		Page 1
1	S. Becker	
2	UNITED STATES PATENT AND TRADEMARK OFFICE	
3	BEFORE THE PATENT TRIAL AND APPEAL BOARD	
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5		
6	JTEKT CORPORATION	
7	Petitioner	
8	V.	
9	GKN AUTOMOTIVE LTD.	
10	Patent Owner	
11		
12	Case No. IPR2016-00046	
13	Patent No. 8,215,440	
14		
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16		
17	DEPOSITION OF STEVEN J. BECKER	
18	Alexandria, Virginia	
19	June 2, 2016	
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22		
23		
24	Reported by: Mary Ann Payonk	
25	Job No. 107969	

1S. Becker1S. Becker2APPEARANCES:3ON BEHALF OF PETTIONER:4LISA MANDRUSIAK, ESQUIRE5June 2, 201669:06 a.m.7Paposition of STEVEN J. BECKER, held at9the offices of Oblon, McClelland, Maier &10Neustadt, LLP, 1940 Duke Street, Alexandria,11Virginia, pursuant to Notice before Mary Ann12Payonk, Nationally Certified Realtime Reporter13and Notary Public of the District of Columbia,14Commonwealth of Virginia, and State of New15Southfield, MI 48075161617ALSO PRESENT:18JENNIFER BRUMBAUGH, ESQUIRE19Deputy Director of Intellectual Property20202121222323242425252526Page 427Sinder and testified as3called as a witness, having been duly4sworn, was examined and testified as5follows:5A. At	2APPEARANCES:3ON BEHALF OF PETITIONER:4LISA MANDRUSIAK, ESQUIRE5RYAN SMITH, ESQUIRE6OBLON, McCLELLAND, MAIER & NEI71940 Duke Street8Alexandria, Virginia 2231491010ON BEHALF OF PATENT OWNER:11SANGEETA SHAH, ESQUIRE12KRISTIN MURPHY, ESQUIRE13BROOKS KUSHMAN141000 Town Center	2 APPEARANCES: 3 ON BEHALF OF PET 4 LISA MANDRUS 5 RYAN SMITH, E 6 OBLON, McCLE 7 1940 Duke Street 9 1940 Duke Street, Alexandria, 10 ON BEHALF OF PAT 11 SANGEETA SHA 10 ON BEHALF OF PAT 11 SANGEETA SHA 12 APPEARANCES: 3 ON BEHALF OF PET 4 LISA MANDRUS 5 RYAN SMITH, E 6 OBLON, McCLE 7 1940 Duke Street 1940 Duke Street 1940 Duke Street 10 ON BEHALF OF PAT 11 SANGEETA SHA 11 SANGEETA SHA 12 KRISTIN MURPI 13 BROOKS KUSHI 14 1000 Town Cente	K, ESQUIRE JIRE ND, MAIER & NEUSTADT 2314 T OWNER: ESQUIRE ESQUIRE
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5 follows: 5 A. At	- ·		
6 EXAMINATION 6 Q. Okay, continue.			
7 BY MS. SHAH: 7 A. At Fournier Robson, I do direct			
8 Q. Good morning, Mr. Becker. 8 engineering consulting where we either design			÷
9 A. Good morning. 9 products or provide testing services for			ting services for
10Q. How many times have you been deposed10clients.11before?11Q. Is there a relationship between			nchin hotwoon
			-
	1 57	L L	Thi sorry, is it Robson
	Horensic'		ike sort of the same
	13 Forensic?		
	he you're old hat at 14 A. Yeah. They're like sort of the same	And would you like a quick 15 company but just a	
	he you're old hat at14A. Yeah. They're like sort of the sameId you like a quick15company but just a the one side's difference		side
	ne you're old hat at14A. Yeah. They're like sort of the samId you like a quick15company but just a the one side's differrotocol for today?16liability than the other side.	t of the protocol for today? 16 liability than the otl	
	ne you're old hat at14A. Yeah. They're like sort of the samld you like a quick15company but just a the one side's differrotocol for today?16liability than the other side.17Q. Okay. And so in in the context	t of the protocol for today? 16 liability than the otl 17 Q. Okay. And	n in the context
	he you're old hat at14A. Yeah. They're like sort of the samId you like a quick15company but just a the one side's differrotocol for today?16liability than the other side.17Q. Okay. And so in in the context18of I guess what's the split of your time	t of the protocol for today?16liability than the oth17Q. Okay. And20 I guess if you can take us18of I guess what's	n in the context split of your time
	he you're old hat at14A. Yeah. They're like sort of the samId you like a quick15company but just a the one side's differrotocol for today?16liability than the other side.17Q. Okay. And so in in the contextif you can take us18and what your like,19between Fournier Robson and Robson Fournier	t of the protocol for today? 16 liability than the oth 17 Q. Okay. And 20 I guess if you can take us 216 liability than the oth 217 Q. Okay. And 218 of I guess what's 219 between Fournier R	n in the context split of your time on and Robson Forensic?
22 Forensic and Fournier Robson. At Robson 22 engineering consulting.	he you're old hat at14A. Yeah. They're like sort of the sameId you like a quick15company but just a the one side's differrotocol for today?16liability than the other side.17Q. Okay. And so in in the contextif you can take us18and what your like,1920A. Yeah, I I have about 10 percent	t of the protocol for today?16liability than the otl17Q. Okay. And20I guess if you can take us18of I guess what's20A. Yeah, I I J	n in the context split of your time on and Robson Forensic? e about 10 percent to
23 Forensic I perform investigations for clients, 23 Q. Okay.	ne you're old hat at14A. Yeah. They're like sort of the sameId you like a quick15company but just a the one side's differrotocol for today?16liability than the other side.17Q. Okay. And so in in the contextif you can take us18and what your like,19between Fournier Robson and Robson Fourwork for Robson2120percent, depending on the year, direct	t of the protocol for today?16liability than the oth17Q. Okay. And50 I guess if you can take us18of I guess what'sackground and what your like,19between Fournier Raployment.20A. Yeah, I I Icurrently work for Robson2120 percent, dependit	n in the context split of your time on and Robson Forensic? e about 10 percent to on the year, direct
24 often related to litigation matters, mostly 24 A. And then in my forensics work I have	he you're old hat at14A. Yeah. They're like sort of the samId you like a quick15company but just a the one side's differrotocol for today?16liability than the other side.17Q. Okay. And so in in the contextif you can take us18and what your like,19between Fournier Robson and Robson Fournierc.20work for Robson21obson. At Robson22	t of the protocol for today?16liability than the off161317Q. Okay. And17Q. Okay. And180f I guess what's18180f I guess what's1919between Fournier R19between Fournier R1020A. Yeah, I I for the protocol for Robson212020percent, dependition2120percent, dependition22engineering consult	n in the context split of your time on and Robson Forensic? e about 10 percent to on the year, direct
25 related to vehicle work, also related to 25 about 60 percent plaintiff and 40 percent	he you're old hat at14A. Yeah. They're like sort of the sameId you like a quick15company but just a the one side's differrotocol for today?16liability than the other side.17Q. Okay. And so in in the contextif you can take us18of I guess what's the split of your timeand what your like,19between Fournier Robson and Robson Fourc.20A. Yeah, I I have about 10 percentwork for Robson2120 percent, depending on the year, directigations for clients,23Q. Okay.	t of the protocol for today?16liability than the oth50 I guess if you can take us17Q. Okay. And60 I guess if you can take us18of I guess what's61 guess if you can take us18of I guess what's62 guess if you can take us18of I guess what's63 guess if you can take us18of I guess what's64 guess if you can take us18of I guess what's65 guess if you can take us18of I guess what's66 guess if you can take us18067 guess if you can take us1868 guess if you can take us1869 guess if you can take us1860 guess if you can take us1860 guess if you can take us1861 guess what your like,1962 guess if you can take us2063 guess if you can take us2064 guess if you can take us2164 guess if you can take us2265 guess if you can take us2365 guess if you can take us2366 guess if you can take us2466 guess if you can take us2367 guess if you can take us2468 guess if you can take us2368 guess if you can take us2469 guess if you can take us2369 guess if you can take us2460 guess if you can take us2360 guess if you can take us2461 guess if you can take us2462 guess if you can take us25<	n in the context split of your time on and Robson Forensic? e about 10 percent to on the year, direct

2 (Pages 2 to 5)

	Page	6	Page 7
1	S. Becker	1	S. Becker
2	defense.	2	so I can't get into the details of the case.
3	Q. All right. And you've been doing	3	Q. What's the title of the case?
4	that for how long, the forensics work?	4	A. It was related to ARB, and it was a
5	A. Since 2009.	5	rear axle disconnect.
6	Q. And about how many how many times	6	Q. I'm sorry, related is ARB the
7	have you been retained as an expert through	7	- · · ·
8	that period?	8	company A. ARB's
9	*	9	
	A. Ballpark, around 300.		Q that hired you?
10	Q. And would you say you mostly do	10	A the company, correct. No, they're
11	I'm sorry, did you say mostly plaintiffs work?	11	not the company that hired me. They're
12	A. Again, 60 percent plaintiffs and	12	they're
13	40 percent defense.	13	Q. It's the company
14	Q. Okay. Have you ever been involved in	14	A. They owned a patent.
15	an in an intellectual property litigation	15	Q. I see.
16	before?	16	A. I got hired by an attorney I don't
17	A. Yes.	17	recall.
18	Q. And in what capacity were you	18	Q. At what firm?
19	involved before?	19	A. I don't have that in front of me.
20	A. As an expert.	20	Q. How long ago were you a patent
21	Q. And what case was that?	21	expert?
22	A. It was related to a rear	22	A. Two to three years ago.
23	differential.	23	Q. And that was for District Court
24	Q. Okay.	24	litigation
25	A. I don't know the status of the case	25	A. I wouldn't
	Page	8	Page 9
1	S. Becker	1	S. Becker
2	Q if you know?	2	A. Well, something ends up crashing.
3	A know.	3	Q. Okay.
4	Q. So you were deposed?	4	A. Somehow, somebody gets hurt.
5	A. No.	5	Q. Okay.
б	Q. And with the work that you do at	6	A. And then the the component is
7	Robson, is most of that sort of related to	7	drawn into question as to whether that
8	well, I guess describe for me what the majority	8	contributed to the crash
9	of that work entails.	9	Q. Okay.
10	A. Sure.	10	A or the injury or whatever.
11	Q. The sort of subject matter.	11	Q. Right. And that's what percent
12	A. Yeah. The primary subject matter,	12	so, I'm sorry, of the of the time?
13	vehicle crashes or products liability.	13	A. Oh.
14	Q. Okay. Have you have you handled	14	Q. If I if I recall correctly, you
15	any driveline-related sort of subject matter	15	said about 90 percent of your current work and
16	cases at Robson?	16	that's been over the last since 2009 has
17	A. Definitely, yes.	17	been with respect to the forensic side
18	Q. And can you describe some of that	18	A. No, it
19	work for me?	19	Q crash?
20	A. Yeah, sure. Some of them involved	20	A. No, it would be 80 to 90 percent.
21	axle systems; some involved transmissions. I'd	21	Q. Okay. And of that 80 to 90 percent,
22	-	22	what percentage of it has to do with sort of
		ぞん	what percentage of it has to do with soft of
þγ	say the more the larger bulk involved		
23 24	transmission systems.	23	crash test analysis and investigations?
23 24 25	• •		

3 (Pages 6 to 9)

	Page 10	'	Page 11
1	S. Becker	1	S. Becker
2	percentage that would be related just to	2	Q. Okay.
3	crashes.	3	
		-	A. Did the design work for the patent
4	Q. Is it the majority?	4	application, and the patent was filed and
5	A. Correct.	5	accepted. I'm not named on the patent; the
6	Q. Okay. And then you you indicated	6	owner of the idea is. And I provided all the
7	that you've also you know, about 10 to maybe	7	design and engineering prototype procurement
8	20 percent of your work is with respect to	8	and testing.
9	engineering	9	Q. Okay. So when you say design and
10	A. Correct.	10	engineering, you know, what are you referring
11	Q currently.	11	to?
12	And can you describe for me some of	12	A. Okay, yeah. That includes the
13	the engineering type matters that you're	13	calculations for the structural capability of
14	involved in	14	the components.
15	A. Sure.	15	Q. Uh-huh.
16	Q with Fournier.	16	A. Durability evaluation estimation, and
17	A. One of my more recent projects was	17	then the drawing of the, you know, the CAD
18	designing a product called The Truck Brush.	18	models, the creation of the 3-D model, then the
19	Q. Uh-huh.	19	fit and function. So in other words, the
20	A. And it's a hydraulically actuated	20	general tolerancing and how the the
21	brush that removes the snow off the roofs of	21	product's going to interact with the other
22	tractor trailers as attached to a a	22	components in the product.
23	hydraulic piece of equipment like a front	23	Q. Okay. And then can you describe for
24	loader or a fork truck or something of that	24	me other other are there other products
25	nature.	25	that you've been involved in designing?
	Page 12	2	Page 13
1	S. Becker	1	S. Becker
2	A. Sure. There's also a a cell phone	2	and product reliability planning.
	-	1	1 1 0
3	product that's being developed for detecting	3	O. Okay. So the design of the product
3 4	product that's being developed for detecting crashes.	4	Q. Okay. So the design of the product itself sort of came to you?
4	crashes.	4	itself sort of came to you?
4 5	crashes. Q. Uh-huh.	4 5	itself sort of came to you? A. Correct.
4 5 6	crashes. Q. Uh-huh. A. So it was outlining the test program	4 5 6	itself sort of came to you?A. Correct.Q. And then you were verifying it?
4 5 6 7	crashes. Q. Uh-huh. A. So it was outlining the test program and how to validate and verify that the product	4 5 6 7	itself sort of came to you?A. Correct.Q. And then you were verifying it?A. Correct.
4 5 6 7 8	crashes. Q. Uh-huh. A. So it was outlining the test program and how to validate and verify that the product can function correctly and appropriately, and	4 5 6 7 8	itself sort of came to you?A. Correct.Q. And then you were verifying it?A. Correct.Q. Okay. And how long did that
4 5 7 8 9	crashes. Q. Uh-huh. A. So it was outlining the test program and how to validate and verify that the product can function correctly and appropriately, and then doing that testing at a facility crashing	4 5 7 8 9	itself sort of came to you?A. Correct.Q. And then you were verifying it?A. Correct.Q. Okay. And how long did that verification process take?
4 5 7 8 9 10	crashes. Q. Uh-huh. A. So it was outlining the test program and how to validate and verify that the product can function correctly and appropriately, and then doing that testing at a facility crashing vehicles.	4 5 7 8 9 10	 itself sort of came to you? A. Correct. Q. And then you were verifying it? A. Correct. Q. Okay. And how long did that verification process take? A. I believe it's still going on.
4 5 7 8 9 10	crashes. Q. Uh-huh. A. So it was outlining the test program and how to validate and verify that the product can function correctly and appropriately, and then doing that testing at a facility crashing vehicles. Q. So is it sort of like a black box for	4 5 7 8 9 10	 itself sort of came to you? A. Correct. Q. And then you were verifying it? A. Correct. Q. Okay. And how long did that verification process take? A. I believe it's still going on. Q. So would that be months? Would it be
4 5 7 8 9 10 11 12	 crashes. Q. Uh-huh. A. So it was outlining the test program and how to validate and verify that the product can function correctly and appropriately, and then doing that testing at a facility crashing vehicles. Q. So is it sort of like a black box for cars or something along those lines? 	4 5 7 8 9 10 11 12	 itself sort of came to you? A. Correct. Q. And then you were verifying it? A. Correct. Q. Okay. And how long did that verification process take? A. I believe it's still going on. Q. So would that be months? Would it be six months
4 5 7 8 9 10 11 12 13	 crashes. Q. Uh-huh. A. So it was outlining the test program and how to validate and verify that the product can function correctly and appropriately, and then doing that testing at a facility crashing vehicles. Q. So is it sort of like a black box for cars or something along those lines? A. It's more insurance type of thing. 	4 5 7 8 9 10 11 12 13	 itself sort of came to you? A. Correct. Q. And then you were verifying it? A. Correct. Q. Okay. And how long did that verification process take? A. I believe it's still going on. Q. So would that be months? Would it be six months A. Yeah, my
4 5 6 7 8 9 10 11 12 13 14	 crashes. Q. Uh-huh. A. So it was outlining the test program and how to validate and verify that the product can function correctly and appropriately, and then doing that testing at a facility crashing vehicles. Q. So is it sort of like a black box for cars or something along those lines? A. It's more insurance type of thing. Q. I see. 	4 5 6 7 8 9 10 11 12 13 14	 itself sort of came to you? A. Correct. Q. And then you were verifying it? A. Correct. Q. Okay. And how long did that verification process take? A. I believe it's still going on. Q. So would that be months? Would it be six months A. Yeah, my Q or more?
4 5 6 7 8 9 10 11 12 13 14 15	 crashes. Q. Uh-huh. A. So it was outlining the test program and how to validate and verify that the product can function correctly and appropriately, and then doing that testing at a facility crashing vehicles. Q. So is it sort of like a black box for cars or something along those lines? A. It's more insurance type of thing. Q. I see. How long for example, with the 	4 5 7 9 10 11 12 13 14 15	 itself sort of came to you? A. Correct. Q. And then you were verifying it? A. Correct. Q. Okay. And how long did that verification process take? A. I believe it's still going on. Q. So would that be months? Would it be six months A. Yeah, my Q or more? A component of it, my last set of
4 5 6 7 8 9 10 11 12 13 14 15 16	 crashes. Q. Uh-huh. A. So it was outlining the test program and how to validate and verify that the product can function correctly and appropriately, and then doing that testing at a facility crashing vehicles. Q. So is it sort of like a black box for cars or something along those lines? A. It's more insurance type of thing. Q. I see. How long for example, with the with the cell phone product, how long did it 	4 5 7 9 10 11 12 13 14 15 16	 itself sort of came to you? A. Correct. Q. And then you were verifying it? A. Correct. Q. Okay. And how long did that verification process take? A. I believe it's still going on. Q. So would that be months? Would it be six months A. Yeah, my Q or more? A component of it, my last set of components of it was about, oh, just under a
4 5 6 7 8 9 10 11 12 13 14 15 16 17	 crashes. Q. Uh-huh. A. So it was outlining the test program and how to validate and verify that the product can function correctly and appropriately, and then doing that testing at a facility crashing vehicles. Q. So is it sort of like a black box for cars or something along those lines? A. It's more insurance type of thing. Q. I see. How long for example, with the with the cell phone product, how long did it take you to well, okay, let's back up. 	4 5 6 7 8 9 10 11 12 13 14 15 16 17	 itself sort of came to you? A. Correct. Q. And then you were verifying it? A. Correct. Q. Okay. And how long did that verification process take? A. I believe it's still going on. Q. So would that be months? Would it be six months A. Yeah, my Q or more? A component of it, my last set of components of it was about, oh, just under a year.
4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	 crashes. Q. Uh-huh. A. So it was outlining the test program and how to validate and verify that the product can function correctly and appropriately, and then doing that testing at a facility crashing vehicles. Q. So is it sort of like a black box for cars or something along those lines? A. It's more insurance type of thing. Q. I see. How long for example, with the with the cell phone product, how long did it take you to well, okay, let's back up. What what design work did you do 	4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	 itself sort of came to you? A. Correct. Q. And then you were verifying it? A. Correct. Q. Okay. And how long did that verification process take? A. I believe it's still going on. Q. So would that be months? Would it be six months A. Yeah, my Q or more? A component of it, my last set of components of it was about, oh, just under a year. Q. And that's again just the
4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19	 crashes. Q. Uh-huh. A. So it was outlining the test program and how to validate and verify that the product can function correctly and appropriately, and then doing that testing at a facility crashing vehicles. Q. So is it sort of like a black box for cars or something along those lines? A. It's more insurance type of thing. Q. I see. How long for example, with the with the cell phone product, how long did it take you to well, okay, let's back up. What what design work did you do for that product? 	4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19	 itself sort of came to you? A. Correct. Q. And then you were verifying it? A. Correct. Q. Okay. And how long did that verification process take? A. I believe it's still going on. Q. So would that be months? Would it be six months A. Yeah, my Q or more? A component of it, my last set of components of it was about, oh, just under a year. Q. And that's again just the verification side of it
4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	 crashes. Q. Uh-huh. A. So it was outlining the test program and how to validate and verify that the product can function correctly and appropriately, and then doing that testing at a facility crashing vehicles. Q. So is it sort of like a black box for cars or something along those lines? A. It's more insurance type of thing. Q. I see. How long for example, with the with the cell phone product, how long did it take you to well, okay, let's back up. What what design work did you do for that product? A. Oh, that was the evaluation of the 	4 5 7 9 10 11 12 13 14 15 16 17 18 19 20	 itself sort of came to you? A. Correct. Q. And then you were verifying it? A. Correct. Q. Okay. And how long did that verification process take? A. I believe it's still going on. Q. So would that be months? Would it be six months A. Yeah, my Q or more? A component of it, my last set of components of it was about, oh, just under a year. Q. And that's again just the verification side of it A. Exactly.
4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 20 21	 crashes. Q. Uh-huh. A. So it was outlining the test program and how to validate and verify that the product can function correctly and appropriately, and then doing that testing at a facility crashing vehicles. Q. So is it sort of like a black box for cars or something along those lines? A. It's more insurance type of thing. Q. I see. How long for example, with the with the cell phone product, how long did it take you to well, okay, let's back up. What what design work did you do for that product? A. Oh, that was the evaluation of the capabilities for the hardware involved 	4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21	 itself sort of came to you? A. Correct. Q. And then you were verifying it? A. Correct. Q. Okay. And how long did that verification process take? A. I believe it's still going on. Q. So would that be months? Would it be six months A. Yeah, my Q or more? A component of it, my last set of components of it was about, oh, just under a year. Q. And that's again just the verification side of it A. Exactly. Q is that right?
4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 20 21 22	 crashes. Q. Uh-huh. A. So it was outlining the test program and how to validate and verify that the product can function correctly and appropriately, and then doing that testing at a facility crashing vehicles. Q. So is it sort of like a black box for cars or something along those lines? A. It's more insurance type of thing. Q. I see. How long for example, with the with the cell phone product, how long did it take you to well, okay, let's back up. What what design work did you do for that product? A. Oh, that was the evaluation of the capabilities for the hardware involved Q. Uh-huh. 	4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 9 20 21 22	 itself sort of came to you? A. Correct. Q. And then you were verifying it? A. Correct. Q. Okay. And how long did that verification process take? A. I believe it's still going on. Q. So would that be months? Would it be six months A. Yeah, my Q or more? A component of it, my last set of components of it was about, oh, just under a year. Q. And that's again just the verification side of it A. Exactly. Q is that right? And do you have any idea how long the
4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 9 20 22 22 22	 crashes. Q. Uh-huh. A. So it was outlining the test program and how to validate and verify that the product can function correctly and appropriately, and then doing that testing at a facility crashing vehicles. Q. So is it sort of like a black box for cars or something along those lines? A. It's more insurance type of thing. Q. I see. How long for example, with the with the cell phone product, how long did it take you to well, okay, let's back up. What what design work did you do for that product? A. Oh, that was the evaluation of the capabilities for the hardware involved Q. Uh-huh. A for the sensors, and then it was 	4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 9 20 21 22 23	 itself sort of came to you? A. Correct. Q. And then you were verifying it? A. Correct. Q. Okay. And how long did that verification process take? A. I believe it's still going on. Q. So would that be months? Would it be six months A. Yeah, my Q or more? A component of it, my last set of components of it was about, oh, just under a year. Q. And that's again just the verification side of it A. Exactly. Q is that right? And do you have any idea how long the design side of it took, or you weren't involved
4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 20 21 22	 crashes. Q. Uh-huh. A. So it was outlining the test program and how to validate and verify that the product can function correctly and appropriately, and then doing that testing at a facility crashing vehicles. Q. So is it sort of like a black box for cars or something along those lines? A. It's more insurance type of thing. Q. I see. How long for example, with the with the cell phone product, how long did it take you to well, okay, let's back up. What what design work did you do for that product? A. Oh, that was the evaluation of the capabilities for the hardware involved Q. Uh-huh. 	4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 9 20 21 22	 itself sort of came to you? A. Correct. Q. And then you were verifying it? A. Correct. Q. Okay. And how long did that verification process take? A. I believe it's still going on. Q. So would that be months? Would it be six months A. Yeah, my Q or more? A component of it, my last set of components of it was about, oh, just under a year. Q. And that's again just the verification side of it A. Exactly. Q is that right? And do you have any idea how long the

4 (Pages 10 to 13)

	Page 14		Page 15
1	S. Becker	1	S. Becker
2	couldn't comment.	2	layout.
3	Q. Okay. And with respect to the prior	3	Q. Uh-huh.
4	product you mentioned?	4	A. They wanted to use this type of
5	A. Again, that was that product	5	brush.
6	started in I think 2013.	6	Q. I see.
7	Q. Uh-huh.	7	A. And they wanted to cover a truck. So
8	A. I think we got the patent last year.	8	those were kind of the incoming specifications.
9	Q. Okay. And were you involved in the	9	And then they wanted to interact with these
10	design of that product?	10	types of pieces of equipment, so that's the
11	A. Oh, certainly, yes.	11	other end, so then I had to put in everything
12	Q. Yes. So in what capacity were you	12	in between.
13	involved in the design?	13	Q. Okay. And how you get hired
14	A. That was the one that I just	14	through Robson? Is that how this works
15	previously answered. I was doing the	15	A. No, I'm
16		16	Q basically?
17	calculations, the stress analysis, the layout	17	
18	and construction, CAD modeling, and then the	18 18	A employed directly by Robson.
10 19	tolerancing.	10 19	Q. Okay.
	Q. Okay. So once again, would the		A. So they they call either an admin
20	structural sort of details have been provided	20	or call me or they call one of our business
21 22	to you in advance?	21 22	development people.
	A. No.		Q. Okay.
23	Q. Okay. So for that, you you did	23	A. And the case work either is directed
24	come up with a	24	to me or I take in the inquiry and then send
25	A. They had a sort of a general	25	that to the admin and then we file the
	Page 16		Page 17
1	S. Becker	1	S. Becker
2	S. Becker paperwork.	1 2	S. Becker So now your next question, ma'am?
2 3	S. Becker paperwork. Q. Okay, fine. So you're a 100 percent	1 2 3	S. Becker So now your next question, ma'am? BY MS. SHAH:
2 3 4	S. Becker paperwork. Q. Okay, fine. So you're a 100 percent employee of Robson's	1 2 3 4	S. Becker So now your next question, ma'am? BY MS. SHAH: Q. Okay, so going back to the last
2 3 4 5	S. Becker paperwork. Q. Okay, fine. So you're a 100 percent employee of Robson's A. Salary.	1 2 3 4 5	S. Becker So now your next question, ma'am? BY MS. SHAH: Q. Okay, so going back to the last question, you you you indicated that
2 3 4	S. Becker paperwork. Q. Okay, fine. So you're a 100 percent employee of Robson's A. Salary. Q right?	1 2 3 4	S. Becker So now your next question, ma'am? BY MS. SHAH: Q. Okay, so going back to the last
2 3 4 5	S. Becker paperwork. Q. Okay, fine. So you're a 100 percent employee of Robson's A. Salary.	1 2 3 4 5	S. Becker So now your next question, ma'am? BY MS. SHAH: Q. Okay, so going back to the last question, you you you indicated that
2 3 4 5 6 7 8	S. Becker paperwork. Q. Okay, fine. So you're a 100 percent employee of Robson's A. Salary. Q right? A. Right. Q. Okay. Then they've got the sort of	1 2 3 4 5 6	S. Becker So now your next question, ma'am? BY MS. SHAH: Q. Okay, so going back to the last question, you you you indicated that you're 100 percent employed by Robson; is that correct? A. Correct.
2 3 4 5 6 7 8 9	S. Becker paperwork. Q. Okay, fine. So you're a 100 percent employee of Robson's A. Salary. Q right? A. Right. Q. Okay. Then they've got the sort of splits of your time between the forensic side	1 2 3 4 5 6 7	S. Becker So now your next question, ma'am? BY MS. SHAH: Q. Okay, so going back to the last question, you you you indicated that you're 100 percent employed by Robson; is that correct? A. Correct. Q. And they have kind of allocated your
2 3 4 5 6 7 8 9	S. Becker paperwork. Q. Okay, fine. So you're a 100 percent employee of Robson's A. Salary. Q right? A. Right. Q. Okay. Then they've got the sort of splits of your time between the forensic side of it and the sort of	1 2 3 4 5 6 7 8 9 10	S. Becker So now your next question, ma'am? BY MS. SHAH: Q. Okay, so going back to the last question, you you you indicated that you're 100 percent employed by Robson; is that correct? A. Correct. Q. And they have kind of allocated your time between Forensics and the Fournier
2 3 4 5 6 7 8 9 10	S. Becker paperwork. Q. Okay, fine. So you're a 100 percent employee of Robson's A. Salary. Q right? A. Right. Q. Okay. Then they've got the sort of splits of your time between the forensic side	1 2 3 4 5 6 7 8 9 10 11	S. Becker So now your next question, ma'am? BY MS. SHAH: Q. Okay, so going back to the last question, you you you indicated that you're 100 percent employed by Robson; is that correct? A. Correct. Q. And they have kind of allocated your time between Forensics and the Fournier engineering component?
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5 (Pages 14 to 17)

	Page 18		Page 19
1	S. Becker	1	S. Becker
2	MS. SHAH: No, there's just the	2	resolution of litigation involving vehicle
3	three. I can give you this copy.	3	crashes, fires, and other losses.
4	MS. MANDRUSIAK: Thank you.	4	Is that accurate?
5	BY MS. SHAH:	5	In the sort of second sentence of the
6	Q. So if you can identify for me what	6	first page, do you see that sentence?
7	the first exhibit is here.	7	A. Yeah.
8	A. It looks like something from our	8	Q. And is that sentence accurate?
9	website.	9	A. Correct.
10	Q. Do you recognize this?	10	Q. And again, is that sort of roughly
11	A. Yes.	11	80 percent of work that you do for Robson
12^{-1}		12	Forensic?
13	A. A portion of it, yeah.	13	A. Correct, yeah. Investigations,
14	Q. What portion of it did you help	14	reports, and testimony.
15	create?	15	Q. And then continuing on to the second
16		16	page, it talks about the the first sentence
17	1	17	of the second page talks about your work as an
18		18	engineer associated with computer-aided design
19		19	and crash modeling, physical testing.
20		20	Just the second I'm sorry, it's
21		21	the first sentence of the second page. Does
22		22	that essentially capture the work that you do
23		23	for Fournier Robson?
24	∂	24	MS. MANDRUSIAK: Objection, form.
25		25	A. Well, it it says "was," so I think
<u> </u>		2.5	
	Page 20		Page 21
1	S. Becker	1	S. Becker
2	it's kind of referring to my my previous	2	Q. Okay.
3	work.	3	A. But it was all one place.
4	Q. Okay. Okay, so then let's so	4	Q. Got it.
5	in in the context of your previous work,	5	A. It's not like I moved around.
6	what experience do you have that then ties in	6	
7	1 2	6	Q. So you were in the same building but
	with this this sentence, the first sentence	7	the letterhead kept changing?
8	· ·		the letterhead kept changing? A. Exactly.
	with this this sentence, the first sentence	7	the letterhead kept changing?
8 9 10	with this this sentence, the first sentence of the second page? A. Sure. I provided computer-aided	7 8	the letterhead kept changing? A. Exactly.
8 9 10 11	with this this sentence, the first sentenceof the second page?A. Sure. I provided computer-aideddesign, crash modeling, physical testing, data	7 8 9	the letterhead kept changing?A. Exactly.Q. Okay. And while you were in that
8 9 10 11 12	 with this this sentence, the first sentence of the second page? A. Sure. I provided computer-aided design, crash modeling, physical testing, data analysis for durability and performance. And I had a specialty in noise and 	7 8 9 10 11 12	the letterhead kept changing?A. Exactly.Q. Okay. And while you were in thatsort of essentially the same job is that
8 9 10 11 12 13	 with this this sentence, the first sentence of the second page? A. Sure. I provided computer-aided design, crash modeling, physical testing, data analysis for durability and performance. And I had a specialty in noise and vibration, and I did that at at Chrysler and 	7 8 9 10 11 12 13	the letterhead kept changing?A. Exactly.Q. Okay. And while you were in that sort of essentially the same job is that fair? It's the same job all the way through
8 9 10 11 12 13 14	 with this this sentence, the first sentence of the second page? A. Sure. I provided computer-aided design, crash modeling, physical testing, data analysis for durability and performance. And I had a specialty in noise and vibration, and I did that at at Chrysler and at New Venture Gear, Chrysler, Magna 	7 8 9 10 11 12 13 14	 the letterhead kept changing? A. Exactly. Q. Okay. And while you were in that sort of essentially the same job is that fair? It's the same job all the way through while the titles sort of the companies
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8 9 10 11 12 13 14 15 16 17 18 20 21 22	 with this this sentence, the first sentence of the second page? A. Sure. I provided computer-aided design, crash modeling, physical testing, data analysis for durability and performance. And I had a specialty in noise and vibration, and I did that at at Chrysler and at New Venture Gear, Chrysler, Magna Powertrain. There was kind of like a can I give you a little background? Q. Absolutely, please. A. New Venture Gear was a joint venture between Chrysler and General Motors to make transmissions, axles, four-wheel drive systems. And they diventured. Is that a word? They broke up and then I was a Chrysler employee for four years, working for Carlos Lobo. And then they sold us to Magna and then that became 	7 8 9 10 11 13 14 15 16 17 18 20 21 22	 the letterhead kept changing? A. Exactly. Q. Okay. And while you were in that sort of essentially the same job is that fair? It's the same job all the way through while the titles sort of the companies changed? A. During that segment of my career, yeah. Q. And the so can you describe for me the the nature of the work that you did at that point?

