



Behind the Wheels Podcast Transcription

Episode 4

It's All About the Torque

ANNOUNCER

You're listening to Behind the Wheels with Doug Mason, Dave Walters, and Mike Yagley. This is a show where we talk about heavy truck and medium duty axle ends. Doug, Dave, and Mike bring close to 100 years of experience and expertise in the transportation business.

Join us once a month to learn new things about axle ends. Sponsored by Alcoa® Wheels, the global leader in aluminum wheel innovation.

MIKE YAGLEY

Well, hello. Welcome to another episode of Behind the Wheels. I'm Mike Yagley.

DOUG MASON

And I'm Doug Mason.

DAVE WALTERS

And I'm Dave Walters.

MIKE YAGLEY

So, this is a very special COVID-19 episode of behind the wheels. We're recording all in three different locations, three different states. We had somebody write in with a great question. Dennis Squire asked a question and it says, would like to hear a discussion on re-torquing wheel nuts. It goes on and he says, in Canada, the dealers state that on every invoice that the wheels must be re torqued. They also use this in their defense when wheels come loose. The areas we go in the U.S., re-torquing is not requested on all tire company invoices. What is the panel's opinion? When we saw this, we thought, gee, that's a really, really good question. And so, we decided this is such a good question, we thought we'll tackle it. We'll dedicate a whole episode to it.

DOUG MASON

Well, I think that what it is, Mike, let us know that when we were talking about the nuts and bolts, that there's definitely interest out there in more detail than what we got into previously. So, I think we'll get into some history here that Dave has on where some of this comes from. And I think we'll review again, in a little more detail, the real importance of the torquing procedure. And, even as it's noted by our question here, when they said, they also use this in their defense when wheels come loose, indicates that wheels do still come loose. And this is a very important topic.

MIKE YAGLEY

Let's go back. And I know we covered this a couple of times already. It's always good that they say that what inflation pressure is to tires torquing is to wheels. What they're trying to get at there is we just can't seem to talk about torque enough. So, we're constantly revisiting it. We're going to revisit it again in this episode. Let's talk a little bit about why re-torque happens. Dave, you want to kick that off?



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DAVE WALTERS

At TMC, we spend a lot of time talking about torque issues, and re-torques, or torque checks. And we'll get into that a little bit later. But we did a study at one of the TMC meetings where each of us went out and bought different fasteners from different suppliers and just randomly brought them to TMC. And we put those fasteners that we bought over the road on the machine. And we found out that technically the quality of fasteners was a tremendous scale. We contacted our federal government and kind of got some information. And what we found out was, if they're marked grade A, they have to be what they're marked. But, if they're not marked, chances of them being grade A is slim to none. And it was a very educational little task we did. So, quality of fasteners is where we always start out with. You better start out with quality fasteners before we get into any of these other subjects.

MIKE YAGLEY

One of the things that we talked about, once you have those quality fasteners, we talked before about having to clean studs, cleaning off the studs, getting all the gunk off of there. Making sure that, if you have dirt or maybe some corrosion on the studs, that's going to bind things up and that's going to cause all sorts of problems, give you poor torque readings.

MIKE YAGLEY

We already talked, I think, in a couple of episodes about oil and the importance of just a couple of drops of oil right there on the stud. And it's really good if you can get a drop of oil between the nut and the free spinning washer. You want to make sure everything is aligned up when you're putting the wheels on. And Alcoa Wheels sells alignment tools. There are other alignment tools out there on the market to make sure that everything is going on nice and clean, that the wheels not going to get cocked when you put the wheels on. And all of that is about having that joint, when you torque that up that first time, put the wheels on, you torque the whole thing up, that you're not going to get a whole lot of joint settling.

MIKE YAGLEY

Now, even with all of that, there's still going to be a little bit of joint settling. And so, the whole point of this re-torque is about after the joint settles. That's why they're asking for a re-torque. But we're going to get into the difference between a re-torque and a torque check. Because, if everything is done and everything is done, right, hopefully at the end, after you go through this, you just do a quick torque check and you're good to go. I'm going to ask Dave, because Dave, actually, of all of us, you have the most historical understanding of the old ball seat systems and the way those were put together back in the day.

DAVE WALTERS

Yeah. Ball seat was very prevalent for many years. And the ball seat wheels you had to re-torque because they had inner and outer cap nuts, right-handed left-handed threads, depends on what side of the truck you were on. So, technically what the recommendation was is you loosened up every other one, you re-torque the inner cap nut. Then you would go back and loosen up the other five and re-torque the inner one and re-torque the outer one. That was actually re-torque. It was a time-consuming process. So, technically nobody in the world would ever do it, but that was the recommendation. So, they called that re-torque. When we went into hub piloted wheels, it's basically you don't have to un-torque anything. So, we like to refer to that as torque checks now, because you're really not re-torquing. You're just checking the torque.

