REPORTER'S RECORD

VOLUME 6 OF 12 VOLUMES

COURT OF APPEALS NO. 13-24-00525-CV

TRIAL COURT CAUSE NO. DC-C202300105

NICHOLAS JOHNSON	)	IN THE DISTRICT COURT
	)	
VS.	)	JOHNSON COUNTY, TEXAS
	)	
ENGINEERED PERFORMANCE RACING, AND MITCHELL WILSON	)	413TH JUDICIAL DISTRICT

JURY TRIAL

On JUNE 5, 2024, the following proceedings came on to be heard in the above-entitled and numbered cause before the Honorable John E. Neill, Judge presiding, held in Cleburne, Johnson County, Texas:

Proceedings reported by Machine Shorthand.

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I N D E X

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JURY TRIAL

EXHIBITS

P R O C E E D I N G

(Jury not present.)

THE COURT: Anything we need to take up before the Jury comes in?

MR. HURLEY: I think so, Your Honor.

THE COURT: Okay. Let's -- Are you ready? Let's go on the record then. This is --

MR. HURLEY: Judge, I don't know that we need this to be on the record.

THE COURT: Oh, we don't. Okay. We're off the record.

(Off-the-record discussion.)

THE COURT: We're on. Go ahead.

MR. MATOUKA: So the parties have discussed -- there's an issue as to attorney fees here, but the parties have agreed that we could submit expert testimony in the form of affidavits to the Court after the close of trial.

MR. HURLEY: Submit that issue to the bench.

THE COURT: Okay.

MR. MATOUKA: And so in our view, that will actually speed up the trial and move us along while still addressing that issue.

THE COURT: Okay. So there won't necessarily be a, I guess, a Jury issue.

MR. HURLEY: Yeah, we'll have to take that out.

MR. MATOUKA: Yes, sir, Your Honor.

THE COURT: Okay. Very good. Anything else?

MR. HURLEY: No, sir.

MR. MATOUKA: Not from Plaintiff, Your Honor.

THE COURT: Is the Jury here?

THE BAILIFF: Yes, sir.

THE COURT: All of them are here?

THE BAILIFF: Yes, sir.

THE COURT: Plaintiff ready to proceed?

MR. MATOUKA: Yes, Your Honor.

THE COURT: And Defense as well?

MR. HURLEY: Yes, Your Honor.

THE COURT: All right. Thank you. Let's go ahead and bring them in.

(Jury present.)

THE COURT: Y'all can be seated. We stand in your honor when you come in.

You can be seated, Counsel.

Good morning. My name is John Neill. I am not Judge Bosworth. Judge Bosworth, early this morning, was called to a family emergency, so I agreed to step in and to take -- preside over the trial. I hope that's not too much of an inconvenience for y'all or the parties to

this case.

Let me give you a little bit of procedure on how we'll work. It may be the same as Judge Bosworth. I don't know. It may be a little bit different. But we'll go today until about 10:15 or 10:30, take about a 15-minute break. And then we'll go until lunch, take a break about noon, lunch break for an hour-and-a-half, come back at 1:30 and do it all again in the afternoon, take a break at about 3:00 for about 15 minutes, then we'll try to conclude about 4:30 each day. Okay.

So I am actually a Judge of Court-At-Law One which is two floors up. I've got a docket, a very small docket for the next three days, which is how I'm able to handle this trial as well. What that does mean though is that I may need to take a break when it's not one of those regularly scheduled breaks to go up and handle a mental health type hearing or a juvenile hearing, something like that. Okay. So just be patient with me as we go through this.

I picked it up this morning. The attorneys came in and briefed me on the case. They came in early to brief me on the case so I'm up to speed as much as I think I can be. All right.

This is C202300105. It's Johnson versus Engineered Performance Racing and Mitchell Wilson.

Is the Plaintiff ready to proceed this morning?

MR. MATOUKA: Yes, Your Honor.

THE COURT: And Defendants are ready as well?

MR. HURLEY: Yes, Your Honor.

THE COURT: Thank you. All right. Your next witness.

MR. MATOUKA: Plaintiff calls Matt Pool.

THE COURT: Sir, if you'll come right around the Court Reporter, up the ramp, I'll get you sworn in.

THE WITNESS: Yes, sir.

THE COURT: The hidden ramp. Come on up.

(Witness sworn.)

THE COURT: Just have a seat for me. Once you get settled in, if you'll pull that microphone down towards you, state your name for the record, and spell both your first and your last names for me.

THE WITNESS: You want full name or what I go by?

THE COURT: Let's go full name and then tell me what you go by as well.

THE WITNESS: Okay. Name is Steven Matthew Pool, S-T-E-V-E-N, M-A-T-T-H-E-W, P-O-O-L, and I go by Matt.

THE COURT: Thank you.

Go ahead, Counsel.

MATTHEW POOL,

Having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. MATOUKA:

Q. Good afternoon -- or good morning, I'm sorry, Mr. Pool. How are you doing today?

A. Sinking in the seat. Sorry.

Q. So let's get a back -- a bit of your background. What do you currently do for a living?

A. I work for the City of Garland, Street Design Department, civil engineering.

Q. Okay. And, I guess, what is your background and education?

A. Background, well, education, mechanical engineering. Basically, background, I've been designing and building stuff since I was 13. Between structural, mechanical and civil, I've been running numbers all my life.

Q. And where did you go to school?

A. Sacramento State in California.

Q. Okay. And are you familiar with the car at issue and the engine at issue in this matter?

A. The engine in this matter, yes. Yes. I have a pretty good knowledge, well, vast knowledge on the engine

itself as far as how it operates and all that good stuff, but this particular motor, I've got a vast amount of information on it as well, because I was part of the process of getting it tuned and during some of the assembly.

Q. Okay. And let's kind of back up a little bit. The type of car at issue here is a 1995 Nissan 300 ZX, correct?

A. Correct.

Q. And are you familiar with those cars?

A. Yes, it's -- '90 to '96, it was sold in the U.S. They were made up through '98 in Japan. We can still access some of the -- what we call JDM cars from Japan, but otherwise, I've been working on the Nissan 300ZX, the VG30DE motor and DET, DT for 24 years now.

Q. And, I mean, how have you been working on these motors?

A. Everything from bringing them back to life to made a thousand-nine horsepower out of them. And I had a shop for about eight years before I decided to go back to engineering because I'm not a very good businessman. I'm too nice.

Q. And, so, but you do you still work on these motors?

A. All the time. I got five in my little

thousand-square-foot shop right now.

Q. So you have extensive experience with this type of engine?

A. Yes, very extensive.

Q. And you -- are you experienced using -- Well, strike that. What type of tools do you use when you're working on these engines?

A. Typically, everything from dial indicators, micrometers, calipers, your typical screwdrivers and wrenches, torque wrenches, strain gauges, and whatever it takes to assemble the motor properly.

Q. And have people come to you in the past to help them diagnose engine failures?

A. Yes.

Q. Is that something you do fairly frequently?

A. Most of the time, yeah, because by the time I'm getting in to do a build for somebody, it's because they've had a failure and they're, excuse me, ready to move to the next level, and usually that's go big.

MR. MATOUKA: Your Honor, I'd move to designate him as a expert witness on machining and assessing the engine at issue in this case.

THE COURT: Mr. Hurley.

MR. HURLEY: Your Honor, he's been designated per the rules, however, we'd still like the opportunity,

obviously, to cross-examine him on qualifications.

THE COURT: Very good. Thank you. You can continue.

Q. (BY MR. MATOUKA) So as -- were you hired by Plaintiff in this matter to look into the failure of the engine?

A. No, I was not.

Q. Were you hired by his counsel?

A. Yes, I was.

Q. And as part of that, how did you go about forming an opinion?

A. On what in particular?

Q. On the ultimate cause of the engine failure in August of '21.

A. Nick and I, you know, had numerous conversation. Basically, all the information he was sharing with Mitch, he shared with myself, since Mitch and I were vested, had vested interest in the motor. So he was sharing the same information with me, and I was looking it over as well trying to help him, you know, kind of figure out what happened, why it happened and, you know, how easy or difficult it is to fix.

Q. And after you were retained by Mr. Johnson's counsel, did you review a significant amount of information?

A. Yes.
Q. And --
A. A lot.
Q. And can you, I guess, briefly describe what you reviewed as in forming your opinion?
A. Well, there's a couple of things I reviewed that, unfortunately, we can't mention. But otherwise, looking at all the photos from every piston, ring lands, bearings, bearing conditions, videos of measurements that we've seen, deck height, the, I guess, information or findings from the other three shops, you know, what their findings were, and just kind of look through them all to validate or question things myself. I never take anything at face value. I always try to look a little deeper just to make sure we're all on the same page. And if I'm going to help at all, that I can help in the right way, point in the right direction.

MR. MATOUKA: Absolutely.

Your Honor, may we approach?

THE COURT: Yes, sir.

(The following occurred at the bench, outside the presence of the Jury.)

MR. MATOUKA: Your Honor, there, as part of his review, there is a disputed exhibit, No. 10, the King report.

MR. HURLEY: Uh-huh.

MR. MATOUKA: It is Plaintiff's belief that he should be able to rely upon it as part of his expert opinion. There's been argument as to whether it's admissible hearsay, so there's already been a ruling on that, so I wanted to bring it to your attention before I try to submit it.

MR. HURLEY: So I totally agree he can rely on it. I do not think it's admissible for the same reasons Judge Bosworth said before. So I think he can say he relied on it. I don't think he can testify as to its contents because of it being hearsay.

THE COURT: I agree.

(The following occurred in open court.)

Q. (BY MR. MATOUKA) Without telling me the contents, did you review a report from the manufacturer of the bearings in this issue?

A. Yes, I did.

Q. And was that something you relied upon in forming your opinion on this matter?

A. Not really.

Q. Was it consistent with your understanding of the cause of the fault?

A. Yes, and it fit in line with, you know, what we were finding.

Q. Okay. So I guess let's kind of start with what is your understanding, what is your opinion as to the cause of the engine failure on August 30th, 2021?

A. Well, my opinion of it, based on, I guess, for lack of better words, the pictures and the videos, the -- I will call them facts at this point that have been, you know, given, there was not sufficient oil clearance in the main bores. It was a little too tight for the amount of power that was used or that was given. It wasn't set up for the power goals that it was supposed to be set up for.

Q. And when you say the clearances were too tight, is -- were they too tight for a stock engine or just a high performance engine?

A. A high performance engine. Stock engine, it was right -- right at the top end of the standard limit on the sides where we're having the issue, the side oil clearance.

Q. Okay.

A. Sorry. I had to clarify.

Q. I guess, can you explain what parts or what pieces of evidence that you reviewed led you to that conclusion?

A. Watching the video, watching the three different machinists do their bore measurements with the dial indicators and everything. I've used those same dial

indicators. I personally have a digital one that I use now. But when I was watching those, basically, we were looking for -- or I was watching for the difference from the measurement from top to bottom. If we're talking a concentric circle, which is what the bore should be, no matter where you measure, it should always come back to zero.

Well, in the case of the measurements that were shown, you see he zeros it, and as you move around, it's significantly off the zero. You do have a tolerance of roughly half-a-thousandth of clearance, a variance to go, which was in the limit, but it was -- it looked as though it was depicting roughly one-and-a-half-thousandths, about three times that limit.

Q. Okay. And how could that -- I guess, for everyone here who doesn't understand engines, we're talking about main housing bores and bearings, how could that lead to an engine failure?

A. Well, when you're dealing with a tight tolerance, with oil, you're using -- the oil is your hydraulic barrier, so a viscous barrier that's trying not to get the parts to touch. You don't want metal on metal. We all know what happens with that. It tends to weld itself, and if it's moving, it tries to move everything else that it's

welded to.

So the oil clearance, the viscous barrier is there, that hydraulic barrier is there to resist that force that's coming down from the piston pushing on it. If it's not large enough -- Like, for instance, the crank has a certain amount of torsion and flex that it will move because it's being loaded heavily. So that oil clearance maintains that barrier and keeps it away from touching the bearings.

But the bearings are there as kind of a sacrificial material, so that, hopefully, you don't destroy the block. You can change out the bearings, but the idea is you don't want it to touch the bearings. You want it to live long and have a good, prosperous life with power. So if it's too tight, that flex and torsion from the power will push it and it will push past that small barrier, and then it touches the bearing. The second it touches the bearing, it grabs it and tries to spin it. And that's where we get the term "spun a bearing".

So if you don't have the right oil clearance to facilitate the power in that torsion and that, you know, that flex, it's going to fail. It's going to touch, and there's no ifs, ands, or buts about it.

Q. And did you consider other potential causes for engine failure?

A. Yes.

Q. And can you identify what other potential causes you considered?

A. Well, a lot of them were, basically, you know, what was in the oil filter, how many oil changes were done, was it fresh oil before, you know, the particular dyno day, kind of what was the process that led -- that you got to before you went to the dyno as far as did it -- in line with the normal practices that we all typically do in the motorsport industry, and just trying to assess, okay, did anything else happen, anything else unusual.

I'm looking -- like I was chatting with Nick a few times, I was asking was there any noises, anything unusual that led up to before getting there. And everything came back, you know, no, everything was fine, you know, until, of course, we see the dyno and I see the dyno charts and the runs, the pulls that they did.

And they -- Abbey Motorsports basically did their due diligence. They started out light like you're supposed to and kind of see where everything is at, and slowly ramp things up, you know, find issues early on before, hey, let's send this thing to the moon and not know are we going to get there.

And it held to a certain point. It held a certain amount of power back because it had just enough

oil barrier. After the fact, after we see all the measurements, it had enough oil barrier for a certain amount of power, but not necessarily the power that Nick finally ultimately hit.

Q. And I'm just getting -- I'm working to get exhibit -- what's been marked as Exhibit 5, I believe, the dyno chart that you were referencing.

All right. Can you explain, I guess, just broadly, what it is we're looking at here, what this -- this is?

A. Okay. This is actually not necessarily a dyno chart, but the data log from -- it looks like session 6 run 5, so probably one of the last runs of the day. That's the data log from the ECU that was recording, you know, records all the sensors and everything for analysis as you're going through, excuse me, because as you do the dyno, you see the power and the tort curve, the airflow ratios, which also depict here as well, boost levels. And then you analyze that data versus what you have in the computer, make changes to the computer, adjusting injector pulls for the air/fuel ratio or modifying the ignition timing to fire it off a little sooner or a little bit later, depending on where your power band is and what's happening.

In this case, it's -- looks like it's just

one of the last runs where right about, I would say 12 seconds or so, I noticed a little flat line or a little break, yeah, right in there, a little break in the oil pressure on the second, the second graph, where it goes up, kind of kicked down just a hair.

In that run there is, based on what Nick was telling me, when they had oil pressure issues. When I was looking over the data, well, it started right there. Something started to happen there where we start to drop, the oil pressure.

And then ultimately at the end at about 17 seconds, you can actually -- It's hard to see in the chart here, but -- Actually, go back just a little bit. Right -- yeah, right after that is where you can actually see a little more of a dip. Everything is still on the upward climb on the RPMs, but you've got another drop here where I think the final failure hit before they pulled it off the dyno where it got -- it looked like the 10 PSI or so drop happened.

And then from there, it was kind of, okay, that's where they stopped. But up to that point, most everything -- the only thing that always kind of jumped up was a similar issue that Mitch and I had when we were on the engine dyno was a discrepancy in the wide band O2s, which measure the air/fuel ratio, the top chart there.

Normally, we like to see those right on top of each other. They, I mean, both sides of the motor are working properly, they're working the same. But Mitch and I had a similar issue on it where I think I found it was a deficient O2 sensor itself. When we moved it around, it followed the sensor. Okay. Checked everything else on it. And that's when Mitch and I agreed, okay, we've got one good sensor, we can run it just fine. Abbey Motorsports found the same thing. From what I understand, they ran another one in the other tailpipe, a secondary one, matched it to the good one, and off they went.

So here it does show that discrepancy. I -- you know, I guess for lack of words, take it as a grain of salt, because Mitch and I also had a similar discussion when we were on the engine dyno and everything was -- you know, we determined that everything was sufficient to keep running the motor, as did Abbey Motorsports after they did their due diligence of checking O2s and putting their own wide band sensor in and verifying it, yes, this sensor isn't good, we're not going to use it, we're going to use -- but we're measuring both sides of the engine and getting the same results.

Q. And would that be the sensor that Mr. Johnson testified about being plugged into the tailpipe?

A. Yes, sir.

Q. All right. Mr. Johnson also testified about a knock sensor. Can you explain what that is?

A. Yes. A knock sensor, on these motors in particular, there's only one, and it sits right top dead center of the back of the motor. And it's basically a -- or, well, it's a microphone. It's listening for vibrations, for noises, for -- it picks up different frequencies. But the computer is programmed to measure a certain frequency that's called knock. It happens during preignition, you know, like when you're driving down the road, if you've ever heard a car or been in one of your own, give it a lot of gas, it's a hot day, and all of the sudden you kind of get that "beans in a coffee can" type of sound. That's typically your preignition dieseling, well, dieseling is a little different, but preignition, too hot and it's firing off too early and it creates a vibration in a frequency that the ECU picks up.

There are safety parameters in the computer that pull down timing, add fuel to try to save that, but the knock sensor picks up that. You can watch it either in a data log, or like when you're on a dyno, you can plug in a set of headphones, listen more intently so you kind of get rid of all the exhaust and engine noise that you're listening to, lets you focus on just that.

But, otherwise, yeah, the knock sensor is

there to let you know if something is not right and you should stop sooner than later. In this case, the knock sensor data that I did when I went through the data log --

Not sure I can get you to pull that up.

Go down. Knock Sensor One levels. Yeah, not the threshold, just the knock levels. Yes. Can you scale that up maybe?

(Off-the-record discussion.)

A. Try the knock threshold then.

Q. You want me to add knock threshold?

A. Yeah. For some reason, the sensor level is not there. Yeah. There we go.

Okay. So what this is telling or showing us in the knock sensor readings, up till the end of the run, roughly which is about 20, 25 seconds where the run ended and you see the knock fall off, what this is showing us is that there's engine noise, there's vibration, there's things that it's picking up. But there's a threshold, so to speak. There's a standard to it. And, typically, driving around town, it's roughly about 34 decibels, nothing spectacular.

Full bore in the middle of a run, it can go 50 to 60 decibels. Anything over that, you're, okay, you might want to look at something. You want to try to lower that. You start adjusting the tune, adding more fuel,

taking timing out, whatever you need to to get the threshold down, because when you start getting into the higher thresholds, the higher decibel that it's picking up, it's sensing something is not right, and one that can trigger a safety feature, which kind of takes away from the fun of tuning the car right because now you're trying to fight a safety feature to tune again. So you don't want that. You want to fix the problem so you can keep tuning properly.

But in this case, yeah, we barely peaked the 50 mark, and under the normal circumstances, that's right there within, I guess, a standard or normal level for what we're doing. Nothing spectacular jumps out at me other than, yes, it slowly ramps up as it should, engine vibrations are going up, power is going up, it's increasing the RPM. And then at the end, the only question that always got me was as soon as it dropped, a couple of good spikes after that, and that could be one of two things of where we lost oil pressure, maybe just got a little vibration in the crank for whatever reason, that picked up as a knock reading, or, it could just be an anomaly, not sure.

But the section in particular talking about from the bottom to the ramp to the top and the run ended is basically your critical info. And right now, that's --

as that sat in that last run, yeah, run -- session 6, run 5, it was all still well within normal, even flatlined at the top at the end of the run, like it was -- you know, it had settled in, still within normal parameters.

Q. And what happens, let's say you have an engine knock and you ignore it, what could happen?

A. Small knock or small noise like this, virtually nothing. High knock where you hear it and it's significantly loud, if you hear it outside the car and you let it go for way too long, you can melt pistons, crack ring lands, melt valve seats, burn up spark plugs. If it's in a high enough horsepower car, you can start bending wrist pins, folding -- folding the pistons, bending -- or bending rods, destroying rod bearings. You can -- You let it go long enough, you can destroy the motor.

Q. And is it your understanding that Defendant's contention is that an improper tune here caused the failure?

A. Based on everything that I looked through, Abbey Motorsports did way more than I expected. They did their job. They did their job. I mean, they -- the fact that they got twenty -- I think it was 24 runs through it, you know, they were doing their due diligence going through. It's a new ECU, not a factory ECU, so it's what we call

standalone, so it requires more in depth tuning. So, again, you start small, you load it up on, you know, a loaded eddy current style dyno to get all the different load cells so you can tune it properly for everyday driving, drive it up and down a hill, whatnot. And they did. They started out small, only going halfway through the power band or RPM band until they got to the end when, okay, it's -- the car is responding like it should, up until that point.

And then once the boost level and power level got beyond the oil clearance, then, you know, I think they only made two or three full boost runs in it before they had to abort.

Q. You mentioned eddy current brake.

A. Yes.

Q. What is that?

A. Eddy current dyno or eddy brakes on the dyno is a giant electrical current, magnetic current that slows the dyno down as the car is forcing or pushing through it. You can turn it off and just let the car run and measure it, or what we call load it up using the eddy current to hold the car in a particular RPM band, hold it at a RPM so you can actually give it throttle but hold it there, and that way it will move the load calculation in the maps, in the fuel and timing maps across, so you can actually make

sure that you can check the power and the torque levels to get them where they're supposed to be, make sure the air/fuel ratios are correct and all that good stuff in all of the cells, not just -- Because if you -- if on a brand new standalone style ECU, you just put it in and run it with no load on it or no variable load, no like driving around town and all the different variations you have, just like, you know, just straight run like you're running down a drag strip, you only run in a very small swath of the map. Well, if you only tune that bit of the map, any time you get outside that map, driving around town for whatever reason, then you're not in tune, and then you can ruin the motor.

So an eddy brake dyno is typically the only dynos I personally use between Mustang dynos, Dynapacks, Dynocoms. Some Dynojets have them. But I think in this case, Abbey Motorsports was on a Dynapack setup, if I remember correctly, which is a eddy current based dyno. So it can do just that. You can load it up and get the full tune. And that's one of the reasons why you put 30 runs through it is you're going different cells, you're making sure that the map matches, you're blending stuff in and getting it dialed in. Otherwise, you can just run it.

Q. And --

A. And tune it through this little tiny area.

Q. And I apologize first for speaking over you. I've thrown the throttle position and RPM on there, and I can blow that up.

A. No, I can see it.

Q. Do you see any evidence of an eddy current brake being used here?

A. Oh, yeah, yeah.

Q. Can you describe where that is?

A. Right there at the beginning from about 5 seconds to 8 seconds.

Q. And --

A. What that is is you'll see in the second graph section there, the line that shoots straight up and flat, that's our throttle position. That's, basically, you're off the gas, and all the sudden, (descriptive sound) my foot is all the way down. I've opened the throttles all the way up. And the eddy current is holding the RPM flat at that flat section, holding the car still.

MR. MATOUKA: And not -- I apologize.

Your Honor, there was a laser pointer at -- yesterday. I was just wondering if we might be able to provide the witness with that.

And I apologize for breaking in your explanation, but I just figure it might be useful if you can point to things.

THE COURT: You can stand up if you need to.

THE WITNESS: I've got long monkey arms. I'm good.

A. So, looking at it, so starting right here, they've turned the eddy brake on and then they gave it full throttle, so now the eddy brake is holding the motor until everything settles in. And usually what they mean by "settle in" is getting the air/fuel temperature, the boost comes up where you need it, you get everything ready for the run, versus if you don't load it up, sometimes all those parameters come in a little late and you're missing a big area that you're trying to dial in.

So in doing this, they load it up, get everything settled in, and then right here about 3 seconds later, the dyno lets it go, and then the RPMs ramp up. And they just ramp up nice and linear. You're still at full throttle. So the eddy brake dyno is there to get things preloaded.

And you can do that at all the different RPM bands if you choose to, load it up and hold it. And a lot of times during it loaded, what we call loaded dynos, a loaded base tunes when we're doing standalones, is you'll do every RPM range, 1000, 2000, 3,000, 4,000. We'll go all the way up. And typically about 4,000 is where you stop because trying to hit full boost and hold it at

4,000, you generate a lot of temperatures and a lot of heat, and we don't like that. So usually after about 4,000 RPMs, we kind of, okay, we'll finish calculating the math after a full run.

But we'll load the dyno up, load the vehicles up roughly about tops of 60 seconds. Usually only takes about 30 seconds to get things dialed in, let it cool back off, let the dyno cool back off, let the motor kind of regulate back down, and then start the next set of cells you're going to go into.

So holding this for 3 seconds was nothing new. I mean, every dyno run I do, same thing. Like I say, load the dyno up, I hold it at 2,000, 2500 RPMs, about 40 miles an hour, get everything settled in, hit the button, let it go, and then finish the tune. And that's normal practice for this style dyno.

Q. And so in your review of this data log from the dyno, did you see any evidence of an improper tune?

A. Um, no. I had questions in the early areas of boost where I would usually run things maybe a little heavier, a little fatter, a little more fuel, so to speak, but the air/fuel ratio that they were using is what we call the optimal fuel level or fuel ratio for keeping the temperatures and everything regulated. Typically, we'll add a little more just for cooling purposes, but at the

level that they had early on, I believe it was around 3 to 3500 RPMs. Let's see.

Q. Would you like me to add any -- any additional data tracks on there?

A. No, I think you have it up here with -- maybe engine issue, I think where the wide bands were.

Q. No, I've taken wide bands off. Do you want the O2 on?

A. Yes, I think the O2 and the boost. Wide band, yeah.

Q. Then you want me to throw --

A. The boost, manifold pressure. Go up to the M's. There it is, manifold pressure right there, right under knock threshold.

MR. MATOUKA: Jury, I sincerely apologize.

THE WITNESS: You're doing great for someone who doesn't know the program, so...

A. What we're looking at here is -- If I can see the RPMs. Okay. So right in here, right as the boost starts to climb -- This is the boost curve right here. Right as the boost starts to climb here, sits at about 12-and-a-half air/fuel ratio, which, again, is that sweet spot to make the most power. But, typically, we like to fatten that up at the end for cooling purposes, longevity and life. And a lot of times, you know, as tuners,

we'll -- I'll make that adjustment at the end, when we're done with everything, we'll make some final adjustments.

