

1 SUPREME COURT OF THE STATE OF NEW YORK  
2 COUNTY OF NEW YORK

3 NATASHA AUSTIN AND NICOLE AUSTIN,

4 Plaintiffs,

5 -against- Index No. 10215/00  
Volume II

6 DAIMLERCHRYSLER CORPORATION,  
7 WESBURY JEEP EAGLE, INC.,  
8 MARIBEL ORTIZ, AS INTENDED  
9 ADMINISTRATRIX OF THE ESTATE  
OF JOSE A. SIERRA, DECEASED,  
GRACE H. EVANS AND LISA N.  
EVANS,

Defendants.

10 \_\_\_\_\_/

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12 The continuation of the videotaped  
13 deposition of JUDSON B. ESTES, a witness in the  
14 above-entitled matter, taken before Melinda S.  
15 Moore, (CSR-2258), a Notary Public, at 840 West Long  
16 Lake, Suite 200, Troy, Michigan, on May 27, 2005,  
17 commencing at or about 8:38 a.m.

18

APPEARANCES:

19

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11 VIDEO TECHNICIAN:

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1 Troy, Michigan

2 May 27, 2005

3 \* \* \* \* \*

4 VIDEO TECHNICIAN: Today's date is May  
5 27th, 2005, and we're back on the record at 8:38  
6 a.m. This is the continued video deposition of  
7 Mr. Judson Estes.

8 MS. FOGEL: This is Maureen Fogel from  
9 Herzfeld & Rubin for DaimlerChrysler Corporation. I  
10 would just like to renew the objection that was put  
11 on the record yesterday during the beginning of  
12 Steve Lazarus' deposition. We are objecting to the  
13 videotaping of the deposition as being not in  
14 accordance with the New York Code Rules and  
15 Regulations 202.15 with regard to the notice  
16 provisions that are stated therein, and yesterday  
17 also we had cited to a particular case.

18 We have agreed today to continue with the  
19 videotaped depositions since we're all here from New  
20 York and California, and that we will visit the  
21 issue of whether the videotape portion of the  
22 deposition can be utilized with the court on another  
23 day.

24 \* \* \* \* \*

25 J U D S O N B. E S T E S

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1 after having been previously duly sworn by the  
2 Notary Public, was examined and testified on his  
3 oath as follows:

4 EXAMINATION

5 BY MS. SPAGNOLI:

6 Q Good morning, Mr. Estes.

7 A Morning.

8 Q Have you reviewed anything since leaving here  
9 yesterday?

10 A No, I have not.

11 Q Have you had any conversations with anyone about  
12 your testimony?

13 A No.

14 Q When you left yesterday, I noticed that you were  
15 talking with the attorneys in the parking lot. Were  
16 you discussing your testimony?

17 A No, I don't think we were.

18 Q Did you have any discussion at all about what your  
19 testimony might cover today?

20 A No. I think we were talking about real estate.

21 Q Okay. So you have not had any conversation with  
22 anyone since your testimony started about the  
23 questions that I've asked you or the testimony that  
24 you've given?

25 A I talked to my wife a little bit about it. Other



1 than that, I have not spoken to anyone.

2 Q Okay. Yesterday, when we broke, you were telling us

3 that with respect to your -- well, let me withdraw.

4 We were talking about the reinforcement  
5 bracket that was added to the 1997 model Jeep Grand  
6 Cherokees as a result of the -- I think you said, as  
7 a result of two things. The first was you wanted to  
8 keep a hole in the left side rail from deforming and  
9 compromising the vent line and the fuel filler line,  
10 and, secondly, you said that the reinforcement  
11 bracket was installed in order to manage the crush  
12 so that the fuel tank would not contact the  
13 differential as it was in the earlier models. Am I  
14 correct?

15 MS. FOGEL: Objection to the form. You can  
16 answer.

17 THE WITNESS: The way you stated it is not  
18 correct. The bracket was installed on the left rear  
19 rail to prevent contact with the hole as it closed,  
20 not to deform it. The bracket also had the effect  
21 of lifting the tank up on top of the differential  
22 but it still contacted it.

23 Q (BY MS. SPAGNOLI): Right. You wanted to change the  
24 way the tank contacted the differential from the  
25 earlier model?

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1 MS. FOGEL: Objection to form. You can  
2 answer.

3 THE WITNESS: The true intent of the  
4 bracket was to prevent contact with the fill and  
5 vent lines on the body frame rail where they went  
6 through.

7 Q (BY MS. SPAGNOLI): Are you now changing your  
8 testimony?

9 A No, no. That's what we intended to do. It did lift  
10 the tank above it.

11 Q And that was a change from the prior models?

12 A Yes. Adding the bracket was a change from prior  
13 models.

14 Q In the prior models -- no, the change from the prior  
15 model was that the manner in which the fuel tank  
16 contacted the differential was different?

17 MS. FOGEL: Objection to form. You can  
18 answer.

19 THE WITNESS: Where the tank hits the  
20 differential is raised by introducing the side  
21 bracket on the left side. That bracket helps the  
22 tank rise over the differential. It still contacts  
23 the differential, and the contact with the  
24 differential is still in the same place on the tank.  
25 Q (BY MS. SPAGNOLI): So the means by which the

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1 bracket affects the differential and fuel tank  
2 contact is that it's not as a direct impact; it's an  
3 impact that purportedly allows the tank to not have  
4 a blunt force impact with the differential?

5 MS. FOGEL: Objection to form. You can  
6 answer.

7 THE WITNESS: It allows the tank to slide  
8 over the top of the differential.

9 Q (BY MS. SPAGNOLI): Instead of blunt force?

10 A It's a round differential and you can't really hit  
11 it square.

12 Q Well, it was hitting it square before, wasn't it?

13 MS. FOGEL: Objection to form. You can  
14 answer.

15 THE WITNESS: It's hard to hit a round  
16 thing square. You almost always glance off of it at  
17 some level, and the idea is to make it hit it more  
18 on the top of the differential. That was a benefit  
19 of using the bracket.

20 Q (BY MS. SPAGNOLI): Are you saying that the fuel  
21 tanks in the '93 to '96 model Jeep Grand Cherokees  
22 did not basically wrap around the differential in  
23 the rear impact --

24 A Not in every case.

25 Q -- as opposed to sliding off?

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1 A Not in every case.

2 Q Did it do that in some cases?

3 A I don't recall.

4 Q Well, then, how can you say not in every case?

5 A Pardon me for a minute. The fuel tank does not wrap  
6 around completely the differential. It hits it and  
7 some of them hit and slide over it; some of them hit  
8 and slide off to the side. The way the tank  
9 contacts the differential is test to test  
10 independent and changes every one. To say it does

11 one thing or another in every test would be very  
12 difficult to say.

13 Q Well, then, how can you say that the addition of the  
14 reinforcement bracket was going to change the manner  
15 in which the tank slid off the differential?

16 A Well, no, it has helped the differential, and I  
17 tried to be clear, that it has helped the fuel tank  
18 move in that direction, that it adds a propensity to  
19 move the fuel tank in that direction, that we talked  
20 a lot yesterday about what I meant by help and  
21 aided, and it increases the probability that the  
22 tank will slide over the top of the differential.  
23 This is what I'm trying to say, is that it's an aid  
24 for the tank. It does not make it do that 100  
25 percent of the time.

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1 Q You said that the way the tank contacts the  
2 differential is test to test independent and changes  
3 every one. How many tests did you do with the  
4 reinforcement bracket that allowed you to conclude  
5 that the reinforcement bracket would change the  
6 manner in which the fuel tank would hit the

7 differential?

8 MS. FOGEL: Objection to form. You can  
9 answer.

10 THE WITNESS: I don't remember how many  
11 exactly. In the most recent review of the data,  
12 that's where we would have to read the test  
13 descriptions to get a precise number. It was four  
14 or five, I think, but I can't remember precisely.

15 Q (BY MS. SPAGNOLI): You think you did four or five  
16 tests that had the bracket?

17 A I think so.

18 Q And would those tests note the manner in which the  
19 fuel tank hit the differential?

20 A That would be up to the guy at the proving grounds,  
21 whether he wrote it down into the data on the Fuel  
22 Impact Summary Sheet.

23 Q By 1995 or '96 did you expect that the engineers  
24 running the impact tests on the Jeep Grand Cherokees  
25 would make a note of contact between the fuel tank

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1 and the differential?

2 A Did I expect them to make a note?

3 Q Right.

4 A No, I guess I didn't.

5 Q Okay. So that's not something that was an issue  
6 that needed to be noted in the report to bring to  
7 the attention of the development engineers?

8 A No. I don't think that contact between the fuel  
9 tank and the axle needed to be noted every time.

10 Q Okay. When did it need to be noted?

11 A The experience of the test engineers as they look at  
12 the crash test after the event would tell them if  
13 something unusual had happened, and when something  
14 unusual or distinct had happened, then that's noted.  
15 That's what would be noted. That's a guideline for  
16 the notations in the impact test logs.

17 Q We saw in the original tests that were used to  
18 certify the Jeep Grand Cherokee as in compliance  
19 with the federal standard that the test engineers  
20 had, in fact, noted contact between the fuel tank  
21 and various components including the axle. Do you  
22 recall that?

23 A Yep.

24 Q And so at least in '90, '91, '92, when those tests  
25 were run, that was an unusual or unexpected

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1 occurrence; is that what you're telling us?

2 MS. FOGEL: Objection to form. You can  
3 answer.

4 THE WITNESS: The first question was when  
5 did they have to do it. The fact that they did do  
6 it didn't mean that they had to make the notation.  
7 You could note a lot of different things on there  
8 but what you were expected to do is to note the  
9 unusual things.

10 It varies by each test engineer what they  
11 make notes of, and it varies where the vehicle is in  
12 its development cycle as to whether it's unusual or  
13 as it progresses through the cycling, and you see it  
14 again and again. You go, oh, that's the same thing,  
15 I don't have to note it, it occurs naturally in the  
16 progress of the test.

17 Q (BY MS. SPAGNOLI): So when was it decided with  
18 respect to the Jeep Grand Cherokee that the contact  
19 between the fuel tank and the axle and differential  
20 was no longer something to be noted in the crash  
21 tests?

22 MS. FOGEL: Objection to form. You can  
23 answer.

24 THE WITNESS: It would imply that there was  
25 an actual conscious decision to do that, and I don't



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1 believe that's the case. You will have a group of  
2 men looking at the same kinds of tests and after a  
3 while, you all begin to recognize that this is a  
4 standard pattern. Did we all decide that we weren't  
5 going to write this down today? No, that's not the  
6 way those things occur in engineering.

7 Q (BY MS. SPAGNOLI): And even though the contact with  
8 the tank and the differential became an expected  
9 occurrence in the 301 rear impact tests, you still,  
10 when you became the manager of the Jeep Grand  
11 Cherokee test program, decided to try and do  
12 something about it to change that impact and  
13 contact, correct?

14 MS. FOGEL: Objection to the form.

15 THE WITNESS: When the changes in 1996 were  
16 proposed for the vehicle, that is when we needed to  
17 alter the structure of the vehicle to make the new  
18 system pass.

19 MS. SPAGNOLI: Move to strike as  
20 nonresponsive.

21 Q (BY MS. SPAGNOLI): Can you answer my question,

22 please?

23 MS. FOGEL: Have the question read back,

24 please.

25 Q (BY MS. SPAGNOLI): And even though the contact with

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1 the tank and differential became an expected  
2 occurrence in the 301 rear impact tests, when you  
3 became manager of the Jeep Grand Cherokee test  
4 program, you decided to try and do something about  
5 it to change the nature of that impact, correct?

6 MS. FOGEL: Objection to form.

7 THE WITNESS: I did not decide to change  
8 the nature of the impact because I was the new  
9 manager.

10 MS. SPAGNOLI: We need to go off the record  
11 for a minute.

12 VIDEO TECHNICIAN: Going off the record at  
13 8:51 a.m.

14 (Off the record.)

15 VIDEO TECHNICIAN: We're back on the record  
16 at 8:53 a.m.

17 Q (BY MS. SPAGNOLI): What were the changes in 1996

18 that you had to make in the structure of the Grand  
19 Cherokee to make the new fuel system pass?

20 MS. FOGEL: Objection to the form. You can  
21 answer.

22 THE WITNESS: I think that we didn't get  
23 around to actually fixing it until 1997 by adding  
24 the bracket. Is that the answer that you were  
25 looking for? Repeat that question.

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1 Q (BY MS. SPAGNOLI): Well, I'm following up on your  
2 statement. You testified that when the changes in  
3 1996 were proposed for the vehicle, that is when you  
4 needed to alter the structure of the vehicle to make  
5 the new system pass. What changes to the structure  
6 of the vehicle were necessary to make the new system  
7 pass?

8 MS. FOGEL: Objection to the form.

9 THE WITNESS: The proposed system in 1996  
10 needed to have the pass-through hole reinforced, and  
11 those were the changes we put in. We did not get  
12 the changes in till 1996.

13 Q (BY MS. SPAGNOLI): When you say the pass-through

14 hole needed to be reinforced, was there a  
15 pass-through hole in the left side frame rail in the  
16 '93 to '96 model Jeep Grand Cherokees?

17 A As I recall, there was.

18 Q And so what was the reinforcement of the hole -- let  
19 me withdraw.

20 Why was there a change necessary to  
21 reinforce the hole for the left side frame rail  
22 because of the change in the fuel system?

23 A The new fuel system's vent and fill lines were  
24 contacted by the hole when the vehicle was in the  
25 rear impact test.

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1 Q Are you saying that had not occurred in the prior  
2 tests?

3 A I had not seen it occur in the prior tests.

4 Q Had it been noted in the prior tests?

5 A It had not been noted as far as I remember in the  
6 prior tests.

7 Q And is that something that should have been noted if  
8 it had occurred in the prior tests?

9 A The men who observed each test would know what the

10 pattern of crush and contact was. If it was unusual  
11 and different and something that they hadn't  
12 expected, they probably would have noted it. I did  
13 not remember seeing those notes and so I do not  
14 think that it occurred. I do not actually see the  
15 tests. When you see the films and read the reports,  
16 to see that very subtle contact between the fill and  
17 vent lines and that hole is difficult, so I did not  
18 see it directly and I don't know if it was there.

19 Q Well, when you saw it yourself, you thought it was  
20 something you needed to fix, right?

21 A There was the test that we had spoke about earlier,  
22 5380, and in that test with the new fuel system, it  
23 had a change in the way it behaved, and I wanted to  
24 --

25 COURT REPORTER: Excuse me, in the way it

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1 --

2 THE WITNESS: Behaved in the contact, and I  
3 wanted to fix that as a result of that test.

4 Q (BY MS. SPAGNOLI): Okay. When you say there was a  
5 change in the way it behaved --

6 A The body structure and fuel system, the entire test  
7 result.

8 Q Because of the failed welds?

9 A I'm not sure whether they were failed welds or they  
10 pulled out. I'm not sure exactly what the issue is  
11 with those welds. I'm not a weld expert, but the  
12 metal there in that film, I remember, it was  
13 vertical. That was something new. It had  
14 separated. That was something new. And the fuel  
15 system had failed. And as a result of those tests  
16 where the fuel system failed, we were obligated to  
17 change the way the system performed in the test to  
18 improve it, and that's when I took on the task, as  
19 you can see through the testing, to improve the  
20 performance of the vehicle so that that would not  
21 occur again.

22 Q Now, in the 5380 test that you talked about, was the  
23 failure of the fuel system the fact that the vent  
24 line and the fuel fill line that went through the  
25 hole in the left side frame rail actually were

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1 severed, causing a leak in excess of the standards?

2 A No, the lines themselves weren't severed, and I  
3 would like to refresh my memory for a minute.

4 Q Sure.

5 A Yeah, this is the test that I remember. I just  
6 wanted to make sure it was this one. The lines were  
7 not severed. There was a plastic fitting on the  
8 tank that had been built as a prototype, as a short  
9 run. You know, they make five or ten of them, and  
10 that fitting didn't remain attached to the tank, and  
11 that's the note in the test letter, and the reason  
12 it didn't remain attached to the tank is that the  
13 lines and the line -- the fill and vent line hose  
14 were pulled and the fitting wasn't properly welded  
15 on. As I recall, that extra strength from the  
16 pulling and the poor prototype welding separated it,  
17 and that's a very large hole in the tank when that  
18 occurs.

19 The system can be fixed in a couple ways:

20 One, an improved weld, and, two, to minimize the  
21 force that pulls on the fill and vent line, which is  
22 eventually what we got around to with the bracket.

23 Q Okay. So, first of all, the statement in the 5380  
24 test report says -- and let me mark that. Have I  
25 already done that?

1 A I have it in front of me as Exhibit 7.

2 Q Okay. Exhibit 7, the 5380 test report states under  
3 Post Test Remarks, "There was excessive fuel leakage  
4 during impact and the subsequent 30 minutes,  
5 resulting from partial separation of the vent line  
6 fitting from the tank." Have I read that  
7 accurately?

8 A Yes, ma'am.

9 Q Now, are you telling us that the vent line fitting  
10 separation occurred because of the change in the  
11 frame rail's movement during the impact portion of  
12 the test? In other words, the frame rail where the  
13 vent line and fitting fuel line pass-through moved  
14 in such a way that you believe they helped separate  
15 the vent line from the tank?

16 A Moved and crushed, and, yes, I do believe that that  
17 was one of the contributing factors. Now, that's  
18 just my belief, and I think that that's the way it  
19 happened.

20 Q Okay. And you also mentioned that you think that in  
21 addition to the failed or problem welds in the frame  
22 rail that there was a weld issue with respect to  
23 where the vent line attached to the tank; is that  
24 right?



25 A There was on this tank an issue with the weld where

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1 the fitting is attached to the tank.

