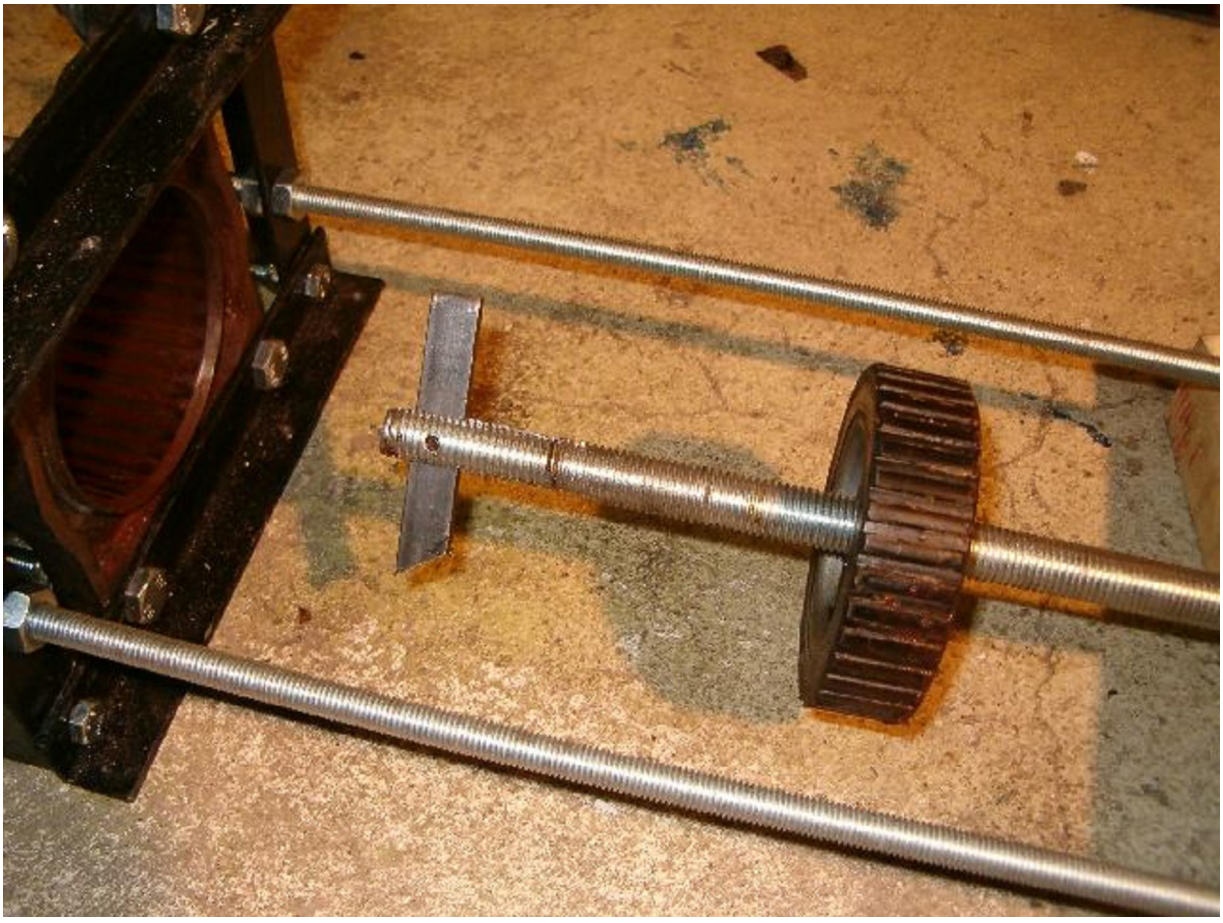
There is small threaded pin holding flat iron in place. Hole drilled to side of threaded bar has threads in it and flat iron moves freely except it can't rotate full circle. Gravity keeps it aligned with threaded bar when bar is held correct way around and rotate it sideways when bar is turned 180 degrees.

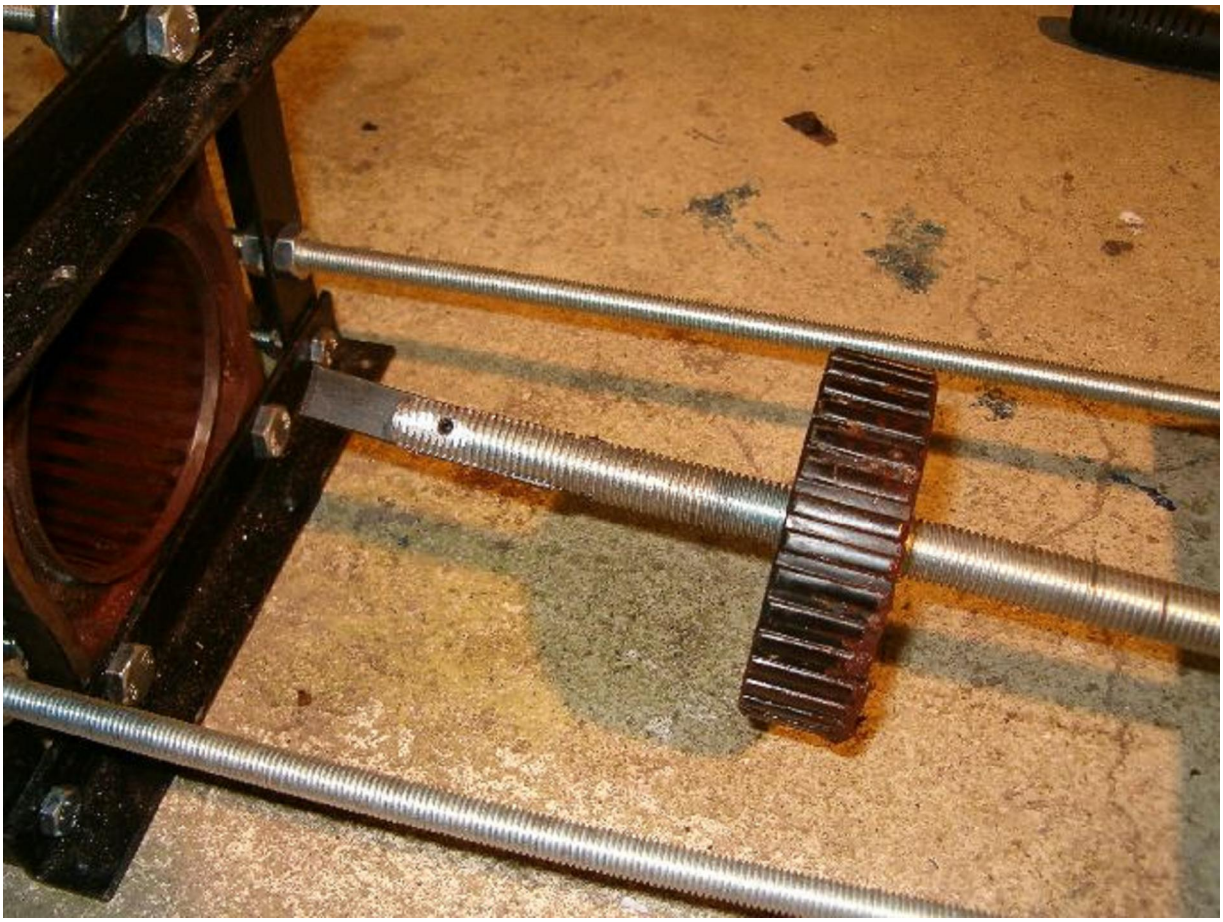
Hook in action on 3rd (rearmost) bearing on '92 TT











On '78 TT 3rd bearing support made nice plowing marks to grease and dirt inside torque tube. 2nd and 1st bearing are still inside the tube.



One small trick we found helpful was to position flat iron at end of fishing tool in up down direction. When flat iron was pointing sideways, for some reason bearing support was more eager to turn slanted. Pulling while flat iron pointed up down made them come out straight.

Bearing support has clearly changed some time between '78 (early Euro model made summer of '77) and '92 (Euro made March of that year). '78 is more rubbery where '92 looks and feels plastic. This is 3rd bearing from '92. Will get comparison pictures when parts are clean.







This is little late now but it's very important to take measurements before anything is moved. Still when putting all back in these measurements shouldn't be followed blindly as parts might have moved a lot over the years. On both center shafts there are signs where black plastic tubes had resided. We plan to use these as guides where to put bearings back.

On '92 there is harmonic vibration damper between 2nd and 3rd bearing. If 3rd starts to move forward with center shaft this might cause small problems at taking 3rd out but it shouldn't prevent it totally. On '78, 1st bearing moved with center shaft some 7" and is now almost out. This is worrying as it should be black plastic pipe and center shaft that have lowest friction against each other, not tube wall and bearing support. Otherwise entire support is inclined to move when shaft expands and contracts little when heated up by exhaust.

'78 tube walls shows some signs that all three bearing supports had moved forward about 5 mm. We plan to set them and center shaft along them back to correct position. Not sure what we're going to do with worn rear bores on it. Perhaps have more metal welded to shaft and new bores made to it.

Current situation is that center shaft and 3rd bearing are out on both tubes. Job will progress some time during next few weeks.

Great pics! I sure could have used them in 2002 when I tore into mine for the first time. This will help any of the DIY'ers out there scared to tackle it themselves.

I do not know who came up with the idea for the tool but I can say I didn't copy it from anything I had ever seen but it is my drawing. It's a common tool design probably figured out by a monkey centuries ago to fix his 928.....