And this was kind of the only area that was a factor after that, then air/fuel ratios drop off, boost increases, and everything is -- everything is right where it should be. So there was only a small 500, 800 RPM area that I would have probably set it up a little bit thicker. That's about it. But otherwise, everything else seemed within norms, within reason.

Q. And this, I guess, you would have done this differently, correct?

A. A little bit.

Q. Do you have any reason to believe that that difference could cause an engine failure?

A. Not in this case. I've seen worse on the dynos that have survived just fine and technically still are running today. Seen way worse.

Q. So I'm going to take a screen shot of this and offer it as an exhibit for the Jury. Can you explain what detonation is.

A. I kind of did a little bit earlier. Detonation is what the knock sensor reads, but detonation typically comes in with -- A high cylinder temperature will ignite the fuel early. Typically, you want the fuel to be ignited by the spark plug, not by the heat of the

cylinder. I mean like, basically, I'm going to call it what dieseling comes from, because diesels have high compression, they smash it up and it just fires based on cylinder temp increasing pressures and stuff like that. And that's what fires off.

But in our case, our fuel isn't good for detonation. It doesn't like it. So if the cylinder temperatures get too hot, you know, it's running too lean, which is not enough fuel. You know, stoich fuel ratio is 14.7 to 1. That's optimal. But in the real world, that stoich doesn't control cylinder temperature, so we tend to add more fuel to it. Manufacturers do it, all car companies, everybody adds more fuel to it because that's how we control that temperature and help all our motors last 200, 300, 400,000 miles. So if you just stayed stoich the whole time under boost, it will get too hot and it will start to fire off early. And if it fires off because of cylinder temperatures, it creates that frequency, that vibration that the knock sensor would pick up.

So detonation is not an engine's friend in any way, shape or form, so you try to mitigate it as quickly as possible. For the most part, motors can handle some amount of detonation for certain amounts of time. I mean, we see plenty of cars on the road driving around

that sounds like it's ready to fall apart, the motor keeps driving, rattling away, okay, but you just can't do it indefinitely, you know. Eventually, it will let go, and then you're rebuilding a motor, fixing something, whatever the case is.

In this case, there wasn't a significant amount, if any, based on -- I mean, I wasn't there so I couldn't hear everything, but based on the data and the information provided, there wasn't any detonation in this case that I feel would have done any damage to anything.

Q. And would you be able to, if you -- if someone is there, what would detonation sound like?

A. Beans in a coffee can. If you can -- I don't know. We don't do coffee cans much anymore, so rocks in a can. You know, put a couple rocks in a can, shake it up, that's what it sounds like. You don't want that sound from your motor. It's not a good sound.

Q. And what type of damage do you see? Like if detonation causes an engine failure, what type of damage are you looking for to diagnose that?

A. Depending on how bad the detonation is, how long it lasts, I mean, there's -- there's a lot of qualifications go with it, there's time, intensity, you know, you keep doing it back to back to back, going, yeah, it's fixing it, no, it's not fixing itself. But if you

let it go too long, you will actually finally see detonation damage. Like I said earlier, you'll see damage at the spark plugs. It will melt the strap off the spark plugs or start melting the tip of the spark plug. I don't know if anyone has messed with a spark plug much, but that spark plug gap will get large because it will melt the tip down. You can see pits. Typically, aluminum heads take the hit first, as aluminum melts faster than steel does, or aluminum pistons. You'll see lots of pitting, almost like somebody -- in the early stages, it will be a lot of just like needle marks, just pitting going on. And then from there, you'll start to see the corners round away from excessive heat. It will just -- just starts to melt.

So from there, it's just, as it melts stuff, well, things start changing shape. If you keep going, the cylinder could bind up, then you could be bending rods with it, you could be putting more excessive pressure on the -- on the rod, on the piston in the rods against the crank, you know, damaging the rod bearings because you'll overrun the amount of force it can handle with the oil barrier, with the oil barrier and clearance and the rod bearings.

So just a lot of it, really, you see a lot of melting going on, a lot of heat. Put a lot of heat into anything, it tends to melt. So that's what you typically

see first is melting. You can melt away around the valves, the steel valve seats and you'll see pits in there and stuff. Pretty easy to find if someone has let it go long enough.

Q. And did you -- you reviewed pictures as part of the process of forming your expert opinion?

A. Yes.

MR. MATOUKA: Okay. May I approach, Your Honor?

THE COURT: You may.

Q. I want to hand you what's been premarked Plaintiff's Exhibit 3. I apologize, it's a lot of pictures of the engine and its constituent parts. But you mentioned pistons, right?

A. Yes.

Q. So let's go to page 7.

A. Yep.

Q. And so can you -- and I think there's a number of pictures of pistons coming up, but can you kind of describe what we're looking at and what you would be looking for to diagnose detonation?

A. In this case, based on the angle of the picture, it would be a little more difficult to tell because a lot of the damage would really start at the top corners, top edges right in here where it would start, if there was

significant detonation. You can also get like some rattling, like some marks like here. You see a little bit here, but this is also kind of normal wear. But you get excessive wear down here because you get imbalances in the -- in the combustion chamber, tends to rattle the piston around.

But, yeah, see more damage, the longer it went, the more damage. I would -- it wouldn't be consistently smooth across here. I would see a lot more roughness, so to speak, as though -- Let's see, a good example would be -- I can't come up with a good example. Trying to think. Taking the piston, dragging it across the ground, about what it would look like, but it doesn't really give anybody a good reference.

Q. Would it help if you had one of the pistons?

A. Yes.

MR. MATOUKA: May I approach, Your Honor?

THE COURT: You may.

Q. This has been marked as Plaintiff's Exhibit 13. I'm just going to hand you one. Tell me if you want a different one.

A. Okay. I know there's one in here particularly, probably the worst that I would like to see.

See if this is the worst one.

Q. If you'd like, I can just put them all up there

for you.

A. Oh, actually this is it. No. 6. I think No. 4 was the worst. No. 5. No. 4. Okay. So, okay, so relative to the pictures, there is not a lot happening on these pistons, other than -- go to picture -- or go to piston 4, which I guess it's --

Q. Unfortunately, I don't have the numbers.

A. Let me see if I can find it for you. Go through it. Yeah, that one. Keep going. Keep going. Oh, back one. That one.

Okay. So this is the one I have in my hand. This side damage here that you can see right there looks really, I mean, to me, it looks really bad in the picture, but now that I've got it in my hand, I can barely feel it with my fingernail, so almost not a huge concern really other than it's worn and it shouldn't be. It should look more like the other side.

Go to the next picture. It should look more like that realistically, but, so there is some wear here, but it could be from debris running through it.

But getting back to detonation and melting of the heat that goes into it, the ceramic coating definitely helps substantially with distributing the heat and keeping that detonation heat at bay, along with all the coatings that Mitch has on the side, that EPR does, the coatings

are phenomenal in taking care of heat, but in this case, at the top --

THE WITNESS: Got a top picture of that?

MR. MATOUKA: I don't believe I do.

Sorry, Jury, for flipping through these so fast.

THE WITNESS: Yeah, you're into bearings now. You're going to see the top picture of them.

MR. MATOUKA: I don't believe I have a picture of the top here, but we will pass those around.

THE WITNESS: So I'll try to stand up. Hopefully your eyes are better than mine.

A. But where I do look a little more in depth here is right here, what we call the valve pockets where the valves come down, it's what we call interference motor. If the timing belt jumps, the valves hit the pistons so they actually have a little clearance in here to help aid in the timing and giving you a little leeway.

But right now, this is bare aluminum. These are, you know, forged aluminum pistons, and if we had significant detonation, especially on these thin areas here, I would suspect I would have seen this started to melt away or degrade a little bit because there's no coating up against the side here, if we had substantial detonation or heat-related issues, along with a lot of

times if the detonation is bad enough, once you start getting damage to the top of the pistons, it will actually start to lock the rings in because it will smash it down, and the clearance for these rings to move is -- I can't even remember what the clearance is on it. It's very small. Doesn't take much to pinch them, so to speak. And these are still moving freely.

But I saw another picture as you were scrolling through them, that one had a little more scoring on the side that I wanted to look in.

MR. MATOUKA: And, Your Honor, may I approach again?

THE COURT: Yes, sir, you may.

MR. MATOUKA: And may I pass that to the Jury so that they can look at it?

THE WITNESS: Yeah, this is No. 4.

THE COURT: Are those in evidence?

MR. MATOUKA: These are in evidence. These are the ones that we're going to substitute photos for after the trial.

THE COURT: You may publish.

Q. So I want to -- I do want to talk a little bit about this marking on the side of the piston that you were talking about.

A. Yes.

Q. In your -- Could that have been caused by debris in the engine?

A. Well, a bearing had let go, which is the case, based on finding, you know, found in the oil pan and in the oil filter. Debris did run through everything. So, yes, as the crank is spinning, that debris is coming out and being thrown out, so it could have gotten up alongside the cylinder wall and got between there. And as the piston's going up and down rubbing it, could be in that regards also. Well, actually, I'm sorry. In this case, this motor didn't have oil squirters for those pistons, so the oil squirters themselves wouldn't have squirted it up there lubricating that area as well.

So it could be a combination of those two instances where as the debris is being flung out, it's being flung up into the cylinder wall sticking in and the pistons rubbing against it, and maybe a combination. I'll be speculating. I don't want to do that.

Q. And so based on everything you've reviewed, and you reviewed --

MR. MATOUKA: Well, actually, may I approach again, Your Honor?

THE COURT: Yes, sir.

Q. You mentioned the spark plugs, correct?

A. Yes, sir.

Q. And detonation does what to those?

A. Typically, in the beginnings, the tips will start to soften up. And in the case of the spark plugs that Nick uses, they're pretty pronounced and very sharp. Almost looks like a little piston on top of the ceramic. Nice, sharp edges. They'll start to round over as they start getting too much heat in them.

Q. All right.

A. A then lot of times the strap will start to degrade and melt down or sometimes fall off. If there's a substantial amount of detonation, it will melt them.

MR. MATOUKA: I'm giving the witness the other half of 13, or the other part of 13.

(Off-the-record discussion.)

THE WITNESS: Sorry, I talk to myself a lot.

Q. And can you describe what you're looking at right now?

A. Well, if all goes well, these are the spark plugs that came out of the engine after the dyno. I wasn't there to see them removed, so I'm only as good as the information I'm being supplied at the moment. As I'm looking at these, they actually look a little on the, quote, unquote, rich side, because they're -- Typically, when you got a good burn or good burn characteristic, they look a lot more kind of like -- You don't have them up

there. Okay. They look like -- This No. 6 has got a little white around it. It's kind of grayish. But the electrodes that are coming up out of them are all nicely squared off.

Q. And do you see any evidence of melting?

A. Um, not at the moment, nope.

Q. And --

A. No, I don't see any -- I don't see any signs of excessive heat at the moment.

Q. And if -- if the fuel mixtures were off on the different sides, would you expect to see something there?

A. Well, typically, I'd see a different color on one bank versus the other bank. One would show a leaner condition. We use spark plugs a lot to kind of help gauge where our tune is at. We'll pull them out, just check them. If they're really dark, too much fuel. If you have too much fuel in there, it won't fire right because it will basically wash the air/fuel ratio out, and we'll call it fouling the plug. It will glaze over the plug, make it harder to create the arc.

And then on the other spectrum of that is: Pull it out and it's really clean, you know, looks like it's a brand new spark plug, well, that's not enough fuel, you're not getting anything in there so you would be running lean, could get detonation in there, and/or you

have a down injector that's not firing off right.

These, for the most part, look very consistent across the board, with the exception of No. 6 is probably still within reason, but it's probably the cleanest, but it's not -- it doesn't show signs of excessive temperatures or heat or anything like that or, you know, a bad cylinder, so to speak, a bad burn characteristic.

MR. MATOUKA: May I publish, Your Honor?

THE COURT: You may.

MR. MATOUKA: Do you have the --

(Off-the-record discussion.)

Q. And, Mr. Pool, have you had a chance to look at all of the pistons?

A. I looked at four of them.

Q. Do you remember which ones you didn't have an opportunity to look at?

A. Not off the top of my head. I just remember the 2, 4, 6 bank, which is 2 and 6, or 4 and 6. I think I got 3 here as well. But 4 and 6 were the worst of them as far as they look like they have taken the most damage as far as the skirting scrapes and stuff like that. Nothing substantial really jumped out on the other, on the 1, 3, 5, I guess the right side of the motor.

Q. And that was based on the photographs you had

seen previously?

A. Correct.

MR. MATOUKA: Okay. I'm going to hand you the remaining pistons so that you can have an opportunity to inspect them.

THE WITNESS: Let me look at these too then. I just glanced.

A. They actually look better in person than in the picture, but they're at least clean now. The pictures, they're still dirty.

Q. And as you're looking, if you see anything that sticks out to you, would you explain it to the Jury, please?

A. Yes, sir. So No. 4, I've already discussed with just how damage is on the side here, which is similar to -- yeah, No. 6, No. 6 cylinder.

So on these motors, we have -- call, I guess, a firing order. It goes 1, 2, 3, 4, 5, 6, you know. So we got the 1, 3, 5 side, which would be our passenger side of our motor, the right side. And then the 2, 4, 6 side is on the left side, slash, driver side of the motor. Well, not in the U.K. It's backwards. So left and right sides of the motor.

In this case, the 2, 4, 6 side, which is the left side of the motor, shows a lot more of this scoring

mark here, which I can only speculate, if I'm allowed, as far as my opinion on that one.

THE COURT: Subject to objection.

THE WITNESS: Okay.

MR. MATOUKA: You are permitted to give expert opinion.

A. Kind of the same thing we already discussed that potentially that debris got flung up in to those -- those cylinders. As it came off, the 1, 3, 5 side is here, the bearing failed, grabbed the material, and material got velocitied over to be able to carry and hit here. If anything, it maybe came up this way, hit either shallow on this side so we didn't get that much debris on there, or, it just stuck to the crank long enough before it got enough velocity to get out and be thrown to the other side. So the only way I can come up with why those cylinders in particular have that score mark, and it's on the bottom side of the piston, which would be the bottom side of the cylinder wall as well.

But again, it's my hypothesis, yeah, because the 1, 3, 5 side is, you know, they're fairly good. Got a fresh ding on this one, but that looks more like it got dropped, hit something, so...

Q. Which piston would that be?

A. The No. 1 has a little ding in the side here in

the corner, but it doesn't look like it's a melted ding. Looks like an impact.

Q. And as you're looking at them, have any of them had issues with the piston rings themselves?

A. Not so far. All the rings are still moving and spinning freely.

Did you want me to call out which piston I'm looking at as I'm sitting here staring at them?

Q. Only to the extent you find something that you believe is, you know, relevant to your opinion --

A. Okay.

Q. -- identify the piston that you're talking about, please.

A. Yes, sir. Yeah, No. 2 also has a ding and scratch on the side here. Got a bunch of little dings in the corners. But ring lands are still moving just fine. Nothing, nothing jumps out at me. Actually, let me look at the bearings here. On the No. 2 that I'm looking at right now, there is a piece of -- couple pieces of copper in here. I don't know if that's the bearing failure or transfer.

Q. Can you explain what you're doing and looking at right now?

A. Right now, I took the rod cap off. Sorry about that. I took the rod cap off so I can get a better

examination of the inside bearing for the rod bearing here, because I see there's some copper material in here which is the second or third layer of most bearings. And I know we had a bunch of debris go through, but we also had, you know, potential bearing issue, clearance issue, so I want to see if this is a transfer from something that ran through it and got imbedded or is it a chunk missing out of this bearing and we had other bearing failures.

So my high-tech fingernail test. I'm snagging on the front side of it, so this is -- bearing material has been imbedded from another bearing. And how I'm determining that is if the material was taken out of the bearing, there would be a hole. So if I ran my fingernail over it, I would catch on the backside of that hole. Since the material is imbedded on the -- on the bearing, my fingernail is catching on the front side of it and having to go up and over it. So it wasn't a bearing failure here. It's deposits from the other failed bearing that made it through the engine.

Like I said, high-tech fingernail test.

Q. So having reviewed all of these, looking at all of these bearings and the spark plugs, and having reviewed the dyno blog -- or the data log from the dyno runs or dyno run, is there any evidence that points to detonation being the cause of the engine failure?

A. From what I'm seeing here, I see no signs of excessive cylinder temperatures which would, I guess, relate towards detonation.

Q. And in the data log, there is no evidence of, you know, detonation that could cause engine failure?

A. Yeah, from looking at the decibel readings from the knock thresholds, nothing showing unusual spikes, no unusual fluctuations in the RPMs, because that's another one that, I guess, could kind of go back to when you have -- especially if you have significant amount of detonation, you'll see the RPM start to flutter, because the engine is speeding up and slowing down, and as it's firing off early, it's slowing the engine down just a hair and we'll start to see those flutters and as it's fighting that pressure and trying to slow down a little bit because it's not firing at the right time. And if I recall right, I didn't see any of those anomalies either. But, yeah, from what I'm seeing right now in front of me, I see a lot of debris scoring on the bearings. I don't see any excessive cylinder temperature, detonation style indications on the pistons or the ring lands, or even in the valve pockets where I have bare aluminum, everything still looks clean and sharp and all in all those areas, because they did -- EPR did have to repocket the -- or reclearance those valve pockets for the larger valves.

And he did it after the coating was done as -- that's why the coating is missing off of it. So we've got the bare aluminum there that's not showing any excessive heat issues, especially in the thin area on the side of the piston. That would be the first place that would disappear because it's so thin, it can't hold a lot of heat. So it would just melt off almost instantly, you know, based on its thickness.

So right now looking at them, I'm not seeing anything that indicates we had any temperature-related issues that would cause detonation.

Q. And so I think you talked earlier about the insufficient clearance in the main housing bores, correct?

A. Correct.

Q. What could -- how could that occur as part of a machining process?

A. That is a handful of different ways. Like how -- I guess, want me to just start going through them?

Q. Well, I mean, maybe this will help speed up the process. Can you go to the last image of Exhibit 3?

A. That can get me close. Be a good semi-starting point. A couple areas in this photo that might help me explain this. So ways that this bore could be mis-machined, one could be the machine could be slightly out of line, just a hair, you know, where it's taken a bad

path, even though vertically it might look good but it might be not here. Hard to say.

Another one is -- another key one that most machinists have fun with, so to speak, is the difference in materials, the billet main cap versus the cast iron block, two different hardness or strengths of materials. Most of the main caps are in the range of --

(Clarification by Court Reporter.)

A. Chromoly 4140 versus your cast iron block, which is a little softer, so it -- it takes a little more -- you have to be a little more patient, so to speak, when machining them, because as the tool comes around from the soft material, it hits the hard material, it can flex the tool a little bit and change that dimension until it settles in and it picks back up, so you get weird anomalies at the mating points. So most machinists go, "We do them, it just takes longer" because they've got to be more careful because of the change in materials.

Another one is if like the main caps in particular, whether it be a stock girdle or even these billet main caps, doesn't matter, when they're torqued down, if, you know, usually there's a torque sequence of sometimes three to four steps to seat it right so it doesn't bind up and end up crooked, so it seats flat. If for some reason during those four steps you missed the

last one, then it's not fully seated, fully locked down, fully loaded. So you machine it out, looks good, then all the sudden you get that last bit of load on it and that dimension changes. It could be that.

There's just a handful of things that kind of can go into it. It's just a lot of it is patience and taking your time. From everything that I've witnessed and discussed with different machinists who have done motors for me, as I've talked to them about billet caps, unfortunately -- well, not unfortunately. My experience with billet caps has been EPR's billet caps, because Mitch is one of the first ones to introduce the stronger caps for the higher horsepower ratings back in the day.

Q. And is there any issue with using the same or different types of bolts in fastening for machining versus assembly?

A. Yes. It's a small amount when torque -- you know, at torque spec. Like the factory bolts, they're just threaded in the block. They're a big, coarse thread. Of course, I don't know if anyone knows the difference between coarse and fine threads. Coarse are further apart. Fine, they're really close together and like you have to turn them a lot more to tighten them down. Well, the coarse threads on the block when loaded up have a different or a lower load characteristic than the fine

thread of, say, the ARP bolts that we use for most of our builds. They have the coarse thread at the bottom, as they get fed in separately, and then it's a fine thread, 12-point bolt on top. And that's the one that puts the load and puts the torque on versus a stock bolt puts all the load and torque from the bottom threads up.

So, yes, you could have an upwards of sometimes a 10 percent difference depending on how far up, how high up in the torque spec you're going. So in this case, I don't know if this was just a beginning picture or initial, I mean, because in this one, he's got -- it looks like a stock style bolt setup in there, versus the bolt that we used in the motor. Could be initial setup, initial cutting. Hard to say. I wasn't there to see the final, final cut on it to see what was actually used.

Q. But if that was used throughout, if these bolts were used throughout and then different bolts were used for final assembly, that could create some issues in the clearances?

A. Yes, it could change the load characteristic on the block as it flexes and takes up that extra strain.

Q. And you mentioned that you -- you have experience with EPR's billet caps.

A. Correct.

Q. Have you purchased an engines from them before?

A. Not engines, but Mitch has done engine work for me, my own, one of my personal motors, and then -- Actually, well, one customer motor, and then another customer had him do a motor for them that I got ahold of but I didn't -- you know, it wasn't commissioned through me.

Q. So has any of that work involved machining the main housing bores?

A. Yes, both of them.

Q. And how did that turn out?

A. Actually, on the first motor, the first set of caps that I did with him, I believe -- I don't know because I wasn't there, but if I remember correctly, the machining process was done at a different shop called Reher-Morrison, because he didn't have -- his machine wasn't capable of dealing with the main caps yet. So that block, I don't know if Mr. Wilson -- I don't know if Mitch himself did the machining there or if Reher-Morrison's, you know, employees took care of that for him in this case, on the first motor.

That one, perfect, within, I think .0002 of eccentricity, perfect circle. Just measured it last week. I just took it apart again. My motor, which was done right about the same time Nick's was, because I picked it up a couple months later, which was done at Mitch's shop,

because of what Nick was finding, I was like, well, you know what, let me check mine. I'll validate you. We'll see. Because they were done, I'm assuming, about the same time on the same machine. And I found very similar results in my own caps where they're tight on the side.

Q. And you measured these multiple times?

A. Yes, over three different days, getting different temperatures, stuff like that, just making sure, making sure I'm not doing something goofy or making sure I get the same results doing the same thing. But then I measured the first motor we did, and it came out perfect. So then I went back, measured mine against, same results I got before. Okay. So it had to be something that happened at around the same time. And I did send a video, but never got a response back.

Q. How long have you known Mitch?

A. Um, first interaction with Mitch was back in 2003. I ordered a turbo kit from him when he was selling -- he had a parts company.

Q. And have you worked with him or purchased stuff from him since then?

A. He did two sets of heads for me in 2008. And then did my partner's motor at the same time. Did -- or did his short block, which is just the block, pistons and rods, short block, not the heads on top. So he just did

the machining of the block for me and I did the assembly on it. And that's -- I think that's it.

Q. Did your --

A. Up until I moved to Texas in 2017.

Q. And in 2017, were you working with him or purchasing anything from him?

A. Like that's when he started doing my motors for me, you know, the two motors that I've had him do.

Q. And with what you've gotten from him, other than what we just talked about with the main housing bores being too tight, have you had any other issues with the work he's produced?

A. Minor ones.

Q. And, I guess, could you identify a couple of those?

A. Since 2017 or any of the --

Q. Well, we'll go from since 2017.

A. Okay. Really the only issues I had were, like I said, were small. And Mitch and I talked about them and it was we take -- I say we, but, you know, because it's a process that I do regardless of the shop, but typically pull all the oil drain or all the oil galley plugs out and we tap them to put Allen head plugs in them so we can take them out and service them and clean them periodically, get debris out of them, make sure we roast a bearing, debris

goes through it, gets stuck in the galley, we don't put it back together and loosen that debris and take another step, so we have access to be able to clean them easier.

In this case, the heads and the back of my block or back of the block, the first block I had him do, both leaked. Wasn't sufficient sealant on them. And the water pump on the front of the same motor, the plug was sticking out just a little bit where the pump wouldn't sit down all the way. Like I said, it was small. Took it out, sealed it some more, put it back in. But that one I caught early because I had to put the water pump on before putting the motor in the car, but didn't find the leaking oil galleys in the head or the back of the block until after it was in and running, and subsequently had to tear it all down, reseal them, and then it was fine after that.

But, yeah, I, again, like Mitch and I were, I mean, well, we were friends. And as far as I knew, we were still friends, but like I think that's kind of -- I guess it's changed because I haven't heard from him since 2021 when I sent the last video, 2022, whenever I sent the video showing him my results of my motor, I haven't heard from him since. So, but otherwise, we were always talking just, hey, you know, keep on stuff, we were good friends, I had a good rapport, you know, and looking out for each other, so to speak.

MR. MATOUKA: Your Honor, I think this would be a good time if you wanted to take a break for the Jury.

THE COURT: Sounds good to me. All right. Ladies and gentlemen, let me remind you, do not discuss this matter with anyone, including each other. Do not remain within the hearing of anyone discussing this matter. Take a break, 15 minutes, resume at 10:35. Have a good break. We'll see you in 15 minutes.

(Recess taken.)

(Jury present.)

THE COURT: Y'all can be seated.

Counsel, you can be seated.

Go ahead, Counselor.

MR. MATOUKA: All right. So may I approach, Your Honor?

THE COURT: You may.

Q. (BY MR. MATOUKA) I'm going to hand to you what's been marked as Plaintiff's Exhibit No. 8. Have you seen this document before?

A. Yes, I have.

Q. And is this the build sheet for Mr. Johnson's engine?

A. Yes. They are the same ones -- or, yeah, I guess the first build sheet measurements.

Q. And did you review this as part of forming your

opinion?