2 Q Now, since this is a plastic tank, are there welds  
3 with respect to the seals on the tank for the vents?

4 Where does the welding occur?

5 A The welding is a vibrasonic welding system and it's  
6 a large plastic plate and it has two male nipples on  
7 it, one large, one small, a fill and a vent, and  
8 they vibrate this plastic onto the plastic of the  
9 tank with a stamp, and that vibrating welding is  
10 supposed to meld onto it. When the manufacturer of  
11 the tank produced this very short run, there was a  
12 quality control issue with that specific weld. When  
13 it broke and separated in this test, we noted that  
14 some of the weld was a little thinner where it  
15 separated, and it shouldn't have been that way.  
16 They went back to the manufacturer and I believe  
17 reworked the process. I was not involved in that  
18 part of it but we didn't see this issue again in our  
19 subsequent series of tests.

20 Q Okay. So let me ask you to confirm for me that in

21 the crash test report for 5380 there is no reference  
22 to this quality control issue with respect to the  
23 weld on the tank. Am I right?  
24 A No, no, because that's not visible post test. That  
25 comes about in the tear-down after the test.

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1 Q And where in the test -- where in the -- well, let  
2 me withdraw.  
3 Does that kind of a post-test tear-down  
4 observation get recorded somewhere?  
5 A No, there's no formal way to do that at Chrysler.  
6 We don't have a written document that does that.  
7 You have the one letter that I wrote that was a  
8 meeting minutes that recorded my observations for  
9 this particular vehicle.  
10 Q Right. Can you tell me where in your observations  
11 then that were reported you noted that there were  
12 weld failures either in the tank attachment for the  
13 vent or the weld failures in the frame rails.  
14 A What I have written here is, "The test vehicle  
15 exceeded the standard for fuel leakage [and] the  
16 vehicle crush pattern was observed to be quite

17 different..." That's all I wrote as my notes on  
18 that rear impact test here in Exhibit 5.

19 Q So those observations you've been telling us are not  
20 recorded, at least in these minutes, correct?

21 A No. That's where they would have been recorded if I  
22 had written anything else.

23 Q Okay. Now, and you basically are telling us that  
24 the likelihood of observations after an impact test  
25 which raised some concerns and may need to be

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1 addressed would not necessarily be found anywhere in  
2 the written files of Chrysler; is that right?

3 A The concerns that we had -- and typically that would  
4 get written down -- were things that we could not --  
5 how do I want to say it? Easily assign cause. It's  
6 -- you look at it and you go, it was miswelded. If  
7 you look at it and you'd say I don't know what  
8 happened, and you make a note of it and try to  
9 pursue, and the issue when the tank separated is  
10 clear to someone with engineering background, just a  
11 mechanical background to look at it and go, that's  
12 why it broke, so typically we would not make a note

13 of that where you could assign it to what looks like  
14 a pretty obvious cause.

15 Q Well, you would agree with me that for people  
16 looking at what Chrysler and its engineers did in  
17 the design of the Jeep Grand Cherokee, that there  
18 may have been many things that went on in crash  
19 tests that were issues that had to be addressed but  
20 they were not put in the written record; is that  
21 true?

22 MS. FOGEL: Objection to the form. You can  
23 answer.

24 THE WITNESS: There are many things that  
25 engineers discuss and talk about and reveal and fix

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1 in the development of a vehicle that are not  
2 documented.

3 Q (BY MS. SPAGNOLI): Okay. Do you agree with me that  
4 a consumer's expectations of safety from the fuel  
5 system in a Jeep Grand Cherokee should not depend  
6 upon whether or not the welds in the frame rails  
7 hold in a rear impact?

8 MS. FOGEL: Objection to the form. It's

9 also asking the witness for legal conclusions when  
10 you start talking about consumer expectations, but  
11 you can answer.

12 THE WITNESS: I expect to be safe in my car  
13 when I drive it, and I presume that my expectations  
14 are the same as many other consumers. I can only  
15 give you my feedback for how I feel when I'm in my  
16 car.

17 Q (BY MS. SPAGNOLI): Well, and as an engineer for  
18 Chrysler, would you agree that your objective was  
19 not to have a fuel system that was marginally in  
20 compliance with the standard but that might be out  
21 of compliance if there were weld failures?

22 A My objective as a test engineer at Chrysler was to  
23 provide a vehicle that exceeded the standard even in  
24 the face of variation like some occasional weld  
25 failures. I wanted it to exceed the standard. I

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1 did a lot of work. I spent a lot of money. I did a  
2 lot of time to make sure that the vehicle, even  
3 though this condition occurred once, that if it  
4 occurred again, it would not cause the system to

5 fail or even approach the standards.

6 Q Okay.

7 A That's my expectation for everyone else who does

8 that job today, when I put my family in Chrysler

9 cars, which we all drive Chrysler cars, that those

10 vehicles will perform above and beyond the standard.

11 Q Okay. And one of the ways you expect your vehicles

12 to perform above and beyond the standard is to not

13 have their fuel systems compromised if there are

14 weld quality issues in the manufacture of the

15 vehicle, correct?

16 A I expect that the variation in welding can be taken

17 into account in the modeling and the testing and

18 that it will still exceed the standard in a wide

19 variety of conditions.

20 Q Okay. Now, with respect to the Jeep Grand

21 Cherokee's -- vehicle's construction, do you have

22 any reason to believe that there would be any

23 significant difference between a 1996 Jeep Grand

24 Cherokee and a 1997 Jeep Grand Cherokee?

25 MS. FOGEL: Objection to form. You can

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1 answer.

2 THE WITNESS: The only vehicle structure  
3 difference in the rear of the car that I recall  
4 today is the addition of the bracket on the left  
5 rear side.

6 Q (BY MS. SPAGNOLI): Okay. Do you have any reason to  
7 believe that that bracket would affect the stiffness  
8 of the vehicle in a significant way?

9 A The stiffness of the vehicle -- I want to be clear  
10 about how we define the stiffness of the vehicle.  
11 The stiffness of the vehicle in the impact tests is  
12 what you're asking me about, the stiffness of the  
13 vehicle in a turning maneuver, the stiffness of the  
14 vehicle in a trailing maneuver?

15 Q In the tests, in the impact tests.

16 A The stiffness of the vehicle in the impact test,  
17 when you add the bracket, it -- you know, I expected  
18 it to change it, but there's a way we could -- I  
19 mean, if you had the data traces and we looked at  
20 the peak g's, you could actually prove whether or  
21 not it had increased stiffness. I don't have that  
22 data in front of me, but I know my engineering  
23 judgement would tell me that, yeah, I expect it to  
24 be a little stiffer, but I don't know exactly how  
25 much or -- and we would -- I mean, that's a

1 definable problem but I don't have the data to tell  
2 you.

3 Q How would you define that?

4 A I'd look at the accelerometer traces. We put  
5 accelerometers on the car. We measure its g forces  
6 and you could look at those traces and tell the  
7 difference.

8 Q And what would be the effect of a stiffer rear end  
9 in a rear impact?

10 MS. FOGEL: Objection to form. You can  
11 answer.

12 THE WITNESS: It would be kind of  
13 speculative for me. I think that the stiffer rear  
14 end, the way that bracket made it, allowed the  
15 vehicle to perform, I think, in an improved manner.

16 The occupants themselves is what you're asking me?

17 Q (BY MS. SPAGNOLI): No, I'm not asking about the  
18 occupants. I'm asking about the performance of the  
19 vehicle in the rear impact as a result of a stiffer  
20 construction.

21 A When you say performance, are we talking about the  
22 performance to 301 guidelines for fuel leakage, that  
23 metric, the performance in acceleration, the



24 performance as measured how? I'm struggling with  
25 that.

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1 Q Well, let's start with compliance with the standard.

2 MS. FOGEL: Objection to form.

3 THE WITNESS: The compliance with the  
4 standard and the Chrysler guidelines in particular,  
5 the compliance to the standard is the same whether  
6 or not the bracket is there or not. I think that  
7 the bracket enhances the performance of the vehicle  
8 with the fuel system contact because of the way it  
9 changes the geometry in the test.

10 Q (BY MS. SPAGNOLI): Do you believe --

11 A I'm not sure I answered your question.

12 Q Okay. Well, that was a good start. Let me ask you  
13 this: With respect to compliance with the standard,  
14 you're saying you would expect the vehicle to be  
15 able to comply with the standard with or without the  
16 bracket, correct?

17 A The vehicle in 1996 should comply with or without  
18 the bracket. The vehicle in 1997, because of the  
19 change to the fuel system and the systems that were

20 installed, it needed the bracket to comply.  
21 Q Well, you've said that a couple times that the  
22 changes to the fuel system is what needed the  
23 bracket, but there was nothing about the frame rail  
24 that changed between the old fuel system for the '96  
25 vehicle and the fuel system for the '97 vehicle,

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1 correct? You had the lines passing through the  
2 frame rail in both cases, correct?  
3 A The lines passed through the frame rail in both  
4 cases.  
5 Q And what is it about the fuel system specifically  
6 that changed that required a change in the frame  
7 rail?  
8 A The lines that pass through the frame rail were  
9 different between '96 and '97. The way they were  
10 attached to the tank was different, and the tank  
11 itself was different, and it was those lines and  
12 their attachments that I wanted to use the bracket  
13 to protect.  
14 Q Are you saying that the fuel tank attachments in the  
15 predecessor tank were less likely to pull apart

16 because of contact with the frame rail where it  
17 passed through the hole than in the tank for the '97  
18 vehicle?

19 A Well, they never did in any of the testing, and  
20 that's what I can say. I don't know whether they  
21 were more likely or not likely, but in the testing  
22 that was in place when I got there, they never did  
23 fail. When I ran tests with the new tank, I saw  
24 this failure and I went about to fix it.

25 Q Okay. So do you know that there was no separation

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1 of a vent or fill line from a tank in a prior test  
2 that occurred on a model vehicle before you started  
3 doing testing on the Grand Cherokees?

4 A I was never told of it and I did not see it in the  
5 films.

6 Q Okay. Well, it could have happened and the  
7 engineers decided it was not an unusual or  
8 unexpected occurrence, it was something they could  
9 fix easily, and, therefore, they didn't need to note  
10 it in any reports, correct?

11 A If --

12 MS. FOGEL: Objection to the form.  
13 THE WITNESS: If the separation caused  
14 leakage, it would have been noted. If the  
15 separation had caused any kind of failure -- I've  
16 got to believe that any separation would have caused  
17 a failure. That would have been noted. Because  
18 there weren't failures in the development of the  
19 tests that I saw and recall, I don't think that it  
20 occurred, but that all happened before my time when  
21 I was there.

22 Q (BY MS. SPAGNOLI): Well, if there was contact  
23 between the lines and the hole in the frame rail  
24 that did not cause an actual leak, it would not  
25 necessarily have been noted in the test, from what

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1 you're telling us, that occurred before you became  
2 manager?

3 MS. FOGEL: Objection to the form.

4 THE WITNESS: I would say not necessarily,  
5 no, because that might be just the way it happens in  
6 the crash test.

7 Q (BY MS. SPAGNOLI): So --

8 A I don't know, but it might not be necessary.

9 Q Okay. So you can't say as you sit here today that  
10 there wasn't the potential for the same kind of  
11 failure in the '96 version of the vehicle as you saw  
12 in the proposed '97 fuel system in prior tests,  
13 correct?

14 MS. FOGEL: Objection to the form.

15 THE WITNESS: Well, the potential for  
16 failure is always there. It's always there. That's  
17 why you run tests.

18 Q (BY MS. SPAGNOLI): And whether or not there was  
19 contact because of the pass through the frame rail,  
20 that -- let me withdraw.

21 Apparently your predecessors, if there was  
22 contact between the vent line, the fill line, and  
23 the hole in the frame rail but it didn't result in a  
24 leak, they justified that result in believing they  
25 didn't need to do anything to prevent a failure in

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1 that area, correct?

2 MS. FOGEL: Objection to the form.

3 THE WITNESS: There's a guideline in one of

4 the documents you showed me where it says contact  
5 with an unfriendly surface is something you have to  
6 withdraw and fix. The contact between the fill and  
7 vent line and this big round hole with rounded edges  
8 in it might not have drawn the attention of the  
9 crash test engineers at that time. I can see easily  
10 in my own mind that if this big round hose that's  
11 rubbery goes through this rounded hole, and it was  
12 held there after the crash test, it might not be a  
13 problem. You'd have to look at that specific car  
14 and say what was the shapes and where were the edges  
15 at and is there any potential, and that's a  
16 judgement call to the engineers to look at that and  
17 go, well, you know, it looks okay to me. It's all  
18 round; everything there is round. You know, there  
19 aren't any sharp edges in that particular set of  
20 interfaces. You know --

21 COURT REPORTER: I'm sorry, there aren't  
22 any sharp edges --

23 THE WITNESS: Sharp edges, and that  
24 interface, you know, there's the hose, there's the  
25 frame rail, there's the pass-through. Everything on

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1 there is rounded. It's a round hose. It's got a  
2 rim on the pass-through in the liner. I could  
3 easily see where even if it did pull a little bit on  
4 previous tests, they would go, well, you know, it's  
5 okay.

6 Q (BY MS. SPAGNOLI): Because you wouldn't consider  
7 that to be an unfriendly surface?

8 A It was not an unfriendly surface. It's all round  
9 stuff and it's a big round rubber hose and it's  
10 stretchy.

11 Q And if it was just contact, that wasn't something  
12 you needed to be concerned about?

13 A If it was just contact, it wouldn't have been noted.  
14 It wouldn't have been unusual. It wouldn't have  
15 been something that you would write down.

16 Q So with respect to what ended up being the '97  
17 model --

18 A Okay.

19 Q -- the only change structurally that you're aware of  
20 is the addition of this bracket as we've talked  
21 about, correct?

22 A Yes, ma'am, that's the only one I recall.

23 Q And would you expect the addition of the bracket to  
24 change the crush characteristics in a rear impact?

25 A I actually had hoped it would change the crush

1 characteristics.

2 Q In the sense that you would -- you've described  
3 where the tank would not strike the differential in  
4 the same manner as you had seen on the prior test?

5 A Yeah. The intent of the bracket was to prevent the  
6 pass-through hole from closing at all on the fill  
7 and vent lines, and after the test, we noted that it  
8 performed what to us was somewhat in an  
9 unanticipated way, that it lifted the tank up and  
10 over the axle. It was one of those things that  
11 went, well, it did what we thought we wanted it to  
12 do and we got this nice side benefit as well.

13 Q And was that -- as a result of that side benefit,  
14 did the vehicles that were tested after and with the  
15 bracket added to it experiencing less crush than the  
16 vehicles that were tested without the bracket?

17 MS. FOGEL: Objection to form. You can  
18 answer.

19 THE WITNESS: I don't remember the exact  
20 crush numbers. I'd have to look them all up. I  
21 think we might be able to do that if we dug through  
22 all the stuff, but the exact crush numbers are



23 measured on almost every test.  
24 Q (BY MS. SPAGNOLI): Right.  
25 A And could you dig all that up and see if it crushed

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1 different or crushed less.  
2 Q Did you expect that it would?  
3 A No, I didn't expect to see that number change a lot.  
4 That number, it's -- I want to say a high level  
5 metric, and based on like the shear forces involved,  
6 it's going to be the same. What happens is you move  
7 the crush around, and the total crush is kind of the  
8 same, so you wouldn't see a change really.  
9 Q Well, in terms of crush and the extent of crush, how  
10 much would be a lot and how much would be a little?  
11 MS. FOGEL: Objection to form. You can  
12 answer.  
13 THE WITNESS: They teach you in engineering  
14 school any change over 10 percent in a metric is a  
15 lot. Double digit changes are a lot and you need to  
16 look into that. So the metric on dynamic crush is  
17 22, 25 inches, so a couple inches would term it a  
18 lot.

19 Q (BY MS. SPAGNOLI): A couple inches, two inches,  
20 more or less?

21 A Ten percent of the, yeah, the metric. As I recall,  
22 dynamic crush on rear impacts is a little bit larger  
23 than 20 inches and somewhat less than 25.

24 Q Okay. And so if there were a five-inch change  
25 between a vehicle tested that had the same structure

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1 and a vehicle test -- and another vehicle that was  
2 supposed to have the same structure, that would be a  
3 lot?

4 A A five-inch change --

5 Q Right.

6 A -- in dynamic crush would be a lot.

7 Q Okay. And would you agree with me that with respect  
8 to how a fuel system performs in a rear impact,  
9 that, again, a consumer driving in a vehicle should  
10 not be subjected to a potential failure because the  
11 vehicle they're driving is less likely to withstand  
12 crush in a rear impact than a similar vehicle that  
13 came off the production line?

14 MS. FOGEL: Objection.

15 Q (BY MS. SPAGNOLI): Do you understand my question?

16 A No, ma'am.

17 Q Okay. I'll start it over. If there -- would you

18 agree with me that if you have two Jeep Grand

19 Cherokees that come off the production line and one

20 of them had a rear impact test that crushed five

21 inches more than the next vehicle off the line, that

22 would be a concern? Would you agree?

23 MS. FOGEL: Objection to the form. You can

24 answer.

25 Q (BY MS. SPAGNOLI): In terms of fuel system

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1 performance in rear impact.

2 A I would investigate where the crush went, and, yeah,

3 if there was -- if there was a five-inch change

4 between two subsequent tests in the car, that would

5 be an unusual event that would send us looking --

6 Q Okay.

7 A -- for an answer.

8 Q And is that because you would hope that the vehicles

9 would not have that significant of a variance one to

10 the next off the production line?

11 A Yeah. I would hope that they don't have that much  
12 variation one to the other in the cars.

13 Q Okay. And is that because that type of variance  
14 could really dramatically affect the performance of  
15 the vehicle in impacts?

16 A The reason that I would pursue it, I think, would --  
17 because I don't like variation in general, and as an  
18 engineer you're taught to the eliminate variation --  
19 that's what you're after, and because it had  
20 performance in impacts, that was my job.