6 (Pages 18 to 21)

1S. Becker1S. Becker2you did2give you the overview3A. Correct.3Q. Sure.4Q during that period of time?4A instead of the	Page 23
2you did2give you the overview3A. Correct.3Q. Sure.4Q during that period of time?4A instead of the	
3A. Correct.3Q. Sure.4Q during that period of time?4A instead of the	
4 Q during that period of time? 4 A instead of the	
5 A. Correct. 5 Q. Yeah.	
6 Q. All right. So then the second 6 A piecemeal?	
7 sentence says in this role, you were 7 Q. Yeah, go ahead.	
8 responsible for designing vehicle systems, 8 A. The customer specifications wou	ld
9 identifying, diagnosing, and remediating noise 9 come in from the client, say, a Chrysler,	
10 and vibration throughout entire vehicles. 10 Ford, a Nissan or Land Rover, etc.	
11 Is it accurate to say you were 11 I would be part of the review team	
12 responsible for designing the vehicle systems 12 for the specifications. We would hash or	
13 as well as identifying, diagnosing, and 13 we were going to do for an overall mode	
14 remediating noise and vibration throughout the 14 product as a team. That would go back t	
15 entire vehicles? 15 customer. They would either agree, disa	
16 Were you actually involved with the 16 you know, then the core design would co	
17 design of the vehicle systems or more on the 17 The parts responsible engineers ar	
18 kind of testing side of it? 18 the people who had to sign off on the dra	
19 A. No, I was involved with the designing 19 My role was on the review of the design	~
20 side. 20 coming up with the new ideas or solution	
21 Q. Okay. 21 problems.	
22 A. I had responsibility for and 22 Q. Uh-huh.	
23 again, it depended on what manager I had at the 23 A. So I had to critique the design	
24 time as to how much I got involved. But 24 initial concepts and send those off to my	
25 basically what would happen is is the can I 25 modeling guys that worked for me to do	
Page 24	Page 25
1 S. Becker 1 S. Becker	
2 refinement of the structure and the internal 2 component drawings, send that back, a	and and
3 components 3 then it became an iterative process thr	
4 Q. Uh-huh. 4 finalization of the product.	8
5 A whether it's the specific geometry 5 Q. Okay. And so this would sort	of
6 of the gearing or the toothing model for the 6 component by component essentially	
7 chain drive system or the adapters for the 7 a	
8 drivelines, prop shafts, or axle shapes. 8 A. Yeah, depending on because	bv
9 Then they would create the 9 "component," you mean product by pr	
10 tolerancing and perform the initial 10 Q. Uh-huh.	
11 calculations, assign that to the prototype 11 A. Yeah.	
	rted to
12 department, who would make the first 12 Q. And then, for example, you sta	
13 components. They would send them up to me for 13 mention that there would be, you know	
13 components. They would send them up to me for 13 mention that there would be, you know	
13components. They would send them up to me for13mention that there would be, you know14review and validation and developing the test14specific gears with, you know, gear to	
13components. They would send them up to me for13mention that there would be, you know14review and validation and developing the test14specific gears with, you know, gear to15plan as to how we're going to say that the15relationships that you'd be working on	 e
13components. They would send them up to me for13mention that there would be, you know14review and validation and developing the test14specific gears with, you know, gear to15plan as to how we're going to say that the151516design works.1616	e vou give
 components. They would send them up to me for review and validation and developing the test plan as to how we're going to say that the design works. Q. Uh-huh. mention that there would be, you know specific gears with, you know, gear to relationships that you'd be working on Can you give me sort of in the context of the work that you did, can you give me sort of the work that you give me	e vou give lucts that
13components. They would send them up to me for review and validation and developing the test13mention that there would be, you know specific gears with, you know, gear to relationships that you'd be working on Can you give me sort of in the context of the work that you did, can you me some examples of the sorts of proceed.13components. They would send them up to me for review and validation and developing the test1314review and validation and developing the test1415plan as to how we're going to say that the1516design works.1617Q. Uh-huh.1718A. We would work out what the test18	e vou give lucts that
13components. They would send them up to me for review and validation and developing the test13mention that there would be, you know specific gears with, you know, gear to relationships that you'd be working on Can you give me sort of in the context of the work that you did, can you me some examples of the sorts of proce 	e you give lucts that 1?
13components. They would send them up to me for review and validation and developing the test plan as to how we're going to say that the design works.13mention that there would be, you know specific gears with, you know, gear to relationships that you'd be working on Can you give me sort of in the context of the work that you did, can you me some examples of the sorts of proce you worked on in this iterative fashior 	you give lucts that n? ne up
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7 (Pages 22 to 25)

	Page 26		Page 27
1	S. Becker	1	S. Becker
2	and the torque multiplication needed to get the	2	and then test it?
3	drill head to operate slowly while the drive	3	A. There would be a ratio requirement
4	system's operating fast but yet still fit in	4	Q. Uh-huh.
5	the design shaft.	5	A from the customer.
6	More commonly, it's involved with	6	Q. Okay.
7	designing and developing either an axle gear or	7	A. That would be the only sort of given
8	a planetary gearset for a transfer case or a	8	input.
9	transmission.	9	Q. I see.
10	There, you're working on sort of	10	A. And then we would design the gear.
11	three components of a gear. You have the	11	Q. To meet
12	macrogeometry, in other words, the packaging	12	A. Raw, yeah.
13	envelope. Then you have the tooth	13	Q. Okay.
14	macrogeometry, which is the overlap and how	14	A. And that was what we called our gear
15	many teeth and the thickness of the tooth and	15	center.
16	where the root lies and things of that nature.	16	Q. Uh-huh. Did you did you design
17	Then you have the microgeometry where we would	17	any sort of products or components from
18	model the profile of the tooth in the	18	scratch?
19	micrometer type of dimensions.	19	A. Of course. They were they were
20	Q. Okay. So, for example, when you're	20	more frequently from scratch.
21	talking about this sort of with respect to	21	Q. And give me an example of of that
22	the axle gears and the work that you did there,	22	kind of development work.
23	would you there would be again this problem	23	A. Well, let's go back to my first
24	that would be identified to you, and and you	24	electric vehicle. We did the the Chrysler
25	and your group would come up with a gear design	25	electric minivan. I think we called it the
		+	
		1	
	Page 28		Page 29
1	S. Becker	1	S. Becker
2	S. Becker N.V.T.(110). And we had a unique gearset.	1 2	S. Becker him for PRE work, parts responsible, the the
	S. Becker	1	S. Becker
2 3 4	S. Becker N.V.T.(110). And we had a unique gearset. They wanted a I think the first box was a two-speed; the second box was a one-speed. And	1 2 3 4	S. Becker him for PRE work, parts responsible, the the working with the drafters type job. And and then there was all the people at Chrysler. I
2 3	S. Becker N.V.T.(110). And we had a unique gearset. They wanted a I think the first box was a	1 2 3	S. Becker him for PRE work, parts responsible, the the working with the drafters type job. And and
2 3 4 5 6	S. Becker N.V.T.(110). And we had a unique gearset. They wanted a I think the first box was a two-speed; the second box was a one-speed. And in the second box, the one-speed, we were designing the, you know, the core gears. There	1 2 3 4	S. Becker him for PRE work, parts responsible, the the working with the drafters type job. And and then there was all the people at Chrysler. I don't recall the size of their team. So that team was probably about six
2 3 4 5 6 7	S. Becker N.V.T.(110). And we had a unique gearset. They wanted a I think the first box was a two-speed; the second box was a one-speed. And in the second box, the one-speed, we were designing the, you know, the core gears. There was an input shaft where the gear cut into the	1 2 3 4 5	S. Becker him for PRE work, parts responsible, the the working with the drafters type job. And and then there was all the people at Chrysler. I don't recall the size of their team. So that team was probably about six or seven people. And then, of course, you
2 3 4 5 6 7 8	S. Becker N.V.T.(110). And we had a unique gearset. They wanted a I think the first box was a two-speed; the second box was a one-speed. And in the second box, the one-speed, we were designing the, you know, the core gears. There	1 2 3 4 5 6	S. Becker him for PRE work, parts responsible, the the working with the drafters type job. And and then there was all the people at Chrysler. I don't recall the size of their team. So that team was probably about six
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8 (Pages 26 to 29)

1S. Becker1S. Becker2validation plan.A. We changedA. We changed4of design work that you would b aim to theA. We changed5A. Yeah. That would be similar to theA. We changed6NV1500 rear-wheel drive transmission, the T350A. Hat car since then so I'm not6NV1500 rear-wheel drive transmission, the T350G. O. Star Saf ara syou know, the work7and T355 transaxles. There's a number of them.R. Hat sa goar a gear-driven design1A. That's a gear a gear-driven design11Q. Hus Saf ara syou know, the work12A. That's a gear a gear-driven design12A. On, at the time, document13A. That's a gear a gear-driven design12A. On at the time, document14Q. Tm sorry, and that's for what forVertice BMWs.12A. The Series X cars, the all-wheel16A. The 3 Series X cars, the all-wheel16Q. Okay. And then going back to the17drive BMWs.17working on gear design and validation, did that18Q. And do you know if the work that you17Working on gear design and validation, did that19did ultimately made its way into a a vehicle16N. Definitely, yeah.12A. Yeah.21A. Definitely, yeah.14B. O. Kay. And so I know you your development work23Chryster minivan and we ended up moving that into a a modified design for th Tesla, the production years associated with that product.15B. Ekcke		Page 30		Page 51
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19 MS. SHAH: Sure. So why why 19 Audi. We make the Audi product but I think we				
DO don't we		• •		-
	20	don't we	20	make it in Europe and we had two prototypes. I
21 MS. MANDRUSIAK: Let him finish his 21 don't remember what the outcome of that was.				
22 answer I think would be appropriate. 22 Definitely, the Nissan pickup truck.				
23You kind of cut him off.23And then, of course, the products I designed		You kind of cut him off.		
MS. SHAH: Yeah, sure, no problem. 24 while I was at Chrysler. That would be in the	24		h1	The former of Change in The former like in the
25 BY MS. SHAH: 25 Dodge Viper, the Chrysler minivan, the Dodge				-

9 (Pages 30 to 33)

	Page 34		Page 35
1	S. Becker	1	S. Becker
2	Stratus, the Cirrus convertible. And those	2	Q. Okay. So let's take it one one at
3	would be the products that came out on or	3	a time.
4	around the time when I was employed there. You	4	So you were describing to me the
5	know that I didn't continue working at Chrysler	5	sort of your work as a gear designer and doing
6	on Chrysler products afterwards.	6	essentially you know, designing gears and
7		7	
8	Q. Okay. So is it fair to say that the	8	sometimes doing validation work associated with
	design work that you did related essentially	1	the those kinds of products. That was for
9	to, you know, designing gears, standalone or	9	which company?
10	that went into transfer cases?	10	A. That was for New Process Gear,
11	Is that the majority of the design	11	Chrysler Magna Powertrain.
12	work that you did while you were, I guess,	12	Q. Okay. And then you also said you'd
13	with kind of in the ten years that you	13	worked directly for Chrysler prior to that.
14	worked for Chrysler and Magna and these various	14	And that was from what period to what period?
15	other companies?	15	A. I worked for Modern Engineering at
16	MS. MANDRUSIAK: Objection, form.	16	Chrysler so I was hired by the Chrysler guy,
17	A. No. That was while I was with New	17	but they didn't hire people directly at that
18	Venture Gear New Process Gear group.	18	time so I was on site but I was paid through
19	BY MS. SHAH:	19	Modern.
20	Q. Okay.	20	Q. Okay.
21	A. Before that, I was with at	21	A. There was what was that? If I had
22	Chrysler directly in Dearborn Dearborn	22	my CV in front of me, I could tell you the
23	Heights? in Auburn Hills, Michigan. And	23	exact dates, but I believe it was '94 to '97,
24	there, I was doing design work on vehicle	24	or something like that.
25	non nondriveline-specific components.	25	And that was in the scientific test
	Dago 36		Dago 27
	Page 36		Page 37
1	S. Becker	1	S. Becker
2	S. Becker labs. And there, I was designing all variety	1 2	S. Becker mounts on the sides and two lower mounts, one
2 3	S. Becker labs. And there, I was designing all variety of components, intake systems, engine mounts,	1 2 3	S. Becker mounts on the sides and two lower mounts, one in the front and a bobble mount in the rear. I
2	S. Becker labs. And there, I was designing all variety of components, intake systems, engine mounts, some structural components like bumpers and B	1 2 3 4	S. Becker mounts on the sides and two lower mounts, one in the front and a bobble mount in the rear. I was tasked with redesigning and redeveloping
2 3	S. Becker labs. And there, I was designing all variety of components, intake systems, engine mounts,	1 2 3	S. Becker mounts on the sides and two lower mounts, one in the front and a bobble mount in the rear. I
2 3 4	S. Becker labs. And there, I was designing all variety of components, intake systems, engine mounts, some structural components like bumpers and B	1 2 3 4	S. Becker mounts on the sides and two lower mounts, one in the front and a bobble mount in the rear. I was tasked with redesigning and redeveloping
2 3 4 5	S. Becker labs. And there, I was designing all variety of components, intake systems, engine mounts, some structural components like bumpers and B pillars, half shafts, validating transmission	1 2 3 4 5	S. Becker mounts on the sides and two lower mounts, one in the front and a bobble mount in the rear. I was tasked with redesigning and redeveloping that so we changed it to a double dogbone
2 3 4 5 6	S. Becker labs. And there, I was designing all variety of components, intake systems, engine mounts, some structural components like bumpers and B pillars, half shafts, validating transmission designs from both New Process Gear as well as	1 2 3 4 5 6	S. Becker mounts on the sides and two lower mounts, one in the front and a bobble mount in the rear. I was tasked with redesigning and redeveloping that so we changed it to a double dogbone design on the one side and a hydrobushing on
2 3 4 5 6 7	S. Becker labs. And there, I was designing all variety of components, intake systems, engine mounts, some structural components like bumpers and B pillars, half shafts, validating transmission designs from both New Process Gear as well as competitors and Chrysler's internal automatic	1 2 3 4 5 6 7	S. Becker mounts on the sides and two lower mounts, one in the front and a bobble mount in the rear. I was tasked with redesigning and redeveloping that so we changed it to a double dogbone design on the one side and a hydrobushing on the other side. Coming up with a packaging,
2 3 4 5 6 7 8	S. Becker labs. And there, I was designing all variety of components, intake systems, engine mounts, some structural components like bumpers and B pillars, half shafts, validating transmission designs from both New Process Gear as well as competitors and Chrysler's internal automatic transmission group, steering columns,	1 2 3 4 5 6 7 8	S. Becker mounts on the sides and two lower mounts, one in the front and a bobble mount in the rear. I was tasked with redesigning and redeveloping that so we changed it to a double dogbone design on the one side and a hydrobushing on the other side. Coming up with a packaging, the rate requirements, cutting steel and making prototypes in our lab to evaluate the concept,
2 3 4 5 6 7 8 9	S. Becker labs. And there, I was designing all variety of components, intake systems, engine mounts, some structural components like bumpers and B pillars, half shafts, validating transmission designs from both New Process Gear as well as competitors and Chrysler's internal automatic transmission group, steering columns, instrument panels, and some of the overall body in white structure.	1 2 3 4 5 6 7 8 9	S. Becker mounts on the sides and two lower mounts, one in the front and a bobble mount in the rear. I was tasked with redesigning and redeveloping that so we changed it to a double dogbone design on the one side and a hydrobushing on the other side. Coming up with a packaging, the rate requirements, cutting steel and making prototypes in our lab to evaluate the concept, then sending those to the part responsible
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10 (Pages 34 to 37)

	Page 30		Page 39
1	S. Becker	1	S. Becker
2	Q. And how would you describe your work	2	Q. Ground up?
3	with respect to driveline systems?	3	A. Correct.
4	A. It depends on the driveline. But,	4	Q. And that was for which company?
5	for example, like on the Dodge Viper, when I	5	A. New Process, New Venture Gear, Magna
6	was at Chrysler, there was a redesign of the	6	Powertrain.
7	driveline system. The driveline had a bending	7	Q. And can you describe the nature of
8	problem and we had to redesign and develop a	8	the design work that you did, that that you
9	solution for that issue.	9	were specifically involved in for that
10	When it's at New Process Gear, New	10	driveline system?
11	Venture Gear it's coming up with the core	11	A. Sure. Again, that would be taking
12	product as a team, you know, basically from	12	the customer specification in as to what they
13	concept to production.	13	wanted the vehicle to do, or it was working
14	Q. Okay. Are you complete with your	14	with our advance group to pitch a new type of
15	answer?	15	product to a customer.
16	Would that be in the context of where	16	Then they accept that product and we
17	there's a problem that's been identified? Is	17	start making the product through the
18	that	18	engineering development phase.
19	A. No, that would be	19	So on the new concepts, for example,
20	Q accurate or	20	let's start with like the the Jeep Grand
21	A for that would be for that	21	Cherokee four-wheel drive system. We pitched
22	would be for new products.	22	to Jeep that we could implement an electrically
23	Q. Okay. And so for new products,	23	actuated clutch torque distribution system that
24	you've you have designed a driveline system?	24	would offer them a selectability for driver
25	A. Correct.	25	conditions, snow, rain, water, you know, dry,
		-	i
	Page 40		Page 41
1	S. Becker	1	S. Becker
	S. Becker	1	S. Becker
1 2 3	S. Becker off-road. And on the team, we developed the		S. Becker site, and then there would be two dedicated, at
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2 3	S. Becker off-road. And on the team, we developed the specification. We created concept prototypes and	1 2 3	S. Becker site, and then there would be two dedicated, at least two dedicated people at the Chrysler site on a product like that.
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11 (Pages 38 to 41)

	Page 42		Page 43
1	S. Becker	1	S. Becker
2	agreement in front of me to to tell you.	2	declaration that you've put together for
3	Q. Okay. And who were you contacted by?	3	purposes of for for filing on behalf of
4	A. Steve Kahn.	4	JTEKT?
5	Q. Is that someone at Oblon?	5	A. Correct.
6	A. No, he's a I think he's like a	6	Q. And did you author that declaration?
7	,		A. Yes.
	third-party finds-experts type of person.	8	
8	Q. All right. Is that someone who has		Q. Did you author it independently?
9	contacted you in the past for expert work?	9	A. I discussed it with peer reviewers
10	A. No. He was a new client.	10	and with Oblon.
11	Q. Okay. And what did you understand	11	Q. And by "peer reviewers," who do you
12	the nature of your retention to be?	12	mean?
13	A. That there was a patent contention.	13	A. Persons in my company who are
14	They wanted a review of a couple of designs	14	mechanical engineers.
15	related to all-wheel drive systems.	15	Q. Okay.
16	Q. Okay. And how many roughly, how	16	A. One is Tom Lacek; another is Marcus
17	many hours have you spent as sort of in that	17	Mazza. We have a peer review process where we
18	capacity?	18	review all the documents we send out.
19	MS. MANDRUSIAK: Objection,	19	Q. So you would have sent the I guess
20	relevance.	20	a draft declaration to them to review?
21	A. I would have to have my billing in	21	A. Yeah. We had ongoing discussions.
22	front of me for like an exact number. I know	22	Q. And what were the nature of those
23	it's probably less than 40. Maybe around 40	23	discussions?
24	hours.	24	MS. MANDRUSIAK: Objection, form.
25	Q. Okay. There was is there a	25	To the to the extent it may involve
	Page 44		Page 45
1	S. Becker	1	Page 45 S. Becker
1 2			
	S. Becker	1	S. Becker
2	S. Becker any privileged information that Oblon	1 2	S. Becker know, the merits of each, what each section meant, and then how to address that. You know,
2 3	S. Becker any privileged information that Oblon shared with you, just caution you.	1 2 3	S. Becker know, the merits of each, what each section meant, and then how to address that. You know, it's overall peer review, language of the
2 3 4	S. Becker any privileged information that Oblon shared with you, just caution you. THE WITNESS: Sure. A. The discussions would have been about	1 2 3 4	S. Becker know, the merits of each, what each section meant, and then how to address that. You know, it's overall peer review, language of the report and
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2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 20 21	S. Becker any privileged information that Oblon shared with you, just caution you. THE WITNESS: Sure. A. The discussions would have been about the work, you know, from what did I want to put down, how do I want to lay it out, that type of thing. BY MS. SHAH: Q. Did you exchange drafts with them of of declarations? A. I only ended up with one copy on my computer but there were drafts prior to that, you know, written and then changed. Q. But with, I'm sorry, the two individuals, the two A. Oh, likely Q sort of peer reviewers. A. Likely, yeah. Q. And do you recall what the nature of the changes were that were made? Were	$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\2\\13\\14\\15\\16\\17\\18\\9\\20\\21\end{array} $	S. Becker know, the merits of each, what each section meant, and then how to address that. You know, it's overall peer review, language of the report and Q. Okay. Are any of were any of the peer reviewers attorneys? A. No. Q. And what what's their background, the the background of these there's two, right, people that you mentioned as peer reviewers? A. Correct. Q. What are their backgrounds? A. Mark Ismasa is a mechanical engineer that used to work at Aberdeen and Chrysler doing vehicle engineering work. Tom Lacek's a mechanical engineer, PE. He used to do gosh, I don't know what he used to do exactly. He's been with Robson for a long time.
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$\begin{array}{c} 2\\ 3\\ 4\\ 5\\ 6\\ 7\\ 8\\ 9\\ 10\\ 11\\ 13\\ 14\\ 15\\ 16\\ 18\\ 9\\ 21\\ 22\\ 23\end{array}$	S. Becker any privileged information that Oblon shared with you, just caution you. THE WITNESS: Sure. A. The discussions would have been about the work, you know, from what did I want to put down, how do I want to lay it out, that type of thing. BY MS. SHAH: Q. Did you exchange drafts with them of of declarations? A. I only ended up with one copy on my computer but there were drafts prior to that, you know, written and then changed. Q. But with, I'm sorry, the two individuals, the two A. Oh, likely Q sort of peer reviewers. A. Likely, yeah. Q. And do you recall what the nature of the changes were that were made? Were A. No. Q. What kind of input did you get from	$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\2\\13\\14\\15\\16\\17\\18\\9\\20\\21\end{array} $	 S. Becker know, the merits of each, what each section meant, and then how to address that. You know, it's overall peer review, language of the report and Q. Okay. Are any of were any of the peer reviewers attorneys? A. No. Q. And what what's their background, the the background of these there's two, right, people that you mentioned as peer reviewers? A. Correct. Q. What are their backgrounds? A. Mark Ismasa is a mechanical engineer that used to work at Aberdeen and Chrysler doing vehicle engineering work. Tom Lacek's a mechanical engineer, PE. He used to do gosh, I don't know what he used to do exactly. He's been with Robson for a long time. Q. Do you have any patents that you've filed?
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 9 20 21 22	S. Becker any privileged information that Oblon shared with you, just caution you. THE WITNESS: Sure. A. The discussions would have been about the work, you know, from what did I want to put down, how do I want to lay it out, that type of thing. BY MS. SHAH: Q. Did you exchange drafts with them of of declarations? A. I only ended up with one copy on my computer but there were drafts prior to that, you know, written and then changed. Q. But with, I'm sorry, the two individuals, the two A. Oh, likely Q sort of peer reviewers. A. Likely, yeah. Q. And do you recall what the nature of the changes were that were made? Were A. No.	$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\23\\14\\15\\16\\17\\18\\9\\20\\21\\22\\23\end{array} $	S. Becker know, the merits of each, what each section meant, and then how to address that. You know, it's overall peer review, language of the report and Q. Okay. Are any of were any of the peer reviewers attorneys? A. No. Q. And what what's their background, the the background of these there's two, right, people that you mentioned as peer reviewers? A. Correct. Q. What are their backgrounds? A. Mark Ismasa is a mechanical engineer that used to work at Aberdeen and Chrysler doing vehicle engineering work. Tom Lacek's a mechanical engineer, PE. He used to do gosh, I don't know what he used to do exactly. He's been with Robson for a long time. Q. Do you have any patents that you've

12 (Pages 42 to 45)

	Page 46	5	Page 47
1	S. Becker	1	S. Becker
2	that they filed?	2	
3	A. I'm not aware of any.	3	
4	Q. Do you know if any of the, I guess,	4	
5	the subject matter that's in the declaration	5	•
6	that was filed is content that came from the	6	BY MS. SHAH:
7	peer reviewers?	7	Q. Okay.
8	A. I don't know what you mean by that.	8	A it didn't make it into the
9	Q. So in the you you had	9	declaration, as I recall.
10	discussions with your sort of peers	10	Q. So what were the do you recall
11	A. Correct.	11	what were the kinds of, I guess, comments that
12	Q about the the subject matter of	12	he had about the declaration that you then shot
13	the declarations	13	
14	A. Yes.	14	A. Well, the other day we were
15	Q is that correct?	15	discussing, whatchamacallit, hub disconnects,
16	And there was presumably some sort of	16	and we never put that in the declaration.
17	give-and-take, some some ideas and	17	Q. Okay. Anything else that you
18	information that came from the other peer	18	remember about those discussions?
19	reviewers related to this to this	19	A. No, that
20	declaration; is that correct?	20	MS. MANDRUSIAK: Objection, form.
21	A. Generally, yes.	21	A. That was the main thing that I
22	Q. Would any of that have made it into	22	recall.
23	the final declaration, any of their input?	23	BY MS. SHAH:
24	A. Actually	24	Q. Okay. Do you know about how many
25	MS. MANDRUSIAK: Objection to form.	25	drafts that you created for the declaration?
	Page 48	3	Page 49
1	S. Becker	1	S. Becker
2	MS. MANDRUSIAK: Objection,	2	context? For what purpose?
3	relevance.	3	A. For review and compare to what I was
4	A. No.	4	going to create for the declaration.
5	BY MS. SHAH:	5	Q. Okay. The references that were
б	Q. Were there several?	6	relied on in the declaration, for example, the
7	MS. MANDRUSIAK: Objection,	7	Teraoka reference or the Watanabe reference,
8	relevance.	8	were those references that you searched for and
9	A. All's I have is the one copy left, so	9	obtained?
10	it was always an overwrite.	10	A. No. Those were provided by Oblon.
11	BY MS. SHAH:	11	Q. So when you were first retained, were
12	Q. So for purposes of the declaration,	12	you given a set of references?
13	the references that you looked at, where did	13	A. I don't recall the timing.
14	you receive those references from?	14	
15	A. The patents?	15	for purposes of the declaration; right?
16	Q. Yes.	16	MS. MANDRUSIAK: Objection, asked
17	A. From Oblon.	17	and answered.
18	Q. Did you was there did you	18	A. Well, no. As as I mentioned, I
n 0		19	reviewed other ones that I looked up.
19	were you involved in any prior art searching?		-
20	A. Yes.	20	Q. Okay.
20 21	A. Yes.Q. Can you describe for me that process?	20 21	Q. Okay.A. For the ones that made it into the
20 21 22	A. Yes.Q. Can you describe for me that process?A. Sure. I looked at the patents we had	20 21 22	Q. Okay.A. For the ones that made it into the final declaration was Teraoka, Watanabe, and
20 21 22 23	A. Yes.Q. Can you describe for me that process?A. Sure. I looked at the patents we hadfrom New Venture Gear, Porter and Sharma and	20 21 22 23	Q. Okay. A. For the ones that made it into the final declaration was Teraoka, Watanabe, and Burrows, which were provided.
20 21 22	A. Yes.Q. Can you describe for me that process?A. Sure. I looked at the patents we had	20 21 22	 Q. Okay. A. For the ones that made it into the final declaration was Teraoka, Watanabe, and Burrows, which were provided. Q. Okay. Have you read the petition

13 (Pages 46 to 49)

15 deposition? 15 industry would be familiar that a clutch causes 16 A. A little bit of the patent 16 familiar with that concept. 17 prosecution history. 17 familiar with that concept. 18 Q. Okay. Going back to the you 18 Q. And what's your understanding of a 19 mentioned you looked at some other patents that 19 person of ordinary skill in the art? What does 20 didn't that didn't make it into the 20 that term mean to you? 21 declaration. 21 A. It means somebody in my industry 22 Is there were there any references 24 that you independently looked at that did make 25 23 of my engineers, or one of my managers could be a person of ordinary skill from my previous 3 A. It's sort of an ipse dixit. Being 4 work. 5 Q. Okay. So there's no - is there a specific educational level that's required? 7 satisfy that term, "person of ordinary skill in 7 MS. MANDRUSIAK: Objection, form. 8 the art," with reference to this particular 9 experience. I've had associate's degreed 9 let's say the '440 pate		Tage 50		Tage 51
3 You're referring. 3 A. Not that I recall. 4 Q. Okay. Well, what can you tell me, 6 Q. Okay. Well, what can you tell me, 6 your deposition today? 6 A. Specifically in prep for the dep 8 today was the declaration, your response, the 8 A. In relation to this case, obviousness? 9 various patent - the the three patent 9 was related to what a person of ordinary skill 10 four patents, your '440 patent, the Teraoka, 10 in the art who's in the industry is familiar 11 Burrows, Watanabe, and oh, and the judge's 11 with."? 12 O. Okay. Was there anything else that 3 with."? 13 Q. Okay. Going back to the you 16 familiar with a clutch causes 14 prosecution history. 17 familiar with the components and the 15 declaration. 20 Okay. Going back to the you 18 16 declaration. 12 A. In the anso somebody in my industry 17 Is there anything that you looked at 14 A. It means somebody in my industry 16 background or experince that's required to <td>1</td> <td>S. Becker</td> <td>1</td> <td>S. Becker</td>	1	S. Becker	1	S. Becker
4 Q. Okay, Well, what – can you tell me, 4 Q. Okay, What's your understanding 5 what materials did you read in preparing for 5 of – of obviousness? 7 A. Specifically in prep for the dep 7 Q. Yes. 8 A. In relation to this case, obviousness 9 various patent – the – the three patent –. 9 was related to what a person of ordinary skill 10 four patents, your '440 patent, the Teraoka, 10 in the art who's in the industry is familiar 11 wirtows, Watanabe, and – oh, and the judge's 12 Q. And what do you mean by "familiar 12 response. 12 Q. And what do you mean by "familiar 13 Q. Okay. Was there anything else that 19 industry would be familiar that a clutch causes 15 deposition'. 17 familiar with that concept. 10 14 you reviewed in preparation for today's 14 A. In the ans somehody in my industry should be familiar with that concept. 10 15 deposition'. 10 A. In the ans somehody in my industry 10 16 declaration. 21 A. It means somehody in my industry 17 Ish	2	A. I'm not certain exactly to what	2	it into the declaration?
5what materials did you read in preparing for your deposition today?5of - of obviousness?7A. Specifically in prep for the dep today was the declaration, your response, the twarous patent - the - the three patent - to four patents, your '440 patent, the Teraoka, series ponse.7Q. Yes.10Four patents, your '440 patent, the Teraoka, urewed in preparation for today's you reviewed in preparation for today's to the position?A. In relation to this case, obviousness was helded to what a person of ordinary skill with."12Q. Okay. Was there anything else that you reviewed in preparation for today's to the position?A. In other words, someone in my industry would be familiar with that concept.13Q. Okay. Going back to theyou mentioned you looked at some other patents that declaration.1014S. Becker20A. In means someoby in my industry who's familiar with the components and the design process for making automotive patrs related to drivel in systems.15S. Becker1S. Becker2of my engineers, or one of my managers could be background or experience that's required to statisty that term. "person of ordinary skill in the art," with references that sequired to statisty that term. "person of ordinary skill in the tart," with reference to this particular that skill level. Ive had you's obvice familiar with the components and the industry. G. J. S. Becker120. Is there a certain amount of statisty that term, "person of ordinary skill in the tart," with reference to this particular that skill level. Ive had you's obvice an you know, kew what the yeve ed of college who had al	3	you're referring.	3	A. Not that I recall.
6 your deposition today? 6 A. Obviousness? 7 A. Specifically in prep for the dep 7 Q. Yes. 8 today was the declaration, your response, the 9 Various patent - the - the three patent - 9 various patent - the - the three patent - 9 Was the declaration, your response, the 11 Burrows, Watanabe, and - oh, and the judge's 11 in the art who's in the industry is familiar 12 response. 12 Q. Aday. Was there anything else that 12 13 Q. Okay. Was there anything else that 13 with. 14 14 your reviewed in preparation for today's 14 with. 15 14 your reviewed in preparation for today's 14 with. 16 15 deposition? 17 16 And What's your understanding of a 16 A. A little bit of the patent 16 familiar with that concept. 17 g. Okay. Going back to theyou 18 A. It means somebody in my industry 14 you reviewed in that didn't make it into the 22 A. It means somebody in my industry 12 that you independently loo	4	Q. Okay. Well, what can you tell me,	4	Q. Okay. What's your understanding
7 A. Špecifically in prep for the dep 8 today was the declaration, your response, the 9 today was the declaration, your response, the 10 four patents, your '440 patent, the Teraoka, 11 Burrows, Watanabe, and - oh, and the judge's 12 response. 13 Q. Okay. Was there anything else that 14 you reviewed in preparation for today's 15 deposition? 16 A. A little bit of the patent 17 Q. Okay. Was there anything else that 18 Q. Okay. Going back to the - you 19 persocution history. 10 mentioned you looked at some other patents that 10 declaration. 11 bere anything that you looked at 12 other than - I guess let me strike that. 13 s becker 14 S. Becker 15 industry. 16 S. Becker 17 S. Becker 18 g. Is there a certain amount of 15 background or experience that's required to 16 background or experience to this particular	5	what materials did you read in preparing for	5	of of obviousness?
8 today was the declaration, your response, the 8 A. In relation to this case, obviousness 9 various patent the the three patent 9 was related to what a person of ordinary skill 11 Burrows, Watanabe, andoh, and the judge's 11 in the art who's in the industry is familiar 12 Q. Okay, Was there anything else that 12 Q. And what do you mean by "familiar 13 Q. Okay, Was there anything else that 13 with." 14 you reviewed in preparation for today's 14 A. In other words, someone in my 15 deposition? 16 A. A little bit of the patent 16 16 A. A little bit of the patent 16 familiar with that concept. 17 18 Q. Okay. Going back to the you 18 Q. And what's your understanding of a 19 19 mentioned you looked at some other patents that 19 person of ordinary skill in the art? What does 11 declaration. 21 declaration. 22 who's familiar with the components and the industry 20 that rou undependently looked at that dia make 25 I could assign, you know, either one 23 tha	6	your deposition today?	6	A. Obviousness?
9 various patent the the three patent 9 was related to what a person of ordinary skill 10 four patents, your '440 patent, the Teraoka, 10 in the art who's in the industry is familiar 12 response. 12 in the art who's in the industry is familiar 12 response. 12 Q. And what do you mean by "familiar 14 you reviewed in preparation for today's 14 A. In other words, someone in my 15 deposition? 15 industry would be familiar that a clutch causes 15 deposition? 16 drag. Anybody who's in my industry shull be 16 response. 7 Familiar with that concept. 17 prosecution history. 7 8 Q. And what's your understanding of a 18 Q. Okay. Going back to the you 18 9 erson of ordinary skill in the art? What does 10 declaration. 21 A. It means somebody in my industry who's familiar with the components and the 12 Is there anything that you looked at 22 Ha term mean to you? A. It means somebody in my industry. 14 Is there anything that you looked at that did make 25	7	A. Specifically in prep for the dep	7	Q. Yes.
9 various patent the the three patent 9 was related to what a person of ordinary skill 10 four patents, your '440 patent, the Teraoka, 10 in the art who's in the industry is familiar 12 response. 12 in the art who's in the industry is familiar 12 response. 12 Q. And what do you mean by "familiar 14 you reviewed in preparation for today's 14 A. In other words, someone in my 15 deposition? 15 industry would be familiar that a clutch causes 15 deposition? 16 drag. Anybody who's in my industry shull be 16 response. 7 Familiar with that concept. 17 prosecution history. 7 8 Q. And what's your understanding of a 18 Q. Okay. Going back to the you 18 9 erson of ordinary skill in the art? What does 10 declaration. 21 A. It means somebody in my industry who's familiar with the components and the 12 Is there anything that you looked at 22 Ha term mean to you? A. It means somebody in my industry. 14 Is there anything that you looked at that did make 25	8	today was the declaration, your response, the	8	A. In relation to this case, obviousness
11 Burrows, Watanabe, and oh, and the judge's 11 with. 12 response. 12 With. 13 Q. Okay. Was there anything else that 13 with.? 14 you reviewed in preparation for today's 14 A. I other words, someone in my 15 deposition? 15 industry would be familiar with that concept. 16 A. A little bit of the patent 16 drag. Anybody who's in my industry should be 16 prosecution history. 17 R. And what's your understanding of a 17 prosecution history. 17 Q. And what's your understanding of a 16 declaration. 20 4. It means somebody in my industry 17 Is there anything that you looked at 22 who's familiar with the components and the 18 there anything that you looked at 24 A. It means somebody in my industry 18 there any references 22 Page 52 14 S. Becker 1 Could assign, you know, either one 15 S. Becker 1 S. Becker 1 2 Is there a certain amount of 5 5 </td <td>9</td> <td>various patent the the three patent</td> <td>9</td> <td>was related to what a person of ordinary skill</td>	9	various patent the the three patent	9	was related to what a person of ordinary skill
12 response. 12 Q. And what do you mean by "familiar 13 Q. Okay. Was there anything else that 13 with"? 14 A. In other words, someone in my industry would be familiar that a clutch causes 15 deposition? 15 16 A. A little bit of the patent 16 17 familiar with that concept. 17 18 Q. Okay. Going back to the you 18 19 mentioned you looked at some other patents that 19 10 declaration. 20 A. It means somebody in my industry 21 declaration. 21 A. It means somebody in my industry 21 sthere anything that you looked at 22 who's familiar with the components and the 22 Is there anything that you looked at 23 related to driveline systems. 23 that you independently looked at that did make 25 I could assign, you know, either one 24 S. Becker 1 S. Becker 2 2 0 Is design process for maising automotive parts 16 3 a person of ordinary skill in may previous 4 A. It	10	four patents, your '440 patent, the Teraoka,	10	in the art who's in the industry is familiar
13 Q. Okay. Was there anything else that 13 with"? 14 you reviewed in preparation for today's 14 A. In other words, someone in my 14 you reviewed in preparation for today's 14 A. In other words, someone in my 15 industry would be familiar that a clutch causes 16 A. A little bit of the patent 16 17 prosecution history. 17 18 Q. And what's your understanding of a 19 mentioned you looked at some other patents that 19 10 declaration. 20 11 there anything that you looked at 22 12 Is there anyte there any references 24 14 you independently looked at that did make 25 14 S. Becker 2 15 industry would be familiar with the components and the 16 background or experience that's required to 16 background or experience that's required to 16 background or experience to this particular 16 background or experience to this particular 16 background or experience to this particular	11	Burrows, Watanabe, and oh, and the judge's	11	with.
4 you reviewed in preparation for today's 14 A. In other words, someone in my 15 deposition? 15 15 deposition? 15 16 A. little bit of the patent 16 17 prosecution history. 17 18 Q. Okay. Going back to the you 18 19 mentioned you looked at some other patents that 19 20 didn't that didn't make it into the 20 21 declaration. 21 22 Is there anything that you looked at 23 23 other thanI guess let me strike that. 23 24 Is there were there any references 24 24 Is there - were there any references 24 24 S. Becker 1 25 I could assign, you know, either one 26 Page 52 Page 53 3 a person of ordinary skill from my previous 4 4 work. Q. Okay. So there's no is there a 5 Q. Is there a certain amount of 5 6 background or experience that's required to	12	response.	12	Q. And what do you mean by "familiar
15 deposition? 15 industry would be familiar that a clutch causes 16 A. A little bit of the patent 16 A. A little bit of the patent 17 16 A. A little bit of the patent 17 familiar with that concept. 18 Q. Okay. Going back to the you 18 Gamiliar with that concept. 19 mentioned you looked at some other patents that 19 person of ordinary skill in the art? What does 21 declaration. 21 A. It means somebody in my industry 22 Is there any thing that you looked at 22 who's familiar with the components and the 23 other thanI guess let me strike that. 23 design process for making automotive parts 24 Is there - were there any references 24 related to driveline systems. 15 24 of my engineers, or one of my managers could be 3 a person of ordinary skill from my previous 4 4 work. 9 Loont think a specific date defines 2 0. Okay. So there's no - is there a 3 a person of ordinary skill in 4 A. It's sort of an ipse dixit. Being 4 4 that industry would be desig	13	Q. Okay. Was there anything else that	13	with"?
16 A. A little bit of the patent 16 drag. Anybody who's in my industry should be 17 prosecution history. 17 familiar with that concept. Q. And what's your understanding of a 19 mentioned you looked at some other patents that 19 person of ordinary skill in the art? What does 20 didn't that didn't make it into the 20 A. It means somebody in my industry 21 Is there anything that you looked at 22 who's familiar with the components and the 23 other than I guess let me strike that. 23 related to driveline systems. 24 Is there were there any references 24 I could assign, you know, either one 24 S. Becker 1 S. Becker 1 2 0. Nat you independently looked at that did make 25 Page 53 3 a person of ordinary skill from my previous 3 A. It's sort of an ipse dixit. Being 4 familiar with the components and the industry. 9 0. MS. MANDRUSIAK: Objection, form. 5 Q. Is there a certain amount of 6 5 S. Mondrust: Objection, form. 6 background or experience tha''s required to 7 <td< td=""><td>14</td><td>you reviewed in preparation for today's</td><td>14</td><td>A. In other words, someone in my</td></td<>	14	you reviewed in preparation for today's	14	A. In other words, someone in my
17 prosecution history. 17 familiar with that concept. 18 Q. Okay. Going back to the you 18 Q. And what's your understanding of a 19 mentioned you looked at some other patents that 19 person of ordinary skill in the art? What does 20 didn't that didn't make it into the 20 A. It means somehody in my industry 21 declaration. 21 A. It means somehody in my industry 22 Is there anything that you looked at 22 who's familiar with the components and the 23 other than I guess let me strike that. 23 related to driveline systems. 24 Is there were there any references 24 related to driveline systems. 25 24 of my engineers, or one of my managers could be a person of ordinary skill from my previous 4 A. It's sort of an ipse dixit. Being 4 work. 5 Q. Okay. So there's no is there a 9 specific ducational level that's required? 7 satisfy that term, "person of ordinary skill in 7 MS. MANDRUSIAK: Objection, form. 4 8 the art," with reference to this particular 9 specoific ducatioal level that's required?	15	deposition?	15	industry would be familiar that a clutch causes
18 Q. Okay. Going back to the you 18 Q. And what's your understanding of a 19 mentioned you looked at some other patents that 19 person of ordinary skill in the art? What does 20 didn't that didn't make it into the 20 that term mean to you? 21 declaration. 21 A. It means somebody in my industry 22 Is there anything that you looked at 23 design process for making automotive parts 23 other than I guess let me strike that. 23 that term mean to you? 24 Is there were there any references 24 that you independently looked at that did make 25 I could assign, you know, either one 25 To subso of ordinary skill from my previous 3 a person of ordinary skill from my previous 3 A. It's sort of an ipse dixit. Being 4 work. 5 Q. Shere a certain amount of 5 Q. Okay. So there's no is there a 5 background or experience that's required to 5 MS. MANDRUSIAK: Objection, form. A. No, you could overcome that with 6 background or experific date defines 11 A. I don't think a specific date defines 12 miliarity with the components and with how	16	A. A little bit of the patent	16	drag. Anybody who's in my industry should be
19mentioned you looked at some other patents that 20 didn't that didn't make it into the 20 declaration.19person of ordinary skill in the art? What does that term mean to you?21declaration.21A. It means somebody in my industry 2021action.21A. It means somebody in my industry 2122Is there anything that you looked at 232324Is there were there any references 242425that you independently looked at that did make 252526Fage 5227Page 5328a person of ordinary skill from my previous 434work.215Q. Is there a certain amount of 556background or experience that's required to 537satisfy that term, "person of ordinary skill in 848A. Idon't think a specific date defines 1179MS. MANDRUSIAK: Objection, form.1010MS. MANDRUSIAK: Objection, form.1111A. I don't think a specific date defines 121112that skill level. I've had guys who come out 141213orollege who had already designed vehicles 141414components sol Can't define it by an 151815DY MS. SHAH:1016Tye had people work form ewho had 1617Ph.Ds that really did not know vehicle 161718components and you're familiar with the 2019	17	prosecution history.	17	familiar with that concept.
20 didn't that didn't make it into the 20 that term mean to you? 21 declaration. 21 A. It means somebody in my industry 21 is there anything that you looked at 22 who's familiar with the components and the 23 other than I guess let me strike that. 23 who's familiar with the components and the 24 Is there anything that you looked at that did make 25 related to driveline systems. 24 Is there were there any references 24 I could assign, you know, either one 25 mage 52 Page 53 26 related to driveline systems. 1 27 of my engineers, or one of my managers could be 3 A. It's sort of an ipse dixit. Being 3 a person of ordinary skill from my previous 3 A. It's sort of an ipse dixit. Being 4 work. 5 Q. Okay. So there's no is there a 5 g. Is there a certain amount of 5 Q. Okay. So there's no is there a 6 background or experience that's required to 6 specific educational level that's required? 7 satisfy that term, "person of ordinary skill in 7 MS. MANDRUSI	18		18	Q. And what's your understanding of a
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	23	skill in art.	23	
25 familiar with the components and familiar with 25 BY MS. SHAH:	24	Q. And what does it take to become	24	familiar with the art.

