THE STATE OF SOUTH CAROLINA
In The Court of Appeals

APPEAL FROM CHARLESTON COUNTY
Court of Common Pleas

RECEIVED
AUG 02 2017
SC Court of Appeals

The Honorable J.C. Nicholson, Jr.

Appellate Case No. 2016-002209

Steven Newbern and Claudia Newbern,..... Appellants,

v.

Ford Motor Company,.....Respondent.

RECORD ON APPEAL VOLUME II

BARNES LAW FIRM, LLC
Kathleen C. Barnes, Bar No. 78854
Post Office Box 897
Hampton, SC 29924
(803) 943-4529

LAW OFFICES OF STEPHEN E. VAN GAASBECK
Stephen E. Van Gaasbeck
19815 Helotes Creek Road
Helotes, TX 78023
Phone: 210-924-9294
Fax: 210-260-4021

Attorneys for Appellants

Raymond O. Bodiford
121 South Orange Ave.,
Suite 1150
Orlando, FL 32801
Phone: 407-423-9728
Fax: 407-648 1899

YARBOROUGH APPLEGATE LLC
William Applegate
291 East Bay St.,
Second Floor
Charleston, SC 29401
Phone: 843-972-0150
Fax: 843-277-6691

BOWMAN & BROOKE, LLP
Robert L. Wise
901 E. Byrd Street, Suite 1650
Richmond, VA 23219
Phone: 804-819-1134
Fax: 804-649-1762

TURNER, PADGET, GRAHAM & LANEY, P.A.
J. Kenneth Carter, Jr.
Carmelo B. Sammataro
Bettis C. Rainsford, Jr.
Post Office Box 1473
Columbia, SC 29202
Phone: 803-254-2200
Fax: 803-799-3957

Attorneys for Respondent

INDEX

PAGE

Index.....i

Notice of Appeal, October 31, 2016.....1

Order Granting Defendant's Motion for a Directed Verdict, September 16, 2016.....3

Form 4 Order Denying Plaintiff's Motion for a New Trial, September 29, 2016.....6

Amended Consent Scheduling Order, January 22, 2015.....7

Order Denying Defendant's Motion for Costs, February 8, 2017.....11

Complaint, May 17, 2013.....12

Answer to Complaint, July 12, 2013.....19

Amended Complaint, March 29, 2016.....32

Answer to Amended Complaint, April 15, 2016.....37

Defendant's Consolidated Motion to Exclude and Motion *in Limine*, September 12, 2016.....45

Affidavit of Ram Krishnaswami, September 12, 2016.....63

Motion for a New Trial, September 26, 2016.....66

Exhibit A, Krishnaswami Deposition Notice.....85

Exhibit B, Krishnaswami Expert Disclosures.....90

Exhibit C, Testimony of Ram Krishnaswami.....93

Exhibit D, Calibration Excerpt (filed under seal).....259

Exhibit E, Excerpt Exceptions (filed under seal).....261

Transcript of Proceedings of September 12, 2016.....263

Voir Dire.....265

Defendant's Motions in Limine.....272

Transcript of Proceedings of September 13, 2016.....292

Court's Motions Rulings.....295

Opening Statement of Plaintiffs.....300
Opening Statement of Defendant.....329
Claudia Newbern
Direct Examination by Mr. Van Gaasbeck.....346
Cross Examination by Mr. Carter.....391
Redirect Examination by Mr. Van Gaasbeck.....394
Ram Krishnaswami
Direct Examination by Mr. Van Gaasbeck.....396
Transcript of Proceedings of September 14, 2016.....471
Dr. Andrew Eiseman
Direct Examination by Mr. Van Gaasbeck.....476
Ram Krishnaswami continued
Cross Examination by Mr. Gladd.....512
Redirect Examination by Mr. Van Gaasbeck.....568
Paul Lewis
Direct Examination by Mr. Van Gaasbeck.....605
Cross Examination by Mr. Carter.....655
Redirect Examination by Mr. Van Gaasbeck.....659
Transcript of Proceedings of September 15, 2016.....665
Steven Newbern
Direct Examination by Mr. Van Gaasbeck.....671
Cross Examination by Mr. Gladd.....736
Redirect Examination by Mr. Van Gaasbeck.....738
Defendant's Motion for a Directed Verdict.....740
Transcript of Proceedings of September 16, 2016.....762

Continuation of Defendant's Motion for a Directed Verdict.....764

Ruling by the Court.....775

Trial Exhibits

Plaintiff's Exhibit 47.....778

Plaintiff's Exhibit 72.....779

Plaintiff's Exhibit 93 (submitted on a CD).....780

Plaintiff's Exhibit 260.....781

Plaintiff's Exhibit 265.....805

Plaintiff's Exhibit 268.....850

Plaintiff's Exhibit 270.....854

Defendant's Exhibits 1.1 to 1.8.....855

Defendant's Exhibit 50 (filed under seal).....864

Certificate of Counsel.....865

STATE OF SOUTH CAROLINA — COURT OF COMMON PLEAS

COUNTY OF CHARLESTON — CASE NO. 2013-CP-10-2928

STEVEN NEWBERN AND CLAUDIA NEWBERN,

PLAINTIFFS,

VS.

FORD MOTOR COMPANY,

DEFENDANT.

TRANSCRIPT OF RECORD

SEPTEMBER 14, 2016
CHARLESTON, SC

VOLUME 3 OF 5

B E F O R E:

HONORABLE J.C. NICHOLSON, JUDGE, AND A JURY.

A P P E A R A N C E S:

STEVE VAN GAASBECK, ESQUIRE
RAYMOND BODIFORD, ESQUIRE
WILLIAM APPLEGATE, ESQUIRE

Attorneys for the Plaintiff

J. KENNETH CARTER, ESQUIRE
NICHOLAS GLADD, ESQUIRE
ROBERT WISE, ESQUIRE
CARMELO SAMMATARO, ESQUIRE
Attorneys for the Defendant

* *

Ruth C. Weese, RDR
Official Court Reporter
Ninth Judicial Circuit

I N D E X

Page

WITNESS

ANDREW EISEMAN 420

DIRECT EXAMINATION BY MR. VAN GAASBECK 454

CROSS EXAMINATION BY MR. GLADD

RAM KRISHNASWAMI

CROSS EXAMINATION BY MR. GLAAD 457

REDIRECT EXAMINATION BY MR. VAN GAASBECK 513

PAUL LEWIS

DIRECT EXAMINATION BY MR. VAN GAASBECK 558

CROSS-EXAMINATION BY MR. CARTER 609

REDIRECT EXAMINATION BY MR. VAN GAASBECK 647

E X H I B I T S

	Page Admitted
Defendant's Ex.	
50-calibration report	484
134-calibration report	487
82.1-82.9-video clips	495
76.1-video clip	511
28.1-photo	626
28.3-photo	627
28.9-photo	638
28.7-photo	643
28.8-photo	643
28.10-photo	643
Plaintiff's Ex.	
265-surrogate study	584

(The following proceedings were held September 14, 2016, Charleston County, South Carolina, @ 9:22 a.m.)

THE COURT: Anything from the Plaintiff before we bring the jury in?

MR. VAN GAASBECK: No, we are good, Your Honor, thank you.

THE COURT: Anything from the Defendant?

MR. GLADD: Your Honor, they are going to call Dr. Eiseman first. We had a motion in limine on that, Your Honor, so we understand there was a ruling from Your Honor. I understand we will need to make objections timely during the examination.

THE COURT: You are talking about your motion in limine on excluding his opinion on the cause of injury.

MR. GLADD: Just for injury causation, lack of foundation for that injury.

THE COURT: We will have to see what he says.

MR. GLADD: Thank you, Your Honor.

THE COURT: Did I take it under advisement or did I deny it? I don't remember.

MR. GLADD: I remember --

THE COURT: Just protect yourself and make the objection appropriately during the trial because even if I denied the motion in limine you still have to make it just to protect yourself.

MR. VAN GAASBECK: I wonder if someone could tell the judge -- the jury that Mr. Bodiford may not be remaining with us. That he may not --

THE COURT: Mr. who?

MR. VAN GAASBECK: Mr. Bodiford.

THE COURT: I will tell them. Does he want to stay?

MR. VAN GAASBECK: We are going to see about that. I want him to go home.

THE COURT: Mr. Bodiford, do you want to leave or do you want to stay?

MR. BODIFORD: I am going to stay this morning.

THE COURT: When he leaves just remind me and I will tell the jury he is having health problems and he had to leave, okay?

MR. WISE: Your Honor, there's a question from your clerk about the pro hac vice papers from the Supreme Court. It will come to the court directly, but there is also a hotline that we

can call.

THE COURT: See if it's signed. Anything else before we bring the jury?

MR. VAN GAASBECK: No, sir, thank you.

THE COURT: Bring us the jury, please.

(Whereupon the jury entered the courtroom at 9:48 a.m.)

THE COURT: Ladies and gentlemen of the jury, yesterday when we quit we were going to have the cross-examination on Mr. Krishnaswami; however, the Plaintiff is going to call Dr. Eiseman out of order, then we will finish up the cross-examination that we started. So we are going to call -- the Plaintiffs are going to call Dr. Eiseman. We will finish him, then go back to Mr. Krishnaswami at that time. Call your next witness.

MR. VAN GAASBECK: Thank you, Your Honor. Your Honor, we call Dr. Eiseman.

ANDREW EISEMAN

having been duly sworn, testifies as follows:

THE CLERK: Please state your first and last name and spell your last name loudly and clearly for the microphone.

THE WITNESS: Andrew Eiseman, last name is spelled E-I-S-E-M-A-N.

DIRECT EXAMINATION

BY MR. VAN GAASBECK:

Q. You don't do a lot of testifying, I assume?

A. I do not.

Q. You tried to take my place.

A. I am happy to be a physician.

Q. Thank you, Doctor. I would like to give the jury an idea of actually what your qualifications are and what your specialty is, let me start with that. What is your specialty?

A. I am an ophthalmic plastic and reconstructive surgeon, that is a subspecialty of ophthalmology that deals with eye socket trauma, reconstruction of the eyelid and also a portion of my work is in cosmetic surgery around the eye and the eyelids as well.