MIKE YAGLEY

So, you actually had to take half of the nuts off and then put them back on again. And that's really what a re-torque is. Isn't it?

DAVE WALTERS

Five out of the ten you had to redo that way. And then, you had to do the other five. It was a very time-consuming process. And, if you had an 18-wheel truck, you're basically doing that eight times. And people just didn't do. So, that was what they referred to as a re-torque.

Behind the Wheels Podcast
Episode 4
It's All About the Torque

DOUG MASON

And then, when you're re-torquing, you're just resetting the whole joint again. So, there's still a lot of the same potential issues in place. So, it is a much better situation, now that we've moved to the hub piloted where you really are, like you said, just checking the torque. You shouldn't be making any changes. You shouldn't be adding any more torque to it. And it might be a... this is a good point here to also discuss the actual torquing process of how they do this torque check. Right? If it's a check, we're not trying to add anything to it. We're just trying to ensure that it's still within the proper range so that we know that everything was done properly to begin with. Correct?

DAVE WALTERS

That is correct. And, when you get into checking the torque, to be technically accurate, because I've done this at a lot of fleets, with fleet customers, you really have to go to more of a dowel indicator type torque wrench, because then you can see if there's any movement. That's critical. Where, if you have the clicker type and you set the wrench for 500 where you torqued it and they all click, we don't know if there's any movement. We just know that they're above 500. A lot of this is doing it with stuff. The breakaways can work much like the clickers. So, a lot of the fleets had to actually go to the torque checks, they had to go to dial indicator base torque wrench to see if there was movement.

MIKE YAGLEY

One of the big problems with the torque check with those clickers, there's an awful lot of shops out there that are using the good enough, tight enough method. And they'd have the guns set as high as it'll go. It's someplace over 500-foot pounds. I think, Dave, you've seen it where it's well over 900foot pounds, 1,200 foot pounds. I mean, it's crazy the kind of numbers they can get. You're over 500.

DAVE WALTERS

Yeah. I mean, with a one-inch gun and a lot of shop air, you can get a tremendous amount of torque. And people need to realize that that's probably where you damage fasteners. And we can go back to the start with quality fasteners. You don't start with quality fasteners and you put that type of torque, you're going to have all sorts of issues. There's torque tools now. There's nut runners, they call them, and torquing devices that can do the same thing. They're still pretty costly but they do torque very well. So, I mean, there are products out there that you don't manually have to torque. But again, when we talked, the good and tight method is you go around and you click, click, click. And all we know is they're over five-foot pounds. So, we like to say, run them up, then you bring them to torque. That means you want to see movement before that torque wrench clicks. There's a big difference there.

MIKE YAGLEY

For that running them up, you want to go almost a hand tighten. You don't need them real tight. Just run it right up there. But, like Dave said, you want to see movement when you're starting to use that torque wrench. It doesn't take a whole lot of turn from loose.

DAVE WALTERS

Basically, the half inch gun and get you really close to the torque anyways, instead of using even a one inch or a three quarter. This gun can get you up there. And then, you torque it. The cost reduction of buying the heavier tools and the maintenance is a value to these shops that basically do this correctly. Now, a lot of them will have the oneinch guns because, if they get a road service on the road or something like that, they have to try to get the nuts back off. But they tell their mechanics, you use a half inch gun to install them.

DOUG MASON

Yeah. It was kind of interesting. We were talking to a few fleets about back at the TMC meeting, if you'll recall, and how they set it up so that you could only run one way with your nut runners. So, you could only take off the nuts, you couldn't drive them on, to ensure that, when they were being put on, they were using the actual correct equipment to ensure the proper torque.

MIKE YAGLEY

You're talking about the large, the one-inch guns?

DOUG MASON

Yeah. So, you can still use it to get it off, like Dave was saying. In some instances, they've been put on with a one-inch gun on the road or something so tight that you need that much power to get it off. But you don't have it set up so you can actually use it in the shop that way, which I thought was a pretty good pokey oak for them to put in place.

MIKE YAGLEY

Now, we were talking about torque check. Our question came in, why does that have to be done? And why is that different in Canada? And here again, Dave, I think we need to go back to how TMC has developed a system that really is a torque check system, but allows fleets who have a good system in place with their statistical troll, we'll call it, reduce that kind of burden. So, maybe you can give us a little background on how that developed and how that is different between the Canadian side of the border and the U.S.