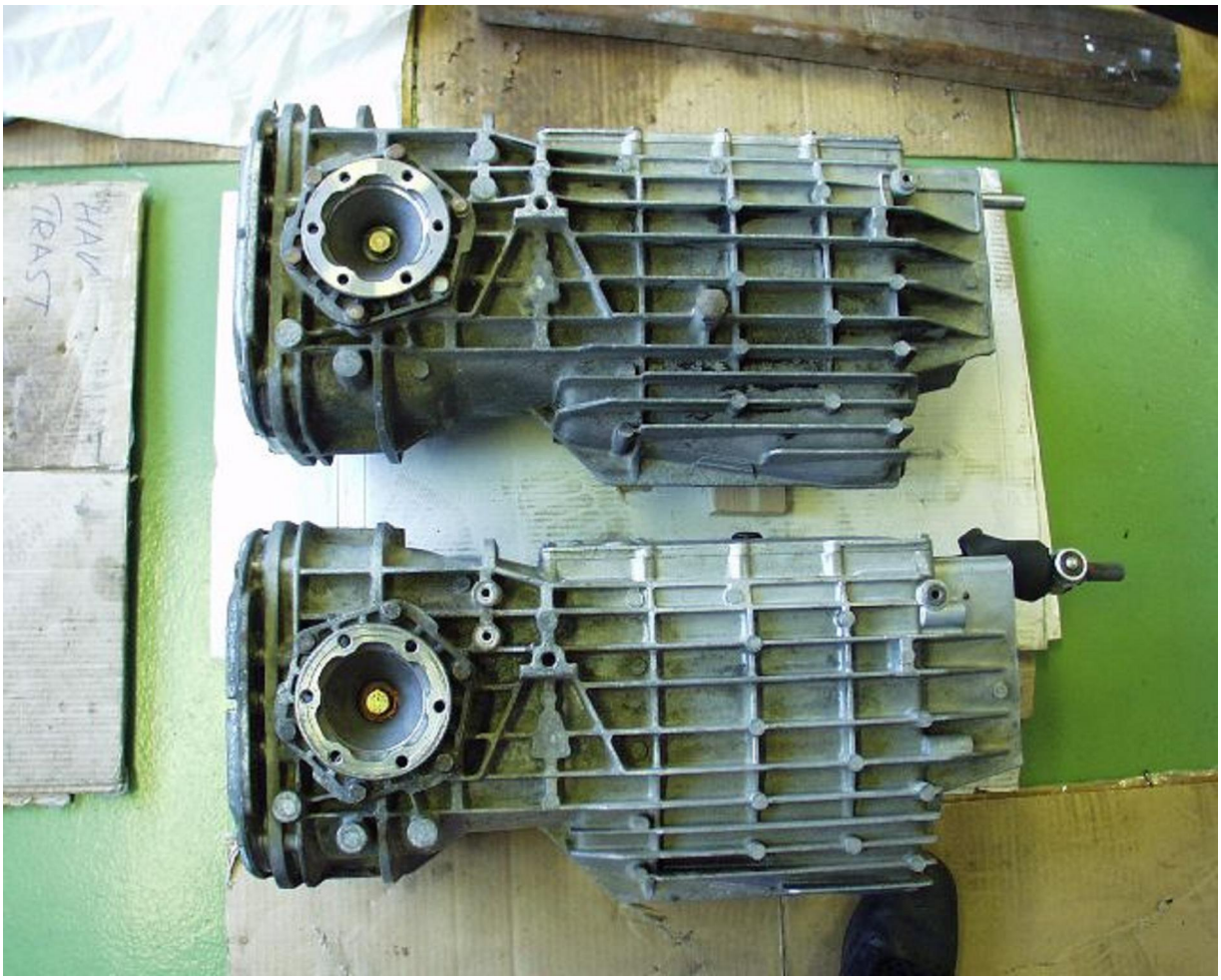
BTW, when you reassemble, make sure the direction of the bearing inserts will allow you to insert the shaft without pushing the bearings out of the carriers or the inserts out of the bearings. Also, I have seen a couple of the vibration damper's come apart and cause a nasty rattle while going over bumps in the road. And make sure the shaft is very clean when you reinsert it, makes it slide through the bearing inserts much easier and minimizes the chance of moving the bearing carriers. Oh yeah, I lube the tube with silicone spray when removing the bearing carriers, helps them come out much easier.

Dave
Motorsport Dave Lomas

AFAIK 05 came '80 in middle of production year meaning first Euro S still got 03. Not sure if some 4.5 engine cars (mainly Euros) use 03 up to end of '82 or if they also have 05.

TT lenght difference comes from different gearboxes and rear subframe. Subframe and TT was changed at same time to move gearbox 30mm forward. Difference isn't very obvious in pictures but it's there.

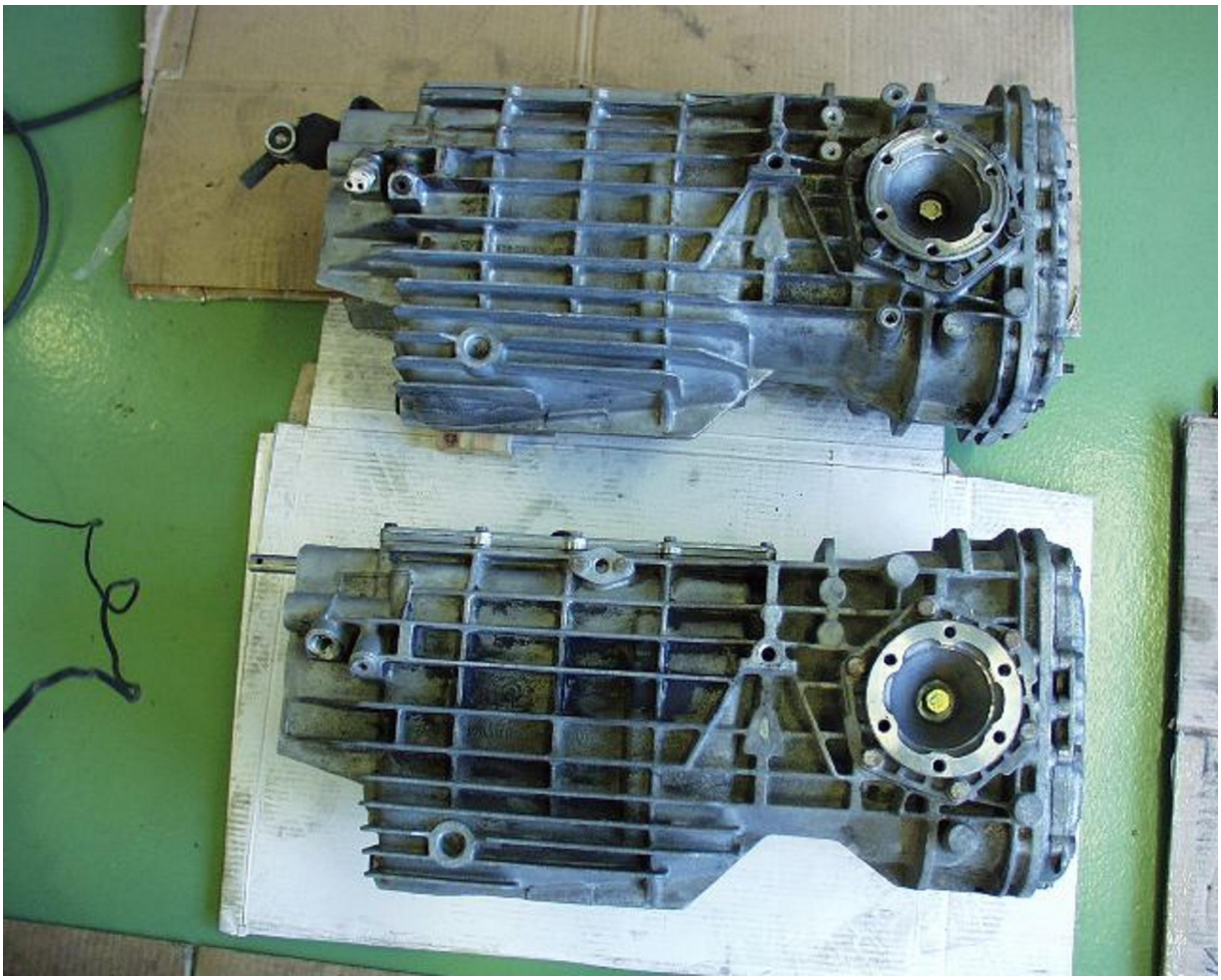
G28.10 on top, G28.03 bottom.



Two threaded holes between joint flange and gearbox mount hole are for mounting vibration damper support. Other end of damper mounts to rear subframe. Later subframes have mounting ear left over in casting to allow subframe to be used on these old cars and there was no point in changing casting mould anyway. AFAIK gearbox dampers were deleted either when battery box was integrated to body for '79 model year or engine mounts were changed from square to round style in '83, probably already in '79. Engine dampers were deleted same time as engine mounts changed. AFAIK there are unused threads in lower suspension supporting bows at least up to '87 but not in '92 anymore even though it's possible to make these as support casting is still the same. When ever factory had a chance they used same casting while end result changed. This saves lot of money and keeps number of different part types down.

10 and all boxes after it have large nut on center of the right side. Under it is adjustment for lever counter spring. All earlier versions have different system where there are two springs around inner shifter rod. On G28.12 lever that later type spring (under large nut) pushes was changed and this makes gear lever stay between 2-3 when in neutral. AFAIK all boxes up to '86 should have gear lever between 4-5 and two of springs, weak between 4-5 to 2-3 and stronger between 2-3 to R-1. On many early boxes weaker spring is so weak that it has no effect and it's possible to make lever stay between 2-3 by setting lever front ball cup joint slanted.

G28.03 on top, G28.10 bottom.