Q. Doctor, where did you receive your education?

A. My undergraduate training was at the United States Military Academy at West Point. I then went to the Uniformed Services University of the Health Sciences for medical school. My ophthalmology training was at the Walter Reed Army Medical Center and I did my ophthalmic plastic

surgery training at an institution in Philadelphia known as the Wills Eye Hospital.

Q. Does mean that you were in the military?

A. Yes, sir. I spent 26 years on active duty. The last 14 years of my active duty time were at Walter Reed Army Medical Center. And from 2001 until 2012 when I retired I was the only ophthalmic plastic surgeon at Walter Reed and during that time we cared for several hundred injured soldiers, sailors, airmen and marines from the wars in Iraq and Afghanistan. So I have a considerable amount of training and work with the care of ophthalmic trauma.

Q. So just to be certain, you weren't treating hundreds people for anything other than eye injuries; is that fair to say?

A. So when I speak of the hundreds, I mean I had a practice of taking care of active duty soldiers in the Washington, D.C. area, their dependents, retirees, but 85 percent of all the injured soldiers and sailors from the wars in Iraq and Afghanistan were eventually air vac'd to Walter Reed. And so part of our mission was to care for the injured soldiers and sailors from those

conflicts as well.

Q. In that process did you gain experience and the ability to determine the types of things that might -- the type of injuries which might cause an eye to be injured or lost?

A. Absolutely. So one of the things that we always would do is look for patterns of injuries to enhance the care of our patients and understanding the mechanism of injury is important as well so that we can perhaps prevent injuries as well. So we can have a preventive portion of our practice as well as caring for the injuries.

Q. In doing so and in looking at people who have come to you that had had injuries, are you able to categorize the mechanism of injury at least in general ways?

A. Oftentimes you can. There are specific patterns of injuries which are more consistent with either blunt trauma or sharp injury. And certainly in the wars in Iraq and Afghanistan, a combined mechanism of trauma was often found as well, foreign bodies as well as blunt trauma.

Q. And I am sorry. Were you the -- you said that you were the only doctor in one position at someplace. Where was that?

A. Right. So even though the eye is a relatively small organ, there are actually nine different subspecialities within ophthalmology and one of those subspecialties is ophthalmic plastic surgery. At Walter Reed we actually had one of each kind of subspecialist to be able to insure that we could care for all injuries or all abnormalities of the eye. And I was the only ophthalmic plastic surgeon there and so I was involved in many, many of these trauma cases because most of those involved injuries to the bones around the eye socket and to the eyelids and the eye as well.

Q. How can injury in the bones and around eye socket have any effect on an eye?

A. So the eye socket is bounded on all sides by bone. And when the eye is injured you can actually have injuries to all of the areas of the eye and the eye socket. And the eye socket is what is manifested by those bones. And so if there's an injury to the eye it can damage the eyelid, it can damage the bones. If the bones around the eye socket are damaged they can cause injuries to the eye from fragments of bone. They can actually also damage the nerves that leads from the eye to the

brain causing a compressive or shearing injury to the optic nerve. And so learning how to care for all of those injuries is important to insure that we maintain the maximal level of vision for each individual.

Q. When you review a patient's condition does medical history have any value?

A. Medical history is always very, very important. The first thing you always do. The one interesting issue with caring for injured soldiers and sailors as I did at Walter Reed is oftentimes you don't have a lot of history because they're oftentimes where an individual would be air vac'd from Iraq or Afghanistan. They will go to Germany for a day or two. They were sometimes back at Walter Reed within 48 to 72 hours and they were still in an induced coma due to the level of injury and we would not have any ability to really have any sort of history from them. So we can still care for the eye without that history, but we would always prefer to have the history so that we can have an idea as to potential hidden injuries or the mechanism which can help us care for them.

Q. For example, medevac usually leads his unit, nobody goes with him and no one can tell

anybody what happened except for the injured person; is that fair to say?

A. Sure. So there are always people in the unit who could potentially help with that, the first responder, the medic at the scene of the injury can help with that. Certainly each physician along the way can help with that. There were even times when at the very onset of the war where people would actually write what they thought had happened on the eye patch and that would stick with them until they got back to Walter Reed and we would read what had occurred off the eye patch just to make sure that the physicians down the stream would have a better idea as to what happened.

Q. Working in that environment then were you -- would reviewing the previous -- any other contact with other doctors who have worked with that person prior to you be of any assistance?

A. Extremely helpful. And so the first thing that we do any time we see a new patient is to review as many of the records as we possibly can so we become quite adept at looking at old exam notes, old operative reports, and those are all very important. Even if you weren't the examining physician or the operating physician looking at

what had been done previously is very, very important to understand where to go in the future.

Q. Is that the type of information that you would usually use in your profession in order to help you perform the work that you perform?

A. Yes, sir.

Q. So let me then ask you about Mr. Newbern and ask you has Mr. Newbern been a patient of yours?

A. Yes, sir.

Q. Can you let us know then what the purposes were of the work that you have done with him as a physician?

THE COURT: Before we get to that, are you going to offer him as an expert in some capacity?

MR. VAN GAASBECK: Yes, Your Honor. We would offer the doctor as an expert in his specialty.

THE COURT: What specialty are you offering?

MR. VAN GAASBECK: Well, ophthalmology, surgical ophthalmology is one and then for the purposes of identifying and differentiating between blunt trauma.

THE COURT: All right. Do you want to ask him questions on his qualifications before I allow defense to cross-examine on the qualifications? Before the Court makes a decision on what he is qualified or not qualified? I don't know in Texas, but in South Carolina the defense has an opportunity to cross-examine before the Court rules on that issue. Anything else you want to ask him before I turn him over to cross?

MR. VAN GAASBECK: No, sir.

THE COURT: About his education?

BY MR. VAN GAASBECK:

Q. Well, you told us that you went to the Military Uniformed Services school; is that correct?

A. Yes, sir.

Q. What's the purpose of that?

A. So going back into the 1960's when doctors were drafted for the Vietnam War, then moving into the 70's when all of the drafted doctors got out of the military and went back to private practices, the military had then some difficulty recruiting qualified physicians and to overcome that they had a two-pronged effort. One was to open their own medical school to insure a

pipeline of qualified physicians to serve in the military. And the other was to begin to offer scholarships to civilian medical schools in return for service in the military as a physician. And both of those programs have been highly successful in recruiting and maintaining physicians to care for the military dependents and the active duty personnel.

Q. Were you recruited out of West Point or did you go wanting to be a doctor?

A. Right. So I actually had always wanted to be a physician and then had an amazing opportunity to actually attend West Point and was lucky enough to find out that two percent of any graduating class from West Point can go directly into medical school without first having to do a combat armed tours going into the infantry for instance or becoming a pilot and then in return for that, though, was a significant commitment back to the military in that upon graduation from West Point and all the training that they provided me I actually owed the military back 22 years before I was allowed to leave.

Q. Did you go directly in?

A. Yes, sir. So I went directly from

West Point to medical school.

Q. So you were in the top two percent?

A. Well, I actually was, but it's not that you have to be in the top two percent. You have to be -- so the two percent is a number so 1000 graduates year, about 20 can go directly to medical school. Not all of them are in the top two percent of their class, but they need to be within the top 20 that wanted to go that program.

Q. So what then did you learn in that program? What was the training that you received there?

A. So Uniformed Services University of Health Sciences is fully accredited by the ACGME which is the medical school accreditation program in the United States. It was a fully accredited medical school. It's not any different than any other medical school. The only difference is that you are an active duty Army officer or Air Force officer or Naval officer and you for that paid medical school, you then return years of service back to the military.

Q. So what level of medical training did you receive in that school? Where did that take you? What did you come out of as?

A. So at the end of four years of medical school you're a medical doctor and then after that you have to then choose and or be selected for a training program. So when you come out of medical school you are an MD, but you are not at that point qualified to actually care for patients. You then -- you can't sit for any board. And so to do that you have to then do a residency.

My residency was in ophthalmology and then my subspecialty training after ophthalmology training was in ophthalmic plastic surgery.

Q. You mentioned a board of some sort. What is that?

A. Right. So all medical specialties have board certification processes and I am a board certified ophthalmologist with subspecialty training in ophthalmic plastic surgery.

Q. And so how many years then of experience have you got in that specialty?

A. So I have been an ophthalmologist since 1991 and I have been an ophthalmic plastic surgeon since 1997.

Q. Thank you. And do you continue in those capacities?

A. I am currently the chairman of the

Storm Eye Institute which is the ophthalmology department at the Medical University of South Carolina and at the Medical University of South Carolina I am once again the only ophthalmic plastic surgeon at that university.

Q. Have you ever had any teaching positions?

A. Yes. So I was the program director which is the residency training director for seven years. I was the chairman of the ophthalmology department at the Walter Reed. Upon my retirement from the military joining the Medical University of South Carolina we train ophthalmology residents there. I'm actually an associate professor of ophthalmology and the director of the ophthalmic plastic surgeon service. And I am also an endowed share at the Medical University of South Carolina as well.

Q. During your work with Walter Reed or at any other point in your life did you receive information on or did you receive training on how to determine patterns of injury and mechanism of injury as part of that, of your educational process?

A. Absolutely. So one of the things with

my subspecialty is that we do care for a significant portion of eye trauma cases. Once again as we have discussed before, understanding mechanism of injury, understanding how the injury occurred tells you a lot as to how to care for that eye. If an injury area is blunt there's certain patterns of blunt injury. There are certain areas where the eye can be damaged. And you need to understand that because when you bring a patient to the operating room to explore the eye under the operating microscope you need to know where to look for the injuries because if you don't know where to look you can actually miss one of the injuries because as you can imagine there is a lot of swelling, there is bleeding. During that initial time is the best time to find those injuries because they can prevent much more significant problems in the future if you don't care for those at the immediate time.

Q. So you have -- am I correct then there are actually two specialties that you have, one includes surgical?

A. So all ophthalmologists are trained as surgeons. And then within the nine different subspecialities some are more surgical than others.