DAVE WALTERS

Oh, I certainly can. And you're very fortunate. I actually wrote this RP 237 and it is tort checking guidelines for just wheels. And basically, in this procedure, we're basically saying, you fleets that have your process under the control, you periodically check 30 nuts at different timeframes. If your process is under control, there's actually a sheet in here where you fill it out. And, if your process is under the control, you keep that on file and say, hey, I got my process under control. I checked 30 on this truck, 30 on that at different times. You know what I mean? Basically, it says you do a mile drive by, you come back, you recheck your torques. And what we found from two major fleets in this country that, if they cleaned everything, use quality fasteners, torqued the wheels up, they didn't lose one iota of torque for the next toll period until they have to take the tires off again.

DAVE WALTERS

So, a lot of these fleets, that saved them money because they were spending the money to do the re-torques and go to a place and bring them back in. And we've found out that they can basically show that they've got the process under control. And these sheets that we made was so important because you want to keep those because, if you get into any type of wheel failure, wheel off, or something, you'd say, hey we were doing all this and something else happened. And most of the time doing it with these fleets, it would be checking your outside road surface. So, we-

MIKE YAGLEY

Now, the key to all that is that test drive, right? Do you have that five-mile test drive after the wheels are put onto the vehicle? You want to make sure you're going over railroad tracks. You want to take plenty of turns. And you want to sort of see what you can do to get a little bit of a movement in that joint and if there is any movement there. Like Dave said, if it's done right, then there's not going to be any movement. You're going to be good to go. And that's going to be just as tight after that test run as it was beforehand. Just to restate, you have that documentation that says that you checked it and you're all set for any regulatory, hopefully, any sort of regulatory questions that come up.

MIKE YAGLEY

I think this gets, just a little side note, sort of a pet peeves of us, is the little green arrows that go on the axle ends. And those aren't going to really do a whole lot for you. That's not going to tell you if you've done the good and tight method where it actually is over torqued and that's going to weaken the stud. It's not going to tell you... you don't need a whole lot of turn on those studs to get a little bit loose. But really what you need to do is do it once and do it right. That's what's going to keep that axle end put together. Any other comments on the torque check, Dave?

DAVE WALTERS

Like I said, we actually proved this with mega tech data. It's really helpful to understand if you keep your process under control and do things right, torque them right, bring them up the torque, these systems are very good. Again, the key is doing them right the first time.

Behind the Wheels Podcast
Episode 4
It's All About the Torque



MIKE YAGLEY

So, what happened? Why is Canada different?

DAVE WALTERS

Okay. I can give you the history on this too, because I was actually on the panel that was called up there to help create these procedures in Canada. And what happened in Canada was they were having a lot of wheel offs. And the government up there said, wow. They had deaths. They had an epidemic. And they said, we got to do something to ensure that this doesn't keep happening. Wheels are falling off trucks right and left, and we got to do something.

DAVE WALTERS

So, they called a panel of us industry experts, as they called us, to come up. Help us write their training program, what they would have to do to train the person correctly. And we were using our TMC user's guide to wheels and rims and all that. Technically they wanted us to put together where they could come in and train the guy, like an eight-hour class, give them certification, and then basically make a law up there where you had to have a licensed wheel installer put this on your truck. And then, you have to come back where you re-torque 50 to a hundred miles. Then you get like a little sticker stating that you did all that. So, I mean, it started because there was deaths. There was a numerous amount of wheel offs. And so, they put together this program.

DOUG MASON

So, I guess one thing that is important relative to the question that we had, if you're part of a fleet and the fleet has a good procedure in place, and you've got all of the records in place, you're going to know that things are being done right. And having it done specifically to a certain procedure is not going to be critical. It's going to be the data of that fleet that's going to drive how that a torque check is being done.

DOUG MASON

But, if you are simply having your tire wheel assemblies done off site, contracted out in some manner, or even like a roadside, like you mentioned before, Dave, it's important to do that recheck per the TMC recommendations because you don't know. And that is where you can get into the situations where you will potentially have a wheel off or have a situation that could have been avoided if you had done the torque check-in.

DAVE WALTER

Exactly. Now, in Canada, it's so different because it's mandated by law that the person that installed that must be certified. And then, you have to go back in 50 to a hundred miles to get it redone. Here, what I always tell people, and it's the many fleets in the many customers I deal with saying, we have Tire and Rim Association and they train tire shop personnel. And they get certified as a TRA, does basically the same class that the Canadians are doing. So, I always go a fleet, see if the guy was certified by Tire and Rim. And they even have where you can train the trainer so they can send the trainer off to all the shops up there. And then, he can come back and train the personnel at the other shop.

