



Behind the Wheels Podcast

BONUS Episode 1 From TMC with Chuck Bartley

War Stories: Wheel End Lubrication

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

Welcome to Behind the Wheels. I'm Mike Yagley, and I'm here with Chuck Bartley, a legend in wheel technology maintenance. Chuck, thank you for joining us.

CHUCK BARTLEY

Thank you, Mike. Good to be here, Mike.

MIKE YAGLEY

So we all have war stories, right?

CHUCK BARTLEY

Oh, yeah.

MIKE YAGLEY

And sometimes it's just fun to go through some of the war stories, and I'm wondering if you have any great war stories to share? I know you do.

CHUCK BARTLEY

Oh, yeah.

MIKE YAGLEY

And here's the deal. What I really want is something that, if you can tell us a story that would be helpful to our listeners, something that might teach them something that should be useful for them.

CHUCK BARTLEY

Sure. We'll go into the story, and then we'll basically tell you how to correct it.

MIKE YAGLEY

Okay.

CHUCK BARTLEY

How about that?



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MIKE YAGLEY

Sounds good.

CHUCK BARTLEY

So we go into a place, and we're going to basically do training. And usually when I go in, I try to look around the place, get a feel for what they're up against, what they're doing before I even start. And lo and behold, they're still on ball seat wheels.

MIKE YAGLEY

We just talked about ball seat.

CHUCK BARTLEY

Did you?

MIKE YAGLEY

It is a nightmare.

CHUCK BARTLEY

It is. But the worst one on this one was they were using anti-seize on the inner and outer cap nut, all over the stud.

MIKE YAGLEY

Okay, go on.

CHUCK BARTLEY

So this is just unbelievable when you see this.

MIKE YAGLEY

Because anti-seize sort of fell out of favor in the industry, right? Obviously.

CHUCK BARTLEY

Yes.

MIKE YAGLEY

So does everybody know, when you say they used anti-seize, does everybody know what you're talking about?

CHUCK BARTLEY

Oh, I'm sure.

MIKE YAGLEY

Okay.

CHUCK BARTLEY

I'm sure. I'm sure they do. But I mean, look, anti-seize is very bad in the wheel end section.

MIKE YAGLEY

Right.

CHUCK BARTLEY

Because anti-seize is a great product. Does what it says, it won't let things seize when we want to get a joint tight and stay tight. So we basically outlawed or tell them, don't use anti-seize when they're mounting hub powder or ball seat.

MIKE YAGLEY

Okay.

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CHUCK BARTLEY

But when you go into the ball seat section, you're not supposed to use any lubrication whatsoever, at all.

MIKE YAGLEY

Right. Because everything's a friction surface there.

CHUCK BARTLEY

Yes. So, then there's a technicality. You can use a drop of oil, but then you've got to drop the torque 100-foot pounds to be correct. But we just say-

MIKE YAGLEY

Right. And if you put oil on, it's only out the stud.

CHUCK BARTLEY

It's only on the stud. One to two drops, that's it. But we tell you, we really don't want you to do that. So, during a training class or whatever, they just couldn't get over anti-seize. They used it for everything. They had just gallons of this stuff. And this is what they used. I mean, it was goobed on bad, really bad. So, I can't tell about the story of what we said, but they just couldn't get over-

MIKE YAGLEY

I'm sure there were expletives involved.

CHUCK BARTLEY

Yes, but how can you do this without this anti-seize? And then it was like, okay, if you're doing this on ball seat, let's go see the hub powder section. What are you doing there? Same thing.

MIKE YAGLEY

They covered everything with anti-seize?

CHUCK BARTLEY

Everything, the whole stud, everything, so that it's behind the washer.

MIKE YAGLEY

It almost seems like the wheel wouldn't stay on.

CHUCK BARTLEY

This is why they call it. It wasn't a hard one to figure out, Mike.

MIKE YAGLEY

Okay.

CHUCK BARTLEY

So the lesson basically is you've got to do the proper cleaning, the proper lubrication to achieve the proper torque.

MIKE YAGLEY

Right.

CHUCK BARTLEY

That is just as simple as it can get. But that's the most memorable I think I can remember doing a training class.

MIKE YAGLEY

So let's say we have customers out there, let's say that somebody is out there and they're using anti-seize or they're just using lubricant. What do you tell them to fix it?

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CHUCK BARTLEY

Well, we tell them we-

MIKE YAGLEY

We all want to use lubricant. I mean, we've had a lot of discussions on the podcast already about lubricant and the importance of using it and using it properly.