14 (Pages 50 to 53)

1	iuge 51		
_	S. Becker	1	S. Becker
2	Q. So is it accurate to say then that	2	independently.
3	there's no specific educational requirement	3	BY MS. SHAH:
4	necessarily or years of driveline experience to	4	Q. Okay. So taking it out of the
5	satisfy the requirement of a person of ordinary	5	context of, I guess, designers you would have
6	skill in the art?	6	worked with, looking at it in the context of
7	MS. MANDRUSIAK: Objection, form.	7	the '440 patent, are there any qualifications
8	A. No, I'm saying I can't define that	8	that are required to meet the definition of a
9	specifically. I can't put a number to it	9	person of ordinary skill in the art?
10	because it depends on the individual.	10	MS. MANDRUSIAK: Objection, form.
11	But generally, you know, kind of the	11	A. I would recommend that they have
12	generality, people have a bachelor's degree in	12	experience in designing draft line systems or
13	engineering and are familiar with the	13	developing vehicle products. As a general rule
14	components. There are people who have	14	of thumb, again, a bachelor's degree in
15	associate's degrees who are familiar in the	15	engineering would be helpful. That gives you
16	art. There are people who have Ph.Ds who are	16	the background processes of developing and
17	familiar with the art, etc.	17	creating a product.
18	Q. Okay. So then is it accurate to say	18	BY MS. SHAH:
19	there is no specific minimal amount of either	19	Q. So it's sufficient that they would
20	educational background or experience that's	20	have had experience developing any vehicle
21	required to, in your mind, to be a designer of	21	product, that that experience would be
22	a driveline system?	22	sufficient to satisfy the standard for a person
23	MS. MANDRUSIAK: Objection, form.	23	of ordinary skill in the art?
24	A. Again, I'm saying I can't define	24	A. Any vehicle with a driveline product,
25	that. I would evaluate candidates	25	yeah. Obviously, the guy who designs the lug
	Page 56		Page 57
1	S. Becker	1	S. Becker
2	nut and just the lug nut wouldn't have	2	say, a test machine. There, the test machine's
3	potentially knowledge in driveline systems.	3	going to need to engage a component and have a
4	Q. What kind of knowledge do you think	4	driveline system.
		5	•
5	is sold of a prerequisite to be able to design	1 2	I'll take my design guys from AT&T
5 6	is sort of a prerequisite to be able to design a driveline system?	6	I'll take my design guys from AT&T test. They made some of my test machines.
6 7	a driveline system?		I'll take my design guys from AT&T test. They made some of my test machines. They had to be familiar with making a
6	· · · ·	6	test. They made some of my test machines.
6 7	a driveline system?A. Sure. If we're talking about creating them from scratch, then it's a	6 7	test. They made some of my test machines. They had to be familiar with making a low-vibration driveline that had driveline
6 7 8	a driveline system? A. Sure. If we're talking about	6 7 8	test. They made some of my test machines. They had to be familiar with making a
6 7 8 9	a driveline system?A. Sure. If we're talking about creating them from scratch, then it's a familiarity with the components that go into a	6 7 8 9	test. They made some of my test machines. They had to be familiar with making a low-vibration driveline that had driveline connections, gear boxes that made minimal
6 7 9 10 11 12	a driveline system?A. Sure. If we're talking about creating them from scratch, then it's a familiarity with the components that go into a driveline, driveline features, their fit and	6 7 8 9 10	test. They made some of my test machines. They had to be familiar with making a low-vibration driveline that had driveline connections, gear boxes that made minimal influence on the test product. Another example is my dune buggy work. There, you've got to be familiar with
6 7 8 9 10 11	 a driveline system? A. Sure. If we're talking about creating them from scratch, then it's a familiarity with the components that go into a driveline, driveline features, their fit and function, some of their failings and problems, 	6 7 8 9 10 11	test. They made some of my test machines. They had to be familiar with making a low-vibration driveline that had driveline connections, gear boxes that made minimal influence on the test product. Another example is my dune buggy
6 7 9 10 11 12 13 14	a driveline system? A. Sure. If we're talking about creating them from scratch, then it's a familiarity with the components that go into a driveline, driveline features, their fit and function, some of their failings and problems, different types of configurations and applications to driveline systems. Drivelines aren't just used in cars;	6 7 8 9 10 11 12 13 14	test. They made some of my test machines. They had to be familiar with making a low-vibration driveline that had driveline connections, gear boxes that made minimal influence on the test product. Another example is my dune buggy work. There, you've got to be familiar with the driveline system's life and strength, the adaptation to transmission and to delivering
6 7 8 9 10 11 12 13 14 15	a driveline system? A. Sure. If we're talking about creating them from scratch, then it's a familiarity with the components that go into a driveline, driveline features, their fit and function, some of their failings and problems, different types of configurations and applications to driveline systems. Drivelines aren't just used in cars; they're used in other types of vehicles and in	6 7 8 9 10 11 12 13 14 15	test. They made some of my test machines. They had to be familiar with making a low-vibration driveline that had driveline connections, gear boxes that made minimal influence on the test product. Another example is my dune buggy work. There, you've got to be familiar with the driveline system's life and strength, the adaptation to transmission and to delivering the powers to the wheels, so sizing of the
6 7 8 9 10 11 12 13 14 15 16	a driveline system? A. Sure. If we're talking about creating them from scratch, then it's a familiarity with the components that go into a driveline, driveline features, their fit and function, some of their failings and problems, different types of configurations and applications to driveline systems. Drivelines aren't just used in cars; they're used in other types of vehicles and in machines and quite a variety of components.	6 7 8 9 10 11 12 13 14 15 16	test. They made some of my test machines. They had to be familiar with making a low-vibration driveline that had driveline connections, gear boxes that made minimal influence on the test product. Another example is my dune buggy work. There, you've got to be familiar with the driveline system's life and strength, the adaptation to transmission and to delivering the powers to the wheels, so sizing of the axle, laying out of the components.
6 7 8 9 10 11 12 13 14 15 16 17	a driveline system? A. Sure. If we're talking about creating them from scratch, then it's a familiarity with the components that go into a driveline, driveline features, their fit and function, some of their failings and problems, different types of configurations and applications to driveline systems. Drivelines aren't just used in cars; they're used in other types of vehicles and in machines and quite a variety of components. Q. Okay. So let's sort of take this	6 7 8 9 10 11 12 13 14 15 16 17	test. They made some of my test machines. They had to be familiar with making a low-vibration driveline that had driveline connections, gear boxes that made minimal influence on the test product. Another example is my dune buggy work. There, you've got to be familiar with the driveline system's life and strength, the adaptation to transmission and to delivering the powers to the wheels, so sizing of the axle, laying out of the components. Then you've got more advanced
6 7 8 9 10 11 13 14 15 16 17 18	a driveline system? A. Sure. If we're talking about creating them from scratch, then it's a familiarity with the components that go into a driveline, driveline features, their fit and function, some of their failings and problems, different types of configurations and applications to driveline systems. Drivelines aren't just used in cars; they're used in other types of vehicles and in machines and quite a variety of components. Q. Okay. So let's sort of take this individually. You mentioned that a designer of	6 7 8 9 10 11 12 13 14 15 16 17 18	test. They made some of my test machines. They had to be familiar with making a low-vibration driveline that had driveline connections, gear boxes that made minimal influence on the test product. Another example is my dune buggy work. There, you've got to be familiar with the driveline system's life and strength, the adaptation to transmission and to delivering the powers to the wheels, so sizing of the axle, laying out of the components. Then you've got more advanced features that may be related to a driveline.
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6 7 8 9 10 11 13 14 15 16 17 18 20 21 22 23	 a driveline system? A. Sure. If we're talking about creating them from scratch, then it's a familiarity with the components that go into a driveline, driveline features, their fit and function, some of their failings and problems, different types of configurations and applications to driveline systems. Drivelines aren't just used in cars; they're used in other types of vehicles and in machines and quite a variety of components. Q. Okay. So let's sort of take this individually. You mentioned that a designer of a driveline system should have familiarity with driveline features. Can you identify for me the sort of the list of features that you're referencing? 	6 7 8 9 10 11 12 13 14 15 16 17 19 20 21 22 23	test. They made some of my test machines. They had to be familiar with making a low-vibration driveline that had driveline connections, gear boxes that made minimal influence on the test product. Another example is my dune buggy work. There, you've got to be familiar with the driveline system's life and strength, the adaptation to transmission and to delivering the powers to the wheels, so sizing of the axle, laying out of the components. Then you've got more advanced features that may be related to a driveline. Depending on the driveline, you have your driveline control systems, so we have electrical engineers that work on driveline systems. They develop the actuators, motors, control schema, software available for the
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15 (Pages 54 to 57)

1	S. Becker	1	S. Becker
2	of the driveline. You've got your	2	parameters. These things need to be validated
3	transmissions, your clutches, dual clutches,	3	and verified and generally are tweaked by
4	synchronizers, dog clutches, clutch packs,	4	vehicle development and vehicle synthesis
5	chain drives, belt drives, geared systems both	5	groups.
6	planetary, spur, helical, bevel, hypoid. All	6	When you get up to the OEM level on
7	these play various factors.	7	any individual car or truck, you're probably
8	Then you get into packaging of each	8	talking I'd say about 150 people that work on
9	one of those components as well depending on	9	the driveline system just for any, you know,
10	where you are in the driveline development	10	one model of vehicle.
11	system.	11	Q. And so in your experience, how long
12	Q. Okay. So if you were a driveline	12	does that sort of if there's a ground-up
13	designer, as you were discussing before, that	13	design that's being worked on for a driveline
14	you needed certain familiarity with these	14	system, how long would that take?
15	features, what's the extent of the	15	A. The whole process?
16	understanding that you would need to have with	16	Q. Yes.
17	respect to, let's say, the control side of it?	17	A. To what point?
18	A. Sure. On the control side, they'd	18	Q. I guess to where it's ready to go
19	have to have a background in electronics,	19	into a vehicle, completing testing and
20	capability for simulation because a lot of the	20	validation.
21	control sides were on simulation as far as	21	A. Sure. Our current design cycles are
22	conventional vehicle development goes.	22	usually in the two-year range.
23	Verification and validation, because	23	Q. Okay. And that again would entail
23 24	a lot of the function of the control schema	24 24	
24 25		24 25	this group of 100-plus people that you were
2.5	doesn't fit only within the simulation	2.5	referring to?
	Page 60		Page 61
1	Page 60 S. Becker	1	Page 61 S. Becker
	S. Becker	1	S. Becker
1 2 3	S. Becker A. Yeah, that's just on the OEM side.	1	
2	S. Becker A. Yeah, that's just on the OEM side. That's not talking about suppliers.	2	S. Becker going to do the the knuckle joint hubs and attachment to the wheels.
2 3 4	S. Becker A. Yeah, that's just on the OEM side. That's not talking about suppliers. Q. And how many and again, that	2 3	S. Becker going to do the the knuckle joint hubs and attachment to the wheels. And that defines your your full
2 3 4 5	S. Becker A. Yeah, that's just on the OEM side. That's not talking about suppliers. Q. And how many and again, that that includes can you list for me sort of	2 3 4	S. Becker going to do the the knuckle joint hubs and attachment to the wheels. And that defines your your full driveline system, which is basically everything
2 3 4 5 6	S. Becker A. Yeah, that's just on the OEM side. That's not talking about suppliers. Q. And how many and again, that that includes can you list for me sort of all the different departments that are involved	2 3 4 5	S. Becker going to do the the knuckle joint hubs and attachment to the wheels. And that defines your your full driveline system, which is basically everything downstream of the engine. That's going to
2 3 4 5	S. Becker A. Yeah, that's just on the OEM side. That's not talking about suppliers. Q. And how many and again, that that includes can you list for me sort of all the different departments that are involved in kind of working together to ultimately	2 3 4 5 6	S. Becker going to do the the knuckle joint hubs and attachment to the wheels. And that defines your your full driveline system, which is basically everything downstream of the engine. That's going to start the design process.
2 3 4 5 6 7 8	S. Becker A. Yeah, that's just on the OEM side. That's not talking about suppliers. Q. And how many and again, that that includes can you list for me sort of all the different departments that are involved in kind of working together to ultimately design the driveline system from sort of, you	2 3 4 5 6 7	S. Becker going to do the the knuckle joint hubs and attachment to the wheels. And that defines your your full driveline system, which is basically everything downstream of the engine. That's going to start the design process. They're going to interact with
2 3 4 5 6 7 8 9	S. Becker A. Yeah, that's just on the OEM side. That's not talking about suppliers. Q. And how many and again, that that includes can you list for me sort of all the different departments that are involved in kind of working together to ultimately design the driveline system from sort of, you know, from absolutely from scratch all the	2 3 4 5 6 7 8	S. Becker going to do the the knuckle joint hubs and attachment to the wheels. And that defines your your full driveline system, which is basically everything downstream of the engine. That's going to start the design process. They're going to interact with suppliers as well as the internal manufacturing
2 3 4 5 6 7 8 9	S. Becker A. Yeah, that's just on the OEM side. That's not talking about suppliers. Q. And how many and again, that that includes can you list for me sort of all the different departments that are involved in kind of working together to ultimately design the driveline system from sort of, you know, from absolutely from scratch all the way through validation?	2 3 4 5 6 7 8 9	S. Becker going to do the the knuckle joint hubs and attachment to the wheels. And that defines your your full driveline system, which is basically everything downstream of the engine. That's going to start the design process. They're going to interact with suppliers as well as the internal manufacturing people for packaging envelope and shape and
2 3 4 5 6 7 8 9 10 11	S. Becker A. Yeah, that's just on the OEM side. That's not talking about suppliers. Q. And how many and again, that that includes can you list for me sort of all the different departments that are involved in kind of working together to ultimately design the driveline system from sort of, you know, from absolutely from scratch all the way through validation? A. So you start out with your your	2 3 4 5 6 7 8 9 10 11	S. Becker going to do the the knuckle joint hubs and attachment to the wheels. And that defines your your full driveline system, which is basically everything downstream of the engine. That's going to start the design process. They're going to interact with suppliers as well as the internal manufacturing people for packaging envelope and shape and size, which means that they need to put lump
2 3 4 5 6 7 8 9 10 11	S. Becker A. Yeah, that's just on the OEM side. That's not talking about suppliers. Q. And how many and again, that that includes can you list for me sort of all the different departments that are involved in kind of working together to ultimately design the driveline system from sort of, you know, from absolutely from scratch all the way through validation? A. So you start out with your your advanced concepts people. They're going to	2 3 4 5 7 8 9 10 11 12	S. Becker going to do the the knuckle joint hubs and attachment to the wheels. And that defines your your full driveline system, which is basically everything downstream of the engine. That's going to start the design process. They're going to interact with suppliers as well as the internal manufacturing people for packaging envelope and shape and size, which means that they need to put lump sums together with the modeling group. They're
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2 3 4 5 6 7 8 9 10 11 12 13 14	S. Becker A. Yeah, that's just on the OEM side. That's not talking about suppliers. Q. And how many and again, that that includes can you list for me sort of all the different departments that are involved in kind of working together to ultimately design the driveline system from sort of, you know, from absolutely from scratch all the way through validation? A. So you start out with your your advanced concepts people. They're going to have the interaction with the marketing group, sadly enough. So you develop what features	2 3 4 5 6 7 8 9 10 11 12 13 14	S. Becker going to do the the knuckle joint hubs and attachment to the wheels. And that defines your your full driveline system, which is basically everything downstream of the engine. That's going to start the design process. They're going to interact with suppliers as well as the internal manufacturing people for packaging envelope and shape and size, which means that they need to put lump sums together with the modeling group. They're going to create a 3-D model using these lump systems of the various components to define a
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2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	S. Becker A. Yeah, that's just on the OEM side. That's not talking about suppliers. Q. And how many and again, that that includes can you list for me sort of all the different departments that are involved in kind of working together to ultimately design the driveline system from sort of, you know, from absolutely from scratch all the way through validation? A. So you start out with your your advanced concepts people. They're going to have the interaction with the marketing group, sadly enough. So you develop what features they want capable for the vehicle. Then you're going to have the	2 3 4 5 6 7 8 9 10 11 12 13 14	S. Becker going to do the the knuckle joint hubs and attachment to the wheels. And that defines your your full driveline system, which is basically everything downstream of the engine. That's going to start the design process. They're going to interact with suppliers as well as the internal manufacturing people for packaging envelope and shape and size, which means that they need to put lump sums together with the modeling group. They're going to create a 3-D model using these lump systems of the various components to define a packaging envelope for each one of the segments of the driveline.
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	Page 62		Page 63
1	S. Becker	1	S. Becker
2	to use.	2	guys as far as manufacturing methods that are
3	Predominantly now, products are using	3	available, and costs and timing.
4	electronic control or electronic motor	4	There's going to be the project
5	actuation or solenoid actuation. In the past,	5	management group that's going to start setting
6	they used to be various vacuum systems that	6	up the Gantt charts and the product timing
7	would draw on engine core accessories. So now	7	windows, backing out each component to design
8	that we're out of accessories, we don't have to	8	concept, function, and ultimate delivery
9	work as often with the engine group, but the	9	schedule for the early prototypes.
10	transmission group still is required to	10	Your simulation group's meanwhile
11	interact with the engine group for the mating	11	working in the background evaluating a few of
12	of the transmission to the engine.	12	the various designs with the designers and the
13	Then you're going to have your	13	drafters. Their teams are meeting with they
14	your CAFE and fuel economy group with their	14	usually have a cross-functional team of
15	input as far as weights and efficiencies. So	15	manufacturing people, simulation people, and
16	whether we get a a double-clutch	16	the core engineering and test development and
17	transmission or a standard transmission,	17	verification people to sort of synthesize how
18	automatics, manuals, again, that's going to	18	that plan's going to go together.
19	have feedback from marketing and business	19	I think we're now to the point where
20	development as to what they figure the	20	we've got a a concept together. The
21	estimated market size is for the product and	21	components are going to start being
22	the projected volumes.	22	manufactured. There's going to be supplier
23	The projected volumes determine the	23	sourcing involvement so those guys are going to
24	paths we'll follow for manufacturing so at that	24	be negotiating with the business guys, with the
25	point, we will start tying in the production	25	various suppliers of the components or raw
	Page 64		Page 65
1	Page 64 S. Becker	1	Page 65 S. Becker
1 2	S. Becker		S. Becker
1 2 3	S. Becker materials, depending for what types of	1	
2	S. Becker materials, depending for what types of materials we're going to use and	1 2	S. Becker had three different designs of fifth gear and two different designs of final drive ratio,
2 3	S. Becker materials, depending for what types of materials we're going to use and Q. Okay, why don't I just stop you at	1 2 3	S. Becker had three different designs of fifth gear and
2 3 4	S. Becker materials, depending for what types of materials we're going to use and	1 2 3 4	S. Becker had three different designs of fifth gear and two different designs of final drive ratio, which impacted the few economy and performance
2 3 4 5	S. Becker materials, depending for what types of materials we're going to use and Q. Okay, why don't I just stop you at that point. On the the first part that you started to outline, you know, with all these	1 2 3 4 5	S. Becker had three different designs of fifth gear and two different designs of final drive ratio, which impacted the few economy and performance level of the vehicle.
2 3 4 5 6	S. Becker materials, depending for what types of materials we're going to use and Q. Okay, why don't I just stop you at that point. On the the first part that you	1 2 3 4 5 6	S. Becker had three different designs of fifth gear and two different designs of final drive ratio, which impacted the few economy and performance level of the vehicle. So there was a you know, various
2 3 4 5 6 7	S. Becker materials, depending for what types of materials we're going to use and Q. Okay, why don't I just stop you at that point. On the the first part that you started to outline, you know, with all these various groups, these effectively work together	1 2 3 4 5 6 7	S. Becker had three different designs of fifth gear and two different designs of final drive ratio, which impacted the few economy and performance level of the vehicle. So there was a you know, various iterations available to the customer that the
2 3 4 5 6 7 8	S. Becker materials, depending for what types of materials we're going to use and Q. Okay, why don't I just stop you at that point. On the the first part that you started to outline, you know, with all these various groups, these effectively work together in an iterative way?	1 2 3 4 5 6 7 8	S. Becker had three different designs of fifth gear and two different designs of final drive ratio, which impacted the few economy and performance level of the vehicle. So there was a you know, various iterations available to the customer that the customer wouldn't even know about. And then
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	Page 66		Page 67
1	S. Becker	1	S. Becker
2	a mild all-wheel drive systems versus a	2	did I say? Independent clutches
3	stronger all-wheel drive system.	3	throwing the torque to each system. And
4	And then there's going to be the	4	that's still working with brake traction
5	interaction with marketing and things as to the	5	control, but it's going to actuate the
6	performance level you want out of a vehicle.	6	brakes less and rely on the clutches
7	So let's take a a Chevy View	7	more so that the vehicle has a higher
8	Chevy View? a Saturn View, which is the	8	off-road performance.
9	MV900 product that I'd worked on.	9	BY MS. SHAH:
10	In that one, they had a more mild	10	Q. Okay. So then is it fair to say that
11	all-wheel drive system so they worked with	11	driveline systems in general let let's
12	brake traction actuation. So in other words,	12	talk about specifically for automotive
13	let's say you go up a hill, and the hill's made	13	vehicles, that they interact with a variety of
14	of sand. In a Saturn View, you go up, it's	14	other sort of vehicle systems within the car
15	going to stop and just stop, because the brakes	15	and that the driveline designer then has to
16	are going to lock up because everything thinks	16	work in conjunction with a variety of other
17	it's slipping. Excuse me.	17	engineers from different vehicle systems groups
18	You take an Audi up that same hill	18	to sort of ensure that the overall performance
19	and it's going to walk up the whole hill	19	characteristics of the vehicle are met?
20	because the Audi's got our torque vectoring	20	MS. MANDRUSIAK: Objection, form.
21	system. So it's got independent clutches that	21	A. That's definitely a a good overall
22	are throwing	22	characteristic, characterization of the
23	THE REPORTER: It's got	23	driveline systems is that you have to work with
24	independent?	24	the controls guys, the brakes guys, the engine
25	THE WITNESS: Independent what	25	folks, yeah. And the vehicle structure,
	Page 68		Page 69
1	S. Becker	1	Page 69 S. Becker
2		1 2	
2 3	S. Becker because if the vehicle's all wobbly underneath, this thing's not going to work. Same thing	1	S. Becker A. Sure. Like, let's take suspension. Q. Okay.
2 3 4	S. Becker because if the vehicle's all wobbly underneath, this thing's not going to work. Same thing with suspension.	1 2 3 4	S. Becker A. Sure. Like, let's take suspension. Q. Okay. A. In addition to having to work with
2 3 4 5	S. Becker because if the vehicle's all wobbly underneath, this thing's not going to work. Same thing with suspension. And that's what vehicle synthesis is	1 2 3 4 5	S. Becker A. Sure. Like, let's take suspension. Q. Okay. A. In addition to having to work with the the vehicle driveline people, the
2 3 4 5 6	S. Becker because if the vehicle's all wobbly underneath, this thing's not going to work. Same thing with suspension. And that's what vehicle synthesis is supposed to be there for. Each OEM's going to	1 2 3 4 5 6	S. Becker A. Sure. Like, let's take suspension. Q. Okay. A. In addition to having to work with the the vehicle driveline people, the suspension's got to respond to the powertrain.
2 3 4 5 6 7	S. Becker because if the vehicle's all wobbly underneath, this thing's not going to work. Same thing with suspension. And that's what vehicle synthesis is supposed to be there for. Each OEM's going to have a vehicle synthesis group that's going to	1 2 3 4 5	S. Becker A. Sure. Like, let's take suspension. Q. Okay. A. In addition to having to work with the the vehicle driveline people, the suspension's got to respond to the powertrain. In other words, it's got to be able to respond
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$\begin{array}{c} 2\\ 3\\ 4\\ 5\\ 6\\ 7\\ 8\\ 9\\ 0\\ 1\\ 1\\ 2\\ 1\\ 4\\ 1\\ 5\\ 6\\ 7\\ 8\\ 9\\ 0\\ 1\\ 1\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\$	S. Becker because if the vehicle's all wobbly underneath, this thing's not going to work. Same thing with suspension. And that's what vehicle synthesis is supposed to be there for. Each OEM's going to have a vehicle synthesis group that's going to make sure that that communication's current between each component development group. Q. Of all the different sorts of sort of design work that's involved with the vehicle components, automotive vehicle components, is the driveline sort of system the one that's most interconnected with a variety of other vehicle systems? A. Not necessarily. It depends on the vehicle. You'd have to, you know, identify a specific vehicle if you want me to do that. Q. Okay. So is there another vehicle, I guess, let's say a it's another specific component that has this much of an interrelated kind of aspect from one vehicle system to	$\begin{array}{c}1\\2\\3\\4\\5\\6\\7\\8\\9\\0\\1\\1\\2\\1\\4\\1\\6\\7\\8\\9\\0\\1\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2$	S. Becker A. Sure. Like, let's take suspension. Q. Okay. A. In addition to having to work with the the vehicle driveline people, the suspension's got to respond to the powertrain. In other words, it's got to be able to respond to taking that torque up as well as creating the handling characteristics, which interacts again with the vehicle controls as well as the electronics now because now we have electronic suspension systems. And then they've also got to work tightly with the body in white people and the vehicle structure component groups because they need to have a vehicle stiffness target and the structural attachment points for the suspension that the body in white's going to ride on. The electronics guys doing the control modules and power distribution center system, they've got to work with the driveline guys if we've got electronics because they've
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$\begin{array}{c} 2\\ 3\\ 4\\ 5\\ 6\\ 7\\ 8\\ 9\\ 0\\ 1\\ 1\\ 2\\ 3\\ 4\\ 1\\ 5\\ 6\\ 7\\ 8\\ 9\\ 0\\ 1\\ 1\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\$	S. Becker because if the vehicle's all wobbly underneath, this thing's not going to work. Same thing with suspension. And that's what vehicle synthesis is supposed to be there for. Each OEM's going to have a vehicle synthesis group that's going to make sure that that communication's current between each component development group. Q. Of all the different sorts of sort of design work that's involved with the vehicle components, automotive vehicle components, is the driveline sort of system the one that's most interconnected with a variety of other vehicle systems? A. Not necessarily. It depends on the vehicle. You'd have to, you know, identify a specific vehicle if you want me to do that. Q. Okay. So is there another vehicle, I guess, let's say a it's another specific component that has this much of an interrelated kind of aspect from one vehicle system to	$\begin{array}{c}1\\2\\3\\4\\5\\6\\7\\8\\9\\0\\1\\1\\2\\1\\4\\1\\6\\7\\8\\9\\0\\1\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2$	S. Becker A. Sure. Like, let's take suspension. Q. Okay. A. In addition to having to work with the the vehicle driveline people, the suspension's got to respond to the powertrain. In other words, it's got to be able to respond to taking that torque up as well as creating the handling characteristics, which interacts again with the vehicle controls as well as the electronics now because now we have electronic suspension systems. And then they've also got to work tightly with the body in white people and the vehicle structure component groups because they need to have a vehicle stiffness target and the structural attachment points for the suspension that the body in white's going to ride on. The electronics guys doing the control modules and power distribution center system, they've got to work with the driveline guys if we've got electronics because they've

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	cker
2group, the interiors group. There there's2whir, shudder, quite a dynamic interaction there.3quite a dynamic interaction there.3Then you find the shudder.	
3quite a dynamic interaction there.3Then you	
	have the efficiencies or
4 Q. Okay. Let's let's back up. 4 losses, and that's	s going to affect your CAFE
	onomy ratings as well as your
	use the engine again's trying to
	r emissions. But that's based
	make the engine work based on
9 Q. What are the primary considerations 9 the driveline syst	
	you've got your control
	ficiency losses through each
	ether that's friction or heat or
	the mats metion of heat of
	ve got your stiffness. The
	es are going to create the
	of the driveline as well as the
	ve got durability, of
	g you want the thing to live,
	v hard it's going to be used,
	gain weight, which is going to
	fuel economy and your vehicle
	And then sizing the engine, of
	and if I left anothing a sut
	ow if I left anything out.
Page 72	Page 73
1 S. Becker 1 S. Bec	
	Chrysler had the design
	doing the sort of appearance,
	work with marketing on function.
	of course, you had products
	y in production so you had the
	nd problem solutions analysis
	ould work with the products that
	n, not advanced, not new
	ess that was like another
11 for coming up with new ideas, sending them 11 separation.	
	Vere you part of this advanced
13They would also do competitive13product developr	
	t of all the groups.
-	ent points in time,
16tear them apart and evaluate their cost and16depending on	
17everything else.17A. No, I	
18And then that progressed to a point18Q the	
-	rt of all the groups at all
	had the weirdest job in the
21 other times, they were just in charge of 21 company.	
22advanced stuff. So it depended on I guess22Q. Okay.	
23 management structure at the time, whether they 23 A. When cos	st reduction had a change, it
	h me for valid for
25broad products group.25verification. Wh	nen new products had an idea,

19 (Pages 70 to 73)

	Page 74		Page 75
1	S. Becker	1	S. Becker
2	they had to go through me for part of the team	2	designing was with respect to gear design and
3	evaluation of the product. Existing product	3	then verification of related systems?
4	development, of course, that was more obvious	4	A. For a portion of the time, yes; for
5	that it had to go through me for product	5	another portion, no. I gave up the gearing
6	evaluation and end of line development. So all	6	work to Bob Wilson's group somewhere around the
7	the groups worked through me or my group.	7	mid mid period of time that I was working
8	Q. And that's because the one of the	8	there and focused on overall product
9	core areas that you were involved in was	9	development.
10	verification?	10	Q. In your capacity sort of strike
		11	that.
	A. Yeah, the testing and everything	12	
12	else. And as well as the gear design, because	13	While you were working on product
13	all all of our products had some sort of		development, did you have to interface with the
14	gearing involved or chain system involved.	14	electronic engineers for purposes of driveline
15	Q. So to sort of summarize, the the	15	control systems?
16	work that you did mostly was with respect to	16	A. Definitely.
17	gear design and verification?	17	Q. What was the nature of the iterative
18	A. It's hard to characterize it that	18	process between your product development work
19	way. No, I wouldn't characterize it like that.	19	and the control side?
20	The gear development center when I	20	A. Sure. Anything they developed as far
21	was a part of that group was primarily focused	21	as controls were involved needed both product
22	on that, but I was taking on structures and	22	durability testing, so we were working with the
23	other components of of the products.	23	module suppliers as well as the electronics
24	Q. On the engineering side, would you	24	shift actuator suppliers developing and
25	say the majority of your work with respect to	25	designing how their products would be evaluated
	Page 76		Page 77
	Page 76		Page 77
1	S. Becker	1	S. Becker
2	S. Becker for product durability and function. And then	2	S. Becker with the shift select lever and the clutch
2 3	S. Becker for product durability and function. And then whenever they needed testing, they had they	2 3	S. Becker with the shift select lever and the clutch apply system.
2 3 4	S. Becker for product durability and function. And then whenever they needed testing, they had they went through my group.	2 3 4	S. Becker with the shift select lever and the clutch apply system. They needed a sensor to tell them
2 3 4 5	S. Becker for product durability and function. And then whenever they needed testing, they had they went through my group. Q. Were you ever involved in designing	2 3 4 5	S. Becker with the shift select lever and the clutch apply system. They needed a sensor to tell them where they were, and the sensors were getting
2 3 4 5 6	S. Becker for product durability and function. And then whenever they needed testing, they had they went through my group. Q. Were you ever involved in designing controls?	2 3 4 5 6	S. Becker with the shift select lever and the clutch apply system. They needed a sensor to tell them where they were, and the sensors were getting eaten into to the point where if the person
2 3 4 5 6 7	S. Becker for product durability and function. And then whenever they needed testing, they had they went through my group. Q. Were you ever involved in designing controls? A. No. I was part of the team that was	2 3 4 5 6 7	S. Becker with the shift select lever and the clutch apply system. They needed a sensor to tell them where they were, and the sensors were getting eaten into to the point where if the person didn't shift the vehicle for a long period of
2 3 4 5 6	S. Becker for product durability and function. And then whenever they needed testing, they had they went through my group. Q. Were you ever involved in designing controls? A. No. I was part of the team that was designing the overall fit and function of the	2 3 4 5 6	S. Becker with the shift select lever and the clutch apply system. They needed a sensor to tell them where they were, and the sensors were getting eaten into to the point where if the person didn't shift the vehicle for a long period of time, the fingers that told it where it was
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2 3 4 5 6 7 8	S. Becker for product durability and function. And then whenever they needed testing, they had they went through my group. Q. Were you ever involved in designing controls? A. No. I was part of the team that was designing the overall fit and function of the	2 3 5 6 7 8 9	S. Becker with the shift select lever and the clutch apply system. They needed a sensor to tell them where they were, and the sensors were getting eaten into to the point where if the person didn't shift the vehicle for a long period of time, the fingers that told it where it was
2 3 4 5 6 7 8 9 10	S. Becker for product durability and function. And then whenever they needed testing, they had they went through my group. Q. Were you ever involved in designing controls? A. No. I was part of the team that was designing the overall fit and function of the product which would define the controls, the end game of the control structure, but I wasn't doing the actual controls.	2 3 4 5 6 7 8 9 10 11	S. Becker with the shift select lever and the clutch apply system. They needed a sensor to tell them where they were, and the sensors were getting eaten into to the point where if the person didn't shift the vehicle for a long period of time, the fingers that told it where it was would lose signal and it would not know where to go. So I had to come up with a means of
2 3 4 5 6 7 8 9 10 11	S. Becker for product durability and function. And then whenever they needed testing, they had they went through my group. Q. Were you ever involved in designing controls? A. No. I was part of the team that was designing the overall fit and function of the product which would define the controls, the end game of the control structure, but I wasn't doing the actual controls. Q. Do you understand what's involved	2 3 4 5 6 7 8 9 10 11 12	S. Becker with the shift select lever and the clutch apply system. They needed a sensor to tell them where they were, and the sensors were getting eaten into to the point where if the person didn't shift the vehicle for a long period of time, the fingers that told it where it was would lose signal and it would not know where to go. So I had to come up with a means of finding out how this could happen, work with
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$\begin{array}{c} 2\\ 3\\ 4\\ 5\\ 6\\ 7\\ 8\\ 9\\ 1\\ 1\\ 1\\ 2\\ 3\\ 1\\ 4\\ 5\\ 6\\ 7\\ 1\\ 1\\ 2\\ 0\\ 2\\ 1\\ 1\\ 2\\ 0\\ 2\\ 1\\ 1\\ 1\\ 2\\ 0\\ 2\\ 1\\ 2\\ 1\\ 1\\ 1\\ 2\\ 0\\ 2\\ 1\\ 2\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\$	 S. Becker for product durability and function. And then whenever they needed testing, they had they went through my group. Q. Were you ever involved in designing controls? A. No. I was part of the team that was designing the overall fit and function of the product which would define the controls, the end game of the control structure, but I wasn't doing the actual controls. Q. Do you understand what's involved with designing the controls to fit I guess to satisfy, quote-unquote, "overall fit and function"? A. Definitely. Q. But you've never been in actually involved in the design of those control systems? A. Correct. Well, again except for concept and durability. So like, for example, 	$\begin{array}{c} 2\\ 3\\ 4\\ 5\\ 6\\ 7\\ 8\\ 9\\ 1\\ 1\\ 1\\ 2\\ 1\\ 4\\ 5\\ 6\\ 7\\ 8\\ 9\\ 0\\ 1\\ 1\\ 2\\ 0\\ 2\\ 1\\ 1\\ 2\\ 0\\ 2\\ 1\\ 1\\ 1\\ 1\\ 0\\ 1\\ 1\\ 0\\ 2\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\$	S. Becker with the shift select lever and the clutch apply system. They needed a sensor to tell them where they were, and the sensors were getting eaten into to the point where if the person didn't shift the vehicle for a long period of time, the fingers that told it where it was would lose signal and it would not know where to go. So I had to come up with a means of finding out how this could happen, work with the controls guys for how to solve the problem, and then verify that the problem was solved. Q. Okay. A. And so Q. I'm sorry. Are you A. Sorry. Q finished? A. That that resulted in a new product.
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20 (Pages 74 to 77)