21 COURT REPORTER: I'm sorry.

22 THE WITNESS: Because it had a change in  
23 performance in impact or could have a change in  
24 performance in impact, I didn't want to see that  
25 kind of variation. I don't ever remember seeing

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1 that kind of variation, but if there was that kind  
2 of variation, I would pursue it. Whether or not it  
3 changed the performance, pass or fail, in this  
4 impact standard, that's -- if there was that kind of  
5 information, as I sit here today, we would have  
6 looked at it.

7 Q (BY MS. SPAGNOLI): Okay. So, for example, if you  
8 have a Jeep Grand Cherokee -- and I think we looked  
9 at yesterday the stiffness of the vehicle. Well,  
10 let's look at the one you certified compliance for  
11 this vehicle. I'm going to give you, first of all,  
12 Exhibit 8, which is the fuel system integrity  
13 compliance report for the '97 Jeep Grand Cherokee,  
14 and take a look at that, and then let me get my --  
15 my secretary doesn't believe in staples. She likes  
16 paper clips -- drives me nuts.

17 I'm going to mark as Exhibit 9 test 5967,  
18 which I believe is the test which you used to  
19 certify compliance of the '97 Jeep Grand Cherokee.  
20 And you'll find in here, I hope, the vehicle dynamic  
21 crush analysis.

22 A Yep.

23 Q Okay. On this one it's 19.9, correct, plus or minus  
24 one inch?

25 A Yeah.

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1 Q So that's the range of expectation you have for the  
2 dynamic crush of the vehicle that was certified,

3 correct?

4 A Yeah. This one is a little low, uh-huh.

5 Q So 20 -- so the range here would be 19 to 21 for

6 dynamic crush? That would be an expected range, an

7 acceptable range?

8 A Yeah.

9 Q Okay.

10 A The dynamic crush on this one is lower than I had

11 remembered then.

12 Q Okay. But at any rate, given what you've said is

13 your standard engineering judgement, plus or minus

14 one inch would give us 19 or 18.9 to 20.9 as the

15 range of crush that would be within the accepted

16 margin, correct?

17 A The analysis has an accuracy of plus or minus one

18 inch.

19 Q Right. And, again, the -- what you had considered

20 to be a reasonable engineering judgement for

21 expected crush on the '97 Jeep Grand Cherokee would

22 be within, let's say, 19 to 21 inches or 18 to 21

23 inches, correct?

24 A The Grand Cherokee's rear impact crush, the way I

25 recall it, was in the low 20's, and this test seems

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1 to be at the edge of that distribution.

2 Q Meaning a vehicle that had less crush than other  
3 vehicles you recall testing?

4 A Yes, ma'am.

5 Q And would you agree with me that if the vehicle that  
6 you're using to certify compliance is one that  
7 experienced on the low end of crush, you would not  
8 want a consumer to be exposed to a vehicle that  
9 exceeded this -- let me withdraw.

10 Do you agree with me that if a vehicle  
11 crush was more than two inches above what you tested  
12 and certified as compliant with the standard, that  
13 you might have a concern about whether that vehicle  
14 would comply with the standard?

15 MS. FOGEL: Objection to form. You can  
16 answer.

17 THE WITNESS: You know, looking at the data  
18 you've given me here about dynamic crush, and in an  
19 attempt to reconstruct what I would have thought  
20 when I saw this number, now that I have seen the  
21 crush patterns from the development tests and this  
22 one here in the compliance test, I could see that I  
23 would not be alarmed at all to see a 19.9 ring up as  
24 dynamic crush, and my reasons for that are when you  
25 look back on the series of tests that you gave me

1 here in Exhibit 5, and I look at the chart of  
2 histories for rear crush, rear impacts, I see a  
3 19.9, I see an 18.9, I see a 21.2, I see a 22.2.  
4 They're all hanging in that same area, so this one  
5 here at 19.9, in my compliance test, at the time I  
6 would have looked right back at this chart and said,  
7 looks like it's in the normal course of events.

8 Q (BY MS. SPAGNOLI): Do you know if the tests that  
9 are listed on the chart you're looking at had leaks?

10 A That's not indicated here on the chart. We could go  
11 back through the data and look.

12 Q Well, is it a pass if it leaks?

13 A It is not a pass if it leaks.

14 Q Okay. Do you know if the leak pass or fail was  
15 dependent on how much crush you had?

16 A No, I don't think that it was. There was -- in the  
17 '96 and '97's, the mechanism -- there are actually  
18 two mechanisms that were fixed, identified and  
19 fixed, and neither one of them really had to do with  
20 dynamic crush.

21 Q Okay. So you don't believe with respect to the '97



22 Jeep Grand Cherokee that a change in dynamic crush  
23 plus or minus, let's say, four inches would be a  
24 reason to be concerned that a vehicle on the high  
25 end of crush would not be able to comply with the

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1 standard?

2 MS. FOGEL: Objection to form. You can  
3 answer.

4 THE WITNESS: No. I don't think that the  
5 way we measure dynamic crush really has a lot to do  
6 with the performance of this fuel system in crash  
7 tests.

8 Q (BY MS. SPAGNOLI): Okay. So you would be confident  
9 that if you took a '97 Jeep Grand Cherokee that was  
10 at the high end of those vehicles that you tested  
11 and were within the range that came off the  
12 production line -- let's mark it at 23 inches -- you  
13 would not be concerned that that vehicle would be  
14 able to comply with the test; is that what you're  
15 telling us?

16 MS. FOGEL: Objection to form. You can  
17 answer.

18 THE WITNESS: The basis of using dynamic  
19 crush to predict its performance in the test, I  
20 don't believe, is invalid. I don't think that  
21 dynamic crush is a predictor of performance in the  
22 test. The 23 inches, we have vehicles that have  
23 crushed in that range in the rear impact test, and  
24 if I ran one and I got 23 inches, I wouldn't presume  
25 to say it would fail. I would look at the test and

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1 I would look at how the systems interacted with the  
2 body frame, and those are the indicators that  
3 predict whether or not it was on the edge of passing  
4 or firmly in the middle of passing.

5 The dynamic crush, the way it's measured,  
6 can be a misleading number sometimes the way it's  
7 measured. It's -- the dynamic crush doesn't exactly  
8 lead you to performance of the fuel system.

9 Q (BY MS. SPAGNOLI): With respect to your  
10 understanding of the structural construction of the  
11 '97 Jeep Grand Cherokee, would you agree that it  
12 would be within the manufacturing tolerances for  
13 this vehicle for a '97 Jeep Grand Cherokee to have

14 crush characteristics that would allow up to 23 or  
15 24 inches of crush in a rear impact?  
16 A I have data here that shows some 22's, some 23's and  
17 some 18's, so that appears to be the variation  
18 distribution for tests of this weight. You would  
19 really want to look at the weight of the car and how  
20 the exact speeds line up. You know, there's  
21 variation in the speed of the bullet that hits it,  
22 so those are the -- really the contributors to the  
23 energy.  
24 Q So given your prior testimony concerning engineering  
25 judgement as far as reasonable variation, ten

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1 percent, you said, was a lot?  
2 A Ten percent is a lot of variation.  
3 Q All right. In the case of the Jeep Grand Cherokees  
4 that you tested, given the plus or minus 10 percent,  
5 do you agree with me that the range you might get in  
6 a Jeep Grand Cherokee is anywhere from 16 to 25?  
7 MS. FOGEL: Objection to form.  
8 THE WITNESS: I never saw either one of  
9 those at the distribution at the ends, but that is a

10 10 percent at each end of it from what we did  
11 observe.  
12 Q (BY MS. SPAGNOLI): Okay. So that would be a range  
13 given what you tested of dynamic crush in a rear  
14 impact for this '97 Jeep Grand Cherokee?

15 A I'm looking for maximums.

16 COURT REPORTER: I'm sorry?

17 THE WITNESS: I'm looking for maximums.

18 Twenty-five at the high end is what you could  
19 expect. Sixteen -- 25 to 16, I would say, is a  
20 normal range for this vehicle, you know, at the  
21 kinds of weight and speeds that we hit it.

22 Q (BY MS. SPAGNOLI): Okay.

23 MS. SPAGNOLI: Let's go off the record and  
24 take a short break.

25 VIDEO TECHNICIAN: Going off the record at

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1 9:34 a.m.

2 (Off the record.)

3 VIDEO TECHNICIAN: Back on the record at

4 9:44 a.m.

5 Q (BY MS. SPAGNOLI): Mr. Estes, if you could look

6 back at what we marked as Exhibit 3, which was the  
7 compliance report for the 1995 Jeep Grand Cherokee,  
8 and you look at the --

9 A Exhibit 3 in mine is the '96 --

10 Q Oh, I'm sorry. Do you know what, because if you  
11 look at the attachments, it says '95, so I'm  
12 assuming that that's just a typo then? I'm looking  
13 at page 6, the 'ZJ' Body Jeep 'Grand Cherokee' Sport  
14 Utility, Summary III.

15 A The dates are all the same. Yeah, looks like a  
16 typo.

17 Q Okay. So the three tests that are listed on page 6  
18 for fuel system integrity for rear impact were  
19 actually the tests that were used to certify  
20 compliance for the '96 vehicle; is that right?

21 A There are two rear impacts on page 6 that were used  
22 to comply the car.

23 Q Okay. And those two are 4472 and 4561, correct?

24 A Yep.

25 Q And then if you look at the exhibit that I gave you,

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1 Exhibit 8, which is the '97 model compliance report,

2 and you look at Summary III for the rear impact,  
3 there's now, instead of those two tests, there's  
4 test 5967 that certified compliance; is that right?

5 A Yes, on page 6 it says 5967 certified rear impact  
6 compliance.

7 Q And if you look at the description of the vehicle,  
8 is there anything in the discussion section which  
9 would suggest that there were changes between '96  
10 and '97 that required a new compliance test?

11 A In the summary on page 6, it notes a reinforcing  
12 bracket, vehicle model description. Now, which  
13 description were you talking about?

14 Q Well, where did you see the reinforcing bracket?

15 A Just a second -- page 6, is it?

16 Q Right.

17 A Six, page 6, description of vehicle 5967, the last  
18 line says "MPI engine and reinforcing bracket."

19 COURT REPORTER: I'm sorry.

20 THE WITNESS: "MPI engine and reinforcing  
21 bracket."

22 Q (BY MS. SPAGNOLI): Right. Okay. So does that  
23 reinforcing bracket addition, did that in and of  
24 itself require a new compliance test?

25 A I thought it was a significant structural change and

1 required a new test.

2 Q Okay. Do you see on page 1 or 2 where there's a  
3 discussion about the vehicle?

4 A Just a second. There's a section here that says  
5 Discussion. I guess it's two. It doesn't say on  
6 mine, but --

7 Q Did you write that section?

8 A These documents for the most part are cut and paste  
9 from the year before, and I issued the document but  
10 I don't believe I actually wrote this part.

11 Q Okay. Do you see, though, in the first paragraph it  
12 says, "The Chrysler Corporation 1997 'ZJ-74' Body,  
13 Jeep 'Grand Cherokee,' Sport Utility vehicle is  
14 essentially carryover from the 1997 model?" I'm  
15 assuming that's a typo, again, and it should be '96  
16 model?

17 A Yep.

18 Q And then it says, "With the exception of fuel filter  
19 relocated to the top of the fuel sending unit  
20 module." Have I read that correctly?

21 A Yes.

22 Q And isn't it true that in this portion of the report  
23 you are supposed to document any changes that  
24 required a new compliance test?

25 A I don't know whether it's supposed to go in this

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1 portion of the report or in the back in the  
2 description of each of the test vehicles. I'm  
3 unclear as to the exact area I'm supposed to put the  
4 description.

5 Q Okay. But you signed both the '95 and the '96  
6 compliance report?

7 A Yes, I did.

8 Q And you're telling us you didn't know what you  
9 needed to put in each section?

10 A I don't remember now. I might have known it then,  
11 but today, to ask me a question where everything  
12 goes, I don't remember.

13 Q Well, there's nothing in your description on page 2  
14 that carries over to page 3 that suggests that there  
15 was a significant structural change in the '97 Jeep  
16 Grand Cherokee that required a new compliance test,  
17 correct?

18 MS. FOGEL: Objection to form.

19 THE WITNESS: Well, ma'am, down here in the  
20 section where it says, "The rear structure of the



21 'ZJ' is available in four different build levels.  
22 The 'ZJ' can have a Trailer Hitch, skid plate or a  
23 Reinforcing Bracket and a combination of skid plate  
24 and Trailer Hitch."  
25 Q (BY MS. SPAGNOLI): Okay.

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1 A Does it talk about the reinforcing bracket on the  
2 '96?

3 Q No, it doesn't reference it.

4 A Well, then I did describe the change there.

5 Q Okay. Did you describe the change as being a  
6 significant structural change between the '96 and  
7 the '97?

8 MS. FOGEL: Objection to form. You can  
9 answer.

10 THE WITNESS: I don't remember now whether  
11 adding the text was sufficient or did I have to do  
12 something else to highlight it. I think -- I think  
13 you're just supposed to add the text.

14 Q (BY MS. SPAGNOLI): Okay. What you did say was that  
15 the vehicle was essentially a carryover except for  
16 the fuel filter relocated to the top of the fuel

17 sending unit module, correct?  
18 A That's what I said.  
19 Q And when you used the word essentially carryover,  
20 that means that there is nothing else that is a  
21 significant change from the one vehicle to the next,  
22 correct?

23 MS. FOGEL: Objection to the form. You can  
24 answer.

25 THE WITNESS: Given the 25,000 different

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1 parts that go into a car, one extra part which we  
2 described makes it different, but it's the same car  
3 for most intents and purposes. There are small  
4 differences which I hope I captured everywhere, but  
5 I don't remember all of them, but it is essentially,  
6 in my definition of the word essentially, the same  
7 car.

8 Q (BY MS. SPAGNOLI): Okay. Well, can a bracket be a  
9 small change but a significant change?

10 A Yes, it can.

11 Q And is that what you're saying occurred between the  
12 '96 and '97 model?

13 A There is the change of the bracket between the '96  
14 and '97 model.

15 Q Is it a small change or a significant change or  
16 both?

17 A Small is always in scale relative to something else,  
18 and relative to the entire performance of the whole  
19 car in its all encompassing crash test performance,  
20 adding one little bracket to modify the rear impact  
21 looks small, but for the rear impact section of it,  
22 it is a change that allows difference in performance  
23 for that piece of it, but there are 13 other tests  
24 that this document does cover, and one of 13 is  
25 modified slightly by a bracket that we introduced.

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1 So in my mind it becomes nitpicking over the word  
2 essential and the word small. They're there.

3 Q Give me one second. These are out of order. I'm  
4 going to mark -- I want to go through some of the  
5 other crash tests with you for the '97 vehicle, or  
6 actually some earlier ones than that. The first one  
7 I'm going to mark is crash test 5199, and let me  
8 look at the list that Ms. Fogel read me yesterday.

9 I don't see 5199 on the list of crash tests that you  
10 looked at before your deposition, so I'm going to  
11 present to you Exhibit 10 and ask you to take a look  
12 at that.

13 MS. FOGEL: Do you have a copy of that for  
14 me?

15 MS. SPAGNOLI: I only have two. I thought  
16 you had all the crash tests with you. Wait. Here  
17 it is.

18 MS. FOGEL: I just want to see what you're  
19 showing him and then I'll give it back to you.

20 MS. SPAGNOLI: Here's an extra one. Here's  
21 an extra one. I got it. It's extra.

22 Q (BY MS. SPAGNOLI): Okay. Have you had a chance to  
23 look at that one?

24 A I've reviewed it slightly.

25 Q Okay. This vehicle -- have you seen this test

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1 before?

2 A I don't remember it but it should have been shown to  
3 me earlier, yeah. When I started the job, this was  
4 one of the ones done just previous to my arrival, so

5 I don't recall, but I should have seen it.

6 Q So you should have seen it back in '95?

7 A Yeah.

8 Q Okay. And how did this 1993 production ZJ modified

9 to represent a '96 fuel system perform in this 301

10 impact test?

11 A It failed the rear impact test due to post-test

12 pressure leaks.

13 Q And where do you see that?

14 A That's documented here under Post Test Remarks under

15 the Vehicle Crash Test Letter, page 2.

16 Q Okay. Do you know where the leaks were that caused

17 the fuel system not to hold the pressure?

18 A I don't recall on this test where they were, no.

19 Q Do you have any idea what was done, if anything, to

20 address the failure of this vehicle on this crash

21 test?

22 A No, I don't. I don't remember.

23 Q Okay. What was the dynamic crush on this test?

24 A This was a big one. This is 23.1.

25 Q Okay.

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1 A The speed was also three-tenths of a mile higher on  
2 this one.

3 Q Did this vehicle have a trailer hitch?

4 A No. In fact, there's explicit direction to have the  
5 trailer hitch and skid plate removed.

6 Q Okay. Was the -- were the '96 -- '93 to '96 model  
7 Jeep Grand Cherokees dependent on the presence of a  
8 trailer hitch in order to comply with the 301 rear  
9 impact standard?

10 A No.

11 Q So you would not have expected a different  
12 performance in terms of compliance in the rear  
13 impact test between a '93 to '96 Grand Cherokee that  
14 had a trailer hitch versus one that did not?

15 A In terms of the compliance as to whether the fuel  
16 system passed or failed?

17 Q Right.

18 A It should have passed in either condition, with or  
19 without the trailer hitch.

20 Q Okay. Do you know what the '96 fuel system was like  
21 compared to what became the '97 fuel system?

22 A I don't really remember the exact details of what  
23 was there. As we've been going through this over  
24 the last couple days, I was trying to remember what  
25 we replaced, and I'm sure I knew that, but I really

1 can't remember too much about it now.

2 Q Well, was the '95 fuel system a co-extruded fuel  
3 tank like the type of fuel tank that you put in the  
4 '97 model?