CHUCK BARTLEY

It has to be used properly. So basically, if you get too much or you end up getting the lubricant behind the face, into the mounting joint or whatever, you're getting a false torque reading.

MIKE YAGLEY

Right.

CHUCK BARTLEY

So now you're losing the clamping force, clamping force, we lose wheels. About 80% of anti-seize has copper in it. Copper and aluminum don't mix well. So, when you think you're helping yourself corrosion, you're creating more corrosion.

MIKE YAGLEY

I didn't know that. That's something that [crosstalk 00:04:37].

CHUCK BARTLEY

If you look at anti-seize, about 80% of it has copper in it somewhere.

MIKE YAGLEY

From the engineering world, we tend to look, we say, "Okay, this is the specification. This is how life is supposed to work. Will it work properly? What are the specifications around that?" When we tell somebody... We put a lot of study into what we tell them. We're not typically going to try things that we know aren't going to work like anti-seize.

CHUCK BARTLEY

Right.

MIKE YAGLEY

And I have to admit, I haven't studied anti-seize. I mean, I'm familiar with it, but I don't know what the chemical breakdown is. I'm not an expert on anti-seize. So I guess it sort of surprised me, it's got copper in there.

CHUCK BARTLEY

About 80% of anti-seize has a copper in it somewhere.

MIKE YAGLEY

Okay.

CHUCK BARTLEY

Then with anti-seize, there's so many different lubricity levels that you couldn't get a consistent reading when you did clamp force. So that's why we went to motor oil from TMC doing the studies. So, we went to motor oil. Then we got into the, back in the late '90s, early 2000s, we always said 30 weight in our service manual.

MIKE YAGLEY

Yeah, that's right.

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CHUCK BARTLEY

But the guy says, "I don't have 30 weight. I have 40 weight. Why can't I use that?" Well, then it dawned on us, it doesn't matter. Motor oil is motor oil. So that's where the change came from the motor oil.

MIKE YAGLEY

Yeah, so it works either way.

CHUCK BARTLEY

Yeah.

MIKE YAGLEY

Okay. Any other war stories?

CHUCK BARTLEY

Nothing that I can really tell you.

MIKE YAGLEY

We're going to have an episode, I think, called Wheels of Shame.

CHUCK BARTLEY

Oh, yes.

MIKE YAGLEY

Or the Hall of Shame, I don't know what we're going to call it.

CHUCK BARTLEY

The Pallet of Shame.

MIKE YAGLEY

The Pallet of Shame. But we have in the back room of our office, we have a pallet of wheels that are memorably bad, that were turned in, that were given to us by customers asking for a warranty return, and they were so dramatically bad, poorly maintained. Pick one of those and why don't you tell me about it?

CHUCK BARTLEY

Oh, the whole rim flange area was caved in from probably about three of the hand hole areas from one end to the other. Big old dent. So, we call the customer and says it was an impact hit. You hit something. "I did not. I hit a pothole, that's it. Your wheel is so bad that I hit a little pothole and it caused this much damage."

MIKE YAGLEY

I hit a little pothole.

CHUCK BARTLEY

A little pothole. Lo and behold, after talking to the rest of the company, he hit a bridge abutment, but he claimed it was the little pothole. I mean, it was a huge dent.

MIKE YAGLEY

We're going to have to get back there and pull that pallet out and show our listeners some of these wheels. The thing is, is that I'm hoping we can have some lessons from them.

CHUCK BARTLEY

Oh, yeah

MIKE YAGLEY

I mean, of course, better than don't hit a bridge abutment. That one might be a little bit obvious.

CHUCK BARTLEY

Yeah. You give them A for effort for trying for the warranty, right?

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MIKE YAGLEY

But the thing is that we've got to sort of... That wheel of shame, those wheels are actually, if I remember right, and it's been a while since I've taken a look at them, but there's things we're going to learn from them.

CHUCK BARTLEY

Oh, yeah.

MIKE YAGLEY

There's things that-

CHUCK BARTLEY

Every wheel that comes in for warranty has a story, and you can learn something from it. So that's the great part about our warranty program. We study the wheel, try to figure out what happened, how to help that customer, how to fix a problem if you can see it. Or maybe they just got the wrong wheel. They specked out the wrong wheel. They need to be in severe service or whatever the case may be. But every wheel will tell you a story. It's like doing a scrap analysis is what it really is.

MIKE YAGLEY

Yeah.