DAVE WALTERS

So, even in the U.S., we do have people that are trained and certified. And it's important. But, in Canada, they want the next step. In Canada has a \$50,000 fine for having a wheel fall off of a truck or a bus. Doesn't matter what happened. If a wheel falls off a truck or a bus, the owner of that vehicle is paying the \$50,000 fine. So, they went a lot further than what we have done here in the U.S. Again, I always try to tell somebody, we do have certified techs. Look for them when you go into a shop, because they'll have their TRA, TIA certification. And look for those things because you know those persons have been trained properly.

MIKE YAGLEY

So, there's a couple of things, and I want to really highlight this, because the question that Dennis had was specifically about the additional cost that he is accruing there when he goes up to Canada. And there's a couple of things that I really want to highlight that are driving that. First of all, is you have that certification. That automatically has a smaller pool of people who can do the job. And that's going to drive up the cost a little bit. Probably the bigger thing is this requirement to have the wheel re-torqued, or really it's more of a torque check, 50 to a hundred miles. And then, the fact that there's some sort of regulatory oversight of that that you have to get a sticker put on it. All of that drives additional cost up there in Canada where that's not the case down in the States. Is that an accurate summary there, Dave?

DAVE WALTERS

Yeah. I mean, the cost of what Canada has by putting this program in, and having their people trained, and certified, and just the whole system is a lot different. Where we are fortunate here in the U.S. where the Tire and Rim, or TIA is Tire Industry Association, the tire shop, people actually did this themselves. So, we don't really need government regulation. We kind of did it ourselves. We tell our people, look to see if they are TIA certified. And they are trained then to put on that. Our OSHA laws down here basically says, before you put a tire on a wheel and the wheel on a vehicle, you must be trained by the manufacturer. Basically TIA saw that in OSHA regulation and went out and did that. Wheel companies, we have training people. Tire companies have training people. But this was just much simpler for us to do. And it's not regulated by the government, so you really don't have the costs.

MIKE YAGLEY

Probably the last thing I'd like to highlight here, and I think we're sort of saying it, but I want to make sure we make it very explicit, is that additional regulations that are happening up there in Canada aren't necessarily improving their wheel off situation. They still have wheel offs up there and Canada. They have plenty of them, just like we have plenty down here in the States. And the systems that are in place, there's a lot of things that can contribute to a wheel off. If somebody chooses to use the good and tight method, I don't know that there's anything in the regulations that's going to really make sure that nobody has torqued that axle end 1200foot pounds. Do you know if there's something in those regulations, Dave? Or is it just as reliant on the mechanic as it is down here?

DAVE WALTERS

It's very reliant on the mechanic. In their regulations, they say, tighten them with like a half inch gun and bring them up to torque. But again, we train our guys the same way. And what I always say, in the heat of battle are those practices always followed? No. And unfortunately, that's really the problem.

DAVE WALTERS

I mean, years ago, mounting tires onto wheels, people used ether and different other things. And basically, a lot of the tire shop owners said, if we find a can of ether in your truck, you're going to get fired. It's almost that way with the one-inch gun. If we find a one-inch gun in your truck, we're going to fire you because, unfortunately, if it's there, they use it. And it's quicker. A lot of times, that's what people do.

DAVE WALTERS

So, like I said, wheel offs are still out there. Have we done a better job than we used to? Absolutely. Canada bringing the awareness up, what they did, \$50,000 gets his attention. Here in the U.S., we have the greatest group of lawyers ever waiting for an accident or something to happen. And the awareness is there. And, us as industry people, try to keep showing more awareness. Someday, somehow we'll figure out that over torque is as bad as under torque. That's something that we just keep on speaking and hopefully it will get out there.



Behind the Wheels Podcast
Episode 4
It's All About the Torque

MIKE YAGLEY

I think that about does it. Dennis, I hope we answered your question. Re-torque, thank you very much for that question. Re-torque is a subject that's very near and dear to our hearts. I think that pretty much is it for this COVID-19. We're all in three different locations, like I mentioned, all doing it over the phone. Anybody have any final words?

DOUG MASON

Stay safe on the roads.

MIKE YAGLEY

Absolutely. And thanks to all those fleets out there who are doing the essential work of keeping those supply chains running. I think that does it. We'll see you next time.

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