5 A I don't remember. I don't think so, but I don't  
6 remember.

7 Q Well, this says "Proposed 1995 co-extruded fuel  
8 tank." That would have been a tank put in a vehicle  
9 basically on your watch, right?

10 A This tank, this model, I know about -- oops -- that  
11 model and what that tank was, but what was there  
12 previous to it, I don't remember.

13 Q You know what the '95 co-extruded fuel tank was  
14 like?

15 A Yeah, the proposed one for '95.

16 Q How is it different from the one in '97?

17 A It was a co-extruded plastic tank that was to be an  
18 improvement for emissions. What it replaced, I  
19 don't really remember, but I know about this tank.

20 Q I'm not asking what it replaced. I'm asking you the  
21 difference between the '95 and the '97 fuel tank.

22 A The '95 tank is the one that was in place before I  
23 got there, and that's the one I don't really

24 remember its details for.

25 Q Okay.

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1 A This proposed tank never made it for '95 and it

2 didn't make it for '96. Its design sibling is the

3 '97 tank.

4 Q Okay. So when it says "'93 production ZJ modified

5 to represent 1996 fuel system," you know what the

6 '96 fuel system is that this is referencing,

7 correct?

8 A Yes. It's a design intent. They want to put it in

9 in 1996 and that's the system which I have some

10 familiarity with.

11 Q Okay. And that's the one you were working on that

12 didn't get in until '97?

13 A Yes, ma'am.

14 Q Okay. So is there -- can you tell us what changes,

15 if any, were made to the fuel system from the

16 proposed '96 fuel system that actually -- into the

17 actual production '97 fuel system? In other words,

18 what happened between this point and when you

19 ultimately got the new fuel system in the '97?



20 A Just to the fuel system itself?

21 Q Correct.

22 A I wasn't the fuel system design and release --

23 COURT REPORTER: I'm sorry.

24 THE WITNESS: I wasn't the fuel system

25 design and release engineer, and the changes that I

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1 recall involve the fuel sending unit. There is  
2 what's known as a mason jar on top of it, and it --  
3 in one of the tests of which off the top at the  
4 moment I don't recall which one, it cracked -- the  
5 top of the tank cracked, and we reinforced that. We  
6 added little feet to the bottom of it. There were a  
7 series of design changes of which I'm not sure all  
8 of, but it was the intent to prevent the top of the  
9 tank from having a leak in the impact event. There  
10 was a series of design changes. I remember the  
11 reinforcement and I remember the little feet but  
12 there were probably other things in there that I  
13 don't recall.

14 Q (BY MS. SPAGNOLI): Okay. And, again, with respect  
15 to test 5199, in terms of why the pressure check did

16 not hold, you don't have an explanation for that?

17 A No, I don't really know why that one didn't hold

18 pressure.

19 Q Let me mark as Exhibit 11 test 5208. And, again, I

20 don't think this was on the list of tests that you

21 looked at before your deposition, so if you'd like

22 to take a moment to look it over. I'll ask you

23 questions about it.

24 MS. FOGEL: Is this an extra, Christine?

25 MS. SPAGNOLI: Yeah.

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1 Q (BY MS. SPAGNOLI): Okay. Have you ever seen this

2 test report before?

3 A I don't remember it but I'm sure I looked at it at

4 the time.

5 Q Okay. This test was run in July of 1994, and so

6 that would have been just before you came to become

7 manager of the Jeep Grand Cherokee test program?

8 A Yeah. It's before I was manager there.

9 Q But certainly it was a test that was attempting to

10 test the vehicle with the modified fuel tank?

11 A Yes, it was a test of the new tank, yes.

12 Q Okay. This is called a 1995 C1 pilot - production  
13 built. So does that mean that in all respects  
14 except for the fuel tank this vehicle was a  
15 production '95 Jeep Grand Cherokee?

16 A That's the description in the test letter, yes.

17 Q Okay. And what happened on this test?

18 A It leaked in excess of the federal limit in the  
19 rollover, is what it says in Post Test Remarks.

20 Q Do you know why?

21 A I don't remember this specific one, no.

22 Q So you have no explanation for where the leak came  
23 from?

24 A No.

25 Q Okay. It's not noted in the report, is it?

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1 A No, no, it's not.

2 Q Okay. So you can't say that the leak here was from  
3 the fuel tank versus something else with respect to  
4 the vehicle; is that right?

5 A Yeah, I cannot say that.

6 Q Okay. You can't tell whether this tank leaked  
7 because the tank hit the differential or there was

8 contact between the frame rail and the vent and fill  
9 lines, correct?  
10 A The cause of the leak is not clear.  
11 Q Okay. What is the dynamic crush measurement for  
12 this vehicle?  
13 A This one -- let's see here. This one is lower than  
14 the previous one. The speed was lower and the crush  
15 was lower -- crush, crush, crush -- this one was --  
16 my copy says 19 and there's no digits --  
17 Q Okay.  
18 A -- smaller than that, so this one looks like 19,  
19 but, you know --  
20 Q Okay. And you said the speed was lower. The speed  
21 here was 30.4 miles per hour, correct?  
22 A Yeah, uh-huh. And on my chart, I have -- in Exhibit  
23 5, I think this is --  
24 Q Right.  
25 A -- you gave me -- I've got it listed as 19.9 and

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1 that's what makes me wonder if the photocopy didn't  
2 blip off the .9.  
3 Q Okay. All I can tell you is this is what we got,

4 and it doesn't have a .9 after it.

5 A Yeah, I know.

6 Q Okay. Next I want to show you test 5493, and I'll

7 mark this as Exhibit 12. And this is one of the

8 ones that counsel showed you the day before your

9 deposition, and this appears to be a test that was

10 conducted with you as the manager of the crash test

11 program for the Grand Cherokee, correct?

12 A Yes, this would have been one of the tests that I

13 ran.

14 Q Okay. This vehicle is a 1996 C1 pilot built vehicle

15 production intent. What does that mean?

16 A When you build the pilots, they're the final tryout

17 of the production system, and that's how you intend

18 to release the car as you go forward, but there are

19 sometimes issues of all sorts in the assembly plant

20 as one starts to build them and they need to get

21 fixed, so the intent is to build it this way. This

22 is a pilot car. We build pilot cars to try the

23 manufacturing system out. That's why it's not as

24 produced but as intended.

25 Q Okay. What fuel system did this vehicle have?

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1 A It does not describe the fuel system as anything  
2 different than the 1996 production. There is,  
3 therefore, an assumption that it would be in the  
4 1996 production system.

5 Q From what you've told us does that mean that the  
6 fuel system here is one that was not the new system  
7 that you were attempting to introduce for the '96  
8 model; it was actually the carryover from the prior  
9 model?

10 A That's the assumption that I'm going to make because  
11 there is no explicit direction anywhere in the thing  
12 that I could see to change the system away from the  
13 1996 production intent system that the vehicle came  
14 with.

15 Q Okay. And this test, is there any fuel leakage in  
16 this test?

17 A Just a moment. Is the crash test letter here?  
18 There was no leakage.

19 Q And what is the dynamic crush for this vehicle?

20 A This one says it's 20.0.

21 Q Okay. And was there -- let me withdraw.

22 From what you've told us, this is a test  
23 that you would have observed or looked at the films,  
24 correct?

25 A Yes.

1 Q And in keeping with what you've told us earlier,  
2 even though it is not noted on this crash test  
3 report, your expectation is that the fuel tank would  
4 have contacted the rear axle and the fuel lines  
5 within the frame rail would have had some contact;  
6 is that right?

7 MS. FOGEL: Objection to form. You can  
8 answer.

9 THE WITNESS: I would have expected that  
10 the fuel tank contacts the rear axle, and the fill  
11 and vent lines had a contact with their pass-through  
12 hole.

13 Q (BY MS. SPAGNOLI): Okay. Let me show you crash  
14 test 5 -- let's do these in timing order here. Hold  
15 on one second. This is test 5339, and I'll mark it  
16 as Exhibit 13.

17 MS. SPAGNOLI: Counsel, I only have one of  
18 these.

19 MS. FOGEL: If I could just look at what  
20 you're handing him.

21 MS. SPAGNOLI: Yes, absolutely.

22 Q (BY MS. SPAGNOLI): While she's looking, I'm going

23 to ask you to go back to 5208, and at the top it  
24 says "Hot Test." What does that mean?  
25 A The date that the issue of the vehicle test request

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1 is 7-23, and then we wanted it run by 7-26, which is  
2 three days, which is a shorter amount of time than  
3 typical proving grounds preparation of a vehicle.

4 Q Do you have an understanding as to why a hot test  
5 gets run?

6 A There's a lot of reasons. There could have been a  
7 need for this test to meet timing and development.

8 I don't know why this test was listed as hot.

9 Q Okay. If in July of 1994 this vehicle is basically  
10 a production built vehicle without any significant  
11 changes from the prior vehicle models that had been  
12 certified in compliance, why would a new 301 test  
13 have been run?

14 A The significant difference between this vehicle and  
15 previous models was the new fuel system with the  
16 co-extruded tank and that's why they ran the test.

17 Q Okay. I thought we had -- maybe that was the other  
18 test. This one is one that I thought was with the



19 fuel system that was the carryover.  
20 A Well, we're talking about test No. VC5208?  
21 Q Yes.  
22 A The description on my --  
23 Q Oh, you're right.  
24 A -- shows the co-extruded tank.  
25 Q Okay. So was this 5208 the version of the tank that

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1 you inherited when you were trying to get the new  
2 tank to --  
3 A It was the design intent. The versions change. You  
4 know, after every time they run a test and it  
5 doesn't work, they try to fix it and they run it  
6 again.  
7 Q Okay.  
8 A So exact version, probably not, but that intent.  
9 Q Okay. Let's look at 5339 which counsel has now  
10 handed you. This is Exhibit 13. This a test run in  
11 December of 1994, and, again, this test was run at  
12 your direction, correct?  
13 A Just a second. Yes, I issued the test request.  
14 Q Okay. And how is this vehicle -- well, this is an

15 actual 1994 production vehicle, correct?

16 A Yep, that's its description.

17 Q So nothing different in this test in 1994 from the

18 earlier versions from what you can tell from the

19 build condition description; is that right?

20 A There's an interesting note to me here and I don't

21 recall why we did it, but we do have a pressure test

22 transducer in the gas fill vent line, and that

23 strikes me as an unusual piece of instrumentation

24 but I don't know why we did that, so other than

25 that, I do not see a difference why I would have

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1 inserted a pressure transducer in the fill line. I

2 don't see why.

3 Q Is a gas fill vent line the line that you've

4 described previously that goes from the tank through

5 the pass-through hole in the left side frame rail?

6 A Yeah. I think that I'm describing the same line

7 that goes through the pass-through hole.

8 Q And what does a pressure test transducer tell you?

9 A What the pressure transducer should tell you is the

10 change in atmospheric pressure or liquid pressure in

11 the local area of the transducer. There in the gas  
12 fill vent line it should tell you the liquid or air  
13 pressure.

14 Q Why would that be something you would want to know?

15 A You know, I just don't remember. I looked at this  
16 and went, why is that there.

17 Q Well, in general why would that be something you  
18 would want to measure?

19 A To measure the pressure inside the vessel would  
20 indicate whether the pressure in the vessel was  
21 changing during the test.

22 Q Why would that be important?

23 MS. FOGEL: Objection to form.

24 THE WITNESS: The pressure in the tank, it  
25 could be important if it rose a lot. If it changed

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1 a dramatic amount, I guess it could be important. I  
2 don't remember much about this transducer or why it  
3 was there.

4 Q (BY MS. SPAGNOLI): Well, would it be important also  
5 to find out if you are not able to hold pressure?

6 A Yes, that would be important to not hold pressure.

7 That's part of our standard post test --

8 Q And not holding pressure would indicate some type of  
9 a potential leak, correct?

10 MS. FOGEL: Objection to form. You can  
11 answer.

12 THE WITNESS: The post-test pressure check  
13 indicates a leak if the post-test pressure check  
14 fails.

15 Q (BY MS. SPAGNOLI): And in the normal circumstances  
16 of the test, do you just check the pressure in the  
17 tank or do you also check the vent and filler line?

18 A In the normal rear impact tests, we don't check the  
19 pressure at all. This pressure transducer is  
20 unusual.

21 Q Okay. And from looking at this test, you cannot  
22 explain why that was done in this instance?

23 A No, ma'am, I don't know and don't remember why I  
24 added this pressure test transducer.

25 Q Now, in the Post Test Remarks for this December 1994

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1 test, the engineer noted, "That the fuel tank was  
2 contacted by the rear axle, the rear sway bar and

3 sway bar bracket, and by the rear exhaust system."

4 Have I read that accurately?

5 A I wasn't on that page. Just a second. The fuel

6 tank was contacted by the rear axle, the sway bar

7 and sway bar bracket, and the exhaust system, that's

8 correct.

9 Q Now, from what you've told us, those are not

10 necessarily unexpected contacts from your experience

11 with this vehicle, correct?

12 A Yes. Those would be normal contacts.

13 Q And this would just be an occasion where the

14 engineer happened to note it even though it was

15 something that had been occurring regularly in the

16 Jeep Grand Cherokee test, correct?

17 A Yep, yep. Let me look who the engineer was. Yep,

18 he just wrote it down.

19 Q Okay. And did you do anything when you got that

20 report to address the fuel tank contact with the

21 rear axle, the sway bar, the sway bar bracket and

22 the exhaust system?

23 A Not that I --

24 MS. FOGEL: Objection to form. You can

25 answer.

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1 THE WITNESS: Not that I recall.

2 Q (BY MS. SPAGNOLI): You didn't recommend any changes  
3 to address that contact; is that right?

4 A Not that I recall, no.

5 Q Okay. Can you tell us what the dynamic crush was on  
6 this vehicle? I think it's way towards the back.

7 4043 is the page.

8 A This one was 22.2, the relative speed of 30.4.

9 Q Oh, we've already talked about 5380. That's why I  
10 was wondering -- so I'm going to put that one down.

11 Let me get 5441. I'm going to mark as Exhibit 14  
12 test 5441 from April of 1995, and, again, this is on  
13 the list of tests you looked at just before your  
14 deposition. Now, this vehicle was also tested at  
15 your direction, correct?

16 A Yes, ma'am.

17 Q And it's described as a 1994 production built ZJ  
18 Grand Cherokee modified to represent 1996 production  
19 for rear impact. Can you tell us what it was about  
20 the rear impact changes that were made for the 1996  
21 production? In other words, what was it that was  
22 different in the '94 production vehicle that was  
23 changed to represent the 1996 production intent?

24 A What it says is that there was -- the co-extruded  
25 fuel tank with the reinforced sending unit cover,

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1 the steel fuel rails with matching line bundle, the  
2 rear liftgate with a fixed glass and a reinforced  
3 bumper bar, fascia and brackets for 1996.

4 Q With respect to the co-extruded fuel tank, that's  
5 the tank we've already discussed and you said was  
6 not actually implemented till '97, correct?

7 A Yeah, this is a design change, this one subsequent  
8 to 5380, right?

9 Q Right.

10 A Yeah, and the 5380 is an earlier test and the one  
11 earlier we looked at earlier where the top cracked  
12 and we've gone back to try to reinforce the top now,  
13 and that's noted here. I didn't remember that there  
14 were these other changes.

15 Q Oh, I'm sorry. You know, I don't think I did ask  
16 you, but can you go back to 5380 and let's talk  
17 about it more specifically. Maybe we did cover this  
18 and I apologize if I've already talked about it.  
19 5380 is the February '95 test that had the partial  
20 separation of the vent line fitting from the tank,  
21 so we did talk about that. You said you had to

22 reinforce that weld at the --

23 A The weld --

24 Q -- at the tank?

25 A -- on the tank on this one --

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1 Q Okay.

2 A -- was bad.

3 Q So now we're looking at the next test in April of

4 '95, and that reinforced sending unit cover has

5 been --

6 A Tested once, at least once, both on 5380 and now

7 again on 5441.

8 Q And you believe there was something else done to

9 reinforce the vent fitting?

10 A Yes, I believe there was. I recall having a meeting

11 with our design release engineer, and she took our

12 data and the part back over to the supplier, Cotech,

13 to investigate the cause of this welding.

14 Q That had to do with the failure on 5380, correct?

15 A Yes, ma'am.

16 Q Now, in this 5441 test, there's a reference to 1996

17 steel fuel rails and matching line bundle. What is



18 that?

19 A I don't remember.

20 Q The next item says "1996 rear lift gate with fixed  
21 glass." Do you remember how that rear liftgate  
22 differed from the '95 version or '94?

23 A Somewhere along in here, there's a fixed glass and a  
24 flipper glass, and occasionally we make note of it.  
25 The fixed glass is, you know, glued in and then

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1 there's a flipper that allows the glass itself to  
2 rotate up.

3 Q So you can open it?

4 A Yeah. And I think that we make a difference of --  
5 between the two on these tests, and I don't recall  
6 anything else different between the liftgates.

7 Q Okay. What about the reinforced bumper bar fascia  
8 and brackets, what is that?

9 A You know, I don't remember that at all.

10 Q Okay. Now, if we look at the static rollover  
11 summary and the test result, this one had a failure  
12 of a leak during the static roll after the impact on  
13 the test, right?

14 A Yes.

15 Q And then the note by the engineer says there

16 "appears to be a faulty rollover valve?"

17 A Yes, ma'am.

18 Q What is that?

19 A The tank needs to draw air in to the tank as it uses

20 fuel so it doesn't create a vacuum, and in that air

21 inlet valve, there is like a snorkel, a ball, and

22 when the vehicle is turned upside down, the ball is

23 supposed to seal the valve. In this particular one,

24 I remember we opened it up, looked at the welding on

25 the plate that had failed previously. It was fine,

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1 and then made this special tank for us. The ball

2 was missing in the valve, so that when it turned

3 over, the fuel just ran out.