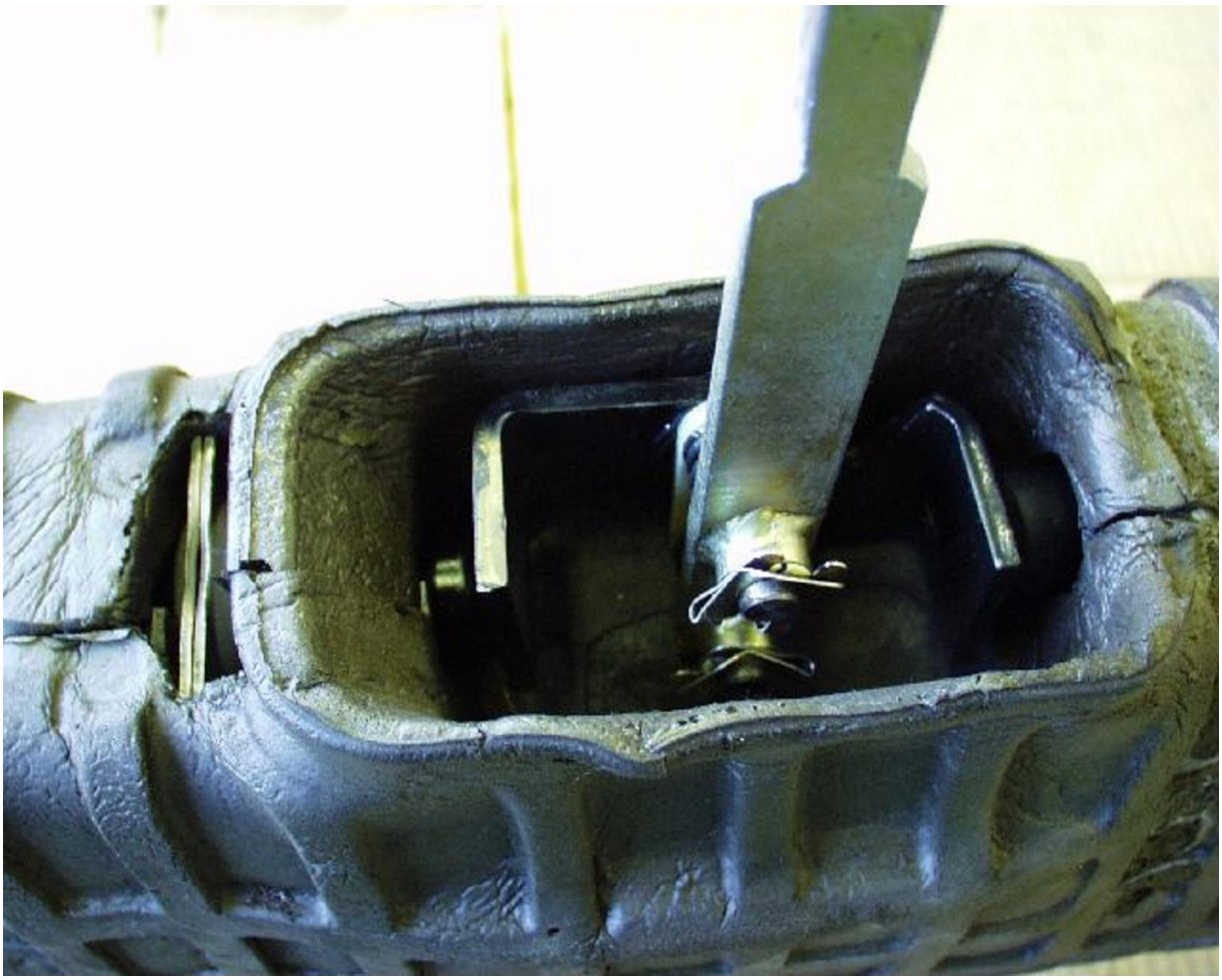


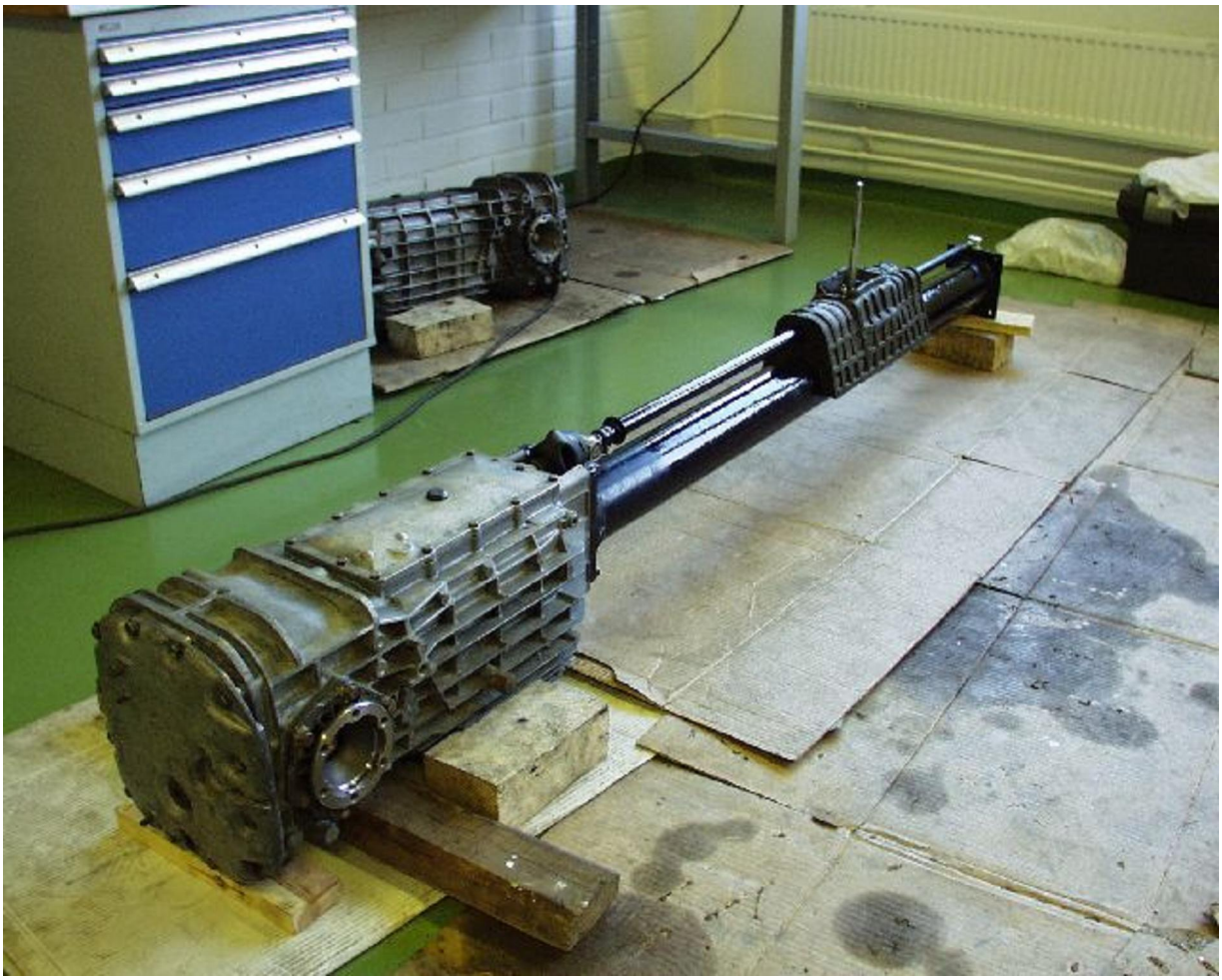
03 has two holes in this left side also for vibration damper support. Rest of the holes around joint flange are for '78 model year only battery box. End flange has studs also for the box.

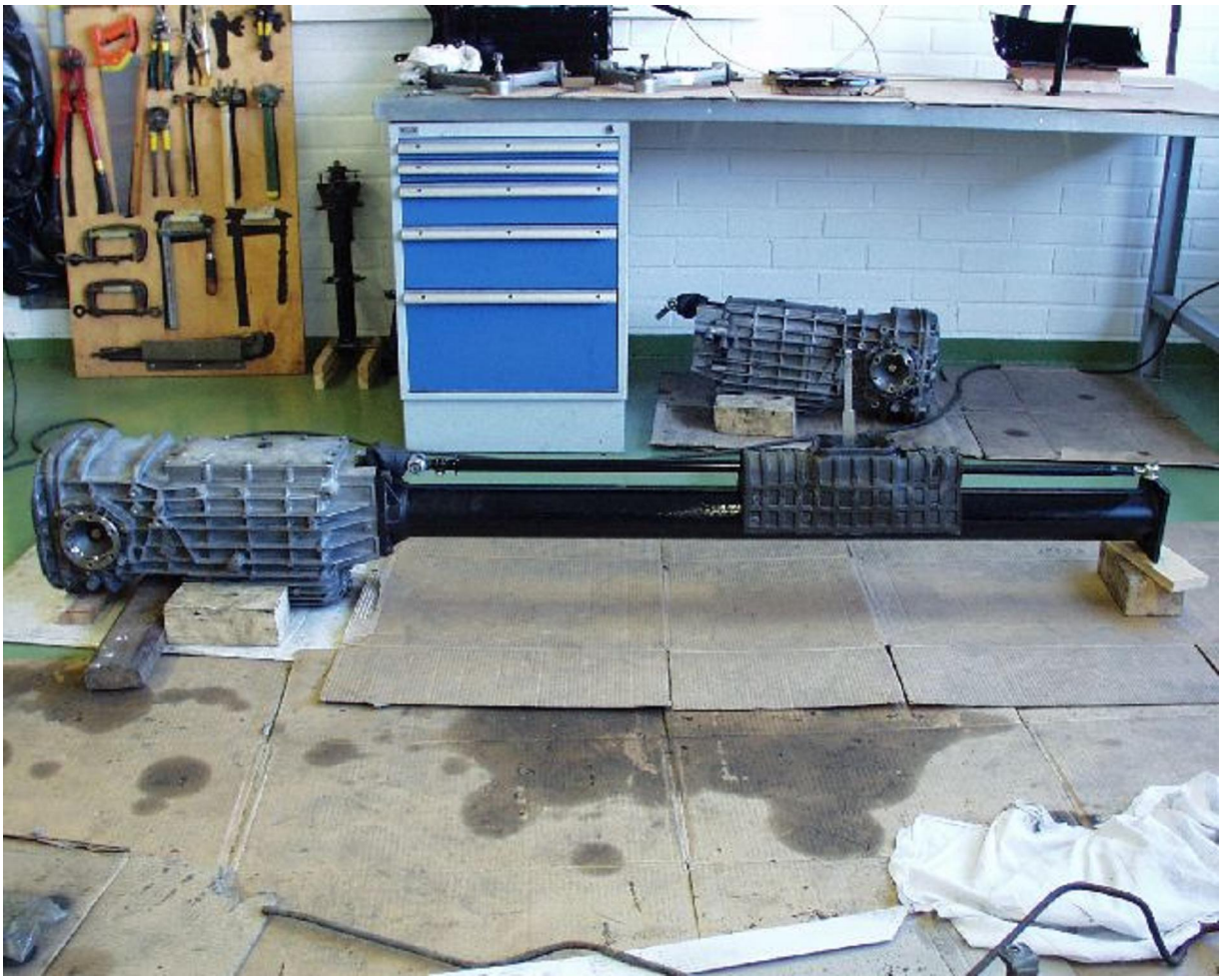
10 has completely new system for keeping lever on gears and neutral compared to older boxes. Aluminium piece at this side, left from center of box just below top, is part of it.

When we installed 10 to '78 we had to modify it somewhat. It obviously didn't have all those mounting holes for vibration dampers and battery box. We had to improvise one support as there's no material in casting below joint flange on 10 like 03 has. Used next one towards rear and piece of flat iron. Has worked fine for past four years.

There was at least one change to TT within 03 years. '78 cars have gear shift rod bearing bracket mounted to body when all later cars have it on central tube. Quess idea behind first version was to have gear lever fixed to body so it wouldn't move when engine-TT-gearbox package moves slightly. On '78 when engine and gearbox mounts sag this twists lever and in general makes removing TT and adjusting gear lever more difficult. We added mounting support on top of central shaft for bearing bracket and adjusted lever on floor before mounting TT-gearbox package to car.