	Page 78		Page 79
1	S. Becker	1	S. Becker
2	MS. MANDRUSIAK: Objection, form.	2	more than what exists in on in the Robson
3	A. Not with the electronics themselves	3	Forensic Exhibit 1 that we we looked at
4	but with the testing of the electronics	4	earlier?
5	controls modules both for their output and	5	A. Yeah. In here, you would see
6	durability.	6	driveline systems and powertrain systems,
7	Q. Do you consider yourself to be an	7	steering, braking, bumpers, structure,
8	expert in driveline design?	8	photogrammetry, acoustics, white water
9	A. Yes.	9	kayaking, materials failure analysis, general
10	Q. And what are the what credentials	10	mechanical engineering stuff. So I would
11	would you point to to satisfy that I guess,	11	consider myself an expert in mechanical
12^{11}	your your opinion?	12	engineering.
13	A. My work expertise and past history.	13	MS. MANDRUSIAK: It's been about an
14	In other words, I've designed and been involved	14	
15 15	with various components of the design of both	15	hour and a half. Is this a good time for a break?
15 16	front-wheel drive vehicles, rear-wheel drive	16	MS. SHAH: Sure.
10 17	vehicles, all-wheel drive vehicles, four-wheel	17	
18		18	(Recess taken.) MS. SHAH: I'd like to mark this.
	drive vehicles, and electric vehicles, and	10 19	
19 20	every variety of those.	19 20	(Becker Exhibit No. 2 was marked for
	Q. What other areas do you consider to	20 21	identification.)
21	be an expert in?		BY MS. SHAH:
22	A. You want a list?	22	Q. If you could, read the title of
23	Q. Is it extensive?	23	what's been marked as Exhibit 2.
24	A. It is extensive.	24 25	A. It's an SAE paper, 2006-01-0580,
25	Q. Does it exist in is it something	25	all-wheel drive "All-wheel Driveline
	Page 80		Page 81
1	S. Becker	1	S. Becker
2	S. Becker Mechatronic Systems: Principles of Wheel Power		S. Becker Do you see that part?
2 3	S. Becker Mechatronic Systems: Principles of Wheel Power Management."	1	S. Becker Do you see that part? A. Yes.
2 3 4	S. Becker Mechatronic Systems: Principles of Wheel Power Management." Q. What's your understanding of	1 2 3 4	S. Becker Do you see that part? A. Yes. Q. If you could read that sentence.
2 3	S. Becker Mechatronic Systems: Principles of Wheel Power Management." Q. What's your understanding of mechatronics?	1 2 3 4 5	S. Becker Do you see that part? A. Yes. Q. If you could read that sentence. A. "There are two key elements in this
2 3 4	S. Becker Mechatronic Systems: Principles of Wheel Power Management." Q. What's your understanding of	1 2 3 4	S. Becker Do you see that part? A. Yes. Q. If you could read that sentence. A. "There are two key elements in this definition." And I believe he's defining a
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2 3 4 5 6 7 8	S. Becker Mechatronic Systems: Principles of Wheel Power Management." Q. What's your understanding of mechatronics? A. That that goes back to basically	1 2 3 4 5 6 7 8	S. Becker Do you see that part? A. Yes. Q. If you could read that sentence. A. "There are two key elements in this definition." And I believe he's defining a driveline system. "The driveline system location, a part of the powertrain located
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	Page 82		Page 83
1	S. Becker	1	S. Becker
2	facilitate torque vectoring?	2	to a specified set of inputs. In other words,
3	A. Definitely.	3	you see slip, do this. The other one you
4	Q. What kind of can you describe the	4	stated, can you restate that?
5	sorts of hardware arrangements that help	5	Q. Yes, it's automated mechanical
6	facilitate torque vectoring?	6	systems.
7	A. Yeah. You would need to be able to	7	A. Automated mechanical systems
8	manipulate the torque and speed to each of the	8	determine when they want to interact with your
9	four wheels, so you need some form of all-wheel	9	mechanical system all by themselves. They have
10	drive. Generally, that's performed or achieved	10	a sort of brain.
11	by a clutch pack actuation system.	11	Q. What do you mean by they have
12	Q. And can you describe what what do	12	I'm I'm not clear on your answer. What do
13	you mean by "clutch pack actuation system"?	13	you mean by "they have a sort of brain"?
14	A. An actuation system that activates a	14	
		15	A. A mechatronic system generally is
15	clutch pack that will control the torque and	16	defined as an electronic system interacting
16	speed for each wheel. It can also be achieved		with just a mechanical system. That's going to
17	by electronic power drive at each wheel with	17	have a controller, but it's going to follow a
18	a wheel hub motors or types of devices.	18	prescribed pattern.
19	Q. Is there a preferred hardware	19	An automated system is going to do
20	arrangement to facilitate torque vectoring?	20	that all by itself. It's going to decide all
21	A. Not that I'm aware of.	21	by itself when it wants to apply stuff.
22	Q. Is is there a distinction between	22	Q. Which provides more flexibility, a
23	mechatronic systems and automated mechanical	23	mechatronic system or an automated mechanical
24	systems?	24	system?
25	A. Sure. A mechatronic system performs	25	A. Depends on how well you design your
	Page 84		Page 85
1	S. Becker	1	S. Becker
2	mechatronic system. They could both provide	2	So in here, no longer speaking from
3	the same function and flexibility, but an	3	him, he's defining what he's calling an
4	automated system theoretically being able to	4	automated mechanical system.
5	come up with its own solutions would	5	Q. Okay. Is that consistent with
б	potentially be more flexible.	6	what your understanding of what an automated
7	Q. So if you could turn to, again on the	7	mechanical system includes?
8	first page of Exhibit 2, the right-hand column,	8	A. No, no. What he's describing is a
9	the first full paragraph, the last sentence of	9	passive system.
10	that first full paragraph, it starts with "The	10	Q. Okay. So based on the
11	driveline mechatronic systems."	11	characterization as he's defined it in this
12	Do you see that?	12	last sentence of the paragraph that you were
13	A. Yeah. That's backwards.	13	just reading from, do you agree with this
14	Q. So you I'm sorry, could you read	14	characterization?
15	that sentence?	15	MS. MANDRUSIAK: Objection, form.
16	A. Oh, sorry.	16	A. A a mechatronic system would be
17	Q. And then tell me if you agree or	17	more flexible than a passive system, yes.
18	disagree with that characterization.	18	BY MS. SHAH:
19	A. "The driveline mechatronic systems	19	Q. What are the advantages of having a
20	are more flexible and proactive in distributing	20	more flexible system?
21	the engine power to the wheels than automated	21	A. You can adapt to how much you apply
22	mechanical systems, e.g., numerous of limited	22	torque or slip.
23	slip differentials, mechanically electronically	23	Q. How you would apply torque and slip
24	lockable differentials, viscous clutches, no	24	to a wheel? That's what you're
25	spins, on-demand systems, and many others."	25	A. Of course.
			22 (Pages 82 to 85)

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1	rage oo		
1	S. Becker	1	S. Becker
2	Q referring to?	2	communication system that distributes
3	A. Yes.	3	information across the car from the engine
4	Q. So then moving on to the last	4	control modules to the transmission control
5	paragraph of page 1 of Exhibit 2, there's a	5	module to the transfer case control module,
6	sentence in here. If you could read the first	6	which in this case would be an all-wheel drive
7	sentence of that paragraph, please.	7	control system module, as well as some of the
8	A. "Another contemporary tendency in the	8	other signals.
9	driveline system design relates to networking	9	Basically, it's the routing of all
10	with other vehicle systems such as steering	10	sensors so that they can be read by everybody.
11	system, brakes, suspension systems, and	11	Q. So if you could turn to page 2 of
12	others."	12	Exhibit 2, please. So if you can look at the
13	Q. Okay. And do you agree that there's	13	second-to-last sentence of the first paragraph
14	that sort of interrelationship between this	14	that starts with "For example."
15	sort of networking, as he refers to it, between	15	A. Correct. "For example, a vehicle
16	driveline systems and other vehicle systems?	16	with four drive wheels has three power dividing
17	A. Yes. We use the CAN bus to look at,	17	units. The first one is the transfer case.
18	say, the steering yaw rate or the application	18	Two more units are installed on the front and
19	of brakes or if there's an electronic	19	rear axles. See figure 2."
20	suspension travel monitoring system to vary our	20	Q. And then if you could read the
21	driveline system function.	21	sentence just below that, please.
22	Q. Can you describe for me what the	22	A. "As seen from this, combinations of
23	the I guess the operation and the function	23	the mechanisms and subsystems that could be
24	of the CAN bus is?	24	employed for these three PDUs are practically
25	A. Sure. The CAN bus is the	25	uncountable."
	Page 88		Page 89
1	S. Becker	1	S. Becker
2	Q. And do you agree with the	2	Q. So then
3	characterization in these two sentences?	3	A. Control the PDUs in different
J			
4	A. Not exactly.	4	fashions based on this.
	A. Not exactly.Q. And why not?	4 5	fashions based on this. Q. Okay. So then is it accurate if you
4	Q. And why not?A. Well, it's easily countable. But you	5 6	fashions based on this.
4 5	Q. And why not?	5 6 7	fashions based on this. Q. Okay. So then is it accurate if you
4 5 6 7 8	Q. And why not?A. Well, it's easily countable. But you have many combinations so the overall characterization is correct.	5 6	fashions based on this.Q. Okay. So then is it accurate if you had such a wide range of mechanisms and subsystems that there would be a very significant number of permutations of how you
4 5 6 7 8 9	Q. And why not?A. Well, it's easily countable. But you have many combinations so the overall characterization is correct.Q. Okay. So if I'm understanding the	5 6 7	 fashions based on this. Q. Okay. So then is it accurate if you had such a wide range of mechanisms and subsystems that there would be a very significant number of permutations of how you could arrange how you could employ the three
4 5 7 8 9 10	 Q. And why not? A. Well, it's easily countable. But you have many combinations so the overall characterization is correct. Q. Okay. So if I'm understanding the final sentence of that paragraph, he's talking 	5 6 7 8 9 10	fashions based on this. Q. Okay. So then is it accurate if you had such a wide range of mechanisms and subsystems that there would be a very significant number of permutations of how you could arrange how you could employ the three PDUs to take into consideration the various
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4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 20 21 22	 Q. And why not? A. Well, it's easily countable. But you have many combinations so the overall characterization is correct. Q. Okay. So if I'm understanding the final sentence of that paragraph, he's talking about combination of combinations of mechanisms and subsystems that could be employed by three PDUs, power dividing units. What are the different kinds of mechanisms and subsystems that could be employed? MS. MANDRUSIAK: Objection, foundation. A. He's referring to likely control mechanisms and subsystems. In other words, the vehicle can look at steering, suspension, braking, throttle, road vibration, I guess 	5 6 7 8 9 10 11 12 13 14 15 16 17 18 20 21 22	 fashions based on this. Q. Okay. So then is it accurate if you had such a wide range of mechanisms and subsystems that there would be a very significant number of permutations of how you could arrange how you could employ the three PDUs to take into consideration the various mechanisms and subsystems? MS. MANDRUSIAK: Objection, form. A. Yeah, in general, that's the concept, that depending on what you're reading from these other systems, you would change how you control your PDUs, as he's calling them. Q. How do you decide what's optimal, then? If you've got such a large number of potential combinations, how does a driveline designer determine what is optimal, an optimal driveline design?

23 (Pages 86 to 89)

	rage 90		i dge 91
1	S. Becker	1	S. Becker
2	A. That's going to be defined by	2	undesirable handling characteristics.
3	marketing and the vehicle concept group. In	3	But you don't have an optimum design,
4	other words, they're going to want the vehicle	4	single optimum design. It's going to be
5	to do something.	5	different for a car than it is for a truck.
6	Q. Okay.	6	It's going to be different for an off-road
7	A. They're going to want the vehicle to	7	vehicle than it is a soccer mom SUV.
8	be, as they call them, fun and sporty, which	8	Q. Okay. So with respect to, let's say,
9	means cheap. So you're not going to put a	9	the differences for a conventional let's
10	really complicated driveline system on that	10	all-wheel drive vehicle for traditional routes
11	vehicle.	11	as compared to an ATV, what would be the
12	You're going to put as much safety as	12	different considerations?
13	you can into that, you know, just as you would	13	And how would that affect the
14		14	
15	for any other vehicle, but the driveline	14 15	driveline design? A. Well
15 16	control schema is not going to be as complex as	15 16	
	a top-end, higher priced, more cost involved in		MS. MANDRUSIAK: Objection, form.
17	the driveline system vehicle.	17	A it depends on what you mean by ATV
18	So then let's just define we're	18	because like in England, an ATV's an
19	working on one all-wheel drive vehicle system.	19	all-terrain vehicle.
20	On that vehicle, we've got given inputs. We	20	BY MS. SHAH:
21	want to control this the best we can. Money's	21	Q. Okay.
22	no object. So there, you're going to have a	22	A. And that includes Jeeps, trucks, Land
23	full-on torque vectoring system. You're going	23	Rovers, etc. An ATV is going to be in America
24	to employ as many sensor readings as you can to	24	a lower cost vehicle and it's going to be only
25	then control and minimize yaw events and other	25	driven off-road. So an on-road vehicle so
	Page 92		Page 93
-		1	
1	S. Becker	1	S. Becker
2	let's say we're talking a small SUV. Again,	2	A. Yeah. Principally, your on-road
3	it's going to depend on the the luxurt	3	control schema is going to be more concerned
4	refinement of that vehicle.	4	with handling characteristics; your off-road
5	The control the control schema for	5	control schema is going to be more concerned
6	a Honda is not the same as it is for the for	6	with slipping.
7	the Audi or for the Acura, you know, so	7	Q. Are there any other relevant factors
8	they've got their two different levels of trim.	8	between on-road versus off-road considerations
9	THE REPORTER: Of? Of trim?	9	for driveline design purposes?
10	THE WITNESS: Trim.	10	A. Ratio. Off-road, you're going to
11	THE REPORTER: Thank you.	11	develop a a secondary ratio, usually for
12	A. So you have to define that.	12	delivering more power to the wheels because
13	BY MS. SHAH:	13	you're going to be operating at slower speeds,
14	Q. Okay. So apart from the sort of	14	except in the case of our off-road race
15	the differences between, let's say, a base	15	vehicles where we're operating at high speeds
16	model and a luxury model, are there differences	16	so that we use a different type of underdrive
17	that are relevant in terms of the ultimate	17	ratio. So again, it's ratio based.
18	terrain from a you know, conventional roads	18	And again, you could do that in your
19	to off-roading?	19	on-road vehicle as well so it it's not a
20	Is that relevant from a driveline	20	clear clear-cut division.
21	design perspective?	21	Q. So I guess the question is there's a
22	A. Off-road versus on-road only?	22	variety of things that one could do as part of
23	Q. Yes.	23	driveline design.
2.5	Q. 103.		
24	A. Definitely.	24	What determines what are the
	-		

24 (Pages 90 to 93)

1	Page 94		Page 95
	S. Becker	1	S. Becker
2	functionality ultimately is included in the	2	with four or more drive wheels result from
3	driveline design?	3	vehicle operational properties such as energy,
4	What are the what are the	4	fuel efficiency" I forgot fuel efficiency
5	considerations that drive that design process?	5	" cross country mobility, tractive and
6	MS. MANDRUSIAK: Objection, form.	6	velocity properties, vehicle turnability, and
7	A. Again, that's usually going to be	7	stability of motion and handling."
8	decided at the OEM level, and that's going to	8	Q. Do you agree with that
9	be based on weight and cost.	9	THE REPORTER: I'm sorry, repeat.
10	BY MS. SHAH:	10	MS. SHAH: Yeah, sure.
	Q. Are there any	11	BY MS. SHAH:
12	A. And then	12	Q. Do you agree with that
13	Q other considerations?	13	characterization?
13 14		13 14	
	A. And then and then the marketing of		A. Yeah, generally. I think he's got
15	the vehicle, whether they're going to be a	15	them all in there.
16	sporty car or a a conventional riding	16	Q. Then if you could continue to the
17	vehicle.	17	next sentence and read that sentence, please.
18	Q. Okay. If we could turn to again	18	A. "No doubt these vehicle operational
19	sticking to page 2 of the this Exhibit 2,	19	properties considerably depend on total power
20	the SAE article, if you could look under the	20	applied to the drive wheels. This" yeah,
21	heading "Vehicle Dynamics Versus Vehicle	21	period.
22	Performance in Driveline Systems Design," if	22	Q. Do you agree with that as well?
23	you could read the first sentence under that	23	A. Yeah, for the most part, yeah.
24	heading, please.	24	Q. Then the final sentence of that
25	A. "Dynamics and performance of vehicles	25	paragraph, please.
	Page 96		Page 97
1	S. Becker	1	S. Becker
2	A. "At the same time, the listed	2	Q. Make it out?
3	operational properties strongly depend on the	3	A out everything without my cell
		15	A Out everything without my cen
1	distribution of total nowar among the drive	1	
4	distribution of total power among the drive	4	phone magnifier maybe.
5	wheels." Oh, that was the next sentence.	5	phone magnifier maybe.Q. So do you have your cell phone? Feel
5 6	wheels." Oh, that was the next sentence. Sorry.	5 6	phone magnifier maybe.Q. So do you have your cell phone? Feel free to magnify it.
5 6 7	wheels." Oh, that was the next sentence. Sorry. "In the given road terrain	5 6 7	phone magnifier maybe.Q. So do you have your cell phone? Feelfree to magnify it.A. Okay. That might help. Interesting.
5 6 7 8	wheels." Oh, that was the next sentence. Sorry. "In the given road terrain conditions, the same vehicle with a constant	5 6 7 8	phone magnifier maybe.Q. So do you have your cell phone? Feel free to magnify it.A. Okay. That might help. Interesting.Okay.
5 6 7 8 9	wheels." Oh, that was the next sentence. Sorry. "In the given road terrain conditions, the same vehicle with a constant total power at the drive wheels but with	5 6 7 8 9	phone magnifier maybe.Q. So do you have your cell phone? Feel free to magnify it.A. Okay. That might help. Interesting.Okay.Q. You can see? You're able to see
5 6 7 8 9 10	wheels." Oh, that was the next sentence. Sorry. "In the given road terrain conditions, the same vehicle with a constant total power at the drive wheels but with different power distribution among the drive	5 6 7 8 9 10	 phone magnifier maybe. Q. So do you have your cell phone? Feel free to magnify it. A. Okay. That might help. Interesting. Okay. Q. You can see? You're able to see figure 3 now?
5 6 7 8 9 10	wheels." Oh, that was the next sentence. Sorry. "In the given road terrain conditions, the same vehicle with a constant total power at the drive wheels but with different power distribution among the drive axles and left and right wheels of each axle	5 6 7 8 9 10 11	 phone magnifier maybe. Q. So do you have your cell phone? Feel free to magnify it. A. Okay. That might help. Interesting. Okay. Q. You can see? You're able to see figure 3 now? A. Yeah.
5 6 7 8 9 10 11	wheels." Oh, that was the next sentence. Sorry. "In the given road terrain conditions, the same vehicle with a constant total power at the drive wheels but with different power distribution among the drive axles and left and right wheels of each axle will perform differently, that is, the criteria	5 6 7 8 9 10 11 12	 phone magnifier maybe. Q. So do you have your cell phone? Feel free to magnify it. A. Okay. That might help. Interesting. Okay. Q. You can see? You're able to see figure 3 now? A. Yeah. Q. All right. So you see the the
5 6 7 8 9 10 11 12 13	wheels." Oh, that was the next sentence. Sorry. "In the given road terrain conditions, the same vehicle with a constant total power at the drive wheels but with different power distribution among the drive axles and left and right wheels of each axle will perform differently, that is, the criteria of the above-listed operational properties will	5 6 7 8 9 10 11 12 13	 phone magnifier maybe. Q. So do you have your cell phone? Feel free to magnify it. A. Okay. That might help. Interesting. Okay. Q. You can see? You're able to see figure 3 now? A. Yeah. Q. All right. So you see the the sort of box that's identified as "driveline"
5 6 7 8 9 10 11 12 13 14	wheels." Oh, that was the next sentence. Sorry. "In the given road terrain conditions, the same vehicle with a constant total power at the drive wheels but with different power distribution among the drive axles and left and right wheels of each axle will perform differently, that is, the criteria of the above-listed operational properties will have different quantities."	5 6 7 8 9 10 11 12 13 14	 phone magnifier maybe. Q. So do you have your cell phone? Feel free to magnify it. A. Okay. That might help. Interesting. Okay. Q. You can see? You're able to see figure 3 now? A. Yeah. Q. All right. So you see the the sort of box that's identified as "driveline system"?
5 6 7 8 9 10 11 12 13 14 15	 wheels." Oh, that was the next sentence. Sorry. "In the given road terrain conditions, the same vehicle with a constant total power at the drive wheels but with different power distribution among the drive axles and left and right wheels of each axle will perform differently, that is, the criteria of the above-listed operational properties will have different quantities." Q. And do you agree with those two 	5 6 7 8 9 10 11 12 13 14 15	 phone magnifier maybe. Q. So do you have your cell phone? Feel free to magnify it. A. Okay. That might help. Interesting. Okay. Q. You can see? You're able to see figure 3 now? A. Yeah. Q. All right. So you see the the sort of box that's identified as "driveline system"? A. Yes.
5 6 7 8 9 10 11 12 13 14 15 16	 wheels." Oh, that was the next sentence. Sorry. "In the given road terrain conditions, the same vehicle with a constant total power at the drive wheels but with different power distribution among the drive axles and left and right wheels of each axle will perform differently, that is, the criteria of the above-listed operational properties will have different quantities." Q. And do you agree with those two sentences? 	5 6 7 8 9 10 11 12 13 14 15 16	 phone magnifier maybe. Q. So do you have your cell phone? Feel free to magnify it. A. Okay. That might help. Interesting. Okay. Q. You can see? You're able to see figure 3 now? A. Yeah. Q. All right. So you see the the sort of box that's identified as "driveline system"? A. Yes. Q. And that sort of interconnection that
5 6 7 8 9 10 11 12 13 14 15 16 17	 wheels." Oh, that was the next sentence. Sorry. "In the given road terrain conditions, the same vehicle with a constant total power at the drive wheels but with different power distribution among the drive axles and left and right wheels of each axle will perform differently, that is, the criteria of the above-listed operational properties will have different quantities." Q. And do you agree with those two sentences? A. Definitely. 	5 6 7 8 9 10 11 12 13 14 15 16 17	 phone magnifier maybe. Q. So do you have your cell phone? Feel free to magnify it. A. Okay. That might help. Interesting. Okay. Q. You can see? You're able to see figure 3 now? A. Yeah. Q. All right. So you see the the sort of box that's identified as "driveline system"? A. Yes. Q. And that sort of interconnection that the driveline system has with respect to the
5 6 7 8 9 10 11 12 13 14 15 16 17 18	 wheels." Oh, that was the next sentence. Sorry. "In the given road terrain conditions, the same vehicle with a constant total power at the drive wheels but with different power distribution among the drive axles and left and right wheels of each axle will perform differently, that is, the criteria of the above-listed operational properties will have different quantities." Q. And do you agree with those two sentences? A. Definitely. Q. All right. So then if you see, 	$5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 10 \\ 11 \\ 12 \\ 14 \\ 15 \\ 16 \\ 17 \\ 18 \\ 18 \\ 18 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10$	 phone magnifier maybe. Q. So do you have your cell phone? Feel free to magnify it. A. Okay. That might help. Interesting. Okay. Q. You can see? You're able to see figure 3 now? A. Yeah. Q. All right. So you see the the sort of box that's identified as "driveline system"? A. Yes. Q. And that sort of interconnection that the driveline system has with respect to the three sort of boxes above that that describe
5 6 7 8 9 10 11 12 13 14 15 16 17 18 19	 wheels." Oh, that was the next sentence. Sorry. "In the given road terrain conditions, the same vehicle with a constant total power at the drive wheels but with different power distribution among the drive axles and left and right wheels of each axle will perform differently, that is, the criteria of the above-listed operational properties will have different quantities." Q. And do you agree with those two sentences? A. Definitely. Q. All right. So then if you see, there's a figure 3 here that's also on the same 	5 6 7 9 10 12 13 15 17 18 19 19	 phone magnifier maybe. Q. So do you have your cell phone? Feel free to magnify it. A. Okay. That might help. Interesting. Okay. Q. You can see? You're able to see figure 3 now? A. Yeah. Q. All right. So you see the the sort of box that's identified as "driveline system"? A. Yes. Q. And that sort of interconnection that the driveline system has with respect to the three sort of boxes above that that describe various vehicle operational properties?
5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	 wheels." Oh, that was the next sentence. Sorry. "In the given road terrain conditions, the same vehicle with a constant total power at the drive wheels but with different power distribution among the drive axles and left and right wheels of each axle will perform differently, that is, the criteria of the above-listed operational properties will have different quantities." Q. And do you agree with those two sentences? A. Definitely. Q. All right. So then if you see, there's a figure 3 here that's also on the same page, page 2 of Exhibit 2. 	$5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 10 \\ 11 \\ 12 \\ 13 \\ 14 \\ 15 \\ 16 \\ 17 \\ 18 \\ 9 \\ 20 \\$	 phone magnifier maybe. Q. So do you have your cell phone? Feel free to magnify it. A. Okay. That might help. Interesting. Okay. Q. You can see? You're able to see figure 3 now? A. Yeah. Q. All right. So you see the the sort of box that's identified as "driveline system"? A. Yes. Q. And that sort of interconnection that the driveline system has with respect to the three sort of boxes above that that describe various vehicle operational properties? A. Yeah. He's got like a a box
$5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 10 \\ 11 \\ 12 \\ 13 \\ 14 \\ 15 \\ 16 \\ 17 \\ 18 \\ 19 \\ 20 \\ 21 \\$	 wheels." Oh, that was the next sentence. Sorry. "In the given road terrain conditions, the same vehicle with a constant total power at the drive wheels but with different power distribution among the drive axles and left and right wheels of each axle will perform differently, that is, the criteria of the above-listed operational properties will have different quantities." Q. And do you agree with those two sentences? A. Definitely. Q. All right. So then if you see, there's a figure 3 here that's also on the same page, page 2 of Exhibit 2. Do you see that figure? 	$5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 10 \\ 11 \\ 12 \\ 14 \\ 16 \\ 17 \\ 18 \\ 9 \\ 20 \\ 21$	 phone magnifier maybe. Q. So do you have your cell phone? Feel free to magnify it. A. Okay. That might help. Interesting. Okay. Q. You can see? You're able to see figure 3 now? A. Yeah. Q. All right. So you see the the sort of box that's identified as "driveline system"? A. Yes. Q. And that sort of interconnection that the driveline system has with respect to the three sort of boxes above that that describe various vehicle operational properties? A. Yeah. He's got like a a box around tractive velocities, etc., off-road
5 6 7 8 9 10 11 12 13 14 15 16 17 18 20 21 22	 wheels." Oh, that was the next sentence. Sorry. "In the given road terrain conditions, the same vehicle with a constant total power at the drive wheels but with different power distribution among the drive axles and left and right wheels of each axle will perform differently, that is, the criteria of the above-listed operational properties will have different quantities." Q. And do you agree with those two sentences? A. Definitely. Q. All right. So then if you see, there's a figure 3 here that's also on the same page, page 2 of Exhibit 2. Do you see that figure? A. I do, sort of. 	$5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 10 \\ 12 \\ 13 \\ 14 \\ 15 \\ 6 \\ 17 \\ 19 \\ 20 \\ 21 \\ 22 \\ 22 \\ 22 \\ 22 \\ 22 \\ 22$	 phone magnifier maybe. Q. So do you have your cell phone? Feel free to magnify it. A. Okay. That might help. Interesting. Okay. Q. You can see? You're able to see figure 3 now? A. Yeah. Q. All right. So you see the the sort of box that's identified as "driveline system"? A. Yes. Q. And that sort of interconnection that the driveline system has with respect to the three sort of boxes above that that describe various vehicle operational properties? A. Yeah. He's got like a a box around tractive velocities, etc., off-road mobility, and handling.
5 6 7 8 9 10 11 12 13 14 15 16 17 18 9 20 21 22 23	 wheels." Oh, that was the next sentence. Sorry. "In the given road terrain conditions, the same vehicle with a constant total power at the drive wheels but with different power distribution among the drive axles and left and right wheels of each axle will perform differently, that is, the criteria of the above-listed operational properties will have different quantities." Q. And do you agree with those two sentences? A. Definitely. Q. All right. So then if you see, there's a figure 3 here that's also on the same page, page 2 of Exhibit 2. Do you see that figure? A. I do, sort of. Q. It's a little small. 	$5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 10 \\ 12 \\ 13 \\ 14 \\ 15 \\ 17 \\ 19 \\ 21 \\ 22 \\ 23 \\ 23 \\ 23 \\ 23 \\ 23 \\ 23$	 phone magnifier maybe. Q. So do you have your cell phone? Feel free to magnify it. A. Okay. That might help. Interesting. Okay. Q. You can see? You're able to see figure 3 now? A. Yeah. Q. All right. So you see the the sort of box that's identified as "driveline system"? A. Yes. Q. And that sort of interconnection that the driveline system has with respect to the three sort of boxes above that that describe various vehicle operational properties? A. Yeah. He's got like a a box around tractive velocities, etc., off-road mobility, and handling. Q. And also fuel consumption and
5 6 7 8 9 10 11 12 13 14 15 16 7 18 9 20 1 22 22	 wheels." Oh, that was the next sentence. Sorry. "In the given road terrain conditions, the same vehicle with a constant total power at the drive wheels but with different power distribution among the drive axles and left and right wheels of each axle will perform differently, that is, the criteria of the above-listed operational properties will have different quantities." Q. And do you agree with those two sentences? A. Definitely. Q. All right. So then if you see, there's a figure 3 here that's also on the same page, page 2 of Exhibit 2. Do you see that figure? A. I do, sort of. 	$5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 10 \\ 12 \\ 13 \\ 14 \\ 15 \\ 6 \\ 17 \\ 19 \\ 20 \\ 21 \\ 22 \\ 22 \\ 22 \\ 22 \\ 22 \\ 22$	 phone magnifier maybe. Q. So do you have your cell phone? Feel free to magnify it. A. Okay. That might help. Interesting. Okay. Q. You can see? You're able to see figure 3 now? A. Yeah. Q. All right. So you see the the sort of box that's identified as "driveline system"? A. Yes. Q. And that sort of interconnection that the driveline system has with respect to the three sort of boxes above that that describe various vehicle operational properties? A. Yeah. He's got like a a box around tractive velocities, etc., off-road mobility, and handling.