4 Q Okay. Can you tell me if there is a dynamic crush

5 measurement for this test vehicle.

6 A I don't see one attached to this document as given

7 to me.

8 Q Okay. And this is not on your chart, is it?

9 A Let's see here. No, my chart is dated 3-3-95, and

10 this test was run a month later, more or less. Here  
11 in the test letter, if you look, it says vehicle  
12 velocity and dynamic crush only if requested, and it  
13 must not -- either it's not attached or it didn't  
14 get requested.

15 Q Okay. Let me hand you Exhibit 15. This is test  
16 5681, also on the list of tests that counsel showed  
17 you before your deposition.

18 MS. FOGEL: Let the record reflect that the  
19 tests that were shown to the witness before the  
20 deposition included the Vehicle Crash Test Letter,  
21 the Vehicle Crash Test Request, and did not  
22 necessarily include some of the other pages that  
23 were included in some of these exhibits which  
24 include things like dimensions, drawings, and  
25 photocopies of photographs.

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1 MS. SPAGNOLI: Okay. So the things you  
2 showed him were only the letter and the vehicle test  
3 request specifically, in each of the tests that you  
4 listed for me?

5 MS. FOGEL: To my recollection, yes.

6 MS. SPAGNOLI: Okay.

7 Q (BY MS. SPAGNOLI): All right. If you could -- I  
8 mean, when you're ready.

9 MS. FOGEL: Let me take a quick look before  
10 we hand it to him because I don't have a copy of  
11 this. Okay.

12 Q (BY MS. SPAGNOLI): Okay. This test is dated  
13 November 1995 and it says it's a 1997 USA 301  
14 development test, so you're looking at a test of a  
15 vehicle that is meant to represent the production  
16 1997 vehicle; is that right?

17 A Yeah. It's a '97 production intent vehicle.

18 Q Okay. And it says it is a 1996 production ZJ that's  
19 being tested and it has some modifications to  
20 reflect the 1997 model; is that right?

21 A Yes.

22 Q And with respect to those changes that affect the  
23 fuel system and their performance on a rear impact  
24 test, is the 1997 fuel sending unit and fuel tank  
25 the only difference between the 1996 production

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1 vehicle and the '97 model?

2 MS. FOGEL: Objection to form. You can  
3 answer.

4 THE WITNESS: In the description, it states  
5 explicitly there was a body-in-white, body --  
6 bracket, body-in-white reinforcement under the floor  
7 pan for the 1997 design intent, so I believe that it  
8 had the new gas tank as described, '97 fuel sending  
9 unit and '97 fuel tank design and the bracket on the  
10 left side.

11 Q (BY MS. SPAGNOLI): Okay. When it says  
12 reinforcement under the floor pan, that -- you  
13 believe that's referencing the left side frame rail  
14 bracket?

15 A Yes, ma'am, it's under the floor pan.

16 Q Okay. And this vehicle had a fuel leak at impact,  
17 correct?

18 A Yes, it did, as stated here.

19 Q Does anything in this documentation tell us what --  
20 why there was a leak in this test?

21 A Just a minute. Yeah, there's -- I think it only  
22 says fuel leak at impact on my copy, but it's an  
23 extraordinarily poor copy for those texts.

24 Q Is that for the notes that the engineer wrote?

25 A Yes, the Post Test Fuel System Observations.

1 Q "Fuel leak at impact more than five ounces?"

2 A Yeah, it does say "more than five ounces" quite  
3 clearly but I'm not quite sure what it says before  
4 that.

5 Q And why is a fuel -- what is a fuel leak at impact  
6 on the test, because there's a number of stages that  
7 you check for leaks; is that right?

8 A Yep.

9 Q So what does a fuel leak at impact tell you?

10 A In the barrier room -- it's an enormous room like a  
11 barn -- when the vehicle is hit by the bullet, it  
12 began to leak right there. There was no subsequent  
13 pressure test; there was no rollover. Leak at  
14 impact means that it leaked in the test facility.

15 Q Okay. And you said bullet. You mean the moving  
16 barrier?

17 A There's a moving barrier, yes, commonly referred to  
18 as the bullet vehicle, but, yeah, it's the type IV  
19 301 rear moving barrier.

20 Q Okay. In other words, this vehicle wasn't struck by  
21 a car; it was struck by a flat plywood moving  
22 barrier?

23 A Struck by the normal required 301 barrier.

24 Q Okay. And was it struck at the test speed of 30 --

25 over 30 miles an hour?

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1 A This one indicates it was struck at speed 30.2.

2 Q Okay. And is that a little low for your test?

3 A It is a little low.

4 Q Now, when it says Post Impact Leakage, it says "At  
5 impact greater than five ounces." What is the test  
6 requirement for leakage at impact on the 301 test,  
7 the standard?

8 A Just a second. It was in -- referenced in something  
9 you gave me yesterday. We'll find it in a minute --  
10 your Exhibit 10.

11 Q You're looking at the Ginny Fischbach presentation?

12 A Yep, your Exhibit No. 10 that you gave me, it listed  
13 the test requirements for leakage and on the page --  
14 it says 5124 -- "one ounce (by weight) during impact  
15 motion." I believe that was the answer to the  
16 question.

17 Q Right. That's the standard that the government has,  
18 correct?

19 A Yep, uh-huh.

20 Q And in this case, a greater than five ounce leak

21 would have exceeded the standard, right?  
22 A Oh, yes.  
23 Q And it also would have exceeded the Chrysler  
24 internal guideline --  
25 A Oh, yeah.

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1 Q -- which is zero leakage?  
2 A Zero leakage.  
3 Q Okay. So in this case we had a leak that both did  
4 not comply with Chrysler's requirement nor did it  
5 comply with the government test standard, correct?  
6 A That's correct, ma'am.  
7 Q And then Post Impact Leakage, first five minutes, it  
8 says there's another greater than five ounce leak so  
9 that's the five minutes the vehicle is sitting after  
10 the impact; is that right?  
11 A Just a second. I have to find that. Yep, that's  
12 what it says.  
13 Q And, again, what is the government standard for  
14 leakage during the first five minutes after the  
15 impact?  
16 A The first five minutes is five ounces.



17 Q Okay. So, again, in this instance, the leak after  
18 impact in the first five minutes also exceeded the  
19 government test standard, correct?  
20 A Yes, it did.  
21 Q And it also exceeded Chrysler's standard, correct?  
22 A Yes, it did.  
23 Q Do you have an understanding as to where the leak  
24 came from in this test?  
25 A In this one, I don't remember.

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1 Q Okay. And there's nothing in the test itself that  
2 notes why there was a leak in this test --  
3 A No.  
4 Q -- correct?  
5 A No, there's no good memory joggers for me in this  
6 test.  
7 Q And how much was the dynamic crush in this test?  
8 A Just a second.  
9 Q Back at the back, 3144.  
10 A This dynamic crush is listed at 21.1, and the speed  
11 was 30.2.  
12 Q The speed was 30.2?

13 A Yes, ma'am.

14 Q Now, since there are no memory joggers in this test

15 report, or all the documentation that I've handed

16 you --

17 A Well --

18 Q -- are you telling me --

19 A -- now that I'm looking through it quite

20 completely --

21 Q Yeah.

22 A -- there's the very, very last page.

23 Q Right.

24 A And even though it's not a very good photocopy of

25 it, I think it's telling me that the lid at the top

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1 of the mason jar cracked again.

2 Q What are you looking at that tells you that?

3 A This is 3163. There's a photograph, and the large

4 white section here should have been a complete

5 circle.

6 Q Well, why does that tell you there may have been a

7 leak there?

8 A The photograph -- and it's really hard to tell, and

9 like I said, I don't quite remember all of it, but  
10 you asked me if there was any evidence as to why I  
11 thought this one leaks. I think that this one leaks  
12 due to the top of the fuel sending unit again  
13 leaking.

14 Q Are you guessing?

15 MS. FOGEL: Objection to form.

16 THE WITNESS: The photograph indicates that  
17 to me.

18 Q (BY MS. SPAGNOLI): Well, the photograph doesn't  
19 actually show any fluid leak, does it?

20 A No. It does show here, if you notice, "Post"  
21 written on it.

22 Q Right.

23 A And the time and place that this post test would  
24 have been taken is after disassembly in the vehicle  
25 development garage after we drained all the fluid

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1 out of it.

2 Q Right. And so other than looking at this picture,  
3 you have no recollection at all of what, if any,  
4 source of leak there was in this test; is that

5 right?

6 MS. FOGEL: Objection to the form. You can  
7 answer.

8 THE WITNESS: This picture -- until I saw  
9 this picture, I did not remember why this vehicle  
10 leaked at all. Looking at this picture, I have a  
11 hint that it probably was the fuel sending unit.

12 Q (BY MS. SPAGNOLI): But you can't say that for sure?

13 A No, because I don't remember.

14 Q And if you look at a couple pictures further back,  
15 3159, do we see a picture of the fuel tank in  
16 contact with the differential?

17 A Yeah, I think you do.

18 Q And do we see that there actually appears to be an  
19 indentation in the tank where the tank and the  
20 differential come together?

21 MS. FOGEL: Objection to the form. You can  
22 answer.

23 THE WITNESS: I don't think that's the  
24 differential causing that dent.

25 Q (BY MS. SPAGNOLI): There's a dent right there,

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1 isn't there?

2 MS. FOGEL: Objection to the form. You can  
3 answer.

4 THE WITNESS: Given the quality of these  
5 photographs, there's a -- there's a black spot,  
6 right, and I think what that black spot is is where  
7 the paint came off. That's what I think that spot  
8 is. I don't think it's a dent. That's what I think  
9 that spot is.

10 Q (BY MS. SPAGNOLI): In the immediate area of the  
11 black spot -- why don't you hold that photograph up  
12 for the video camera. Point to what you're  
13 referring to as this black spot.

14 A See the little spot here?

15 Q Yep. And is that right at the location where the  
16 differential's furthest edge or point is in contact  
17 with the tank?

18 A Yeah, it is.

19 Q And do you know if there was a leak there?

20 MS. FOGEL: Objection to form. You can  
21 answer.

22 THE WITNESS: If there was a leak right  
23 there where it could be easily seen after the test,  
24 that had a very high probability of being noted. I  
25 would expect that any leak right there where you

1 could see it like this on the lift, someone would  
2 have written that down, because this is obvious, and  
3 it would have been unusual for it -- on this big  
4 round surface for it to have caused a leak.

5 Q (BY MS. SPAGNOLI): Okay. If there is contact like  
6 that -- and clearly there is contact between the  
7 differential and the tank in this picture, right?

8 MS. FOGEL: Objection to form.

9 THE WITNESS: I can't tell whether there's  
10 contact or not. There's no contrast. There's a  
11 couple of black dots.

12 Q (BY MS. SPAGNOLI): Well, if the paint was scraped  
13 off, then that would suggest there was contact,  
14 right?

15 A Yeah, it would. I mean, it suggests it, but to say  
16 that there was clearly contact --

17 Q Well, if there was contact but not a leak in that  
18 location, that's again an acceptable result?

19 A Yes, contact but not a leak, that's pretty normal.

20 Q That was -- for this vehicle it was normal?

21 A Yes.

22 Q Okay. Are you saying it's normal for other  
23 vehicles?

24 MS. FOGEL: Objection to form.

25 THE WITNESS: I was intimately familiar

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1 with the Grand Cherokee vehicle development and it's  
2 normal for this vehicle.

3 Q (BY MS. SPAGNOLI): And so you can't say with  
4 respect to other vehicles; is that right?

5 MS. FOGEL: Objection to form. You can  
6 answer.

7 THE WITNESS: Other vehicles which I was  
8 responsible for, it would have been normal.

9 Q (BY MS. SPAGNOLI): What other vehicles were you  
10 responsible for?

11 A The Wrangler. It was called TJ. It had the same  
12 kind of contact with its rear differential that this  
13 one does, similar.

14 Q And the other vehicle that you were responsible for?

15 A The TJ and the XJ, which is a Cherokee.

16 Q And was contact between the differential and the  
17 fuel tank normal on the XJ?

18 A Yes.

19 Q Was there anything done on the Cherokee to try and

20 eliminate or reduce the effect of contact between  
21 the fuel tank and the differential in that vehicle?

22 MS. FOGEL: Objection to form.

23 THE WITNESS: Not that I recall.

24 VIDEO TECHNICIAN: Five minutes left on the  
25 tapes.

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1 MS. SPAGNOLI: Okay. Let's change tapes.

2 VIDEO TECHNICIAN: Going off the record at  
3 10:41 a.m.

4 (Off the record.)

5 VIDEO TECHNICIAN: We're back on the record  
6 at 10:52 a.m.

7 Q (BY MS. SPAGNOLI): All right. Mr. Estes, just to  
8 clarify, if we look back at Exhibit 15, there is a  
9 clarification apparently or a correction with  
10 respect to whether the vehicle tested in 5681 had  
11 the left frame rail reinforcement bracket. Have you  
12 determined that that was not an accurate description  
13 of the bracket that we see here?

14 A Yeah. After a complete review of the build  
15 condition for vehicle 5681, I believe I misspoke



16 earlier, and that the bracket and body-in-white  
17 reinforcement under the floor pan is not the one in  
18 the rear of the vehicle but associated with the air  
19 bag electronic control module.

20 Q Okay. So the vehicle that was tested here did not  
21 have the left frame rail reinforcement bracket; is  
22 that right?

23 A Yes, it does not indicate that reinforcement  
24 bracket. It indicates a different one.

25 Q All right. Now, let me ask you to look at Exhibit

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1 16 which is test No. 5789 from January of 1986.  
2 Now, earlier when I've asked you if you've seen  
3 these before, counsel has pointed out that the  
4 documents she gave you in connection with the crash  
5 tests were, as previously noted, the Vehicle Crash  
6 Test Letter and the Vehicle Crash Test Request but  
7 not the attached data including the dynamic crush  
8 report and the photographs or transducer data; is  
9 that right?

10 A That's correct. I hadn't seen the transducer data  
11 or photographs in some of the reports which are now

12 attached.

13 Q Okay. So what I'm showing you is an addition in  
14 each case to the reports that were shown to you by  
15 counsel; is that right?

16 A Yes, ma'am.

17 Q Okay. Now, in 5789 the vehicle that we have here is  
18 a 1996 production ZJ, again, modified to represent  
19 the 1997 vehicle, correct?

20 A Which test?

21 Q 5789, Exhibit 16. Do you have that?

22 A No.

23 Q Oh, sorry.

24 MS. FOGEL: Sorry.

25 THE WITNESS: Thank you. 5789 -- what was

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1 the question again, please?

2 Q (BY MS. SPAGNOLI): All right. Test No. 5789 from  
3 January of 1996 is a test that you requested, right?

4 A Yes, ma'am.

5 Q Okay. It has -- it is a 1996 production ZJ modified  
6 to represent the 1997; is that right?

7 A Yeah, it was modified with the new fuel sending unit

8 and fuel tank design.

9 Q Okay. So the only difference between the '96  
10 production vehicle that you tested that was modified  
11 to represent the '97 was that it had the fuel  
12 sending unit and fuel tank that was being intended  
13 for the '97 model, correct?

14 MS. FOGEL: Object to the form.

15 THE WITNESS: The differences noted here  
16 are only the fuel sending unit and fuel tank design.

17 Q (BY MS. SPAGNOLI): So in all other respects, this  
18 vehicle was a production 1996 ZJ, correct?

19 A The only differences noted were the fuel tank and  
20 fuel tank design on this test letter.

21 Q All right. This test had a leak in excess of the  
22 allowable limits in the engine compartment area  
23 during the post test static rollover. Do you see  
24 that?

25 A Just a second. The Post Test Fuel System

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1 Observations, handwritten, I can't read it, but on  
2 the Electronic Test Letter there indicates that  
3 there were no fuel leaks at impact or in the 25

4 minutes after impact, but there was fuel leakage in  
5 excess of the allowable limits in the engine  
6 compartment during the post-test static rollover.

7 Q Okay. Do you know what the source of the leak from  
8 the engine compartment was in this test?

9 A I don't remember this one.

10 Q At all?

11 A No.

12 Q Would a leak in the engine compartment be a  
13 violation of the test requirement?

14 A Yes, ma'am.

15 Q Was there anything different in the engine  
16 compartment in the '96 production ZJ vehicle that  
17 was tested in this test? I'm sorry, let me restate  
18 my question.

19 The engine compartment of the vehicle  
20 tested was a production 1996 ZJ, correct?

21 A It was a 1996 production ZJ.

22 Q And so you had a failure in the engine compartment  
23 which was a production engine compartment, correct?

24 A It would appear to me that that is true. The only  
25 other thing that I wanted to say is when the first

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1 of these style of tests came, the original  
2 description was for a new steel fuel rail, the  
3 matching line bundle, and then that description  
4 falls off and isn't repeated, and I don't recall  
5 whether that should have been repeated and carried  
6 forward or was just implicit in the fuel tank and  
7 sending unit design, so I can't say for certain  
8 whether it was exactly a '96 production fuel system  
9 in the engine compartment.

10 Q Are you guessing?

11 A I think that the way I used to do things would have  
12 implied that the changes went with this fuel tank  
13 and sending unit, but I can't be sure.

14 Q Well, sir, you agree with me that the build  
15 condition is supposed to represent the actual  
16 condition of the vehicle that you tested including  
17 any differences from a production vehicle, correct?

18 A Yes, ma'am.

19 Q And you would agree with me that test 5789 does not  
20 indicate any production changes in the test vehicle  
21 from a 1996 production ZJ with respect to the engine  
22 compartment, correct?

23 A No, it doesn't indicate that explicitly.

24 Q Okay. And this test, because of the leak in the  
25 fuel system in the engine compartment, this is a

1 failure of the government standard, correct?

