Rear Axle Dual Idler Installation, Revisited

By Rick Tinsley

These comments are offered as an addendum to Keith Mackey's excellent article in the January/February 2002 issue of **THE SETOFF** wherein he addressed the replacement of an MT-19 rear axle and installation of the recently available U.S. Tsubaki axle sprocket with Power–Lock hub, a dual idler bracket, and an additional idler sprocket. Keith stated that his objectives in presenting the article were to call attention to pitfalls he had experienced and to provide tips to make the job easier for others in the future. Similarly, I am offering herein a few comments explaining additional pitfalls I encountered while installing these components on my ex–CN MT-19.

A few comments explaining additional pitfalls

About a year ago I began to consider replacing my rear axle. I was concerned that my car was a likely candidate for a rear axle fatigue failure because (1) my car weighs 1,170 pounds, making it considerably heavier than the typical MT-19 with side curtains and (2) my rear axle was slightly bent (so that the center bearing forced it to become straight twice during each revolution, thus inducing a corresponding bending stress twice during each revolution).

Thankfully, Les King has recently begun offering the complete rear axle replacement kit for the ex–Canadian Fairmont MT-19s (with size 40–2 chain) consisting of a high–strength axle, Tsubaki axle sprocket with Power–Lock hub, extra idler sprocket, and a dual idler bracket. I purchased all of these along with the hub puller mentioned in Keith's article. Most of us remember the many techniques and theories that have been discussed during the past couple of years (on our Speeders web site) for removing the hubs, ranging from heating the hubs with a torch to using a hydraulic jack (Porta–Power). Les' puller makes removing the hubs a simple task to say the very least!

The part of the disassembly procedure that was a mystery to me and was, by far, the most challenging was removing the insulating cones from the axle tapers. I cannot remember reading about anyone discussing this challenging task. Therefore, I will outline the procedure that I followed.

After the hubs are removed, at least one insulating cone must then be removed from the axle (that is, if both cones remain on the axle tapers) so that the axle can be pulled through one of the axle bearing inner races. My insulating cones stayed on the axle tapers, so this is where my experience lies. I would think that if the cones stay with the hubs one may choose not to replace them. However, if it is necessary to replace them, a wood or metal rod of correct diameter could possibly be placed against the cone at its small end. With several "taps" on the rod with a hammer, the cone would, one hopes, dislodge from the hub taper. However, if the cones stay with the axle, at least one of them must be removed.

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Before I attempted to remove the insulating cones, I insured that everything on the axle was free and sliding (the old axle sprocket hub, the center bearing/housing, and the thrust collars). I must reiterate Keith's comment about the necessity of cleaning the axle before attempting to remove it. Don't be fooled into thinking that this is a two–minute chore! It takes perseverance to get the axle clean enough and completely free of burrs so that it will slide through the bearing inner race.

I was told that one technique for removing the insulating cones from the axle tapers is to turn the axle nut around and thread it back onto the axle to protect the axle threads. Then place a board against the nut and beat on the board with a large hammer. This forces the axle toward the opposite side of the car (remember that the thrust collars, center bearing/housing, and axle sprocket are free and sliding) until it stops when the inner edge of the insulating cone bears against the axle bearing housing. Further hammer blows will tend to dislodge the cone from the axle. This is what I did; however, I used a new nut (size 7/8–9) so that I would not inadvertently deform the original axle nut. With much diligence and many hammer blows I finally separated the cones from the axle. The cones almost weld themselves to the axle taper and, I can assure you, they do not want to come off! Permit me to say at this time that the removal technique I have just described IS NOT a good one for removing the cones! There are too many components that can be damaged during this process, not the least of which are the bearing housings. The problem was that, at the time, I was unaware of a better procedure.

After removing the cones and sliding the (perfectly clean) axle through the bearing and out of the car, I then recleaned the bearing housings around the axle openings to prevent inadvertently pushing some grit into the openings while installing the new axle with the center bearing (turned around), Power–Lock hublsprocket, and thrust collars.

Keith and I have slightly different preferences with respect to installing the new components. He stated that nothing on the axle should be tightened before run–out checks are made. I agree. He then said to properly center the axle and tighten the thrust collars to secure the axle in place (before the hubs are installed). Instead, I feel that the thrust collars should not be tightened until after the final installation of the hubs and wheels.