A. To a degree, yes.

Q. And did -- do you have any views on it?

A. I'm sorry?

Q. Do you have any views on what's in this document?

A. The only thing I came up with looking at it initially was that the numbers didn't work. Like Mr. Johnson also had mentioned in his testimony, that in this particular one, it's actually an interference-based motor. Based on the housing bore, and the journal, if you put a bearing in there, it's not going to work. And even if you take the two numbers and, say, subtract them just by themselves, it doesn't make the double-035 clearance, 3-and-a-half-thousandths clearance. So initially looking at it, like this isn't right, it doesn't -- it doesn't compute.

MR. MATOUKA: And may I approach again, Your Honor?

THE COURT: Yes, sir, you may.

MR. MATOUKA: I'm going to hand you what has been marked as Defendant's Exhibit 17.

MR. HURLEY: Your Honor, if he can just hand him the entire book.

MR. MATOUKA: Yeah, I'm going to. I was just flipping to it.

THE WITNESS: In this mess of stuff?

MR. MATOUKA: No, it's right here, Defendant's Exhibit No. 17.

THE WITNESS: Okay. Is this the updated one, correct?

MR. MATOUKA: Yes.

A. Yes. When I reviewed this one, it ended up coming down to the same conclusion. And one of the things I noticed, only because I know what the bearing thickness is, that the oil clearance, if we take the journal housing bore, added the bearings to it, the oil clearance actually calculates out to roughly .002, which is about 2-thousandths versus the 3-and-a-half-thousandths that he has written here.

And one of the other kind of key pieces of information that's missing in a build sheet is, you know, if you're going to run all the numbers and all the calculations from an engineering standpoint, you want to know what all those numbers are so anyone can come back and duplicate your answers. And in this case, he doesn't have the bearing thickness on here. But as I stated, I know what the bearing thickness is because I also measure them and check them and have the exact same set of bearings in my motors.

Q. And if you'll give me just a moment, I'm trying

to -- struggling to actually get this. I'd like the Jury to be able to see what you're talking about. Well, I don't believe I will be at the moment, but your -- it's the updated build sheet that Defendant showed that was handwritten, correct?

A. Correct. Yes, that is what I'm looking at.

Q. And there is no bearing thickness?

A. Correct, not that I was able to find.

Q. And that causes a problem why?

A. In just the calculations. If you're -- if someone, if, you know, the customer is looking at this and, you know, has enough knowledge of addition and subtraction and looks at it, they'd be like, "Well, how did you get this clearance number? These numbers don't make that." Because, basically, you take the journal and housing bore, like, subtract the two, you should have this gap. Well, we don't have that gap. It doesn't compute in that directly. We're missing a piece of information. And unless the end user, the customer looks at it and goes back and looks up what bearings they have and goes back to the manufacturer and pulls up the thicknesses and plugs those back in, it's kind of -- It's putting together information that's not complete, so it's hard to replicate, so to speak, unless you have all the dimensions you're going up against in order to calculate your oil

clearance. You've got to know everything that's in the way.

Q. And do you know what the thickness of the bearings here --

A. Yes.

Q. -- are? And have you done a calculation using that thickness and these numbers?

A. Yes.

Q. And does that result in the oil clearance as written there?

A. Like I mentioned just a couple of minutes ago, it did not. It came in at .002 or 2-thousandths versus the 3-and-a-half-thousandths that he was shooting for, which -- I'm sorry, the -- that, you know, 2-thousandths is the upper end of the stock limit. The stock limit is 2.2. So he was just under kind of the upper limit of a stock, you know, clearance, based on these numbers and a bearing, the associated bearing thickness.

Q. And would that be sufficient clearance for a high performance engine?

A. Not one that we would like to use as a high performance motor, but could be sufficient enough. I wouldn't necessarily trust it. I wouldn't, if it was a motor I was putting together and I found that, I would ask my machinist to open it up a little bit more to get the

clearance we need versus, okay, I'm just going to run it, because then you run the risk of ripping the bearings out of it.

Q. Could that cause oil starvation at a higher performance?

A. Yes, because you don't have enough oil clearance. Not necessarily oil starvation, but lack of oil barrier, not able to get a thick enough barrier to resist the torsional loads and vibration loads that are coming from each piston firing separately across the board.

Q. Is there anything else that could cause this failure of the bearings in the main housing bores?

A. The only other thing I was thinking of that as it kind of pertained back to one of the reports I read is the bearing crush height, which is also -- I know what this particular spec is for this bearing, and if that is not taken into account and isn't addressed properly and it's too much, you get too much crush on the side of the bearing and it binds the bearing up, kind of pushes it in a little bit, it will compromise it. And if it's too loose, it allows it not to hold itself in place very well and can vibrate and move, and it's minimal, but it's enough that, you know, the bearing manufacturers have spec for a reason, because they don't want their bearings to move. They want them to do their job.

So that's the only other thing that also kind of plays into a particular main bearing or even a rod bearing failure is making sure that crush height is, you know, is set up, is accounted for in the machine process and whatnot.

Q. And kind of switching gears here, you were involved in -- in tuning Mr. Johnson's engine before it was sent to the U.K. for the second time, correct?

A. Correct.

Q. And as part of that process, do you recall approximately what RPMs you were able to achieve?

A. We were, unfortunately, electronically limited somehow to about 5500 RPMs. Myself and Haltech, after going through it, we could not figure out why it wasn't letting us go past it. My -- my assumption is it was in -- something to do with the harness that I had set up for being this standalone piece of -- to sit on an engine dyno, that one of the signals wasn't getting the right information and we didn't have enough time to go through and fully diagnose it and, you know, compare it to a vehicle to go, "What am I missing that's not allowing this to work?" So it's like, you know, I discussed it with Mr. Johnson at the same time going, "Let me know if it does it when you get it in the car because that lets me know how I should look at this harness more, because

virtually we don't have -- like mentioned, we don't have infinite amount of time on the dyno. The shop has other motors they need to get on there. And, well, we don't have endless money to do it.

So, you know, myself and Haltech went through it, couldn't figure out what it was. And we just kind of, well, it's -- we ran it for a couple of days, more or less broke it in based on what Mr. Johnson was looking for, you know. It wasn't a hundred percent of what we were hoping for, Mitch and I and Mr. Johnson, all three of us, kind of wasn't the optimal circumstances and what we were really hoping to happen, but it was the first time that we know of that anyone has even attempted it, to have an engine dyno with this motor and setup. So there were going to be things that we needed to address. And, unfortunately, it was outside of Mitch's expertise on the electronic side, it was on mine, and that's where I went back and forth, and I didn't have enough time to sort it out. And since then, we haven't been back on the engine dyno, so I haven't addressed it since then. So, unfortunately, yes, we were stuck at 5500 and 10 pounds of boost.

Q. Would you say that was effectively stock performance for an engine like that?

A. In this case, yes, it -- Well, the RPM could have been higher for stock, but the power, the power was a

little greater than stock, but it was significantly under what we were -- what the goal was. And we didn't get to run it all the way out or run full boost through it.

Q. And would a oil clearance of .0023, I think you said --

A. Correct.

Q. -- would that cause any issues at those power levels?

A. No, because it's still basically at less than stock to less than stock power levels, engine, less than stock power levels.

Q. And were there -- were there any issues with the -- not the dyno -- the turbos while you were there?

A. Um, at the time, no, the turbos were spoiling just fine. The only issue I had at one point was a turbo started spewing oil, the passenger, the left side or right side turbo started spewing oil out the front and back of it, and, you know, thought maybe it would -- the turbo was blown for some reason. But turned out there's just the drain plug, the drain that comes off the turbo into the bottom of the pan still had a plug on it and the hose was over it, but it was a black plug so we didn't see it, put the hose over it. Once we removed it, the turbo was fine.

Q. At any point while you were trying to get this on the dyno, was there any issue with the valves?

A. Not sure of my -- my impression after the first day when it wouldn't start and we lost -- basically lost compression was that it had touched the valves again because it lost compression on -- I think we tested two of the cylinders. Just really doesn't matter, if one has got zero compression, motor is coming apart. "We're going to run it on five." No.

So at that point, you know, Mitch -- we had, you know, Mitch had to take it back off the dyno, take it back to the shop and fix it. I think that's when the heads were swapped at that point, if I remember correctly. And then once we came back to the dyno, then it -- everything cleared and everything fired up, you know, I think within the first couple turns after we built oil pressure up and then turned the injectors on.

MR. MATOUKA: Nothing further.

CROSS-EXAMINATION

BY MR. HURLEY:

Q. Good morning, Mr. Pool. My name is Brandon Hurley. We've never met before, have we?

A. No. I guess just in passing in here, but no formal introduction.

Q. I want to go back to the beginning, talk a little bit about your background, what you do now and kind of what your qualifications are. You mentioned that you have

an engineering background?

A. Uh-huh.

Q. Do you have a degree?

A. I've got E.I.T.

Q. What is E.I.T.?

A. Engineer-in-training. It's the national test you take right before taking the P.E.

Q. So you are not a Professional Engineer?

A. No, I have not taken the P.E. yet.

Q. Do you have a college degree?

A. No.

Q. You said you went to Sacramento State in California?

A. Correct.

Q. How many years did you go there?

A. Two-and-a-half.

Q. Did you ever go anywhere else?

A. No.

Q. Since Sacramento State, you've had no other college education?

A. No, no other college education, correct.

Q. Any kind of technical education, vocational?

A. On the job mean anything?

Q. No, I mean actual, a formal education maybe just in a vocational as opposed to academic?

A. No, I have not done any other, like, vocational or trade school style educations.
Q. You also mentioned -- what city do you currently work for?
A. City of Garland.
Q. How long have you worked there?
A. Five years.
Q. And where did you work before that?
A. My shop.
Q. And was that --
A. Yeah, sorry.
Q. I'm sorry. Is that --
A. It goes back and forth. I started my shop doing cars and work, stuff like that, then went back to -- went back into engineering again. I bounce back and forth. Sorry.
Q. Was your shop in California?
A. I've had three in California because I grew.
Q. Did you ever, as your primary source of income, though, do work on cars here in Texas?
A. Yes.
Q. Or did you come here to go to work for Garland?
A. No, I came here to work on cars and have my shop. My shop is WinFactory.
Q. How long have you had your shop here in Texas?

A. Since the day I got here in 2017.
Q. Then when did you go to work for Garland?
A. Went through 2019, and I still do my shop stuff, but it's a lot more on the -- for people I like and doing the big jobs that people want to do.
Q. You mentioned the tools you use.
A. Uh-huh.
Q. And you rattled off a couple of them but I didn't write them down fast enough. What are they?
A. Well, in particular to building motors?
Q. Yes.
A. I've got numerous calipers, a couple of dial indicators, let's see, my calipers, or micrometers, my bore gauge, my strain gauge, torque wrenches, feeler gauges, things that kind of pertain to taking the fine measurements. When I really want to get old school and simple, I've got plastic gauge.
Q. And how do you calibrate those?
A. They come -- like in particular, the micrometer come with a calibration -- a calibration, I guess, post, so to speak, where it's a set distance and you set your calibration based off that.
Q. So you self-calibrate?
A. Yeah, I zero it out, make sure everything is good, make sure -- I dropped it and moved it. I try not

to drop things.

Q. You ever get them certified by an outside party?

A. Only my strain gauge.

Q. What is a strain gauge?

A. It's a digital torque wrench, basically, instead of -- Do you know anything about torque wrenches?

Q. A little bit, yeah.

A. Okay. The old clicker styles and stuff like that. Well, this is a strain gauge that works off of -- high-tech term -- of a piece of electric sensor. As you pull on it, it measures that strain, you know, calibrates it and can get it back to a torque number that we're used to seeing so we can apply it to the bolt we're tightening down.

Q. So that's the only -- that's the only instrument you use that you send out to a third party to get certified?

A. Yes, the -- my digital bore gauge that I'd just received was certified before I got it and --

Q. You say you just received it. When did you get it?

A. A couple of years ago, yeah. Then I used it literally for this case shortly thereafter. Because prior to that, I had sold numerous tools before then.

Q. I want to make sure we understand what it is you

do, not for the City of Garland, but with engines. You are not a machinist, correct?

A. No.

Q. You are not -- you -- do you take on the responsibility of doing complete rebuilds to engines?

A. For the most part, yes.

Q. But you always seek somebody else's help to do the machine work, correct?

A. Yes. I use machinists to do my machine work to the specs that I'm used to seeing and have built my motors to in the past, and I verify those numbers when I get them from my machine shops.

Q. Why don't you do your own machining?

A. Because I don't have half-a-million dollars to start buying giant equipment to do it.

Q. If you did, would you be qualified to machine or is that something that takes specific experience and know-how?

A. I have used machines, but I don't own any. I have used them.

Q. But if you owned them, what would be --

A. I would use them.

Q. What would be the process for you to get comfortable becoming a machinist?

A. Doing what I know about machining and torque

specs and getting things set up right and everything that I've discussed with numerous machine shops on the processes and follow those processes and measure and check my end results. If they match what they're supposed to match and fall within my specs, off I go.

Q. You've never worked in a machine shop, have you?

A. No, I -- Well, not for a machine shop, but I have gone and done work in machine shops.

Q. And that's in connection when you hire them to do work on the engines you're working on?

A. Yeah. Sometimes I go down and help. I would be bored, go down, see their processes and, you know, they would allow me to, you know, do stuff on my individual motors, but it was small and insignificant. I understand the process.

Q. Other than your own shop, have you ever worked for anyone else that did engine rebuilding, been an employee of a shop that did engine rebuilds?

A. They didn't do engine rebuilds, but they did tear heads and stuff off. Anyway, I worked for Discount Tire and Service for about eight months here in Terrell.

Q. Anywhere else in your work history that you ever worked for?

A. Worked for somebody? No. I've done everything myself since I was 17.

Q. So all of your training has come from simply your own experience?

A. Uh-huh.

Q. You were never trained by a mentor or someone else you were working with?

A. All of my mechanics and machinists were my mentors.

Q. When you say all yours, do you specifically employ mechanics and machinists?

A. No. Yours and my friends, my colleagues, people that have done work for me, I have picked their brains, I have watched their processes, I have sat by them and watched them do everything they're supposed to do and how they do it and why they do it and we discuss it and I understand it because of my background and my ability to think outside the box, I get it, so to speak.

Q. So --

A. So, yes.

Q. I'm sorry, I didn't mean to cut you off.

A. Oh, you're all right. I was done.

Q. Watching others do this is the main basis for your experience and expertise in testifying about what you're testifying about today then, right?

A. Watching and doing. My experience is a lot more in the things that I have done.

Q. But you've never machined a cylinder bore, have you?

A. No, but I know what it looks like when it's right and I know what it looks like when it's wrong.

Q. And that's just based on you watching?

A. My experience in using tools to measure things.

Q. Okay.

A. And knowing what the measurements are supposed to be. So if it doesn't match measurements and it's not right, I don't care whether I do it or they do it, it's not rocket science to, you know, read a caliper and understand whether or not something is within or where it's supposed to be.

Q. But there are specific processes you're supposed to use when you use these measuring tools that's very, very specific, correct, or can you just kind of throw it in there and see what happens?

A. If you understand what you're doing, sure, you can throw it in there and see what happens. But I know what I'm doing, so it's like it's easy.

Q. So it doesn't take a specific technique or --

A. Oh, it takes a specific technique that I could teach you and show you in about 30 seconds.

Q. And where did you learn that technique?

A. At the machine shops that used to do all my

machining.

Q. So by watching others?

A. And doing it.

Q. Do you own your own car, high performance car?

A. Yes, I do.

Q. Do you own your own high performance car?

A. Yes.

Q. What kind is that?

A. Same car, 300ZX, twin turbo.

Q. And does it currently have an engine in it?

A. Yep.

Q. And you, obviously, do all the work on that engine, correct?

A. Yep.

Q. Have you made any mistakes in your work on that engine before?

A. No.

Q. It's always run perfectly?

A. Yeah.

Q. Would you consider yourself a car enthusiast? Kind of talked about that yesterday. Do you consider yourself a --

A. I'd consider myself a little more than enthusiast.

Q. What do you mean by that?

A. I know way more than the average enthusiast, especially when it comes to these cars.

Q. You talked about your shop, too. Where is it?

A. On my property now.

Q. Is it just your garage, basically?

A. No, it's a thousand-square-foot shop with 600 square foot of covering, enclosed, steel, stand-up building, 8-inch concrete, with two-post lift and parts washer and a press and my vice and my lathe and...

Q. So what kind of work are you currently doing for customers in that shop?

A. Building performance motors, assembling them.

Q. You say building performance motors, but that excludes machining, correct?

A. Correct.

Q. Is there anything else that you farm out to a third party?

A. No, just the machine work. Everything else I do myself.

Q. Other than the machine work, the rest of it is just assembly, correct?

A. Yeah, nuts and bolts.

Q. Okay. You said you were hired by the Plaintiff's counsel, correct?

A. Correct.

Q. What is your arrangement with Plaintiff's counsel?
A. What do you mean?
Q. Are you getting paid? Did they pat you on the back?
A. Getting paid.
Q. How much are you being paid?
A. Is that relevant?
Q. Yes, sir, it is.
A. Okay. 150 an hour.
Q. How many hours have you put into this case thus far?
A. Oh, I only get 150 for this.
Q. So you didn't get paid for any of your previous work?
A. Yeah, the reports and all that analyzing stuff I did, yes.
Q. So what's been your total charge to date, do you know?
A. 2300.
Q. And if I was good enough, I could do the math, but how many hours would you say you've spent on this project?
A. As of, well, short of being up here now, 23 hours.

Q. When were you first engaged?
A. Let's see -- 2014 -- No. Sorry. Engaged into which part are you after?
Q. Asked to be an expert in this case.
A. Oh, let's see. I was engaged back in the beginning of February.
Q. Of?
A. This year.
Q. '24?
A. Yes.
Q. We talked about the things you looked at to come to your opinions. We talked a little bit about this yesterday with Mr. Johnson. Is really the basis for your opinion the information provided to you by Mr. Johnson?
A. Yes, that's pretty obvious.
Q. And did he come to you with a theory about the failure or did y'all develop that together?
A. No. He had no idea why it failed other than seeing the measurements and saying things weren't, you know, were looking tight on the sides. And after I looked through everything and watched the videos myself and everything, went, "Hum, yeah, little tight on the sides. Could be, but, you know, do more, you know, do more digging, get more information."
Q. So what did he tell you when you first started

talking about it?

A. He just said it's one of the bearings, ate -- ate one of the main bearings.

Q. So at that point he did not have a theory about clearance?

A. No, he hadn't taken it apart yet. Or after he had taken it apart, you know, is when he said it ate one of the main bearings, and he was just sending pictures as he was sending them to me and Mitch.

Q. So that was before you were hired though, correct?

A. Oh, yes, yes, long, long before that.

Q. So we talked about that yesterday too --

A. Yeah -- sorry.

Q. -- with Mr. Johnson. You were involved really from, well, go all the way back to the dyno run here --

A. Correct.

Q. -- in America, and you stayed consistently involved from that point forward.

A. Correct.

Q. So was -- was the theory about oil clearance something that you came up with or Mr. Johnson came up with or you came up through collaboration of the two of you?

A. I came up with the oil clearance, you know,

potential issue based on the measurements that the three different shops had taken, you know, watching those videos, especially the -- I think it was the third video where they actually did all their, you know, proper calibrations and getting their micrometers and bore gauges set up and measuring everything and temperature readings and all that stuff and coming to their conclusion watching that video going, okay, that makes sense.

Q. So when you said three shops, what were the names of the three shops?

A. I have no idea. I just watched videos. I know they were -- I know that there were three different shops. That's all I know. What their names are, I do not recall.

Q. You said you really didn't rely on the King report; is that correct?

A. I took it as information.

Q. Okay.

A. Because there is things in that report that, you know, makes sense as well.

Q. So when along this path that we're talking about from the time you were first involved with the dyno run here in America, to, obviously, a couple of months ago, when did you conclude that it was, in your opinion, a clearance issue?

A. When, I guess this has been ongoing for, what,

two years now.

Q. I can maybe ask a little more broadly. Was it early on? Was it more recently?

A. No, pretty early on, so to speak. I mean, it got more corroborated and kind of lined up better once the King report came in, you know, it made sense, along with all the pictures and the findings and the measurements, stuff like that. I took as much of the information as -- I took all the information I was given, you know, and just slowly whittled it into what can cause this particular issue.

Q. And --

A. And there's only a handful of things that can cause this particular issue.

Q. So I'm -- you just said the information you were given. I want to clarify something. Prior to today, had you ever physically inspected these parts that are before you?

A. Physically, yes.

Q. When was that?

A. Sunday.

Q. Pardon?

A. Sunday.

Q. Oh, okay.

A. I inspected one.

Q. Okay. So it's been in the last week then?
A. Yeah.
Q. So prior to that, you had formulated your opinion without ever seeing the physical parts, correct?
A. Correct. This just helped solidify it a little bit more.
Q. And I also want to make clear, all the information you were given about measurements or videos or any of the other stuff that you mentioned, all of that information was gathered after the failure that occurred at the dyno run in England, correct?
A. Correct.
Q. Nothing -- nothing you've looked at as far as information was information before that failure, correct?
A. No measurements or anything like that before the failure during the motor build, because I had seen the motor in pieces in assembly, you know, stages, but no measurements or videos or anything like that being, I guess, witnessed at the time to validate whether or not it was different than it is now.
Q. So I think maybe you answered part of the next question I have. So to be clear, everything you're relying on for your opinion are things that happened after the failure in England?
A. And my personal findings.

Q. Which, again, were -- occurred after the event in -- the failure event in England?
A. Yes. And by, I mean, personal findings is what I found in my own motor that was done at a similar time.
Q. You never did any actual measurements to come to your opinion, did you?
A. On which?
Q. On the engine we're here talking about.
A. No. I had no reason to.
Q. Let's talk about measurements for a minute. You said you learned how to properly measure things by watching others do it. Can you specifically tell us who those people were that you watched?
A. Allen -- or Adam Griffin.
Q. And where does he work?
A. Crackaway Performance. Well, used to. Unfortunately, the owner recently passed away, which was the other person that I watched and who showed me and taught me the measurements of a machine process. Rick. I feel bad, I can't even remember his last name. Anyway, Rick was the owner, but he passed away from cancer just three years ago.
Q. Anyone else?
A. Dave at Dale's Machine, who did my heads, repaired heads for me. Let's see, who else. Mel Hyatt

(Phonetic spelling), my machinist in Eldorado who lives in California, does all my CNC machining.

Q. What is that? I'm sorry. What is CNC machining?

A. CNC machining is a different form of machining than, you know, the style machining Mitch does where it's more in a C -- I don't know if you know anything about CNC machines. Trying to -- how to explain them. It's all, you know, computer controlled machining.

Q. Well, let me ask you this: That CNC machining wouldn't be relevant to this case because it was a different kind of machining?

A. No, because measurements and tolerances all apply.

Q. So did you learn how to do proper measurements and gauge tolerances from the CNC machining individual?

A. Yes, because I also design parts and have to understand those tolerances and measurements very carefully. Otherwise, in certain cases, cars won't stop right and people will die.

Q. So when you watched the video of measurements, what convinced you that it was done correctly?

A. One, the amount of time spent making sure that the machinist or the gentleman doing the measurement was getting the right numbers. He didn't just put it in there and two seconds go, yeah, and then move on. He spent

significant amount of time making sure, because like you mentioned earlier, can't just throw it in there. But it only takes about 30 seconds to learn how to do it. And you get it set up right, and you're looking for that minimum, looking for the smallest number as the gauge is compressed. If -- As you turn it up, the gauge opens up, number gets bigger. So once you hit the small number, that's the size of your bore. You turn it, and the goal is when you rock it back and forth, you're going back for that same small number. It should -- or, basically, zero. And if it doesn't get back to the same number, something is not -- it's not a circle.

Q. So you watched videos, you looked at pictures, you talked to Mr. Johnson. Did you really use the data logs that we were looking at earlier? Did you use those data logs to come to your opinion?

A. Yes.

Q. What -- how did you use them?

A. Well, being I've been tuning for 18 years, I know what I'm looking at in the tunes and the graphs, the air/fuel ratios, the timing maps, and what the given expectation is out of -- in particular, this motor. I have tuned probably about a hundred of these things successfully. So I have a very good understanding what the output is, what it looks like, what it's supposed to

be, and what the data looks like while doing it.

Q. You said you've done a hundred tunes. You said earlier though that the dyno run that you did here in America for Mr. Johnson's car was the first one that had probably ever been done in America.

A. On the engine dyno, but the results and the measurements are all the same. The first time on the engine dyno is really just an electrical issue of you don't have the car to plug into where all the sensors and stuff talk appropriately.

Q. Do you own your own dyno?

A. I used to. Sold it when I sold my shop.

Q. And how long ago was that?

A. 12 years ago.

Q. So would that have been when you were still in California?

A. Yes.

Q. So the dyno data log, that comes about because it literally is downloading data from whatever the dyno is picking up into a computer program that then makes these graphs, correct?

A. No. The data log information you're looking at is all the information that's coming out of the computer and into the computer relative to the engine. The dyno graph is actually a separate graph, I'm not sure we have.

Q. And what does it look like?
A. A curve. It's -- I would have to -- you would have to have it for me to be able to explain it to you.
Q. How is it different than the data log we just looked at?
A. Because the dyno curve is giving you data on how much horsepower is -- the dyno is seeing, how much torque the dyno is seeing, and then if it's -- if you have your RPM signal hooked up, it will tell you what RPM the horsepower is coming in at, the torque is coming in at. Also if you have your air/fuel ratio, like Abbey Motorsports did, they had it in the tailpipe, that information can also be put on that data chart, along with the boost signal, if you have a boost, you know, if they have the boost hose teed in to be able to register the boost so you can actually log the horsepower, the torque, the boost, the air/fuel ratio, and RPMs, and that's a separate graph and separate set of data.
Q. And all those are from separate sensors that have to be hooked up correctly to get that data, correct?
A. Sure, I mean the dyno is its own -- its own machine.
Q. But it has to be connected to the vehicle to gather that data, so it has to be -- each one of those readings takes a different sensor, correct?