Now these are down again as gear lever is extremely sloppy. Probably broken spring under large nut on the side. We'll do total rebuild so that we don't have to touch them ever again.

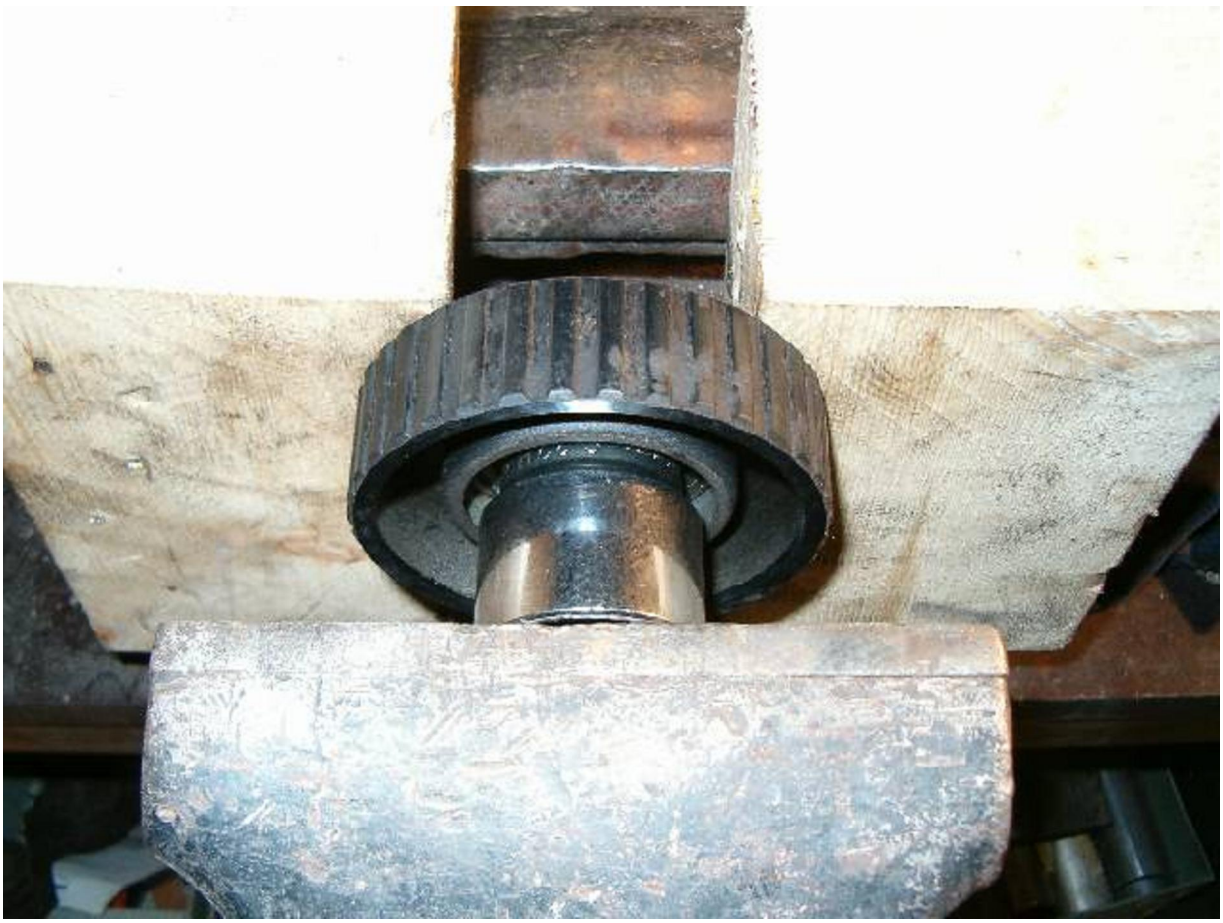
gruffalo, good catch. They're exacly that from http://www.helsinginsanomat.fi. We do not discriminate any pages. GTS cams on top of traffic pages and Carrera GT test drive article.

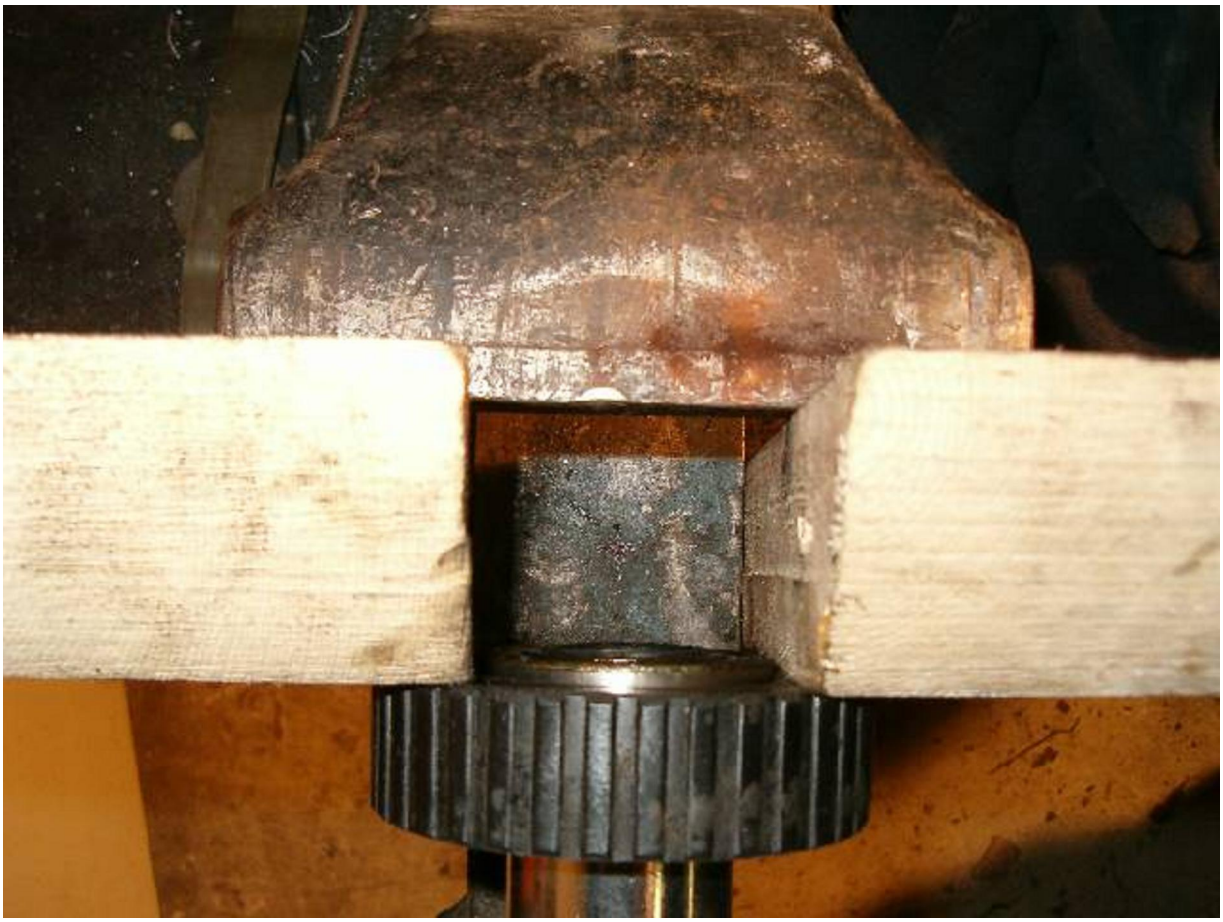


PS. Here's other faster method for fishing bearings out. I like slow one by one way and this all at once approach wouldn't work very well with '90 and later tubes because of vibration damper between 2nd and 3rd bearing. It would mean five times resistance when pulling than taking them one by one and vibration damper can stay in on slower method.

http://www.clarks-garage.com/shop-manual/susp-16.htm
Some progress during last weekend. We took bearings apart. It was easier than what we thought. All what was needed was vice, four different size sockets and two blocks of wood. First we removed bearing from outer support by pushing it out with suitable sized sockets thicker end. It gave uniform pressure to black plastic and didn't damage it at all. There was noo need to try to preserve bearing by pushing it out agains outer race as they are going to be changed.







Once bearing was out it was little easier to push out inner black plastic and metal piece attached to it. Bearings inner diameter is 30mm. First we pushed with socket what's outer diameter is about 31-32mm to make metal tube start to move. Then we changed to other smaller diamater socket what just cleared bearings inside. It was easier this way than using smaller socket from the start. It tried to turn sideways until it started to go little inside bearing and couldn't anymore.





There is no need to try to straighten four point of metal tube and black plastic that are turned

outwards. Infact trying to do so easily makes tube and black plastic inside it twist out of round. If they need to be bend it can be done more easily once tube is out of bearing. Socket that we used on other side was 36mm. It just about cleared larger end of black plastic. One or two mm smaller would be too small.



Now all six are in pieces and we are looking for new bearings locally and thinking of ways to make sure bearing supports can not move inside TT once they are back together.

I will probably end up with shielded C3 and high temperature grease as those are readily available. I'm not sure how important C value is in this application but Porsche seems to think it's needed. Othervise they wouldn't have bothered to use non 'standard' hard to find part. As exhaust heats up TT grease should stand as much heat as possible without turning too much liquid IMHO. Especially if we end up adding more stuff inside tube for bearing support hold down. This could prevent bearings to cool down.