One of the more surgical fields within ophthalmology is ophthalmic plastic surgery. We actually have a lot of overlap with ENT surgeons, with dermatologists, with plastic surgeons, neurosurgeons. We do a lot of joint cases because of the fact that we take care of a lot of trauma patients and they can have multi system trauma and we are part of that trauma team.

Q. Your Honor, at this time we would tender Dr. Eiseman as an expert in ophthalmology and also in surgical ophthalmology with the deeper specialty as a plastic ophthalmology.

THE COURT: Okay. Cross-examination?

MR. GLADD: No objection regarding ophthalmology and ophthalmic plastic surgery and reconstruction, Your Honor.

THE COURT: Okay.

BY MR. VAN GAASBECK:

Q. Now, do you know Mr. Newbern?

A. Yes, sir.

Q. And can you tell us what is the basis of your information or knowledge of Mr. Newbern?

A. So Mr. Newbern was injured in December of 2012 and I first met him about a month after that injury when he was referred to me by the

initial treating ophthalmologist for severe pain in the right eye, loss of vision in the right eye, for removal of the right eye.

Q. At the end of your observations and your initial evaluations at some point did you make a determination as to whether or not the eye needed to be removed?

A. Yes, sir. So initially when we did the evaluation there was concern for a very rare but well known disorder called sympathetic ophthalmia. So embryologically when you are still within the womb you are protected from the immune system within the body. And when the eye is injured the immune system can now see portions of the eye that it has never seen before and there can actually be an auto-immune reaction, in other words the eye -- the body can actually begin to attack your noninjured eye.

That is often presented with light sensitivity, inflammation inside of the noninjured eye. And when I initially saw Mr. Newbern I was concerned about that because he had significant light sensitivity in the noninjured eye. I then referred him to our neuroophthalmologist and our UVI or eye inflammation specialist, Dr. Pamela

Chavis, who did a full evaluation was also concerned for that disorder coupled with the fact that the right eye at that point had no ability to even detect light anymore. And it was felt in the best interest of relieving his severe discomfort in the right eye and to minimize the chance of increasing the risk of this disorder called sympathetic ophthalmia where the left eye could become involved, we scheduled him within 48 hours for removal of the right eye.

Q. So actually the loss of one eye can create a danger for the uninjured eye?

A. So not much the loss of the eye, but any time that there is an injury that causes the eye to actually rupture, whether that is blunt or sharp, so the mechanism of injury there is not as important as the fact that the eye is now exposed to the body's immune system, can cause inflammation and damage and eventual loss of vision to the noninjured eye.

Q. What does removing an eye entail?

A. When an eye is removed the patient is brought to the operating room. He is induced under general anesthesia so that he is asleep for the procedure. It takes about an hour and-a-half to do

that. The surface cover of the eye is carefully removed. The eye muscles that are attached to the eye are removed. The eye is then removed. An artificial implant is then placed into the eye socket. The eye muscles are then reattached to that implant so the artificial eye will have movement and the tissues are then closed over the eye. The eyelids are then sutured together for about a week and the patient wears a large contact lens over the eye socket tissue for a month to a month and-a-half until the artificial eye can be fashioned.

Q. During that process do you have a view of the entire eye and also the eye socket?

A. Yes, sir. So when the eye is removed we dissect completely around the eye and deep into eye socket and oftentimes foreign bodies, abnormal tissues, scarring, additional injuries that were not able to be detected initially can be found.

Q. In this case there had been a lot of questions asked of you in a deposition by the defense about glass, broken glass causing his injury, Mr. Newbern's injury; do you recall those?

A. Yes, sir.

Q. Were you able to in your review of the

medical records identify different areas and stages along the process of his treatment for any of the injuries which would help you determine whether or not the glass particles caused an injury to his eye?

A. So as we discussed before, I performed my surgery, I reviewed carefully the medical records including the operative note from the physician who had done the initial repair of the eye and the eyelid. That physician, although I was not at that surgery, that physician made no mention of glass in the eye or in the eyelid. There was no glass found around the eye at that time or recorded in that operative report. During my surgery no glass was found and we dissected significantly into the eye socket. Reviewing the CT scan examination before taking Mr. Newbern to the operating room there was no glass found on the CT scan. Glass is not found a hundred percent of the time on the CT, but oftentimes glass can be found on a CT scan which is an advanced x-ray technique for looking at the eye socket and eye. There also were no other facial lacerations identified by the trauma team or by any of the treating ophthalmologists. So I think it is unlikely that broken glass was the

culprit in his injuries.

MR. GLADD: Objection, Your Honor, lack of foundation.

THE COURT: Overruled. Go ahead.

BY MR. VAN GAASBECK:

Q. And were you able to review for example, the records of the repairing of the broken nose?

A. Yes, sir. So eventually Mr. Newbern underwent nasal fracture repair and a sinus surgery repair. Once again I was not present for those, but did review those operative notes and there was no mention of glass found in any of those operative reports.

Q. Thank you. Were you able -- when you observed Mr. Newbern, did you see any evidence then that would help you identify whether or not this was a blunt trauma or penetrating injury that injured the eyeball?

MR. GLADD: Objection, Your Honor, lack of foundation again.

THE COURT: Okay. Overruled.

THE WITNESS: In my opinion, the evidence is strongest to determine that this was due to blunt trauma.

BY MR. VAN GAASBECK:

Q. What are the types of things that you were looking at that help you identify that?

A. So there are several things that brought me to this conclusion. The first is the lack of glass being found in any of the surgeries, the lack of additional facial lacerations other than the eyelid laceration and it's very, very common to have an eyelid laceration with blunt trauma. The area of the laceration or destruction of the eye itself, the eye has a very specific pattern when injured with blunt trauma as to where it will rupture. And the two most common areas for rupture is what is called the scleral limbus which is the junction of the color portion of the eye and the white portion of the eye. And that was where Mr. Newbern's injury was.

The eye wall is about 50 percent as thick in that area as it is in other areas of the eye. The other common area for a rupture of the eye with blunt trauma is underneath the insertion of the eye muscles. There were no injuries found underneath the insertion of the eye muscles. Additionally, blunt trauma will oftentimes cause fractures of the maxillary sinus and fractures of

the nasal bones and fractures of the floor of the eye socket and all of those were present as well. Typically, to fracture those bones the most common size of the blunt trauma or the instrument or object causing the blunt trauma would be greater than the size of the eye socket and so it is most likely that this was due to in my opinion blunt trauma and that the object that caused the blunt trauma had a diameter greater than the size of the eye socket.

Q. You were talking about the limbus and a laceration of the limbus. What actually is the limbus?

A. So the limbus is the junction of the clear covering of the eye which is known as the cornea. That's an area that's clear. A lot of people don't quite understand where that is. So the easiest way to describe that would be that it's where the color portion of the eye which is the iris meshes into the white portion of the eye and that is a very common area for a rupture of the globe after blunt trauma.

Q. And I saw some reference to a clock, 11:00 to 7:00 in relation to the limbus. Can you let me know or help me with understanding what that

reference is to?

A. Yes, sir. So as you would image it's the hours of the clock, but the easiest way to think about that, though, is since it was his right eye and when you're doing surgery you're at the head of the bed so you are operating over the eyebrow. And so it was the right eye, but it was also the temporal or the lateral aspect of the right eye. So it was this side of the eye.

Q. Let me see if I can activate our technology here. If we have a --

(Off-the-record conference.)

BY MR. VAN GAASBECK:

Q. If the limbus is a circle?

A. Yes, sir.

Q. And so when you are talking about 11:00 would that be something like here?

A. Well, so it is all once again the perspective and so it would actually be on the other side as I was looking at it if I was an operating surgeon.

Q. So but as far as 11:00 to 7:00 on a clock, it would be sort of a half moon?

A. Yes.

Q. So sort of a crescent shape?

A. Yes.

Q. Thank you. So then if I am looking at Mr. Newbern, straight at him, we were looking as you would be looking at him, it would be the right eye, so it would be this eye? Am I right so far?

A. Yes, sir.

Q. So -- and you can touch that now and if can you show us which side of the limbus it would be on?

A. Well, if that's the color portion of the eye then the limbus actually would be this area and the laceration was in that area (indicating).

Q. Thank you. If you were to see a laceration, if you were to see a half moon shape that is actually caused by something punching through an eyelid and causing a half moon shape, would you expect to see -- what would you expect to see on the eyelid itself?

A. I'm not sure I completely understand the question, but blunt trauma can cause both an eyelid laceration, just the force of the injury can actually tear the tissue and also that force can then be transmitted to the eye which can then cause a rupture of the covering of the eye. And so when we say laceration or ruptured globe, that does not

always -- really doesn't indicate what the source of that is. Those are terms that are used whether it's sharp or blunt, but once again, we make our determination as to how it occurred based on the associated injuries and the pattern of injury.

Q. I was wondering if there was a half moon shape in the place of the iris or limbus on his eyelid that would correspond to that which would be a penetrating type of injury. Is there a penetrating type of C shape on the eyelid opposite of where you find the C shape in the limbus?

A. So I really can't answer that fully because I wasn't at the initial repair and by the time I saw his eyelid it was repaired and it -- so I can't answer that.

Q. Does a -- you mentioned that you can have a laceration without a penetrating, a laceration with a blunt trauma; is that correct?

A. Yes, sir.

Q. How does laceration of an eyelid, for example, occur with blunt trauma? That is my question.

A. Sure. So the eyelid is attached, either side of the eye socket, by ligaments and those are attached to the covering of the bone and

they are firmly attached. And so if the force of the blunt instrument hits the eye with such force it can actually cause the eyelid tissue to tear because it is tethered on both sides, it doesn't have a lot of give. So if the force is greater than the ability of the ligament to tear from the bone it will tear the tissue of the eyelid as opposed to tearing the lid off of the bone. It's a fairly common pattern of injury that we see. For instance, the most common blunt trauma that we care for is a fist. And the fist tends to be bigger than the size of the eye socket so it commonly will cause an eyelid laceration, ruptured globe and fractures of the bones as well. It's a common pattern of injury we see frequently.

Q. Have you ever seen in your experience a sharp object penetrating the eye making that half moon laceration exactly where the limbus is?