A. But the sensors are built into the dyno, not off the car. It's not pulling -- the dyno is not pulling any information off the car, off the ECU, off the engine itself. It's measuring all the external information.

Q. So you just said that -- what is it that was hooked into the tailpipe?

A. The wide band O2. It's an external sensor that's attached to the dyno, not to the car.

Q. And does it -- as it relates to the dyno run done at Abbey Motorsports, was that wide band O2 sensor operating correctly?

A. According to Abbey Motorsports, yes, because it came in line with the other good working O2 that Mitch and I also knew was working right.

Q. And if it's connected to the tailpipe, isn't there multiple tailpipes?

A. There's two.

Q. And so which one was it connected to?

A. Probably the side that was deficient.

Q. But you don't know for sure because you weren't there, obviously?

A. Correct, I was not there. So I would like to think that, you know, out of all the other thoroughness that I was able to look at in the information that Abbey Motorsports did, that they put it in the right spot.

Q. But that is an assumption?
A. They had a 50/50 chance of getting it right, so, yes, it is an assumption.
Q. So I need to go back then because I'm afraid I confused the issue. Did you rely on the data log in coming to your opinion or the dyno charts or both?
A. Both. I take all the information and compile it together based on my experiences and the things that I've seen and done in, you know, my lifetime.
Q. What were the -- were the -- were the dyno charts what you expected them to be? Was there anything that was an anomaly in those?
A. Actually, did better than I thought. In -- at the end, it actually made a little bit more power than I was expecting.
Q. And --
A. Also, well, yeah, yeah, actually, because based on the conversion factor, yeah, I was expecting about 10 percent less power than what he ultimately got because he had all the new cams, the new, you know, port job, head work, stuff like that, so I knew that was going to -- that was going to change the expectation just a little bit, but it actually performed, you know, better at the time, other than, of course, losing the bearing.
Q. What would cause it to perform better than you

expected?

A. A good airflow, which would be cams, heads, CNC work --

Q. So all the things Mr. Wilson did to the car?

A. Along with the intake piping and the exhaust and stuff which are, you know, bolt on, but, yes, the -- yes, the -- yes, everything that Mitch did to the car would produce more power, correct.

Q. You talked about the knock sensor.

A. Yes.

Q. And you -- we looked at a chart. You said that if there was severe knocking due to detonation, you would hear it, it would -- would make an audible noise.

A. Uh-huh.

Q. And you said based on that chart, you don't think there was any knocking.

A. Not based on it, because to hear it over the engine noise, 50 decibels, you won't hear over the engine and exhaust noise, but you would hear it with the headphones on, if it was, you know, of substance. When the decibel reading gets up over, say, hundred-thirty, hundred-fifty decibels, well, that outruns the engine noise and you'll hear it with or without headphones.

MR. HURLEY: Okay. I hope you still have Plaintiff's Exhibit 1 in front of you. You may have to

look through the documents. I think they're right there in front of you, all the loose documents.

THE WITNESS: These guys?

MR. HURLEY: Yeah. It will say "Plaintiff's Exhibit 1" down in the lower right-hand corner.

And the top of it will be an invoice from EPR.

THE WITNESS: I don't see that one yet. This might take a minute.

This is Plaintiff's Exhibit 8. Do you mean this one?

MR. HURLEY: No, it would be a loose document. It will be Plaintiff's Exhibit 1.

MR. MATOUKA: Your Honor, may I approach?

THE COURT: You may.

THE WITNESS: I don't think it's in this. I think this is all engine pictures.

Oh, in that one. Hey, look at that. Exhibit 1.

MR. HURLEY: I'm sorry.

If you'll turn back to the second Abbey Motorsport's invoice, which is probably about five or six pages back, it's an Abbey Motorsport's invoice dated 8/24/21.

THE WITNESS: Yes, I have it right here.

Q. So under the description of labor work, it's obvious the description what Abbey Motorsports did at the dyno tune.

It says, "Get car onto dyno, confirm timing, base boost over 1.5 bar, bypass boost solenoid base boost .7 bar, brass filter in bleed side of boost solenoid. Tune car for base boost, start to raise boost, unable to raise boost, customer found loose boost pipe jubilee clip, rectified and checked all other pipes. Carried on tuning car, noise from engine, work to maybe sort issue, adjust NVCS, noise stopped, few more runs, noise still there, stopped running car, removed from dyno."

So there was noise present at the dyno run?

A. Yes, but it doesn't specify whether it's detonation or knock-related noise.

Q. But it doesn't say it's not either, right?

A. Correct, but it doesn't say it is, so it goes both ways.

Q. And I think this is obvious, but let me just make sure. Obviously, you were not there at this dyno run, right?

A. Correct, maybe in spirit, but...

Q. So if there was a noise present, it could have been a detonation noise, we just don't know.

A. Could have been --

MR. MATOUKA: Objection, calls for speculation, I mean.

THE COURT: Overrule. You can answer.

A. Okay. Could have been. It could have been the valve seat that is sitting in the valve train.

Q. So it could have been a lot of things?

A. Could have been numerous different things.

Q. And as you pointed to the graph earlier, your point about the knock sensor presumes also that the knock sensor is attached and working, correct?

A. Uh-huh.

Q. Do you know, I mean, can you, you, personally, tell us today that that knock sensor was attached and working?

A. It was when Mitch and I were on the dyno, on the engine dyno.

Q. But that was a completely different run, right?

A. Different day, different run, different everything.

Q. I'm talking about the one that happened in England with Abbey Motorsports.

A. I don't even know if he had all the injectors plugged in.

Q. So you can't tell us anything about the setup of the dyno?

A. No, I couldn't tell you -- The knock -- The knock sensor doesn't have anything to do with the dyno. That's still on the engine itself.

Q. But it has to be attached to the dyno to read, right?

A. No. It's still attached to the ECU. The headphones are attached to the ECU. It's all car related, it's all engine related, not dyno related.

Q. So --

A. The dyno doesn't care about the knock sensor.

Q. So the graph we looked at was not information from the dyno?

A. No. I stated that. That graph was the data log from the ECU, not from the dyno.

Q. So --

A. Not from the dyno data itself, but the data from the ECU during that dyno run.

Q. So that data runs through the dyno?

A. No.

Q. It runs straight to someone's computer?

A. Runs straight through the ECU --

Q. So --

A. -- and computer, yes.

Q. -- the connection from the ECU to the computer that's gathering that data has to be done correctly?

A. No, the Haltech does a pretty good job of doing it itself. It doesn't need the computer for it.

Q. I'm sorry. Can you explain that?

A. The Haltech is a standalone ECU, standalone engine control unit, so it will record the data. You can put the laptop off to the side; the ECU will record all of its data, all of its information as it comes in. All the computer does is open the file so you can look at it. There's nothing spectacular or calibrated about its collection process.

Q. So that being the case, of all that data we looked at then, did any of it use the dyno system to generate that data or is it all what you just described?

A. Just what I described. It's only the dyno -- the dyno machine itself does not affect what the ECU reads. The ECU is just reading what the engine is doing. The ECU is controlling the engine and telling the -- and getting information from the engine, and that's it. And then the dyno is reading what the tires are doing, because that's the only place of reference it has other than a couple, you know, sensor pickups, so to speak, that are added on secondary. They're kind of tapped in.

Q. So who was the last person that calibrated the ECU?

A. I guess it would be either Abbey Motorsports or

Haltech, from my understanding.

Q. It wasn't you because you're the last person that did any tuning to it before it went to Abbey Motorsports?

A. No, because, unfortunately, when -- by the time it got to the U.K., for whatever reason, the long-term, short-term processes weren't reading or weren't recording.

Q. And I'm sorry to interrupt you, but what does that mean?

A. Sorry. Yeah, too much information in my head. But long-term, short-term readings are the readings that the ECU gathers from the wide band O2 sensors, that air/fuel ratios. It does a short term. There's a short time frame that it measures and it averages, and then there's a long term that measures over a vast time to get a larger average. The short term is good for what's happening right now. Long term is, well, how has it been performing over, say, a week, versus how is it performing over an hour. But the long term and short term logs weren't popping up, so Nick got ahold of Haltech and they had to fix or update the program to get it to turn on.

Q. And let me ask you a question before you explain anything further. All of that that you described was nothing that Mitchell Wilson was involved with, right?

A. No.

Q. And so who was involved in that process? You

just mentioned Mr. Johnson.

A. And Haltech.

Q. And Haltech.

A. Yeah.

Q. The manufacturer.

A. Correct.

Q. Were you involved as well?

A. No, I was not.

Q. So what was the consequence of that? What did they have to do?

A. Update the -- update the, I believe, the maps -- or not the maps. Update one of the sensors that wasn't -- it wasn't -- it didn't want to turn on. And it's Haltech and their programming and their master brains of technology and programming, so they figured it out and got it fixed.

Q. So as a result of all that, the tuning or the adjustments you had made to the ECU here in America before it left, all that was lost?

A. No. Haltech was able to recover the fuel and timing map that we had generated because it was enough to get the car running at the point since we were limited to 5500 RPMs and 10 pounds of boost on the dyno here. They were able to recover that so that Nick could get back, you know, get it back running, fire up and get it over to

Abbey and they could, you know, then do their magic.

Q. So was any of your work lost?

A. At this point, there might be a few little things, a few bits of cells that maybe Abbey didn't change that were probably just fine. Hard to say. I haven't compared.

Q. I'm sorry. I mean when there was this problem with the ECU that you just described and you said some of the mapping you did they could recover --

A. Yeah.

Q. -- but what I'm asking: Is that all the work you did when you were in charge of the dyno or did some of your work get lost as a result of that ECU problem?

A. That is a good question that I don't have an answer for because I have not been able to, you know, I guess didn't look to get into comparing or looking at all the information and contacting Haltech to find out what they were able to salvage or not salvage. Nick was back on the road, he was happy, for lack of better words, cool, go get your car and have fun.

Q. So without that fix by Haltech, once the car got to England, the car wouldn't have run?

A. No, it was running. It just wasn't -- it just wasn't logging the short term and long term. Otherwise, it was running.

Q. Okay. And so what was the consequence of not logging the short term and long term, just data?

A. Yeah, it's -- From a tuning perspective, looking at the long term and short term gives you a quick and dirty analysis of if you're running lean or rich, if you've got too much fuel going in or not enough fuel going in on the average, so it kind of gives you an idea where things are sitting, you know, initially.

Q. So what are the consequences -- You just mentioned something that I've been curious about. What are the consequences of running too lean or too rich in your fuel?

A. Plus or minus half a point to a point, not a whole lot when you're just cruising around, it's not a lot of load, not a lot of temperature, but if you're trying to do loaded runs, from full throttle, full boost runs, say you're above what we would normally tune for, you know, say if we tried to stay at the stoic 14.71 at full boost, that's lean in our conditions, but it's stoic, it's actually proper, but we call it lean because it generates a lot of heat, and that heat hurts things, it melts pistons down, ruins valve seats and destroys spark plugs and all kind of bad things happen.

Q. It could deform parts in the engine if it got hot enough?

A. Depending on what's getting deformed. It depends on what it is that -- what heat is going to deform what. To, you know, warp the heads in the block, you've got to overheat the motor mostly with coolant, like not having enough coolant in there and you get your standard overheating problem. Detonation heat melts everything down and it deforms the pistons, yes.

Q. So --

A. Starting -- all starts at the pistons mostly.

Q. So determination of determining whether it runs lean or rich is an item controlled by the ECU?

A. Controlled by the ECU programmed by the tuner.

Q. Okay. So did you do that when you tuned it here in America?

A. Which part?

Q. The tuning that had to do with the lean versus rich nature of the fuel.

A. No, typically I don't pay attention to those because I'm actually tuning it. I'm looking at it in real time. The long term, short terms don't apply at that point. Long term, short term are more of your daily averages, so to speak.

Q. Do you know if Abbey Motorsports tuned it regarding the lean versus rich fuel mix ratio?

A. Based on the air/fuel ratios we could, you know,

witness off the data logs, yes, they were watching that.

Q. And this is something that has confused me the whole time as well. You're literally tuning as you watch the dyno run, right? You're making adjustments. Isn't that what the tuner is doing?

A. You can -- you can literally make the adjustments on the fly. Like as it's running through it, you can add fuel, add timing, take things in and out, as it's doing right then and there. Or, usually, they'll run as you're watching everything, and that's why we'll run -- you'll make a run, cut it short, like "Um, something is not, I want to fix that right quick," and then fix it while everything is cooling down and stable, versus trying to do it under full load and when you've only got a window of about 4 seconds.

Q. But the process of that adjustment has to be done, maybe not exactly while the engine is running, but during the dyno --

A. Correct.

Q. -- run?

A. Correct.

Q. There is no starting point where you come in and say, "I'm going to tune it," and then we're going to put it on the dyno?

A. Yes, you can put what we call a base tune in, and

it's one of those things that most tuners, we all know it, we've been around long enough, so to speak, we have -- we know what a base tune does to get it to work. We can fire it up. We can look at air/fuel ratios. And at that point when setting up a base tune, that's where your short term and long term, you know, can -- usually, the short terms will come into play just for a quick ballpark to get you in there, to get you to the dyno for all the fine-tuning. And, yeah, but we can set up the base map, but a lot of times, especially from Haltech now they've had such a vast, I guess -- well, I'm losing the word right now. They've got a lot of files. Just slipping. But they've got files and data from years and decades of doing this that now they send -- when they send the ECU out to you, they have a pretty good starting base map already on there for 95 percent of the cars.

Q. So would you call what's done during the dyno run process fine-tuning?

A. That's more the fine-tuning process, yes.

Q. What happens if you don't do the fine-tuning correctly? What are some of the potential consequences?

A. Well, it depends on how far off the base tune is. Sometimes we can put a base tune in and be within 5 percent of fine-tune, car will be fine for years, just fine.

Q. And what if it's not, what are some of the consequences?

A. Can blow stuff up, things melt, things break.

Q. And could it cause the engine to stop running?

A. If it's broken, yes. Yes, it will typically stop running if it breaks.

Q. Are there multiple O2 sensors?

A. There can be.

Q. Do you know if there was in Mr. Johnson's car engine?

A. Trying to think if I remember correctly. When we did the engine dyno, we had the main two wide band 02s, but I do not recall if Mr. Johnson installed his -- the -- excuse me -- installed the, quote, unquote, factory narrow band 02s, because typically your wide band will also take care of your narrow band signal as well. Some of us will run them both because we don't feel like taking the factory ones out and you have to put the wide band ones in a specific location so they're not generating too much heat and damaging them.

Q. So we've used this term "wide band" a couple of times. Is that in place of those sensors or is that in addition to those sensors?

A. It can be either/or.

Q. And what does a wide band sensor measure?

A. Like I said, wide band, wide band 02 measures the oxygen in the exhaust, so it measures between, you know, when you're going stoic, you're basing your air/fuel ratio off the fuel comes in, it burns, some oxygen leaves with it. So it measures that oxygen, excuse me, that oxygen level. And then from there, gives the calculation for air/fuel ratio letting you know where you're at. Are you close to stoic or you got more fuel than stoic, less fuel than stoic. And so we're using that for the tuning processes. And a wide band operates from a 0 to 5 volt system, which, again, this is just extra information for you, versus a factory narrow band that's in your daily driver car runs on a 0 to 1 volt. So it has more calibration, more accuracy on the 0 to 5 versus 0 to 1, so that's why we use them for tuning because it gives us a much more accurate reading, a more fine-tuned reading.

Q. And we talked about that sensor being placed in the tailpipe, correct?

A. Yes.

Q. Why was it placed in the tailpipe?

A. Because jacking up the car and trying to stick it back in the exhaust is sometimes laborious.

Q. And so how does a tailpipe work on this car? Does it -- is it two separate tailpipes or do two come together as one?

A. It's two typically married with either H pipe or X pipe, which means they share the exhaust. So to kind of add where you're going with it, yes, the exhausts marry and mix to a degree before exiting, so there is some blending of the two exhausts at that point, but it's, for lack of better words, small, but it's always for -- I mean, I would -- not going to speak for every tuner out there but myself. I keep that in mind as I'm -- if I use a tailpipe wide band, I keep that in mind, especially if I'm running 02s for -- or the wide bands for the ECU when I -- if I stick one in the tailpipe to verify it, I keep that in mind of if I have a discrepancy, what is my average going to be out the back.

Q. So that was -- That is exactly where I was going. So you end up having a average of the two. And wasn't it two --

A. To a degree.

Q. -- exhaust pipes running off of each side of the engine?

A. Yes.

Q. So if one side of the engine is bad, as we've kind of -- I think you kind of discussed earlier, you thought one side of the engine is where the problems were, the other side seemed to be not as bad. So if you have one bad, one good, and they mix together, doesn't that

give a false reading in the sense that it doesn't really report what the bad one is really doing?

MR. MATOUKA: Objection. Mischaracterizes prior testimony as to one side of the engine being bad.

THE COURT: Overrule. You can answer the question if you understand it.

A. Yeah. It does give you an -- it's not a -- it's not a direct average, because the densities of the exhaust as it's going through the pipes, it doesn't -- that -- Between the X pipe is a small, like on -- probably like shaped like an X, and it's just a small, married point in the middle, very small. And it's mostly there to balance the exhaust pressures and do some, quote, unquote, exhaust scavenging to help pull exhaust through, decrease back pressure, so better flow. So it's a small amount of mixing that actually happens. So it's not a direct average. It's not like, "Oh, this one is running, you know, 5, and this one is running 2, so our average is 3." No. It's a percentage. It's a percentage that gets mixed in and kicked out, so it's more of a dilution. It dilutes it a little bit. So, yes, it's not a hundred percent dead accurate to it, but from the tuning aspect and the tuning world of things, we know what we're looking at when we see it and go, "Okay, if it's significantly off, it will still be significantly off." It won't all the sudden be like,

"Oh, it's really good." No. It's very noticeable.

Q. (BY MR. HURLEY) But in this instance, was there only one wide band tuner put into the exhaust pipes?

A. Yes, because from what I understand, there was a deficient wide band that, like we discussed earlier, that Mitch and I also had dealt with when we were on the engine dyno.

Q. So which side was the -- which exhaust pipe, coming from which side was it put in?

A. Depends on which side was deficient at the time.

Q. No, no. I'm asking in the actual tune, do you know which side the wide band was put in?

A. From Abbey Motorsports?

Q. Yes.

A. I have no idea.

MR. MATOUKA: Objection, asked and answered.

THE COURT: Overruled. Go ahead.

A. Yeah, I wasn't there. I don't know which one they put it in. We covered earlier. They had a 50/50 chance of putting it in there.

Q. So it could have been on the side that was not the problem, right?

A. Could be.

Q. Okay.

A. But can I clarify a little bit?

Q. Go ahead.

A. Just briefly. But I -- coming from a dyno shop, I would say that like myself and probably others here, we wouldn't just stick it in one tailpipe and not check the other one just to see where we were at, just to make sure we were in the right side.

Q. So --

A. So I find it extremely unlikely that it was in the wrong side.

Q. But you can't tell us?

A. No, I cannot tell you that. I can tell you from my experience and my expertise that it's --

Q. What you would have done.

A. -- slim to none.

Q. It's what you would have done if you were doing it?

A. Correct.

Q. Before I forget, because I just looked down on the floor here, these parts that you looked at, where were they before today?

A. In the box.

Q. No, but I mean who has been in possession?

A. Nick.

Q. Can you tell us what the chain of custody was for those parts from the time of the failure at the dyno run

till today?

A. I cannot. I was not in the U.K. to follow them around to find out, you know, who had what, when, where, and how.

Q. You mentioned with one of them, you said, "Oh, this is a lot better, this is a lot cleaner than it is in the picture."

A. Yes.

Q. Does that mean these parts have been cleaned and spruced up?

A. Oh, yeah, they're definitely clean. They don't -- no part comes out of an engine looking like that.

Q. So somebody has cleaned them?

A. Yeah. The oil has been removed from them so it's an easier analysis versus looking at dirty engine parts and not being able to actually see the damage because it's covered in oil or exhaust, you know, coatings or whatnot. So it makes it easier to analyze whether or not there's any damage.

Q. Did looking at these engine parts today, did they provide you any information that you hadn't had up to this point to formulate your opinion, or does it just makes no difference?

A. I would say it validated my conclusion a little bit more as they looked way better in person.

Q. After --

A. After the cleaning, stuff like that, I was able to see more of them and, you know, basically have them in hand, feel them, look at them more closely, not just a grainy picture emailed to me. Looking at them, it told me more that there was definitely not any detonation that I have experienced.

Q. Let's go back and talk a little bit about when you were involved in the dyno run here in the United States, in Texas. How did you get involved to do the dyno run?

A. Mitch asked me to -- asked me to do it with him, basically. And Nick agreed.

Q. Had you had any contact with Nick Johnson before that of any kind?

A. Yes.

Q. What was your contact with him before that?

A. We've had lots of contact. Honestly, that's a very good question. I don't know if we talked much about the motor before any of that. I think once it came down to doing the engine dyno, when that decision was made between Nick and Mitch, if I recall, that's when Nick and I started speaking more about what was going into his build, why he was doing it, what he was doing and, you know, what he was looking for out of it, type thing. Up

until that point, our last real interaction was when he bought a couple of fiberglass wings from me.

Q. You said that he told you what he wanted out of it. What did he tell you he wanted out of it?

A. To try to make at least, if not more than what he did on his -- on the previous motor with -- that had less modifications.

Q. And --

A. But we already discussed, with the turbos he had, there's only a limit, because you've only got so much air pushing through it. He had small turbos.

Q. And what was your understanding of how the dyno run here in Texas was going to kind of further that goal?

A. Sorry. Might need to clarify that a little bit more.

Q. What was the purpose of the dyno run here?

A. The main purpose, from what I understood at the time, was to break it in on the dyno, do the break-in on it, make sure that -- make sure it fired up because, you know, of the first failure bending valves, he didn't want to, you know, get it back over there, have the same thing. He wanted to make sure it ran. And then, if possible, do the break-in, the initial break-in on the dyno here so that when he got it, he could expedite his process to get to the dyno, finish the car so he could get to his car

meets and shows and stuff like that. And it was just mostly see, can we make the power out of it, but it was -- 90 percent of it started with breaking it in, making sure it ran, made sure it did what it was supposed to before shipping it off.

Q. So I've read in some communications that they talk about Haltech gold, Haltech platinum. There's different levels of dyno runs that they can kind of do on their machines. Is that correct? Basically, gathering more information or doing more on --

A. The Haltech themselves don't have anything to do with dynos, you know, in relation -- You're combining two that are actually separate. But, yeah, Haltech has their platinums, their elites, elite 25 -- or 2000s, 2500s. And all it is is they have added features to them. If you want to also attach, say, tire temperature sensors to it, that, I believe, goes into the elite 2500 series, not the 2000 series. The Haltech platinum is kind of your baseline, like get you in, still standalone, but not a lot of bells and whistles, does what you need it to do and the bare minimum type thing.

Q. Which one was the one done in Texas? What category did it fall into?

A. Mr. Johnson's?

Q. Yes.

A. The Haltech 2000.
Q. 2000, is that what you said?
A. If I remember correctly, yes.
Q. And what all did that include?
A. Well, at the time, all we had was the dual wide band controller that we were using with it at the time.
Q. And the dual wide band controller, one of those two did not operate correctly?
A. The wide band sensor itself was not operating correctly. The controller and all that stuff was still working right. The sensor itself was insufficient.
Q. And how did you overcome that problem, or did you?
A. We weren't able to because we didn't have a back-up wide band O2, so Mitch and I did our test, swapped the O2s to see was it a bad O2, was it a bad side, swapped wires, found that it was following the O2. Okay. I'll pay attention to the one that's actually working right because what it worked out was it was significantly enough off that the motor would respond differently. You know, if we tried to run it, it would, one, it would smell a little bit different out the exhaust because it wasn't burning right, didn't have enough fuel, or it would start -- it would have a rough idle. I don't know if you've experienced rough idle where they just kind of miss

where -- I'm going to make engine noises really quick so bear with me. It will kind of (descriptive sound). Okay. Something is not right.

But in the case of Nick's, it was running smooth, so Mitch and I both looked at it, went, "This one makes the most sense. Let's move the sensors around, check it all out. We're going to run with this one," and negated the one that looked like it was running lean.

Q. So you and Mr. Johnson both have testified that at that dyno run here in Texas, the maximum RPMs you could reach was 5500?

A. Correct.

Q. And you said it was an electronics issue?

A. It had something to do with the new wiring harness setup that I had done, so I was apparently missing something. Some signal wasn't quite a hundred percent to get it out of, I guess, some kind of safe rev limit mode, and Haltech couldn't even find it.

Q. So as a result of that limitation on your RPMs, what kind of data did you not get that you expected to get out of that dyno run?

A. The boost and horsepower, the RPM range to be able to get to the higher RPM range and the higher boost to, you know, see how everything responded. We could only get to 5500 RPMs of response. So we just kind of dialed

it in to that and finished the break-in for Nick, you know, cleaned it up. And if I remember correctly, I think Mitch did one or two oil changes on it, too, while we were there, you know, from the first day to the second day.

Q. How long in --

A. Trying to make sure.

Q. -- in numbers of minutes or hours or however you need to measure this, how long was that engine run on the dyno?

A. We had to get a few different gallons of gas or jugs of gas a couple of times because we were -- I would say in the grand total of things, we probably had that thing running, out of the three days we were really running it, oh, man, 8 to 10 hours.

Q. And --

A. We were doing lots of idling and running and slight revs and touches and just checking stuff and, you know, like I said, when we were having issues with RPM, Haltech was in looking at it. We were running it, just letting it run, like, let it break in. It's just running.

Q. And you spent some significant time on the phone with Haltech during that dyno trying to figure out what was wrong, right?

A. Correct, with Andrew, Haltech.

Q. But you and Haltech could not come to a

conclusion about how to fix it?

A. No. That's when we both determined that it had to do something with one of the signaling in the harness that was like a key ignition, like to start the car, that wasn't either communing right or wasn't hooked up or properly to release it from, say, like free park rev. I don't know. It's to keep you from -- In some cases, some of these will have this where if you're in neutral, it won't let you rev it all the way out to 7,000 RPMs unless you turn it off, like in an automatic and stuff like that, just trying to preserve the motor.