2 A Yes, it is.

3 Q Was this test reported to the government?

4 A No, it was not as far as I remember.

5 Q The dynamic crush on this test is 20 inches, if I'm

6 looking at page 2050, correct?

7 A Yes, dynamic crush on this one was 20.0 at 30 miles

8 an hour.

9 Q Okay. Now, if you have a production vehicle that is

10 involved in a test that fails the government

11 standard, you have a requirement to report it to the

12 government, do you not?

13 A I don't remember. I don't think so.

14 Q You don't think Chrysler has to report failures of

15 production vehicles in 301 compliance tests?

16 A I don't believe this was a compliance test.

17 Q It was a test on a production vehicle that failed

18 the government standard 301 test, correct?

19 MS. FOGEL: Objection to the form.

20 THE WITNESS: It was a production vehicle

21 with 1997 fuel system and fuel tank design at the

22 minimum change to represent '97 production intent.

23 Q (BY MS. SPAGNOLI): Right. And you would agree with  
24 me that the fuel tank and fuel sending unit were not  
25 the reason for the failure on this test, correct?

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1 MS. FOGEL: Objection to the form.

2 THE WITNESS: They're not in the engine  
3 compartment which the only note here says that's  
4 where the leak occurred.

5 Q (BY MS. SPAGNOLI): Right. And if this was a  
6 production vehicle with a production engine that  
7 failed a 301 barrier test and failed the government  
8 standard, you're telling me you don't know whether  
9 or not that is a test that needs to be reported to  
10 the government?

11 A The engine itself was likely to be production. What  
12 I am unsure of is whether when we changed the fuel  
13 sending unit and the fuel tank design if we didn't  
14 take with that fuel system change the whole fuel  
15 system as described previously, so I can't say  
16 exactly whether or not it should have been reported.  
17 I don't believe that it was reported.

18 Q Well, if it was not -- if it was a vehicle that was

19 production in all senses with respect to the engine  
20 compartment and there was a failure, meaning it did  
21 not comply with the government standard, would that  
22 require you to report the test to the government?

23 MS. FOGEL: Objection to form. You can  
24 answer.

25 THE WITNESS: I don't know right now as I

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1 sit here whether that's the way that works out.

2 Q (BY MS. SPAGNOLI): Okay.

3 A I don't remember the intricacies.

4 Q And by suggesting that maybe there were some changes  
5 in this vehicle that are not reflected on the build  
6 condition, is that a means for you to justify not  
7 reporting this test to the government?

8 A The changes that are written on the build condition,  
9 I think, would have been shorthand for changing the  
10 fuel system. Whether or not they're justification,  
11 I don't remember this failure mode and I don't  
12 remember the occurrence at that time, so exactly  
13 what it was that went through our mind as to whether  
14 we justified not calling or calling our Safety



15 Office to report it, I can't say.

16 Q Well, certainly someone would have had to discuss

17 this test and the fact that you failed the

18 government standard, correct?

19 A This test did fail the government standard.

20 Q And rather than just passing by this test, people

21 would have had to have talked about it, right?

22 A Yes.

23 Q And would have had to justify what to do in response

24 to the failure of this '96 production ZJ with a new

25 fuel tank and sending unit not being required to

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1 report the result to the government, right?

2 MS. FOGEL: Objection to the form. You can

3 answer.

4 THE WITNESS: There was almost certainly

5 some discussion about this test and its failure. I

6 don't remember specifically why this one failed. As

7 I've sat here -- and I'm trying to look through the

8 photographs to see if this is the specific test in

9 my memory that there was a fuel rail contact with

10 body-in-white at the plenum area. I can't say

11 whether that was this one or another one. In the  
12 photographs I had hoped to see a picture of it, but  
13 I don't, and so I can't recall the exact mechanism  
14 as to why this one leaked in the engine compartment.

15 MS. FOGEL: I don't have a copy of the  
16 exhibit. Does that include the Fuel System and  
17 Static Rollover Summary?

18 MS. SPAGNOLI: Absolutely.

19 THE WITNESS: Yeah, it does.

20 Q (BY MS. SPAGNOLI): So was this occurrence a failure  
21 of a government standard on a production vehicle a  
22 common occurrence?

23 MS. FOGEL: Objection to the form.

24 THE WITNESS: No. The production vehicles  
25 did not fail the government standard. This failure

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1 is unusual and it was noted as an unusual failure in  
2 the post-test letter.

3 Q (BY MS. SPAGNOLI): And what was done about it is  
4 something that just does not register in your brain  
5 at this point in time; is that what you're saying?

6 MS. FOGEL: Objection to the form.

7 THE WITNESS: There was a change to the  
8 plenum to allow more space for a fuel rail to  
9 translate rearward in the car. I can't recall  
10 whether this vehicle was the one that had this  
11 change in it or caused that change. I remember  
12 having the fuel rail in our vehicles contact the  
13 plenum area and changing the body-in-white to  
14 prevent that, but whether it was this test or  
15 another, I'm not sure.

16 Q (BY MS. SPAGNOLI): But with respect to this  
17 specific test, you cannot explain what, if anything,  
18 was done with respect to a decision about whether  
19 this test required a report to the government; is  
20 that right?

21 MS. FOGEL: Objection to the form.

22 THE WITNESS: With respect to this specific  
23 test, I don't recall the decision or the discussion  
24 around the decision as to why we did or didn't call  
25 the Safety Office and our government reporting. I

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1 don't remember.

2 Q (BY MS. SPAGNOLI): Can I ask you to take a look at

3 Exhibit 17, please.

4 MS. FOGEL: I have it right here.

5 Q (BY MS. SPAGNOLI): This is test 5854, a 1997 301  
6 development test on a 1996 production ZJ modified to  
7 represent the 1997, correct?

8 A Yes, it's a modified 1996.

9 Q And it's a test from March of 1996, correct?

10 A Yes, it is.

11 Q This is a test that you requested, correct?

12 A Just a second. Yes, it is.

13 Q And there is a 1997 fuel sending unit, a 1997 fuel  
14 tank design in this vehicle, as well, similar to the  
15 last vehicle, correct?

16 A It has the same description as the previous test  
17 5789.

18 Q Is this a test that you were shown yesterday or the  
19 day before?

20 A It should have been but I don't remember it  
21 specifically.

22 Q I don't see it on the list that was read to me.

23 MS. SPAGNOLI: Perhaps counsel could  
24 confirm whether 5854, any portion of that test was  
25 shown to the witness the day before yesterday.

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1 MS. FOGEL: This is one of the tests for  
2 1997, and I believe it was.

3 MS. SPAGNOLI: Okay. When you read me the  
4 list, I asked you to tell me the numbers of the  
5 tests that you showed the witness, and I have 5339,  
6 5380, 5441, 5493, 5890, 5993, 5681, 5789, 5890, 5926  
7 and 5967.

8 MS. FOGEL: And before that I told you I  
9 showed him the ones for '96 and '97.

10 MS. SPAGNOLI: And then I asked you to tell  
11 me specifically which ones they were --

12 MS. FOGEL: That's correct.

13 MS. SPAGNOLI: -- and that's the list that  
14 you read me that I've just read back.

15 MS. FOGEL: Well, I'm going to rely on what  
16 you're representing to me, because I don't have a  
17 copy of the transcript yet, and if I missed one when  
18 I read the list, then so be it, but I believe as I  
19 sit here now -- and you've asked me. I told you  
20 that I showed him all the '97's, and if that's a  
21 '97, then I believe that's one of the ones I showed  
22 him.

23 MS. SPAGNOLI: Okay. And you would have  
24 showed him, again, the safety test letter and the  
25 test request; is that right?

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1 MS. FOGEL: That's correct.

2 MS. SPAGNOLI: Okay.

3 Q (BY MS. SPAGNOLI): Again, in connection with the  
4 build condition of the vehicle that was tested in  
5 test 5854, was this in all respects a production  
6 1996 ZJ with the exception of the fuel sending unit  
7 and the fuel tank?

8 A That's the build condition as written on this test  
9 letter.

10 Q Okay. And this test had a fuel leakage at impact in  
11 excess of the allowable limits, correct?

12 A Yeah. That is the description here. The post-test  
13 letter describes it as greater than five ounces at  
14 impact.

15 Q And what page are you reading from, 4453?

16 A 4453. There is something written up there, but I  
17 cannot read it and cannot find it typed in.

18 Q Okay. It says "Fuel at impact. Leakage exceeded  
19 allowable limit," I believe. Does that look like  
20 what it says?

21 A That, I would be guessing at, but it's something

22 close. I can't tell really.

23 Q Okay. There's no description of where the leak

24 occurred in this test, correct?

25 A No, there isn't.

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1 Q It's a leak that occurred at impact of greater than

2 five ounces, correct?

3 A That's what it indicates, yes, ma'am.

4 Q Do you know why this test vehicle leaked?

5 A I don't remember at the moment.

6 Q Okay. What is the dynamic crush in this test?

7 A Here's our dynamic crush of 20.3 inches.

8 Q Okay. Was the failure of this test reported to the

9 government?

10 A No.

11 Q Do you know why?

12 A It was a 1996 production vehicle to be modified with

13 '97 production intent parts. So it was a test of

14 preproduction parts.

15 Q And the only preproduction parts were the tank and

16 the fuel sending unit, correct?

17 MS. FOGEL: Objection to the form. That's

18 not what the document says.

19 THE WITNESS: The description says that.

20 Q (BY MS. SPAGNOLI): Right?

21 A The description says 1997 fuel sending unit and fuel  
22 tank design.

23 Q And you don't know whether the failure occurred in  
24 the preproduction parts or the production parts,  
25 correct?

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1 A They are not clear as to where the failure occurs.

2 Q Okay. So you cannot answer my question; is that  
3 right?

4 A Which question was that?

5 Q You don't know whether the failure occurred in the  
6 preproduction parts or the production parts; am I  
7 correct?

8 MS. FOGEL: Objection to the form.

9 THE WITNESS: I don't know where the  
10 failure occurred.

11 Q (BY MS. SPAGNOLI): Okay. Let's look at Exhibit 18,  
12 test 5890.

13 MS. SPAGNOLI: It's actually the little



14 skinny one.

15 MS. FOGEL: That's this one here.

16 THE WITNESS: Thanks.

17 Q (BY MS. SPAGNOLI): This is an April 22, 1996 test

18 of a 1996 production ZJ modified to represent a

19 1997; am I correct?

20 A Exhibit 18 is a 1996 production vehicle with

21 modifications to the fuel tank, sending unit and

22 fuel tank design to represent the '97 intent.

23 Q Okay. This, again, refers to the fuel sending unit

24 and the new '97 fuel tank design, correct?

25 A Yes.

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1 Q It also references a trailer hitch single side

2 bracket on left rear. Is that the first time that

3 we've seen a test with this reinforcement bracket?

4 A Yes, to my knowledge, that's the first time I've

5 included that description in the test build

6 condition.

7 Q Okay. And what -- what was the result of this test?

8 A Post Test Remarks state "There were no fuel leaks at

9 impact [and] fuel system integrity was maintained."

10 Q Okay. Is there any note with respect to whether  
11 there was contact between the fuel tank or fuel  
12 lines and any components within the rear of the  
13 vehicle?

14 A I don't appear to have the handwritten set of notes  
15 and all I can find for the notes are the written --  
16 typed-in text of the post-test letter, and the only  
17 indication there is that it passed the test.

18 Q Okay. But, again, given your observations and  
19 experience in testing Grand Cherokees, you would  
20 have expected that there would be contact between  
21 the tank and the axle at least in the test; is that  
22 right?

23 A Yeah, I would have expected the tank and axle to  
24 contact.

25 Q Okay. Is there any other location where you would

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1 have expected contact between the tank or components  
2 of the tank and the vehicle?

3 A The rear bumper contacts the inside of the -- or the  
4 forward face of the rear bumper contacts the gas  
5 tank.

6 Q Okay. Any other areas that you expected contact?

7 A No, not particularly, as I recall.

8 Q Okay. Let me ask you to take a look at Exhibit 19.

9 A Which one is 19?

10 Q This is test 5926, dated May 9, 1996. It's a 1996

11 production ZJ modified to represent 1997. Do you

12 see that?

13 A Yes, ma'am.

14 Q And this has a '97 fuel sending unit and fuel tank

15 design, correct?

16 A It's described as having a 1997 fuel sending unit

17 and 1997 fuel tank design, yes.

18 Q And it has a skid plate, correct?

19 A Skid plate only, no trailer hitch bracket.

20 Q Okay. When it says "Skid plate only, no trailer

21 hitch bracket," is there some mechanism of

22 attachment of the skid plate that substitutes for

23 the frame rail reinforcement bracket?

24 A The skid plate is attached to the rear body-in-white

25 in the same structural area. I don't recall whether

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1 it uses the exact same bolt holes or not but it goes

2 in the same spot, so -- did that answer the  
3 question?

4 Q Well, is the skid plate attachment meant to provide  
5 the same reinforcement of the left frame rail as the  
6 reinforcement bracket or the trailer hitch  
7 attachment?

8 A The skid plate here, when we were testing it, we  
9 wanted to make certain that it performed the same  
10 way as the reinforcing bracket, so we wanted to see  
11 if the skid plate -- because you can order a car  
12 with skid plate only, and the idea was do we have to  
13 add the bracket and the skid plate or is the skid  
14 plate going to perform as well as the bracket did.

15 Q And what did you decide?

16 A Well, this one passed the test and the skid plate  
17 performed as well as the bracket in these tests.

18 Q And when you refer to a skid plate, what is a skid  
19 plate?

20 A A skid plate is a large stamped metal, a basket  
21 container, for lack of a better word, that covers  
22 the entire gas tank and mounts up to the frame to  
23 prevent the gas tank from getting damaged in  
24 off-road maneuvers is its main intent, but it forms  
25 a large metal shield to prevent all kinds of damage

1 on the gas tank, primarily when it skids off and  
2 over some under-vehicle object.

3 Q So the skid plate, you said, is a large metal shield  
4 that prevents all kinds of damage occurring to the  
5 gas tank; is that right?

6 A Yes, it prevents a variety of damage to the tank.

7 Q Okay. Can you -- look at the mechanical request for  
8 the -- this crash test vehicle. Do you see where it  
9 says "No Stoddard added at JTE fuel tank empty?"

10 A Yes, ma'am.

11 Q Does that mean the test was run without any Stoddard  
12 in the tank?

13 A No, ma'am.

14 Q What does that mean?

15 A That means that we shipped the vehicle from  
16 Jeep/Truck and Engineering facility to Chelsea  
17 without any of the Stoddard solvent in it.

18 Q Okay. And so you put the Stoddard in when it  
19 arrived at the test facility?

20 A Yeah, and that should be noted in that summary by  
21 the proving grounds guys because they're the ones  
22 who put the Stoddard solvent in it.

23 Q Okay.

24 A Yeah, and here on your page 3177, it -- fuel type

25 and quantity, specific gravity, Stoddard solvent --

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1 COURT REPORTER: I'm sorry.

2 THE WITNESS: Specific gravity, that's a  
3 description of the Stoddard solvent, type, and then  
4 it says right there they had 21.5 gallons into car.

5 Q (BY MS. SPAGNOLI): What was the speed that -- the  
6 actual test speed of this test?

7 A This test speed was 30.1 miles an hour.

8 Q So it was fairly -- it was just above the 30 mile an  
9 hour limit?

10 A Yes, one-tenth of a mile above the limit.

11 Q Okay. And the dynamic crush on this vehicle -- I'm  
12 looking at page 3209 -- is 18.1 inches; is that  
13 right?

14 A Yes, it is.

15 Q And that's the lowest one we've seen, right?

16 A Yes.

17 Q And is this the only test that we've seen that  
18 actually had a skid plate attached?

19 A So far, it's the only one with a skid plate.

20 Q Okay. Was there contact between the skid plate and

21 the differential in this case?

22 A I don't recall.

23 Q Are there photographs that show the underside of the

24 vehicle here?

25 A There are photographs.

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1 Q If we look at page 3221, do we actually see the skid

2 plate next to the differential?

3 A Just a second. Yeah, it is next to it. I'm not

4 sure what that large black line indicates, but,

5 yeah, it's right there next to it. You can see

6 targets U7 and U10 are on the skid plate and target

7 U6 is on the differential.

8 Q Can you hold that up for the camera and then just

9 point out what you mean by the target.

10 A This one is U10, this one is U7. There's a black

11 line, and then this one here is U6, and that's the

12 differential area here.

13 Q Okay. So that large white area, sort of lighter

14 appearing area is the shield that covers the gas

15 tank; is that right?

16 A Yes, ma'am. This is the photograph of the skid

17 plate post test.

18 Q Okay. And does the shield also cover the front end  
19 of the tank so that in this case the tank is not  
20 contacting the differential; it's the shield that's  
21 contacting the differential?

22 MS. FOGEL: Objection, form. You can  
23 answer.

24 THE WITNESS: I know what you're asking me  
25 and I don't remember whether it goes up there or

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1 not. I don't remember.

2 Q (BY MS. SPAGNOLI): Okay. Next let's look at test  
3 5927. This is a 5-9-96 test and I've marked it as  
4 Exhibit 20. This is a 1996 production ZJ modified  
5 to represent the 1997, right?

6 A Yep, it's a 1996 production ZJ with modifications to  
7 represent '97 design intent.

8 Q Okay. And the changes again here are we have the  
9 '97 fuel sending unit and fuel tank, correct?

10 A Yes.

11 Q And here we have a full trailer hitch with no skid  
12 plate and no bracket, right?



13 A That's the description.

14 Q Okay. And the trailer hitch, as we discussed,

15 attaches to the left frame rail similar to where the

16 skid plate attaches, correct?

17 A I believe it attaches in the same area of the

18 vehicle, but like I said before, I'm not certain if

19 it uses the exact same attachment points.