A. Well, it can. I mean can because if it happens to cut through the eyelid and hit the eye in that exact spot, it can cause a very similar injury.

Q. But if it is a penetrating object which is slicing through, have you seen penetrating objects that are half moon shapes?

A. That is certainly possible.

Q. So in the end what was it that -- what was your opinion as to what the object was or the mechanism of this injury was?

MR. GLADD: Objection, Your Honor, lack of foundation.

THE COURT: Overruled.

THE WITNESS: My opinion based on all of the evidence, including the nasal fracture, the eye socket fractures, the lid laceration, the rupture, the location of the rupture and the fact that no glass was found by any of the surgeons who operated on Mr. Newbern was that it was most likely due to blunt trauma and that the size of the object was greater than the size of the eye socket.

BY MR. VAN GAASBECK:

Q. Can you say by a reasonable medical certainty that the most probable cause of the injury to Mr. Newbern's eye would be blunt trauma?

A. That is my opinion, yes, sir.

Q. The --

THE COURT: Your objection continues to run to that last question I presume?

MR. GLADD: Yes, sir.

THE COURT: Overruled, okay?

BY MR. VAN GAASBECK:

Q. Was -- in your experience in looking at the type of injury that Mr. Newbern had, is this the type of injury that would cause pain?

A. Yes, sir.

Q. Can you explain what that would be like? How it would cause pain?

A. So the eye is very, very sensitive as anyone who has ever even just had an eyelash or particle of sand get into the eye and when the eye is damaged to that extent it is quite commonly very, very painful. One of the reasons that we will actually remove an eye that can no longer see is because of chronic discomfort.

So one of the diagnostic -- one of the diagnostic codes actually within our taxonomy is a blind, painful eye and that's a well known disorder. And if the eye is blind and painful and it can't be -- that pain can't be managed otherwise we will sometimes actually remove the eye to reduce that discomfort.

Q. Once you remove the eye then I guess it's never going to be another problem with the eye, where the eye was?

A. Yes, sir. So when an eye is removed

that eye is gone and cannot be replaced in any way, shape or form. Unfortunately not everyone's eye removed when it is painful has complete resolution of their pain. Luckily the vast majority of people do have significant reduction or complete absence of pain after that. However, because there are additional injuries, including eye socket injuries, there's a possibility of additional problems with that eye socket. Not every patient who has an eye removed can comfortably wear an artificial eye. The implant that is placed in the eye socket can become infected. There may be reduced movement of the artificial eye such that it is a cosmetic problem and unfortunately even though we remove the eye to reduce the risk of the inflammation in the other eye, inflammation to the other eye is a lifetime risk that will follow Mr. Newbern and he will require at least yearly examinations of his remaining eye to insure its health and to insure that there is no evidence of inflammation occurring in that eye.

Q. What has been Mr. Newbern's course then after his eye was removed?

A. So after his eye was removed he was fitted with an artificial. Physicians don't

actually make the artificial eye. It's a gentleman or a lady that the term for their profession is ocularist. They actually make the prosthetic or the artificial eye. Initially when Mr. Newbern was fitted for his first artificial eye he had some difficulty wearing it because a band of scar tissue had formed between the surface of the eye socket tissue and the eyelid. It was pressing down. That was removed initially in the office. And that allowed him to wear the eye a little more comfortably. Some of that scar tissue reformed. However, the decision was made to leave that additional scar tissue alone because he was able to wear the eye more comfortably. He does, however, still have some eyelid droop on that side so although an artifical eye is there, the eyelid position on the right side is still a little bit lower than the position of the eyelid on the left side.

Q. How is he -- I understand there are many different possible complications. What would these be that Mr. Newbern has that you recorded or observed with Mr. Newbern?

A. Someone coughed. I didn't quite hear.

Q. What observations are there -- what

observations have you made as far as then his ability to adapt to that and whether or not there are any complications, minor or otherwise, that crop up from time to time as you have noticed in his treatment?

A. Sure. So he adapted quite well to the wear of the artificial eye. There are two minor things that he has noticed. The first thing that he has noticed is the reduced peripheral vision on the right side. He has reported concern with people or objects, feelings that they are sneaking up on his right side. And that is very common for people because they have lost a portion of their peripheral vision. The other thing that we always highly recommend is that individuals who've lost their eye wear protective glasses at all times. Because sort of a crass way of saying it, but he has lost his spare. And so if anything were to happen or that would injure his left eye, that would be an even greater disability because he now has to rely on only that one eye for his sight.

Q. Are there any effects on your ability to perceive things or your ability to perceive spacial distances or areas when you have lost an eye?

A. The two major deficits with someone who has lost an eye is the reduced peripheral vision on the side of the loss of the eye. And also a reduction of some depth perception. The medical term for that is stereopsis. And you actually need to have two different eyes to detect and discriminate fine changes in depth. Most people's brains can adapt. They can understand and can accommodate to most of the depth perception tasks during the day but very, very fine stereopsis, for instance he will never be able to land an aircraft on an aircraft carrier. He would never be able to become a microsurgeon who needed to use a microscope. But for instance I know that that microphone is in front of you because it's blocking you. So that's a one eye cue for depth. But the very, very fine depth perception tasks require both eyes. So he has lost that permanently well.

Q. Have you had any participation in determining what his ability to work in his previous profession is?

A. Yes, sir. So after removing the eye and after his surgical recovery and fitting for the artificial eye, Mr. Newbern brought a form for me to fill out indicating potential work restrictions

in his attempt to go back to work. I filled that out carefully indicating that he would be able to go back to work, but that certain accommodations would be required to insure that his left eye would be maximally protected.

Q. As a result of that was that successful? Did he go back to work?

A. I believe initially it was not successful. I think -- I don't know actually whether or not he has ever actually been rehired or not. I know he shared that with me. I can't remember, but I know initially there was significant reticence in letting him go back to his job. Not that he didn't want to go back, but that his employer was having a difficult time accommodating him with their restrictions placed on him that I had indicated to protect that left eye.

Q. Did he ever do anything with you or talk to you about finding any way to release him for work way that would let him go back to work with Boeing?

A. It was my understanding and my feeling that he did really want to go back to work, but that he was having difficulty with his employer and making those accommodations. They were having

difficulty making those accommodations to get him back to work.

Q. And you don't know at this point, I guess, how successful that was?

A. I think he is back to work, but I don't remember. The last time I saw him as a patient was I believe October of 2015.

Q. Thank you, Doctor. Do you see any need for your continued interaction with him as a result of the sequela of this injury?

A. So as the ophthalmic plastic surgeon, I see him on an as-needed basis. I am happy to be his ophthalmologist as well that I do strongly believe that anyone who has lost an eye, especially after a ruptured globe as we have mentioned, has that lifetime risk of sympathetic ophthalmia. So he needs a full ophthalmologic exam at least once yearly. And that can be with me or with any local ophthalmologist, but that if he were ever to require eyelid surgery or any eye socket revision that could be something where he should seek the care of an ophthalmic plastic surgeon or someone else.

Q. Do you have an approximation of how many times you actually have seen Mr. Newbern?

A. Probably seen him ten times, maybe 12 times maybe.

Q. Were they regularly scheduled or were there any types of situations where he came to you to report something that he would like you to help him with?

A. I can't answer that a hundred percent with assurance, but I believe once or twice he called in to be seen not as a regularly scheduled patient, based on a problem. Initially as I mentioned he was having some difficulty wearing the artifical eye because of that band of scar tissue and I believe that he was concerned about that and called in and we saw him. That was when we did the release of that scar tissue. I don't believe that was a regularly scheduled appointment.

Q. Does your training or experience help you understand whether or not people who have lost an eye have changes in the way they perceive their place in the world?

A. Yes. So having an eye removed is a very stressful and psychologically traumatic experience. I have removed hundreds of eyes in my practice. It's one of the unfortunate things that I do in my field. I went into the world of

ophthalmology to save eyes and save vision, but sometimes we do have to remove an eye. It is an organ. It's a very valued sense. Sight is very, very important to everyone. Having an eye removed is a very difficult experience to go through.

Q. Has Mr. Newbern reported -- has his family reported any changes in his personality or any effects which you may attribute to the loss of the eye, confidence, anything like that?

A. Certainly not my field of expertise, but I do believe Mr. Newbern had mentioned to me the difficulty which would be expected in having the loss of an eye. That he was feeling, you know, the normal levels of stress and psychological difficulties with adjusting to the loss of that eye.

MR. VAN GAASBECK: I pass the witness. Thank you.

THE COURT: Cross-examination.

CROSS-EXAMINATION

BY MR. GLADD:

Q. Good morning. Twenty-six years in the military?

A. Yes, sir.

Q. Thank you for your service. Dr.

state your name, please.

THE WITNESS: Yes, sir. Ram Krishnaswami, last name is spelled K-R-I-S-H-N-A-S-W-A-M-I.

THE COURT: Thank you, Mr. Krishnaswami. Cross-examination.

MR. GLADD: May it please the Court.

CROSS-EXAMINATION

BY MR. GLADD:

Q. This may sound a little delayed, but Mr. Krishnaswami, where were you born and raised?

A. Good morning. I was born in India. I was raised in India in South India in a city called Madras, now renamed Chennai.

Q. And where were you educated?

A. Well, I did my high school and primary school in India. I had my undergraduate in India as well. I went to a university similar to the university here. I had my undergraduate in mechanical and production engineering. I graduated from there 1990. I came to this country in 1990 to receive my master's in engineering. I went to Wayne State University in Detroit and got a master of science and engineering. I graduated from that program in 1992. After that, I worked for a local

company in the area of automotive structure analysis starting in early 1993. I continued that employment and through them I was employed at Ford Motor Company for several years. And I became a Ford Motor Company employee in 1999. During my work at Ford Motor Company I was able to go back to school and got another master's degree in management and engineering from MIT in Cambridge, Massachusetts.

Q. What year was that?

A. That was in January of 2006 I graduated from that program. From 2004 to 2006. It was a two-year master's program.

Q. I should have asked, but where do you live now?

A. I live in the suburbs of Detroit. I live in a city called Wixom, Michigan.

Q. You live with your family?

A. Yes. I live there with my family. My wife and I have a son, a college going son, and I have a daughter in high school.