But after Haltech jumped in, because I went through it looking at everything I could, checking wiring, going back through my wiring schematic, and nothing was jumping out at me, and so I had them come in, like, is there any signal I'm missing that can help point me to fix it, to solve this. And Andrew was with, you know, remote tuning in with us, looking at all the information for probably a good couple of hours, and he was trying different things, you know, to get it, and it just would not go past 5500.

Q. Who made the ultimate determination, "We're not going to try to fix it anymore. Let's just take it off the dyno and be done"? Or was it a group decision?

A. Well, initially, it was basically a agreed

decision with Mitch and I, because, like we said before, only got so much money and so much time, and we were hogging up the engine dyno at Reher-Morrison. The engine was sitting there for a while, and they needed it. So we couldn't -- We were hoping just to be in and out, like it was going to go smooth, but we knew it was the first time around of doing this, we might have a few hiccups. Well, we weren't expecting that hiccup, neither of us were. So at some point, we just kind of went, "Well, we're not going to sit and leave this thing on the dyno for a week as I'm chasing electrical gremlins," you know.

And then at that point we made the decision, talked to Nick, gave him the info, gave him our confidence that we did everything we could. It worked out to, you know, got some break-in time on it, everything sounds good, looked good, it's responding, you know. The motor is doing what we -- or what I expect it to do. It was doing what Mitch expected it to do based on his mechanical stuff that he had done. But we just weren't able to put the power, the ultimate power and boost through it for, I guess, final checking, so to speak.

Q. So, ultimately, Mr. Johnson approved y'all's suggestion to go ahead and stop?

A. Yeah, because there -- I mean, he really didn't have much choice for the grand scheme of things, because

the odds of getting back on the engine dyno would have pushed -- Because the motor had to come off the dyno so that Reher-Morrison could use it. So we -- to get back on the dyno was going to be like a month-and-a-half or so out. It was going to be an extended time out. And Mr. Johnson was running out of time to -- for his import fees to not increase, I believe, to get the motor back, you know. He had an agreement with the import fees to -- that this was going back under warranty, it'd be back in a certain amount of time, and was trying to avoid that time frame from expiring.

Q. So based on that, he was okay with not figuring out the problem and getting it back on the dyno for a full run?

A. Yeah, it was -- at that point, it was a group collaboration of, "Okay, we got you," because can't get it back on the dyno in time and finish it and get it boxed up and Mitch be able to get it boxed up and shipped to him and beat that expiration date.

Q. So that was my next question. After the dyno run, to your understanding, did the engine get crated up and sent to England at that point?

A. Yes, from what I understand, yes.

Q. Did you do anything to it, to the engine to further tune it after it came off the dyno?

A. No.

Q. To your understanding, did Mr. Wilson do anything else to the engine before he crated it up and sent it to him?

A. He just had to take the custom manifold, custom part that he had to make to get it on the engine dyno, he had to remove those, but they were outside parts. They weren't internal parts.

Q. You just mentioned something I want to ask about before we go to lunch. You said there's custom parts made for the dyno run?

A. Correct.

Q. Who made those?

A. Mitch did, EPR Racing.

Q. And did he do those -- did he charge?

A. I'm not sure.

MR. MATOUKA: Objection, relevance.

THE COURT: You can answer if you know.

A. Yeah, sorry, I don't know if he -- if he billed out for that or not. I think it was a -- If I remember right, it was a conversation between Nick and Mitch about it. Whether anything came of it, I don't know what the actual outcome was.

Q. (BY MR. HURLEY) Did you build any parts for the dyno run?

A. The electrical table, ECU table, fuel pump setup. I built a handful of -- you know, to be able to facilitate running it on the dyno. I did all the electrical and fueling system.

MR. HURLEY: Your Honor, I'm about to switch to another topic.

THE COURT: Let's take a break. This would be a good time. It is almost noon. We're going to take a break for lunch. I've got a hearing in my Court at 1:30. It will last about 10 minutes, so we'll get started a little bit late. So y'all have a little bit longer at lunch. We'll get started at 1:45 this afternoon.

Do not discuss this matter with anyone, including each other. Do not remain within the hearing of anyone who is discussing this matter. Have a good lunch. We'll see you at 1:45.

(Recess taken.)

(Jury present.)

THE COURT: Everybody have a good lunch? Good.

All right. We're going to continue, Mr. Hurley, if you're ready.

MR. HURLEY: Thank you, Your Honor.

Q. (BY MR. HURLEY) Mr. Pool, when we left off, we were talking about the dyno run that you were involved

with here in America before the engine left to go back to England.

A. Uh-huh.

Q. I want to make sure I understood. When the engine left here, it had an O2 sensor that was not working, correct?

A. Correct, or not working properly or a hundred percent.

Q. Also, for some reason that we don't know, there was some long-term and short-term fuel data that did not make it into the ECU, correct?

A. Just based on what Mr. Johnson had told me about conversing with Haltech about. I did not verify that during the dyno myself because I was in the middle of tuning. So long terms, short terms didn't make a difference to me at the time.

Q. But was that data there when it left your hands or do you know?

A. I do not know.

Q. Okay. Without short-term and long-term fuel -- Let me step back. That short-term and long-term fuel data is what's used to kind of think about how the fuel ratio should be, right?

A. During your daily driving and running around town, stuff like, that your long -- or your nontuning

event driving and operations.

Q. So do we know when that long-term and short-term fuel data was lost or disappeared from the ECU?

A. Assuming when Mr. Johnson finally got everything up and running and went to check and realized it wasn't there.

Q. Which was -- which was --

A. In the U.K., not here.

Q. After he installed the engine?

A. Correct.

Q. So is it accurate to say that he drove -- We heard testimony yesterday that he drove the car for five to six months, put maybe 400 miles on it before it actually went to Abbey Motorsports. So during that period, does that mean it was being operated without that long-term and short-term fuel data?

A. I don't know when the long-term, short-term data got rectified. My understanding was it was shortly after the car got running, but I wasn't there so I don't know exactly how many hours or miles or time had been put on the motor with or without the long term, short term.

Q. If you had had your preferences and there wasn't a time rush on, would it have been your suggestion to replace that broken O2 sensor before engine left America?

A. Yes, I would have replaced the 02 and, you know,

gone after my wiring harness and rectified that so we could get the full running capability out of it. We would have found probably a lot of things, you know, earlier.

Q. But that wasn't an option because Mr. Johnson needed his car back within a certain time frame?

A. That and time and money, money involved and time on the dyno, utilizing Reher-Morrison's space.

Q. So when you say that the Haltech -- Did Haltech correct the long-term and short-term fuel data missing by putting it back on the base tune that included base long-term and short-term fuel data or did they actually recover the data?

A. I don't know if they were able to recover any data or if they were just able to fix the file to have it operate and then they just brought my fuel and timing maps in since they had already had those rectified at least up to 5500 RPMs.

Q. But with a broken O2 sensor, would that data be able to be gathered?

A. Yeah, it will still -- it will still read a long term, short term.

Q. But isn't that what the 02 sensor is doing?

A. Just that one -- that one bank 02 wouldn't be an accurate long term, short term because it will measure long-term and short-term data for both banks. So one bank

would have been, you know, inefficient, wouldn't have been accurate.

Q. And -- Okay. Accurate. Okay. That was going to be my next word. So, but what was recovered, what you just mentioned, was the ignition and fuel map that you had previously done, correct?

A. Correct. At least to my knowledge to -- or to my understanding when Nick and I talked about it.

Q. Do you know how they did that?

A. Just copy and paste.

Q. So --

A. You can literally open a good working map and tell Haltech to copy over different maps, different parameters and copy right in to the new file.

Q. Do you know what an open loop is in these systems?

A. Yeah.

Q. What is that?

A. It's, to me, when the 02 sensor is working, when the narrow band O2 sensor is working for your long terms, short terms.

Q. What does it mean by open loop?

A. It -- The ECU monitors, typically through a certain RPM band, if I remember right, it's right around 55 to 6,000 RPMs, it's no longer relevant so the program

doesn't keep it in use. And at idle, it doesn't do anything because it has a whole separate idle set of parameters. So in normal driving, from like roughly say 2000 RPMs to 5500 RPMs, the open loop is -- the 02 sensors are cycling, they're doing their job, they're reading air/fuel ratios and letting the computer know, "Hey, this is what I'm seeing." And the computer goes, "Well, I have a target I'm shooting for." And if the 02s are reading higher or lower, the ECU will make an adjustment based on that. So that's the point of doing the initial tuning side of things is those are, you know, negated. You're not looking at the short term, long terms at that point. Your goal is to get it at optimal running there so that the computer doesn't have to make as big of changes. Because, otherwise, like, tuners wouldn't be needed, just, well, let the ECU figure it out. Well, the ECU might have to make large changes, and then it becomes a larger sweep it's trying to correct for. So as tuners, we get in and straighten that stuff out.

Q. So can the open loop system work when there is no -- if there's not a functioning O2 sensor?

A. It was functioning. It just wasn't functioning accurately.

Q. Okay. Is the open loop doing its -- Can it do its job without the correct data from the 02 sensor?

A. On that bank, it wouldn't be as efficient. In this case, it was showing a lean condition, so it would sense it was running leaner, and it would have, if I remember right, added about 10 percent more fuel.

Q. And so --

A. So it would have been a little richer in the grand scheme of things in open loop form.

Q. In closed loop form, what would it do?

A. Nothing. The wide band O2 short terms don't do anything. Closed loop, it's just -- it's doing -- it's basing its information on the tune.

Q. Could a broken O2 sensor lead to a lean fuel fixture as well?

A. Yeah.

Q. Just because it's not operating correctly?

A. If it's operating wrong and it's reading a rich condition, if it's sensing it's got a voltage -- voltage capacity that's saying it's in the richer side of things, then the ECU is going to go, "Okay. Thanks. And it's going to pull fuel out."

Q. When was detonation more likely to happen, in lean fuel or rich fuel conditions?

A. What was that again?

Q. Which -- in which condition is detonation more likely to happen, lean fuel or rich fuel?

A. If the 02 was reading rich, because then it would -- the ECU would effectively lean it out trying to get that to come back up to the target.

Q. So if you have a lean fuel situation as a result of the broken or the malfunctioning 02 sensor, then you could have a detonation?

A. No. If you've got a lean sensing wide band 02, if it's sensing lean, then the computer is going to add fuel to fatten it up to bring it down there. So it's going to be -- The overall air/fuel ratio out the tailpipe would be richer, but the sensor won't have proper information, so to speak.

Q. And that's what could lead to detonation?

A. For this case of the bad 02, no. It's actually just the opposite. It will actually put more fuel in there keeping the cylinders cooler on that bank.

Q. So we talked about hearing the sound of detonation. You said you have done dyno runs before, correct?

A. Uh-huh.

Q. In the room that you do the dyno run, there are no mufflers on that engine, are there?

A. Um, what do you mean, like in -- for Nick's case or just in cars in general?

Q. In general.

A. In general, I'm sitting in the vehicle doing it.
Q. But it's in an enclosed room, so it's loud?
A. Oh, yeah.
Q. So wouldn't it be harder to hear the detonation knocks at that point because it's loud?
A. Yeah. That's why if you can hear the detonation over the engine noise, it's loud, it's big. That is not good.
Q. You -- we were talking about micrometers earlier, and you said you used a micrometer to measure one of your engines that Mr. Wilson had worked on, correct?
A. Yes.
Q. What kind of micrometer is that, the brand?
A. I'm probably going to butcher the name. And my brain is not even going to say it. It starts with an M. It's -- oh, man, I'm horrible now. To be honest, I couldn't spit it out right now because I feel like I'll butcher it and it won't come across right. It's a commonly used brand.
Q. Okay.
A. Sorry.
Q. What is the minimum measurement on it? Is it a thousandth? Is it half a thousandth? Is it --
A. Half a -- or one-ten-thousandths.
Q. One-ten-thousandths?

A. Yeah.
Q. Did it come with an instruction manual?
A. Yeah.
Q. What -- does it give instructions on how to properly use it?
A. To calibrate it and measure and, you know, use a very little end, you know, try to mass, you know, tighten it down with the main stick, use a -- the end friction -- friction adjustment so you get the same consistent measurement.
Q. Did you ever review any pictures or physically -- I don't know if they're in there or not -- the caps? Did you ever review those?
A. The main caps?
Q. Yes.
A. As far as what did I review of them?
Q. Did you ever see a picture of them or actually hold them in your hand or anything like that?
A. Yes. Oh, I didn't hold in my hand, but I saw them in person when Mitch was assembling the motor.
Q. But I'm talking about --
A. Oh, afterwards? No. No, I haven't got them. The only thing I've held in my hands from the motor since the failure is these pistons here.
Q. Do you know what the term "threading" is in the

main cap?

A. Yes.

Q. What is that?

A. When the main cap is moving around a little bit, kind of transfers material from one material to the other.

Q. And if there was detonation, would it be most apparent in the main caps?

A. No.

Q. Why not?

A. Well, this is the fun part. Okay. So the main bearings to the main caps and, you know, relative to the rod bearings, the one single main bearing is approximately 30 percent bigger than a rod bearing. Well, you've got two main bearings supporting one rod bearing during the power stroke. So, literally, you have over two-and-a-half times the surface area of oil resistance and capacity, along with oil clearance is typically 50 percent greater on the main bearings than on the rod bearings. The rod bearing takes the brunt of the load first. So long before the mass of the vibrations and issues from, say, a detonation event getting to the mains, it long goes -- the bulk of the force hits the rod bearings first. So in order for it to front that bad, you'll have the threading would normally occur just at high RPM just due to crank vibrations, versus a detonation event.

Q. You spoke a little bit earlier about reviewing the handwritten build sheet, correct?
A. Correct.
Q. That is --
A. Still in front of me.
Q. -- the Defendant's Exhibit 17. Let me pull it up here.
A. Yeah, I still have it here.
MR. HURLEY: Did it turn off? There we go. Sorry.
Q. Now, the part of this build sheet that's most relevant to what we're talking about today is this bottom box, correct?
A. Correct.
Q. You said that the missing numbers in this to do a mathematical calculation are the thickness of the bearings, correct?
A. Correct.
Q. But you knew the thickness of the bearings because they're all standard?
A. Yes.
Q. Those don't vary?
A. Not enough to effect this. They actually vary within .000001, or no, wait, sorry .00001.
Q. On what do you base that last statement?

A. Manufacturer specification and measurements I've taken of my own bearings.

Q. So you said you know the main bearing thickness so you can then do a mathematical calculation that should get you to oil clearance. These clearly were not done by mathematical calculation. These were done by actual measurements, correct?

A. One would hope so.

Q. So while the math is what you did on paper, these are from actual measurements, correct?

MR. MATOUKA: Objection. Calls for speculation.

A. Possibly.

THE COURT: Overruled. You can answer.

A. One would hope so, that these are the correct measurements.

Q. So the mathematical calculation doesn't matter. It's the actual measurement, correct?

A. There's a plus and minus to that.

Q. What's the plus and minus to that?

A. Well, the plus is that, you know, you look at it and go, well, the mechanical clearance might be different in the right way or different in a bad way. As if you're measuring it and going, "Oh, you know, it's like, oh, just because it measured this so when I put it together, I get

this."

Well, you shouldn't really when you're measuring to the degree that we're measuring under the circumstances, you should get that clearance, because otherwise then that clearance is not there. And if you're measuring one thing and getting another, how do you prove what clearance you actually have if you can't actually measure it.

Q. When you say you measure one thing and get another, how do you get another other than measuring?

A. Exactly. So if your measuring it and writing it, down how do you get something different in the end.

Q. Right. But if these are actual measurements, what do you mean you get something different in the end? You mean that post traumatic failure, those measurements?

A. Could.

Q. So let me ask you this. When it comes to bearings, the thickness of the bearings, do they conform to the boring once put in place and torqued out?

A. If everything is done correct, yes.

Q. So the thickness of the bearing outside of the engine are also not the accurate measure of the thickness, correct?

A. No, they still are.

Q. But you just said they conform to the bearing, or

to the housing bore.

A. And there's a crush height that goes along with it. It's in the calculation and in the manufacturing process that takes that into account.

The whole idea is that when you put the bearing in, if you bore -- if you, you know, if you're line hone and bore and all that good stuff is a concentric circle, it's a nice, perfect circle, you put the bearings in, realistically, everything is calculated right, the manufacturer design and build their bearings to, you know, duplicate that perfect circle, there's no reason why it shouldn't be.

And from my own personal measurements, it's the case. I can explain --

Q. We're going to get back -- we're going to get back to the video that was you doing your measurements in a minute.

A. Uh-huh.

Q. But for purposes of this sheet and Mr. Johnson's engine, not yours, do you have reason to believe that those oil clearances on the far right-hand side that was done by measurement are incorrect?

A. Correct. They do not add up. They do not work.

Q. No, no, I'm not asking about the math part. I'm asking about the actual measurement part. Are you

contending that the measurements were done incorrectly?

A. Yes, based on the measurements he has here on his journals and housing bore and based on the bearing thickness.

Q. But that's based on your math, not an actual measurement.

A. I'm not sure exactly what you're getting at because the only way to calculate that stuff other than --

Q. Actually measure.

A. You can measure it, but again, like I said, from experience, I can do the same measurement, which I just did two weeks ago, and the math worked with the measurements I found.

Q. But --

A. So in this case, the measurements don't work with this math.

Q. But as we sit here today, you have no evidence or no basis to say that the measurements done to come to these numbers were done incorrectly, correct?

A. The only basis I have is using my brain.

Q. You mean the math?

A. Yes. How else are you going to -- If -- What is the purpose of a build sheet if the end user can't duplicate the information?

Q. Well, let me ask you this: Do all engine

builders give out their build sheets?

A. No. Most do, but some don't. Like, I haven't gotten a build sheet from Mitch for any of my builds.

Q. So it's not a requirement that a engine builder gives out anything?

A. No.

Q. The build sheet is more for their internal purposes, correct?

A. Possibly.

Q. When it comes to the build sheet, this is the only piece of data that any of us have that talk about the measurements before the catastrophic event, correct?

A. Correct.

Q. And the numbers on the far right side, which is the oil clearance, I know it's a little bit of hen scratch.

A. I know what they are, yeah.

Q. What do those say?

A. Basically 35-ten-thousandths or three-and-a-half-thousandths, 33, 3.3, 3.4, 3.4, excuse me.

Q. If that is, hypothetically speaking, if those are the real oil clearances that were present when the engine left Mr. Wilson's shop, those oil clearances are sufficient, correct?

A. Correct.

Q. Let me ask you a couple of other questions about delivery because I want to get kind of the chain of events correctly. The dyno run that we talked about that you were involved in, after that, the engine gets crated and shipped to London or to England, correct? Do you know what happens to it after that?

A. When it gets shipped there, I'm assuming it went through customs and all that good stuff before Nick was able to pick it up.

Q. Were you having ongoing conversations with Mr. Johnson when he received the engine?

A. No.

Q. Do you know how long he took to put the engine in or any of the specifics of what happened with the engine after that?

A. Not off the top of my head.

Q. But, eventually, and I think Mr. Johnson said yesterday, about six months after he got it back, he ends up at Abbey Motorsports for that dyno run, correct?

A. I'm going to go with "yes" based on the information, correct.

Q. And you had no role in that dyno run at Abbey Motorsports, correct?

A. Correct, I did not have anything to do with that

one.

Q. Were you -- were you on the phone or video linked in or anything like that for that dyno run? Did you observe it in real time?

A. No, I wasn't doing any remote tuning or anything like that.

Q. When did you first learn the engine had failed?

A. I'm assuming might have been a few days later, after Mr. Johnson had talked to Mitch.

Q. So this is a question that I think just --

A. I'm not exactly sure. I mean, I don't have the dates of when we first started conversations about it.

Q. I understand.

A. I didn't know I was going to have to keep notes.

Q. This is my ignorance. So if you tuned the car when it was on the dyno run here in Texas, why did it need to be tuned again by Abbey Motorsports?

A. Because the tune wasn't finished because we were limited to 5500 RPMs, and we were doing it for break-in purposes and testing, for the most part, to make sure that everything operated right, because even once it got over to the U.K., their fuel is different than ours, so it would have to be retuned anyway to match their fuel consistency.

Q. So had you gotten the dyno run here above 5500

RPMs, would they have still needed the Abbey Motorsport's tune?

A. Yes, still would have to redo it.

Q. That's because of the differences in fuel and things like that?

A. Yes, yeah.

Q. Based on the information you've seen and reviewed, did Abbey Motorsport's tune get completed?

A. Almost, based on everything I've seen to this point.

Q. So when you say almost, what does that mean?

A. I believe they were only able to make, if I remember right, it was three, maybe four full boost runs.

Q. And --

A. Full boost and full RPM, the target boost that Mr. Johnson was going for and, you know, hitting, you know, going to the end of the RPM range. I believe it was 7200 RPMs.

Q. So they did that you said how many times?

A. I believe they saw, if I remember right, it was either three or four full runs, if I remember correctly.

Q. So if there wasn't sufficient oil clearance, why wouldn't it have failed on the very first of those?

A. Power level wasn't reached enough to push those -- push that oil clearance to its limit.

Q. I mentioned that you -- You mentioned that you did some measurements on your own engine, correct?

A. Correct.

Q. I want to make sure we look at that video before we let you go.

MR. MATOUKA: Objection. It hasn't been admitted into evidence.

MR. HURLEY: Yes, it was. It was Exhibit No. 22 that you agreed to.

MR. MATOUKA: The video?

MR. HURLEY: Uh-huh.

MR. MATOUKA: Oh, okay. Cool.

(Off-the-record discussion.)

MR. HURLEY: This is a different one. This is his. Oh, I'm sorry.

Q. (BY MR. HURLEY) So while I'm looking for this, you videoed yourself doing a measurement of the housing bore of your own engine, correct?

A. Correct.

Q. And why did you do that?

A. Because of what came to light from Nick's findings and knowing that our motors were machined rough about the same time and same place. I'm shooting for a thousand to 1100 horsepower. I -- You know, my plan was to look it over anyway, so it just prompted me to take

that look.

Q. And so do you remember roughly like the time or the date of when you did this?

A. I guess at this point, about a year-and-a-half ago, if I remember right, September, August, September.

Q. So --

A. I, honestly, I don't recall.

MR. HURLEY: This is a video that's been admitted under Defendant's Exhibit 22. I'm going to play it, then I'm going to ask you some questions about it.

THE WITNESS: Okay.

MR. HURLEY: I don't think it has sound.

THE WITNESS: It should.

THE COURT: It does have sound?

MR. MATOUKA: It may.

THE WITNESS: I talk a lot. I can't imagine.

MR. MATOUKA: He's got the audio up there.

MR. HURLEY: Oh, I'm sorry. I'll start it over. That may be a little loud. Here we go.

(A portion of video playing.)

Q. (BY MR. HURLEY) Let me ask you a question before we go any further. You're holding the camera with one hand, holding the -- is that a micrometer?

A. Uh-huh.

Q. Holding the micrometer with the other hand.

A. Bore gauge.

Q. Okay. Bore gauge. I'm sorry. So you're holding the camera with one hand and the bore gauge with the other?

A. Uh-huh.

Q. Having one hand on one end of the micrometer, is that the proper way to use it?

A. Oh, I see where you're getting at.

Q. Shouldn't you be using two hands?

A. Okay. Are you ready for this? I did the video after doing this measurement about 12 times multiple different ways with or without bearings. So in this case, I only documented the fact that it's different. It wasn't even a hundred percent different from the measurements I found when using two hands by myself.

Q. But all we have is the video of you using one hand, correct?

A. Correct, but it still shows the delta that was insufficient because it's not a perfect circle like it should be.

(A portion of video playing.)

Q. You see how the actual micrometer is kind of moving? You're kind of -- the shaft of it is kind of moving back and forth. Does that distort readings?

A. You're supposed to move it around till you get

the lowest reading again.

Q. Supposed to move the entire shaft around?

A. If I'm getting too close to the oil feed galley, yeah, I need to move it back to make sure I'm not measuring inside the oil feed galley.

(A portion of video playing.)

Q. When you roll it over like that, is that the proper technique? See, you're rolling it.

A. Yeah, I'm rolling it.

Q. Does gravity not end up having an --

A. No.

Q. -- effect on it when you roll it like that?

A. No. Why would gravity? It's spring-loaded. Takes up the tension. Typically, the reason why I use two hands is to stabilize the other end so it doesn't fall into the oil galleys, oil feed lines, and you can keep it in a similar spot.

(A portion of video playing.)

Q. So this engine that you're measuring right here, where is it currently?

A. In my garage.

Q. What's its current status? Is it being used?

A. It looks just like it does in that video. I haven't done anything more with it. I haven't run it yet.

Q. And why is that?

A. Because of what I found.
Q. How are you going to fix that?
A. I'm going to probably have another machine shop machine it for me.
Q. And that's all it would take to fix it?
A. Yeah, that's all it really needs is a good proper line hone to straighten it all back out.
Q. And I know this is probably going to be a ballpark, but how much will that cost?
A. Uh, I think the last quote I got was like 400 bucks.
Q. Okay. I want to make sure I understand all of your -- all of the basis for your opinion. I think I understand what your opinion is, but I want to understand the basis.

Prior to Sunday before trial, you had never physically inspected any part on the engine after the failure, correct?
A. Not physically, no, no.
Q. All of the information that you did have was things like pictures and videos?
A. Uh-huh.
Q. And information you received from Mr. Johnson, correct?
A. Reports and whatnot, yes.

Q. Did you do any independent investigation outside of that?

A. As in?

Q. Anything else other than relying on those videos, photos, and the information from Mr. Johnson?

A. Also did some more research and more digging in just to see if anything that could potentially, you know, lead to these, this style of result that maybe I wasn't aware of. And, unfortunately, didn't find anything, you know, in my searching.

And I actually called my two machine shops and chatted with them about it as well. And they kind of hem and hawed about it as well, going "Doesn't make sense to me either. Yeah, I mean, typically, it's a machining error." "Okay. Well, that's kind of what I'm thinking but I'm going to keep looking."