CHUCK BARTLEY

You're just basically taking it, instead of being a tire and figuring it out, we're taking a wheel and trying to figure out what went wrong. Now is it a customer, is it maintenance, or was it us?

MIKE YAGLEY

Right, right. I mean, every company has their share of things that don't go perfectly.

CHUCK BARTLEY

Right.

MIKE YAGLEY

Typically a bolt hole is going to be 26 millimeters, which is a little bit more than an inch, just a fraction more than an inch. I saw one, if I remember right, the bolt holes were elongated for like three inches.

CHUCK BARTLEY

We call that the stylized Peterbilt bolt hole. That's how big they were.

MIKE YAGLEY

I don't know how you could drive with that.

CHUCK BARTLEY

I don't know how you don't feel that rocking or whatever.

MIKE YAGLEY

Exactly. Your vehicle is not riding right in that kind of environment. So that by itself is a lesson, right? If the ride is bad, probably the first thing you should be taking a look at, are your tires mounted properly? I know that one of the big things that I saw when I was... Most of my life was out in China, right?

CHUCK BARTLEY

Yep.

MIKE YAGLEY

I just could not get customers to lube the tire, the tire bead seat, the bead seat of the wheel where the tire sits on both sides. So there's four locations that they needed to lubricate, both tire bead seats and both wheel bead seats.

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CHUCK BARTLEY

Correct.

MIKE YAGLEY

I could not get them to do it, and they could not understand why their tires wouldn't mount properly.

CHUCK BARTLEY

Yeah, bead seat concentricity.

MIKE YAGLEY

That's exactly what would happen. They'd put the tire on, and they're used to steel wheels, right?

CHUCK BARTLEY

Oh, yeah.

MIKE YAGLEY

Where that whole surface is painted. Everything slips and slides across it real nice and easy, no problems. We have a machined surface on that wheel, right?

CHUCK BARTLEY

In the drop center.

MIKE YAGLEY

In the drop center in the bead seat.

CHUCK BARTLEY

15 degree drops center.

MIKE YAGLEY

Yeah, that 15 degree drop center. And so, if you look at it, you run your fingers across it, you can feel the roughness, and that roughness is going to catch that tire. That tire is not going to go on there. And we don't paint that surface. It's all just, that's just as machined. And so, what happens is when they're mounting the tire, it gets caught up on there. The tire is not concentric anymore. And you can look at the rib. There's a rib that runs-

CHUCK BARTLEY

We call it a GG ring.

MIKE YAGLEY

The GG ring. Thank you. And so, you've got that rib, the GG ring that goes along, then you can see, and so long as that's somewhat-

CHUCK BARTLEY

Symmetrical all the way around.

MIKE YAGLEY

Symmetrical, a couple of millimeters... I apologize, I speak in metric. So long as you see that consistent couple two, three, four millimeters, it's typically two or three millimeters all the way around, you're good, no problems. But when they don't lube the tire, or they only lube the tire and they don't lube the wheel, or something like this, the next thing you know, you're looking at that, and it's all over the place.

CHUCK BARTLEY

Oh, yeah. It's like dips and waves.

MIKE YAGLEY

Yeah.



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CHUCK BARTLEY

That's all you see.

MIKE YAGLE

And then they wonder why their wheel... What is this? What's wrong? Your wheel is out of round.

CHUCK BARTLEY

Why do I have imbalance? Why do I have vibration?

MIKE YAGLEY

Yeah.

CHUCK BARTLEY

Oh, yeah.

MIKE YAGLEY

And then you go and talk to them, you explain to them. And I'll tell you what happened to me. And I don't know if this ever happened to you, but it's like, "But that's going to take more time. I don't want to do that." This is a Chinese guy I'm dealing with, but he would not do it. "You guys are going to have to fix your wheels. You have to make your wheels just... paint them, do something, but I don't want to have to do extra work." I was talking to a wall trying to get him to do the right thing.

CHUCK BARTLEY

Yeah. 30 seconds, all it probably would take. Hey.

MIKE YAGLEY

Thank you, Chuck. This has been a great discussion.

CHUCK BARTLEY

Okay, Mike.

MIKE YAGLEY

I'm going to have you back some time, and we'll just sort of shoot the breeze if you-

CHUCK BARTLEY

That works.

MIKE YAGLEY

If anything of interest comes up, let me know, and we can get you on.

CHUCK BARTLEY

All right. Sounds good.

MIKE YAGLEY

Thank you.

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