Q. Your son just started college?

A. Yes, he did. He started three weeks back.

Q. Now, when did you first start with Ford

Motor Company, what year?

A. I was placed at Ford in 1993 as a consulting engineer to work in the crash safety area. That's when I physically started working for Ford Motor Company at their offices. I became an employee in 1999.

Q. You are an engineer with Ford?

A. Yes.

Q. So tell me -- let's go through your different jobs that you have had with Ford and your positions.

A. Yes. Again, my area of expertise is mechanical engineering and within mechanical engineering there are various subspecialities. The areas where I specialize is in numerical analysis, computation analysis. Basically as the name sounds such as using computer and computer technology to perform many of the analysis tasks. And an area that was developing at this time was mechanical engineering and use of computational analysis as computers were becoming more prevalent. Powerful computers were becoming more prevalent so it was natural for engineers like myself at the time to gravitate towards that. That's what I chose and that was -- those techniques were also adopted by

many manufacturing companies, let it be aerospace companies, let it be automotive companies or any structural engineering companies.

And in the automotive area the techniques that were used were also being used to design automotive body structures in the area of crash safety so that we can perform these crash safety simulations like a car hitting a wall, car hitting another car, and things like that so that we can drive the design process more efficiently and when we start testing it we have high confidence in the test results. So that's the area that I started working in.

Q. Specifically in restraint and crash worthiness safety?

A. The same areas that was being used for structural were also used for restraint system development. When you use the word restraints it typically refers to airbags, seat belts and the sensor system that include these systems. So the same techniques were also used for simulation in those areas as well.

Q. Regarding the actual components in vehicles, what area were you working on in your time as an engineer with Ford, which you still are,

what components, what were you doing with airbags?

A. Specifically with respect to the airbags later in the 90's when we were doing the design of airbags, we had to come up with the shape of the airbag, size of the airbag, trying to understand what shape and size of airbag is usually required to be placed for the various conditions for which it is being used.

And then as the design progresses through the shapes and sizes as we get more information to simulation and testing. So those were the kind of tasks I did and once the system gets mature and things like that, we would interface with the suppliers of these materials to insure that they are packaged in an appropriate manner. For example, the folding of the airbag is essential. Even though it is a fabric it has to be folded in a very precise manner. It has to be folded in a certain repeatable manner.

What I mean by that is we have a paper napkin here. You see it is folded in an accordion manner here. The airbag is also similarly folded in this type of a manner and the side panels are also accordion and this whole airbag is then placed in the pack called a cushion pack. And the way it

is also folded, it is also tucked just like how you tuck a shirt inside. What this tucking does is initially when they unfold they are designed to unfold in a certain way towards the sides radially before they come out. This type of process is called a bias folding. So this is also called engineer folds within the industry. So those kinds of details we start getting into and we start setting up the airbag lines to accommodate for things like that.

Q. That's really specific, folding, tucking the airbags, is that the engineering?

A. Yes. That is engineering. Engineering is just not related to electronics. It is just not related to sheet metal or hard objects. Even soft objects like fabric have to be engineered. The way we fold them, we package them, so they unfold in a repeatable manner, they unfold in a set pattern and the lines are able to repeat this process over and over and over again is all engineering. And there are many supplier companies with whom we work who have patented this folding technology because so much time and effort goes into the process of engineering these folds.

Q. This is just one -- regarding the

folding, the tucking, the engineering on that, is that just one hat that you have worn in this?

A. One hat that I have worn and then we work with our instrument panel engineers to insure that there's a cover on top of the airbag. That's a part you can cover. It has what we call as a seam, it is a scribe or a line on the instrument panel so that when the airbag cover opens or on the driver's side on the steering wheel we have when the airbag cover opens, it opens in a prescribed manner. That is also engineering. And we have to insure that the covers open and at the same time from a styling perspective we don't see lines bleed through so they are not -- they are aesthetically appealing so that we want don't lines going across your instrument panel so that there are a set of engineers who look into that aspect of it. So there are multiple specialities and engineers that work on multiple components.

Q. What about -- so that's folding the bag how the bag comes out. What about the sensors that go into determining whether to deploy an airbag? Have you worked with sensors?

A. Yes, I have worked extensively with sensors over several programs at Ford, and sensing

systems like airbag systems became electronic in nature, fully electronic in nature at Ford during late 90's or in 2000. And these sensors again with advancement in electronics, they are being relied on for recognition of crash events and more importantly suppression when you are hitting a curb or going over a pothole, things like that. So the sensor is relied upon extensively to determine when to fire and when not to fire an airbag.

Q. As in all the sensors, folding the bag, the covers, many other components that go in airbags, has there been a history, a development history of how they have come to -- where they started to where they are today?

A. Definitely. And early airbags were placed in experimental fleets in the early 70's and then through 90's. So they became more prevalent in passenger cars and as sensing technology was available more airbags were placed in cars not only for front impact protection, airbags were placed for side impact protection. Airbags were placed for rollover protection when vehicles roll over in a crash. So airbags have come a long way.

Q. What about the power of airbags? Say in the early 90's what was the power of the airbags

versus what they are now?

A. Well, in the early 90's the bags today -- we call the 90's airbags power airbags. The airbags in the 90's came out with more power than the airbags that we have in our car today and there was a reason for that. And the reason for that is the early laws, the regulatory laws to which the vehicles have to comply to were skewed towards an unbelted occupant, an occupant who was not wearing a belt and if they are in a crash they needed it for the safety. So an unbelted occupant moves into the restraint system with more energy, restraint system in the airbags with more energy than a belted occupant because the belt does the majority of the work in a belted condition. In order to restrain the unbelted occupant the airbag had to come out much quicker and with much more energy to withstand the forces.

Q. Do they come out with that same energy today?

A. No, they do not. And that is why we call today's airbags as depowered because the unintentional harm from these early power bags were that even in the mid to late 90's showed that these bags were hurting kids and killing kids in the

front seat and hurting adults. So the industry petitioned the regulatory agencies to depower these airbags so that we can have -- we can avoid these field incidents. And in order to reduce the power of the airbag the laws regulating these airbags had to change. So the regulatory agencies went towards more belted tests in the barrier and did away with unbelted tests for the barrier condition for when you hit the wall.

Q. And the regulatory agency you mentioned a couple of times, did we hear that name yesterday?

A. Yes, we did. It is called an acronym NHTSA, National Highway Traffic Safety Administration. And the rules that they made that govern the vehicle for crash safety are listed under another acronym FMVSS, Federal Motor Vehicle Safety Standards.

Q. So we started with maximum power in our airbags throughout its history, then depowered airbags. What came about in the early 2000's?

A. In the early 2000's they changed, NHTSA, the rules further and decided to use model size dummies or different size occupants. They introduced testing where you had small stature persons sitting close to the steering wheel, close

to the instrument panel. They included artifact tests in some unbelted occupant tests, but at the lower speed, not at the higher speed like we had before. Because they didn't want to get back to the old condition of power airbags. In order -- plus they also introduced what we call in the industry as out of position test to insure that the bag does not cause any injuries.

So those were the kinds of things that they could introduce and they introduced more tests and more conditions under which we needed to be tested. More importantly, they wanted us to suppress the airbag on the passenger side if you detected a child seat in that right front occupant. So if someone put a child seat there and if they were going to cinch it we had to be able to recognize it using sensors to suppress the airbag deployment if there was a child seat. And even if you choose to deploy with a booster seat we have to prove that the airbag was not harming.

Q. Is that just one of the examples of smart technology, the weight sensors?

A. Correct, yes.

Q. Early 2000's what about dual stage airbags? What are we talking about there?

A. It is the same technology. In order to meet these conditions we had to come up with dual stage airbags. For most of the crashes we use as I said yesterday a primary stage or first stage and in some crashes, in some high severity crashes we use a combination of a primary and a secondary stage, what we also call as first and second stage which are fired in very short intervals in the order of ten milliseconds to deploy in a high severity crash so the airbag has more energy to perform its job.

Q. Two stages. In stage one, stage two is there a difference in the power of the airbag?

A. Yes, there is.

Q. So stage one versus stage two, which has more power?

A. Stage one by itself. Let's say if you have stage one and stage two being fired close to one another, that is called a full power. And stage one by itself has about 70 percent, 65 to 70 percent of that power.

Q. Of the full power?

A. Approximately, yes.

Q. Just for perspective, if it is 65 to 70 percent of the full power, what's that

65 percent of the full power versus a 1990 airbag?

A. Oh, maybe about half of it.

Q. So in the history of the airbags to where we are today, is there a term in the industry regarding today's advanced airbags that we use?

A. Yes. As I just said I think, it is advanced dual stage airbags.

Q. And then and what we described there, stage one, stage two, does it depend on the severity of the crash what airbag you are going to get?

A. Correct.

Q. All right. And then how is that determined? Is it -- how -- what does Ford use to determine what you are going to get in a crash?

A. Based on the crash tests that we do, extensive crash tests we do from low speed to moderate to high speed crashes.

Q. Yesterday -- we will get to it in a minute, but there was the long graph that was put up. It said pretension stage one, unbelted stage two. What are those called, those five mode categories?

A. Those categories are called different thresholds. Basically as I said yesterday,

threshold meaning if you are belted if you want only the pretensioners, so that's a pretensioner issue. Then you would have and followed by that if you are unbelted you need a bag sooner than when you are belted so you would come into an unbelted threshold. Then you would follow into a belted threshold. And that's how you progress all the way to the belted high severity crashes.

Q. Could be like a ladder?

A. Oh, yes, it can be like a ladder, like a step.

Q. Okay. So the higher the severity of the crash the higher you will go up the ladder? The last one would be the stage two?

A. Belted stage two if you are belted.

Q. Okay. And the lowest one being what?

A. Just the pretensioner if you are belted. If you are unbelted you would skip the pretensioner stage and go to the second step there.

