

# My 1910 Buick

## Model 17

### Rear End Rebuild



by Bill Trant

Some of you may remember that during our Chapter's Babe Run in July, 2011 my vehicle suffered a major engine failure when the centre main bearing broke out of the crankcase. Having repaired the engine it was behaving flawlessly and everything was "happy" with my car.

While backing the car into a parking space at the Thompson Creek Farm in Maple Ridge during our Chapter's 2013 June Tour the car suffered another failure. A loud 'clunk' was heard coming from the rear end of my car with the subsequent jolting stop of the vehicle. I quickly determined the car wasn't going any further and, with the help of the Dunns', Michael Leedham and Derek Long, onto the trouble trailer it went.

Once again I called upon the assistance of my brother Peter and friend Paul Carter (and his shop) to help me with the repair. Together we removed the rear end from the car and took it apart. The picture below will show you part of what we found, the pinion

had several teeth missing, the majority of the Hyatt bearings were worn out but the most troubling thing was that the crown gear half of the carrier was broken. If you look carefully at the picture below you will see a major break at the base of the thread.



*The first thing we saw when the rear end came apart*

What to do? Contact Skip Carpenter of course! I called Skip and told him about the broken crown gear half of the carrier. He immediately said "not to worry" they all break. He put me in touch with Bruce Zillmer who had a pattern to recast these carriers. I contacted Bruce and he said he would send his pattern to Skip who agreed to have one cast for me at the very modest price of \$85.00. Skip also told me that Doug Layport, the same machinist who did the major part of the machining of my replacement crankcase, was jugged up to machine these carriers.

I then contacted Doug and he said he'd be happy to do the machining on mine. Once those things were put in motion I started to address all the other issues with the rear end, namely the replacement of all the bearings and seals. My brother suggested I upgrade the bearings and to use tapered Timken bearings for the carrier and Torrington bearings for the pinion. Having done some research as to what would fit the best, I found all the bearings and seals I needed on e-Bay for a total cost of less than \$200.00 . I already had a brand new crown & pinion set in my stock in the basement. Several years ago Mike Yeakel had a number of sets of these gears made and, fortunately, I had purchased a set "just in case".

As always happens, there were several other problems discovered during this repair and re-engineer project.

- \* drive shaft itself was bent about 25 thou.
- \* the axles were worn
- \* all the bearings were worn or broken
- \* the drive shaft was worn



*Broken Pinion*  
*Not very pretty!*

While the casting of the carrier and it's subsequent machining was being done we put our minds to dealing with the above issues. To straighten the drive shaft we ran several beads of arc weld to the shaft hoping that when the metal cooled and shrank it would pull the shaft straight. We were lucky because after the first weld had cooled the shaft improved from being 25 thou. bent to only 7 thou.. What to do about this 7 thou. you might ask? Well the answer was to take the drive shaft to my friend Barry Rutherford, the owner of Shadbolt Cams, and ask him for his advice. He simply placed it in his cam straightening machine and after a few raps with "Arnold" (his name for a large impact hammer) the drive shaft was only 2 thou. out which we all felt was acceptable.

By the time the newly cast and machined crown gear half of the carrier arrived, I had completed the remaining machining.

This work included the following:

- \* machine stops for the Timken bearing cups
- \* machine plates for the new seals
- \* have the axle spray welding done by Pacific Parts in Vancouver and grind the areas for the new style wheel bearings
- \* have the housings machined to accept a stepped sleeve for the new wheel bearings
- \* machine the stepped sleeves for the new wheel bearings
- \* repair and machine the worn area of the drive shaft
- \* machine new spacers to take the place of the original ball thrust bearings
- \* machine a new drive shaft sleeve to fit the new Torrington pinion bearings

Once all of the above and other repairs too numerous to describe, were complete I was ready to start the reassembly. My goal was to set the gear backlash between 4 & 8 thou. and the carrier bearing pre-load at between 7 and 15 inch pounds. I can happily report that both these goals were accomplished.

The pictures below will illustrate some of what was described on the previous page.



Drive shaft straightening



Axle spray welding to fit new style bearings. Bottom axle before grinding and the top one is after



Stepped sleeve for new style wheel bearing



New style Lock Collar Ball wheel bearing



Torrington pinion bearings with new sleeve installed



Stop for Timken cup and new seal and plate



Timken bearing in rear end housing



Spacer to replace original ball thrusts seen just below Timken bearing



Rear end being assembled

With the rear end fully assembled, it was now time to put it in the car and go for a test drive. What a treat that was! The car ran smoother and quieter than it ever has - it didn't even sound or drive like my car! There is no doubt that this rear end had been failing for quite some time and, I suspect, the carrier was the first thing to break which resulted in an extreme amount of backlash with the resulting failure of the pinion.

A big thanks to Paul Carter for allowing me to use his shop but a particular thanks to my brother Peter without whose guidance, talent and encouragement this project may have never been completed. Without Peter & Paul I couldn't have done it!

Hopefully I will now be able to enjoy many more miles of touring in this car. It truly is fun to drive and kind of fun to fix as well!

I've included a few pictures to show the end result and pictures of some of the pieces that didn't go back in.

**Below are parts that did not go back in!**



Crown, pinion and crown gear half of the carrier



Carrier Hyatt bearings which were replaced by Timken ones



Carrier thrust bearings, also replaced by the Timken bearings



Wheel bearings which were replaced by the Lock Collar Ball bearings



Remember the picture on Page 1 - looks different now!



Fully assembled



Pinion bearing and sleeve which were replaced by Torrington ones with a new sleeve



Being installed



Finished and on the road

Thanks to the following who provided advice and/or helped with the repair:

- |                |                  |
|----------------|------------------|
| Peter Trant    | Barry Rutherford |
| Paul Carter    | Pacific Parts    |
| Skip Carpenter | Doug Layport     |
| Bruce Zillmer  | Mike Yeakel      |

Thanks also to Fred & Trudy Dunn, Michael Leedham and Derek Long who helped load me onto the trailer.