25 (Pages 94 to 97)

	Page 98	3	Page 99
1	S. Becker	1	S. Becker
2	Q. Stability of motion?	2	Q. Okay.
3	A. I was just identifying the boxes.	3	A. And turnability.
4	Q. Okay. And do you agree that the	4	Q. All right. So is there anything else
5	driveline driveline systems essentially have	5	you would add or subtract from this chart with
6	to, you know, sort of factor in those at a	6	respect to the relationship of driveline
7	minimum, these operational parameters that are	7	systems to vehicle operational properties that
8	identified in the three boxes that are	8	are relevant from a design standpoint?
9	connected to the driveline system in this	9	A. NVH.
10	chart?	10	
	A. Well, it also contributes to	11	Q. Okay.
12	smoothness of ride.	12	A. And yeah just NVH. Probably also
		12 13	durability. He doesn't have durability in
13	Q. Okay. And is there also a		there.
14	relationship between driveline systems and	14	Q. Durability of the system as a whole,
15	braking capability?	15	you're saying?
16	A. Depends on what you include in the	16	A. Correct. Of the driveline system.
17	driveline systems. Some people include brake	17	Q. Uh-huh.
18	traction control as part of the driveline	18	A. And I didn't peer review this paper
19	system. I don't. Apparently, he doesn't	19	so this is my first look at it.
20	either.	20	Q. Sure. You you've not seen this
21	Q. Okay. And the steering?	21	paper before?
22	Is there also a relationship between	22	A. Correct.
23	the I guess the driveline systems and the	23	Q. This Exhibit 2 paper.
24	desired steering control properties?	24	All right then, if you could look at
25	A. Well, that's the handling.	25	the sort of paragraph that's underneath figure
	Page 100		Page 101
1			
1	S. Becker	1	S. Becker
2	S. Becker 3 where he's the author is describing a	1 2	S. Becker would include those three parameters that are
2 3	S. Becker 3 where he's the author is describing a methodology for designing a driveline system,	1 2 3	S. Becker would include those three parameters that are listed here as A, B, and C?
2 3 4	S. Becker 3 where he's the author is describing a methodology for designing a driveline system, if you could read that	1 2 3 4	S. Becker would include those three parameters that are listed here as A, B, and C? A. Sure.
2 3 4 5	S. Becker 3 where he's the author is describing a methodology for designing a driveline system, if you could read that A. Section?	1 2 3 4 5	S. Becker would include those three parameters that are listed here as A, B, and C? A. Sure. Q. Okay. Let's specifically look at
2 3 4 5 6	S. Becker 3 where he's the author is describing a methodology for designing a driveline system, if you could read that A. Section? Q out loud. Yes, please.	1 2 3 4 5 6	S. Becker would include those three parameters that are listed here as A, B, and C? A. Sure. Q. Okay. Let's specifically look at some of these operational properties that are
2 3 4 5 6 7	S. Becker 3 where he's the author is describing a methodology for designing a driveline system, if you could read that A. Section? Q out loud. Yes, please. A. "Based on the presented materials,	1 2 3 4 5 6 7	S. Becker would include those three parameters that are listed here as A, B, and C? A. Sure. Q. Okay. Let's specifically look at some of these operational properties that are listed in figure 3.
2 3 4 5 6 7 8	S. Becker 3 where he's the author is describing a methodology for designing a driveline system, if you could read that A. Section? Q out loud. Yes, please. A. "Based on the presented materials, one could notice that a methodology for	1 2 3 4 5 6 7 8	S. Becker would include those three parameters that are listed here as A, B, and C? A. Sure. Q. Okay. Let's specifically look at some of these operational properties that are listed in figure 3. Can you describe for me depending
2 3 4 5 6 7 8 9	S. Becker 3 where he's the author is describing a methodology for designing a driveline system, if you could read that A. Section? Q out loud. Yes, please. A. "Based on the presented materials, one could notice that a methodology for designing driveline systems should provide a	1 2 3 4 5 6 7 8 9	S. Becker would include those three parameters that are listed here as A, B, and C? A. Sure. Q. Okay. Let's specifically look at some of these operational properties that are listed in figure 3. Can you describe for me depending on, let's say, the desired vehicle operational
2 3 4 5 6 7 8 9 10	S. Becker 3 where he's the author is describing a methodology for designing a driveline system, if you could read that A. Section? Q out loud. Yes, please. A. "Based on the presented materials, one could notice that a methodology for designing driveline systems should provide a way to optimally manage power distributions to	1 2 3 4 5 6 7 8 9	S. Becker would include those three parameters that are listed here as A, B, and C? A. Sure. Q. Okay. Let's specifically look at some of these operational properties that are listed in figure 3. Can you describe for me depending on, let's say, the desired vehicle operational property for let's take handling, you know,
2 3 4 5 6 7 8 9 10 11	S. Becker 3 where he's the author is describing a methodology for designing a driveline system, if you could read that A. Section? Q out loud. Yes, please. A. "Based on the presented materials, one could notice that a methodology for designing driveline systems should provide a way to optimally manage power distributions to the drive wheels and to determine the optimum	1 2 3 4 5 6 7 8 9 10 11	S. Becker would include those three parameters that are listed here as A, B, and C? A. Sure. Q. Okay. Let's specifically look at some of these operational properties that are listed in figure 3. Can you describe for me depending on, let's say, the desired vehicle operational property for let's take handling, you know, how would that impact the driveline design?
2 3 4 5 7 8 9 10 11	S. Becker 3 where he's the author is describing a methodology for designing a driveline system, if you could read that A. Section? Q out loud. Yes, please. A. "Based on the presented materials, one could notice that a methodology for designing driveline systems should provide a way to optimally manage power distributions to the drive wheels and to determine the optimum characteristics of driveline systems based on	1 2 3 4 5 6 7 8 9 10 11 12	S. Becker would include those three parameters that are listed here as A, B, and C? A. Sure. Q. Okay. Let's specifically look at some of these operational properties that are listed in figure 3. Can you describe for me depending on, let's say, the desired vehicle operational property for let's take handling, you know, how would that impact the driveline design? MS. MANDRUSIAK: Objection, form.
2 3 4 5 6 7 8 9 10 11 12 13	S. Becker 3 where he's the author is describing a methodology for designing a driveline system, if you could read that A. Section? Q out loud. Yes, please. A. "Based on the presented materials, one could notice that a methodology for designing driveline systems should provide a way to optimally manage power distributions to the drive wheels and to determine the optimum characteristics of driveline systems based on the criteria of the operational properties and	1 2 3 4 5 6 7 8 9 10 11 12 13	S. Becker would include those three parameters that are listed here as A, B, and C? A. Sure. Q. Okay. Let's specifically look at some of these operational properties that are listed in figure 3. Can you describe for me depending on, let's say, the desired vehicle operational property for let's take handling, you know, how would that impact the driveline design? MS. MANDRUSIAK: Objection, form. A. With three features. One, the weight
2 3 4 5 6 7 8 9 10 11 12 13 14	S. Becker 3 where he's the author is describing a methodology for designing a driveline system, if you could read that A. Section? Q out loud. Yes, please. A. "Based on the presented materials, one could notice that a methodology for designing driveline systems should provide a way to optimally manage power distributions to the drive wheels and to determine the optimum characteristics of driveline systems based on the criteria of the operational properties and link these vehicle operational properties'	1 2 3 4 5 6 7 8 9 10 11 12 13 14	S. Becker would include those three parameters that are listed here as A, B, and C? A. Sure. Q. Okay. Let's specifically look at some of these operational properties that are listed in figure 3. Can you describe for me depending on, let's say, the desired vehicle operational property for let's take handling, you know, how would that impact the driveline design? MS. MANDRUSIAK: Objection, form. A. With three features. One, the weight of the driveline system is going to affect
2 3 4 5 6 7 8 9 10 11 12 13 14 15	S. Becker 3 where he's the author is describing a methodology for designing a driveline system, if you could read that A. Section? Q out loud. Yes, please. A. "Based on the presented materials, one could notice that a methodology for designing driveline systems should provide a way to optimally manage power distributions to the drive wheels and to determine the optimum characteristics of driveline systems based on the criteria of the operational properties and link these vehicle operational properties' optimization with vehicle dynamics improvement	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	S. Becker would include those three parameters that are listed here as A, B, and C? A. Sure. Q. Okay. Let's specifically look at some of these operational properties that are listed in figure 3. Can you describe for me depending on, let's say, the desired vehicle operational property for let's take handling, you know, how would that impact the driveline design? MS. MANDRUSIAK: Objection, form. A. With three features. One, the weight of the driveline system is going to affect handling. Two, the power distribution to the
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	S. Becker 3 where he's the author is describing a methodology for designing a driveline system, if you could read that A. Section? Q out loud. Yes, please. A. "Based on the presented materials, one could notice that a methodology for designing driveline systems should provide a way to optimally manage power distributions to the drive wheels and to determine the optimum characteristics of driveline systems based on the criteria of the operational properties and link these vehicle operational properties' optimization with vehicle dynamics improvement and finally lead to the the required vehicle	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	S. Becker would include those three parameters that are listed here as A, B, and C? A. Sure. Q. Okay. Let's specifically look at some of these operational properties that are listed in figure 3. Can you describe for me depending on, let's say, the desired vehicle operational property for let's take handling, you know, how would that impact the driveline design? MS. MANDRUSIAK: Objection, form. A. With three features. One, the weight of the driveline system is going to affect handling. Two, the power distribution to the wheels. You know, front-wheel drive car is
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17	S. Becker 3 where he's the author is describing a methodology for designing a driveline system, if you could read that A. Section? Q out loud. Yes, please. A. "Based on the presented materials, one could notice that a methodology for designing driveline systems should provide a way to optimally manage power distributions to the drive wheels and to determine the optimum characteristics of driveline systems based on the criteria of the operational properties and link these vehicle operational properties' optimization with vehicle dynamics improvement and finally lead to the the required vehicle performance and technical efficiency."	$ 1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 10 \\ 11 \\ 12 \\ 13 \\ 14 \\ 15 \\ 16 \\ 17 \\ $	S. Becker would include those three parameters that are listed here as A, B, and C? A. Sure. Q. Okay. Let's specifically look at some of these operational properties that are listed in figure 3. Can you describe for me depending on, let's say, the desired vehicle operational property for let's take handling, you know, how would that impact the driveline design? MS. MANDRUSIAK: Objection, form. A. With three features. One, the weight of the driveline system is going to affect handling. Two, the power distribution to the wheels. You know, front-wheel drive car is going to be a different configuration than a
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	 S. Becker 3 where he's the author is describing a methodology for designing a driveline system, if you could read that A. Section? Q out loud. Yes, please. A. "Based on the presented materials, one could notice that a methodology for designing driveline systems should provide a way to optimally manage power distributions to the drive wheels and to determine the optimum characteristics of driveline systems based on the criteria of the operational properties and link these vehicle operational properties' optimization with vehicle dynamics improvement and finally lead to the the required vehicle performance and technical efficiency." Q. Do you agree that that's effectively 	$ \begin{array}{c} 1\\ 2\\ 3\\ 4\\ 5\\ 6\\ 7\\ 8\\ 9\\ 10\\ 11\\ 12\\ 13\\ 14\\ 15\\ 16\\ 17\\ 18\\ \end{array} $	S. Becker would include those three parameters that are listed here as A, B, and C? A. Sure. Q. Okay. Let's specifically look at some of these operational properties that are listed in figure 3. Can you describe for me depending on, let's say, the desired vehicle operational property for let's take handling, you know, how would that impact the driveline design? MS. MANDRUSIAK: Objection, form. A. With three features. One, the weight of the driveline system is going to affect handling. Two, the power distribution to the wheels. You know, front-wheel drive car is going to be a different configuration than a rear-wheel drive car. You have understeer,
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	Page 102		Page 103
1	S. Becker	1	S. Becker
2		2	
	Is there anything else? Oh, yeah.	3	that.
3	And again, biasing to affect steering.		Q. Okay. So so for the next line of
4	Q. So these are all	4	questioning, I guess I'm going to focus on how
5	A and efficiency. Sorry, last one.	5	various of these vehicle operational properties
6	Q. So if you're looking to design a car	6	that are listed in figure 3, how they impact
7	that has, let's say, superior handling	7	driveline design. So that's sort of the
8	capabilities, the list of kind of kind of	8	umbrella kind of framework for this line of
9	functions that you just described are all	9	these next set of questions.
10	relevant analyses to then design a driveline	10	So with respect to turnability, if
11	system that has superior handling.	11	that's an important kind of characteristic for
12	Is that is that correct?	12	a vehicle, how would that impact the design of
13	Is that a correct characterization of	13	the driveline system?
14	your testimony?	14	A. Well, it's an important
15	A. It's	15	characteristic for every vehicle. The effects
16	MS. MANDRUSIAK: Objection, form.	16	of the driveline system on turnability's a
17	A. It's a partial characterization. You	17	better characterization in that if you've got
18	know, the steering the handling of the	18	a a locked system, you're going to reduce
19	vehicle is first and foremost going to be	19	your turnability. If you have clutches that
20	affected by your steering control scheme. So	20	are partially engaging, you can affect or
21	the tractive effort the tractive the	21	improve steerability, turnability.
22	tractionability at the wheel and your steering	22	So the driveline system interacts and
23	ratio, steering column response are are	23	affects turnability, but you want good
24	going to be your primary players, and then your	24	turnability in all vehicles, and that's going
25	driveline's going to be a feature to augment	25	to be defined by your steering characteristics,
			· · · ·
	$\mathbf{D} \mathbf{a} \mathbf{a} = 104$		
	Page 104		Page 105
1			
1 2	S. Becker	1	S. Becker
1 2 3	S. Becker so your upfront geometry.		S. Becker A. Well, generally, the more open the
2 3	S. Becker so your upfront geometry. Q. Are there certain hardware and/or	1 2 3	S. Becker A. Well, generally, the more open the system is, in other words, the less resistive,
2 3 4	S. Becker so your upfront geometry. Q. Are there certain hardware and/or software capability of a driveline system that	1 2 3 4	S. Becker A. Well, generally, the more open the system is, in other words, the less resistive, the better the turnability will be.
2 3 4 5	S. Becker so your upfront geometry. Q. Are there certain hardware and/or software capability of a driveline system that impacts turnability?	1 2 3 4 5	S. Becker A. Well, generally, the more open the system is, in other words, the less resistive, the better the turnability will be. Q. Less resistive to what?
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	Page 106		Page 107
1	S. Becker	1	S. Becker
2	operational parameters, you would also have to	2	MS. MANDRUSIAK: Objection, form.
3		3	
	look at the specifics of the hardware and how		A. No, that would have to be developed.
4	that impacts, in this case, let's say	4	You could interchange a variety of those all
5	turnability?	5	except for the locked differential. Once you
6	A. Yes, yeah. Any hardware you put in	6	lock the differential, you're you're going
7	the vehicle you'd have to develop for that	7	to affect the turnability.
8	vehicle whether you choose to use a mechanical	8	BY MS. SHAH:
9	diff, clutch diff, open diff, a locked diff.	9	Q. What's involved with interchanging
10	Q. And, I'm sorry, when you're referring	10	those differential components?
11	to "diff," you're referring to differential?	11	A. Well, it goes back to the design
12	A. Yes, sorry.	12	development development, verification and
13	Q. That's just for the record.	13	predictability and reliability planning. So
14	And so would every change then to	14	you you'd go through your full DVP&R
15	the all these different kinds of well,	15	process.
16	let's just focus on differentials.	16	Q. I'm sorry, there's an acronym you
17	You mentioned I think four different	17	used. What does that stand for?
18	kinds of differentials: A mechanical	18	A. DVP&R? Design, validation
19	differential, a clutch differential, open	19	development, validation, predictability, and
20	differential, and a locked differential.	20	reliability, what I'd said just before that.
21	Would changes would moving from	21	Q. And so for every architecture change
22	one of those differentials to the other	22	that's proposed, you would go through this
23	differential have an impact then with respect	23	
23 24			what you refer to as DVP&R process?
24 25	to the resultant turnability that the vehicle can achieve?	24	A. Exactly.
25	can achieve?	25	Q. Is that correct?
	Page 108		Page 109
1			
1	S. Becker	1	S. Becker
2	S. Becker So for an iterative process, which is	1 2	S. Becker listed here?
2 3	S. Becker So for an iterative process, which is for as far as I understand, what you	1 2 3	S. Becker listed here? A. Yes.
2 3 4	S. Becker So for an iterative process, which is for as far as I understand, what you mentioned was driveline designs are iterative	1 2 3 4	S. Becker listed here? A. Yes. Q. You see in operational parameter?
2 3 4 5	S. Becker So for an iterative process, which is for as far as I understand, what you mentioned was driveline designs are iterative that so for every iteration of a component	1 2 3 4 5	S. Becker listed here? A. Yes. Q. You see in operational parameter? How would that operational parameter impact
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$\begin{array}{c} 2\\ 3\\ 4\\ 5\\ 6\\ 7\\ 8\\ 9\\ 10\\ 11\\ 12\\ 13\\ 14\\ 15\\ 16\\ 17\\ 18\\ 9\\ 20\\ 21\\ 22\\ 22\\ 22\\ 22\\ 22\\ 22\\ 22\\ 22\\ 22$	S. Becker So for an iterative process, which is for as far as I understand, what you mentioned was driveline designs are iterative that so for every iteration of a component change, there would be you would a designer would essentially go through this DVP&R process? A. Yes. MS. MANDRUSIAK: Objection, form. A. And other processes, but yes. BY MS. SHAH: Q. And what other processes would be involved? A. In the DVP&R process, that's just your development plan for predictability and reliability. You would also have oh, what the hell's it called? It's kind of the fault tree for what's going to break. I forgot what it's called right now, but it's basically a durability plan. Q. Okay. All right, so then again	$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\2\\13\\14\\15\\16\\17\\18\\9\\20\\21\\22\end{array} $	 S. Becker listed here? A. Yes. Q. You see in operational parameter? How would that operational parameter impact driveline design? A. Well, there's three parameters in that box, tractive my copy stinks. Velocity and fuel. And those are kind of three different things. So, you know, each one would need to be addressed. Q. Okay. A. In general, like let's just say we change out a differential. You're going to have to look at the change to the fuel economy. Q. All right. A. You change out a differential, it's going to change your tractive effort and how each wheel on that axle system is going to respond. Q. And what is done then to understand the impact on fuel economy when you make that
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28 (Pages 106 to 109)

	Page 110		Page 111
1	S. Becker	1	S. Becker
2	Q. Okay.	2	So then if some new technology or
3	A. And we're going to model the drag	3	change in technology was intended to be
4	caused by the system. And then we're going to	4	applied, it would either be a problem-solving
5	model a vehicle through various maneuvers,	5	technique with the problem being cost, weight,
6	typical maneuvers for whatever that product is.	6	performance, or some other problem. Then that
7	And they'll develop an estimate fuel economy	7	would become part of that product. Or it would
8	because they know what the losses are.	8	be a change implemented in some new release of
9	Q. Yes.	9	that product.
10	A. Eventually, parts would be made and	10	So in other words, like a model year
11	you would verify that and validate it, then you	11	refresh or something like that. So it would be
12	would productionize it.	12	part of the overall systems.
13	Q. And so as you're going through	13	And then what they do is any CN, any
14	different iterations, you for each iteration	14	change notice, they'll try to group as many of
15	you would then model the how the vehicle	15	those together so that everything's getting
16	functions relative to fuel economy losses?	16	validated at once.
17	A. Yeah. Generally, they would do that	17	Q. And then turning to the next
18	upfront in the the early concept phase. You	18	there's another box in figure 3 again of page 2
19	know, we wouldn't typically take some brand new	19	of Exhibit 2, and that just refers to off-road
20	technology in the middle of a full-on	20	mobility.
21	development program after we've already decided	21	Could you explain how off-road
22	on the concept, made prototypes, and then we	22	mobility impacts driveline systems and their
23	wouldn't just swap in something new. That	23	design?
24	would be locked until the the vehicle's	24	A. Sure. That one's heavily tied to the
25	validated.	25	suspension as well. And off-road mobility is
	Page 112		Page 113
1	S. Becker	1	S. Becker
2	again kind of tied to tractive and velocity.	2	differences between the driveline system then
3	In other words, how much slip are you going to	3	for again, let's say take a dune buggy
4	allow, how much distribution of torque are you		
5	······································	14	versus a passenger vehicle?
	going to apply, and then how are you going to	4	versus a passenger vehicle? A. Definitely.
	going to apply, and then how are you going to interact with the weight shift of the vehicle	5	A. Definitely.
6	interact with the weight shift of the vehicle	5 6	A. Definitely.Q. And what are those?
6 7	interact with the weight shift of the vehicle and torque shift at the same time. And a lot	5 6 7	A. Definitely.Q. And what are those?What kind of differences would be
6 7 8	interact with the weight shift of the vehicle and torque shift at the same time. And a lot of that goes back to the marketing of the	5 6 7 8	A. Definitely.Q. And what are those?What kind of differences would be would one be able to identify?
6 7 8 9	interact with the weight shift of the vehicle and torque shift at the same time. And a lot of that goes back to the marketing of the vehicle.	5 6 7 8 9	 A. Definitely. Q. And what are those? What kind of differences would be would one be able to identify? A. On the dune buggy, you're going to be
6 7 8 9 10	interact with the weight shift of the vehicle and torque shift at the same time. And a lot of that goes back to the marketing of the vehicle. Again, you know, like a Jeep brand	5 6 7 8 9 10	 A. Definitely. Q. And what are those? What kind of differences would be would one be able to identify? A. On the dune buggy, you're going to be more focused on locked systems. And not
6 7 9 10 11	interact with the weight shift of the vehicle and torque shift at the same time. And a lot of that goes back to the marketing of the vehicle. Again, you know, like a Jeep brand vehicle's not going to have the same off-road	5 7 8 9 10 11	 A. Definitely. Q. And what are those? What kind of differences would be would one be able to identify? A. On the dune buggy, you're going to be more focused on locked systems. And not necessarily. You know, it could be a sand dune
6 7 9 10 11 12	interact with the weight shift of the vehicle and torque shift at the same time. And a lot of that goes back to the marketing of the vehicle. Again, you know, like a Jeep brand vehicle's not going to have the same off-road characteristics as a Chrysler, or a Chevy's not	5 6 7 8 9 10 11	 A. Definitely. Q. And what are those? What kind of differences would be would one be able to identify? A. On the dune buggy, you're going to be more focused on locked systems. And not necessarily. You know, it could be a sand dune buggy where you want to allow a little bit of
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6 7 9 10 11 12 13 14 15	interact with the weight shift of the vehicle and torque shift at the same time. And a lot of that goes back to the marketing of the vehicle. Again, you know, like a Jeep brand vehicle's not going to have the same off-road characteristics as a Chrysler, or a Chevy's not going to have the same off-road characteristics as a GMC. Q. What about a dune buggy as compared	5 6 7 8 9 10 11 12 13 14 15	 A. Definitely. Q. And what are those? What kind of differences would be would one be able to identify? A. On the dune buggy, you're going to be more focused on locked systems. And not necessarily. You know, it could be a sand dune buggy where you want to allow a little bit of slip. A passenger vehicle's not going to be as concerned with locking vehicle, locking axles and things of that nature for tractive effort
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6 7 8 9 10 11 12 13 14 15 16 17 18 20 21 22	 interact with the weight shift of the vehicle and torque shift at the same time. And a lot of that goes back to the marketing of the vehicle. Again, you know, like a Jeep brand vehicle's not going to have the same off-road characteristics as a Chrysler, or a Chevy's not going to have the same off-road characteristics as a GMC. Q. What about a dune buggy as compared to a passenger vehicle? A. Sure. The dune buggies, we we don't typically employ the all-wheel drive systems except for the very high-end dune buggies. They're they're more frequently looking for only off-road capability. You know, there's no on-road capability so it's 	5 6 7 9 10 11 12 13 14 15 16 17 18 9 20 21 22	 A. Definitely. Q. And what are those? What kind of differences would be would one be able to identify? A. On the dune buggy, you're going to be more focused on locked systems. And not necessarily. You know, it could be a sand dune buggy where you want to allow a little bit of slip. A passenger vehicle's not going to be as concerned with locking vehicle, locking axles and things of that nature for tractive effort if the dune buggy's all-wheel drive. Sorry. Q. Is that typically the case? Are there are there all-wheel drive I guess is there a demand for all-wheel drive buggies, off-road buggies like that? A. Yeah, that's generally in the higher

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1 S. Becker 1 S. Becker 2 two-wheel drive, wasn't all-wheel drive or anything, and it could go through anything, just slowly. 1 S. Becker 4 just slowly. 2 on-road all-wheel drive sports car compared to a high-performance off-road vehicle, you're not going to see drastic differences in components. Not would the - the mid high-range ones as 1 S. Becker 6 more power and more speed. The all-wheel drive comes in, adds a form of complexity, and yout? 7 And you're going to see in the off-road vehicle greater - or different other 8 well as the very high end ones. You don't see them on the cheap ones. 10 No again, it it depends on the - 1 Q. So how would the - specifically in terms of components and the design of the tarts more designed for on-the-road 17 No again, it it depends on your - you contarge to point and you know, it it's a market basket. You can go to the market and maket, you can go to the market and maket, you can go to the market and maket, you can you want? Q. So can you preyt much mix and match? 16 off-road vehicles inghtweight. 20 No are you preyt much mix and match? 2 more designed for aphication. 24 You regoing to aphication. 24 2 something like that. They won't fit. They work function together? No texactly. You - you would like to industry ask me that s		Page 114		Page 115
2 wo-wheel drive, wasn't all-wheel drive or 2 on-road all-wheel drive sports car compared to 4 just Slowly. 3 a high-performance off-road vehicle, you're not 5 So the higher end ones were really 5 componentry. You're going to see control 6 more power and more speed. The all wheel drive 5 And you're going to see control 7 components, adds a form of complexity, and you'll 7 And you're going to see control 8 see them on the - the mid high-range ones as off-road vehicle areare - or different other 9 well as the very high end ones. You don't see 10 and te. 10 O. So how would the - specifically in 11 So again, it it depends on the 12 terms of components, how would in these kinds of 10 off-road vehicle as compared to a vehicle 14 off-road vehicle as compared to a vehicle 16 same thing you can with the car. It just 14 applications? 18 you readerstricts. Q. So can you pretty much mix and match? 15 off-road vehicle's bigbreight. 20 Can whatever set of components together? 16 off-road vehicle's bigbreight. 21	1	S. Becker	1	S. Becker
3 anything, and i could go through anything, just slowly. 3 a high-performance off-road vehicle, you're not going to see drastic differences in comes now and more speed. The all-wheel drive 6 more power and more speed. The all-wheel drive comes now and more speed. The all-wheel drive 7 more power and more speed. The all-wheel drive comes now and more speed. The all-wheel drive 8 see them on the -the mid high-range ones as well as the very high end ones. You don't see off-road vehicle greater - or different other 10 Q. So how would the - specifically in 11 So again, it it depends on the 11 Q. So how would in these kinds of 13 you know, it it's a market basket. You can go to the market and make your due buggy or 16 off-road vehicles are off-road vehicles in whe drive depends on your - your cost target point and your performance characteristics. 10 A. You're going to - 19 Q. So can you pretry much mix and match? 11 S. Becker 21 N. You're going to generally see bigger 21 S. Becker 21 N. You're going to generally see bigger 22 components, you know, so it really 23 Not exactly. You you would like 23 somethin				
4 just slowly. 4 going to see drastic differences in componentry. You're going to see control schema differences. 5 So the higher end ones were really more power and more speed. The all-wheel drive is componentry. You're going to see ontrol schema differences. 7 7 componentry. You're going to see control schema differences. 7 8 well as the very high end ones. You don't see them on the cheap ones. 7 And you're going to see in the off-road vehicles, how do the drivelines differ 10 Os how would the specifically in the more the sign of the ord f-road vehicles, how do the drivelines differ 7 So again, it it depends on the the specifically in the specifics of what you're comparing because, you know, oit it as market basket. You can go to the market and make your dune buggy or off-road vehicles, how do the drivelines differ 7 15 off-road vehicles, how do the drivelines differ 16 5 Same thing you can with the car. It just depends on your your cost target point and your performance characteristics. 16 off-road vehicles, how down, see tigger 8 No want? Can - whatever set of components and controls you want? 17 that's more design of nothe-road 17 depends on the specific application. 20 So are you pretty much mix and match? 18 Smaller components, you would like 20 So				
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22Q. What if you you know, when22you're talking about cost and weight and23you're kind of selecting from this basket that23complexity of integration.24you referred to of available components and24If you just use a front-wheel drive	20		20	Q. Are there any constraints that exist?
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24 you referred to of available components and 24 If you just use a front-wheel drive				
	23			
25 technologies, is it a complicated process to 25 vehicle, you know, you got no all-wheel drive	24	•		
	25	technologies, is it a complicated process to	25	vehicle, you know, you got no all-wheel drive

30 (Pages 114 to 117)

1

	Page 110		Page 119
1	S. Becker	1	S. Becker
2	systems to concern yourself, with there's lower	2	A. They're always coming up with new
3	complexity, lower weight, lower cost.	3	control systems. The whole mechatronic concept
		4	to driveline is less than is about 20 years
4	You put all-wheel drive on the		5
5	vehicle, you now have to connect the two axles	5	old.
6	together and then you have to decide how you	6	Q. Okay.
7	want it to work. So then you increased your	7	A. Before that, they were almost all
8	development complexity. So then let's say you	8	mechanical.
9	want to use, you know, like an existing product	9	Q. So let's say over the last decade if
10	like an open differential that you employed	10	you if you you know, if you got sort of
11	before. Then that's just a matter of	11	an array of components that are available and
12	packaging, fit and function and integrating it	12	array of, let's say, control strategies, is it
13	to the system, which is going to happen	13	possible then to effectively somewhat routinely
14^{10}	anyways.	14	mix and match those components and control
15	• •	15	strategies to achieve, I guess, whatever end
	So then let's incorporate, you know,	16	
16	additional control schemes where we're going to		vehicle characteristics you're looking for?
17	start tagging each one of the sensors and	17	A. Initial concept and cost no object,
18	applying torque vectoring or whatnot. You got	18	sure.
19	to make sure that all works so you're going to	19	Q. Are there any functional constraints
20	have greater development costs.	20	that would exist that would limit your ability
21	Q. So the the connection of different	21	to mix and match components and control
22	components and different control systems that	22	strategies?
23	are potentially available to define a	23	A. Well, again, cost is a functional
24	particular driveline system, they're well known	24	constraint. Weight's a functional constraint.
25	and largely routine, in your opinion?	25	NVH is you know, the performance
	Page 120		Page 121
1	S. Becker	1	S. Becker
2	characteristics, they're all functional	2	today?
3	constraints. So each thing you put in the	3	A. Definitely.
4	vehicle needs to be developed.	4	Q. How would you characterize the nature
5	Q. Let me ask more specifically. Are		Q. How would you characterize the hattice
		15	of your review?
6		5	of your review?
6	there specific component characteristics in	6	MS. MANDRUSIAK: Objection, form.
7	there specific component characteristics in their functionality that limit their ability to	6 7	MS. MANDRUSIAK: Objection, form. A. I don't know that I would. It was an
7 8	there specific component characteristics in their functionality that limit their ability to work with other components and/or control	6 7 8	MS. MANDRUSIAK: Objection, form. A. I don't know that I would. It was an investigation.
7 8 9	there specific component characteristics in their functionality that limit their ability to work with other components and/or control strategies?	6 7 8 9	MS. MANDRUSIAK: Objection, form. A. I don't know that I would. It was an investigation. BY MS. SHAH:
7 8 9 10	there specific component characteristics in their functionality that limit their ability to work with other components and/or control strategies? A. I would have to think about it. I	6 7 8 9 10	MS. MANDRUSIAK: Objection, form. A. I don't know that I would. It was an investigation. BY MS. SHAH: Q. Have you read every page of this
7 8 9 10 11	 there specific component characteristics in their functionality that limit their ability to work with other components and/or control strategies? A. I would have to think about it. I you know, I'd have to if if you gave me a 	6 7 8 9 10 11	MS. MANDRUSIAK: Objection, form. A. I don't know that I would. It was an investigation. BY MS. SHAH: Q. Have you read every page of this patent?
7 8 9 10 11 12	there specific component characteristics in their functionality that limit their ability to work with other components and/or control strategies? A. I would have to think about it. I you know, I'd have to if if you gave me a specific example, I I I could review	6 7 9 10 11	MS. MANDRUSIAK: Objection, form. A. I don't know that I would. It was an investigation. BY MS. SHAH: Q. Have you read every page of this patent? A. I believe so. Yeah, some pages
7 8 9 10 11 12 13	there specific component characteristics in their functionality that limit their ability to work with other components and/or control strategies? A. I would have to think about it. I you know, I'd have to if if you gave me a specific example, I I I could review that, but I'm not coming up with one	6 7 8 9 10 11 12 13	MS. MANDRUSIAK: Objection, form. A. I don't know that I would. It was an investigation. BY MS. SHAH: Q. Have you read every page of this patent? A. I believe so. Yeah, some pages didn't have words.
7 8 9 10 11 12 13 14	there specific component characteristics in their functionality that limit their ability to work with other components and/or control strategies? A. I would have to think about it. I you know, I'd have to if if you gave me a specific example, I I I could review	6 7 9 10 11	MS. MANDRUSIAK: Objection, form. A. I don't know that I would. It was an investigation. BY MS. SHAH: Q. Have you read every page of this patent? A. I believe so. Yeah, some pages
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7 8 9 10 11 12 13 14	there specific component characteristics in their functionality that limit their ability to work with other components and/or control strategies? A. I would have to think about it. I you know, I'd have to if if you gave me a specific example, I I I could review that, but I'm not coming up with one specifically. Doesn't mean they don't exist.	6 7 8 9 10 11 12 13 14	MS. MANDRUSIAK: Objection, form. A. I don't know that I would. It was an investigation. BY MS. SHAH: Q. Have you read every page of this patent? A. I believe so. Yeah, some pages didn't have words. Q. So turning to the back of the patent,
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7 8 9 10 11 12 13 14 15 16 17	there specific component characteristics in their functionality that limit their ability to work with other components and/or control strategies? A. I would have to think about it. I you know, I'd have to if if you gave me a specific example, I I I could review that, but I'm not coming up with one specifically. Doesn't mean they don't exist. It's a very broad hypothetical. MS. SHAH: Off the record? (Discussion held off the record.)	6 7 8 9 10 11 12 13 14 15 16 17	MS. MANDRUSIAK: Objection, form. A. I don't know that I would. It was an investigation. BY MS. SHAH: Q. Have you read every page of this patent? A. I believe so. Yeah, some pages didn't have words. Q. So turning to the back of the patent, the last two pages of the patent, there's a section that refers to that sort of starts starts off with the heading "The
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7 8 9 10 11 12 13 14 15 16 17 18 19	there specific component characteristics in their functionality that limit their ability to work with other components and/or control strategies? A. I would have to think about it. I you know, I'd have to if if you gave me a specific example, I I I could review that, but I'm not coming up with one specifically. Doesn't mean they don't exist. It's a very broad hypothetical. MS. SHAH: Off the record? (Discussion held off the record.) (Becker Exhibit No. 3 was marked for identification.)	6 7 8 9 10 11 12 13 14 15 16 17 18 19	MS. MANDRUSIAK: Objection, form. A. I don't know that I would. It was an investigation. BY MS. SHAH: Q. Have you read every page of this patent? A. I believe so. Yeah, some pages didn't have words. Q. So turning to the back of the patent, the last two pages of the patent, there's a section that refers to that sort of starts starts off with the heading "The invention claimed is" under column 12 of the second-to-last page of Exhibit 3.
7 8 9 10 11 12 13 14 15 16 17 18 19 20	there specific component characteristics in their functionality that limit their ability to work with other components and/or control strategies? A. I would have to think about it. I you know, I'd have to if if you gave me a specific example, I I I could review that, but I'm not coming up with one specifically. Doesn't mean they don't exist. It's a very broad hypothetical. MS. SHAH: Off the record? (Discussion held off the record.) (Becker Exhibit No. 3 was marked for identification.) BY MS. SHAH:	$ \begin{array}{c} 6\\ 7\\ 8\\ 9\\ 10\\ 12\\ 13\\ 14\\ 15\\ 16\\ 17\\ 18\\ 20\\ \end{array} $	MS. MANDRUSIAK: Objection, form. A. I don't know that I would. It was an investigation. BY MS. SHAH: Q. Have you read every page of this patent? A. I believe so. Yeah, some pages didn't have words. Q. So turning to the back of the patent, the last two pages of the patent, there's a section that refers to that sort of starts starts off with the heading "The invention claimed is" under column 12 of the second-to-last page of Exhibit 3. Do you see that?
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7 8 9 10 12 13 14 15 16 17 18 20 21 22	 there specific component characteristics in their functionality that limit their ability to work with other components and/or control strategies? A. I would have to think about it. I you know, I'd have to if if you gave me a specific example, I I I could review that, but I'm not coming up with one specifically. Doesn't mean they don't exist. It's a very broad hypothetical. MS. SHAH: Off the record? (Discussion held off the record.) (Becker Exhibit No. 3 was marked for identification.) BY MS. SHAH: Q. If you could identify for me what's been marked as Exhibit 3, please. 	$\begin{array}{c} 6\\ 7\\ 8\\ 9\\ 10\\ 12\\ 13\\ 15\\ 17\\ 18\\ 9\\ 20\\ 21\\ 22\\ 22\\ 22\\ 22\\ 22\\ 22\\ 22\\ 22\\ 22$	 MS. MANDRUSIAK: Objection, form. A. I don't know that I would. It was an investigation. BY MS. SHAH: Q. Have you read every page of this patent? A. I believe so. Yeah, some pages didn't have words. Q. So turning to the back of the patent, the last two pages of the patent, there's a section that refers to that sort of starts starts off with the heading "The invention claimed is" under column 12 of the second-to-last page of Exhibit 3. Do you see that? A. Correct. Q. Do you understand that those are
7 8 9 10 11 12 13 14 15 16 17 18 20 21 22 21 22 23	 there specific component characteristics in their functionality that limit their ability to work with other components and/or control strategies? A. I would have to think about it. I you know, I'd have to if if you gave me a specific example, I I I could review that, but I'm not coming up with one specifically. Doesn't mean they don't exist. It's a very broad hypothetical. MS. SHAH: Off the record? (Discussion held off the record.) (Becker Exhibit No. 3 was marked for identification.) BY MS. SHAH: Q. If you could identify for me what's been marked as Exhibit 3, please. A. Yeah, this is the the GKN, what I 	$\begin{array}{c} 6\\ 7\\ 8\\ 9\\ 10\\ 11\\ 13\\ 14\\ 15\\ 17\\ 18\\ 9\\ 20\\ 12\\ 23\\ 23\\ 23\\ 23\\ 23\\ 23\\ 23\\ 23\\ 23\\ 2$	 MS. MANDRUSIAK: Objection, form. A. I don't know that I would. It was an investigation. BY MS. SHAH: Q. Have you read every page of this patent? A. I believe so. Yeah, some pages didn't have words. Q. So turning to the back of the patent, the last two pages of the patent, there's a section that refers to that sort of starts starts off with the heading "The invention claimed is" under column 12 of the second-to-last page of Exhibit 3. Do you see that? A. Correct. Q. Do you understand that those are claims of the patent?
7 8 9 10 12 13 14 15 16 17 18 20 21 22	 there specific component characteristics in their functionality that limit their ability to work with other components and/or control strategies? A. I would have to think about it. I you know, I'd have to if if you gave me a specific example, I I I could review that, but I'm not coming up with one specifically. Doesn't mean they don't exist. It's a very broad hypothetical. MS. SHAH: Off the record? (Discussion held off the record.) (Becker Exhibit No. 3 was marked for identification.) BY MS. SHAH: Q. If you could identify for me what's been marked as Exhibit 3, please. 	$\begin{array}{c} 6\\ 7\\ 8\\ 9\\ 10\\ 12\\ 13\\ 15\\ 17\\ 18\\ 9\\ 20\\ 21\\ 22\\ 22\\ 22\\ 22\\ 22\\ 22\\ 22\\ 22\\ 22$	 MS. MANDRUSIAK: Objection, form. A. I don't know that I would. It was an investigation. BY MS. SHAH: Q. Have you read every page of this patent? A. I believe so. Yeah, some pages didn't have words. Q. So turning to the back of the patent, the last two pages of the patent, there's a section that refers to that sort of starts starts off with the heading "The invention claimed is" under column 12 of the second-to-last page of Exhibit 3. Do you see that? A. Correct. Q. Do you understand that those are

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	Page 122		Page 123
1	S. Becker	1	S. Becker
2	of the purpose of these claims?	2	Was there a patent involved in that
3	MS. MANDRUSIAK: Objection, form,	3	patent matter?
4	foundation.	4	A. Definitely.
5	A. I believe these claims are the	5	Q. And did you look at claims there to
6	objective of this is what the patent claims to	6	understand what the scope of those claims were?
7	be patentable or unique.	7	A. Yes.
8	BY MS. SHAH:	8	Q. Was that the first time that you
9	Q. Are you reasonably comfortable with	9	looked at a set of patent claims?
10	the the the language that's articulated	10	A. No.
11	in these claims and understanding what they	11	Q. So when you look when you look at
12	mean?	12	a set of claims, what what process do you
13	MS. MANDRUSIAK: Objection, form.	13	undertake to understand the scope of those
14	A. I had to figure them out. They	14	claims?
15	weren't the industry standard language, but I	15	A. Well, there's a a terminology used
16	understand them.	16	in the claims, and they're usually described
17	BY MS. SHAH:	17	throughout the patent. And then there's
18	Q. So is the is the first time that	18	letters and numbers associated or figures
19	you looked at patent claims was the first	19	and numbers associated to the components
20	engagement you had as a patent expert or as a	20	described in the claims. And it's kind of an
21	technical expert for a patent matter?	21	investigation to figure out, you know, what
22	A. I don't know what you mean.	22	what everybody's talking about.
23	Q. You indicated earlier that you were	23	Q. Okay. So from your evaluation of the
24	retained by a different company for a patent	24	'440 patent, what was your understanding of
25	matter.	25	kind of the objectives of the patent?
			· · · · · · · · · · · · · · · · · · ·
	Page 124	1	Page 125
-			
1	S. Becker	1	S. Becker
2	S. Becker A. The overall goals?	1 2	S. Becker others were as an employee of Magna or New
2 3	S. Becker A. The overall goals? Q. Yes.	1 2 3	S. Becker others were as an employee of Magna or New Venture Gear, New Process Gear. We have 50 or
2 3 4	S. Becker A. The overall goals? Q. Yes. A. They were describing sort of having a	1 2 3 4	S. Becker others were as an employee of Magna or New Venture Gear, New Process Gear. We have 50 or so patents.
2 3 4 5	S. Becker A. The overall goals? Q. Yes. A. They were describing sort of having a shutdown section where a section of the	1 2 3 4 5	S. Becker others were as an employee of Magna or New Venture Gear, New Process Gear. We have 50 or so patents. Q. Okay. So you were reviewing the
2 3 4 5 6	S. Becker A. The overall goals? Q. Yes. A. They were describing sort of having a shutdown section where a section of the driveline was not spinning for fuel efficiency.	1 2 3 4 5 6	S. Becker others were as an employee of Magna or New Venture Gear, New Process Gear. We have 50 or so patents. Q. Okay. So you were reviewing the patents for what purpose then?
2 3 4 5 6 7	S. Becker A. The overall goals? Q. Yes. A. They were describing sort of having a shutdown section where a section of the driveline was not spinning for fuel efficiency. There if I can look at my declaration, I've	1 2 3 4 5 6 7	S. Becker others were as an employee of Magna or New Venture Gear, New Process Gear. We have 50 or so patents. Q. Okay. So you were reviewing the patents for what purpose then? A. They were our products. It was just
2 3 4 5 6 7 8	S. Becker A. The overall goals? Q. Yes. A. They were describing sort of having a shutdown section where a section of the driveline was not spinning for fuel efficiency. There if I can look at my declaration, I've got them outlined there easily; otherwise, it's	1 2 3 4 5 6 7 8	S. Becker others were as an employee of Magna or New Venture Gear, New Process Gear. We have 50 or so patents. Q. Okay. So you were reviewing the patents for what purpose then? A. They were our products. It was just internal company work.
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2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 20 21 22 23	S. Becker A. The overall goals? Q. Yes. A. They were describing sort of having a shutdown section where a section of the driveline was not spinning for fuel efficiency. There if I can look at my declaration, I've got them outlined there easily; otherwise, it's going to take a few seconds. (Becker Exhibit No. 4 was marked for identification.) BY MS. SHAH: Q. So if I could quickly ask you one question not related to the declaration, you mentioned when I was asking you about reviewing patent claims that you did review patent claims prior to your engagement as a patent expert for I think it was ARB or or something like that. In what capacity did you or what was the purpose of your review of patent claims prior to that? A. One was for the truck brush.	$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\12\\14\\15\\16\\17\\18\\9\\20\\21\\22\\23\end{array} $	 S. Becker others were as an employee of Magna or New Venture Gear, New Process Gear. We have 50 or so patents. Q. Okay. So you were reviewing the patents for what purpose then? A. They were our products. It was just internal company work. Q. I see. A. I wasn't on the patents. Q. Yes. So were they from a competitive standpoint to sort of do some benchmarking, or were they to actually look at your own to understand your own patent portfolio? A. I was looking mostly at our own patents at that time. We had other people looking at competitive patents, not me. Q. And had at that time, had you had any meetings or discussion with patent attorneys to understand kind of how one interprets a patent, and specifically, patent claims?