Q. Let's talk about that again. Describe what a pretensioner is for the jury?

A. Well, a pretensioner is also a pyrotechnic device. In the case of the Ford Focus it is like a pipe that has got a cable, a micro gas device attached to it. It is placed on the side of

the seat right where you buckle. It is placed at the end of the buckle of where you would place the metal object called the latch plate into the buckle when you wear your safety belt.

That pretensioner has wires attached to the sensors. The role of the pretensioner is the moment an electrical signal is -- first of all, when it is recognized that you are belted, because we have sensors inside the buckle to tell us whether you are buckled or unbuckled. So when the latch plate is placed inside the buckle and if you are in a crash initially the pretensioner is deployed. When the pretensioner is deployed the micro gas generator has some energy to it, it will push, it will fire, it will -- what it will do is push to which a cable is attached so the buckle head is pulled down. So if I am sitting like that, it pulls down on my safety belt.

The moment it pulls down on the safety belt any slack in the system of the safety belt, because the safety belt itself is fabric. It is nylon fabric and it is wound on a Phillips spool and it is stored inside the retractor which is in the area. So as it pulls down it pulls up any excessive slack in the system that may arise if you

are like riding in an overcoat, things like that.

What it does is it makes the seat belt efficient in case you get into a crash because that slack in a frontal impact would reduce the efficiency of the safety belt. So we want the safety belt to be cinched during crash and that's why it pulls down.

Q. If I am in a crash and I have a seat belt on it is going to make the belt get tighter to me?

A. Yes.

Q. How quickly does that happen?

A. That happens in the first few milliseconds of the crash and we are talking in terms of milliseconds. The pretensioner's job is over in five or six milliseconds. Once it starts to fire by the time it completes its job it is five or six milliseconds.

Q. The 2009 Ford Focus that's involved in this case, does it have a pretensioner?

A. Yes, it does.

Q. For both the driver and the passenger?

A. Yes, it does.

Q. So going up this ladder pretensioner, that's the first thing, is that the first thing you

are going to get?

A. If you are belted, yes.

Q. What's the next threshold? Are you going to get all these necessarily? Depends on how you're seated?

A. It depends on how you are seated.

Q. What's the next threshold?

A. The next threshold would be the unbelted stage one.

Q. Again, stage one means?

A. The primary stage of the airbag.

Q. An airbag. What's the next threshold?

A. Belted stage one.

Q. And then the fourth threshold, please?

A. Unbelted stage two.

Q. Okay. So we see the ladder, it depends on the intensity of the crash how high you go up the ladder; is that right?

A. Yes.

Q. Why does unbelted come before belted?

A. You get an unbelted, if you are unbelted you would need an airbag in a lower severity crash than if you were belted. That's why it comes before.

Q. In restraints what's the primary

restraint device in your vehicle?

A. Safety belts.

Q. Do airbags supplement your belt?

A. Yes. And they are called a supplemental restraint device.

Q. Now, yesterday there was a discussion about calibration?

A. Correct.

Q. What is calibrated, calibrate what?

A. Calibrate the sensor, basically the algorithm that is used in determining the logic or firing an airbag or deploying a pretensioner, that needs to be implemented in a vehicle. So you need to calibrate the sensors, teach the sensors pretty much what the different crash for that vehicle structure and then determine, implant calibration into that electronics so that it recognizes different crashes and it's able to perform.

Q. What are we actually calibrating? What's the -- is there a software that we are calibrating?

A. Calibration by itself is basically a task and what comes out of this task is a software and that software is implanted into the electronic chips that are in the restraint control module.

This is a small aluminum covered box placed between the front seats and in the center area and that is the location where this box is fixed and it communicates with other sensors that we have in the car. We have a sensor up in the radiator area. We have a sensor on the doors, on the side doors, on the front door as well as the rear door and for side impact purposes and it communicates with all these sensors.

It also communicates with the buckle sensors to see whether you are buckled or not. It communicates with the occupant classification sensor on the right front seat to see who is sitting and how heavy they are, if there is a child seat, things like that. And it also communicates on the driver's side with the sensor, which we place on the seat track so that we know if a person is going to be sitting away from the steering wheel because they have long legs or if a person is going to be sitting closer to the steering wheel because they are shorter in stature and they can reach the pedals easily. So we can determine how far an occupant is sitting on that seat track.

Q. If calibrated is the software -- what is the program that it's run? Is there a supplier

involved here?

A. Correct. There is the supplier involved. And they have their own -- the calibration is their propriety knowledge. However, we know the conditions. We provide them the conditions it has to operate. And they are the ones doing the calibration process. They are the ones who own the software. They own the proprietary software and that goes into the hardware that we purchase from them, too.

Q. Who is the supplier of the calibration for the 2009 Ford Focus?

A. It's an automotive supplier by the name of Bosch, B-O-S-C-H.

Q. Is the calibration for the 2009 Ford Focus, is it unique to that vehicle?

A. Yes, it is.

Q. Do other Ford vehicles have different calibrations that are unique to those vehicles?

A. Yes, because the crash signature is unique to the different vehicles because shape, size, weight, all that matters in the amount of energy that the vehicle is going to dissipate to the airbag. Since it is unique to a vehicle the calibration is unique to a vehicle.

Q. Have you ever participated in the calibration of the restraint sensing system for a Ford vehicle?

A. Yes, I have participated in the calibration process on many vehicles.

Q. Specifically what vehicles have you calibrated a system on?

A. Well, from a calibration -- the calibration aspect is done by the supplier. But I work with them in executing some of the targets and I am part of the team that develops the initial targets for these suppliers. So I work with them so that they help me. I have done that on the Explorer Sport Trac program, I have done it on the Ranger program, I have done it on the F-150 truck programs.

Q. Are you describing this calibration, is it a process?

A. It's a process. It's a drawn out process. Takes anywhere from 30 months or so as I said yesterday.

Q. Since you have been involved in that process can you describe for the jury what -- if it's 30 months tell us what happens just generally? At least what happens in that 30-month process?

A. Well, I will try to be brief. We don't have 30 months. But the thing is usually we have to understand what the vehicle is. As designers we want to know whether it is going to be a passenger car or light truck, what is its size, and from there we try to determine what market we are going to sell in, things like that.

Why is it important to know what market we sell in is because each market individually has its own requirements. In North America they have their own requirements. In Europe they have their own requirements. In Japan they have their own requirements. Asia Pacific they have their own requirements. The regulatory agencies design these requirements to reflect the market usage of their product. For example, in Europe pedestrian protection is important in cars. So the design of front bumper. Naturally in Europe there are very small countries with a lot of pedestrians on the road unlike in North America. So that regulations they are ahead in some of the pedestrian regulation than us.

In North America we have our own unique requirements. We have high speed frontal impacts, high speed rear impacts, high speed side impacts

based on the traffic pattern and usage in this country. So we perform those type of -- and that's what the regulatory agencies do. That's why it is important for us to understand where we are going to sell the vehicle.

Then Ford has its own internal guidelines that we place on top of the vehicle. We like to see some guidelines placed for example, related to airbags or related to steering wheel and things like that. So we have those guidelines. So as an engineer, safety engineer working on these products on each of the programs it is very important for me to understand what these regulatory requirements, internal guidelines are, things like that. Based on that we have an idea, very rough idea of what this vehicle is going to do.

Q. So you mentioned steering wheel. Does the steering wheel matter in all this process, the instrument panel, everything that's inside the cockpit?

A. Everything inside a car matters. And everything outside the car matters.

Q. Is that because that's where the occupant is seated?

A. Correct.

Q. That's what's right in front of them?

A. Correct. And then once we get that these are all rough estimates and dimensions and stuff. Then we are able to perform some computer simulations, rough computer simulations based on prior past experiences from cars and trucks. Okay, this is what these are going to be, so let's see where this goes. Just like in a house, the basement gets built first and then the outside structure and roof and then you go about doing the interior of the house.

Same way in cars. The underbody gets done first. We first decide what kind of engine, what kind of power train, what kind of wheelbase and chassis. That gets done first. And once that is decided now those hard points are fixed, we are able to develop the body. We are able to build the body on top of it. And then comes the interior. It is about this time when the early testing would be rough estimates of the underbody with some prototype level upper body and those are the testing that are done. And now we try to see how close or how far our simulation is with some physical testing.

Q. How far out, you talked about 30 months, how far out are we now?

A. We are still about like 24 months into the process and things like that. And this is about the time when we also have an estimated target and that's some of the gray cells that you saw in the report yesterday. So those get filled in by engineers such as myself and we have an idea what we need. We have rough estimate of the airbag, rough estimate of the safety belt, rough estimate of the occupant interior and based on that we come up with these early targets. And we provide it as anything else with more testing, more analysis and more simulation and cross reference as the system gets mature.

By about 14 to 10 months before we are ready to launch production more and more testing is done and that's when because the prototypes have developed and the body structure is more certain now we are able to extract crash signatures by crashing these cars into walls and these signatures are provided. These crash signatures are provided to our supplier of these sensor systems to start working and fixing these signatures and coming out with a calibration based on some algorithm that

they own.

Q. So you saying during that process you have got other design engineers at Ford working on other parts of this vehicle simultaneously?

A. Yes. We don't wait for one person to complete his job and then hand it over to another. We will be doing many things in parallel. It is more efficient to do things in parallel. As some engineers are working on the calibration process, other engineers are working on the airbag to determine the shape and size. Other engineers are working on their wiring. Certain others are working on the body structure. So multiple teams are running in parallel and exchanging information at the same time and they come and narrow down the solutions.

Q. So then the rest of that 12 months out, how do they finally get to a fully calibrated vehicle?

A. Once this process is done, and once like if we meet targets, we don't meet targets, and like we see how far we are, if a redesign is needed after the crash test we go back and we redesign the part. We add more parts. We check into these parts and see whether it meets our goals and if it

doesn't what design change can be made. We go back and check on that. And then once we are satisfied with all these results we provide the opportunity to sign off on this vehicle saying that it is ready to be sold, it met the market requirements, we are satisfied with the Ford requirements and we tell the clients. Meanwhile the clients are also getting ready to do the tooling and the tooling fixtures, things like that. We tell them we are ready to go.