20 Q At any rate, if you have the trailer hitch, did you

21 believe that you would have the similar

22 reinforcement in the left frame rail as you would

23 get with the actual reinforcing bracket? Is that

24 what you were testing?

25 A Yes, it's very similar. The reinforcing bracket is,

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1 in fact, that one-third of the trailer hitch. We

2 simply didn't assemble the whole trailer hitch from

3 the same stamping. That part is part of the trailer

4 hitch.

5 Q Okay. And can you tell me if you have any

6 photographs that would depict the underside where

7 the tank and the differential would be depicted in

8 the crash test, post-crash condition?

9 A I haven't seen these pictures in ten years. I think  
10 photograph 3314 is post test, but there -- it would  
11 have been their habit to put the little tiny word  
12 "post" on a sticker and I don't see that there. I  
13 do see it on 3317 --

14 Q Right.

15 A -- but it's not exactly the differential. It's sort  
16 of sticking out of the corner.

17 Q You actually, if you look at photograph that is --

18 A Which one?

19 Q -- 33 -- hold on one second. There was one -- 3309  
20 looks like pre-impact the gas tank --

21 A That was a pre, yeah.

22 Q -- and the differential, right?

23 A Just a second -- 3309, I got it. 3309 appears to be  
24 a pre-test photograph.

25 Q Could you hold that up and just show us what --

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1 where the edge of the gas tank is and then where the  
2 edge of the differential is.

3 A So here is the gas tank edge and this outline here  
4 is the differential edge, so they're separated by

5 this right here.

6 Q Okay. Now, it looks to me like there's something in  
7 between the two. Is that the stabilizer bar?

8 A I don't know if that's the track bar there or not.

9 It should be, but it's hard to tell. I can't see  
10 what it's connected to on each side. I think it's  
11 the track bar, but it's in the right spot but the  
12 angle looks funny to me, you know, because the track  
13 bar typically goes over the top of the axle and  
14 there it doesn't look like it's on top, so that's  
15 why.

16 Q So we're looking at it from underneath looking up,  
17 so it may actually be above the axle, but it just  
18 looks like it's in between the tank and the  
19 differential in this picture?

20 MS. FOGEL: Objection to form.

21 THE WITNESS: This perspective is unusual.

22 Q (BY MS. SPAGNOLI): Okay.

23 A It doesn't appear to be in -- where it should be for  
24 a production car.

25 Q Okay. So from -- with respect to the -- you call it

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1 a track bar. Is that the same as a stabilizer bar?

2 A The track bar bracket is what connects the axle to  
3 the body, and this appears to be -- to me to be the  
4 track bar bracket. As far as I know, there isn't  
5 anything called a stabilizer bar.

6 Q Okay. In the track -- in the production condition,  
7 is the track bar bracket in between the tank and the  
8 differential or is it above it?

9 A The bracket, the track bar bracket, as you stated,  
10 is welded to the axle and should be on top of the  
11 axle tube and not between the gas tank and the  
12 differential.

13 Q Okay. So in a production vehicle, there would be --  
14 there would be space, clearance between the front of  
15 the tank and the differential and not anything in  
16 between those two components; is that right?

17 MS. FOGEL: Objection to form. You can  
18 answer.

19 THE WITNESS: Let me make sure I understood  
20 your question. There should be space between the  
21 gas tank and the differential and the track bar --

22 Q (BY MS. SPAGNOLI): Right.

23 A -- in production?

24 Q Right. So specifically there would not be a  
25 component or part between the tank and the

1 differential in production; is that right?

2 A There shouldn't be, but I'm not recalling if there

3 is anything else there. We talked a little bit

4 about the skid plate and I don't recall whether it

5 slips up in that area or not.

6 Q Okay.

7 A And that --

8 Q Right. But if you have a vehicle like this one that

9 doesn't have a skid plate and we look at 3314 -- can

10 you flip to that page again.

11 A Yes.

12 Q This does appear then from the condition to be a

13 post-impact photograph, correct?

14 A Yeah, it looks like a post-impact photograph. Like

15 I said, there's -- there should have been a little

16 word. If you notice on other photographs, they have

17 like a magnet or something written "post" on it, but

18 next to the test No. 5927, see, there's something

19 indescribably written there and that should say

20 "post."

21 Q Okay.

22 A But --

23 Q Can you again hold up that picture and just show us

24 the edge of the tank and the edge of the  
25 differential.

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1 A So here's -- the tank is this white unit here and  
2 it's separated here by this black line, and then  
3 this is the differential, this white part here.

4 Q And does it look like the tank is actually in  
5 contact with the differential in that picture?

6 A It's difficult to judge. There's a black line in  
7 there, but whether that's contact or a shadow or  
8 what, I -- I would have presumed, to my knowledge,  
9 that the tank would be in contact with the  
10 differential. Whether it is or not in this  
11 photograph, but whether it touched it or not, that  
12 should have been the normal way it runs.

13 Q Okay. Thank you. Do we have the dynamic crush  
14 measurement for that test?

15 A Oh, I don't know.

16 Q 5927. I thought I had it, but -- try page 3302. It  
17 looks to me like it says 19.6.

18 A Yeah, this one reports a dynamic crush at 19.6 for  
19 30.1 miles an hour.

20 Q Okay. And did we have the dynamic crush for the  
21 5967? I think you have that test report there.  
22 This is the one that you used for compliance, and it  
23 was with the reinforcement bracket but not -- no  
24 trailer hitch or skid plate.  
25 A It's not here.

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1 Q There it is.  
2 A Oh, right here. What was the question about 5867?  
3 Q I'm going to ask you if you can locate for me the  
4 dynamic crush for 5967, the compliance test.  
5 A Dynamic crush.  
6 Q And, again, just to verify, the vehicle, 5967, is a  
7 -- is equipped with the reinforcement bracket but  
8 not the skid plate or the trailer hitch.  
9 A Yeah, vehicle 5967 with the trailer hitch bracket  
10 added after the PO build, the configuration  
11 represented 1997 V-1, which is production intent,  
12 had a dynamic truck of 19.9 inches with a speed of  
13 30.1.  
14 Q Okay. So this is the test that was used to certify  
15 compliance, correct?

16 A Yes, it was, in 1997, vehicle crash No. 5967,  
17 certified the rear impact for the ZJ.  
18 Q Okay. So the certification vehicle was actually the  
19 vehicle that had the trailer hitch bracket as  
20 opposed to the reinforcing bracket or the skid  
21 plate, correct?  
22 A The certification vehicle had only the trailer hitch  
23 bracket and not the skid plate and not the complete  
24 trailer hitch.  
25 Q Is the trailer hitch -- this is where you're not

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1 sure if the trailer hitch bracket resembles or is  
2 the same as the reinforcement bracket; is that  
3 right?  
4 A Oh, no, no. The trailer hitch bracket is the exact  
5 same part of the trailer hitch without the rest of  
6 it.  
7 Q Okay.  
8 A The trailer hitch bracket and the reinforcing  
9 bracket are the same.  
10 Q Okay. So the vehicle that was certified as being in  
11 compliance basically had the reinforcing bracket?



12 A The vehicle 5967 had the trailer hitch reinforcing  
13 bracket.

14 Q Okay. And the test before that, 5927, had the  
15 trailer hitch as well as the trailer hitch  
16 reinforcing bracket, correct?

17 A The 5927 build condition is the full trailer hitch  
18 which doesn't have an extra bracket.

19 Q Right.

20 A It is the bracket itself which includes then the  
21 cross piece and the same bracket in a mirror on the  
22 right side, so it only had the one bracket just like  
23 the compliance car did but it had in addition to it  
24 welded to it the cross piece and the other  
25 right-hand side, so there's only still the one

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1 bracket. It's just got the added trailer hitch  
2 parts.

3 Q Okay.

4 A So there's only the one bracket on that one side.

5 Q I understand. I think we're talking about the same  
6 thing, but --

7 A Okay.

8 Q -- 5927 --

9 A Yes.

10 Q -- has the left side frame rail bracket --

11 A Yep.

12 Q -- plus a cross member that goes outside the bumper

13 plus a bracket on the right frame rail?

14 A That's the complete trailer hitch, yes.

15 Q Okay. And that's what was tested in 5927, right?

16 A Yes.

17 Q 5926 has the skid plate?

18 A 5967, ma'am?

19 Q 5926, the one before that, the one that had the skid

20 plate.

21 A Right, okay, 5926.

22 Q The skid plate would have the left side

23 reinforcement bracket, correct?

24 A No. The 5926 had skid plate only, no bracket.

25 Q Right. But it has an attachment to the left side

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1 frame rail that attaches in the same location and

2 performs the same function?

3 A The skid plate is attached at, I think -- I think

4 it's attached to the same spot the brackets go, but  
5 the skid plate then is there in place of the  
6 bracket.

7 Q Understood. But in terms of how it attaches, the  
8 skid plate --

9 A Yeah.

10 Q -- does the skid plate attach in the same location  
11 on the left side frame rail and the right side frame  
12 rail as a trailer hitch would attach?

13 A That, I'm not sure about. There were a couple of  
14 holes there, and I don't remember whether the  
15 trailer hitch and the bracket and the skid plate all  
16 used the same holes or not, so I can't remember. I  
17 don't remember.

18 Q But when you say the skid plate is meant to be  
19 instead of the reinforcing bracket, there's some  
20 component of how the skid plate attaches that serves  
21 the same function as the reinforcing bracket?

22 A The skid plate and the bracket both have the  
23 physical geometry of a right angle flange which has  
24 a lot of load-carrying capability, and they both  
25 bridge the pass-through hole for the fill and vent

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1 lines where they go through the rail, and they both  
2 bridge that same spot with the same geometry, but  
3 I'm not sure whether they attach in the same spots.

4 Q Okay. But the function as far as the -- managing  
5 the energy is, in your opinion, equivalent --

6 A Yeah. Well, that's why we ran the test --

7 Q -- to the bracket?

8 A -- to prove that it was equivalent, uh-huh.

9 Q Okay.

10 A We thought it was and so, you know, we ran the test  
11 to be sure.

12 Q Okay.

13 MS. SPAGNOLI: Let's go off the record. I  
14 want to make sure I'm done. I think I am close, but  
15 I want to just look at my notes.

16 VIDEO TECHNICIAN: Going off the record at  
17 11:35 a.m.

18 (Off the record.)

19 VIDEO TECHNICIAN: We're back on the record  
20 at 11:50 a.m.

21 Q (BY MS. SPAGNOLI): Okay. Mr. Estes, just a few  
22 follow-up questions. One of the things we talked  
23 about earlier was Stoddard solvent, and I'm not sure  
24 the jury knows what that means or what it is. What  
25 is Stoddard solvent?

1 A Stoddard solvent is a gasoline substitute that we  
2 use to have higher degree of safety for the crash  
3 test personnel. It has the same specific gravity  
4 which means it weighs the same per volume as  
5 gasoline and it has extraordinarily similar fluid  
6 qualities, and it's a standard substitute for  
7 volatile gasoline in crash tests.

8 Q Is Stoddard solvent also red?

9 A There are different colored dyes that you can get  
10 introduced to it. I don't recall it being  
11 particularly red, but --

12 Q But there is some kind of a dye so that you can see  
13 stains after a crash test?

14 A We have a dye; it's a tracer that allows it to be  
15 seen in ultraviolet light, and you can wave the  
16 ultraviolet light around and see the -- if there was  
17 any leakage in a small amount of -- it's very  
18 brightly covered under ultraviolet light, but it  
19 doesn't exactly change its color to the human eye as  
20 I recall.

21 Q I guess my question would be if you had Stoddard  
22 solvent and a leak in a crash test, would the leaked

23 solvent be visible to the eye after the impact test?

24 A Not always, no. I don't always see it after the

25 test.

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1 Q Do you know what -- would it look a different color?

2 Would it be a darker color or -- I mean, is your

3 solvent that Chrysler uses a red color?

4 A It looks an awful lot like gasoline. It's sort of a

5 pinky. You know, if you look at gasoline, it's not

6 exactly red. Like this is very much golden but the

7 gasoline is sort of a rose water colored. It's not

8 like bright red, like pink.

9 Q Right. But it's got a tint to it?

10 A Well, yeah.

11 Q A rose-colored tint?

12 A As I recall, it's sort of a very light rosy pink.

13 Q Okay. And when you have a leak in a test, you would

14 see traces of it and you could see it better if you

15 put ultraviolet light up to it?

16 A Yeah, you could see traces of it sometimes,

17 depending on what it's on, you know. It's like any

18 somewhat clear liquid on things. Sometimes it will

19 wet them, sometimes it will just be little spots,  
20 depending on what it lands on.  
21 Q Okay. And do you -- you also use an ultraviolet  
22 light to try and see if there's been a leak and it  
23 would leave a trace?  
24 A There have been occasions when we have used  
25 ultraviolet light to look to see stuff before we

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1 took it apart. Often you can't see where the leak  
2 is if there is a leak in a development test. These  
3 are all squashed together and you can't tell where  
4 it comes from and you try to use that as a trace.  
5 Q Okay. Can you look at Exhibit 15. This was crash  
6 test 5681, and it's one where there was a leak that  
7 was not noted with respect to the source of the  
8 leak.  
9 A 5681, yes, ma'am.  
10 Q Okay. Do you remember this? We discussed this test  
11 and you pointed out a photograph that showed the  
12 valve on top of the tank. I'm not sure, is this the  
13 vent valve or the --  
14 A In 5681?

15 Q -- filler? Yeah, page 3163. This was the  
16 photograph that you pointed out.  
17 A If this is the test that I remember, and this  
18 photograph seems to indicate this, this is a pretty  
19 obvious hole.  
20 Q Well, sir, can you look at 3163, that photograph.  
21 A Yes, ma'am, I am.  
22 Q That's the one we're looking at, right?  
23 A Yes.  
24 Q And what is the valve that we're looking at there?  
25 Which one is it?

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1 A This is -- the whole piece here is the top of the  
2 fuel -- view -- fuel -- pardon me, the fuel sending  
3 unit. This is the electric pump and sending unit  
4 top.  
5 Q All right. Now, is there any visible Stoddard  
6 solvent in this picture?  
7 A No, not in this picture.  
8 Q Okay. All right. Now, let me change subjects and  
9 go back to the test that occurred with the trailer  
10 hitch bracket or the skid plate. 5890, could you



11 pull out that exhibit. It is test -- it's Exhibit  
12 18, and 19 and 20 are the ones I'm going to ask you  
13 about, or actually exhibit -- yeah.  
14 A Pardon me. Which one now?  
15 Q I want you to look at Exhibit 18, 19, and 20.  
16 A Okay.  
17 Q Whoops. I take that back. I want you to look at  
18 18, 9 and 20. Nine is the actual compliance report,  
19 the one that certified the 1997 vehicle as being in  
20 compliance with the standard. Okay? I want to just  
21 have those side by side.  
22 A I have 9, 18 and 20. Is that what you're looking  
23 for?  
24 Q Right. Nine is the one -- 5967, test that is the  
25 one that you used to certify compliance, right?

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1 A Yep.  
2 Q And as we discussed, it had the trailer hitch  
3 bracket and it had dynamic crush of 19.9 inches,  
4 right?  
5 A Just a minute. Yep, 19.9 inches is the dynamic  
6 crush of 5967.

7 Q And then test 5890, which was Exhibit 18, was also a  
8 vehicle that had the trailer hitch bracket, not the  
9 full trailer hitch but just the bracket, correct?

10 A Yes.

11 Q And it had a dynamic crush of 20.4 inches, correct?

12 A Yes, vehicle crash test 5890 had a dynamic crush of  
13 20.4 inches.

14 Q Okay. So the two vehicles that only had the bracket  
15 had dynamic crush in the rear impact test of 19.9  
16 and 20.4 inches, correct?

17 A Yes.

18 Q Okay. Now, if you look at Exhibit 19, which is the  
19 test 5926, this is the test that had the skid plate  
20 attached, correct?

21 A Just a second. I don't have 19. Twenty, nine --  
22 Exhibit 19 -- skid plate on 5926. What was the  
23 question?

24 Q You've got that test and it only had the skid plate?  
25 It had the skid plate instead of the trailer hitch

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1 bracket, correct?

2 A 5926 had a skid plate and no trailer hitch bracket.

3 Q Right. And this was also -- so that's the  
4 difference in the structure between the two tests  
5 that we've just looked at and the test with the skid  
6 plate, correct?

7 A Yes, I believe that is the primary difference.  
8 There are some other things listed on some of the  
9 vehicles, but that's the difference, I think, in the  
10 area we're talking about.

11 Q Okay. And the dynamic crush in the test that had  
12 the skid plate instead of the trailer hitch bracket  
13 was 18.1 inches, correct?

14 A Yep.

15 Q Okay. And using those numbers from these three  
16 tests then, would you agree with me that the  
17 vehicle -- the Grand Cherokee that had the skid  
18 plate compared to the vehicles that had the trailer  
19 hitch bracket, that there was a more than a 10  
20 percent difference between the dynamic crush in the  
21 vehicles that only had the trailer hitch versus the  
22 one that had the skid plate?

23 A Is there a 10 percent --

24 Q And I meant to say the trailer hitch bracket versus  
25 the vehicle that had the skid plate.

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1 A In the two tests that I have here, 5890 and 5967,  
2 the differences are 1.8 inches total, and so that's  
3 not quite 10 percent, but they are -- that  
4 difference between the smallest crush, 19.9 and  
5 18.1, when you look at that difference, half of it  
6 could be accounted for in the error of resolution,  
7 because they're both plus or minus.

8 COURT REPORTER: I'm sorry.

9 THE WITNESS: Error in resolution. Both of  
10 them are plus or minus one inch, but the difference  
11 between the two, as anyone with arithmetic will tell  
12 you, is 1.8 difference -- 1.8 inches at the noted  
13 dynamic crush between 5926 and 5967 --

14 Q (BY MS. SPAGNOLI): Right.

15 A -- for two different build conditions.

16 Q Right. Well, they're the same build conditions, but  
17 one has the hitch bracket and the other has the skid  
18 plate? That's the difference?