About the length of the TT:

'78 is 1446mm
'92 is 1416mm

So difference is 30mm. These are not absolutely correct as there can be errors in our measurements. Difference is visible though.

ri e shaft protrusion measurement question

Tried to find correct measurement for drive shaft protrusion from WSM. Managed to find four mentions:

For automatic gearbox
WSM Vol 2 page 39-49 dated IV 1980 protrusion A = 36 +/- 0.5 mm measured with coupling
WSM Vol 2 page 39-50 dated IV 1980 intrusion A = 30 +/- 0.5 mm measured without coupling (17 +/- 0.5 mm protrusion with coupling)
WSM Vol 3 page 39-139 VIII 1984 protrusion A = 2 +/- 0.5 mm

For manual gearbox
WSM Vol 2 page 39-65 dated IV 1980 protrusion A = 46.85 - 0.5 mm

I think all four are measured at the rear end. AFAIK they refer to these versions:
39-50 = first 120 made (ROW+US or only US models?) 3sp automatic gearboxes
39-49 = 3sp automatic gearbox
39-139 = 4sp automatic gearbox
39-65 = manual gearbox with shorter (1416mm) central tube starting from middle (not from beginning but not exact middle either) of model year 1980 (with introduction of gearbox type G28/05)

One of the TT's we are rebuilding is older style long (1446mm) tube. More specifically long tubes second (long clamping sleeve) variation even though car is well withing earlier shorter clamp

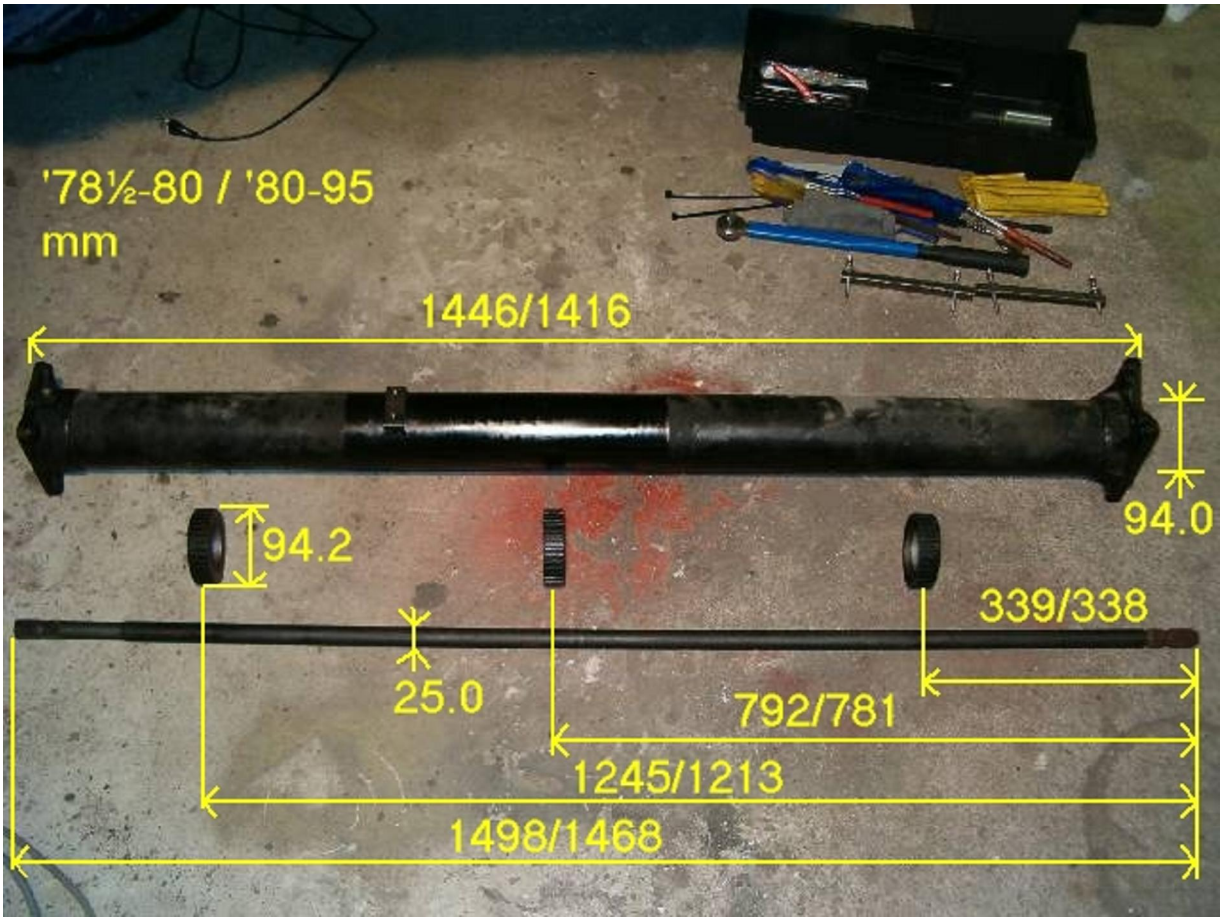
VIN's ('78 VIN 221 and last one was 753 in ROW cars).

Now question is does these long early TT's use same 39-65 measurement 46,85 - 0.5 mm or is there other number for them? Couldn't find anything in WSM. Would like to get center shaft II positioned correctly so that shaft I front end fits perfectly inside pilot bearing. Shaft had moved and we do not have original G28/03 gearbox anymore to use as guide.

Also we are finally trying to properly marry old type TT and G28/10 gearbox together by changing position of clamp bolt groove in rear end of TT. TT rear bores look really bad after piece of gearbox input shaft broke off and shafts rotated against each other. Center shaft had also moved causing clamp bolt to make more damage to shaft. Plan is to have more metal welded to TT shaft and new bores made to it while input shaft is also welded back into one piece. Hope it works. Spare TT's are hard to find in here and shipping from big three is very expensive.

Finally took measurements out from mobile phone and added them to picture.

First numbers (in mm's) are for '78½-80 model year in conjunction with G28.03 gearbox. Second numbers are '80-95 starting with introduction of G28.05.



PET lists ealier style '78-78½ model year TT which has same outside tube lenght as '78½-80 tube but different longer center shaft lenght because shorter clamping sleeve is used. According to one factory document these early TT's had only two support bearings. It was used up to chassis numbers:

Code:

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92881 00753   ROW
92882 00054   USA
92882 09522   Japan
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What is interesting in those numbers is that ROW is so much higher than US and Japan numbers. Does this mean factory used early type parts longer in ROW cars or that US model production started later and/or was slower at first? Possibly this gives clues that US standard production started later after ROW production was well underway already.

Automatic TT's can be devided into these four versions IIRR:

Code:

```
'78       -> '82US/83ROW   3sp gearbox, long TT, 25mm center shaft
'83US/84ROW -> '84         4sp, washers for front flex plate, short TT, 25mm shaft
'85       -> '88         Without front flex plate adjustment, still 25mm shaft
'89       -> '95         28mm thick center shaft
```

Finally some progress again. Vibration damper is out at last. Since there wasn't anything else left it we could use better support made of wood than flat iron at end of threaded rod to pull it out. It was positioned about 94 cm from the front and 34 from rear. Damper lenght is 13.5 cm.






928 216 01 01 ME 01

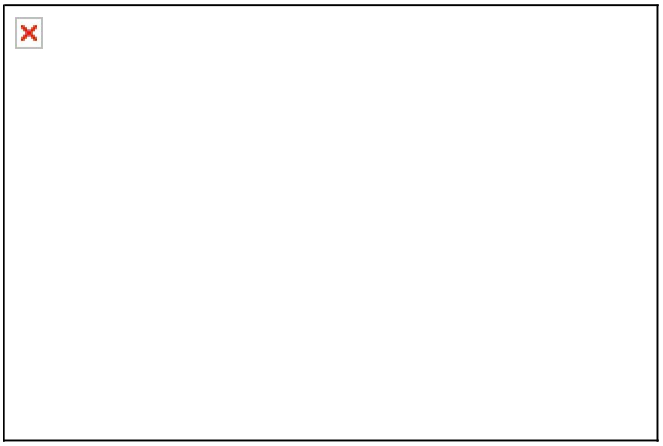




New bearings came from local bearing supply store. We tried to find C5 but had to settle for C4

with high temperature grease. Even those were not available unless one bought at least 20 at a time. Perfect opportunity to have group buy on them. Ended up geting 30 while at it. All of them are now on hands of local 928 owners.

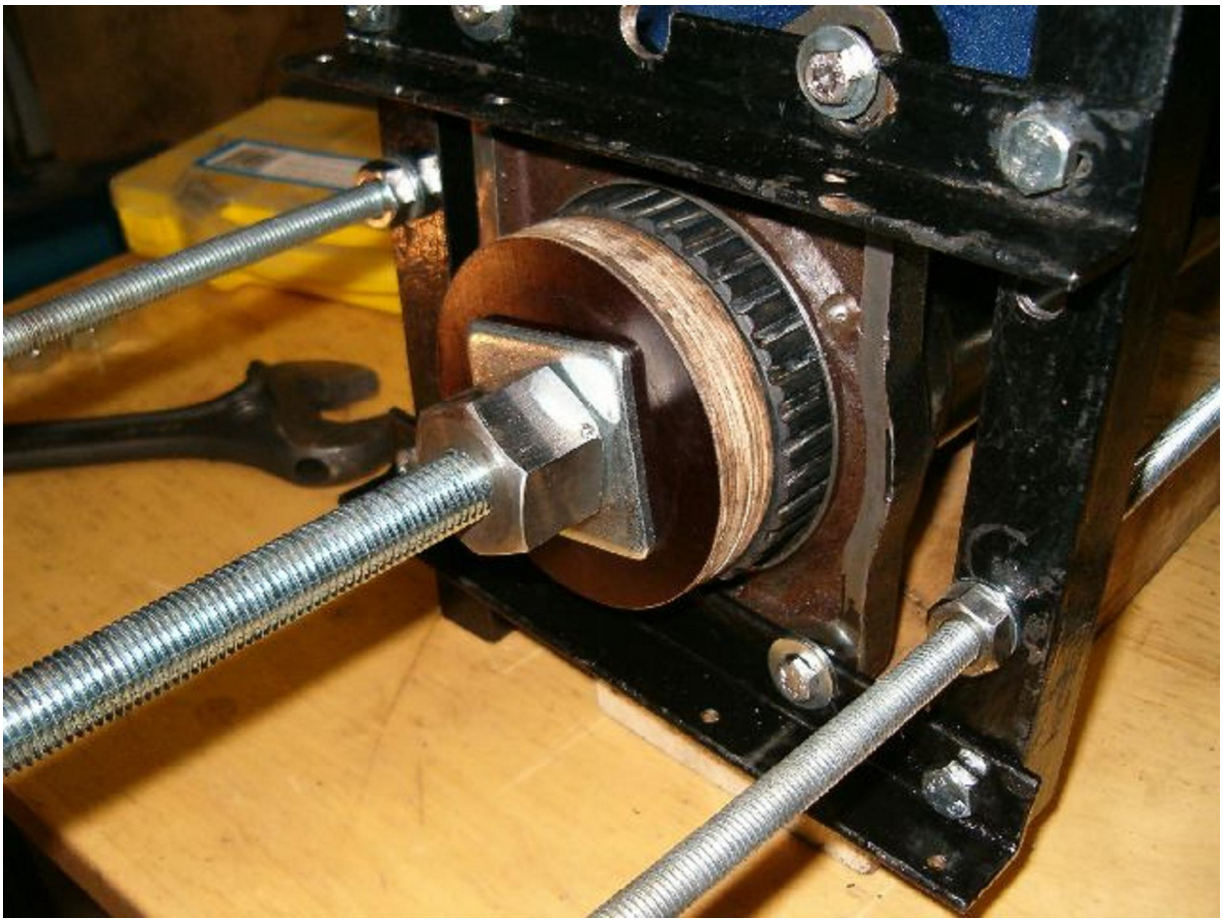
We have started on putting '78 shaft back together. Bearings were pressed into carriers in a vise with aluminum pieces available from local tool store.