So, and then as more information came in, just kept analyzing it, looking at it. My first impression is never take anything at, you know, face value. I'm going to keep digging, keep looking. If I keep coming to the same conclusion over and over again, then it's got to be my conclusion.

Q. Which leads me to my next question. Did your opinion change at all from beginning to end of this investigation?

A. No.
Q. So you --
A. It only got stronger when I saw the pistons in my hand.
Q. So you knew at the very outset that you thought this was a machining error?
A. At the end of all the information that was supplied and research I had done and measurements I had taken personally, yes.
Q. You mentioned the work needed to potentially fix your engine. What did you call that, the work that was going to be done? Honing?
A. It's going to be a line honing in this case. It might need a line bore, but I don't think so because it's tighter on the inside, so they can slowly hone it back out.
Q. Have you ever done a line bore or a honing like that, you, personally?
A. No, not me personally, but I've been there also at Mitch's shop as well as other shops, you know, watching the process happen.
Q. What did you do to eliminate other possible causes of the problem with the engine? Did you do any kind of investigation to basically eliminate other possibilities or did you just focus in on this one

possibility and confirm what you were thinking was right?

A. From mine or for Nick's?

Q. For Nick's.

A. Oh, for Nick's. I thought about a lot of different things. That's why I looked at all the data as well, checking over the data log, looking over the dyno charts, you know, asking about oil filter debris, you know. And then he also sent me all the oil analyses just to, you know, look into that, and, of course, the bearing report and whatnot.

Q. So -- I'm sorry. Go ahead.

A. I'm sorry. Yeah. It's -- I looked over all the information and measurements and, you know, my expertise and, you know, knowledge in this engine and my experiences with multiple engines that I've personally assembled and had machined elsewhere, so to speak. It -- everything just kept coming back to the same thing.

Q. What other possibilities did you consider?

A. Too much power.

Q. What -- what would too much power have done to the engine?

A. It could have done this.

Q. And when you say too much power, how would that occur?

A. By having a bigger turbo, more fuel. Because

realistically, the premise behind having billet main caps, the reason why we go to them, because in a stock form motor, in this motor in particular, stock form, the bottom girdle will stay together till about 850 -- or 800, 850 rear wheel horsepower, almost a thousand engine horsepower. And then the cast iron girdle on the bottom, it's not that strong, so it tends to flex and move, and it will finally just give out, and literally it will open the motor up for you. You don't have to unbolt it. It will open it up and leave it on the ground for you.

So billet main caps being stronger material, which Mitch and I have discussed in the past because numerous other platforms use it for making mass amounts of horsepower, it's there to be a stronger gratuity than the Chromoly 4140 based. You know, it's slight variations here and there, but it's a much stronger material than the factory cast iron so it can handle more power, it can take more abuse before flexing and giving out.

And, typically, this setup should allow us to see a little bit more than -- or maybe even a lot more, but definitely over a thousand horsepower.

Q. In the end, what would the proper clearance have been?

A. Well, the proper clearance is listed there. It just doesn't mathematically add up.

Q. So are you referring to Exhibit 17?
A. Correct. The clearance listed here is --
Q. Would have been --
A. -- a proper clearance.
Q. Would have been proper?
A. If -- if the bearing clearances were that, and you know, had a nice, concentric circle, I highly doubt that it would have been an issue unless there was some other --
Q. Other cause?
A. -- magic cause that went into it.

MR. HURLEY: Thank you.

No further questions, Your Honor.

THE COURT: All right. Redirect?

MR. MATOUKA: Yes.

REDIRECT EXAMINATION

BY MR. MATOUKA:

Q. Is it possible to measure the housing bore and journal diameter without the main bearings being in the engine?
A. Yes. Actually, in my video, that's what I did.
Q. Okay. And so it's possible someone measured those and then didn't measure with the bearings, correct?
A. Not sure what you're getting at there.
Q. Well, you were talking about the -- in the

Defendant's exhibit, the Exhibit 17 that you've been referring to, that the numbers don't add up. The numbers don't add up because there's no measurement for the bearings, correct?

A. In this case, correct. The -- there's no bearing measurement to finish the calculation if you were going to sit at home and run the numbers.

Q. So even if they hypothetically had properly measured the housing bore and the journal diameter, that still wouldn't get them to the oil clearance without the bearings?

A. Correct. As it sits right here, if you just took these numbers, the difference of these numbers is not the oil clearance.

Q. Do you remember if Mr. Johnson was made aware that one of the 02 sensors was inaccurate before it was sent back to him?

A. I believe so. I believe I chatted with him about it.

Q. Okay. You talked about how much it would cost to repair your -- the engine that you've measured that has the too tight of oil clearance, correct?

A. Correct.

Q. And you indicated that would be about $400?

A. Maybe. Somewhere in there.

Q. That engine hasn't been run though?
A. No, no, I haven't run yet.
Q. Hasn't sustained any damage from any type of failure, correct?
A. No, no. It's been collecting dust. I have to take it all apart and clean it.
Q. And we've talked about the spark plugs already, but if there had been a significant difference between the air/fuel ratios on the two banks, would you have seen something different there?
A. A significant amount, yes. 02 -- or the spark plugs would be -- one bank would have a noticeably different color.
Q. And was that present here?
A. No. No, they all are pretty, like I said, pretty darn consistent, other than the No. 6 looks like it's maybe a little on the lighter side of a fueling.
Q. And there -- we saw this video and you were using one hand to measure while recording with the other one, right? When you had done previous measurements, correct?
A. Yes, plenty of times.
Q. Had you used two hands when making those measurements?
A. Yes.
Q. And you -- had you used that same bore gauge on a

different engine?

A. Yes, that's the same bore gauge I just used to measure, well, not only measured my motor again and another client's motor.

Q. And that other motor had -- was concentric and had the appropriate clearances?

A. Yeah, the first one we talked about, the first set of main caps that Mitch had done for me for a customer, that was, I believe done, if I remember correctly, at Reher-Morrison. And that one, same bore gauge, was within, you know, one-ten-thousandths of being a perfect circle with the bearings in it. And then walked over to mine to show my buddy the same thing, kind of what I was up against, what I was dealing, why I was checking it. It was like, "because this is what I found on mine," and walked over, 30 seconds later, measured mine, not a concentric circle. So I was like that's why I got to get it into the machine shop, why it's still sitting in my shop.

Q. You've talked about the main billets in Mr. Johnson's engine and your engine, right, the special ones made by EPR?

A. Correct.

Q. And these are of a stronger material?

A. Correct.

Q. Would it take a lot of force to form them?
A. Yes. That's the whole purpose is that they can handle a lot more force than what we're currently throwing at most of these motors.
Q. And for detonation to have deformed them, would that take a lot of force?
A. It would take a whole lot of detonation to get that far down. That would be a -- a lot more things in the chain of pressures and, you know, materials that are in the way before it would transfer to that point in particular.
Q. And in all the pictures you reviewed, did you see any evidence of that kind of damage?
A. No, I have not. Even reviewing them, the pistons, everything in hand, I -- there was nothing I saw unusual. Even looking over the rings and stuff like that, the rings had a little bit of kind of I would say uneven wear, but not, not a issue that would -- Most heads, mostly on the second ring -- No, still on the top ring. I'm going to say the second ring, it's uneven. There's wearing more on the bottom of the ring than anything else. That was pretty consistent across all of them. But the second ring would not take the brunt of a detonation abuse if it were to be the top ring and there would be other damage to the ring lands, rolling around, rolling the

corners more, and everything still seems pretty squared up, along with, like I mentioned earlier, there's no pitting in the bare aluminum or any melting going on to justify or signify there was any -- any amount of detonation that was worth even considering.

Q. And in your experience, can detonation make a main housing bore tighter?

A. If bad enough, if enough force was put through it to deflect it, it could roll itself. Not only would it get -- the bore would get longer this way, it could curl it in, but it would -- By the time you got to that force load, you've got a lot of other problems.

Q. And that would be apparent in the pistons and elsewhere?

A. Yes. Let's see, where else would be. Yes, the only -- We don't have that information. As far as looking over the crank, the straightness of the crank would also play into that because in order to deform that Chromoly material with the crank beating on it, the crank would have to be significantly bent as well.

Q. And is it your understanding that there was insufficient crush height for the main bearings in this engine?

A. Based on the report I read, yes. That's, you know, part of the research and part of the data that was

supplied.

Q. And is that a result of detonation?

A. No.

Q. Is that a result of improper machining?

A. Typically.

MR. MATOUKA: Nothing further.

THE COURT: Recross?

MR. HURLEY: Your Honor, I do, but I'm going to stand right here because I don't need --

Can you see me? I'm sorry. I'll step over here.

RECROSS-EXAMINATION

BY MR. HURLEY:

Q. There's been an issue about the lugging. Can you explain what lugging is?

A. Well, lugging is basically like loading, loading up the motor and not doing anything with it. You know, holding it at a, say, a low or loaded condition for an extended amount of time.

Q. And does the engine start at that point to where it's not doing what it's supposed to do and that's what the term "lugging" literally means, the engine is literally trying to work and it's not?

A. Um, yeah, if it's -- if it's lugging itself, typically it's -- you're at a point where you're giving it

gas and it's not responding.

Q. You used the term earlier called "dieseling." Does that -- do you use those terms interchangeably?

A. Yes and no, for depending on who I'm talking to for, you know, to get an understanding, you know, as far as the noise or noises.

Q. You said previously that lugging did occur with this motor when it was on the dyno at Abbey Motorsports, correct?

A. No, it was just under load for the dyno tune itself. The eddy current based dyno was holding the car at a certain speed. It wasn't -- it wasn't lugging in its own or on its own accord as far as not having a proper tune in it and you giving it gas and it not doing anything. It was, you know, it was being mechanically limited by the type of dyno and the type of process that was going on to get the tune done.

Q. But that was tantamount to lugging?

A. No.

Q. So you say in -- something you've submitted said, "Load cell tuning does this lugging across the entire fuel map and timing, loading and holding the engine under multiple throttle loads to properly and tune the maps for nearly all conditions."

So do -- are you saying that the engine was

never lugging when it was on the dyno? How does that square with that statement?

A. Okay. Okay. So in retrospect, yes, I did kind of misspeak on the lugging side of the loading of the dyno.

I'm cracking my voice like I'm in high school again.

And it was, I guess, for lack of better words, to help understand what -- you know, most people know what lugging is or, you know, kind of holding something back, it's not really going anywhere. But it's loading the dyno and holding it, not lugging it, not...

Q. So what you're saying is that statement of yours was incorrect?

A. Just in the clarification of how I deemed lugging versus loading.

Q. And then you go on to say, "In the case of the data log," the one that you looked at earlier, "it was only lugged for roughly three-and-a-half seconds." Why did you say that?

A. Because, okay, I started with the lugging to clarify or -- I guess to clarify statements made by others about lugging to, I guess -- I'm trying to clarify, word it here.

I was using "lugging" to, lack of better

words, disprove the issue of what was being seen on the dyno with the loaded 3 seconds on the dyno.

Q. To disprove what the data was showing on the dyno?

A. Showing that it was not lugging, that was a loaded setup. It wasn't necessarily lugging. It wasn't like as soon as they let go of the dyno, it didn't stay there going, "Oh, no, I can't go anywhere." That's lugging. That's when it's fighting its own tune to try to go anywhere. Now it was fighting a mechanical; it was, you know, you're holding it back.

Q. What kind of damage can lugging do to an engine?

A. In the case of like the dyno loading it up?

Q. No, just in general.

A. Well, lugging, lugging an engine would be similar to, say, putting a thousand pounds of concrete in the back of your truck that can only handle 500 pounds, and then you drive down the road for, you know, a couple of hours. You're lugging the car. You're lugging the truck. You're overworking it. You're generating a lot of heat in the engine. You're putting a lot of undue stress on it that's not needed or required and, you know, you can cause damage in long-term use. But it's got to be a lot longer than 3 seconds.

Q. So you also have issued some opinions about the

use of break-in oil by Mr. Johnson that was a brand called Fuchs; is that correct? Is that the way you pronounce that?

A. From what I understand, yeah.

Q. Your contention is that Fuchs is close enough in its characteristic to the oil suggested by Mr. Wilson that it didn't matter that he used Fuchs oil, correct?

A. Correct.

Q. And you base that conclusion on a quick Internet search; is that correct?

A. I looked up the specs on Motul and looked up the specs on the Fuchs oil parameters and also looked up specs against oils that I use from SWEPCO, and they're all within, you know, the same range. If not, Fuchs was actually better than some of the oil I use, and I don't have any issues. So, basically, looked at it and went, "Shouldn't have been any issues with the oil." The oil is a performance-based oil that can handle -- handle the load that this motor was being designed for and machined for.

Q. But you do agree that the documentation called for Motul or Maxima oil which is different than Fuchs, right?

A. It's a different manufacturer, but you can take that with a grain of salt.

Q. Based on your quick Internet search?

A. No, based on my experiences and all the different oils I've used and tested over my 25 years working on cars.

MR. HURLEY: No further questions, Your Honor.

FURTHER REDIRECT EXAMINATION

BY MR. MATOUKA:

Q. When he asked you about your -- what you wrote about lugging, was that in response to things you had read written by Defendant, Defendants and their experts using that term?

A. Correct. That's what I mentioned that I was trying to bring that up early and, you know, get that information straightened out beforehand.

Q. Did the use of the eddy current brake on the dyno, would that cause any damage for the amount of time?

A. No. It would have had to hold it. Especially at 2000 RPMs, no. You would have to hold it there for a lot longer. I mean, that's how we do load cell tuning is you will hold the -- you will hold the car, hold it at a certain RPM, and you will adjust your throttle input to move across the map so you can adjust all the cells. Otherwise, if you let it free run, you're only using a certain set of cells during that free run. So you will load a given run up for 30 to 60 seconds, but then usually

give it a couple of minutes to cool down.

MR. MATOUKA: Nothing further.

MR. HURLEY: Nothing further, Your Honor.

THE COURT: All right. Thank you, sir. You can step down. Appreciate it.

Next witness.

MR. MATOUKA: Your Honor, Plaintiff would like to recall Mr. Johnson.

THE COURT: All right.

All right. Mr. Johnson, if you'll come on up. You're still under oath.

THE WITNESS: Hello again.

NICHOLAS JOHNSON,

Having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. MATOUKA:

Q. All right. Mr. Johnson, and I'll try to be brief about this. Exhibit 13, you have most of it in front of you, the parts.

A. Yeah, my beloved pistons.

Q. Are these the pistons and spark plugs that came from your engine?

A. Yes, that's correct, absolutely.

Q. And you pulled them from your engine, the one that failed on August 30th, 2021?

A. Yes, that's correct. These are the pistons and rods I pulled from the engine, documented and photographed, and I've kept constant possession of since the failure and quite literally until where I'm at today.

Q. And in that time, has anyone else had possession of them?

A. No, they've always been in my possession.

Q. And has anything been done to them since you removed them from the engine?

A. No. They have -- they have been photographed and documented, but in terms of processing or remachining or nothing, nothing like that so they haven't been touched.

Q. And you cleaned them?

A. Yeah, obviously, as Mr. Pool said earlier on in his testimony, take parts out of an engine, they are dirty, they're covered in oil. The top of the pistons will naturally have some carbon buildup or some oil buildup from the removal. For me to be able to, what I believe correctly document the state of the condition of the parts, that buildup and dirt needs to be cleaned off for me to be able to see the metal surfaces that make up these parts. So, yeah, that was something that I did and, obviously, photographed as soon as it had been done. All the photos are time and date stamped of when I took them.

Q. And Exhibit 17 of the Defendant's, which I

believe is right in front of you, which is the handwritten build sheet, correct?

A. That's correct, yeah.

Q. That was only sent to you after you sent them a copy of the build sheet you had received, correct?

A. That's correct, except for I noticed the discrepancy and the dates that had been written down on that build sheet, so I queried it and, obviously, messaged Mr. Wilson. And then I received this document, which is two -- two years roughly after the engine was actually built and measured.

MR. MATOUKA: Nothing further.

CROSS-EXAMINATION

BY MR. HURLEY:

Q. Mr. Johnson, you said you cleaned them. What did you do?

A. As in?

Q. What was the process you used to clean them?

A. WD-40 and a microfiber.

Q. Did you do that cleaning or did someone else do it?

A. I did that cleaning.

Q. How soon did you do it after you took them out?

A. I'd have to take a check. Like I said, I documented everything so everything is time/date stamped.

I would probably guess -- First bunch of photos I took where there was some carbon buildup on the pistons were taken one day, and then I think probably the next day or maybe the weekend, a very short period of time afterwards I then cleaned them up and took further photos of them.

Q. When you say you used WD-40 and a microfiber cloth, what is the process? You just spray it with WD-40 and then rub it down real good?

A. I have some mechanical sympathy, and the purpose of the job of cleaning it is to see what the surface is like underneath and see if there's any damage to it. So I had -- WD-40 is a flipping brilliant product if you ask me. But WD-40 and a microfiber is about -- I didn't use any abrasives or anything like that. I was -- The purpose of the task was to clean it without causing any further damage or -- or marks that hadn't been caused while the components were still in the engine and the engine was running.

Q. So back to my question. Did you douse it with WD-40 and then rub it?

A. A combination of douse, let it soak, you know, have a feel how well it comes off, combination of WD-40 on the cloth itself, rotating the cloth to a clean surface. I'm a car detailer as well. I like my car clean. So, you know, using a clean surface every time to clean each -- I

think I probably went through about eight microfibers going through each one of these.

Q. So it was a thorough cleaning?

A. I believe so, yeah.

Q. About the Defendant's Exhibit 17 --

A. Yes.

Q. -- the first sheet you got was clearly an error because truly the way it was listed, the engine would not have cranked at all had those been the measurements, correct?

A. That's correct, yeah.

Q. And that's how you knew it was wrong?

A. Yes, it was very obvious, but it wasn't a document as much as I had received, obviously, the document when the engine had been built and the engine had been shipped to me and, you know, you cast an eye over it, but the engine runs so there was no reason to look at it in any further depth. So only after there was a problem that happened that I then referred to it. I believe I took it with me to Roe Engineering when they measured the engine that it became apparent, "Hold on, these numbers don't add up." And that's when I, obviously, notified Mitch.

Q. So that was the first time you had noticed it because that was the first time you had given it more than

a passing glance?

A. Yes, that's correct.

Q. So when you contacted Mr. Wilson and he said, "I'll send you the handwritten sheet," it was clear that that was the one that he had actually put those numbers down as he had done the measurements.

A. I'd have to defer back to the actual message, but I'm pretty sure the message reply was, "I'll send you an updated sheet."

Q. Where is that message?

A. In one of our exhibits produced.

Q. Can you tell me which one?

A. I haven't seen the full list of our exhibits so, unfortunately, I don't have that knowledge.

Q. So are you --

A. You'd have to defer to my attorney.

Q. Are you suggesting by using the term "updated" that he did that sheet after you contacted him? Is that your contention?

A. That is an inference that I believe could be drawn.

Q. Is it your contention?

A. Is it my -- Sorry. You have to -- "Contention" is not a word that I use in my --

Q. Is it your belief?

A. Is it my belief that?
Q. He created that sheet after you contacted him about the first sheet that was incorrect.
A. I have no strong belief about it. I think it is a -- I think it is a possibility, yes.
Q. You have no strong belief about it but you believe it is a possibility?
A. I can't, yeah, I believe it's -- I can't prove either way, but I believe it is a possibility that those numbers that have been handwritten down two years after the engine was built could be inaccurate. This, as you may notice --
Q. Well, let me --
A. Let me finish. That is not a time/date stamped document. There is no numbers as to when these were written down in the first place. So the providence of the numbers on this sheet is unknown. No one knows when this was written, and that is why I'm uncertain as to why -- how accurate they are.
Q. The one person that would know would be Mitchell Wilson, correct?
A. Well, he would know whether he wrote it at the time or not or if he's wroten it later, yeah.
Q. That's my point.
A. Yeah, yeah, yeah. That's a reasonable thing to

say.

MR. HURLEY: Thank you. No further questions.

THE COURT: Any redirect, Counsel?

MR. MATOUKA: Your Honor, if I may have a moment, I'd like to print something out with your permission.

THE COURT: Go right ahead.

(Off-the-record discussion.)

(Pause in proceeding.)

MR. MATOUKA: May I approach, Your Honor?

THE COURT: You may.

THE WITNESS: Thank you.

REDIRECT EXAMINATION

BY MR. MATOUKA:

Q. Mr. Johnson, have you seen that before?

A. Yes, I have, yeah.

MR. MATOUKA: I've given him what I -- Plaintiff's proposed Exhibit No. 14 (sic).

MR. HURLEY: I think 15.

MR. MATOUKA: Oh, 15? My apologies.

Q. And can you tell me what that is?

A. That is a screen grab of a message exchange between myself and Mr. Wilson.

Q. And is this the text message that you were just

discussing with Mr. Hurley?

A. Yes, that's correct.

Q. See if I can zoom it for the Jury a little bit. Okay. And is that you on the right side in the blue?

A. That's correct.

Q. And can you tell me what's happening in this text message?

A. So, obviously, this message is post failure. It's 14th of September, 2021. Mr. Wilson is -- it's kind of partially obscured by the date, but he's asked me for -- asked me to take a photo of my build sheet because he can't remember if all the parameters were on there. I've said, "Stand by. I'll get Jodie," who is my wife, "to text over a picture." I believe I was probably at work at the time.

And as it says, "Just noticed on yours you don't have a couple of fields like I have. I have an -- I had older versions that didn't have all the data and made changes and want to give you an updated version copy."

Q. And then that picture, that's you sending a picture to him, correct?

A. That's correct, yeah.

Q. And that's our Exhibit 8, correct?

A. Yeah, that's correct.

MR. MATOUKA: Nothing further.

RECROSS-EXAMINATION

BY MR. HURLEY:

Q. On this exhibit, he says, "I had older versions and I didn't have all the data and made changes and want to be -- I give you an updated version copy."

The data that he didn't have on there related to the torque figures for mains and heads, right?

A. That is -- I think that is what is inferred there, but as you can see on Exhibit 8, the numbers are on the bottom for main stud and head stud torque numbers.

Q. So in that sense, what he was meaning was he wanted to give you a version that was updated and had the additional information from what the one he sent you didn't have, correct?

MR. MATOUKA: Objection. Calls for speculation as to Mr. Wilson's mindset.

THE COURT: You can answer if you know the answer.

THE WITNESS: Can you repeat the question again, please?

Q. (BY MR. HURLEY) So when he says he wanted to send you an updated version, he meant he wanted to send you one that had the information that he thought might have been missing, correct?

A. I just took the sense "updated" in the broadest

sense, that there is something that needed to be changed, that there was an updated numbers. That's -- It's -- That's as broad as the sense I took that message to mean.

Q. At that point, did Mr. Wilson have the engine?

A. No, he didn't. 14th September, it was most clearly with me.

Q. So how could he have updated the numbers?

A. I have no idea. You'd have to ask him.

MR. HURLEY: We will.

Thank you very much, Your Honor.

MR. MATOUKA: Nothing further, Your Honor.

THE COURT: All right. Thank you, sir. You can step down.

THE WITNESS: Thank you very much.

THE COURT: Next witness.

MR. MATOUKA: Plaintiff rests, Your Honor.

THE COURT: Thank you.

Let's take a break. It is -- before you get started. It is 10 before 3. It's a little early. We're going to take about a 15-minute -- let's take a 20-minute break.

MR. HURLEY: Your Honor, we have one thing we'd like to take up with the Court outside the presence of the Jury. Could you give us a little bit more time?

THE COURT: How much time do you think it

will take?

MR. HURLEY: 10 minutes.

THE COURT: Let's break until 3:15. Y'all have a good break. We'll see you at 3:15. Thank you.

(Jury not present.)

THE COURT: Let's go ahead and take it up. What do we have?

MR. HURLEY: At this time, the Defendants like to move for directed verdict on one or more maybe of the Plaintiff's claims. I know this is a little unfair because you weren't here to hear the testimony, but there are two primary claims, one based on the breach of warranty, one based on the breach of contract. Plaintiffs believe that breach of warranty claims also make that a D.T.P.A. claim.

We're going to move for a directed verdict on the breach of warranty claim because what the law states and what we believe there was no evidence of was that this -- there was actual demand under and failure to comply with the written warranty at issue here. What the testimony yesterday elicited said was that the only demand that the Plaintiff made to my client, the Defendant, was for his -- some form of his money to be returned. There was never an offer to allow him to actually do repairs and provide labor for those repairs, which is the only thing

the warranty provided for. Therefore, there was never a demand made under the warranty.

If you look at what the damage model is in this case, they are seeking back all of the money they paid to my client for all of the work he did, which clearly means they believe the contract has been breached and they did not receive anything of value for what they paid for and so they want all their money back.

By definition, there is a case actually out of the Fifth Circuit called Brooks, Tarlton, Gilbert, Douglas, and Kressler versus U.S. Fire Insurance Company, where they go through in detail this kind of dichotomy between what a breach of contract and breach of warranty claim is. And what they say -- and I have copies for the Court and opposing counsel if they want it -- is that clearly what a breach of warranty is is some sort of written promise of something that is then breached. In the context of something like this, a service, it's usually the context of "I had a claim under the warranty. I asked you to fix it. You refused to fix it."

There is another case actually that we have. It's actually out of the San Antonio Court of Appeals where it really goes through and details that in the context of an auto repair work where it says the way this worked was there was a warranty, the car broke down, the

person said, "Under warranty, I expect you to fix it." The mechanic refused to fix it, and that was what the breach of warranty was.

Here, that's not what happened. What happened here is Mr. Johnson went to -- after the failure that we've been talking about -- went to Mr. Wilson and said, "I want some or all of my money back."

And what the testimony was yesterday was, I said, "Did you ever offer to let him fix it?"

He said, "No, that didn't make economic sense. I didn't want to do that. I just wanted for him to, quote, buy out the warranty."

