



## Behind the Wheels Podcast Transcription

### Episode 10: How To Trouble Shoot Wheel End Failures – The Hub

#### 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 another episode of behind the wheels. I'm Mike Yagley.

#### DOUG MASON

I'm Doug Mason.

#### DAVE WALTERS

And I'm Dave Walters.

#### MIKE YAGLEY

I've been looking forward to this show. We're going to be talking about axle end problems, about how to troubleshoot wheel end failures. But today we're going to be focusing mostly, pretty much exclusively probably, on the hub and the kinds of things that can go wrong with the hub and the kinds of things that have changed. The industry is changing dramatically, every component in the vehicle is in a just huge flux. And the hub is also over the past 10, 20 years especially, there's been a lot, has that has changed with the axle end and with the hub. And so what we're going to be doing is we're going to be talking a little bit about that and about how you can troubleshoot when you know something's going wrong with your hub and what you can do, what you can change in your maintenance processes to make sure that you don't go down those roads in the future.

#### DOUG MASON

I think we should start off with maybe Mike, just some of the things that are maybe warning signs or something that is occurring in your wheel end that might give you an indication that you're starting to have issues. And some of those things might be a wheel noise or vibration, a wheel wobble. Obviously, if you have anything smoking or anything like that could be an issue. And also just if things are getting overheated, I mean, the hub cover could be hot to the touch, could be having wheel lockup. It could be having increased stopping distances. And so when you start having stuff like that, or even abnormal tire wear, maybe a good time to start taking a look at your wheel end to see if there is a concern.




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#### MIKE YAGLEY

When you start having those kinds of things, go wrong with your axle end, your things get a little bit hot. You have one axle end that's getting hot, unusually hot. We're going to be focusing today on hubs and it may be the hub, but it may be just a bunch of other things. You could have break problems. You could have... We could go on. And on the scope of that discussion is a little bit big for just this one episode. So we'll be having this kind of discussion, these troubleshooting discussions over the course of several episodes, just peppered in with the rest of our shows. Let's talk a little bit about that, Dave. What are the kinds of things that you see in the field when a hub starts going sideways on ya?

#### DAVE WALTERS

The big thing that really changed in the hubs is most of them are preset hubs now. And preset hubs has really changed the industry because now the original equipment, set the preset on them. So when they're installed, the mechanic's really not adjusting them. So that's done really well for issues as far as bearings go. And then the use of synthetic lube has really helped that. So what we used to think was bearing issues, wheel seal issues. Those are a lot better, but in the same breath, when you have a preset hub and it's been an industry practice to hammer in studs and hammer out studs, you don't want to really be hammering on a preset hub type of thing. So your practices kind of have to change as technology comes more and more prevalent in our industry.

#### DOUG MASON

Dave, what would you say? Let's say someone did go ahead and they're running preset hubs and their practice is to pound them in and out. What would you expect them to see from that? What kind of issues is that going to do?

#### DAVE WALTERS

There's a couple issues that I've seen. And one is you could actually when you're beating the studs in and out, if you don't hit the stud square, especially when you're installing them, and you hit them on one side or the other, and you put a burr that doesn't really seat properly. And when it doesn't seat properly, as you tighten up the joint, you run the truck and you have a place where it can basically become loose. So you have basically then stud issues, stud break.

#### DAVE WALTERS

I'm very involved in TMC and TMC wrote a practice of pressing studs in and out. There's many manufacturers that make tools that actually can pull the studs in and push them back out. So you're not beating on these pretty sophisticated hubs now with the presets. And you don't, you don't want to screw up this bearing loads and the presets and the wheel seals, so pressing the studs in and out has become what we all want to see in the industry where there used to be standard practice of beating the men and being them out.

#### DOUG MASON

So if you do beat them in and out relative to the hub, are you saying that you could mess up the seals and start getting a leak then, or your presets set up and you're going to start getting a wobble or something like that?

#### DAVE WALTERS

You could, I mean, those are great possibilities where back in the days of the non-preset hubs, it was very common to do that. But you know, the more and more you understand the sophistication of these products and aluminum hubs in the market is a gigantic player. You really don't want to be beaten on them aluminum hubs like they did with the old steel hub. So a lot of things have changed and I'll bring up that the studs are basically the springs, they stretch every time to hold the wheels on, we've talked about that many episodes. When these guys go to buy studs, if they don't know and buy reparable studs, they can have a lot of problems down the road.

#### DOUG MASON

Yeah. You got to make sure you get 10.9s as we've said many times before. And a quality stud makes all the difference relative to making sure you have the correct tension in the joint so that you do not have any potential loose wheels or loss of wheel obviously.

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#### DAVE WALTERS

Absolutely. The other thing that you see in hubs now is they'll have like a squealer band on them. And I've even seen cases where that squealer band got warped to the point where it was kind of like applying the brakes and then you have really the break issue, but it was caused by the squealer band activating the sensor. So people've got to understand their sensors for many things in the axle end now where at one time, there was zero sensors in the axle ends and right now, the tire pressure monitoring system's there, the brake systems are there with sensors. So it's becoming a lot more electronic than what it ever was in the past.

