



1940 PACKARD 2-Door Sedan— Continuing the Body Work *by Ron Carpenter*

Now that I have the body painted it is time to work on a different part of the car....I am tired of body work at this time and I still have to polish the car but I will wait until I have it all back together to do that. I have already rebuilt the rear springs by cleaning and replacing the inserts and greasing the springs. I have replaced the front and rear springs bushings and left them loose awaiting final tightening once the car is fully weighted down so that the springs and shackles are "normalized." Otherwise the bushings, if tightened now, would tear them selves up. I have had the differential housing cleaned by my local machine shop in their big tank to get rid of 80 years of metal shavings as everything was really ground up in the differential. More on that later.

I am going to start with the differential pinion seal as that is something that I will need to do no matter what and I want to go a head and change the rear axle gear ratio. The standard rear axle is 436 for a non overdrive car and the over drive car has 455 gear ratio. The over drive reduces the engine speed 28% and so the lower the rear axle ratio. One more thing, Packard used the same carrier for the junior cars all the way to 1950, so a standard 8 in 1949 would use the same size carrier with different gear ratio as the 6 cylinder cars. Well that is not 100 percent true, the spring pads between the 1940 and the 1941 6 cylinders are different. They actually lowered the 1941 cars. They use a 410 ratio in 1949/50 standard 8, so I think that is what I am going to use. I have actually changed my mind on what ratio I am going to use. I have all three ratios available and since we are mainly flat with no hills in my area, not like like San Francisco, so the 410 will be the one I am thinking of using.

I started out with the idea that I would put the 436 ratio of the standard transmission so my first series of pictures will show what I am doing. The standard transmission drive shafts use a different size universal joints so the first thing I need to do is change the universal flange on the differential which uses a larger universal joint but it uses the same size rear pinion seal. The two flanges are interchangeable so I am going to show how I prepare the flange and new pinion seal to install it.

Picture 1

I have the nut loosened and ready to pull the flange. I normally mark the parts as I take them off with a punch mark and then tighten just a little more (1/8 of a flat on the nut) but since I am changing the flange I will just take it up smug and not too tight. I have seen the flange nuts come loose on other cars and just tightened them up with no problems, keep our fingers crossed that it will be fine other wise have to have the rear end reset with a new crush sleeve.





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Picture 2

I am using a puller to remove the flange from the differential. Not too difficult to do but don't hammer on the flange, remember the universal joint goes on it and don't want to damage the area.



3

Picture 3

I have written in the beginning that I was going to change out the differential gears for a 410 ratio instead of the 435 standard non-overdrive ratio. On the 1940/1 6 cylinder cars they used smaller universal joints and as a result the flange is smaller but the parts are same size and I am going to use the 120 flange on the car as that is what my overdrive drive shaft is out of and it is the same length as the 6 cylinder overdrive cars. I have both the smaller flange and the larger flange laid out to show the difference.



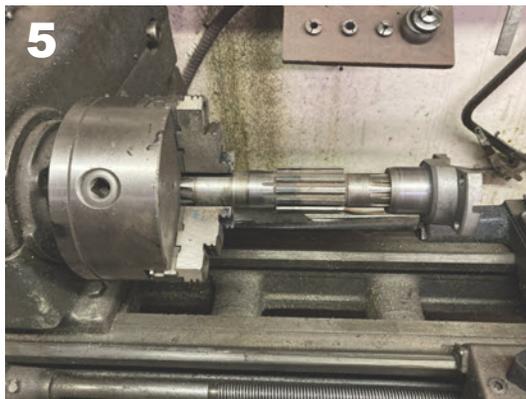
4

Picture 4

I have all the parts laid out again to show the actual unit before I polish and I have removed the slinger ring from the universal joint. This was just pressed on. I have all the parts laid out before I install the slinger ring. I will be using thread lock to reinstall the slinger ring back on the flange.

Picture 5

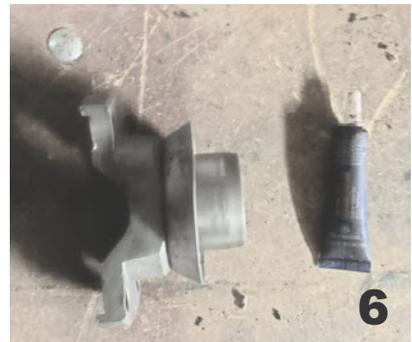
I am using a transmission main shaft that has had all the gears taken off and I put the flange in the lathe and polish the seal area with 400 grit wet and dry paper. I have bead blasted the parts in preparation to do this.



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Picture 6

I am going to use a thread lock to install the slinger. When I pulled the slinger ring off I felt that it might get loose so I Loc-tited the slinger back on. It is



6

probably overkill as I believe that the ring will be held tight once it is installed.

Picture 7

I am now going to remove the rear seal from the "pumpkin" as I like to call it. I have started by drilling two 1/8 holes in the retainer which I will use to remove the seal. Packard put a seal in the retainer and I will remove the retainer and press the seal out of the retainer. The actual seal is the same dimensions as used in the junior and senior cars so one fits all but different retainers to hold the seal.



What it looks like before I pull the seal



Picture 8 and Picture 9

I have my slide hammer screwed into the seal retainer and ready to pull out seal and the seal is now out of the pumpkin. When you do this only pull it out slowly as you can easily pull the screws out of the retainer.



Picture 10

I have the seal retainer with the wiper seal and the old seal. I am ready to clean the retainer to reassemble the seal.

Picture 11

I have set up and soldered the holes in the seal that I drilled and I will be soldering the metal around the seal retainer so that when I install the seal it will help make a seal area that will not leak.



I want to expand on why I soldered the outside of the retainer. I had one '47 clipper that I put three rear seals in before I realized that the retainer it self was leaking and not the seal. I was using a new reproduction seal and I am not sure why it was leaking because it was not the right size or if there was a "scar" in the area that caused it to leak but the solution I came up with was to solder around the retainer



and when the retainer was installed it cut off any excess solder that was displaced when I installed the seal. The new seal did not leak so I have done it this way every since. This was years ago and I am sure if it was the problem with the reproduction seals that they (vendors) would have fixed the problem by now.

Picture 12

I have laid out the parts before I start to assemble the seal. I machined a metal adapter to press the seal into the retainer so that I could put it in straight. I have bead-blasted the retainer before I solder up the holes.

Picture 13

I have installed the new seal and the wiper seal and it is ready to to install in the pumpkin.

Once I have the seal ready to reinstall I used the retaining nut with a large washer to slowly push the seal in to the housing. I only used a little force at a time and gently tapped the seal into place until it was flush.



Picture 14

Once the seal is back in the case the pumpkin is ready to install in the rear differential housing. Use a new gasket (obvious I know but don't use just silicone as a gasket material as I have seen cases where it "washes" out) but on the lower half of the housing use copper washers to seal the threads of the bolts. Packard used copper washers and self locking nuts. Don't put a lock washer against the copper washer.