Q. May I approach, Your Honor?

THE COURT: Yes, sir.

Q. Mr. Krishnaswami, I'm going to pass you an exhibit. Can you identify what that exhibit is?

A. This is the calibration report, final calibration report that was published and accepted. Published by our supplier Bosch and accepted by Ford engineers and the team saying that they are satisfied with the sensor performance with respect to firing time and suppression times of airbags and pretensioners.

Q. You have looked at that document. That document relates to the 2009 Ford Focus and the calibration of that?

A. Yes.

Q. Is that a document that is -- that -- we talked about the 30-month process. Is that a document that is at the end of that process?

A. Yes.

MR. GLADD: Your Honor, I'm going to move to enter Defense Exhibit 50 which is the front calibration report.

THE COURT: Any objection?

MR. VAN GAASBECK: No, sir.

THE COURT: 50 is admitted without objection.

(DFT. EXH. 50 in evidence.)

BY MR. GLADD:

Q. Specifically at the top that's titled what?

A. Front calibration report.

Q. That means it is only related to airbags in the front of the vehicle?

A. Correct.

Q. Did this vehicle also have other airbags?

A. Yes. It has side airbags.

Q. Are those included in that calibration report?

A. There would be a separate side

calibration report. So for side airbag purposes we would go through the same process and determine the side calibration, whether to deploy, not deploy the side airbags, so we go through the extensive process for that airbag. And there is a separate process in case if you have a roll activated airbag that comes down from the roof, things like that. So we have a separate process and very extensive for that, too.

Q. Now, rollover, would this car be outfitted with rollover?

A. No, not this car. This car had a side curtain and that also deployed in this crash I believe, but it is activated upon impact on the side.

Q. Those rollover airbags, that's got another name that I have seen, is that canopy airbags?

A. Yes. Canopy is a trademark name under Ford and that specifically says side curtain that gets deployed during a rollover.

Q. Okay. Each of those depending on the types of airbags have their own calibration process interval?

A. Yes.

Q. Can we pull up BUZ40899, please. Mr. Krishnaswami, is this a document that is inside that large report that we just made an exhibit?

A. Yes. And this was shown to me yesterday. This is about four or five pages down. I believe it's four pages down into this set.

Q. It's inside the report?

A. Yes, it is.

Q. We talked about -- you were asked about these numbers one through 21. What are those one through 21?

A. Those are the different crash tests that we conduct for the calibration process, but I must caution those are not the only crash test we do.

Q. You just mentioned literally hundreds of crash tests?

A. Correct.

Q. Do each of these calibration tests have a different mode?

A. Yes, they are unique mode so that we -- because each crash test is going to have a unique signature to it. That's why we call them unique mode because the crash signature is based on what you hit, how you hit it, where you hit it, all that

is very important. So that's why there are multiple modes that are being tested.

MR. GLADD: May I approach, Your Honor?

THE COURT: Yes, sir.

BY MR. GLADD:

Q. Mr. Krishnaswami, pass you another one page of --

THE COURT: What number is this?

MR. GLADD: 134, Your Honor.

MR. VAN GAASBECK: No objection.

THE COURT: No objection. 134 admitted without objection.

(DFT. EXH. 134 in evidence.)

BY MR. GLADD:

Q. If we could pull that up. Mr. Krishnaswami, regarding modes, what does this document show, exhibit, excuse me.

A. These are basically illustrations of that table that we saw just a while back. So when we are talking about different crash modes this is what we are performing. So what this shows is we hit the car against the rigid barrier, we hit the car in the front against a pole. We hit it on an angle barrier. The angle barrier may be faced angle towards the right. And if I may draw here it

can be also be faced like this.

Q. The other way?

A. The other way. We call it left and right angle barrier. And then comes this test which is the offset deformable barrier and what is being illustrated here is that we have a steel backing plate out here and in front of which we have a honeycomb-type material. This was a testing pioneered by the Insurance Institute for Highway Safety in North America.

So they have these aluminum honeycomb material which is supposed to have a certain stiffness to it to represent the stiffness of front ends of cars and things like that, the soft structure of the cars. So they place it so that initially there is not much resistance to the impact and then once the car bottoms out on this honeycomb material you can go into the hard structures like the engine, cradle, things like that and that's what the backing plate is supposed to represent. So that's another test we do.

And then this is self-explaining. We hit the car into another stationary car of equal mass and size to gather signatures. Then we also have what we call as our dynamic suppression tests

which are like undercarriage type test where the car misses, is designed to miss the front bumper, underrides the front bumper and this is a steel structure like a steel pole that tries to impact the engine cradle and really if you by accident go over the curb or hit a tree trunk we want to suppress the airbag so you don't have airbag in those. So a test like this is done.

And we also have a bumper override condition where we try to miss the bumper and impact only the front portion of the car about ten miles an hour. Let's say if you have -- you are behind a truck in the back where you miss that bumper and the bumper of the truck which has a higher ride and gets into the car. And if it's a low speed you do not want airbags in those conditions. So you test that condition.

Q. So some of these tests are run at different speeds?

A. Correct.

Q. Does the government require some of these tests?

A. No.

Q. Are these industry?

A. These are industry standard tests.

Q. Okay. And for this vehicle, like every vehicle manufactured, it would have been crashed at these modes and other modes?

A. Correct.

Q. Would Ford have videod those crashes?

A. Yes. We video these crashes both in the real time and we also video in high speed. It is the high speed cameras that because the crash is over in a very short duration of time. We are talking about milliseconds, right, so the running joke is do not blink, the crash test is going to be over. So we use high speed cameras to capture frame by frame by frame so these cameras are that 1,000 milliseconds so they take a frame every second and these such -- and remove this frame by frame by frame to understand what is happening in every frame. So these high speed cameras are either placed around the vehicle and sometimes inside the vehicle during the crash to gather the data.

THE COURT: Let me interrupt. We are going to take a break. Ladies and gentlemen of the jury, leave your note pads on your chairs. Please don't talk about the case with anyone and among yourselves. We will take our morning break.

(Thereupon, the jury exited the courtroom at 11:28 a.m.)

(A recess transpired.)

MR. VAN GAASBECK: Mr. Bodiford has gone home.

THE COURT: Yes, sir.

MR. CARTER: Your Honor, before we bring the jury back real quick, I want to clarify what I said before we ended. We have a stipulation regarding the confidential documents, one has been introduced, Exhibit 50. And we will be filing this.

THE COURT: Which exhibit are you talking about?

MR. CARTER: Exhibit 50 which is the calibration report.

THE COURT: Okay. That's the one you say is --

MR. CARTER: It was produced pursuant to a protective order.

THE COURT: Exhibit 50.

MR. CARTER: Defendant Exhibit 50.

THE COURT: I thought it was 150.

MR. GLADD: It is 50, Your Honor.

MR. CARTER: It's in evidence as 50.

THE COURT: Okay. It's in evidence as 50.

MR. CARTER: Yes, sir.

THE COURT: That's the crash test report, video stills.

MR. CARTER: There are going to be some others. No, sir, it's called a calibration report.

THE COURT: Hand it to me. I am sorry. I am looking at the wrong one. I was looking at the wrong exhibit sheet. All right. Calibration report.

MR. CARTER: Yes, sir. I'll alert you of others.

THE COURT: What is the stipulation?

MR. CARTER: The stipulation is that it was produced pursuant to -- it's a consent stipulation first and that was produced pursuant to protective order. Ford has handled it confidential in nature. And that we will do what's necessary to maintain that confidential nature with the Court's involvement.

THE COURT: What do you want me to do?

MR. CARTER: Well --

THE COURT: It's in evidence. The jury is going to have to see it.

MR. CARTER: No, no.

THE COURT: I don't have any problem once the trial is over taking it and sealing it.

MR. CARTER: That's what we are talking about.

THE COURT: As far as the jury seeing it, they are going to see it.

MR. CARTER: Yes, sir. Just after the trial.

THE COURT: Once the trial is over I'll seal it. I have no problem doing that. Other than that I don't know what I can do.

MR. CARTER: That is all we are asking. We will raise this again at the end of the trial.

THE COURT: Just tell me which ones needs to be sealed.

MR. GLADD: At the end of the trial.

THE COURT: I will be happy to do that. Do you want me to tell the jury not to discuss those with anybody?

MR. GLADD: No, sir, Your Honor.

THE COURT: Anything else?

MR. VAN GAASBECK: No, Your Honor.

THE COURT: Bring us the jury, please.

(Whereupon the jury entered the courtroom at

12:00 p.m.)

THE COURT: Thank you very much. You may continue cross.

MR. GLADD: Thank you, Judge.

BY MR. GLADD:

Q. Before the break, Mr. Krishnaswami, we were talking about crash modes and that all -- some of those -- all those crashes are videod; is that right?

A. Yes, sir.

Q. Okay. Your Honor, without objection, we would like to play an assortment of crash tests which are Defendant's Exhibit 82.1 through .9.

THE COURT: 82.

MR. GLADD: Since there's multiple 82's we will call them 82.1 through .9.

THE COURT: Which ones are we talking about?

MR. GLADD: Defense Exhibit 82.

THE COURT: Says crash report.

MR. GLADD: We are going to do some videos from that large exhibit and we will specifically call those 82.1 through 82.9.

THE COURT: Y'all putting in all of 82 which is six pages of crash test report?

MR. GLADD: No, Your Honor. I think we are coddling those down to 82.1 and the video we will describe.

THE COURT: Let me show you.

(Off-the-record conference.)

THE COURT: 82.1 through 82.9 admitted without objection; is that correct?

MR. VAN GAASBECK: Yes, sir. Your Honor.

THE COURT: Thank you very much.

(DFT. EXH. 82.1-82.9 in evidence.)

BY MR. GLADD:

Q. Mr. Krishnaswami, we are going to look at some clips now. If you could walk us through those clips. Would you press play?

A. Well, the crash test number is listed up front and this is a 90 degree into a rigid barrier.

Q. Just for reference, all these crashes were on the long list of the 21 crashes that we saw earlier?

A. Correct. These are some of the crashes from the list.

(Video played.)