#### DOUG MASON

There's some temperature sensors in place down now, too, as well. Right?

#### Dave Walters

Absolutely. And when I go out in the field and you got heat issues, you try to explain to somebody, I was just talking to a major fleet. And I said that the tire starts melting about 290. 400 degrees, the wheels can be affected. The hubs are a little bit... When you go out and you see a hub, that's definitely been overheated. It could be 500, 550 degrees. So each part of the system has its own little part where it can be effected by heat. So knowing which components, what heat they can take is a very big thing. That's why the sensors are becoming more and more important.

#### DOUG MASON

I was reading, I'm not real experienced in the lubes, but I think they run around 325 or something like that. 350 is what the lubes typically end up. Do you know that?

#### DAVE WALTERS

Yeah. The lubes and the synthetic lubes are very good. You know, I come from the days of packing wheel bearings and putting them in there and the grease didn't have the higher temperatures like these synthetic lubes. And you know, when we talk about bearings, Mike brought it up earlier a few years, we were having a little trouble with the wide base wheels in the market and with the different offsets. And you know, when you've really gotten into the deep dive of that, the true blue issue was if you didn't the bearings, there was some off-shore bearings that was causing a lot of problems in our industry. Put it that way.

#### MIKE YAGLEY

Yeah. I was, I was deeply involved with that project and Meritor has a great white paper on bearings on their website, just for free download, to try and educate the public about what to look for in bearings, how you can tell a good bearing from a bad bearing when you're in the purchasing. I strongly advise anybody to take a look at that. They did a lot of work and made it available to everybody. So I learned a lot about bearings, but that was, you're exactly right, Dave. It was if you bought real high quality name brand bearings, that wide base problem didn't show up. Nobody saw it. You know, you could have high offset wide base wheel without any problem. So it took a long time to chase that down. But that was certainly one of the more interesting projects I've worked on in my life

#### DAVE WALTERS

Every day, when you go out and will people say the P end spindle, they called them P ends. The P end spindles with the tapered bearings tended not to have any issues. And the other end to end was much more effective for that. So there was a lot of things going on in that, than the life of that at that time.

#### DOUG MASON

Dave, one of the things that you're always, always telling us and reminding us, especially in these times right now, is that when you do have an issue and you do have a failure of some type, how important it is to really be like a forensic investigator, make sure you save all of the evidence, take as many pictures and not just of the actual failed component, but all adjacent components. Specifically, if people can't get out to review them, you were saying that in some of the instances recently, you've had to diagnose things over the internet rather than going in person. You want to give us a little detail on that?

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#### DAVE WALTERS

You know, I'm telling everybody right now because of the COVID and what we've gone through, diagnosing pieces and failures are a lot different to years ago. Every time you had a major issue, you'd send somebody out there to look over all the pieces and parts and study what happened. The really, because of so many things that's going on in life, that's not being able to cross the border and you know, even to Canada right now, that's a major issue. So what I tell everybody is get as many pictures as you can of every wheel end part that comes in conjunction with the part you think that failed and make sure that you kind of get a history of everything.

#### DAVE WALTERS

Because what you're finding is these people, their driver might be at the scene and he'll say, "I don't know what really happened. I went in to eat and I really didn't look at any of this stuff." Well, get as many pictures as you can from somebody there or from the company who's doing your work and save the pieces, have the pieces send back because once those pieces are destroyed, you really can't reenact what happened. So all we're trying to do is if you ask somebody like us to come out and look at all these things, if you have the pieces, I'm very confident we can piece together a great story for you, but we really can't if we don't have the pieces. Photos are good, but the pieces are even better. Try to save your pieces and parts. And people say, "Well, I don't want to ship them in from someplace." Well, the shipping cost might be the cheapest thing to diagnose an issue.

#### DAVE WALTERS

And I'll give you an example. There was a trailer builder, and he was having some issues with overheating. Took pictures. We really didn't take pictures of the brake drum or any of that. Once he got the pieces back and I got to go to their facility, it was a brake issue. And what they were doing was the trailer brake handle. They were actually storing all the keys to their loads on that trailer brake, and it was activating it. So, I mean, when you get into these problems, you have the wheel, you've got the hubs. And this was with disc brakes too, which was becoming more and more prevalent. As you're deep diving into some of these troubleshootings, once you get the pieces back, it really tells a great sign of what happened and how it happened. So where you people that drive the trucks or own trucks are in the maintenance, get the pieces back, and we can probably piece together the story.

#### DOUG MASON

Dave you talked about the preset. And you've talked about lubes and studs. What would be the next item that you would want to bring up as a concern or a common issue?