I used new insulating cones and fiber wachers that I had purchased from Fairmont over a year ago. I installed the new axle, cones, hubs, and snugged the two axle nuts. I then placed the rear wheels on the hubs and snugged the wheel bolts. I took the car off of its blocks, set it on the floor, and torqued the wheel bolts. Next, I ran a chain through one of the wheel "spoke" holes and around the lower frame member and locked the chain in place. This prevents the wheel from turning while torquing the axle nut. I then repeated the torquing process for the other axle nut.

It was then time to check the gage distance. I clamped a straight bar to the outside face of each rear wheel and carefully measured the distance between the bars. You can imagine my disappointment when my tape measured 63 & 1/8-inches! No matter what dimension you choose for your gage distance, this is too wide! Therefore, my insulating cones required reaming.

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Fortunately, on August 12, 1999, Ron Zammit posted a note on the Speeders web site stating that he had located a source for insulating cone reamers (at left). I ordered at that time one of the MT-19 reamers ($50 plus shipping) because I had a feeling that someday I might need it. Surely enough, "now" was my time of need!

I removed the wheels, hubs (using Les' device), and once again had to deal with those pesky cones stuck to the axle tapers. This time, Jim Paty, my motor car buddy with years of experience, suggested that I try using a bearing puller to break the cones loose from the axle tapers. This device is offered in the McMaster–Carr catalog or can be seen in their electronic catalog on their web site (www.mcmaster.com). The

puller is fairly expensive, but it can be rented at most local tool rental places. This device proved to be a lifesaver! Jim thought that since the cones and axle were new they would probably break loose easily. Not true! Just the single torquing of the axle nuts had once again "welded" the cones to the axle tapers. However, the bearing puller made removing the cones a relatively easy job.

I then measured the thickness of each cone with a dial caliber. One cone measured 0.131 inches, and the other measured 0.128 inches. I recorded this thickness on the outer sulface of each cone with a permanent marker. I rechecked the calculation to prove to myself once again that removing 0.0045 inches from the wall thickness of a cone will move the wheel inboard by 0.125 inches (or 1/8–inch). Then, I inserted the reamer into the first cone, applied pressure, and began turning the reamer inside the cone (by hand). I quickly found that this was going to be a time consuming job! With no more pressure than can be applied by hand, the reamer just doesn't want to remove any material from the cone. Instead, it tends to polish the inside surface. Finally, after about two hours, I had removed enough material from the inside of the cones to provide an acceptable gage distance. I then reinstalled everything, rechecked the gage distance, and found it to be acceptable. Now that the gage distance was properly set, I centered the axle on the car and *then* secured the thrust collars.

If I had this job to do again, I would probably just take my reamer and cones to a local machine shop and request that they remove the desired material from the inside surface of the cones. They may or may not use my reamer to do this.

I next aligned the new axle sprocket with the gearbox sprocket by clamping a straight edge to the side of the axle sprocket and sliding the axle sprocket until it was in line with the gearbox sprocket. I torqued the socket head cap screws on the Power–Lock hub as described in Keith's article. Since this is a Japanese–based product, the socket head cap screws are metric, and they use a metric "Allen" wrench. The wrench is 5mm, and it can be readily obtained with a 3/8–inch drive fitting on one end so that it can be attached to a torque wrench. I purchased mine from Sears.

My next surprise came when I discovered that, even though there is side–to–side movement built into the idler sprockets on their respective shafts, my idlers wouldn't move far enough toward the right side of the car to come into alignment with the gearbox and rear axle sprockets. I had to install 1/4–inch spacers between each idler sprocket and the new bracket to correctly position the idlers. This concerns me somewhat, because it places the vertical component of the front idler sprocket chain load further away from the new idler bracket and the aluminum frame member to which it is attached. This results in a higher torsional load on this relatively weak aluminum frame piece. Only time will tell if this is of any consequence.

I hope my comments will serve as a useful addendum to Keith's informative article and will provide those of you interested in installing Les King's excellent rear axle/dual idler kit with an additional idea or two for making your task an easier one.

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