

Welcome to my page on the compete rebuild with 100% ballracing

and oil seals of the Tamiya 3 speed 4 wheel drive transmission

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After many hours of toil and head scratching you see all the ballraces that I have used.

There is more bearings here than as standard.

Tamiya put in it 20 bronze bearings.

5 of which can not be changed without machining and a lot of modifications.

I have used 22 ballraces, I was tempted to call it 110% because of the extra ballraces.

Also you will see the oil tight seals with custom made housings, sleeves and shims.



Here you see my custom made gaskets.



Here is the complete assembly with all the modified parts.



First we start with the input shaft.  
This has been machined down to allow for clearance  
against the output shaft.



All the parts for assembly.  
You will see on the following pictures that all the faces of  
the casing have been skimmed to all oil tight sealing  
between cases.



The input shaft with ballraced 2nd gear.  
These are some of the ballraces that can not be  
changed without modification.



The input shaft installed.  
Both the shaft and the gear are machined and chemically  
treated and then pressed together.



The input shaft from the rear.  
With the 2nd gear lay shaft bearing installed.



Here is the 2nd gear lay shaft.  
This is also machined down.  
This allows for clearance against the 1st gear lay shaft.



The lay shaft installed with another bearing.  
Also you see the 2nd / 3rd gear dog ring with  
the selector fork.



The gasket in place ready for the front casing.



Now the final stage of the front assembly.  
The spur has been machined on its back face to allow for clearance against the casing.



The spur gear installed with all its bearings.



The above fully assembled with a gasket between them.



We move to the back of the gearbox now.  
You see the bearing for the 1st gear lay shaft



Here is the 2nd gear lay shaft in place.  
This has also been machined to give clearance between the 2nd and 1st gear lay shafts.  
Assemble the 1st gear dog ring and fork with the selector shaft.  
Notice the bearing for the output shaft.



Now we move to the output shaft.  
Here are the bearings and shims for the 1st gear.  
This is another shaft that the bearings can not be changed without modification.



Both the shaft and the gear are machined and chemically treated and then pressed together.



The output shaft fully assembled.



Here is the output shaft in place.  
Also the casing has been attached.



The parts for the 4 wheel drive gear.



The 4 wheel drive gear in place with its selector fork.  
Under it you will see a bearing on the lay shaft.



We are now going to move on to the 4 wheel drive  
output shaft.  
This been machined for clearance.



Here you see some very special parts.  
Custom made sleeves and seals.



The custom made seal in its housing.



The 4 wheel drive output shaft in place with the oil  
seal assembly under it.



This is the 4 wheel drive idler.  
With all it's bearings and custom machined parts.  
Tamiya did not even put a bronze bearing here.



The above assembled.



Here is the end casing.  
This has been modified, it has the 4 wheel drive bearing housing machined.



This is the end casing with the 4 wheel drive idler installed.  
You will see another custom seal assemble to the right.



This is a small seal on the selector shaft.



The last part of the assembly.  
With another gasket, notice the custom seal on the output shaft.



The finished gearbox.  
This modified gearbox is smoother and has much lower friction, with the oils seals on this gearbox fully synthetic oil can be used to minimize gear wear.  
Also you get longer running times and higher speeds.

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*If you are interested in a conversion for yourself or have any questions or comments please*

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*This modification also applies to the Bruiser and mountaineer style transmission*

Tamiya mountaineer busier hi-lux hilux hi lux blazer bearing bearings ballrace ball race ballraces ball races conversion

modification strip down 4 wheel drive truck monster r/c rc oil tight brass alloy aluminium