	Page 126	'	Page 127
1	S. Becker	1	S. Becker
2	Q. Okay. He was an internal attorney	2	Q. Declaration of Steven J. Becker. Do
3	with employed by, I guess, Magna?	3	you see that?
4		4	A. Correct.
	A. I have no idea. He was the guy I was		
5	told to call.	5	Q. And I believe you wanted to review
6	Q. I see. All right.	6	this to answer an earlier question. Okay, and
7	And did you get a tutorial of how one	7	this was the issue of so the the question
8	reads a patent, and specifically, patent	8	was: What was your understanding of the
9	claims?	9	objectives of the patents, of the '440 patents?
10	A. Not specifically, not like a	10	And then you specifically mentioned
11	tutorial. That's an interesting thought.	11	the shutdown section.
12	Q. Have you ever received a tutorial of	12	A. Correct.
13	how patent claims are to be interpreted?	13	Q. And you wanted to take a look at
14	A. No.	14	it's based on your answer, it seemed like you
15	Q. So including up to date, you have not	15	wanted to take a look at your declaration to
16	received a tutorial of how a patent claim is to	16	understand something about the shutdown
17	be construed?	17	section.
18	A. Construed? Well	18	A. No, not about the shutdown section.
19	Q. Interpreted.	19	You had asked me to identify what the what I
20	A construed is "interpret" means	20	determined to be the claims of the patent.
21	you review the patent. You know, I don't know	21	Q. Okay.
22	that you need a tutorial to read.	22	A. I have them outlined in a table so it
23	Q. Okay. So let's turn to Exhibit 4,	23	makes them easier for me to read.
24	your which is your declaration.	24	Q. All right. Did so did you prepare
25	A. Sure.	25	this table that's, let's say let's start
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	Page 128	5	Page 129
1	S. Becker	1	S. Becker
2	with the table that is that begins on page	2	front axle, rear axle. You would have to have
3		3	
	18.		a disconnect or a coupling feature. That's it.
			a disconnect or a coupling feature. That's it. Yeah, the patent calls it the primary
4	A. Yes.	4	Yeah, the patent calls it the primary
4 5	A. Yes.Q. Did you prepare the table that's on	4 5	Yeah, the patent calls it the primary drivetrain and the secondary drivetrain. Those
4 5 6	A. Yes.Q. Did you prepare the table that's on pages 18 and continues on through pages 22?	4 5 6	Yeah, the patent calls it the primary drivetrain and the secondary drivetrain. Those are the two things that need to be connected.
4 5 6 7	A. Yes.Q. Did you prepare the table that's on pages 18 and continues on through pages 22?A. Yes, it's part of the declaration.	4 5 6 7	Yeah, the patent calls it the primary drivetrain and the secondary drivetrain. Those are the two things that need to be connected. Q. Are there any other purposes or goals
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4 5 7 8 9	 A. Yes. Q. Did you prepare the table that's on pages 18 and continues on through pages 22? A. Yes, it's part of the declaration. It goes on further. Q. Okay. And so can you explain to me 	4 5 7 8 9	Yeah, the patent calls it the primary drivetrain and the secondary drivetrain. Those are the two things that need to be connected. Q. Are there any other purposes or goals of the '440 patent? THE REPORTER: The last word? I
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33 (Pages 126 to 129)

			1490 131
1	S. Becker	1	S. Becker
2	though.	2	objectives of the '440 patent was to have a
3	BY MS. SHAH:	3	shutdown section. You also mentioned that one
4	Q. What else? What other features or	4	of the objectives of the '440 patent is to
5	aspects are okay, strike that.	5	include frictional couplings without
6	What other goals or objectives do you	6	differential gearing. Is that correct?
7	think were trying to be met by the '440 patent?	7	A. Well, there were two separate things.
8	MS. MANDRUSIAK: Objection, form,	8	One was to have frictional couplings and one is
9	foundation.	9	to have frictional couplings in place of the
10	A. There's another claim that they were	10	differential gearing.
11	achieving power distribution without	11	Q. Do those two objectives are those
12	differential gearing in the secondary axle.	12	two objectives combined at any point in time,
13	BY MS. SHAH:	13	or are they distinct?
14	Q. How is that achieved?	14	MS. MANDRUSIAK: Objection, form.
15	A. Frictional couplings according to the	15	A. They can be combined.
16	diagrams and and description, and	16	BY MS. SHAH:
17	Q. Is there a specific figure that sort	17	Q. Is there an embodiment or a figure
18	of you could point to that illustrates that	18	that shows the combination of those objectives?
19	architecture?	19	A. The ones I just mentioned,
20	A. Yes. Figure 3 shows that	20	specifically, again, figure 8, figure 13, 5,
21	architecture in the '440 patent, and figure 5	21	and 6.
22	and 6, and figure 8 and I think 10. I'd have	22	Q. And so in the figures that you just
23	to look in more detail, but possibly 12. And	23	mentioned, the the figure illustrates a
24	then that's it.	24	driveline design that both includes a shutdown
25	Q. So you mentioned that one of the	25	section as well as a two-clutch system that
	Page 132	1	Page 133
1	Page 132	1	Page 133
1	S. Becker	1	S. Becker
2	S. Becker does not have differential gearing; is that	2	S. Becker And then you would have to have two frictional
2 3	S. Becker does not have differential gearing; is that correct?	2 3	S. Becker And then you would have to have two frictional clutch packs to replace the differential. Or
2 3 4	S. Becker does not have differential gearing; is that correct? A. No, only figure 3 shows all of that.	2 3 4	S. Becker And then you would have to have two frictional clutch packs to replace the differential. Or one clutch pack could do the same.
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2 3 4 5 6 7 8	S. Becker does not have differential gearing; is that correct? A. No, only figure 3 shows all of that. Q. But it is in figure 3? A. What's that? Q. It would be in figure 3, the system	2 3 4 5 6 7 8	S. Becker And then you would have to have two frictional clutch packs to replace the differential. Or one clutch pack could do the same. Q. How would one clutch pack, I guess, replace a a differential? A. If you slipped either side. Q. And are there any other modifications
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1 S. Becker 2 Q. And when do you understand that date to be? 1 S. Becker 2 A. Date of the patent, July 10, 2012. 4 M. S. MANDRUSIAK: Objection, form. 4 A. Date of the patent, July 10, 2012. 4 A. Ibelieve the question is, was there a differential without differential gearing? 6 Q. Okay. Are you in your declaration you indicate there's a May 6, 2008 date that's also relevant. I can perhaps point you to an exact section. 9 PMS. SHAH: 7 Q. Are you familiar with where that date came from? 1 A. Just somebody. 11 1 Q. Are you familiar with where that date 11 A. Just somebody. 1 Q. Okay. Colkay. 11 A. Idon't have that in front of me. 4 Go kay. For this purpose, Levis just in conjunction with a clutch pack system without 13 One, you't shutting down, asection with the include dhe combination of a shutdown section if 2008 for purposes of the '440 patent. 19 2008. 2 M. Well, if's two separate features. 3. Kres. Not all in one, correct. 0. And it's your testimong when you's shutting down a section with the intention of reducing fuel consumption. Two, you're providing differential gearing? 2008. S. Becker 2 1 S. Becker		Page 134		Page 135
2 Q. And when do you understand that date 2 without differential gearing? 3 to be? MS. MANDRUSIAK: Objection, form. 4 A. Date of the patent, July 10, 2012. A. Thelives the question is, was there 5 And then it was filed April 30, 2009. a differential without differential gearing? 7 you indicate there's a May 6, 2008 date that's a differential without differential gearing? 8 also relevant. 1 can perhaps point you to an exact section. 0 A. I sec it on page 2. II just read it: "Was there a 10 A. I sec it on page 2. IQ. Arc you familiar with where that date 11 Q. Arc you familiar with where that date Q. Tul just read it: "Was there a 12 wastere a system that existed that included the combination of a shutdown section in 13 A. That may be related to the IS MS. MANDRUSIAK: Objection, form. 14 constantion of a shutdown section in WS. MANDRUSIAK: Objection, form. 15 Q. Okay. For this purpose, let's just The secter Q. And it's your testimony that the 2008 for purposes of the '440 patent. Page 136 A. Sust constal ad a shutdown 2008 was there a system that existed that<	1	S Becker	1	S Becker
3 to be? 3 MS. MANDŘUSIAČ: Objection, form. 4 A. Date of the patent, July 10, 2012. And then it was filed April 30, 2009. A. Ibelieve the question is, was there 6 Q. Okay. Are you in your declaration BY MS. SHAH: Combination of a shutdown section is 7 Q. Okay. Are you familiar with where that date 1 Q. Tag ou familiar with where that date 13 A. That may be related to the 13 A. Just somebody. 14 prosecution history document. 14 combination of a shutdown section in 14 prosecution history document. 14 combination of a shutdown section in 15 Q. Okay. For this purpose, Levis just 18 assume that the relevant time frame is May 6, 16 A. Idon't have that in front of me. 16 17 BY MS. SHAH: 17 Q. Okay. For this purpose, Levis just 18 38 2008 for purposes of the '440 patent. 19 2008. 18 actimation of a system that existed that 21 Q. And if's your testimony that the 2008. 2008, for this fuel operiod and the 24 had a clutch pack design would be obvious? 2 2 2 2 9 <td< td=""><td></td><td></td><td></td><td></td></td<>				
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5 And then it was filed April 30, 2009. 5 a differential without differential gearing? 6 Q. Okay, Are you in your declaration you indicate there's a May 6, 2008 date that's BY MS. SHAH: 8 also relevant. 1 can perhaps point you to an exact section. BY MS. SHAH: Q. No. Let me read back the actually, do you want to go ahead and1 can read it. 10 A. 1 see it on page 2. 10 A. Just somebody. Q. I'll just read it. 'Was there a actually, do you want to go ahead and1 can read it. 11 Q. Are you familiar with where that date came from? 11 A. Just somebody. 12 Q. Are you familiar with where that date came from? 11 A. Just somebody. 13 A. That may be related to the famo from? 20 Nasystem that existed that actuch pack system without differential gearing?'' 14 roorecution history document. 16 7 Q. Nas, First May 6, 2008. 15 Q. Okay. For this purpose, let's just 7 BY MS. SHAH: Q. As of this May on or before May 6, 2008. 16 knowledge that existed that actuch pack system that as a shutdown section compled with a different system that a shutdown section compled with a different system that had a shutdown section coupled with a different system that a shutdown section coupled with a different system that a shutdown section coupled with a diffe				
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35 (Pages 134 to 137)

	Page 138		Page 139
1	S. Becker	1	S. Becker
2	versus using one or more clutch packs?	2	differential with that or bias torque just
3	A. I'm sorry, you're going to have to go	3	front to rear or how you connect that rear
4	again.	4	clutch pack. It depends on how you connect to
5	Q. Is there a difference in terms of the	5	the rear clutch pack.
6	functionality of using a differential component	6	Q. Okay. Are there any functional
7	versus using one or more clutch packs?	7	constraints that are relevant in terms of how
8	A. They're both differential components	8	you arrange the various differential
9	unless you're talking about a one or more	9	components?
10	clutch packs outside the differential.	10	A. Well, again, it's it's weight,
11	Q. Yes.	11	cost, NVH, performance, performance being
12	A. Or in combination with the	12	distribution of torque and speed. And then, of
13	differential.	13	course, fuel efficiency.
14	Q. We'll have to take them one at a	14	Q. What are the different kinds of
15	time. Let's start with where the clutch packs	15	differentials that one could employ?
16	are outside of the differential.	16	A. There are Torsen gears; there are
10 17	A. So if the clutch pack's outside of	17	-
18	the differential, then you you need to	18	beveled gears; there are clutch pack design. There's one more. It's got this goofy spring
19	control how much you apply torque and monitor	19	thingy. I can't think of what it's called.
20	the speed of the two wheels relative to the	20	And then there's locked differentials
21	movement of the vehicle, so you'd need to look	21	where they don't actually differentiate so I
22 22	at the sensors.	22	don't know why they call them differentials.
23	If it's with the gearing, then you	23	But they're in a spot so I think that's why
24	you have differentiation and you have control	24	they call them differentials.
25 25	scheme as to whether you want to lock the	25	Q. So in the context of the '440 patent
2.5	· · · · · · · · · · · · · · · · · · ·	2.5	^
	Page 140		Page 141
			5
1	S. Becker	1	S. Becker
1 2	S. Becker when they talk about having power distribution	1 2	
			S. Becker
2	when they talk about having power distribution	2	S. Becker A. Generally, a control scheme again is
2 3	when they talk about having power distribution without differential gearing, do you understand	2 3	S. Becker A. Generally, a control scheme again is going to be cost, weight, performance, etc. Q. And those are readily substitutable
2 3 4	when they talk about having power distribution without differential gearing, do you understand that to be a system where the clutch packs	2 3 4	S. Becker A. Generally, a control scheme again is going to be cost, weight, performance, etc.
2 3 4 5	when they talk about having power distribution without differential gearing, do you understand that to be a system where the clutch packs would be within the differential	2 3 4 5	S. Becker A. Generally, a control scheme again is going to be cost, weight, performance, etc. Q. And those are readily substitutable to go from a bevel gear differential to one or more clutch packs?
2 3 4 5 6	when they talk about having power distribution without differential gearing, do you understand that to be a system where the clutch packs would be within the differential A. In the '440	2 3 4 5 6	S. Becker A. Generally, a control scheme again is going to be cost, weight, performance, etc. Q. And those are readily substitutable to go from a bevel gear differential to one or more clutch packs? A. Well, it's not, like, readily. It's
2 3 4 5 6 7 8	 when they talk about having power distribution without differential gearing, do you understand that to be a system where the clutch packs would be within the differential A. In the '440 Q or external? 	2 3 4 5 6 7	S. Becker A. Generally, a control scheme again is going to be cost, weight, performance, etc. Q. And those are readily substitutable to go from a bevel gear differential to one or more clutch packs? A. Well, it's not, like, readily. It's going to change those characteristics.
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$\begin{array}{c} 2\\ 3\\ 4\\ 5\\ 6\\ 7\\ 8\\ 9\\ 10\\ 11\\ 12\\ 13\\ 14\\ 15\\ 16\\ 17\\ 18\\ 9\\ 20\\ 21\\ \end{array}$	 when they talk about having power distribution without differential gearing, do you understand that to be a system where the clutch packs would be within the differential A. In the '440 Q or external? A. In the '440 patent, they were talking about the clutch packs being and replacing the the differential gearing so that changes the geometry and it becomes an RDM, or rear differential module, not a differential. Q. Okay. So it entirely eliminates the differential from the system and substitutes differential with one or more clutch packs? A. Essentially, yeah. You still differential module." It it eliminates the gears. Not the pinion and the ring gear, but 	$\begin{array}{c} 2\\ 3\\ 4\\ 5\\ 6\\ 7\\ 8\\ 9\\ 1\\ 1\\ 2\\ 3\\ 4\\ 1\\ 5\\ 1\\ 7\\ 8\\ 9\\ 1\\ 1\\ 2\\ 3\\ 1\\ 1\\ 5\\ 1\\ 7\\ 8\\ 9\\ 1\\ 1\\ 1\\ 2\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\$	 S. Becker A. Generally, a control scheme again is going to be cost, weight, performance, etc. Q. And those are readily substitutable to go from a bevel gear differential to one or more clutch packs? A. Well, it's not, like, readily. It's going to change those characteristics. Q. What's entailed in making that kind of a change? A. Doing the DVR DVPR planning and packaging, and cost, weight and NVH, again, etc., etc., the whole development. Q. So it's effectively a routine kind of process-related work? A. Well, it's a selectable component. You know, you you select what size engine you want, you select what size what type of differentiation system you want.
$\begin{array}{c} 2\\ 3\\ 4\\ 5\\ 6\\ 7\\ 8\\ 9\\ 10\\ 112\\ 13\\ 15\\ 16\\ 17\\ 18\\ 9\\ 20\\ 12\\ 21\\ 221\\ 221\\ 221\\ 221\\ 222\\ 222$	 when they talk about having power distribution without differential gearing, do you understand that to be a system where the clutch packs would be within the differential A. In the '440 Q or external? A. In the '440 patent, they were talking about the clutch packs being and replacing the the differential gearing so that changes the geometry and it becomes an RDM, or rear differential module, not a differential. Q. Okay. So it entirely eliminates the differential from the system and substitutes differential with one or more clutch packs? A. Essentially, yeah. You still differential module." It it eliminates the gears. Not the pinion and the ring gear, but it eliminates the bevel gears or the gerotor 	$\begin{array}{c} 2\\ 3\\ 4\\ 5\\ 6\\ 7\\ 8\\ 9\\ 0\\ 1\\ 1\\ 2\\ 1\\ 1\\ 5\\ 6\\ 7\\ 8\\ 9\\ 0\\ 1\\ 1\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\$	 S. Becker A. Generally, a control scheme again is going to be cost, weight, performance, etc. Q. And those are readily substitutable to go from a bevel gear differential to one or more clutch packs? A. Well, it's not, like, readily. It's going to change those characteristics. Q. What's entailed in making that kind of a change? A. Doing the DVR DVPR planning and packaging, and cost, weight and NVH, again, etc., etc., the whole development. Q. So it's effectively a routine kind of process-related work? A. Well, it's a selectable component. You know, you you select what size engine you want, you select what size what type of differentiation system you want. Q. And that would be all based on the
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$\begin{array}{c} 2\\ 3\\ 4\\ 5\\ 6\\ 7\\ 8\\ 9\\ 10\\ 12\\ 13\\ 14\\ 15\\ 16\\ 19\\ 20\\ 22\\ 23\\ 24\\ \end{array}$	 when they talk about having power distribution without differential gearing, do you understand that to be a system where the clutch packs would be within the differential A. In the '440 Q or external? A. In the '440 patent, they were talking about the clutch packs being and replacing the the differential gearing so that changes the geometry and it becomes an RDM, or rear differential module, not a differential. Q. Okay. So it entirely eliminates the differential from the system and substitutes differential with one or more clutch packs? A. Essentially, yeah. You still differential module." It it eliminates the gears. Not the pinion and the ring gear, but it eliminates the other thing, spring thing. Gerotor pump differential or the Torsen 	$\begin{array}{c} 2\\ 3\\ 4\\ 5\\ 6\\ 7\\ 8\\ 9\\ 0\\ 1\\ 1\\ 2\\ 1\\ 1\\ 5\\ 6\\ 7\\ 8\\ 9\\ 0\\ 1\\ 1\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\$	 S. Becker A. Generally, a control scheme again is going to be cost, weight, performance, etc. Q. And those are readily substitutable to go from a bevel gear differential to one or more clutch packs? A. Well, it's not, like, readily. It's going to change those characteristics. Q. What's entailed in making that kind of a change? A. Doing the DVR DVPR planning and packaging, and cost, weight and NVH, again, etc., etc., the whole development. Q. So it's effectively a routine kind of process-related work? A. Well, it's a selectable component. You know, you you select what size engine you want, you select what size what type of differentiation system you want. Q. And that would be all based on the earlier in the day we were talking about vehicle performance characteristics and that
$\begin{array}{c} 2\\ 3\\ 4\\ 5\\ 6\\ 7\\ 8\\ 9\\ 1\\ 1\\ 2\\ 3\\ 1\\ 4\\ 5\\ 6\\ 7\\ 8\\ 9\\ 0\\ 1\\ 1\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 3\end{array}$	 when they talk about having power distribution without differential gearing, do you understand that to be a system where the clutch packs would be within the differential A. In the '440 Q or external? A. In the '440 patent, they were talking about the clutch packs being and replacing the the differential gearing so that changes the geometry and it becomes an RDM, or rear differential module, not a differential. Q. Okay. So it entirely eliminates the differential from the system and substitutes differential with one or more clutch packs? A. Essentially, yeah. You still differential module." It it eliminates the gears. Not the pinion and the ring gear, but it eliminates the other thing, spring thing. Gerotor pump differential or the Torsen gears. 	234 567890 11234567890 11234567890 12222 223	 S. Becker A. Generally, a control scheme again is going to be cost, weight, performance, etc. Q. And those are readily substitutable to go from a bevel gear differential to one or more clutch packs? A. Well, it's not, like, readily. It's going to change those characteristics. Q. What's entailed in making that kind of a change? A. Doing the DVR DVPR planning and packaging, and cost, weight and NVH, again, etc., etc., the whole development. Q. So it's effectively a routine kind of process-related work? A. Well, it's a selectable component. You know, you you select what size engine you want, you select what size what type of differentiation system you want. Q. And that would be all based on the earlier in the day we were talking about vehicle performance characteristics and that there's an array of vehicle performance

36 (Pages 138 to 141)
1	S. Becker	1	S. Becker
	to handling. There's half a dozen or more	2	consideration size and cost and weight and, you
	vehicle performance characteristics that we	3	know, that same array. You're not going to put
	spoke of earlier. The desired vehicle	4	a really complicated system in a really cheap
	performance characteristics then presumably	5	vehicle.
	impact the design of the components that are	6	Q. Do you recall in your declaration you
	selected?	7	indicated that it would be obvious for a person
8	A. That's exactly correct.	8	of skill in the art to take the front drive
9	Q. And so if you have, let's say I	9	and a front drive of Teraoka, the Teraoka
	think there was seven or eight different	10	reference and substitute it with the rear drive
	performance characteristics that were outlined	11	of the Watanabe reference? Do you recall?
	that we discussed earlier and you have, I don't	12	A. The front drive?
	know, five, six differential components to	13	Q. Yes. Why don't we go to your
14	choose from, there's a fair number of	14	specific declaration.
	permutations there that one can go through.	15	A. Yeah. Can you show me what you're
16	Is it essentially can one be	16	referring to?
	readily interchanged for the other one quite	17	Q. So on page 23 of your declaration
	routinely?	18	A. Yeah.
19	A. Well, it depends who owns the patent.	19	Q which is Exhibit 4 here in
20	Q. Oh, okay. Minus the patent side of	20	paragraphs 45 and 46, you discuss the
	it, in a kind of design standpoint functionally	21	conclusions regarding the combination of
	speaking.	22	Teraoka and Watanabe. Do you see that?
23	A. Yeah, functionally speaking, it's	23	A. Correct.
	possible to interchange any of these.	24	Q. And you see in 46, if you can read
25	Again, you're going to take into	25	for me the your the opinion that you have
	Page 144		Page 145
1	S. Becker	1	S. Becker
	provided in paragraph 46.	2	your control scheme or create your control
3	A. "It would have been a matter of	3	scheme. You would have to source the parts.
	simple substitution to replace the rear	4	You'd have to size the parts for durability.
	secondary drivetrain with the rear secondary	5	You'd have to adapt the housing to accommodate
	drivetrain of Watanabe to yield predictable	6	the geometry.
	result reducing mass and rotating losses."	7	You'd have to perform your stress
8	I should have put "if sized	8	analysis calculations to see where the weak
	appropriately" after that but yeah, basically.	9 10	points are, then do your modeling for NVH and friction losses and then, yeah, then it's
10 11	Q. So other than that one change, you	11	performance testing.
11 12	agree request this opinion today? A. Yes, still. You know, it's just	12	Q. But essentially, that's routine, that
	implied that you would account for size because	13	sort of the set of processes that you just
	size is going to relate to everything else.	14	went through?
15	Q. Sure, from simply from a packaging	15	A. I don't consider any of it routine.
	standpoint?	16	It is what we do in the auto industry.
17	A. Packaging, performance, weight, all	17	Q. Okay. But so, okay, when you say
	that jazz.	18	"simple substitution," what is that?
19	Q. So what would be entailed when you're	19	What does that sort of term mean to
	talking about simple substitutions?	20	you?
21	What are the kinds of steps that a	21	A. It means it's a matter of following
22	engineer would have to take in substituting the	22	the typical procedures of the auto industry.
	secondary drivetrain of Watanabe with the	23	Q. And the
	secondary drivetrain of Teraoka?	24	A. Or vehicle design industry, because
25	A. Sure. Well, you would have to adapt	25	it could apply to other vehicles.

37 (Pages 142 to 145)

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	Page 146		Page 147
1	S. Becker	1	S. Becker
2	Q. Okay. And that includes the various	2	the the differential gears and alter your
3	processes and methodologies that you just	3	control scheme.
4	outlined?	4	Q. And is there something in the Teraoka
5	A. Exactly.	5	reference that would lead a person to sort of
6	Q. How would one or what would be the	6	combine Teraoka and Watanabe?
7	rationale to substitute the drivetrain of	7	A. Specifically in Teraoka?
8	Watanabe with the with the rear drivetrain	8	
			Q. Yes.
9	of Teraoka in the first place?	9	A. Do you have a copy of Teraoka?
10	What would be the purpose of that?	10	(Becker Exhibit No. 5 was marked for
11	A. I guess someone would want to	11	identification.)
12	eliminate the bevel gears and change their	12	THE WITNESS: It's in the very
13	control scheme.	13	first paragraph.
14	Q. Is there something in Teraoka oh,	14	BY MS. SHAH:
15	yeah. Okay, I'm sorry. Let me rephrase the	15	Q. Okay. What's specifically in the
16	question.	16	first paragraph
17	So what would be the rational to	17	A. To simplify
18	substitute the drivetrain of Teraoka with the	18	Q you're referring to?
19	rear drivetrain of Watanabe?	19	A the configuration while greatly
20	A. I I knew what you meant.	20	reducing the drag torque of the coupling, which
21	Q. I'll let you repeat your answer	21	is uncoupled during two-wheel drive travel.
22	A. I forgot	22	So if someone wanted to take that
23	Q if you remember.	23	another step further not necessarily a step
24	A my answer. It it's the same	24	further, but a step further in that person's
25	answer. You you're doing it to eliminate	25	mind to eliminate the differential, you
	Page 148		Page 149
1	S. Becker	1	S. Becker
2	could do that with the clutch packs, which	2	for that, and you'd find Watanabe. It's not
3	would be Watanabe.	3	Q. What's the purpose of the clutch pack
4	If someone wanted to further reduce	4	in Teraoka? What is it used for?
5	drag torque and they could do that by opening	5	A. That's going to be well, they
б	the clutch packs, you would substitute	6	don't say exactly how that's used in that it
7	Watanabe. So basically, everything in that	7	can be a component of the decoupling to the
8	sentence leads me to think that if someone were	8	side shafts. It can also be applied to vary
9	thinking that they could do that with Watanabe,	9	the torque to the rear axle. So it's got sort
10	they would do that.	10	of two functions.
	•	10 11	of two functions. But the the actual mechanics of
11	Q. But what would lead one from Teraoka	11	But the the actual mechanics of
11 12	Q. But what would lead one from Teraoka to Watanabe in the first place?	11 12	But the the actual mechanics of the coupling could be within the wet plate
11 12 13	Q. But what would lead one from Teraoka to Watanabe in the first place? MS. MANDRUSIAK: Objection, asked	11 12 13	But the the actual mechanics of the coupling could be within the wet plate clutch or outside the wet plate clutch.
11 12 13 14	Q. But what would lead one from Teraoka to Watanabe in the first place? MS. MANDRUSIAK: Objection, asked and answered.	11 12 13 14	But the the actual mechanics of the coupling could be within the wet plate clutch or outside the wet plate clutch. Doesn't matter.
11 12 13 14 15	 Q. But what would lead one from Teraoka to Watanabe in the first place? MS. MANDRUSIAK: Objection, asked and answered. A. You have a clutch pack already in the 	11 12 13 14 15	But the the actual mechanics of the coupling could be within the wet plate clutch or outside the wet plate clutch. Doesn't matter. Q. Okay. So it it's your opinion
11 12 13 14 15 16	 Q. But what would lead one from Teraoka to Watanabe in the first place? MS. MANDRUSIAK: Objection, asked and answered. A. You have a clutch pack already in the design of Teraoka in the differential or in 	11 12 13 14 15 16	But the the actual mechanics of the coupling could be within the wet plate clutch or outside the wet plate clutch. Doesn't matter. Q. Okay. So it it's your opinion that in the in Teraoka, the clutch can be
11 12 13 14 15 16 17	 Q. But what would lead one from Teraoka to Watanabe in the first place? MS. MANDRUSIAK: Objection, asked and answered. A. You have a clutch pack already in the design of Teraoka in the differential or in the rear differential module. If someone else 	11 12 13 14 15 16 17	But the the actual mechanics of the coupling could be within the wet plate clutch or outside the wet plate clutch. Doesn't matter. Q. Okay. So it it's your opinion that in the in Teraoka, the clutch can be used both as a disconnect mechanism and also to
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11 12 13 14 15 16 17 18 19 20	 Q. But what would lead one from Teraoka to Watanabe in the first place? MS. MANDRUSIAK: Objection, asked and answered. A. You have a clutch pack already in the design of Teraoka in the differential or in the rear differential module. If someone else just said, hey, let's put another differential another clutch pack in there, or they said let's just eliminate the the 	11 12 13 14 15 16 17 18 19 20	But the the actual mechanics of the coupling could be within the wet plate clutch or outside the wet plate clutch. Doesn't matter. Q. Okay. So it it's your opinion that in the in Teraoka, the clutch can be used both as a disconnect mechanism and also to deliver torque? A. Correct, yeah. It it's all part of the again, the rear differential module
11 12 13 14 15 16 17 18 19 20 21	 Q. But what would lead one from Teraoka to Watanabe in the first place? MS. MANDRUSIAK: Objection, asked and answered. A. You have a clutch pack already in the design of Teraoka in the differential or in the rear differential module. If someone else just said, hey, let's put another differential another clutch pack in there, or they said let's just eliminate the the differential, bevel gearing, you would 	11 12 13 14 15 16 17 18 19 20 21	But the the actual mechanics of the coupling could be within the wet plate clutch or outside the wet plate clutch. Doesn't matter. Q. Okay. So it it's your opinion that in the in Teraoka, the clutch can be used both as a disconnect mechanism and also to deliver torque? A. Correct, yeah. It it's all part of the again, the rear differential module or 23 as outlined in I don't know where that
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11 12 13 14 15 16 17 18 20 21 22 23	 Q. But what would lead one from Teraoka to Watanabe in the first place? MS. MANDRUSIAK: Objection, asked and answered. A. You have a clutch pack already in the design of Teraoka in the differential or in the rear differential module. If someone else just said, hey, let's put another differential another clutch pack in there, or they said let's just eliminate the the differential, bevel gearing, you would basically be making Watanabe. BY MS. SHAH: 	11 12 13 14 15 16 17 18 20 21 22 23	But the the actual mechanics of the coupling could be within the wet plate clutch or outside the wet plate clutch. Doesn't matter. Q. Okay. So it it's your opinion that in the in Teraoka, the clutch can be used both as a disconnect mechanism and also to deliver torque? A. Correct, yeah. It it's all part of the again, the rear differential module or 23 as outlined in I don't know where that figure is. I got a pile of blank pages. Figure 1.
11 12 13 14 15 16 17 18 19 20 21 22	 Q. But what would lead one from Teraoka to Watanabe in the first place? MS. MANDRUSIAK: Objection, asked and answered. A. You have a clutch pack already in the design of Teraoka in the differential or in the rear differential module. If someone else just said, hey, let's put another differential another clutch pack in there, or they said let's just eliminate the the differential, bevel gearing, you would basically be making Watanabe. 	11 12 13 14 15 16 17 18 19 20 21 22	But the the actual mechanics of the coupling could be within the wet plate clutch or outside the wet plate clutch. Doesn't matter. Q. Okay. So it it's your opinion that in the in Teraoka, the clutch can be used both as a disconnect mechanism and also to deliver torque? A. Correct, yeah. It it's all part of the again, the rear differential module or 23 as outlined in I don't know where that figure is. I got a pile of blank pages.