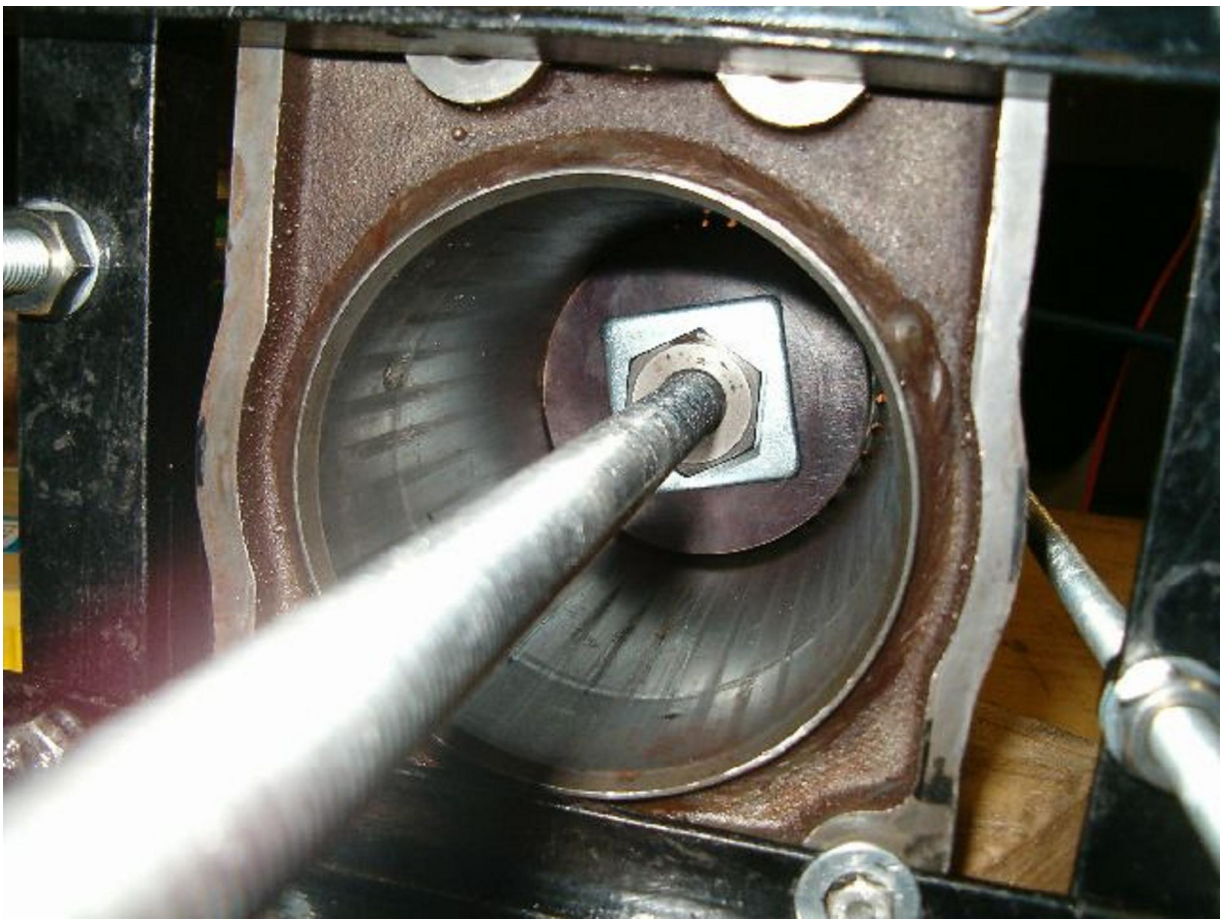


Black center thing was pressed in to bearing using same aluminum pieces and normal sockets. To make sure piece do not have possibility to get out of bearing inner race we made pressing tool from 4mm thick flat steel bar. It was used to bent metal towards outside in a vise.



Center bearing was pressed in from rear even though it would have been shorter distance from the front. Idea behind this is that it is easier to push against flat rear surface that grooved front side. Also at front of TT outer tube there is hole for clamp bolt mounting. Hole will probably make pushing front bearing support little more difficult when we have time to do it.





Here's picture how bearing center thing looks like after metal has been bent in vice with flat iron shown at previous post. Those four pressings on the perimeter should make sure center don't get out from bearing.



We are worried about bearing support moving inside tube. AFAIK this isn't unusual occurrence. To make sure they can't do it we put 70mm diameter plastic sewer pipes between bearing supports. At both ends of each pipe there is rubber band to make them stick to tube walls and prevent moving. Once all is in there's no place for bearing supports to go. Nothing can move except center shaft if it slides back or forth. Gearbox input shaft clamp should keep it from moving. This is complex solution I know. Since time isn't big problem for us we can do things stupid way. If I were doing this as business I would drain in some suitable glue into TT tube to hold carriers in place and be done with it.

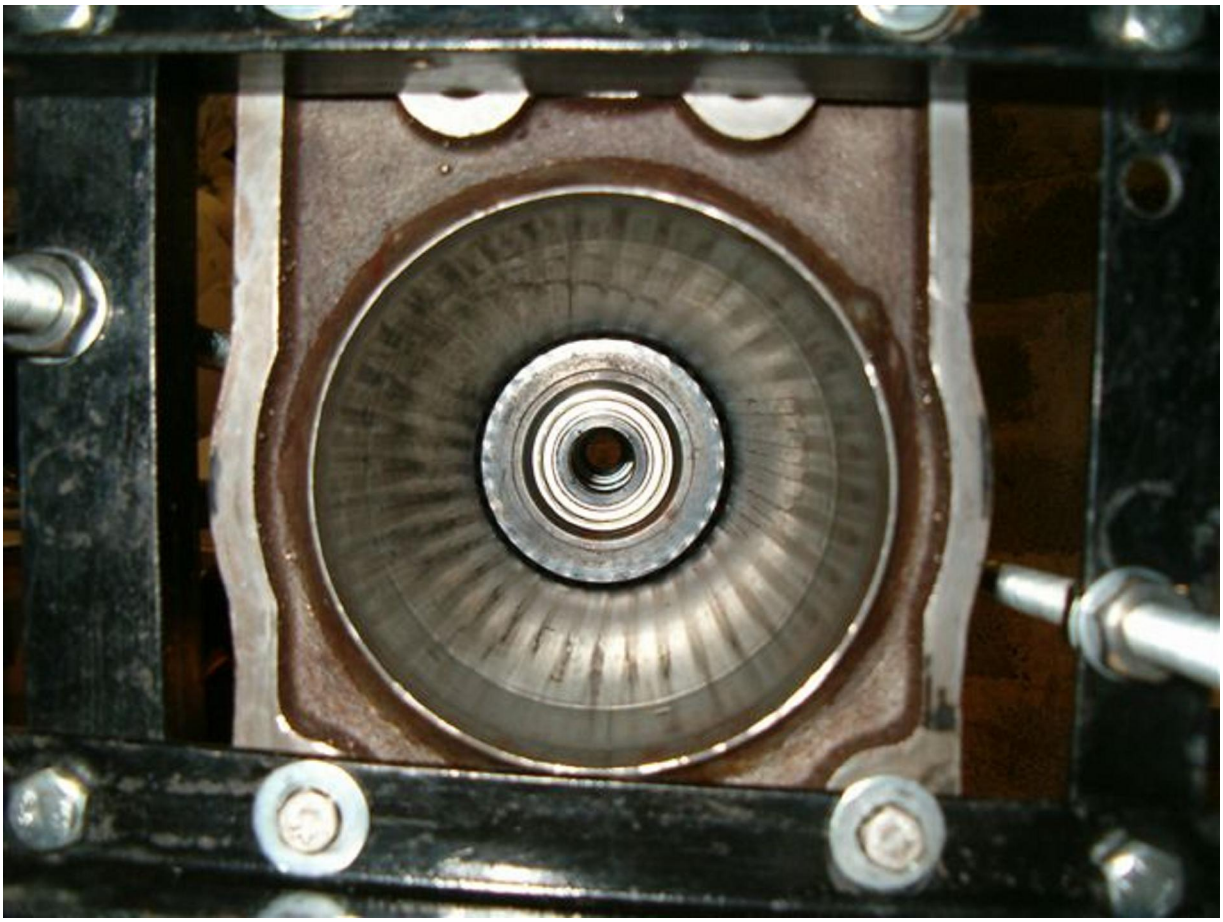






Second pipe between bearing carrier and vibration damper is way too long for that position. Added first two ready pipes into pic just to give idea how all stack up inside tube. When in TT there will not be any gaps between parts of course.

One pipe is already inside '78 TT as are 2nd and 3rd bearing. We hope to get '78 on road few months from now.



We have '78 TT ready now. We also had some problems in pushing center shaft through middle and front bearings. Shaft was tight fit and started to push bearing support forward once we hit end of narrow front portion. It could not push bearing out from carrier as carrier was positioned so that direction where bearing can come out was on side where shaft was entering in. This should guarantee carrier, bearing and internal sleeve can not separate from each other.

At first we put center and rear bearings plus plastic pipe between them into TT tube. Then we pushed center shaft in from rear up to a point where it's front end was close to a position where front bearing needs to be. As front bearing was not in yet it was easier to see what's going on at center bearing. While pushing shaft in we had pipe inside TT supporting center bearing supports front side. Support pipe was held in position by plate and clamps at front end of TT tube. Since center bearing support could not move forward it also held rear bearing support in correct position through intermediate plastic pipe. Without pipe in between I can easily imagine rear bearing support moving with center shaft even though center support is held in place.