#### DAVE WALTERS

Like I said, the wheel seals has always been an issue of late, but really that has become probably really, really improvement in my timeframe in the industry. I mean, that used to be where the wheel seal was leaking and you lost your lube, the bearing heated up and the wheel seals are really improved. I mean, that, to me, that, what I see when you get into the hubs right now, one of the big issues is still seating that brake drum on that hub. And there's a little lip where you know, that brake drum is seated and if it's not cleaned and properly seated, you're going to have some major issues. And I was just on another diagnosis of a wheel end via the computer and they did not get the drum seat in properly. And those wheels come loose pretty quick and cause major damage.

#### MIKE YAGLEY

You know, We were talking a little bit before we went on and we were talking about the heat. And one of the things, a story you told me, you told us during that was somebody had changed their pads, the brake pads, and that friction material change caused a dramatic increase in axle end heat. And it got me thinking about the importance of, we're talking about the importance of having the pictures and have all the information about what happened, but it's also valuable to have good information about what was there before. Have that history. If you have the history of what parts were in place previously, then that might also come into play.

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#### DAVE WALTERS

Absolutely. I try to tell everybody a truck or trailer from an original equipment manufacturer, most of the time, the pieces and parts that they assemble, they know what they're doing. And all of a sudden, you say, "Well, I'm going to change friction material." Well, is that friction material going to cause you to stop faster? Or is it cheaper or what? It's all kind of like, "Why did they start out with this type of friction material? But I think I'm going to change to another one."

#### DAVE WALTERS

And it really can cause you dramatic heat issues, especially in the markets that you're starting and stopping a lot. Refuge hauling is probably the most stop and start. So when those guys change friction material, city buses stop and go all the time, when they change friction material it's really effective. So we used to go out there and do a lot of heat studies, put actual little sensors, or they're not sensors or like heat strips on them. And then we can tell what kind of temperature you're getting.

#### DAVE WALTERS

And I remember being out with one of the engineers from one of the tire companies. And he's like, "Guys, every time you change that, the window of what melts tire bead and what doesn't, that's really something to know." Understand what type of friction material they've got and what you're putting on. And especially your type of industry.

#### MIKE YAGLEY

As I've talked to customers, people will ask me, well, how hot can a wheel get? My first answer is always, if you're not melting the tire, you're not damaging the wheel. The tire is the canary in the coal mine when it comes to the wheel tire system. And it's a lot of these things that you're talking about with the increase of heat, you'll see it in the tire. You know, sometimes depending on what we're talking about, but like the hub, especially hub and wheel, that's going to show up in the tire pretty quickly. Is that what you see Dave?

#### DAVE WALTERS

As I would always tell somebody, whatever the quote, unquote weakest link, and tires melt before it affects the wheel and affects the hub and affects the drums. So that's where you're going to see it probably first. People will say, well, how can that all be related? Well, when you get into a wheel and everything is kind of related, so that's why you want to do this troubleshooting of a wheel end. You might not even think the brake would affect the tire, but it does. There's instances where you just don't relate that. I always go back to studs because studs and cap nuts are such an important part of the system and people will just take them for granted. And they are so important and buying quality fasteners and quality cap nuts and properly oiling them and doing the right practices are critical and people will say, "Oh, I've done it that way forever." Well, folks, the world has changed and oversea parts or counterfeit parts are part of our society. And you better understand that.

#### MIKE YAGLEY

Right. So Dave, is there anything else just really, we've tried to focus on, we've drifted off a little bit into the brakes, but we've tried to focus on the hubs. Is there anything else with the hubs? And actually, the one thing I did want to ask you is we talked briefly about the synthetic lube and how good that is. Have you seen any downside to the change to the synthetic lube?

#### DAVE WALTERS

The downside to the fleets is the cost of it. Every time I always tell somebody if you're only downsize of a product's the cost of it, that's okay. That's really the downside. So I've seen a lot less. We will see a leakage. I guess what I'm saying is, from my perspective, the downside is the cost of it.

#### MIKE YAGLEY

Okay. Well, is there any other items we need to talk about, Dave, with the hub?

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#### DAVE WALTERS

No, I believe we were just kind of giving the highlights of what might happen or what type of failure might. And like you said, a lot of times it's caused by something else, but you kind of have to piece all this together as a whole wheel end, just not a wheel issue or a tire issue. You might have to deep dive more into the wheel end.

#### DOUG MASON

And I guess the key as we always say is prevent it before it happens. So there are a number of walk around inspections you do when you are going out for the day or for the week, whatever it might be. And monthly, quarterly. All these things. There's plenty of things the OEM manufacturers give information on to check, confirm the issues before they get too bad. And so I guess we would always say be safe and do those checks, make sure that you catch the error before it happens. But if something does occur, like you said, Dave, we need the parts and the pictures to be able to diagnose really what's going on.

#### MIKE YAGLEY

All right. Well, I think that does it for this episode of behind the wheels. Thank you for joining us. We'll see you next time.

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