And then what Mr. Johnson went on to say was, in fact, Mr. Wilson did offer to provide parts and said he would take the engine back and work on it, but he said again, "It didn't make economic sense to do that so I didn't want to mess with that. I just wanted money."

So as a result, he never made a claim under the warranty. And what he is now seeking in this court is a full refund of the contract price, which means he's claiming only a breach of contract and not a breach of warranty. So we think directed verdict on the breach of warranty is correct.

Holding that aside now for one second, if the warranty claim goes forward and their D.T.P.A. claim is

allowed to stand, they have sought treble damages under the D.T.P.A., but there has been no evidence, and now that they've rested, there can be no more evidence from the Plaintiff related to the knowing or intentional requirement of the D.T.P.A. to allow them to get the enhanced damage model; therefore, we move for a directed verdict on that portion of their D.T.P.A. claim if the warranty claim stands. And I can provide you these cases if you'd like.

THE COURT: Thank you.

Response.

MR. MATOUKA: Yes, a couple of things. So let's start with the breach of warranty issue. There was actually -- there's actually been two warranty claims in this. The first time, it was sent back and allegedly repaired under warranty; however, the Defendants failed to properly perform their repairs under that warranty and sent them back a defective part again, so they failed to comply with their obligations under the warranty at that point.

The second point is Mr. Johnson testified that he had asked for a warranty claim, that was told that it was a part issue not covered under warranty, which is why he didn't send it back because it wasn't going to be covered under warranty. And then later when it was

determined that it was not a part fault but a machining fault, the Defendants failed to accept any type of responsibility, rejected that claim, and under the terms of the warranty, they were required to do some investigation on their own. They did none of that. They've never seen the engine. They never requested the engine. And so Mr. Johnson. It was available. He requested that they -- he did make a warranty request. They denied it. He proved that it was a machining fault as opposed to a part failure. They refused to accept that, and that's what's brought us here. So we do have two breaches of warranty at this point.

As to knowing and intentional or willfully and knowing or knowingly, it requires that he's aware that he's failing to adhere to the terms of the warranty. Well, Mr. Johnson provided him with all the evidence that everyone else here has, all the experts. Mr. Johnson kept him apprised of the information, the measurements, the videos that were not allowed -- that weren't brought in, he saw them. He saw the report. He saw everything. And Mr. Johnson has testified to that multiple times, and yet, he failed to accept any responsibility or do anything under the warranty as he was required to such as investigating the fault of the engine. And because he failed to do that, he intentionally or knowingly failed to

do so.

THE COURT: Okay. Thank you.

MR. HURLEY: Your Honor, if that was the state for knowingly and intentionally, everything is knowing and intentional. Every time you had a breach of warranty, you would automatically fall into this treble damages provision because when you say, "No, I don't believe it's covered by the warranty, I'm not going to provide you the labor and service that's required under the warranty," then according to what counsel just said, every single time you say that, you fall into this intentional and knowing category, which clearly can't be the case, because what "knowing and intentional" is supposed to mean is that you go forward knowing that you've done something wrong yet continue to do it anyway.

The -- obviously, the contention here is that there's a dispute as to whether or not he ever did anything wrong in the first place. He had no knowledge of and doesn't believe that it was anything done wrong in the first place, so he can't meet the intentional or knowing requirement. And, again, there's been no testimony to that effect.

Going back to the warranty claim, there was a previous warranty claim that was satisfied. The engine -- I mean, this is a perfect example of the way it should

work. They made a warranty claim. It came back. He repaired it. That's when what we were just talking about with the dyno run here in America. Then it was sent back. What the testimony was was after it went back when this issue came up, Mr. Wilson asked to work on the engine. And what Mr. Johnson said was, "No, I don't think that makes economic sense. I want you to give me some amount of money instead." And if you look at the damages they're asking for in this case, it's the entirety of the consideration pay, which means that's breach of contract. That's not breach of warranty. What breach of warranty would mean is, is the damages I suffered as a result of you not doing the warranty work you were supposed to do, which would be cost of repair, not the entirety of the assembly.

So it's clear that based on the way they have pled and now sit out their case, it's only a breach of contract.

THE COURT: Response.

MR. MATOUKA: Your Honor, we are allowed to plead damages in the alternative, and we sought all the damages that we might be entitled to.

I -- once again, when Mr. Johnson made his warranty claim the second time, the Defendant said it's part failure. That was demonstrated to be incorrect,

the -- by the manufacturer of that part. Then the Defendant began manufacturing additional theories and consistently denying Mr. Johnson the opportunity, he didn't -- to inspect it, to do anything. And at that point, he had some obligation under the warranty to do an investigation. He failed to do that. And he intentionally did that.

I mean, honestly, as his counsel indicated in opening statements -- and I know you weren't here for that -- it's because he lost money on this so far and he didn't want to have anything to do with it.

THE COURT: I appreciate it. Let's take a break. I'll announce my ruling at 3:15. Appreciate it.

MR. HURLEY: Thank you, Your Honor.

THE COURT: Thank you.

(Recess taken.)

(Jury not present.)

THE COURT: All right. Let's go on the record. Y'all can be seated.

Counsel, you mentioned it, it's a little unfair to ask me to make a ruling on the motion. It's really unfair to you guys because I don't know what the testimony was yesterday, so I've got to make a ruling based on -- really based on an abundance of caution, and that is to deny the Motion for Directed Verdict. So that

motion is denied.

MR. MATOUKA: My apologies, Your Honor. There was an issue brought to our attention that I had not sought to admit Plaintiff's Exhibit No. 15. Parties discussed this.

THE COURT: Okay.

MR. MATOUKA: And I believe Defense is willing to stipulate that it was admitted. We published it, read it in Mr. Johnson's testimony.

THE COURT: Okay. Agreed?

MR. HURLEY: Agreed, Your Honor.

THE COURT: All right. 15 is admitted.

(Plaintiff's Exhibit No. 15 admitted.)

MR. MATOUKA: Thank you, Your Honor.

THE COURT: All right. Ready to proceed, Counsel?

MR. HURLEY: Yes, Your Honor.

THE COURT: All right. Bring the Jury back in if you would.

(Jury present.)

THE COURT: Y'all caught on quickly. You can be seated.

All right. Plaintiff has rested.

Mr. Hurley, are you ready to proceed?

MR. HURLEY: Yes, Your Honor.

THE COURT: Your first witness.

MR. HURLEY: Defense calls Dylan Bradley.

THE COURT: Mr. Bradley, please come up around the Court Reporter, around the corner and up the ramp for me.

Good afternoon. Raise your right hand.

(Witness sworn.)

THE COURT: Have a seat for me, please, sir. And once you get settled in, pull that microphone down for me. State your name for the record, and spell both your first and your last name.

THE WITNESS: Dylan Bradley, D-Y-L-A-N, B-R-A-D-L-E-Y.

THE COURT: Thank you. Go ahead, Counsel.

DYLAN BRADLEY,

Having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. HURLEY:

Q. Good morning -- or good afternoon, Dylan. You've been designated as an expert in this case by the Defendants. Do you understand that?

A. Yes.

Q. How old a man are you?

A. 34.

Q. How are you currently employed?

A. Currently, I'm employed with a marine restoration company as a mechanic. I rebuild engines for them, big diesel engines and stuff like that.

Q. Other than that business that you work for, do you have any other businesses?

A. Yes, I have my own personal business where I build and tune racing engines.

Q. What kind of racing? What brand of engines are we talking about?

A. Primarily, I deal with late model Lamborghini V10 and V12 engines, very high horse-powered, typically around 1500 to 3,000-plus horsepower.

Q. Do you do machine work on them?

A. Yes.

Q. Do you also do tuning on them?

A. I don't do tuning on Lamborghinis. I allow that to be done by the people that I build the engines for, but I do a lot of tuning for late model G.M. and other imports along with standalone ECUs and stuff like what we're discussing today.

Q. In your personal business, not your marine business --

A. Uh-huh.

Q. -- how many engines would you say you're working on a year?

A. In the personal business, I do between 12 and 20, depending on how, you know, on how busy we get.

Q. Can you kind of walk us through typically what you do to an engine in that personal business?

A. Yeah. I typically will get either a damaged long block, which is everything except for the intake manifold, and I will tear it down, assess damage or plan for the rebuild or build-up, I guess, you know, with my own specific parts that I have designed for these particular platforms. So they're torn down. We -- I machine them, or have certain parts of them machined by other shops because I don't have the capabilities in-house to be able to do that. But, yeah, it's a pretty involved process.

Q. Are you regularly involved in dyno tuning?

A. Yes.

Q. How many dyno tunes would you say you've done in your life?

A. Oh, in my life.

Q. And a ballpark is fine.

A. Hundreds. I mean, it's -- I'd say between a hundred and 200, engine dyno tunes, on an average of two dozen chassis dyno tunes a year.

Q. Before you had your own business and you worked at the marine shop, who did you work for?

A. I worked for Steve Morris Engines for right

around 10 years. Two of those years were volunteer based because the company was just starting out. They weren't really looking for somebody full-time, so I would come in and volunteer my time in the mornings before going to a second shift position where I was being trained in tool and dye.

Q. And for those of us who are not involved in the Motorsports industry, what is -- what is the reputation of Steve Morris Engines?

MR. MATOUKA: Objection, calls for impermissible reputation evidence.

THE COURT: Overruled.

You can answer if you know the answer.

A. He's very well-known in the supercharged and turbocharged engine market. Very well known for making just ridiculous amounts of horsepower. And we build a lot of street capable engines, or used -- I used to build a lot of street capable engines with that company that were really pushing the envelope in all facets of Motorsports.

Q. (BY MR. HURLEY) Why did you leave there?

A. There was a couple reasons, but the main reason was because of finances, and it was a pretty long commute from my place in Holland, Michigan to Norton Shores every day, so I had kids, had -- You know, the cool factor kind of wore off. And I wanted a job that was closer to home

so that I could afford to actually have my own cars to play with and things like that. So there was no bad blood or anything when I left. It was all, you know, really seamless.

Q. So since you started at Steve -- how long did you work there, by the way?

A. It was between like eight and ten years.

Q. So from the time you started at Steve Morris to today, have you always worked on high performance engines?

A. Yeah, primarily. I think I've only ever rebuilt as a stock rebuild maybe three engines in my life.

Q. So quickly tell us, for us lay people, what's the difference in a stock and a high performance engine?

A. Stock is as it comes off the factory floor, so nothing super exciting. It uses components that are mass produced and, you know, they're designed to be used as the vehicle is designed to be used. It's nothing special.

High performance stuff is catered to a specific power goal and intent of use, I guess is a good way to say it. So, you know, you would build a boat, a racing engine for a marine application, offshore power boat or something like that, different than what you would build an engine for a guy that wants to run 8-and-a-half-second quarter-mile passes in his '67 Camaro versus a guy who wants to make 3,000 horsepower drag and

drive car or Lamborghini or whatever.

Q. You've both looked at information and been here in the courtroom. Are you familiar with the type and the methods and mechanics of the engine that we're talking about here today?

A. I can say I'm familiar with the methods. I'm not super well-versed in the Nissan market. That's something that I've never delved into, but I've always held on to the belief that an engine is an engine is an engine. They have one function, and the parts might be different and the induction might be different, but I don't feel that there's nothing that can't be learned pretty quickly with the basis of knowledge that I have.

Q. What did you understand the type of engine was in this case?

A. I knew it was a Nissan, a V6 Nissan based out of the 300 series, I don't know if that's a proper term, 300 series car that Nissan made in the '90s. Yeah, that's about what I knew about it.

Q. When were you first contacted about the issues with the engine in this case?

A. I honestly don't recall exactly what time it was. I remember where I was when Mr. Wilson had reached out to me to just kind of gloss over a data log that he had, and he left it very vague as to the reasonings why he wanted

me to look it over.

Q. What did he ask you to do?

A. He just asked me to look over the data log and give my opinion on what I saw with it, and basically left it at that.

Q. So I want to make sure we're clear about what the data log is because I think there's been a little bit confusion about data logs versus dyno graphs.

A. Sure.

Q. What is the data log?

A. The data log is information that is pulled from the engine control unit, the ECU or the engine control module, depending on which way you want to look at it. It pulls off of specific sensors and records that information on a graph or a run time, the time at which the engine or vehicle is running for, to give you an idea of how the sensors and the engine was operating during that period that the engine was being ran in.

Q. And earlier, Plaintiff's counsel pulled up something that he could manipulate. Was that the data log?

A. Yes.

Q. With the black screen behind it?

A. Yes.

Q. So you got that same data log?

A. Yes.

Q. And what did you then do with that data log?

A. I mainly isolated the portion at which the -- there was a dyno pull where the vehicle is put on the dyno, it's ran for a certain period of time up to typically, you know, max RPM to achieve a certain horsepower number. I was able to take that portion of it and really comb over the specific sensors that I wanted to see.

Q. And what were those?

A. Mainly the wide band or the -- yes, the wide band sensors that measure air/fuel ratio and things of that nature. I wanted to look at base timing to see what kind of ignition timing was being commanded but also throttle position, boost, positive manifold pressure, and oil pressure as well.

Q. So why would that -- why was that the universe of what you wanted to look at?

A. Because those, in my experience, are always the things that tell you the most about what's going on inside of an engine.

Q. Before I go any further, let me ask you this: How did you know Mitchell Wilson?

A. Through -- purely through Instagram at first. I had gotten added to a group of other engine machinists

when I was still with Steve Morris Engines, and we had all, like, kind of talked on that group, you know, and exchanged like our projects that we were working on and stuff like that.

And then we had bumped into each other in Indianapolis at the Performance Racing Industry Expo, and I think we went and grabbed like pizza or something like that. It was one of them things where it's like, you know, you've been walking all day long, you're kind of tired, first time meeting, hey, how's it going, have some pizza, and that was it.

After that, I had used him for some piston coatings for a Ferrari. And pretty much after that, it was just like we just kind of chatted every once in a while, see how things were going.

Q. So back to the data log, you listed off kind of a long list of different data sets that you wanted to see.

A. Sure.

Q. Do those come up each in a separate graph?

A. They can. You can display them on a different graph. You can overlay them on top of one another, which is sometimes useful, but for the most part, yeah, isolating them onto their own graph can be very helpful.

Q. And why did you want to -- what was it about this particular set of data that you thought was going to

indicate to you what had happened?

A. I -- there was only a few things that I wasn't super excited about when I saw the data log. And the main thing was at the beginning of the pull, you see they talk -- Mr. Pool had talked about it where the throttle position sensor goes, you know, really rate to max -- excuse me -- max, max position, and the engine doesn't really accelerate.

But what I was mostly concerned with was the air/fuel ratio showing how aggressively lean it was at the same time the engine is building positive manifold pressure, which is a recipe for an issue.

Q. And so you say that's a recipe for an issue. Remember, we're not all gearheads like you. So can you explain to us why that's a recipe for an issue?

A. In most cases, it causes predetonation. It causes excessive cylinder heat. And those are really the main bulk of the -- of my worry when I first seen it.

Q. So other than the data log, did you look at anything else?

A. Not at that time.

Q. Subsequent to looking at the data log, did you look at anything else?

A. I don't remember how long it was after that, but there was a point at which Mitchell had shown me some

pictures of some damage to get my opinion on that as well, and I honestly couldn't pinpoint a time at which that had happened.

Q. Were those items that had been damaged, were they bearings or were they something else?

A. It was primarily the bearings and some pictures of skirts on pistons.

Q. When you say skirts on a piston, what is that? Is that the thing -- Oh, you can show us?

A. Yeah. Well, this is what's the skirt, your skirt profile on the piston, this is what rides in between the -- in the cylinder bore, essentially.

Q. And based on your professional opinion, what was that damage caused by?

A. It's interesting because I think Mr. Pool had mentioned it as well, like seeing them in person, they looked a lot different than what they were in the pictures. When they were oily and stuff, it was kind of hard to tell exactly what was going on. But, you know, what I can see, it looked like something that had gone in line with cylinder wash, potentially detonation, potentially, you know, excessive amounts of boost at early RPMs. You know, when you throw a bunch of boost at an engine at low RPM and you're underneath what's called your power curve, it can cause the engine to have excessive

amounts of piston rock and things of that nature. Torsional stress.

Q. So, ultimately, after you looked at the pictures, you looked at the data log, did you ever have -- before you kind of issued your initial findings, did you have a big, long discussion with Mr. Wilson?

A. I honestly can't recall. I know I expressed my opinions, but I don't know that it was -- I'm pretty sure that it had been just like, "Oh, wow, that's problematic," or something of that nature. Like I said, it's been so long.

Q. I'm going to show you a document. I cannot publish it yet.

May I approach Your Honor?

THE COURT: You may.

Q. I'm going to hand you what's been marked as Defendant's Exhibit 13. Please don't read it out loud. I'm just going to ask you some questions about it. What is this document?

A. This would be the email that I had sent back to Mitchell after he had asked me to look at the data log and giving somewhat of a breakdown of what I had seen based on a step-by-step process based on what I saw from information in the data.

Q. What's the date on that?

A. November 3rd of '22.

Q. Okay. Is that a true and accurate copy of the email you sent him?

A. Yes.

MR. HURLEY: Your Honor, we would move for admission of Defendant's Exhibit 13.

MR. MATOUKA: Your Honor, we would object because it's hearsay. It's an email that he sent. He can just testify about his opinions.

MR. HURLEY: Your Honor, on March 27th, before the last trial setting, Defendants filed a business record affidavit that included this document, and obviously, the business record affidavit defeats the hearsay objection, and it's obviously been on file more than 14 days before --

THE COURT: It was filed When?

MR. HURLEY: 3/27/24.

MR. MATOUKA: Your Honor, respectfully, we think that -- that the evidence of that being a business record needs to be established by testimony by -- from Mr. Wilson who signed that affidavit, because this is just an email he sent in furtherance of litigation.

THE COURT: All right. The objection is overruled. You said it's 13?

MR. HURLEY: Yes, sir.

THE COURT: 13 is admitted.

(Defendant's Exhibit No. 13 admitted.)

Q. (BY MR. HURLEY) So if you would -- let me turn on the computer here first.

THE COURT: Is your screen on still? Sometimes it's easier to look at that.

Q. This is the email we were just referring to?

A. Uh-huh.

Q. Do you know how long this was after the events that were -- I think what we've been calling the engine failure occurred?

A. I do not.

Q. Was it in -- were you contacted by Mr. Wilson relatively soon after that failure occurred, to your knowledge?

A. I don't recall. As far as I know, with the damage and stuff that happened with the engine, I just learned now the dates of which that had happened, so I honestly don't remember when it was that the engine had the failure.

Q. So let me read you a couple of lines and ask what you meant by that.

In the second line after you thanked him for the data log, you said, "All I can say is wow," Why -- what did you mean by that?

A. I mean, I was just -- I was kind of flabbergasted. I, personally, have never produced a data log that looks like this for a full throttle pull, so I was kind of blown away by the way that it looked.

Q. And what about the way it looked blew you away?

A. Just initially that first three seconds, you know, the air/fuel ratio being pegged the way that it was, and just following what the air/fuel ratio looked like from the wide bands through the rest of the pull, it should have been relatively smooth, and it wasn't. There was a lot of what I like to call porpoising where it's dipping and diving a bunch. Instead, it should be a pretty smooth, solid target number and just follows the RPM curve, essentially, or similar.

Q. So you say, "For the first 3 seconds under full throttle, 5.8 to 8.6, engine is wildly starved for fuel on both banks all while still trying to make boost and RPM but can't."

What does that mean?

A. The engine in regards -- was, you know, for that first three seconds was at like 2000 RPM and the gas pedal's right to the floor. The engine is trying to make RPM, because like in any car, if you put it to the floor, it's going to go somewhere, right, it's going to accelerate and the RPMs are going to raise. And it

wasn't. It was 2000 RPM and it pretty much just stayed there and kind of fluctuated a little bit and actually lost RPM for a little while as well.

Q. So the next line says, "During these three seconds, the AFR -- " What is AFR?

A. Your air/fuel ratio.

Q. "Fluctuates from the start at 14.6 slash 15.8, peaks at 6.6 seconds at 15.8 or 20.3 before dropping to 14.8, 18.3 when the RPM starts to decline."

What does that indicate to you?

A. According to the wide bands, the engine was starved for fuel.

Q. And what -- when you say starved for fuel, you mean it literally is just not getting enough gas?

A. It is not getting enough gas for the airflow that is being introduced into the combustion process.

Q. So we've been using this term all day. Does that mean it is lean?

A. Yes, lean.

Q. What kind of impact does that have on an engine?

A. A few different ones. I mean, primarily it's not going to run very well, but secondly, it will open up grounds for detonation. It is, in my experience, the main one that you want to look out for, yeah.

Q. And so the next sentence says, "Even through

naturally aspirated conditions --" What does aspirated conditions mean?

A. Aspiration is the way at which the engine gets its air. With a forced induction engine, a turbocharged, supercharged engine, air is forced in via a turbocharger or a supercharger, whereas a natural aspirated engine is reliant on its pumping capabilities of being able to pull air through the intake.

Q. So it says, "Even under naturally aspirated conditions, this is excessively lean under a load, not to mention this engine is trying to make positive manifold pressure." What is positive manifold pressure?

A. Engines naturally aspirated will only operate at atmospheric pressure, what the earth will allow it to consume. So adding, adding boost through a turbo or a supercharger forces atmospheres into the engine, so pounds of boost is positive manifold pressure.

Q. So the next line says, "Also during this time, I noticed that the tune is only commanding 12 timing which it will inevitably result in higher than wanted EGT" First of all, what does the "12 timing" mean?

A. 12 degrees of timing is the timing at which, which is based on crankshaft location or in its revolution of 360 degrees, you are commanding the ignition to fire the spark plugs 12 degrees before the piston reaches top

dead center. So as the piston comes up, it gets to a certain point, it can't go up any further because of the stroke of the crankshaft and then it's pulled right back down. Right. So you command timing in degrees of crankshaft rotation so that it will fire at a prescribed point, and as the piston is on its way down, it's completing its combustion process and forcing the piston down with more energy than what it arrived with, creating more power, creating more RPMs, so on and so forth.

Q. What is an EGT that's referenced in that sentence?

A. Exhaust gas temperatures.

Q. So that means temps, heat is going up?

A. Yep.

Q. You then say, "So we have excessive EGTs and wildly lean fueling conditions --

(Clarification by Court Reporter.)

Q. Let me go back and start over. "So we have excessive EGTs and wildly lean fueling conditions, which will lead to predetonation, excessive hammering on the upper shelf of the rod bearings, piston ring and piston skirt wear, and an overall deterioration of the longevity of this engine."

So can you put that in layman's terms for us and explain what that means?

A. So with excessive EGTs, what you end up having is inside of an engine, you have oil that is forced through specific rings right here. And that oil goes out into the bores. And that's what lubricates the piston and the rings and everything else riding up and down as the engine operates. With excessive EGT, what you end up having is it can -- it will burn out that oil in the -- in the bores preemptively or prematurely, and can cause the rings to not be lubricated properly and they will wear out. It will also cause excessive amounts of heat on the top ring primarily causing them to relax and lose their seal on the bore, which is important for making any kind of power whatsoever.

The skirt wear side of things is also part of having an issue with the tune-up in it burning the oil off is because the skirts are also lubricated, which, like I showed before, these are your skirts, and you can see where the skirts were potentially getting metal-to-metal contact because of a lack of oil on the bores.

MR. HURLEY: Hold on one second. We lost our feed for some reason.

Your Honor, I don't know what I did.

I'll ask you a few more questions. Maybe we'll try to get this working here in a minute.

Q. So in the next line down, you say, "From 8.6 to

12 seconds, the engine climbs for 3,775 RPMs but manages to make 24 PSI boost."

What does that mean?

A. It made a lot of boost in a very short amount of time, for something that was running in -- with the data that I was given, was running very short on fuel.

Q. And so, again, does that mean lean fuel?

A. Yes, lean fuel.

Q. And what causes lean fuel?

A. Um, in this regard, it primarily comes down to tune-up, a properly dialed-in fuel table.

Q. And when you say "a properly dialed-in fuel table", what is that part of? Is that part of the machining and mechanics of it or is that the tuning part?

A. The tuning part, yes.

Q. And what -- when you say "fuel table," literally, is that the computer telling the car how much fuel and air to mix?

A. Yeah, along with the tuner's input and things of that nature. It's a -- we call it a table, but it's -- imagine like an Excel document that on one axis it has RPMs that the engine will operate in, and on the other axis it has manifold pressure. So as boost climbs and RPM climbs, it creates an arc, and you have certain values, whether it be volumetric efficiency or what have you, you

add these values, make these values bigger or make these values smaller to add or increase fuel.

Q. So the next line says, "19 PSI gain in under 4 seconds all the while wildly under peak torque RPM."

Why is that of note to you?

A. Typically, with most engines, and especially even more important with smaller displacement engines, you don't want to ramp in boost that fast.

Q. And why is that?

A. Because at a certain point -- I'm trying to think of the proper term. We used to call it unloading, where an engine has produced maximum amount of torque, and at a specific RPM, you start feeding in your -- your -- you start feeding in a lot of boost and a lot of fuel, and you want to make all the power at higher RPM because the engine is what we like to call unsettled or unloaded so that it can -- it can make that kind of power more safely versus down low making a bunch of power, you have the potential for excess amounts of torsional stress on crankshafts and connecting rods and pistons and blocks and everything else under the sun.

Q. So the next line says, "Clearly the boost controller is not set up properly." What is the boost controller?

A. Some set-ups on some cars have boost controller

which is a solenoid that commands a specific amount of -- or allows a specific amount of positive manifold pressure to be built by the turbocharger and the manifold. The wastegate will control that as well where it's a spring-loaded mechanism that opens and closes based on how much spring pressure you have in the wastegate.

Q. And what -- is that a tuning issue or a mechanical issue or?

A. Tuning, yeah, I mean.

Q. Is that part of the ECU we were talking about earlier?

A. It can be if this vehicle is set up with -- with a boost controller or a wastegate that is, you know, user -- it can be altered.

Q. So it says, "Clearly, the boost control is not set up properly. I am impressed the engine block did not break or, at a minimum, lift and torch a head gasket." Why did you think that was a potential?