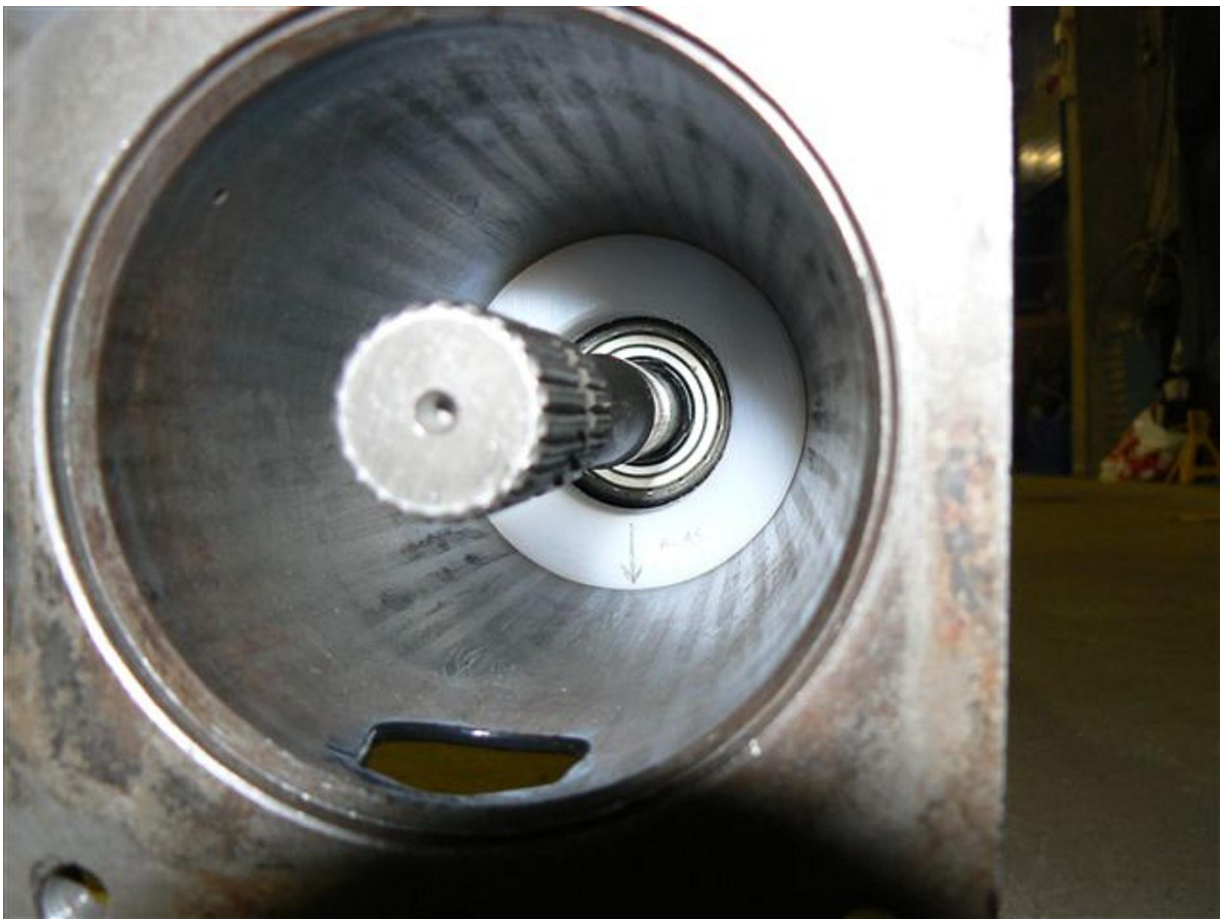
Once center shaft was through center bearing and close to where front bearing would be we pushed plastic pipe and front one in. After this we again installed pipe support at front of the tube and proceeded pushing shaft forward until it was in correct position. Last job was to put in 3cm wide donuts at front and rear ends of bearing-pipe-bearing-pipe-bearing chain. These were made from 10cm wide solid nylon bar and pushed in with pipe. In their center there is 45mm large hole for center shaft to go through. Both donuts were mounted to TT tube by drilling three holes through from outside. Drillings are not all the way through to keep shavings from entering inside TT while we were drilling and to make sure donuts are as strong as possible. We didn't want to use metal in this application as it might rust on to TT and be very difficult to take out. After making holes we made threads to both TT and nylon and mounted bolts to keep them from moving. There is also few mm thick rubber ring between nylon and bearing support. This together with rubbers at ends of plastic pipes allow some slight movement for bearing support to cever for differnt heat expansion rates etc.

Normal TT design has only glue if even that for holding bearing supports in place. We now have support from both sides for all three bearing supports. Internal sleeve should stay in it's place when metal is bend. Only somewhat weak link is how bearing stays in support and even this should not be a problem since there is small drop of glue there. This kind of complex solution is overkill really but good thing in it is it should make 110% sure everything stays where they should. I have some more pics but can't upload them yet.

I think you shouldn't have any problems in fitting '89 tranny into '84, if they are manual gearboxes that is. Automatic TT should also work fine but gearbox will not fit into body without some modification to make more room for torque converter I believe.

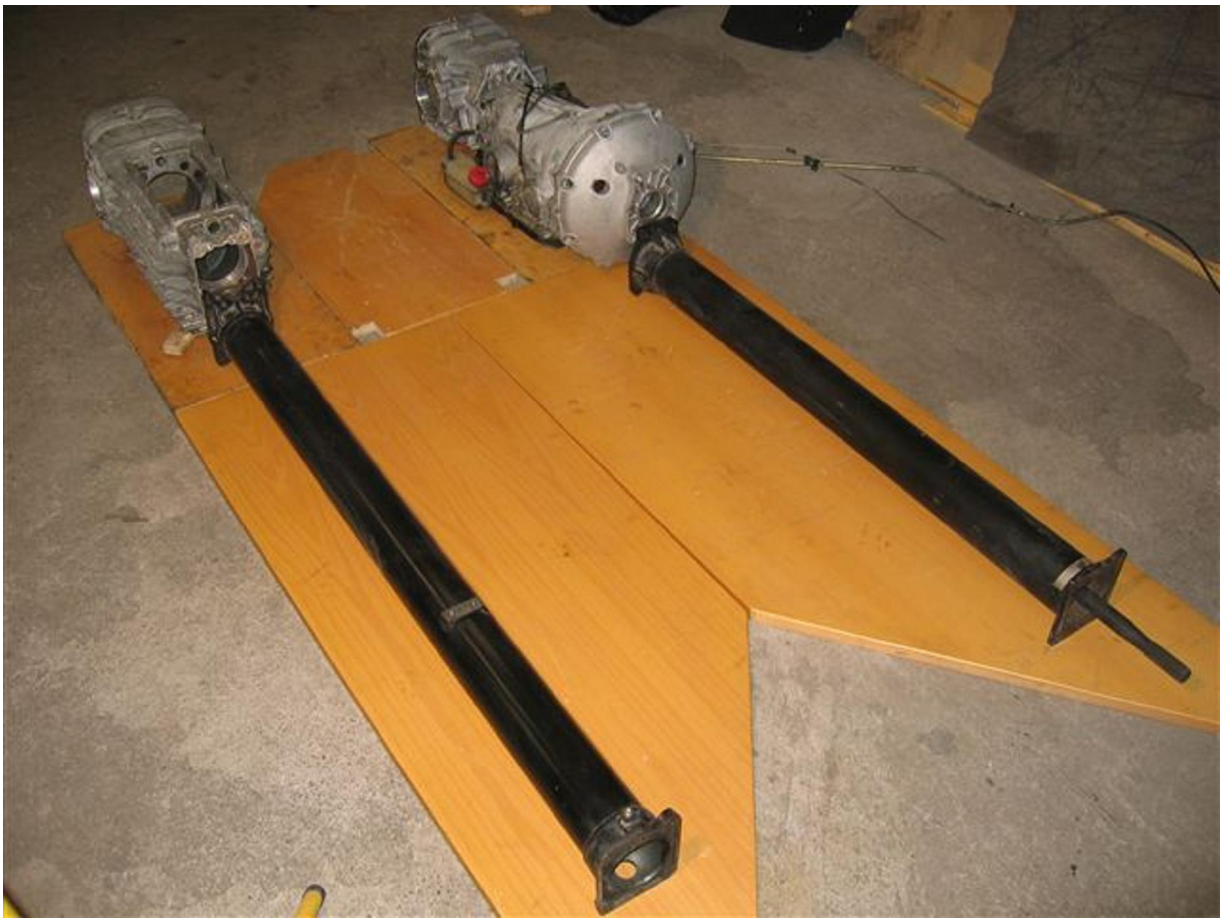
Few pictures of package ready for installation into '78.