38 (Pages 146 to 149)

	Page 150)	Page 151
1	S. Becker	1	S. Becker
2	the clutch?	2	Q. All right. So is there something you
3	A. Okay. In Claim 1, page 3, that is a	3	can point to that where the clutch
4	really long sentence.	4	provides delivers torque?
5	Q. I'm sorry, you're talking about	5	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
6		6	A. Delivers torque? That's the coupling. If I remember, they don't use the
7	Exhibit 5, meaning the Teraoka reference? That's what you're looking at?	7	word "torque"; they use something else.
8	•	8	1 7 2
	A. Yeah, the Teraoka patent.	9	Yeah, you have a in Claim same
9	Q. Again, at what page are you referring to in that reference?	10	page, Claim 3, section 3, in the middle where
10			the line starts 517: "A coupling 521
11	A. Page 3.	11	constructed using a wet multiplate clutch, a
12 13	Q. Okay.	12	final speed reduction gearset, a rear
	A. Claim 1.	13 14	differential, a differential device which
14	Q. Okay.		distributes the driving force of the engine to
15	A. So down, down "A coupling which is	15	the left and right rear wheels."
16	constructed using wet plate wet multiplate	16	That's all part of the RDM, or the
17	clutch disconnects rotation from the wheels	17	rear differential module, which is distributing
18	during travel."	18	the force. And then there's there's
19	And that's applied to the front-wheel	19	definitely more times where they describe it.
20	side or the rear-wheel side power transmission	20	Q. Okay. So based on again, you're
21	system, the previous previous portion of	21	looking at sort of what the paragraph that
22	that sentence.	22	has that's bracketed 0003?
23	Q. Okay.	23	A. Exactly.
24	A. That's you know, it's described	24	Q. In that paragraph, the lines that you
25	several times.	25	just read, those paragraphs in your opinion
	Page 152	2	Page 153
1	S. Becker	1	S. Becker
2	provide evidence of the fact that the clutch	2	multiplate clutch. And down here, they've got
3	delivers torque to the wheels or in this case,	3	a dog clutch. But I believe that dog clutch
4	quote-unquote, distributes driving force to the	4	535. Yeah, the separate drawing. Yeah, that
5	wheels?	5	was an alternative design. That was figure 4.
6	A. Yeah, correct. It's all part of the	6	So if you move the the multiplate
7	rear differential module or what they would	7	clutch up to the front, you're going to meet a
8	call 23, although they call it a final speed	8	dog clutch down below. You can put the sort
9	reduction set 23, but they're pointing to the	9	of the decoupling anywhere you want, but
10	whole module, so or is it 47? I might be	10	they've got what is it, they've got three
11	looking at that wrong.	11	different configurations in this patent, three
12	Q. So is there any distinction between	12	main configurations, figure 1, figure 3 and
13	the coupling and the rear differential in in	13	figure 4. And all of them are going to perform
14	terms of their function in Teraoka?	14	slightly differently component-wise, but in the
15	MS. MANDRUSIAK: Objection, form,	15	end, they they do the same thing.
16	foundation.	16	Q. And what is that? What do what do
17	A. Well, the rear differential itself is	17	they do?
18	the whole module so the clutch is comprised	18	A. In the end, their their goal is to
19	inside the module.	19	decouple and distribute torque.
20	BY MS. SHAH:	20	Q. What kind of differential is is
21	Q. What's the purpose of the wet	21	this differential device that's disclosed in
h n		ha	
22	multiplate clutch as compared to the dog clutch	22	Teraoka? What kind of differential is that?
23	multiplate clutch as compared to the dog clutch in that same paragraph [0003]?	23	A. If you already know, you can tell me,
	multiplate clutch as compared to the dog clutch		

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1	S. Becker	1	S. Becker
2	Q. Okay. Let me change the question	2	Q. I'm sorry, with respect to
3	then.	3	A. Figure 3.
4	A. Which would mean they could put	4	Q. In figure 3 there's also a bevel
5	anything, any differential.	5	gear
6	Q. Okay. With respect to the rear axle,	6	A. Digital.
7	is the clutch mechanism arranged inside the	7	Q differential?
8	differential case?	8	A. Yeah.
9	A. Yes. Well in one design, yes; in	9	Q. As well as the the clutch
10	another design, no.	10	A. Correct.
11	Q. So can you point to me in which	11	Q that's placed on the side shaft?
12	design the clutch mechanism's inside the	12	A. Yeah. The clutch mechanism in
13	differential versus that?	13	that system, the clutch mechanism was for a
14	A. Yes, it's inside the differential	14	coupling of the left and right.
15	case in figure 1, and in front of in the	15	MS. MANDRUSIAK: Are you almost
16	yeah, in figure 2 4 but not in figure 3.	16	done with this line of questioning?
17	Figure 3's kind of weird.	17	MS. SHAH: Yeah.
18	Q. What's the arrangement in figure 3?	18	MS. MANDRUSIAK: Okay.
19	A. It's out on the shaft. I'm sorry,	19	MS. SHAH: Yeah. I'll wrap up so
20	the clutch mechanism is out on one of the side	20	we can break for lunch.
21	shafts.	21	BY MS. SHAH:
22	Q. And what would be the purpose of that	22	Q. Does Teraoka address any problems
23	architecture?	23	associated with clutch systems?
24	A. In that one, they talk about bevel	24	A. You'd have to define what you mean by
25	gear differential mechanism.	25	problems associated with clutch mechanisms.
	Page 156		Page 157
1	S. Becker	1	S. Becker
1 2	Q. For example, specifically talking	2	Q. Does Teraoka address or suggest the
3	about issues with lubricating clutch	3	use of any other system to control power to the
4	mechanisms.	4	wheels other than the differential?
5	A. Yes. Well, it mentions that there's	5	A. Well, it's using an RD a rear
6	going to be lubrication requirements.	6	differential module so that in itself is a
7	Q. Is it does it does it have an	7	differential. It's controlling power to the
8	-	8	rear wheels
9	architecture that is designed to help reduce problems with lubricating clutches?	9	Q. So
10	A. It doesn't get into that detail.	10	A so yes.
	Q. Do you know if Teraoka addresses any	11	Q. I guess my question is, is there
12	problems of vehicle dynamics?	12	anything other than a differential-based system
13		13	that's disclosed or suggested in Teraoka to
	MS. MANDRUSIAK: Objection, form. A. It does.	14	
14 15	BY MS. SHAH:	15	control power to the wheels? A. Other than a differential-based
		16	
16 17	Q. Can you identify them for me, please?	10 17	system? I don't know of anything other than a differential based system. You'd have to have
	A. Yeah. It's all over the place where	18	differential-based system. You'd have to have
18 19	it mentions a four-wheel drive system. And	18 19	split power trains like electronic wheel hubs.
20	whenever you have a four-wheel drive system,	19 20	Q. Okay. So let me
	you're affecting the vehicle dynamics.		A. So it doesn't mention electronic
21	Q. So specifically does Teraoka address	21	wheel hubs.
22 23	any problems associated with transverse or	22 23	Q. So let me refine the question a little bit.
23 24	lateral equalization of power of the rear drive axle?	23 24	Does Teraoka address or suggest the
4 4		K.4	DOES LELAOKA AGGRESS OF SUGGESTINE
25	A. Not that I'm aware of.	25	use of a system to control power to the wheels

40 (Pages 154 to 157)

_	Page 158		Page 159
1	S. Becker	1	S. Becker
2	other than one that includes bevel differential	2	The dog clutch that's in Teraoka,
3	gearing?	3	what role, if any, does that play with respect
4	A. Again, it doesn't define its	4	to synchronizing?
	differentiation in some of the models in that,	5	A. That's a mechanical connect and
5	· · · · · · · · · · · · · · · · · · ·		
6	one, it mentions bevel gearing. So it doesn't	6	disconnect. You would synchronize before you
7	specifically mention another specific type.	7	engage a dog clutch. You would synchronize
8	But in several of them, it doesn't describe the	8	using a clutch plate or a synchronizer.
9	differentiation. So you could theoretically	9	Synchronizer's generally a friction plate. You
10	have just about anything there	10	can either have it circumferential or spatial.
11	Q. Does	11	Q. Do you have to adjust the control
12	A that could perform	12	strategy depending on what kind of clutch you
13	differentiation.	13	have?
14	Q. Okay. Does Teraoka provide any	14	A. Yeah, because you'd need to determine
15	teachings regarding synchronizing?	15	how much apply you need to obtain that
16	A. Again, Teraoka uses a clutch pack,	16	synchronization so you'd have to yeah, it
17	which is a frictionally engaged multidisk	17	would go into the typical DVP&R again.
18	plate. The design of a frictionally engaged	18	MS. SHAH: Okay, we can break.
19	multidisk plate is to synchronize two speeds or	19	(Recess taken.)
20	transmit power, so I guess that in default,	20	BY MS. SHAH:
21	it doesn't use the word "synchronize" here, but	21	Q. So if we could turn back to
22	it uses "multiplate clutch pack," and that's	22	Exhibit 3
23	what they do.	23	A. Uh-huh.
24	Does that answer your question?	24	Q which is the '440 patent, does the
25	Q. Yes.	25	'440 patent talk about the a a problem
	`		^
	Page 160		Page 161
1	S. Becker	1	S. Becker
1 2	S. Becker associated with power losses?	1 2	S. Becker output in the side shaft couplings is
2	associated with power losses? A. Yes.	2	output in the side shaft couplings is
2 3	associated with power losses?A. Yes.Q. In the '440 patent, what's the	2 3	output in the side shaft couplings is transferred to the drive wheels in the secondary axle. And because the couplings have
2 3 4 5	associated with power losses?A. Yes.Q. In the '440 patent, what's thewhat's the proposed solution to addressing that	2 3 4	output in the side shaft couplings is transferred to the drive wheels in the secondary axle. And because the couplings have frictionally engaged couplings, it could be
2 3 4	associated with power losses?A. Yes.Q. In the '440 patent, what's thewhat's the proposed solution to addressing that problem? So maybe let's step back. Maybe you	2 3 4 5	output in the side shaft couplings is transferred to the drive wheels in the secondary axle. And because the couplings have frictionally engaged couplings, it could be when the secondary axles uncouple, the shutdown
2 3 4 5 6 7	 associated with power losses? A. Yes. Q. In the '440 patent, what's the what's the proposed solution to addressing that problem? So maybe let's step back. Maybe you want to 	2 3 4 5 6 7	output in the side shaft couplings is transferred to the drive wheels in the secondary axle. And because the couplings have frictionally engaged couplings, it could be when the secondary axles uncouple, the shutdown sections located between the switch on device
2 3 4 5 6 7 8	 associated with power losses? A. Yes. Q. In the '440 patent, what's the what's the proposed solution to addressing that problem? So maybe let's step back. Maybe you want to A. That's the 	2 3 4 5 6 7 8	output in the side shaft couplings is transferred to the drive wheels in the secondary axle. And because the couplings have frictionally engaged couplings, it could be when the secondary axles uncouple, the shutdown sections located between the switch on device and the side shaft coupling is uncoupled. And
2 3 4 5 6 7 8 9	 associated with power losses? A. Yes. Q. In the '440 patent, what's the what's the proposed solution to addressing that problem? So maybe let's step back. Maybe you want to A. That's the Q identify for me if you could 	2 3 4 5 6 7 8 9	output in the side shaft couplings is transferred to the drive wheels in the secondary axle. And because the couplings have frictionally engaged couplings, it could be when the secondary axles uncouple, the shutdown sections located between the switch on device and the side shaft coupling is uncoupled. And that's the '440 solution to having losses in
2 3 4 5 6 7 8 9 10	 associated with power losses? A. Yes. Q. In the '440 patent, what's the what's the proposed solution to addressing that problem? So maybe let's step back. Maybe you want to A. That's the Q identify for me if you could explain to me what the problem of power losses 	2 3 4 5 6 7 8 9	output in the side shaft couplings is transferred to the drive wheels in the secondary axle. And because the couplings have frictionally engaged couplings, it could be when the secondary axles uncouple, the shutdown sections located between the switch on device and the side shaft coupling is uncoupled. And that's the '440 solution to having losses in the driveline. Basically, the effect of a
2 3 4 5 6 7 8 9 10 11	 associated with power losses? A. Yes. Q. In the '440 patent, what's the what's the proposed solution to addressing that problem? So maybe let's step back. Maybe you want to A. That's the Q identify for me if you could explain to me what the problem of power losses encompasses that's described in the '440 patent 	2 3 4 5 6 7 8 9 10 11	output in the side shaft couplings is transferred to the drive wheels in the secondary axle. And because the couplings have frictionally engaged couplings, it could be when the secondary axles uncouple, the shutdown sections located between the switch on device and the side shaft coupling is uncoupled. And that's the '440 solution to having losses in the driveline. Basically, the effect of a shutdown section.
2 3 4 5 6 7 8 9 10 11 12	 associated with power losses? A. Yes. Q. In the '440 patent, what's the what's the proposed solution to addressing that problem? So maybe let's step back. Maybe you want to A. That's the Q identify for me if you could explain to me what the problem of power losses encompasses that's described in the '440 patent then we can move to the second aspect. 	2 3 4 5 6 7 8 9 10 11 12	output in the side shaft couplings is transferred to the drive wheels in the secondary axle. And because the couplings have frictionally engaged couplings, it could be when the secondary axles uncouple, the shutdown sections located between the switch on device and the side shaft coupling is uncoupled. And that's the '440 solution to having losses in the driveline. Basically, the effect of a shutdown section. Q. Are there any I guess, was it
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2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	 associated with power losses? A. Yes. Q. In the '440 patent, what's the what's the proposed solution to addressing that problem? So maybe let's step back. Maybe you want to A. That's the Q identify for me if you could explain to me what the problem of power losses encompasses that's described in the '440 patent then we can move to the second aspect. A. Yeah, sure. Power losses relate to various things that sap friction or create inefficiencies in the driveline system. In other words, when you're transmitting power to the ground, you want to transmit that with the least amount of components between you and the ground. That's going to have the least amount of losses. 	$\begin{array}{c} 2\\ 3\\ 4\\ 5\\ 6\\ 7\\ 8\\ 9\\ 10\\ 11\\ 12\\ 13\\ 14\\ 15\\ 16\\ 17\\ 18\\ 9\\ 20\\ \end{array}$	 output in the side shaft couplings is transferred to the drive wheels in the secondary axle. And because the couplings have frictionally engaged couplings, it could be when the secondary axles uncouple, the shutdown sections located between the switch on device and the side shaft coupling is uncoupled. And that's the '440 solution to having losses in the driveline. Basically, the effect of a shutdown section. Q. Are there any I guess, was it known prior to May I'm sorry yeah, May 6, 2008, on or before May 6, 2008 was it known to employ a shutdown section to assist with the problem of power losses? A. Yes. Q. And what do you can you you provide some support for that answer? A. Sure. Even in Teraoka they talk
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2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 20 21 22	 associated with power losses? A. Yes. Q. In the '440 patent, what's the what's the proposed solution to addressing that problem? So maybe let's step back. Maybe you want to A. That's the Q identify for me if you could explain to me what the problem of power losses encompasses that's described in the '440 patent then we can move to the second aspect. A. Yeah, sure. Power losses relate to various things that sap friction or create inefficiencies in the driveline system. In other words, when you're transmitting power to the ground, you want to transmit that with the least amount of components between you and the ground. That's going to have the least amount of losses. The power losses that they're discussing are related to the secondary 	2 3 4 5 6 7 8 9 0 112 13 15 17 18 9 0 112 14 15 6 7 8 9 0 112 14 15 20 22	output in the side shaft couplings is transferred to the drive wheels in the secondary axle. And because the couplings have frictionally engaged couplings, it could be when the secondary axles uncouple, the shutdown sections located between the switch on device and the side shaft coupling is uncoupled. And that's the '440 solution to having losses in the driveline. Basically, the effect of a shutdown section. Q. Are there any I guess, was it known prior to May I'm sorry yeah, May 6, 2008, on or before May 6, 2008 was it known to employ a shutdown section to assist with the problem of power losses? A. Yes. Q. And what do you can you you provide some support for that answer? A. Sure. Even in Teraoka they talk about yeah, in Teraoka in my declaration on page 21, Teraoka states sorry, I'll let you

41 (Pages 158 to 161)

-	Page 162		Page 163
1	S. Becker	1	S. Becker
2	rotation of the power transmission system,	2	RDM?
3	especially the large mass propeller shaft stops	3	A. Rear differential module. Sorry.
4	from the 2-4 switching mechanism to the outer	4	Q. And so is that essentially the
		5	
5	case," which is the input side of each clutch	6	rear differential module, is that everything
6	mechanism, "and to the outer plates 121, 23 in		effectively after the propeller shaft?
7	the main clutch and pilot clutch."	7	A. It can be, yeah. It's not
8	So when you have that shutdown	8	everything. You know, you've got side shafts
9	section or you've uncoupled rotation of the	9	and then wheels and stuff.
10	power transmission system, that system's not	10	Q. So in the '440 patents, are the side
11	going to create losses.	11	shaft couplings designed to be low friction
12	Q. So what are architectural components	12	when disengaged?
13	are necessary to facilitate a to create a	13	MS. MANDRUSIAK: Objection.
14	shutdown section?	14	A. In the '440 patent, are the side
15	A. You need to be able to decouple from	15	shafts designed to be low friction?
16	the prime motor on the primary drive axle and	16	BY MS. SHAH:
17	you need to uncouple from the wheels in both	17	Q. Yes.
18	sections, segments.	18	A. Well, they are designed to uncouple,
19	So in other words, you're going to be	19	uncouple with the no friction; otherwise,
20	downstream of the front axle on the prime	20	the their intention is it would stop
21	primary drive axle, and on the secondary	21	rotation.
22	axle you have to be at the RDM or anywhere	22	So if it's low friction, it would
23	associated where you're decoupling the side	23	still cause rotation, which is still possible
24	shafts.	24	because what's going to happen is when you pull
25	Q. Yeah, can you what do you mean by	25	those clutches apart we found this through
		-	
	Page 164		Page 165
1	S. Becker	1	S. Becker
2	testing some product of our own the	2	As they're pulled apart, they're going to have
3	viscosity of the oil is such that it causes the	3	loss resistor as and loss drag. As they have
4		-	less resistance and less drag. As they're
	clutches to drag and can still cause rotation	4	pushed greater closer and harder together,
5	clutches to drag and can still cause rotation at higher speeds.		pushed greater closer and harder together,
5 6	at higher speeds.	4	pushed greater closer and harder together, they're going to create more drag. And you use
5 6 7	at higher speeds. Q. So in your claim charts you identify	4 5	pushed greater closer and harder together, they're going to create more drag. And you use the width of them, the number of clutch plates,
6 7	at higher speeds.Q. So in your claim charts you identifyclutch mechanism 71 as satisfying the side	4 5 6 7	pushed greater closer and harder together, they're going to create more drag. And you use the width of them, the number of clutch plates, to determine capacity.
6 7 8	at higher speeds. Q. So in your claim charts you identify clutch mechanism 71 as satisfying the side shaft coupling component of the claims.	4 5 6 7 8	pushed greater closer and harder together, they're going to create more drag. And you use the width of them, the number of clutch plates, to determine capacity. Q. What's your understanding of the
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	Page 166		Page 167
1	S. Becker	1	S. Becker
2	final drive gearset.	2	the Teraoka embodiments?
3	Q. And what's the purpose of the final	3	A. Well, 27 and 29 are the half shafts.
4	drive gearset?	4	Those will be or what you guys have been
5	A. That's a ratio change. A ratio	5	calling the side shafts. Those will both
6	change alters speed and torque.	6	-
7		7	rotate. 31, 33 of course are the wheels. They
	Q. Are there components of the rear differential 25 in Teraoka that continue to		will rotate. Yeah, that's the most detail you
8		8	can get from that drawing.
9	spin even after it's decoupled in two-wheel	9	Q. And so now turning to Exhibit 3 of
10	drive mode?	10	the which is the '440 patent, looking at,
11	A. They don't cite that specifically.	11	let's say, figure 2, let's start on figure 2.
12	In other words, they don't define where in the	12	No, take that back.
13	rear differential module the the coupling	13	Looking at figure 8 of the '440
14	takes place in that drawing.	14	patent, Exhibit 3, can you identify for me what
15	That's what we call a schematic	15	components of this figure are effectively shut
16	drawing so it just contains the components and	16	down when you switch from four-wheel drive to
17	then they say they're all in here.	17	two-wheel drive mode?
18	If you look at 25 specifically, the	18	A. Sure. They outline 12 as the side
19	line to which it's pointing to, it it	19	shafts. They don't outline the wheels, of
20	encompasses quite a large number of components	20	course, which will be spinning.
21	so it doesn't disclose the specifics of the	21	Yeah, here they don't show the whole
22	coupling.	22	rear differential module. Again, this is a
23	Q. And do you have an understanding of	23	schematic drawing. I believe 4 is pointing to
24	how of what components are what specific	24	two clutches. So their decoupling is somewhere
25	components are rotating when you decouple in	25	related to 4, something within 9.
		-	Terated to 1, Sometiming (Teration)
	5 1 6 0		D 100
	Page 168		Page 169
1	Page 168 S. Becker	1	Page 169 S. Becker
1 2	S. Becker	12	
	S. Becker Q. Are there any other components that	1	S. Becker pretty sure 9 is intended to be a housing but I
2	S. Becker	2	S. Becker pretty sure 9 is intended to be a housing but I can't you know, again, it's a schematic
2 3 4	S. Becker Q. Are there any other components that are not rotating when you're in two-wheel drive mode?	2 3	S. Becker pretty sure 9 is intended to be a housing but I can't you know, again, it's a schematic drawing so I don't know if that's moving or
2 3 4 5	S. Becker Q. Are there any other components that are not rotating when you're in two-wheel drive mode? A. You asked the opposite question	2 3 4	S. Becker pretty sure 9 is intended to be a housing but I can't you know, again, it's a schematic drawing so I don't know if that's moving or not. 18 I believe is not moving. 14, yeah.
2 3 4 5 6	S. Becker Q. Are there any other components that are not rotating when you're in two-wheel drive mode? A. You asked the opposite question previously, didn't you? Rotating?	2 3 4 5	S. Becker pretty sure 9 is intended to be a housing but I can't you know, again, it's a schematic drawing so I don't know if that's moving or not. 18 I believe is not moving. 14, yeah. There's no more precise detail about 16 and 15.
2 3 4 5 6 7	S. Becker Q. Are there any other components that are not rotating when you're in two-wheel drive mode? A. You asked the opposite question previously, didn't you? Rotating? Q. No, so it was fine.	2 3 4 5 6	S. Becker pretty sure 9 is intended to be a housing but I can't you know, again, it's a schematic drawing so I don't know if that's moving or not. 18 I believe is not moving. 14, yeah. There's no more precise detail about 16 and 15. Q. Are there specifics to the
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43 (Pages 166 to 169)

	Page 170		Page 171
1	S. Becker	1	S. Becker
2	two-clutch system will be moving and a portion	2	to tell if 5 or 6 I believe it's 5 is
3	will not.	3	rotating and 6 is not. I have to look that up.
4	Q. Any other differences?	4	But definitely 26 and 8 are not rotating.
5	A. Not specifically.	5	Q. Okay. And so, I'm sorry, in figure
6	Q. In the '440 patent, can you point to	6	5, which component is what you point to as
7	me which component in your opinion constitutes	7	being the side shaft coupling?
8	the side shaft coupling? Starting with figure	8	A. Oh, well, the RDM, the whole rear
9	3.	9	differential module. So basically, figure
10	A. Well, they outline that the switch on	10	the whole thing. Yeah, I think in figure 3
11	mechanism and/or side shaft couplings comprise	11	they just I think it's number 9.
12^{11}	at least one frictionally engaged coupling. So	12	Q. So when you look at turning to the
13	there, they would be describing the	13	claims of the '440 patents, which is on the
14^{13}	frictionally engaged couplings being, excuse	14	-
15	me, clutch packs, so that would be was I	15	last two pages A. Yeah.
15 16	supposed to pick out the figure?	16	
17			Q of the '440 patent, Exhibit Number 2, can you identify the
18	Q. Yes, if you could look at figure 3 and then	17 18	Exhibit Number 3, can you identify the a distinction between Claim 1 and Claim 2?
10 19	A. Yeah.	10 19	
20			MS. MANDRUSIAK: Objection, form.
		20	A. Yeah, Claim 1 is that there's going
21		21	to be a shutdown section and there's going to
22		22	be a primary and a secondary drive axle.
23 04		23	Claim 2 is that you're going to do this without
24 05		24	having differential gearing.
25	and 29 would still be rotating. It's difficult	25	BY MS. SHAH:
	Page 172		Page 173
1	S. Becker	1	Page 173 S. Becker
2		2	S. Becker and you can control it however you want to. I
	S. Becker		S. Becker
2	S. Becker Q. So how do you go about achieving that under the '440 patent? The architecture in Claim 2.	2	S. Becker and you can control it however you want to. I
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	Page 174		Page 175
1	S. Becker	1	S. Becker
2	Teraoka and you substitute the rear drivetrain	2	A. Sure.
3	of Watanabe into the system of Teraoka, is	3	MS. MANDRUSIAK: Objection.
4	there a benefit in terms of fuel economy?	4	Objection, form. Objection, asked and
5	A. That would depend on the	5	answered.
6	mechatronics, your control scheme. You can	6	A. Several things. First, you have to
7	potentially reduce weight, and you can	7	have the concept that you want to eliminate
8	potentially open these clutches up to provide a	8	your differential gearing. When you do that,
9	shutdown section which would, as Teraoka	9	you then are looking at what you're doing for
10	teaches, you have a shutdown section and then	10	an alternative differential system. You would
11	have a fuel economy benefit.	11	then potentially apply Watanabe. You may apply
12	But Watanabe all by itself compared	12	Torsen. You may apply a gerotor system.
13	to Teraoka all by itself, Watanabe, because it	13	BY MS. SHAH:
14	can be used in the front, the rear, or anyplace	14	Q. I'm sorry, let me back up. So why
15 16	isn't necessarily for a fuel economy. It's for	15 16	would one want to eliminate the the bevel
10 17	this control. The result of that control, as	17	differential gearing system?
18	you're taught by Teraoka, is fuel economy	18	A. You're probably looking for an alternative, and that alternative may be an
19	savings. Q. How would so what's your	19	alternative, and that alternative may be all alternative control schema, or potentially
20	understanding in terms of how a person of skill	20	you're looking for a weight savings. There may
21	in the art what would lead a person of skill	21	be a weight savings in eliminating the
22	in the art to to start off with Teraoka and	22	differential housing in bevel gears. What
23	then pull in disclosure from Watanabe? What	23	else? I mean, the fact that they both worked
24	A. Well	24	for the same company would lead someone who's
25	Q. What prompts that?	25	looking at one to find the other.
			5
	Page 176		Page 177
1		1	
1 2	S. Becker	1 2	S. Becker
1 2 3	S. Becker Q. I'm sorry, "they both" who?	1	S. Becker What are the options?
2	S. Becker Q. I'm sorry, "they both" who? A. Tochigi Fuji. Tochigi Fuji are	2	S. Becker
2 3	S. Becker Q. I'm sorry, "they both" who? A. Tochigi Fuji. Tochigi Fuji are Watanabe and Teraoka.	2 3	S. Becker What are the options? A. Torsen differential; again, a clutch
2 3 4	S. Becker Q. I'm sorry, "they both" who? A. Tochigi Fuji. Tochigi Fuji are	2 3 4 5 6	S. Becker What are the options? A. Torsen differential; again, a clutch differential; a locked differential; or a
2 3 4 5	S. Becker Q. I'm sorry, "they both" who? A. Tochigi Fuji. Tochigi Fuji are Watanabe and Teraoka. Q. I'm sorry, so is there more to your	2 3 4 5	S. Becker What are the options? A. Torsen differential; again, a clutch differential; a locked differential; or a permanently open differential.
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	Page 178		Page 179
1	S. Becker	1	S. Becker
2	moment with a partial applied clutch. You	2	packs, what are the various considerations and
3	can't with a fully locked clutch.	3	changes that are required to facilitate that
4	Q. And how does one so that I assume	4	substitution?
5	the the locking, whether it's fully locked	5	A. Depends on what type open
6	or partially locked, is a again, a design	6	differential you're talking about.
7	choice?	7	Q. So what are the different kinds of
8	Or are there performance	8	open differentials?
9	characteristics that are relevant?	9	A. Bevel gear, which is what you were
10	A. Exactly. Performance characteristics	10	discussing before, and then just a a a
11	and a design choice.	11	completely open differential. So you're just
12	Q. Is it just yaw moment that's affected	12	driving one side.
13	or are there other characteristics that are	13	Q. Okay. So let's focus on the bevel
14	affected by that choice?	14	gear differential.
15	A. A number of other characteristics.	15	If you are substituting a system that
16	When you lock the clutch, if you just lock it,	16	has a bevel gear differential for one now that
17	you're driving both system you know,	17	would have two clutches, what changes need to
18	whatever you're locking between the two	18	be made to that system to facilitate that
19	couplings, it's fully transmitting all the	19	change?
20	torque when you partially apply some torque	20	A. Well, you need to supply electronics
21	going somewhere else. So you have to decide	21	because now, you're you have to you have
22 23	why you want to do what. Also, partial apply	22	to develop a control scheme, you have to
24 24	will decrease the life of the clutch as well.	23 24	you're going to be necessitated to monitor
24 25	Q. When you if one was to substitute a an open differential with two clutch	24 25	speed at each wheel. And then you have all your geometry
2.5	*	2.5	· · · · · ·
-	Page 180		Page 181
1	S. Becker	1	S. Becker
2	concerns. You have to make the clutches fit in	2	A. More fuel consumption?
3	whatever rear differential module you're	3	Q. Yes.
4 5	creating.	4	A. Again, it's going to be a "depends"
6	You're going to have your sourcing issues. You got to purchase the clutch packs.	5	answer. If you design it right, no. Q. And what does it depend on?
7	And then you're going to have your life	7	A. It's going to depend on your sizing,
8	testing. You're going to have your NVH where	8	complexity. If in Teraoka if you've got a
9	you may have clutch moan, clutch squeal, or	9	second separate dog clutch or not or if you
10	clutch judder. J-U-D-D-E-R, or something like	10	are just using your friction plates as your,
11	that.	11	you know, coupling device.
	that.	12	In Watanabe, you've now got two
12	Yeah so you need to look at all of	T -	
12 13	Yeah, so you need to look at all of those things. Also the lubricant breakdown's	13	
13	those things. Also the lubricant breakdown's	13 14	clutch packs so you've got to account for their
	those things. Also the lubricant breakdown's going to be a more significant factor affecting	13 14 15	clutch packs so you've got to account for their decoupling so you're going to need the the
13 14 15	those things. Also the lubricant breakdown's going to be a more significant factor affecting clutches than a bevel gearset.	14	clutch packs so you've got to account for their decoupling so you're going to need the the space for that and everything else. So all
13 14	those things. Also the lubricant breakdown's going to be a more significant factor affecting clutches than a bevel gearset. Q. Why is that?	14 15	clutch packs so you've got to account for their decoupling so you're going to need the the space for that and everything else. So all those will play factors.
13 14 15 16	those things. Also the lubricant breakdown's going to be a more significant factor affecting clutches than a bevel gearset.	14 15 16	clutch packs so you've got to account for their decoupling so you're going to need the the space for that and everything else. So all
13 14 15 16 17	those things. Also the lubricant breakdown's going to be a more significant factor affecting clutches than a bevel gearset.Q. Why is that?A. Because bevel gears are just gears.	14 15 16 17	clutch packs so you've got to account for their decoupling so you're going to need the the space for that and everything else. So all those will play factors. Q. Is there a specific problem that's
13 14 15 16 17 18	those things. Also the lubricant breakdown's going to be a more significant factor affecting clutches than a bevel gearset.Q. Why is that?A. Because bevel gears are just gears.They're not predicated on purposeful frictional	14 15 16 17 18	clutch packs so you've got to account for their decoupling so you're going to need the the space for that and everything else. So all those will play factors. Q. Is there a specific problem that's being addressed in Watanabe?
13 14 15 16 17 18 19 20 21	those things. Also the lubricant breakdown's going to be a more significant factor affecting clutches than a bevel gearset.Q. Why is that?A. Because bevel gears are just gears.They're not predicated on purposeful frictional characteristics except for their life.	14 15 16 17 18 19	 clutch packs so you've got to account for their decoupling so you're going to need the the space for that and everything else. So all those will play factors. Q. Is there a specific problem that's being addressed in Watanabe? A. Yeah, well, Watanabe's intention is
13 14 15 16 17 18 20 21 22	 those things. Also the lubricant breakdown's going to be a more significant factor affecting clutches than a bevel gearset. Q. Why is that? A. Because bevel gears are just gears. They're not predicated on purposeful frictional characteristics except for their life. The clutch packs are really keen on 	14 15 16 17 18 19 20 21 22	 clutch packs so you've got to account for their decoupling so you're going to need the the space for that and everything else. So all those will play factors. Q. Is there a specific problem that's being addressed in Watanabe? A. Yeah, well, Watanabe's intention is to be capable of eliminating the gears while
13 14 15 16 17 18 20 21 22 23	 those things. Also the lubricant breakdown's going to be a more significant factor affecting clutches than a bevel gearset. Q. Why is that? A. Because bevel gears are just gears. They're not predicated on purposeful frictional characteristics except for their life. The clutch packs are really keen on their fluid content, fluid friction rate. Q. So if you take the dual clutch system that's disclosed in Watanabe, does that result 	14 15 16 17 18 19 20 21 22 23	 clutch packs so you've got to account for their decoupling so you're going to need the the space for that and everything else. So all those will play factors. Q. Is there a specific problem that's being addressed in Watanabe? A. Yeah, well, Watanabe's intention is to be capable of eliminating the gears while improving the controllability all in one package. Q. Can you point to something, a section
13 14 15 16 17 18 20 21 22	 those things. Also the lubricant breakdown's going to be a more significant factor affecting clutches than a bevel gearset. Q. Why is that? A. Because bevel gears are just gears. They're not predicated on purposeful frictional characteristics except for their life. The clutch packs are really keen on their fluid content, fluid friction rate. Q. So if you take the dual clutch system 	14 15 16 17 18 19 20 21 22	 clutch packs so you've got to account for their decoupling so you're going to need the the space for that and everything else. So all those will play factors. Q. Is there a specific problem that's being addressed in Watanabe? A. Yeah, well, Watanabe's intention is to be capable of eliminating the gears while improving the controllability all in one package.