A. Because I have seen it. I have seen it before at -- when I was working with Steve Morris. I've seen it plenty of times where a wastegate had failed and stayed closed so it created tons of boost at the wrong time. And at 3300 RPM on an engine that was designed to make 2,000 horsepower, it split the block right in half.

Q. Literally, just from the force inside?

A. Yeah, because it just doesn't have the RPM to get the rotating mass to a point where it can handle that much cylinder pressure and also discharge that cylinder pressure fast enough.

Q. What kind of damage, other than potentially splitting the block, what kind of damage could that otherwise do to the internal part of the engine?

A. It would cause a lot of issues, in my experience, with the upper shell of the rod bearings and potentially the lower shell of the main bearings because of that excess amounts of cylinder pressure, it can cause the oil to be displaced and you end up having a metal-to-metal contact-related issue.

Q. Which that metal-to-metal contact, what does that do to the internals of the engine?

A. It causes excessive amounts of wear on your bearings. It can bend crankshafts, bend connecting rods because it doesn't have the lubricity. Typically, it causes a lot of heat and you will potentially spin a bearing, yeah.

Q. So if you go down a couple of lines there, starting off with the oil pressure. Says, "The oil pressure through the pull was quite good which wouldn't be possible if bearings were not measured correctly."

You heard testimony earlier that one of the

reasons they stopped the pull was because there was a 10-pound drop in the oil pressure.

A. Uh-huh.

Q. Did you think the oil pressure was good through the entire thing though still?

A. Yes, primarily, because from my understanding, and correct me if I'm wrong, that this was a wet sump oil system on this engine. And it's not unusual for a wet sump system that doesn't have a scavenging section, which means it sucks the oil back through the engine or back into an oil tank that is outside of the engine. A wet sump just pulls the oil up out of the oil pan, it sends it up through the engine, and then it has to bleed back down by gravity, versus a vacuum effect, essentially.

With a wet sump engine, it is not uncommon to lose oil pressure at the top of a pull because you're holding oil, more oil up top than what you have down at the bottom. It's not unusual to see, especially in drag racing, you know, as cars accelerate and the oil goes to the back of the engine, and you will always -- almost always see a dip in oil pressure.

Q. So that dip in the oil pressure that's been discussed earlier was not of concern to you?

A. No, no.

Q. But why do you say that it wouldn't be possible

if the bearings were not measured correctly?

A. Because how much oil pressure it had, it was impressively good. I mean, it was a hundred PSI worth of oil pressure, and nobody could complain about that in building a high performance engine.

Q. So maintaining that level of oil pressure, does that mean there's sufficient oil clearance?

A. Um, it's indicative of it, yes. I mean, it's -- there's a lot of different -- there's a few different like ways that that can be looked at. But, yeah, when you look at a oil pressure reading, you would be like, "Oh, yeah, I'm impressed with that. I'm happy with that."

Q. So that final paragraph there, let me scroll down a little bit so you can see all of it. It says, "My final thoughts are that this dyno pull was absolutely hell for this engine. The tune was clearly not ready for the wide open throttle testing. Whether or not it is a result of incompetence or ignorance is a moot point. It should have never been -- made it past the first four seconds before the responsible party aborted the pull and checked the data log. Just looking at the AFRs before the pull began should have been enough of an indicator to stop and inspect. The dyno graph tells all."

What do you mean by the dyno graph tells all?

A. I don't recall -- I know at some point I have

seen a dyno graph of this, and it must have been referring to -- to the dyno graph that I've seen of this, of this particular pull, but I don't know.

Q. Is -- Do you feel like between the information you had, which was the data log, maybe the dyno graphs, and pictures, did you need anything more to come to these conclusions?

A. Um, no. No. The whole point of a data log is to tell you exactly what the engine is doing. Rarely have I ever experienced anything that would indicate that a data log would be wrong in comparison to the problems that a vehicle was having.

Q. And does the data log, the data that you viewed in the data log, does it bring you to this conclusion?

A. Yes.

Q. And you say, "The tune was clearly not ready for wide open throttle testing." What does that mean?

A. Um, looking at mainly the -- the boost curve, which is the rate at which boost is added to the engine, and the air/fuel ratio, the wide band sensors, I would have never made it past the first few seconds if I was the one that was dyno-ing it. I would have stopped and figured out why it was running lean, you know, and fixed that problem.

Q. And what was the consequence of continuing to run

it after that point?

A. I mean, it just continues the damage, continues hurting it.

Q. If you'll turn over to the next page, actually, you have one more line. You say, "The wear on the bearings and piston skirts are clearly the result of a poor tune-up."

A. Uh-huh.

Q. Ultimately, why was that your conclusion?

A. In my experience of seeing this kind of damage, many, many times, whether it was from, you know, outside tuning sources, engines coming in for repair, so on and so forth, it just matches up with the hundreds of engines that I've seen hanging connecting rods out of the bottom of them, you know, from tune-up failure.

Q. You mentioned earlier that when Mitchell first contacted you, he was kind of vague, didn't give you any details.

A. Sure.

Q. This email below that says, "Hello, Dylan. Please look over this data log attached and give me a detailed report on what you see, please. There are two images of dyno sessions as well as that show the graphs. Any input you can provide is helpful."

A. Um-hum.

Q. Is that the vague communication you were referring to?

A. Yes.

Q. Did he suggest to you what his thoughts were on it before you came to your opinion?

A. No, he was actually incredibly -- I don't want to say unbiased. I mean, obviously, there's a sense of pride in, you know, wanting to secure your own opinion, but he was incredibly -- he did not try to lead me in any way, shape or form.

Q. If you could, please turn over to Exhibit 10 in the -- Oh, I'm sorry.

MR. HURLEY: May I approach, Your Honor?

THE COURT: You may.

Q. Hand you a notebook that's of preadmitted Defendant's Exhibits. If you would turn to number tab 10 in that book. And then within that tab, would you turn back to the third from last page. Do you see that page that looks like this?

A. Yes.

Q. Is this the data log graphing that you were talking about?

A. Yes.

Q. We saw something similar earlier. What is this showing us?

A. This was just a few of the things that I wanted to point out with throttle position, wide band O2 readings, the RPM, manifold pressure, and the target lambda which they were trying to achieve while making these dyno pulls.

Q. So was this the kind of data you looked at before you wrote your email?

A. Yes.

Q. And the bottom graph in the light blue color I'll call it, what is that severe drop off?

A. So that one is just a -- that's the target air/fuel ratio that you're trying to achieve. You see that it is -- it is 14-5, you know, up at the top there, it's pretty static, it's not moving, it's not fluctuating because the engine is not operating under any load other than idle.

As it dips down, it's showing that it's -- you are trying to command it to make more fuel or add more fuel to increase, trying to add more fuel to account for the increase of power that you're trying to make.

Q. And so you can take this program and manipulate it to show you the data you want to see, correct?

A. I can select from specific sensors that have recorded -- that have recorded timing and things of that nature so I can see that data. I cannot change any of the

parameters or anything like that.

Q. Right. But you can, you can, again, kind of like a spread sheet, you can pick --

A. Yeah.

Q. -- pick which columns to reveal? Could you look at multiple versions of something like this as part of your investigation?

A. Can I?

Q. No, did you? Did you kind of play with it and look at it?

A. Oh, yes. Yes, I selected different parameters than what were initially given to me so that I could see other -- other measurables.

Q. You mentioned in your email that it was a bad tuning that led to the problems. What was bad about the tuning?

A. Primarily the fueling. The timing wasn't, in my opinion, terrible. It wasn't super ideal, but it also wasn't -- wasn't anything out of the ordinary that I've seen before. But what I was mostly concerned about was the first three seconds or so, and then the subsequent seconds afterwards where it continues to run very lean all the while it's making -- it's making a lot of steam, it's making a lot of power with a lack of fuel, according to these, the data log.

Q. So that power, does that put pressure on the engine somehow?

A. Yes.

Q. What -- how does it put pressure on the engine?

A. Well, you put pressure on the engine by adding excess amounts of fuel, for one thing. It closes up the gap between -- it creates a more violent combustion process. But also on top of that, you're adding positive atmospheric pressure to the -- to the engine to create more power. I mean, it's a lot more air. You know, static compression ratio is, on a naturally aspirated engine is X. And it actually goes down as the engine runs, so that you have this thing called dynamic compression, and as the engine is running, the compression ratio gets less because of camshaft timing events and things like that.

But with a forced induction engine, the compression ratio goes up as it's running. So say it's got an 8-to-1 compression ratio at 20-some-pounds of boost, it really has somewhere in the neighborhood of a 17, 18, 19-to-1 compression ration, which is similar to that of a diesel.

And with that, you have closed up the window at which you can make mistakes while tuning, and that it will immediately result in failures and...

Q. What kind of failures?
A. Spun bearings, broken pistons, you know, things of that nature, worn out rings, you know, prematurely worn out piston rings.
Q. When you say -- what does it mean to spin a bearing?
A. The bearing eventually gets to a point where it is -- it is out of -- you lose the oil film that supports the bearing and the connecting rod and the piston. And when you lose that, you have metal-to-metal contact and the bearing will literally weld itself to the crankshaft as it spins. And as the crankshaft continues to spin with the bearing put in place, it just ends up picking that bearing, welding it to the crankshaft, and spinning it right out of the housing bore that it's in.
Q. So it literally can throw portions of the bearings?
A. Right, yeah.
Q. And that could lead to things like metal contaminants being found in the oil?
A. Oh, absolutely, yeah.
Q. And did you understand that's what happened here?
A. Yes.
Q. Is there any question in your mind that the chunks of metal that was found in the oil to be -- I'm

sure you heard this discussed earlier, were those parts of the bearing?

A. Yeah.

Q. And what -- why are you sure that's the case?

A. Experience, and seeing it, you know, multiple times. That's primarily it. You know, seeing the pictures of the bearings being delaminated and, you know, in the condition that they were in would have ended up in the oil.

Q. If you would, I'm going to just ask you to flip through them and tell me which page you're on before I pop it up on the screen. If you'll turn to Exhibit 11. Using the numbers down at the lower right-hand portion, can you give me -- tell me which one is an example of that kind of damage to the bearing that you're talking about?

A. It's a EPR-triple-0167. Looks like flakes of bearing material.

Q. Hold on. I went to the wrong one. You say --

A. 167.

Q. That one?

A. Yes.

Q. And what is that showing us?

A. It's debris on a rag. It looks like bearing material.

Q. And then do we see an actual bearing that looks

like it's been degraded or torn up in some way?
A. Not here.
Q. Again --
A. Oh, yeah, sorry. I mean all of those, 168, 169 is all bearing material. And then you have 170 which is upper shell -- I'm sorry, lower shell of a bearing.
Q. Has that bearing been eroded or damaged in some way?
A. Oh, yeah, absolutely.
Q. What has happened to it, based on your experience?
A. There's a lot of things -- or not a lot of things. There's a few things that could cause a bearing to completely be down to the copper. There's multiple layers of a bearing. On top you have what's called a Babbitt. Then underneath it's, you know, your copper, then it's a steel backing is what the bearing sits in.
What you're seeing there is the copper underlay of the -- of the steel of the bearing.
Q. So one layer has been stripped off of it?
A. Yes.
Q. And that's probably the debris that you were showing us in earlier pictures?
A. Possibly, yeah.
Q. And what do you think caused this stripping of

the outer layer of the bearing?

A. Um, potentially tune-up related issues, but there's also, you know, I've learned some things since being here that also have me having different opinions in regards to not just the dyno tune-up but the time at which the vehicle was running untuned.

Q. So you say that there's something that you've learned since you've been here in the courtroom listening to testimony?

A. Yes.

Q. What was it that you heard that altered your opinion a little bit?

A. The one thing that I really have a hard time understanding is the -- if we had a oxygen sensor that was showing a disparity as aggressive as what we can see in the data log, why it was continued to be used. And secondly, why it was wired to be used with long-term and short-term fuel trims that will make adjustments on fuel on its own.

So if we've got a sensor that's reading on an average of 20 percent leaner than what it should, and the engine is not operating 20 percent leaner and it's adding 20 percent more fuel on its own, then we have an issue of oil degradation, excessive rich condition that can cause problems with the bearings being washed out.

Q. And when they're washed out, what happens?
A. It eventually -- What ends up happening is the additive package breaks down in the oil, especially on break-in oil. Break-in oil is fairly sensitive to this. The additive package can break down and cause you to lose the main benefit of the lubricity of your oil. And essentially it just -- the oil doesn't -- it will -- it will --
Q. It no longer does its job?
A. It no longer does its job.
Q. And so what happens when it doesn't do its job?
A. Then you get metal-to-metal contact, bearing failure, all kind of different failures.
Q. You've heard also the testimony that talked about how this is all about oil clearances in the main bore housing. In your opinion, why is that not the cause of the damage that we're talking about in the ultimate failure of the engine?
A. Because the only thing that we can here look at and measure and understand is the data that we have off of the data log. That's the only thing that is unalterable, it is gospel, it is what was going on in the engine at the time that it was being ran at max RPM, and, you know, to achieve the power that it was intended to be used with.
Q. Is there a chance that the kind of damage that

you're talking about from the circumstance as you just went through describing, could it change the internal dimensions of certain portions of the engine?

A. Um, of course, in my experience, I have seen where detonation will cause your main caps, your main bearing caps, the ones that are connected to the main journal on the crankshaft at the bottom of the block to be unseated and cause them to fret. You will see it with the connecting rods and things like that as well, but it can cause them to be unseated, and what ends up happening is they get oblong shaped, yeah.

Q. So when you mean oblong, they go from being round to being more like an oval?

A. Yeah, they get taller on the -- so if you look at an engine, when you're looking at it, they get taller on the top and narrower on the sides. In the racing world, when we would get an engine back for refresh, it was wildly common to have to, especially in the boosted market, it was wildly common to have to clip the caps, resize everything and rebore it at the end of a season because the bearings, even on a $10,000 engine block, the bearing caps will move around because of the excess torsional stress on the crankshaft and things of that nature.

Q. You heard some testimony earlier that said the

only reason there's a problem on the dyno run at Abbey Motorsports was because the engine had never achieved a certain level of RPMs, despite having been driven for six months, despite going through another dyno run. Do you agree with that?

A. Can you -- Sorry. I blanked out for a second on the first part of the question.

Q. I probably didn't describe it well. You heard -- you heard testimony that said the previous dyno run, the operation for five or six months by Mr. Johnson that was about 4 or 500 miles, none of that put it under any kind of stress, but it was only when it went under stress that it had a catastrophic event. Do you agree that it was just the fact that it had not reached high RPMs?

A. No.

Q. Why not?

A. Because you can have an engine have a failure in the parking lot that's a totally blown stock engine out of a car. It doesn't have to be boosted or anything like that to have this very similar failure. I mean, you see it all the time with brand new vehicles. They have engine-related failures because of injectors hanging open or something like that, and I mean, it's -- it's very common.

Q. Do additional RPMs getting up into a high RPM

range, does that require more oil clearance?

A. It depends on the application and what oil is being used. That's a -- it's kind of a loaded, loaded question, because F1 series race cars and things of that nature will run incredibly, incredibly tight oil clearances at incredibly high RPMs, for the sake of getting every last bit of horsepower out of these engines. But, generally, with the streetcar stuff with this kind of -- with this kind of -- Yes, you would want to open up oil clearances so that you could run a thicker oil that would promote a higher film strength for the sake of your components and, you know, things of that nature, yes.

Q. Based on the information you reviewed, did you think the oil clearances on this engine were appropriate?

A. According to the build sheets, yeah, yeah.

Q. And let's talk about build sheets for a little bit because you're a third party who can explain this to us. How do you go about getting the data for a build sheet?

MR. MATOUKA: Objection, relevance, as to how he gets it versus how the Defendants get it.

MR. HURLEY: I'm asking about industry standards.

THE COURT: I'm going to allow. Go ahead.

A. Are you asking like what kind of tools you would

use or?

Q. (BY MR. HURLEY) No. Is it mathematical? Is it a measurement? How do you go about getting those numbers?

A. It's a mixture of both. But what's gospel ends up being your setting fixtures, your micrometers and things of that nature and measuring the clearance with tools designed to measure those clearances. So for instance, rod or main bearings, you would measure the crankshaft, the journal. You would measure the housing bore that the bearings would go into. You would take that measurement -- um, I'm sorry, I just totally stepped on my foot there a little bit. Yeah, I got ahead of myself a little bit.

When you're setting up the block for machining and things like that, you would machine your main tunnel or whatever to a certain specific dimension. And then you would measure your crankshaft journal and put bearings and stuff in, and use that number that you got for measuring with a micrometer on these journals, putting it onto a bore gauge and measuring it with a bore gauge. That is the industry standard on how to measure for specific clearances, whether it be your piston to wall clearance, your rod bearing clearance, lifter bore clearance, it doesn't matter. That is the industry standard, yeah.

Q. So if you take measurements of these housing bores after an event that could have altered them, are those really indicative of anything?

A. It depends. I mean, it's a loaded question in nature. It can help paint a picture of a problem, but the problem with doing that is you have to be able to recreate the exact order of events that you have to use to be able to torque the caps down appropriately, whether it be with the assembly used or the proper way to seat the cap. There's a lot of gray area with that. I don't want to say that every engine builder does things differently, but there's different types of caps for different types of ways that you would assemble them to measure the housing to get the same measurement that the machinist used or came up with in his machine shop.

Q. You sat through Mr. Pool's testimony.

A. Uh-huh.

Q. And you listened to what he said about his conclusion, being that the information he saw convinced him that there wasn't sufficient oil clearance.

A. Uh-huh.

Q. What portion of his testimony did you disagree with?

A. I don't personally and I don't actually know anybody that uses a micrometer to measure bearing shell

thickness to come up with an oil clearance that would be -- Because it's not the same. It won't be the same clearance if you use the bore, the journal, and bearing shell thickness to get your bearing clearances. I --

Q. So that's not an accurate way to --

A. The only reason why I have ever done that myself was because like with Lamborghinis, it's a lot of work to assemble the main bearing cap on these engines. It's not individuals. It's one big cap, and there's an oil pan that goes on top that you have to use as well. It takes hours to set this thing up. So measuring that, getting that number, getting the bore size and things like that, it gives you a picture of where it could be before you have to put everything together and go to a different set of bearings if you're wrong, you know. So it's easier to do it that way sometimes, but it's only as a baseline. It can't be used as the actual end-all number because you will deviate plus or minus a few thousandths one way from the -- from the mathematical approach every time. I have never been able to duplicate it exactly.

Q. And a couple thousandths doesn't sound like a lot to me, but in this world, it is, correct?

A. Oh, yeah, it's end all, be all, you know.

Q. And why is that?

A. Because that's what we're dealing with is tens of

thousandths of an inch, you know. We're dealing with -- human hair is only 2-thousandths, you know, so we're dealing with 20 times that number smaller to be able to get the bearing clearances that we want. It is very, very particular. That's why our micrometers and bore gauges and stuff read in tenths and not half-thousandths because, you know, a half-thousandths dial bore gauge when you're measuring for your clearances and things of that nature, if it reads on an average -- or it goes up to the highest or lowest number. So if you have something that is measuring one-and-four-tenths, it's going to actually measure one-and-five. So it's going to -- you're going to think that you have more clearance than what you actually do. And that can be problematic when you're setting up oil clearances and things that are going to be as tight as what bearing clearances are. So it's very important to be measuring in the tenths, not in the halves.

Q. You watched the video we showed of the way Mr. Pool did his measurements. Did he use the proper technique?

A. I have found that by dragging the anvil and the -- well, the anvil of the bore gauge, unless you have a specific bore gauge designed for measuring main bores and rod bores and things like that, it can cause the anvil to side load and increase pressure. It closes the circle.

So as you turn it, it drags. And anything that drags creates a resistance. It's a measurement. It's resistance, you know. So as you turn it, you're not turning it equally all the way around, and it can cause it to read poorly. So when you have a specific bore gauge that's designed for this, they have three points at which they are touching down on your journals. They have little wheels that, you know, they go all the way out to the outside and you have the anvil that goes down so that it mitigates that problem. It also has a tension release on there so as you do turn it, you decrease the tension, and as you release it, it snaps back into the exact center part of the bore.

Q. He only used one hand as well. Is that a problem?

A. I personally don't because I can't get an accurate -- I personally cannot get an accurate reading that way.

Q. Using one hand?

A. Right. I always support the inside, not at the anvil itself, the part that actually does the measurement, but on the inside support it so that I can hold it as straight as possible in the bore.

Q. I forgot to ask you something. In coming to your opinion that was in the email, other than looking at the

data logs and dyno graphs and maybe a few pictures, did you do anything else?

A. Not --

Q. Why wasn't -- why wasn't -- why was the dyno graph and the dyno logs and pictures enough, in your opinion?

A. Because I've seen it over and over and over again, the very similar, excuse me, very similar circumstances with different types of engines. It's not an uncommon thing to see in this industry, so, yeah, I mean, I've just...

Q. So you've seen this kind of failure before?

A. Oh, absolutely, yeah.

Q. How many -- I mean how many times would you say?

A. I couldn't tell you. I mean, it's dozens and dozens. I mean, we used to deal with engines coming in all the time that were built by other people that had had problems and stuff, you know, and you tear them apart and you see exactly what's going on with them. I mean, the bearings, the rings tell an exact story of what was going on inside the engine.

Q. You said that today was the first day you've gotten to look at the physical pieces of the engine, correct?

A. Yes.

Q. And in looking at those, how did you say that changed your opinion a little bit?

A. Excuse me. Like I said before, the pistons looked a lot worse in the initial pictures that were taken out. They had oil on them, you know, and probably some debris, I'm assuming, you know. But seeing them in person, I mean, they really, the pistons themselves don't look terrible. I mean, they're, in my opinion, reusable.

But what I was seeing that struck me as interesting was the limited amount of run time this engine had and how glazed or worn the piston rings are. And generally, your piston rings only wear from tune-up related problems or lack of oil control and things like that. You can see on these top rings, they are shiny almost all the way across. They're what's called a barrel-faced ring, and they really should only be shiny, you know, for a very small portion of it. When they're shiny all the way across, that means that the rings have worn to the point of, I mean, they're, in my opinion, they're on the verge of not being any good.

Q. And why would a bad tune cause that?

A. Knowing that it was ran with long-term and short-term fuel trims enabled while running it with a bad oxygen sensor or two bad oxygen sensors or whatever, in my experience, would cause the degradation of the piston

rings in the short amount of time that the engine has ran.

You can also tell that there is -- the rings have relaxed. And there's tension, they're like a spring, you know, they force themselves against the bore. And when you force the ring into the ring land, you should see the same amount of clearance from the gap side here as you do on the backside when you push it out so you can see daylight behind the ring showing that on the backside it has a nice, round circle. But on the front side when you push it out, the ring is still recessed inside of the ring land, which means the rings have gone what they call a D-shaped, means they've relaxed, they've gotten hot, they are not -- the rings are no good. And usually, that is a cause of a couple of different things, whether the tune-up is really rich and it's not allowing oil to stay in the cylinder bores appropriately, or the adverse is it was ran lean and the rings got excessive heat in them and caused the elasticity or the tension to be worked out.

Q. So that -- that bolstered your conclusion or altered it?

A. It added to, I should say. I still believe that it was lean, based on the data log, the information that I have been given, but looking at the actual, physical side of things and the new information that I was given about

the -- about the tune-up, that there was also a rich condition that played a part in the degradation of this engine.

Q. So I'm going to admit my own ignorance here. How can you go from lean to rich in this setting? Does it just -- is it just constantly changing? I mean, at one point it's clearly lean, but now you believe it's also -- was rich at another point?

A. Yes. So it was touched briefly in the last testimony about long-term and short-term fuel trims. So as you're running the engine, you have a certain air/fuel ratio that the engine is trying to achieve. If it's reading lean, it's going to add more fuel to it to compensate for this, right. If it's rich, it's going to pull fuel away.

On the dyno, the long-term and short-term fuel trims were turned off, which is very standard for tuning, but what you see in the data log is that the engine was starved for fuel until the end of the pull. So you have a condition of it being driven around for a few hundred miles with the long-term and short-term fuel trims enabled, working with an improper reading O2 sensor and causing a rich -- it would have caused a rich condition within the engine and could have aided in the degradation of oil contamination and bearing failure and

so on, so forth.

And then you go to the dyno and we turn off that stuff and now it's tuning on -- you're tuning it yourself and we have a lean condition, so I mean, it's...

Q. So it bounces back and forth?

A. It's bouncing back and forth.

MR. HURLEY: Your Honor, I'm about to move into a couple of new topics, but if this would be a good spot to stop for you, start and stop tomorrow morning.

THE COURT: I think it would be a good place. I appreciate that.

Folks, we're going to break for the day. I've got a hearing in my court unrelated to this at 8:30, so it's going to take me a little bit of extra time, so we're not going to get started tomorrow until 9:15, about 15 minutes later than normal.

Please don't discuss this matter with anyone including each other. Don't remain within the hearing of anyone who is discussing this matter. Hope y'all have a good evening. We'll see you back here tomorrow at 9:15.

(Jury not present.)

THE COURT: Anything we need to take up before we leave?

MR. HURLEY: I don't believe so, Your Honor.

THE COURT: All right. See y'all about 9:15.

MR. HURLEY: Thank you, Your Honor.

(Court adjourned.)

THE STATE OF TEXAS)

COUNTY OF JOHNSON)

I, Pamela K. Waits, Official Court Reporter in and for the 413th District Court of Johnson County, State of Texas, do hereby certify that the foregoing contains a true and correct transcription of all portions of evidence and other proceedings requested in writing by counsel for the parties to be included in the volume of the Reporter's Record, in the above-styled and numbered cause, all of which occurred in open court or in chambers and were reported by me.

I further certify that this Reporter's Record of the proceedings truly and correctly reflects the exhibits, if any, admitted, tendered in an offer of proof or offered into evidence.

WITNESS MY OFFICIAL HAND this the 7th day of November, 2024.

/s/ Pamela Waits

Pamela K. Waits, TCRR, TMR, CSR #4991
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