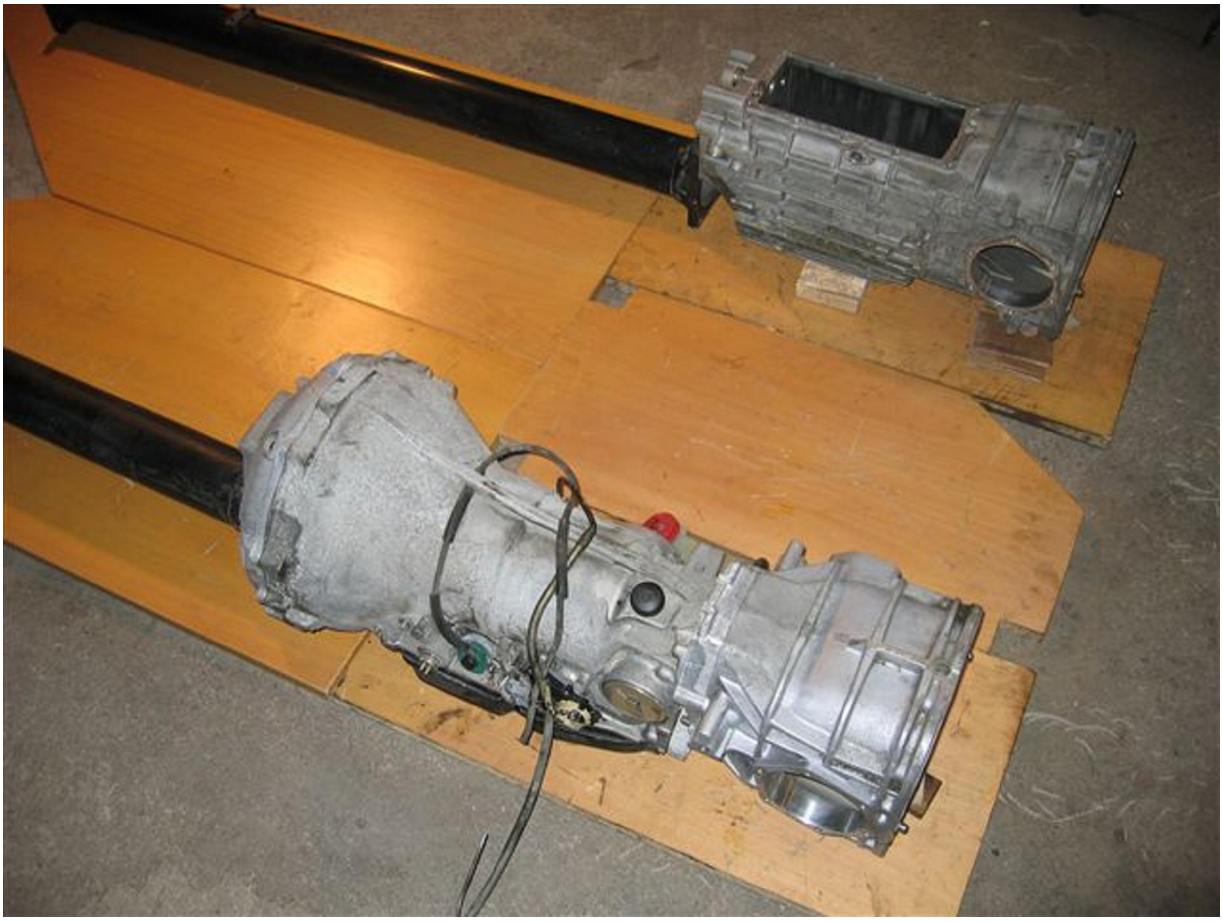


Few comparison pictures of '90 S4 automatic and '92 GTS manual tube and gearbox. Pictures do not show very well that rear end of automatic differential housing is some 3cm +/- few mm further back than manual gearbox rear end when TT front ends are at same plane.

This comes from same '80 MY change where manual gearbox was moved 30mm forward. To do this TT was shortened and rear subframe changed. When automatic gearbox was changed from 3sp to 4sp in '83 MY in US and '84 in ROW TT was shortened but rear subframe stayed same. Thus there is difference in total lenght of the drivetrain package and subframe between automatic and manual gearbox cars all the way to '95 MY. '87 MY torque converter enlargement was done without change to total lenght of the gearbox and thus TT could be left same as earlier 4sp use. Measurements and pictures of automatic tube dismantling once job progresses.









That automatic box is huge compared to manual. No wonder its some 30kg heavier too.

PS. Automatic box is for sale for 500 euros. Without differential, torque converter is included. From front end damage '90 S4 in Germany. I believe its 140-150k kilometers driven. Shipping into US is likely too much but maybe someone in Sweden needs it.

This is waiting to get out from rear end of '90 MY S4 tube.



For some reason factory put vibration damper behind last (2nd or 3rd) support bearing on automatics and so close to torque converter input.

Front end of G28.03 is about 30mm further back than in later manual gearboxes. As it is difficult to mix '80-95 TT and G28.03 you are stuck at using '78-79 TT also unless you want to make new bolt groove into TT center shaft. If you don't want to do that and use later TT tube this in turn means you have to use same period rear subframe and arm from selector lever to coupler at gearbox to take up 30mm difference. Also you need to add mounting point into TT tube for front lever support unless you want to bolt it into body like it was in '78-79 MY. Only G28.03 compatible tube which has mounting point for front lever support is early '80 MY 4.5L tubes. And early '78 MY TT has shorter clamp between clutch shaft and TT center shaft. This only affect first 54 US '78 cars though. Its a minefield...

Reason Porsche changed to shorter TT was to move gearbox forward and gain better handling. So there must be some effect on moving it backwards.

Think mount on drivers side was just to counter heavy battery mounted into end of gearbox at '78 MY. Its overkill in any other MY.

'79 yearly changes document has interesting comment about TT bearings which I have missed

previously.
The long drive shaft has been shortened and runs in three bearings (previosly two bearings).
Update to old thread as have late automatic shaft and vibration damper under work.

Side by side comparison of '88 S4 manual and '90 S4 automatic TT internals and how they are positioned. Gearbox at left and engine at right, from top to bottom row:
- '80½-95 5sp outer tube
- '83/84-95 automatic outer tube
- '78-95 three 5sp center shaft bearing supports and '82-95 vibration damper
- '91('90)-95 automatic vibration damper and two '89-95 center shaft bearing supports
- '80½-95 25mm 5sp center shaft
- '89-95 28mm automatic center shaft

'89-95 automatic bearing support look the same as '78 5sp, '88 S4 5sp and '92 GTS 5sp supports but all critical dimensions except width is different. Bearing type is 6007 and it has 62mm outside and 35mm inside diameter. Plastic inner piece is similar to 25mm support version that it has metal tube against bearing inner race and plastic against center shaft.



Does anyone have pictures of other style bearing support which is found on some automatic shafts at least? The one which is made out of two pieces and that need to be separated to change bearing.

'88 S4 5sp and '90 S4 Aut. dampers.

Factory documentation mention damper change for '91 MY S4 automatics but same year GT still used old style part. It seems at least some late '90 MY S4 got new style already as I believe this tube to be original for car it came from.

In another thread BrendanC says his damper has sticker with 72Hz and 20.5 degrees. I have

also heard damper with 64Hz in it but do not know it it had any degrees number on too. What are these exactly and what should be done with the info while puting things back together?



'88 S4 5sp at top, '90 S4 at center and '92 GTS 5sp at bottom.

Manual GTS seem to use different damper than earlier 5sp cars. Maybe factory didn't see the point in doing two separate style parts when 5sp production numbers were so small.

Interestingly neither of the two late style dampers haven't got sticker on. What ever factory used those Hz and degrees numbers they must have changed something as stickers were nowhere to be found, in these two cases at least.

Late early damper is little over 15cm long where as new style is little under 14cm. Interesting '90 S4 and '92 GTS cast parts are slightly different while they have same part number in casting. Both weigh either same or very close to same and also have same dimensions. All three in fact have same critical measurements except lenght.

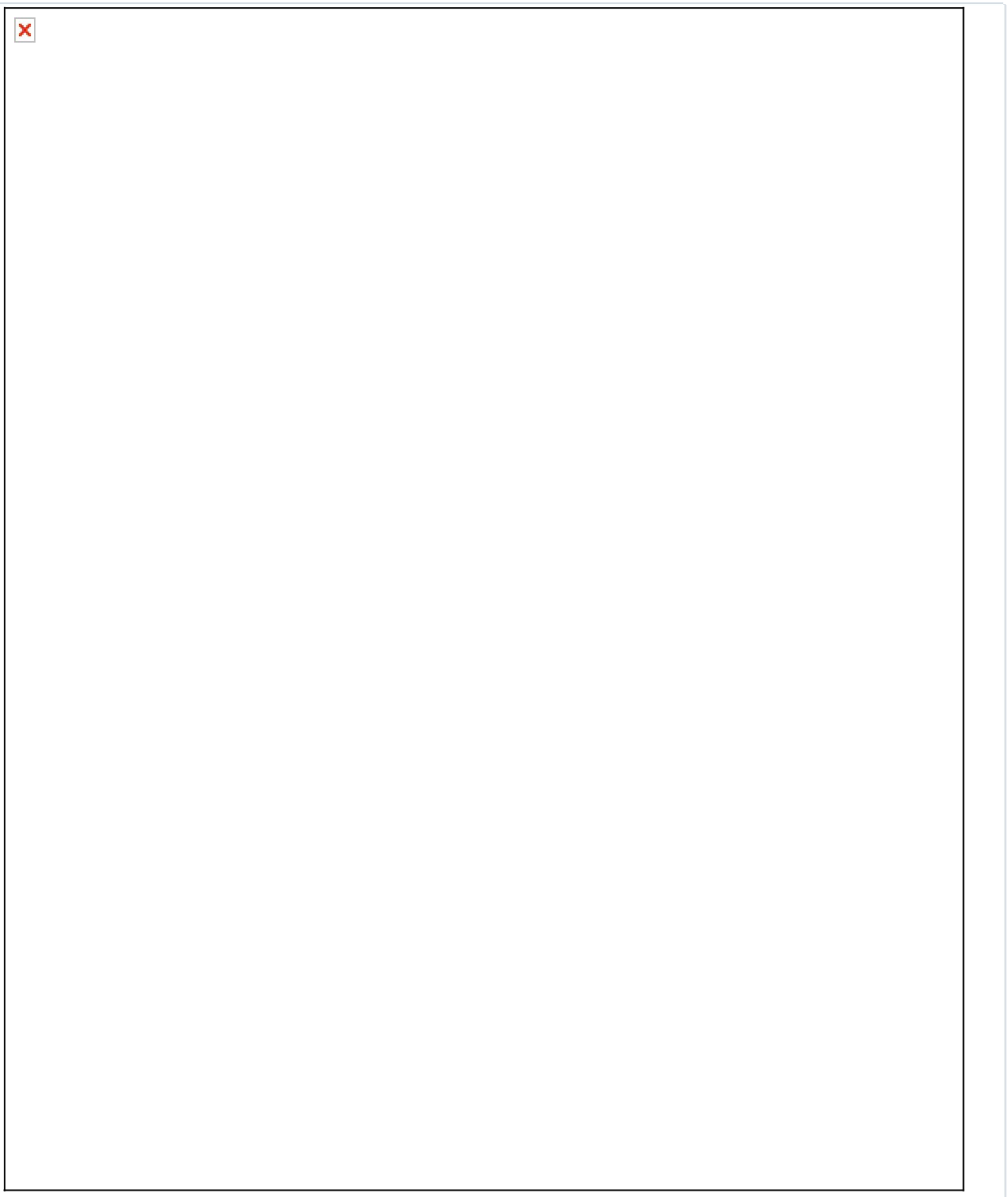


If I calculated right, both style damper castings do have enough large inside hole so that if rubber supports fail center shaft will not have to carry dampers weight. Outside is 84mm and inside 38mm. With 28mm center shaft its very close though as there isn't any spare room at all. 25mm shaft leaves 1.5mm empty space.



Explanation why damper was added from '82 MY yearly changes document. Will this make any more sense to Hz and degree numbers?

Attached Images



Erkka

992 *928 GTS* 5 speed
ak Green Metallic 22L
lassic Gra M

992 *928 GTS* automatic
meth st Metallic 8
Magenta