19 A Yes, that's the difference in the build, yes.

20 Q Okay. And test 5890, which also had the hitch  
21 bracket, had more than a 10 percent difference in  
22 dynamic crush; in other words -- let me restate my  
23 question.

24 5890, which was the other test with the  
25 trailer hitch bracket instead of the skid plate, had

1 more than two inches of dynamic crush than the test  
2 that had only -- that had the skid plate, correct?

3 A Yes, the dynamic crush between vehicle crash test  
4 No. 5926 and 5890 is 2.3 inches.

5 Q Okay. Which would be more than 10 percent?

6 A Yeah; it's about 11.

7 Q Okay.

8 MS. SPAGNOLI: All right. Thank you.

9 That's all the questions I have.

10 EXAMINATION

11 BY MS. FOGEL:

12 Q Mr. Estes, I have a few follow-up questions for you.

13 I'd like you to take a look, please, at Exhibit 16,

14 which is the vehicle crash test 5789.

15 A Yes.

16 Q Okay. Is that a development test?

17 A Yes.

18 Q Okay. And is that a development test where the

19 build condition indicates 1996 production ZJ

20 modified to represent 1997?

21 MS. SPAGNOLI: I'm going to object to the

22 form of the question. It's leading.  
23 THE WITNESS: The Vehicle Crash Test Letter  
24 describes VC5789 as a 1996 production ZJ modified to  
25 represent 1997.

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1 Q (BY MS. FOGEL): And could you tell me at the bottom  
2 of the build condition, the last line there, what  
3 does that say?

4 A "1997 fuel sending unit and 1997 fuel tank design."

5 Q Okay. Does the 1997 fuel tank design also include  
6 fuel rails?

7 A The fuel tank design and the fuel sending unit, I  
8 think, includes the fuel rails and the fuel lines  
9 that connect the rails to the tank.

10 Q Do fuel rails go to the engine of the vehicle?

11 A Yes, they do.

12 Q Okay. Could you please turn to the Fuel System and  
13 Static Rollover Summary page, VI-1.

14 MS. SPAGNOLI: What's the Bates number on  
15 that?

16 THE WITNESS: Is there a DC number?

17 MS. FOGEL: This doesn't have a Bates

18 number on it. I'm sorry. I have a copy of the  
19 exhibit I would be glad to show you.

20 MS. SPAGNOLI: Okay. I'll look for it. I  
21 think I have it. It's 2006.

22 THE WITNESS: Oh, boy, yeah, I see 2006.

23 Q (BY MS. FOGEL): Can you read for us where it says  
24 Under Post Test Fuel System Observations, No. 3? I  
25 know it's not a very poor photocopy.

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1 MS. SPAGNOLI: It's not readable at all.

2 THE WITNESS: It starts out, it says  
3 "No" -- and then I believe the next word is "fuel."  
4 On this page, it's very unreadable, but if you'll  
5 turn to 2008, there are Post Test Remarks that are  
6 typed.

7 Q (BY MS. FOGEL): Okay. I'd like you -- do you know  
8 what I'm going to do? I'll have this marked as the  
9 next exhibit, because perhaps this is a better  
10 photocopy that I have, so whatever number we're up  
11 to, I'll have that marked.

12 MS. SPAGNOLI: Can I see it?

13 MS. FOGEL: Oh, certainly. I'll have that

14 marked as Estes -- what are we up to, 21?

15 MS. SPAGNOLI: Yeah, it's 21.

16 Q (BY MS. FOGEL): And I'd like you to just -- to the  
17 extent that you're able to, read underneath the Post  
18 Test Fuel System Observation section, No. 3, please.

19 MS. SPAGNOLI: Well, maybe he can read the  
20 whole thing, if we can read it.

21 MS. FOGEL: Yeah, I can, if you can't.

22 MS. SPAGNOLI: Well, let's see if he can.

23 MS. FOGEL: Okay.

24 THE WITNESS: It says, "No fuel leaks at  
25 impact. Post test" --

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1 Q (BY MS. FOGEL): If you can read the part that's No.

2 3.

3 A No. 3, I think it says, "Slow leak (after roll) when

4 pressure tested is connected to fuel rail (at

5 Schrader valve)," I believe is what it says on No.

6 3.

7 Q Okay. Does that indicate to you the area of the

8 source of the leak in the engine compartment in

9 vehicle test 5789?



10 A Yes, it does.

11 MS. SPAGNOLI: Object to the form. It's  
12 leading.

13 THE WITNESS: This comment here, with the  
14 slow leak at the Schrader valve, indicates quite  
15 precisely where the fuel leak is on VC5789.

16 Q (BY MS. FOGEL): And what is the source of that leak  
17 that is indicated quite precisely?

18 A The Schrader valve, which is a small pressure-relief  
19 valve, very similar to a tire valve, on the -- on  
20 the fuel rail.

21 Q Okay. And was that fuel rail part of the 1997 fuel  
22 tank design as referenced in the build condition --

23 MS. SPAGNOLI: Object to the form of the  
24 question.

25 Q (BY MS. FOGEL): -- on that Vehicle Crash Test

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1 Letter 5789?

2 MS. SPAGNOLI: Object to the form of the  
3 question, leading.

4 THE WITNESS: I think that the fuel tank  
5 system included with the rails, the fuel lines, as

6 was initially described in the previous test and now  
7 was shortened to just those two words --

8 COURT REPORTER: Was --

9 THE WITNESS: Was shortened to just those  
10 descriptions, which would have included the rail and  
11 the metal lines, and the rail would have included  
12 this Schrader valve.

13 Q (BY MS. FOGEL): And, again, was VC5789 a  
14 development test or something else?

15 A VC5789 is a development test.

16 Q If there was a failure in the 1997 fuel tank design  
17 in this modified 1996 production ZJ, would  
18 DaimlerChrysler have alerted the government to that?

19 A No, we would not have. It was testing before  
20 production.

21 Q Okay.

22 MS. FOGEL: I have no further questions.

23 EXAMINATION

24 BY MS. SPAGNOLI:

25 Q Sir, let's look at test report 5441, Exhibit 14.

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1 This is a report that --

2 A Does it have a number?

3 Q Exhibit 14.

4 A Okay.

5 Q Specifies on the bottom under build condition, "1996

6 co-extruded fuel tank with reinforced sending unit

7 cover," right?

8 A Yes, ma'am.

9 Q And it separately states, "1996 steel fuel rails and

10 matching line bundle," correct?

11 A Yes, ma'am.

12 Q And it doesn't refer to a Schrader valve, does it?

13 A No, it doesn't. The Schrader valve is integral to

14 the build of the fuel rail.

15 Q Right. And the Schrader valve -- there was a

16 Schreuder valve and a fuel line in the 1994

17 production built ZJ Grand Cherokee, right?

18 A I don't know that for sure.

19 Q There was a fuel rail and a Schrader valve in the

20 1995 production built ZJ, wasn't there?

21 MS. FOGEL: Objection to the form. You can

22 answer.

23 THE WITNESS: I can't be certain.

24 Q (BY MS. SPAGNOLI): There was a fuel line, a fuel

25 rail and a Schrader valve in the 1996 production

1 built ZJ, correct?

2 A I don't know.

3 Q You don't know?

4 A I don't know if there was a Schrader valve on the  
5 fuel rail before these changes came in.

6 Q Okay. So when you refer to a 1996 production ZJ,  
7 you don't know if it had a Schrader valve in the  
8 1996 production vehicle; is that right?

9 A In the 1996 production vehicles there is no  
10 knowledge that I have of what the rail was or  
11 wasn't, whether it had a Schrader valve in it or  
12 didn't.

13 Q Okay. And in the test that you -- the description  
14 of the test that you have for the test 5789, you do  
15 not have a description of a different fuel rail or  
16 line bundle from production -- from the production  
17 vehicle; is that right?

18 A No, the description in 5789 indicates only fuel  
19 sending unit and fuel tank design, which, as I  
20 believe, is inclusive of this whole package of the  
21 new fuel system that we were trying to put in.

22 Q Well, I know that you are saying that --

23 A But it does not say it.

24 Q -- because you're trying to explain why you would

25 have called out in one test report a different fuel

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1 rail and line whereas in the report 5789 you don't  
2 call that out. That's what you're trying to explain  
3 to us, right --

4 MS. FOGEL: Objection.

5 Q (BY MS. SPAGNOLI): -- why you would have done it in  
6 one and not the other?

7 MS. FOGEL: Objection to the form. You can  
8 answer.

9 THE WITNESS: When we write a test request  
10 like this, we would normally have had, when the  
11 first change comes in, a large description of it,  
12 and then that change will get shortened as you go  
13 forward. I believe that's what happened here.

14 Q (BY MS. SPAGNOLI): Well, isn't it what happened  
15 here is that the test report dated April 12, 1995,  
16 5441, actually contained the parts that were going  
17 to be implemented in the 1996 production vehicle and  
18 it predates your certification of compliance of the  
19 1996 production vehicle?

20 A The build of vehicle 5441 is production intent for

21 1996.  
22 Q Right.  
23 A And it's done as a test in the prototype stage  
24 before we went to production.  
25 Q Right. And what you're testing is a new fuel tank

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1 and new fuel rails and matching line bundle that  
2 were intended to go into the 1996 production  
3 vehicle, right?  
4 A At that time, in '95, they were intended to go into  
5 the 1996.  
6 Q Right. And this test is dated April 12, '95?  
7 A Yep.  
8 Q So before you certified in July of 1995 the 1996  
9 production vehicle, correct?  
10 A The test is before we did certification.  
11 Q And, in fact, what happened was you actually  
12 implemented in production steel fuel rails and  
13 matching line bundle in the 1996 production vehicle,  
14 and the only thing you didn't do was the new fuel  
15 tank and fuel sending unit which you were still  
16 testing in 1996 for the 1997 model vehicle, right?

17 MS. FOGEL: Objection to the form, assumes  
18 facts not in evidence.

19 THE WITNESS: Yeah, I couldn't say that,  
20 because I don't know for certain --

21 Q (BY MS. SPAGNOLI): Okay.

22 A -- whether those parts were released separate from  
23 the fuel tank system.

24 Q Well, since you don't call them out as being  
25 nonproduction in your 5789 test report, one

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1 explanation for the reason they're not called out is  
2 because between April of '95 and January of '96 the  
3 fuel rails and matching line bundle that you tested  
4 in April of '95 actually became production parts,  
5 correct?

6 MS. FOGEL: Objection to the form. You can  
7 answer.

8 THE WITNESS: That is one possible  
9 explanation.

10 Q (BY MS. SPAGNOLI): And if that is the explanation,  
11 and, in fact, the fuel rails and matching line  
12 bundle had become production in a '96 Jeep Grand

13 Cherokee that you tested on January 18, '96, and you  
14 had a Schrader valve leak in the test, that would be  
15 a condition you should have reported to the  
16 government because it was a failure of a production  
17 vehicle, correct?

18 MS. FOGEL: Objection to the form.

19 THE WITNESS: On the assumption that the  
20 rail was released, then if it was in production and  
21 it failed in a test, we would have reported it.  
22 This is why I believe the description fuel sending  
23 unit and fuel tank design includes the rail and gas  
24 lines because I don't recall what would have been a  
25 very large issue of reporting it to the government

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1 at failure. I believe the test 5789 had the  
2 complete fuel system that hadn't been changed, which  
3 included the tank, the lines, the rails and the  
4 bundle.

5 Q (BY MS. SPAGNOLI): And you're speculating, are you  
6 not, as to whether the parts that were proposed in  
7 your April '95 test had become production parts  
8 before you ran the test in January of '96, right?



9 MS. FOGEL: Objection to the form.

10 Q (BY MS. SPAGNOLI): You said you didn't know.

11 MS. FOGEL: Objection to the form,

12 mischaracterizes his testimony.

13 THE WITNESS: I am not aware that any part

14 of the fuel system was released as described in 5441

15 before it passed the compliance tests.

16 Q (BY MS. SPAGNOLI): Which compliance tests?

17 A Vehicle 5967.

18 Q Right. And you would agree with me, though, that

19 you do not have in your either memory bank or at

20 your disposal the actual production parts on the

21 1996 ZJ vehicle and whether it included the steel

22 fuel rails, Schrader valve and matching line bundle

23 that was tested in April of '95, correct?

24 A No, and that's what I don't remember, whether --

25 Q Okay.

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1 A -- the vehicle in 1-18-96, VC5789 had those parts.

2 It's a presumption on my part that the description

3 includes the entire fuel system, and I didn't

4 describe it completely.

5 Q And you would agree with me you did describe it in  
6 the April '95 test report as a separate item,  
7 correct?

8 A In the 4-12-95 on 5441, I described a complete  
9 system with the three lines of description there,  
10 and it would have been my general habit to shorten  
11 that down to the one line.

12 Q Well, so you broke your habit in the report where  
13 you listed it separately or you just felt a need to  
14 do it there and not --

15 THE WITNESS: This is the first occurrence  
16 of it.

17 MS. FOGEL: Objection to form,  
18 argumentative.

19 THE WITNESS: This 5441 is the first  
20 occurrence of these parts, and so they were  
21 completely described there, and then subsequent  
22 testing afterwards uses a shortened version of it.

23 Q (BY MS. SPAGNOLI): You're speculating about that,  
24 aren't you, sir?

25 A No.

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1 MS. FOGEL: Objection to form.

2 THE WITNESS: When you introduce the first  
3 part -- you can see as you go through all of this  
4 work, the first time it's introduced, it's fully  
5 described, and then subsequent to that, the trailer  
6 hitch single side bracket becomes hitch bracket.  
7 They don't always type in all of the description  
8 every time you use it.

9 Q (BY MS. SPAGNOLI): Well, you're supposed to put in  
10 the things that do not represent production, and in  
11 the case of the 1996 test, the only thing about the  
12 fuel system that you said was not production was the  
13 tank and the sending unit, right?

14 MS. FOGEL: Objection to the form,  
15 argumentative. You can answer.

16 THE WITNESS: The test request states  
17 clearly that the parts that were changed were the  
18 1997 fuel sending unit and 1997 fuel tank design.

19 Q (BY MS. SPAGNOLI): It doesn't say design, does it?

20 A Yes, it does.

21 Q Well, you're saying fuel tank design means something  
22 other than the fuel tank? It means all the other  
23 parts in the fuel system? That's what you're  
24 telling us?

25 A It was --

1 MS. FOGEL: Objection to the form. You can  
2 answer.

3 THE WITNESS: It was probably more properly  
4 described as fuel tank system than fuel tank design.

5 Q (BY MS. SPAGNOLI): Well, it doesn't say fuel tank  
6 system, does it?

7 A No, ma'am, it does not. It says fuel tank design.

8 MS. SPAGNOLI: Very good. No further  
9 questions.

10 MS. FOGEL: I may have one follow-up. I  
11 have to just go off the record.

12 VIDEO TECHNICIAN: Going off the record at  
13 12:18 p.m.

14 (Off the record.)

15 VIDEO TECHNICIAN: We're back on the record  
16 at 12:24 p.m.

17 MS. FOGEL: I have no further questions.

18 MS. SPAGNOLI: Okay, so we're done. Thank  
19 you.

20 VIDEO TECHNICIAN: Deposition concluded at  
21 the 12:24 p.m.

22 (Deposition concluded at or  
23 about 12:24 p.m.)

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1           S T I P U L A T I O N S

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3           IT IS HEREBY STIPULATED AND AGREED by and

4 between the attorneys for the respective parties

5 hereto that all rights provided by the C.P.L.R.,

6 including the right to object to any question,

7 except as to the form, or to move to strike any

8 testimony at this examination, are reserved; and, in

9 addition, the failure to object to any question or

10 to move to strike testimony at this examination

11 shall not be a bar or waiver to make such motion at,

12 and is reserved for, the trial of this action.

13           IT IS FURTHER STIPULATED AND AGREED that

14 this examination may be sworn to, by the witness

15 being examined, before a Notary Public other than

16 the Notary Public before whom this examination was

17 begun, but the failure to do so, or to return the

18 original of this examination to counsel, shall not

19 be deemed a waiver of the rights provided by Rule

20 3116, C.P.L.R, and shall be controlled thereby.

21 IT IS FURTHER STIPULATED AND AGREED by and

22 between the attorneys for the respective parties

23 hereto that a copy of this Examination Before Trial

24 shall be furnished without charge to the attorneys

25 representing the witness testifying herein.

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1 FURTHER DEPONENT SAYETH NOT:

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14 JUDSON B. ESTES

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Subscribed and sworn to before me  
this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
Notary Public, \_\_\_\_\_ County

My Commission expires: \_\_\_\_\_.

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1 STATE OF MICHIGAN )  
 ) ss  
2 COUNTY OF MACOMB )  
3 I, Melinda S. Moore, (CSR-2258), a Notary  
4 Public commissioned and qualified in and for  
5 the State of Michigan, do hereby certify there  
6 came before me on the date and at the location  
7 hereinbefore mentioned, the following named  
8 person, to-wit: JUDSON B. ESTES, who was by  
9 me sworn to testify truthfully concerning the  
10 matters in controversy in this cause; that he  
11 was examined upon his oath and his examination

12 was reduced to typewritten form under my  
13 supervision; that the deposition is a true  
14 record of the testimony given by the witness.

15 I further certify that I am neither  
16 attorney or counsel for, nor related to or  
17 employed by any of the parties hereto or  
18 financially interested in the action.

19 IN WITNESS WHEREOF, I have hereunto set my  
20 hand and affixed my Notarial Seal this 20th  
21 day of June, 2005.

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Melinda S. Moore, Notary Public  
Macomb County, Michigan  
My commission expires: 9-6-2010

FREELANCE REPORTERS, INC.  
(586) 779-1800