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	Page 182		Page 183
1	S. Becker	1	S. Becker
2	described before. The distribution ratio	2	Q. I'm sorry, so you said page 24;
3	it's in my disclosure on page 24.	3	right?
4	Q. This is of your declaration?	4	A. Yes.
5	A. Correct, declaration.	5	Q. All right.
6	Q. Okay. Go ahead.	6	A. So the paragraph above the diagram
7	A. Above the figure, you've got "to	7	and the paragraph below were what I read.
8	allow power distribution without differential	8	Q. Other than this, is there any support
9	gearing between the drive wheels."	9	in sort of in Watanabe with respect to the
10	And then below the drawing, you have	10	issue of I guess with respect to the issue
11	"and by increasing and decreasing the	11	of what what the goal or the purpose of
12	tightening force individually for the multiple	12	Watanabe is?
13	plate clutches, the distribution ratio of the	13	A. I mean, that pretty much sums it up.
14	power between the right and left rear wheels	14	It's probably elsewhere in in Watanabe, but
15	can be adjusted and differential rotation can	15	that's their main purpose.
16	be controlled."	16	Q. Can you point to something
17	Q. And again, those sentences are on	17	specifically within the text of Watanabe that
18	pages 20 and 21 of your declaration?	18	talks about wanting power distribution without
19	A. 4. 24. I'm sorry.	19	differential gearing?
20	MS. SHAH: Oh, I'm sorry. Okay,	20	A. Yeah, they don't contrast and compare
21	can you maybe we don't have this.	21	to a a bevel gear system. Just the fact
22	Yeah, if we can just go off the record	22	that the drawings lack bevel gear, differential
23	for one minute.	23	gears, is the indication that there's no gear.
24	(Discussion held off the record.)	24	Q. Okay. So there's no mention in
25	BY MS. SHAH:	25	Watanabe regarding a power distribution system
	5 104		
	Page 184		Page 185
1	S. Becker	1	S. Becker
2	S. Becker that's intended to remove bevel gear	1 2	S. Becker everybody else. It was discussed. Actually, I
2 3	S. Becker that's intended to remove bevel gear differential gearing	1	S. Becker everybody else. It was discussed. Actually, I do remember a discussion about it.
2 3 4	S. Becker that's intended to remove bevel gear differential gearing MS. MANDRUSIAK: Objection.	1 2 3 4	S. Becker everybody else. It was discussed. Actually, I do remember a discussion about it. We were talking about making the
2 3 4 5	S. Becker that's intended to remove bevel gear differential gearing MS. MANDRUSIAK: Objection. Q is that right?	1 2 3 4 5	S. Becker everybody else. It was discussed. Actually, I do remember a discussion about it. We were talking about making the what was it, the not the Patriot, the
2 3 4 5 6	S. Becker that's intended to remove bevel gear differential gearing MS. MANDRUSIAK: Objection. Q is that right? A. Well	1 2 3 4 5 6	S. Becker everybody else. It was discussed. Actually, I do remember a discussion about it. We were talking about making the what was it, the not the Patriot, the Compass, the Jeep Compass capable of sending
2 3 4 5 6 7	S. Becker that's intended to remove bevel gear differential gearing MS. MANDRUSIAK: Objection. Q is that right? A. Well MS. MANDRUSIAK: Objection, form,	1 2 3 4 5 6 7	S. Becker everybody else. It was discussed. Actually, I do remember a discussion about it. We were talking about making the what was it, the not the Patriot, the Compass, the Jeep Compass capable of sending torque left and right, and there was a
2 3 4 5 6 7 8	S. Becker that's intended to remove bevel gear differential gearing MS. MANDRUSIAK: Objection. Q is that right? A. Well MS. MANDRUSIAK: Objection, form, mischaracterizes his testimony.	1 2 3 4 5 6 7 8	S. Becker everybody else. It was discussed. Actually, I do remember a discussion about it. We were talking about making the what was it, the not the Patriot, the Compass, the Jeep Compass capable of sending torque left and right, and there was a discussion about either making that into a posi
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	Page 186		Page 187
1	S. Becker	1	S. Becker
2	and then you've got a locked open and locked	2	bevel gear system, which is historically
3	closed solid.	3	simpler.
4	Q. What are the considerations in moving	4	I'm thinking there's also another
5	from, sort of, and employing each of those	5	one. Oh, yeah, the the Droder pump
6	systems?	6	where you've got a a Droder pump and
7	A. Well, the locked open's the the	7	a viscous lock. That's a fairly simple
8	one that's used in gocarting and some some	8	system, but you have less control over
9	other systems. What is that? All's I can	9	it.
10	think of at the moment's the gocarting.	10	BY MS. SHAH:
11	The solid lock is used a lot in	11	Q. So you mentioned that for ATVs and
12	off-road vehicles, which also includes some	12	other off-road type vehicles, it's likely that
13	UTVs and ATVs.	13	you would go with a locked differential
14	Torsen, that's going to be a it's	14	arrangement; is that correct?
15	also partially a traction control device in	15	A. Yeah. I'm not saying I would; I'm
16	addition to a differential because it	16	saying they're out there.
17	because of the geometry of the gears, it biases	17	Q. And so I guess the question is, is it
18	torque against slippage at higher speeds.	18	typically the case that ATVs would have
19	And again, you've got the the twin	19	include a locked differential?
20	clutch system.	20	MS. MANDRUSIAK: Objection, form.
21	THE REPORTER: I'm sorry, the?	21	A. Again, I can only refer to a few of
22	THE WITNESS: Twin clutch system,	22	the products I've worked with had that. Other
23	where you're going to be adding	23	products do not, so it I wouldn't
24	complexity to the development and adding	24	characterize it one way or the other.
25	mechatronics. And then you've got the	25	BY MS. SHAH:
		-	
	Page 188		Page 189
1	Page 188		Page 189
1	S. Becker	1	S. Becker
2	S. Becker Q. What's the rationale for including a	1 2	S. Becker BY MS. SHAH:
2 3	S. Becker Q. What's the rationale for including a locked differential with an ATV vehicle?	1 2 3	S. Becker BY MS. SHAH: Q. So because of the kind of altered
2 3 4	S. Becker Q. What's the rationale for including a locked differential with an ATV vehicle? A. It's cheaper.	1 2 3 4	S. Becker BY MS. SHAH: Q. So because of the kind of altered focus of the desired vehicle performance
2 3 4 5	S. Becker Q. What's the rationale for including a locked differential with an ATV vehicle? A. It's cheaper. Q. Anything else?	1 2 3 4 5	S. Becker BY MS. SHAH: Q. So because of the kind of altered focus of the desired vehicle performance characteristics does the architecture change
2 3 4 5 6	S. Becker Q. What's the rationale for including a locked differential with an ATV vehicle? A. It's cheaper. Q. Anything else? A. Then you get more well, you kind	1 2 3 4 5 6	S. Becker BY MS. SHAH: Q. So because of the kind of altered focus of the desired vehicle performance characteristics does the architecture change for an ATV as compared to the driveline
2 3 4 5 6 7	S. Becker Q. What's the rationale for including a locked differential with an ATV vehicle? A. It's cheaper. Q. Anything else? A. Then you get more well, you kind of get more traction. You get less wheel slip.	1 2 3 4 5 6 7	S. Becker BY MS. SHAH: Q. So because of the kind of altered focus of the desired vehicle performance characteristics does the architecture change for an ATV as compared to the driveline architecture of an ATV as compared to a
2 3 4 5 6 7 8	S. Becker Q. What's the rationale for including a locked differential with an ATV vehicle? A. It's cheaper. Q. Anything else? A. Then you get more well, you kind of get more traction. You get less wheel slip. And then you are requiring wheel slip when you	1 2 3 4 5 6 7 8	S. Becker BY MS. SHAH: Q. So because of the kind of altered focus of the desired vehicle performance characteristics does the architecture change for an ATV as compared to the driveline architecture of an ATV as compared to a conventional vehicle?
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48 (Pages 186 to 189)

	Page 190		Page 191
1	S. Becker	1	S. Becker
2	identification.)	2	to page 23 of your declaration
3	BY MS. SHAH:	3	A. Yeah.
4	Q. Mr. Decker, during the break did you	4	Q. I'm sorry, which is Exhibit 4. So if
5	have any substantive discussions with your	5	we compare page 23 of Exhibit 4 to page 19 of
6	counsel about this case?	6	the petition, is there any difference between
7	A. No.	7	that second paragraph and both of those pages?
8	Q. Okay. I'm sorry?	8	A. I think just the citation.
9	A. Did you say Decker? It's Becker.	9	Q. Did you this language that's in
10	Q. I think that's what I said. Let's	10	here, did you draft that language in your
11	see what the record says. Okay.	11	declaration?
12	If you could turn to page 19 of	12	A. I drafted the declaration. That may
13	Exhibit 7, which is the petition that was filed	13	have come up, part of the discussion with my
14	in this case, have you seen this exhibit	14	client.
15	before?	15	Q. And now turning to the charts
16	A. I don't know.	16	themselves, which are pages 23 through 25 of
17	Q. I'm sorry, if you could turn to page	17	Exhibit 4, your declaration as compared to
18	19 of the of Exhibit 3.	18	pages 20 through 21 of Exhibit 7, the petition
19	A. Yeah.	19	in this case, other than the citations, can you
20	Q. I'm sorry, Exhibit 7, the petition.	20	point to any differences in the substance?
21	A. Okay.	21	MS. MANDRUSIAK: Objection,
22	Q. So, for example, if you look at the	22	relevance.
23	second paragraph on page 19	23	A. Yeah, page 25 versus page 21. 25 in
24	A. Uh-huh.	24	my deck and 21 of the document you sent me,
25	Q do you and if you compare that	25	Exhibit 7.
		+	Lamon 7.
	Page 192		Page 193
1		1	
1	S. Becker	1	S. Becker
2	S. Becker BY MS. SHAH:	1 2	S. Becker MS. MANDRUSIAK: Objection. He did
2 3	S. Becker BY MS. SHAH: Q. Okay, yes.	1 2 3	S. Becker MS. MANDRUSIAK: Objection. He did answer the question.
2 3 4	S. Becker BY MS. SHAH: Q. Okay, yes. A. At the bottom, "Therefore, Watanabe	1 2 3 4	S. Becker MS. MANDRUSIAK: Objection. He did answer the question. Q. So you prepared them?
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$\begin{array}{c} 2\\ 3\\ 4\\ 5\\ 6\\ 7\\ 8\\ 9\\ 10\\ 11\\ 13\\ 14\\ 15\\ 16\\ 17\\ 18\\ 9\\ 20\\ 1\\ 22\\ 1\\ 22\\ 22\\ 22\\ 22\\ 22\\ 22\\ 22\\ $	S. Becker BY MS. SHAH: Q. Okay, yes. A. At the bottom, "Therefore, Watanabe discloses" THE WITNESS: I'm sorry, sir. If you're going to read, you must read slowly. A. "Therefore, Watanabe discloses longitudinal compensation by the clutches 89 and 91." Q. So other than that one difference, are these charts effectively the same? A. I haven't finished. Q. Okay. A. Yes. Q. And did you prepare these claim charts, the ones that are in your declaration, for example, the ones that we just referred to on pages 23 through 25 of Exhibit 4? MS. MANDRUSIAK: Objection, asked and answered.	$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\2\\13\\14\\15\\16\\17\\18\\9\\20\\21\\22\end{array} $	S. Becker MS. MANDRUSIAK: Objection. He did answer the question. Q. So you prepared them? A. It's part of my declaration, yeah. I agreed to them. Q. Okay. So when you agreed to them, does that mean that you were provided them and you inserted them into your declaration? MS. MANDRUSIAK: Objection, mischaracterizes his testimony. MS. SHAH: I'm asking the question. THE WITNESS: Yeah, these charts are a result of discussion with my client. BY MS. SHAH: Q. Okay, I'm sorry. I'm not sure if I I have a specific question, which was were you provided the charts and did you then insert them into your declaration? A. Again, I I didn't see this specific document, Exhibit 7, so I can't
2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 5 6 7 8 9 0 1 2 3 4 5 5 7 8 9 0 1 2 3 4 5 7 8 9 0 1 2 3 4 5 7 8 9 0 1 2 3 4 5 7 8 9 0 1 2 3 4 5 7 8 9 0 1 2 3 4 1 2 3 4 5 7 8 9 0 1 2 3 4 1 2 3 4 5 7 8 9 0 1 2 2 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	 S. Becker BY MS. SHAH: Q. Okay, yes. A. At the bottom, "Therefore, Watanabe discloses" THE WITNESS: I'm sorry, sir. If you're going to read, you must read slowly. A. "Therefore, Watanabe discloses longitudinal compensation by the clutches 89 and 91." Q. So other than that one difference, are these charts effectively the same? A. I haven't finished. Q. Okay. A. Yes. Q. And did you prepare these claim charts, the ones that are in your declaration, for example, the ones that we just referred to on pages 23 through 25 of Exhibit 4? MS. MANDRUSIAK: Objection, asked and answered. A. Again, that's part of my declaration. 	$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\23\\14\\15\\16\\17\\18\\9\\20\\21\\22\\23\end{array} $	S. Becker MS. MANDRUSIAK: Objection. He did answer the question. Q. So you prepared them? A. It's part of my declaration, yeah. I agreed to them. Q. Okay. So when you agreed to them, does that mean that you were provided them and you inserted them into your declaration? MS. MANDRUSIAK: Objection, mischaracterizes his testimony. MS. SHAH: I'm asking the question. THE WITNESS: Yeah, these charts are a result of discussion with my client. BY MS. SHAH: Q. Okay, I'm sorry. I'm not sure if I I have a specific question, which was were you provided the charts and did you then insert them into your declaration? A. Again, I I didn't see this specific document, Exhibit 7, so I can't comment as to whether this came from that

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1 S. Becker 1 S. Becker 2 few minor changes. 2 BY MS. SHAH: 3 Q. Is there any specific content in your 4 declaration that you independently authord? 4 M. MANDRUSIAK: Objection, form. 5 A. Yes. 6 Q can you tell me what the mechanism 9 of your declaration you independently authored? 8 A. Burrows discusses using a clutch to 9 of your declaration you independently authored? 8 A. Burrows discusses using a clutch to 9 of your declaration, you independently authored? 8 A. Burrows discusses using a clutch to 10 A. Not specifically, no. 10 A. Clutches. 9 12 (Becker Exhibit No. 8 was marked for 12 Q. Does Burrows contemplate simultaneous 14 BY MS. SHAH: 4 9 eagaement into four-wheel drive, or is there 14 go just to clean up the last set of 15 A. Clutches. 9 12 ous set had, the claim charts that are on 19 9 10 Nell, describe for me the system of 13 thatts? NS.MANDRUSIAK: Objection, asked 2 2
3 Q. Is there inv specific content in your 3 Q. So if we can turn to Exhibit 8, which 4 declaration that you independently authored? is the Burrows patent 5 MS. MANDRUSIAK: Objection, form. 6 6 A. Definitely, yes. 6 7 BY MS. SHAH: 6 8 Q. And can you point to which sections 7 9 of your declaration you independently authored? 7 1 MS. SHAH: 7 2 (Becker Exhibit No. 8 was marked for 2 3 dentification.) 1 4 BY MS. SHAH: 1 4 BY MS. SHAH: 1 5 Q. So just to clean up the last set of 1 6 questions we had, the claim charts that are 6 7 included in your declaration, for example, the 1 8 ones this we've been looking at that are on 1 9 pages 23 to 25 of of the Becker declaration, 9 10 chards? A. Well, Burrows has a front-wheel drive 11 chards? A. Well, Burrows has a front-wheel drive <t< td=""></t<>
3 Q. St ithere any specific content in your 3 Q. So if we can turn to Exhibit 8, which 4 declaration that you independently authored? 5 A. Yes. 5 MS. MANDRUSIAK: Objection, form. 6 A. Yes. 6 A. Definitely, yes. 6 Q can you tell me what the mechanism 7 BY MS. SHAH: 6 Q. And can you point to which sections 9 of your declaration you independently authored? 1 A. Not specifically, no. 11 MS. SHAH: Okay. 1 A. Clutches. 12 (Becker Exhibit No. 8 was marked for 12 Q. Does Burrows contemplate simultaneous 13 identification.) 13 engagement into four-wheel drive, or is there 14 BY MS. SHAH: 14 some alternate mechanism that described? 14 BY MS. SHAH: 14 A. Clutches. 15 Q. So just to clean up the last set of 16 questions we had, the claim charts that are 16 questions we had, the claim charts that are 16 Q. Well, describe for me the system of 19 pages 23 to 25 of of the Becker declaration, 19 Rengel of Gi transfor case unit. <t< td=""></t<>
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5 MS. MANDRUSIAK: Objection, form. 5 A. Yes. 6 A. Definitely, yes. 6 Q can you tell me what the mechanism 7 BY MS. SHAH: 7 is for synchronizing in the Burrows patent? 8 Q. And can you point to which sections 9 or synchronizing in the Burrows discusses using a clutch to 9 of your declaration, you independently authored? 0. Are there 1 MS. SHAH: 1 A. Clutches. 2 Q. So just to clean up the last set of 15 A. I don't know what you mean. 14 BY MS. SHAH: 14 So just to clean up the last set of 15 A. I don't know what you mean. 16 questions we had, the claim charts that are on 16 Q. Well, describe for me the system of 17 included in your declaration, for example, the 16 A. Well, Burrows has a front-wheel drive 10 did you independently author those claim 17 In there, there's a clutch that can 12 MS. MANDRUSIAK: Objection, asked 21 In there, there's a clutch that can 12 MS. MANDRUSIAK: Objection, asked 22 Additionally, they talk about 14 figure 3.
6 A. Definitely, yes. 6 Q can you tell me what the mechanism 7 BY MS. SHAH: 7 8 Q. And can you point to which sections 7 9 of your declaration you independently authored? 8 10 A. Not specifically, no. 10 11 MS. SHAH: 12 12 (Becker Exhibit No. 8 was marked for identification.) 12 13 identification.) 13 14 BY MS. SHAH: 14 15 Q. So just to clean up the last set of include in your declaration, for example, the neethanism that's described? 7 16 questions we had, the claim charts that are on include in your declaration, for example, the synchronizing that's taught in Burrows. 7 16 ones this we've been looking at that are on include in your declaration, for example, the synchronizing that's taught in Burrows. 7 16 ouestions we had, the claim charts that are on include in your declaration, for example, the synchronizing that's taught in Burrows. 7 17 skield wo independently author those claim 20 7 8 18 ones this we've been looking at that are on include in your declaration, for example, the synchronizing in the system of is synchronizing in the system of is sync
7 BY MS. SHAH: 7 is for synchronizing in the Burrows patent? 8 Q. And can you point to which sections 6 9 of your declaration you independently authored? 6 10 A. Not specifically, no. 10 11 MS. SHAH: 10 12 (Becker Exhibit No. 8 was marked for identification.) 10 13 identification.) 13 14 BY MS. SHAH: 14 15 Q. So just to clean up the last set of included in your declaration, for example, the ones this we've been looking at that are on included in your declaration, for example, the ones this we've been looking at that are on included in your declaration, for example, the ones this we've been looking at that are on included in your declaration, if example, the one stis we've been looking at that are on included in your declaration, if example, the one stis we've been looking at that are on included in your declaration, if example, the one discussions with my client. A. Well, Burrows has a front-wheel drive one is synchronizing that's taught in Burrows. 10 A. Mannonuclient is point. In there, there's a clutch that can be engaged of disengaged to synchronize the drive inc. 13 S. Becker 1 In there, there's a clutch that can be engaged or disengaged to synchronize the drive line, front driveline, front 14 S. Becker 1 S. Bec
8 Q. And can you point to which sections 8 A. Burrows discusses using a clutch to 9 of your declaration you independently authord? 0 Are there 1 MS. SHAH: Okay. 11 A. Clutches. 12 (Becker Exhibit No. 8 was marked for included in your declaration, for example, the claim charts that are included in your declaration, for example, the included in your declaration, for example, the included in your declaration, for example, the is solved in your declaration, for example, the is and answered, repeatedly at this point. Q. Well, describe for me the system of synchronizig that's taught in Burrows. 10 A. Well, Burrows has a front-wheel drive included in your declaration, for example, the is a solut. Q. Well, describe for me the system of synchronize the drive include in your declaration, for example, the is a solut. Nell, Burrows has a front-wheel drive include in your declaration, is synchronize the drive include in your declaration, for example, the is a solut. Page 197 12 MS. MANDRUSIAK: Objection, asked is cussions with my client. Page 196 Page 197 14 S. Becker In there's a scond clutch is essentially 51 in drive in is sesentially 51 in qpage 1 of Exhibit 8? Page 197 14 figure 3. And so there may be a second clutch is a soutlined on page 2, paragraph 20, where is a soutlined on page 2, paragraph 20, where is a soutlined on page 2, paragraph 20, where is a soutlined on page 2, paragraph 20, where is into words "changing from tw
9 of your declaration you independently authored? 9 cause synchronization. 10 A. Not specifically, no. 10 Q. Are there 11 MS. SHAH: 11 A. Clutches. 12 (Becker Exhibit No. 8 was marked for identification.) 13 a. Clutches. 13 identification.) 13 a. Clutches. 14 BY MS, SHAH: 14 a. Clutches. 15 Q. So just to clean up the last set of identification.) 15 A. I don't know what you mean. 16 questions we had, the claim charts that are onsethis we've been looking at that are on identify author those claim 7 synchronizing that's taught in Burrows. 19 pages 23 to 25 of of the Becker declaration, pages 23 to 25 of of the Becker declaration. 10 takeoff or transfer case unit. 11 charts? 11 In there, there's a clutch that can 22 12 MS. MANDRUSIAK: Objection, asked 23 driveline. 24 14 Figure 3. And so there may be a second clutch as ascend clutch faire are drives anight of the rear driveline, front 24 14 figure 3. And so there may be a second clutch as ascend clutch located between the there's a second clutch located between the t
10 A. Not specifically, no. 10 Q. Are there 11 MS. SHAH: Okay. 11 A. Clutches. 12 (Becker Exhibits No. 8 was marked for identification.) 13 Q. Does Burrows contemplate simultaneous engagement into four-wheel drive, or is there some alternate mechanism that's described? 14 BY MS. SHAH: 14 S. Mather Claim charts that are included in your declaration, for example, the some alternate mechanism that's described? 15 ones this we've been looking at that are on pages 23 to 25 of of the Becker declaration, 20 did you independently author those claim charts? A. Well, Burrows has a front-wheel drive engine transmission that goes to a power takcoff or transfer case unit. In there, there's a clutch that can be engaged or disengaged to synchronize the driveline, front driveline, front driveline, front driveline, front driveline. 11 S. Becker 21 S. Becker 12 S. Becker 11 S. Becker 13 ifferential and a second pair of wheels. 12 Q. Okay. Do you see the abstract on page 1 of Exhibit 8? 14 Q. Okay. Do you see the abstract on page 1 of Exhibit 8? 14 Q. Okay. Do you see the abstract on page 1 of Exhibit 8? 12 from the bottom talks about begins with the sort of this sery of rotating at least quicerstime the period, do you see that 18? 14 drive."
11 MS. SHAH: Okay. 11 Å. Clutches. 12 (Becker Exhibit No. 8 was marked for 12 Q. Does Burrows contemplate simultaneous engagement into four-wheel drive, or is there some alternate mechanism that's described? 14 BY MS. SHAH: 14 A. I don't know what you mean. 15 Q. So just to clean up the last set of included in your declaration, for example, the ones this we've been looking at that are on 16 Q. Well, describe for me the system of synchronizing that's taught in Burrows. 18 ones this we've been looking at that are on 18 A. Well, Burrows has a front-wheel drive engine transmission that goes to a power 10 charts? 20 WS. MANDRUSIAK: Objection, asked 21 In there, there's a clutch that can 21 charts? 21 In there, there's a clutch that can 22 23 maswered, repeatedly at this point. 23 24 THE WITNESS: Again, those were 24 24 THE WITNESS: Again, those were 24 Additionally, they talk about Page 197 1 S. Becker 1 S. Becker 1 S. Becker 1 S. Becker 1 S. Becker 2 2 14 G. Okay. Do you
12 (Becker Exhibit No. 8 was marked for identification.) 12 Q. Does Burrows contemplate simultaneous engagement into four-wheel drive, or is there some alternate mechanism that's described? 13 BY MS. SHAH: 14 some alternate mechanism that's described? 14 BY MS. SHAH: 14 some alternate mechanism that's described? 15 Q. So just to clean up the last set of included in your declaration, for example, the 15 A. I don't know what you mean. 16 questions we had, the claim charts that are on 16 Q. Well, describe for me the system of 17 included in your declaration, for example, the 17 synchronizing that's taught in Burrows. A. Well, Burrows has a front-wheel drive. 19 pages 23 to 25 of of the Becker declaration, 19 takeoff or transfer case unit. 10 charts? 21 In there, there's a clutch that can 12 MS. MANDRUSIAK: Objection, asked 23 driveline of the rear driveline, front 14 THE WITNESS: Again, those were 24 driveline. Page 197 1 S. Becker 2 reconnecting it to provide drive torque to the rear drive unit, which is essentially 51 in 3 G. Okay. Do you see the abstract on 9 Page 197
13 identification.) 13 engagement into four-wheel drive, or is there some alternate mechanism that's described? 14 BY MS. SHAH: 14 some alternate mechanism that's described? 15 Q. So just to clean up the last set of ucluded in your declaration, for example, the included in your declaration, for example, the pages 23 to 25 of of the Becker declaration, 19 A. Well, Burrows has a front-wheel drive engine transmission that's agest to a power takeoff or transfer case unit. 10 pages 23 to 25 of of the Becker declaration, for example, the drive independently author those claim A. Well, Burrows has a front-wheel drive engine transmission that goes to a power takeoff or transfer case unit. 11 charts? In there, there's a clutch that can be engaged to synchronize the driveline, front 14 THE WITNESS: Again, those were 24 driveline. 25 14 S. Becker 21 S. Becker 1 S. Becker 14 figure 3. And so there may be a second clutch focated between the drive indigeneration on page 1 of Exhibit 8? 1 S. Bocker 1 S. matheff 14 G. Okay. Do you see the abstract on geal of Exhibit 8? 9 Q. Okay. And we may have skipped a line, but 6 A. I did? 15 A. Yes. 1 I guesstine question I have here
14 BY MS. SHAH: 14 some alternate mechanism that's described? 15 Q. So just to clean up the last set of 15 A. I don't know what you mean. 16 questions we had, the claim charts that are 16 Q. Well, describe for me the system of 16 ones this we've been looking at that are on 18 A. Well, Burrows has a front-wheel drive engine transmission that goes to a power 19 pages 23 to 25 of of the Becker declaration, 19 engine transmission that goes to a power 20 did you independently author those claim 20 that are on 18 21 charts? 21 In there, there's a clutch that can 22 22 MS. MANDRUSIAK: Objection, asked 23 and answered, repeatedly at this point. 23 A. Well, Burrows has a front-wheel drive engine transmission that goes to a power 24 THE WITNESS: Again, those were 24 In there, there's a clutch that can 25 25 disconnecting the main rear driveshaft in the 25 Additionally, they talk about 27 24 figure 3. And so there may be a second clutch 3 as outlined on page 2, paragraph 20, where 1 S. Becker 2 Q. Okay. And we may have ski
15 Q. So just to clean up the last set of 15 A. I don't know what you mean. 16 questions we had, the claim charts that are 16 Q. Well, describe for me the system of 17 included in your declaration, for example, the 17 synchronizing tha's taught in Burrows. 18 ones this we've been looking at that are on 18 A. Well, Burrows has a front-wheel drive 19 pages 23 to 25 of of the Becker declaration, 19 and onependently author those claim 10 21 charts? 21 In there, there's a clutch that can 22 23 and answered, repeatedly at this point. 23 and answered, repeatedly at this point. 23 and answered, repeatedly at this point. 24 THE WITNESS: Again, those were 24 Additionally, they talk about 26 24 THE WITNESS: Again, those were 24 S. Becker 1 Ine, but 6 A. I did? 1 Ine, but 6 A. I did? 1 1 Ine, but 1 Indiferential and a secon
16 questions we had, the claim charts that are included in your declaration, for example, the synchronizing that's taught in Burrows. 17 included in your declaration, for example, the synchronizing that's taught in Burrows. 18 ones this we've been looking at that are on did you independently author those claim 18 20 MS. MANDRUSIAK: Objection, asked 20 21 MS. MANDRUSIAK: Objection, asked 21 22 MS. MANDRUSIAK: Objection, asked 22 23 and answered, repeatedly at this point. 24 24 THE WITNESS: Again, those were 24 25 Additionally, they talk about Page 196 Page 197 1 S. Becker 2 disconnecting the main rear driveshaft in the rear drive unit, which is essentially 51 in 4 4 figure 3. And so there may be a second clutch as outlined on page 2, paragraph 20, where 1 6 there's a second pair of weels. 7 Q. Okay. Do you see the abstract on 9 page 1 of Exhibit 8? 9 Q. Okay. Do you see the abstract on 9 page 1 of Exhibit 8? 10 A. Yes. 11 G. Does the actually, the second line 1 this:- sort of this step o
17 included in your declaration, for example, the ones this we've been looking at that are on pages 23 to 25 of of the Becker declaration, 29 7 synchronizing that's taught in Burrows. 18 ones this we've been looking at that are on didy ou independently author those claim 19 engine transmission that goes to a power 19 pages 23 to 25 of of the Becker declaration, 20 indy ou independently author those claim 19 engine transmission that goes to a power 11 charts? 10 In there, there's a clutch that can 10 12 MS. MANDRUSIAK: Objection, asked 21 In there, there's a clutch that can 10 12 MS. MANDRUSIAK: Objection, asked 22 be engaged or disengaged to synchronize the driveline, front 14 THE WITNESS: Again, those were 24 driveline. 25 Additionally, they talk about Page 196 Page 197 1 S. Becker 1 S. Becker 2 disconnecting the main rear driveshaft in the rear drive unit, which is essentially 51 in 3 3 4 figure 3. And so there may be a second clutch focated between the for the shot on page 2, paragraph 20, where 6 A. I did? 7 Q. Okay. Do you see the
18 ones this we've been looking at that are on 18 A. Well, Burrows has a front-wheel drive engine transmission that goes to a power 19 pages 23 to 25 of of the Becker declaration, 19 20 did you independently author those claim 20 21 In there, there's a clutch that can 20 22 MS. MANDRUSIAK: Objection, asked 21 In there, there's a clutch that can 23 and answered, repeatedly at this point. 23 be engaged or disengaged to synchronize the 24 THE WITNESS: Again, those were 24 driveline of the rear driveline, front 24 THE WITNESS: Again, those were 25 Additionally, they talk about 25 discussions with my client. 25 Additionally, they talk about 26 S. Becker 1 S. Becker 2 2 disconnecting the main rear driveshaft in the 2 reconnecting it to provide drive torque to the 3 as outlined on page 2, paragraph 20, where 6 A. I did? 9 4 differential and a second pair of wheels. 7 Q. That's fine. We can that 6 8 Q. Okay. Do you see the abstract on 9
19 pages 23 to 25 of of the Becker declaration, 19 engine transmission that goes to a power 20 did you independently author those claim 20 takeoff or transfer case unit. 21 MS. MANDRUSIAK: Objection, asked 21 In there, there's a clutch that can 22 MS. MANDRUSIAK: Objection, asked 22 be engaged or disengaged to synchronize the 23 and answered, repeatedly at this point. 24 THE WITNESS: Again, those were 24 24 THE WITNESS: Again, those were 24 diveline of the rear driveline, front 24 THE WITNESS: Again, those were 24 diveline. 25 25 Additionally, they talk about Page 197 1 S. Becker 1 S. Becker 1 2 is connecting the main rear driveshaft in the 2 reconnecting it to provide drive torque to the 3 rear drive unit, which is essentially 51 in 3 rear wheels 14 and 15." 4 4 figure 3. And so there may be a second clutch 5 line, but 6 A. I did? 7 Q. Okay. Do you see the abstract on 9 page 1 of Exhibit 8? 9 uder
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19 into the record, please? 19 four-wheel drive, so as you connect four-wheel
A. Sure. "Changing from two-wheel to 20 drive, as you spin that up, that's going to be
four-wheel drive is controlled so that the 21 a power loss. It's going to cause drag on the
22 engine 11 or the second pair of wheels, 22 vehicle.
23 typically, the rear wheels, 14 and 15, to 23 Q. And in Teraoka, do they describe this
rotate at least part of the auxiliary driveline 24 sort of kind of rotation step to facilitate
25 21 for sufficient time period prior to fully 25 synchronization?

50 (Pages 194 to 197)

	Page 198		Page 199
1	S. Becker	1	S. Becker
2	A. No, Teraoka doesn't discuss the pause	2	two-step process that Burrows outlines for kind
3	or what was it? The short period of time?	3	of spinning up the auxiliary driveline could be
4	What do they call it? Sufficient time period.	4	contemplated by Burrows by Teraoka?
5	Teraoka does not discuss the sufficient time	5	A. Teraoka doesn't specifically mention
6		6	it or not mention it. You know, it's not
7	period to spin up the driveshaft.	7	
	Q. Okay. Does Teraoka actually talk	8	discussed. They just say we're going to ask
8	about simultaneous engagement? A. I would have to do a search for the		for the couplings to engage.
9		9	As soon as they make this product and
10	word "simultaneous." It does say	10	they do that, they would see a driveline clunk
11	"simultaneously coupled when switching," if	11	most likely as the commanded application of
12	that's what you mean.	12	torque.
13	Q. And there is there a distinction	13	If it's applied too quickly, you're
14	between simultaneously coupling and the process	14	going to get a clunk. If you apply it with a
15	that's described in the abstract of Burrows,	15	sufficient time period, you're going to
16	Exhibit 8?	16	eliminate that clunk.
17	A. Simultaneous coupling would mean that	17	Q. Can one readily substitute this
18	they occur at a similar time. Burrows	18	two-stage kind of synchronization process
19	describes that as a sufficient time period. So	19	that's described in Burrows, Exhibit 8, into
20	it would depend on your translation.	20	Teraoka?
21	Simultaneous doesn't have to mean instantly; it	21	A. Definitely. I would expect that if
22	just means you ask for the engagement at the	22	you were ever to have not seen Burrows and were
23	same time. It depends on your control scheme	23	to attempt to implement Teraoka, you would
24	what you do with that afterwards.	24	you would do that.
25	Q. So it's your opinion that the sort of	25	Q. Based on what?
	Page 200		Page 201
1	Page 200		Page 201
1	S. Becker	1	S. Becker
2	S. Becker A. Based on relevant skill in the art.	2	S. Becker if we use that terminology, if we equate
2 3	S. Becker A. Based on relevant skill in the art. Again, the performance characteristics of the	2 3	S. Becker if we use that terminology, if we equate all-terrain and off-road vehicle
2 3 4	S. Becker A. Based on relevant skill in the art. Again, the performance characteristics of the driveline are such that you're going to	2 3 4	S. Becker if we use that terminology, if we equate all-terrain and off-road vehicle A. Well, I can't
2 3 4 5	S. Becker A. Based on relevant skill in the art. Again, the performance characteristics of the driveline are such that you're going to minimize NVH-type systems, noise, vibration and	2 3 4 5	S. Becker if we use that terminology, if we equate all-terrain and off-road vehicle A. Well, I can't Q would one expect acceleration
2 3 4 5 6	S. Becker A. Based on relevant skill in the art. Again, the performance characteristics of the driveline are such that you're going to minimize NVH-type systems, noise, vibration and harshness.	2 3 4 5 6	S. Becker if we use that terminology, if we equate all-terrain and off-road vehicle A. Well, I can't Q would one expect acceleration jerks to be greater with an off-road vehicle?
2 3 4 5 6 7	S. Becker A. Based on relevant skill in the art. Again, the performance characteristics of the driveline are such that you're going to minimize NVH-type systems, noise, vibration and harshness. A rapid application of torque to a	2 3 4 5 6 7	S. Becker if we use that terminology, if we equate all-terrain and off-road vehicle A. Well, I can't Q would one expect acceleration jerks to be greater with an off-road vehicle? A. You're going to be using a lower mass
2 3 4 5 6 7 8	S. Becker A. Based on relevant skill in the art. Again, the performance characteristics of the driveline are such that you're going to minimize NVH-type systems, noise, vibration and harshness. A rapid application of torque to a shaft that's not spinning in connecting to a	2 3 4 5 6 7 8	S. Becker if we use that terminology, if we equate all-terrain and off-road vehicle A. Well, I can't Q would one expect acceleration jerks to be greater with an off-road vehicle? A. You're going to be using a lower mass drive system so the jerk itself would be less,
2 3 4 5 6 7 8 9	S. Becker A. Based on relevant skill in the art. Again, the performance characteristics of the driveline are such that you're going to minimize NVH-type systems, noise, vibration and harshness. A rapid application of torque to a shaft that's not spinning in connecting to a shaft that's spinning at, say, any given	2 3 4 5 6 7 8 9	S. Becker if we use that terminology, if we equate all-terrain and off-road vehicle A. Well, I can't Q would one expect acceleration jerks to be greater with an off-road vehicle? A. You're going to be using a lower mass drive system so the jerk itself would be less, but because the vehicle itself also weighs
2 3 4 5 6 7 8 9 10	S. Becker A. Based on relevant skill in the art. Again, the performance characteristics of the driveline are such that you're going to minimize NVH-type systems, noise, vibration and harshness. A rapid application of torque to a shaft that's not spinning in connecting to a shaft that's spinning at, say, any given highway speed or other speed would cause a	2 3 4 5 6 7 8 9 10	S. Becker if we use that terminology, if we equate all-terrain and off-road vehicle A. Well, I can't Q would one expect acceleration jerks to be greater with an off-road vehicle? A. You're going to be using a lower mass drive system so the jerk itself would be less, but because the vehicle itself also weighs less, the effect of that jerk may be the same.
2 3 4 5 6 7 8 9 10 11	S. Becker A. Based on relevant skill in the art. Again, the performance characteristics of the driveline are such that you're going to minimize NVH-type systems, noise, vibration and harshness. A rapid application of torque to a shaft that's not spinning in connecting to a shaft that's spinning at, say, any given highway speed or other speed would cause a significant jerk. Jerk is a sudden	2 3 4 5 6 7 8 9 10 11	S. Becker if we use that terminology, if we equate all-terrain and off-road vehicle A. Well, I can't Q would one expect acceleration jerks to be greater with an off-road vehicle? A. You're going to be using a lower mass drive system so the jerk itself would be less, but because the vehicle itself also weighs less, the effect of that jerk may be the same. In other words, mass provides a
2 3 4 5 6 7 8 9 10 11 12	S. Becker A. Based on relevant skill in the art. Again, the performance characteristics of the driveline are such that you're going to minimize NVH-type systems, noise, vibration and harshness. A rapid application of torque to a shaft that's not spinning in connecting to a shaft that's spinning at, say, any given highway speed or other speed would cause a significant jerk. Jerk is a sudden acceleration of the driveline. That jerk would	2 3 4 5 6 7 8 9 10 11 12	S. Becker if we use that terminology, if we equate all-terrain and off-road vehicle A. Well, I can't Q would one expect acceleration jerks to be greater with an off-road vehicle? A. You're going to be using a lower mass drive system so the jerk itself would be less, but because the vehicle itself also weighs less, the effect of that jerk may be the same. In other words, mass provides a damping for jerk. In a vehicle that's massive,
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2 3 4 5 6 7 8 9 10 11 13 14 15 16 7 8 9 20 21 22 23	 S. Becker A. Based on relevant skill in the art. Again, the performance characteristics of the driveline are such that you're going to minimize NVH-type systems, noise, vibration and harshness. A rapid application of torque to a shaft that's not spinning in connecting to a shaft that's spinning at, say, any given highway speed or other speed would cause a significant jerk. Jerk is a sudden acceleration of the driveline. That jerk would be translated to decrease durability and increased harshness. Q. And is the trade-offs associated with jerks more pronounced for an ATV than for a conventional vehicle? A. Not specifically. Again, it goes back to your definition of ATV. In England, they keep defining ATV as a Land Rover or a vehicle that can go off-road. Here in the U.S., we define ATV as an off-road, you know, generally smaller-looking vehicle. 	2 3 4 5 6 7 8 9 0 1 1 2 3 4 5 6 7 8 9 0 1 1 2 3 4 5 6 7 8 9 0 1 1 2 3 4 5 6 7 8 9 0 1 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 5 7 8 9 0 1 2 3 4 5 5 7 8 9 0 1 2 3 4 5 1 2 3 4 5 5 1 2 3 4 5 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 2 2 2 2 2	S. Becker if we use that terminology, if we equate all-terrain and off-road vehicle A. Well, I can't Q would one expect acceleration jerks to be greater with an off-road vehicle? A. You're going to be using a lower mass drive system so the jerk itself would be less, but because the vehicle itself also weighs less, the effect of that jerk may be the same. In other words, mass provides a damping for jerk. In a vehicle that's massive, having a larger weight system being jerked is going to dampen that jerk greater than a lightweight vehicle. So if you were comparing, say, a like, a Land Rover Discovery and you're going to jerk that drive lane driveline compared to, say, a Yamaha Rhino because of the ridged connections in the Yamaha and the lighter weight of the whole vehicle, the effect of spinning up that driveline should be pretty similar. But again, that would have

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	Page 202		Page 203
1	S. Becker	1	S. Becker
2	then we may wrap up.	2	CERTIFICATE
3	(Recess taken.)	3	COMMONWEALTH OF VIRGINIA:
4	MS. SHAH: So I have no further	4	I, MARY ANN PAYONK, shorthand reporter,
5	questions.	5	do hereby certify that the witness whose
6	MS. MANDRUSIAK: We have no	6	deposition is hereinbefore set forth was duly
	redirect at this time. We will reserve	7	sworn, and that such deposition is a true,
7		8	-
8	the right to read and sign the		correct, and full record of the testimony
9	transcript when it's done.	9	given.
10	ind. Similie Onage maint you very	10	I further certify that I am not related
11	much.	11	to any of the parties to this action by blood
12		12	or by marriage, and that I am in no way
13	(2 eposition aufourneu au et ne print)	13	interested in the outcome of this matter.
14		14	IN WITNESS WHEREOF, I have hereunto set
15		15	my hand this 14th day of June, 2016.
16		16	
17		17	
18		18	MARY ANN PAYONK, Shorthand Reporter
19		19	
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21 22		22	
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23 24		24	
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	Page 204		Page 205
1	S. Becker	12	S. Becker NAME OF CASE:
2	- INDEX TO WITNESSES -	3	DATE OF DEPOSITION:
3	WITNESS PAGE	4	1. To clarify the record.
4	STEVEN J. BECKER	5	 To conform to the facts. To correct transcription error.
5	Examination by Ms. Shah 4	6	5. To concer transcription error.
6	- EXHIBITS -		Page Line Reason
7	NO. DESCRIPTION MARKED	7	From to Page Line Reason
8	Exhibit No. 1 Biography printout 17		Page Line Reason From to
9	Exhibit No. 2 SAE paper 79	9	
10	Exhibit No. 3 '440 patent 120	1.0	Page Line Reason
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