So this is a real time video. That's

into a rigid wall. This would use an unbelted dummy into the wall.

Q. Some of these are belted dummies, some of these are unbelted dummies?

A. Correct. So this is another 90 degree frontal, but this is a high speed impact. This is done at 35 miles an hour. And these are belted dummies. And as you can see, that's into a rigid wall and now affords us a much closer look at it when you perform a high speed film analysis how the bag is coming out, how it is loading and things of that nature. That's important to us.

Q. Is that the same crash, just different video perspective?

A. Correct. That's high speed film. What you saw early on was real time video. And the next one was a high speed film and we place instrumentation on these cars and these wires are dragged by the car and there are boxes recording the data as we go into the wall during the time. And that's the data that is later on used for the calibration process.

Q. This one, 15978, you were asked about this one yesterday on the stand; is that right?

A. Yes.

Q. What type of crash mode is that?

A. This is a front angle right. That's what the acronym FRA stands for and that's a front angle right, and the angle barrier is located at 30 degree. Instead of hitting it straight up it hits into a right angle.

Q. Regarding this one were you asked about the Gs that were recorded?

A. Correct.

Q. Are Gs recorded on some of that instrumentation you are talking about?

A. Yes. That's the data that records the -- that's the acceleration as it is happening into the wall that we recorded and units are measured as Gs.

Q. Was there an exception in the calibration report? Was there an exception for 15978 for a belted occupant in the calibration report?

A. Just give me a moment. You said belted occupant.

Q. Right.

A. No, I don't see that. Let's take a look at that.

(Video played.)

The second would be the real time video. And you see the rotation in the very end and while testing this car we used an unbelted dummy, an unbelted occupant in this test mode and we can use the structural data for both belted and unbelted occupant. It is not -- as I said, a test is done for multiple purposes. For design purposes of airbags and things like that and also structural purposes so that we can extract the data in each crash test and take it individually and analyze it. This is the same video, but now at a higher speed and you can see the occupant loading into it and you can see a bunch in the windshield because of the loading.

Q. And again, those dummies are unbelted in that?

A. Correct. And this is high speed offset deformity. Remember I said that we use honeycomb material in front of the barrier so that it represents front end of a passenger car. So it is that test that is reflected in this video.

(Video played.)

If you can pause it for me. So this is what I was talking about. If I am allowed to mark here. So that is the honeycomb material and it has

a certain depth to it, about three or four feet of depth, has a bumper-type material up front. And then it has the steel backing plate so it is allowed to deform initially and then mark a different color here, that is basically the steel backing plate behind the honeycomb material that represents the stack up after the initial crash is done. Let me clear that. And if you can pause it.

And this is a higher speed crash. And as you can tell this is a belted occupant on the driver side. This is a test pioneered by the Insurance Institute as I mentioned early on. And we try to see what the occupant performance, also structural performance are with respect to sensing and airbags.

Q. What was the number on that test, sir?

A. 15949.

Q. Are we showing every test here or just some of the tests?

A. We are just showing some of the tests.

Q. Is this a slowed down version so we can see?

A. Correct.

Q. Is this another one?

A. This is another one. This is a full

impact test. Remember I said that we gather signatures in different impact modes like hitting another car, hitting a rigid wall, hitting a pole and there are principles behind hitting a rigid wall. It's just like nobody would go drive their car into a rigid wall. The principle behind hitting a rigid wall is, I believe I explained that briefly yesterday, is that it is equivalent to impacting another vehicle of equivalent mass, size and stiffness head on into each other. So when doing crash tests we need objective data and in order to remove the variations that can arise from crash to crash and crash test we try to do some repeatable test. Otherwise we do not know whether we are designing for an artifact of the test or really forwarding some issues to design.

So in order to do that when we hit the rigid wall let's say 25 miles an hour, and let me just plot it here, when you are hitting a rigid wall at 25 miles per hour, it is the same as hitting -- mark this as stationary car, of equivalent mass and stiffness at about 50 miles an hour. So that is the principle behind it.

And variations can happen in the crash test. That's why we put a rigid wall in front of

it and impact it. And if it is completely aligned. So that's the principle behind it.

Q. How about this question: Can you crash every single type of real world crash out there?

A. It is not --

Q. Test for it?

A. It is not possible because there are numerous modes and numerous things. So we try to capture a wide variety of these signals through repeatable objective test and that's why we do this. And here we are using pole because we need to get the pole signature. Initially the pole is going to hit the bumper and it is going to be soft initially until it bottoms out on the engine. That's why we do a pole test and which has to recognize it in a timely fashion to do it.

Q. So this is a whole different crash mode?

A. Correct. See the pole up there? And it is like hitting into a center pole and --

Q. That could be a power line pole?

A. Correct, tree or a pole.

Q. Okay. Then just as another example what is this?

A. Oh, this is a cart test. This is a

real impact test. The same sensors are used to signal, let's say if you are in an impact or impact condition the sensors want to cut off the fuel to the engine in case of crash. So they want to shut off the fuel motor in order to do a crash. Let's say if you are hit in the back a frontal airbag is not going to afford any benefit. This is not a calibration for the frontal airbags. However, this is a calibration for the sensing system because the same sensor, it can sense if you are hit in the back and can send a signal to cut off the fuel feed to the engine. So that is why we do a high speed sensor on this impact mode. So that that action of impact is important to the sensor, too. So it is in order to determine those directions we do these high speed tests.

Q. So this will be a Ford Focus being hit from the rear?

A. Correct.

Q. You wouldn't expect the front airbags to deploy --

A. No.

Q. -- into the rear. Can we play the video, please.

(Video played.)

And then I think we may be getting close to the end. What's this?

A. This is -- as I said we have rigid barrier impact, angle barrier impact, also deformable barrier impacts, car to car impacts and this is the car to car impact. We saw the pole impact. And this is hitting another car where you have only a small overlap between the two cars, 25 percent or so. And this is that test done at 25 miles an hour.

(Video played.)

Here standard size passenger car like a Ford Taurus is present. And you're hitting it with moving Ford Focus and you're overlapping it only a little bit.

Q. Okay.

(Video played.)

A. So again the signatures are gathered here. The front crash sensors, the center console sensors and this is done.

Q. Now, are there also some tests that you run just representative where you don't want to get -- you want to show you are not going to get an airbag?

A. Correct. And this illustration ties

into that. Those are the two modes that we initially saw at the bottom. And what this is is we had a bumper override test about ten miles an hour where you miss the bumper and you load at the front sensors because there are front crash sensors. That's going to see a lot of signal, but the RMC or the center tunnel sensor is not going to pick up that much of a signal. So you don't want the sensors to make a decision based on just one remote sensor somewhere out there. You want the system to behave in unison. You want the system to get data from the front crash senor, compare to the data that it is receiving and based on the comparison of data check with the calibration that we have coded in the box and make the determination whether to fire or suppress an airbag.

This concept, actually I am glad you brought this up, here is called multiple point sensing. It is quite different from what we had in the previous generation of sensors which were called a single point sensing meaning you had only some sensor inside the cockpit inside between the occupants. And decisions were made only off that sensor. This is multiple point sensing so now you have a lot of data up front and no data in the

back. How is the sensor going to behave? That is why this test mode is done.

Q. While we are talking about the whole process, it being predictive, is that important in the airbag system?

A. Definitely. The sensor does not have the luxury of waiting until the crash is over in order to perform its job. It has to monitor real time what is happening, how it is happening, how quickly the crash is happening. And based on existing data points it extrapolates or moves, it knows based on the calibration based on the signal type if it is going to start out this way this is how it is going to end. That's why it makes a decision to fire or suppress an airbag.

So in that regard the sensor is predictive because remember, I believe counsel touched on the time budget in a crash. As it is very little time budget and you need 30 to 40 milliseconds for an airbag to inflate. That's why the systems have to be predictive in nature. It needs to do its job before the airbag can inflate, right, so that's why it is predictive in nature.

Q. Is a -- being predictive, is it based on all those different crash tests, the experience

and history that --

A. Exactly. That's why you do all those crashes so that we can teach the sensor to be predictive. That is the calibration.

Q. While we're on that issue there was a discussion yesterday about isolation. Can you isolate one crash, change something for it and expect to have no effect on the rest of the system?

A. No. It is tied together.

Q. If you change one it is going to have an effect somewhere else?

A. Exactly. Sorry. I paused this crash. And we touched on a couple of the topics.

Q. Let's look at this bumper override. This is low speed?

A. Yes. This is a lower speed. As you can see, the barrier is raised up so that the vehicle can underride. And if you can further pause it there here which is basically you load. We have sensors up here which is a front crash sensor and that is being -- that is seeing a lot of energy; however, the center tunnel sensor inside the cockpit is not going to see any significant energy. So the sensor compares data from here and data from here and then we make the decision.

Q. There was some discussion about that yesterday, up in the front two sensors versus one crash sensor. There was also a discussion used to be three crash sensors. What error -- era of airbag history was three crash sensors used typically?

A. Well, it depends on the manufacturer. Each manufacturer have their choice, but the three crash sensors were a point in time where we had mechanical sensor which were more prevalent. You had three sensors up front here mostly and then there were other diagnostic sensors sometimes placed in the cowl area or the bottom of the area. That was a 90's technology, early 90's technology. But as electronic sensing became prevalent through the late 90's you started having sensors only at this location which is what I call a single point sensing.

More recently in the decades of 2000's what manufacturers are able to do is they have sensor in the center tunnel area and sensors up front, too. This up front sensor can either be one or two. So that's the practice.

Q. Have you looked at -- so this Ford Focus did have two and then went to one. Have you

looked at the calibration for both of those?

A. Yes.

Q. Was there any comparable differences between two and one?

A. No.

Q. Does one perform better than the other?

A. No. They are equivalent.

Q. I think we are -- let's go to the next one. What is this one?

A. This is the undercarriage mode and that's the other mode I talked about. This is to simulate a curb hit or simulate a tree stump when you are going over it. Remember I told you the previous test value you saw, you saw condition where the front sensor is being loaded excessively and there was no loading in the center tunnel sensor. Now you will see the opposite of it. The center tunnel sensor is going to be loaded excessively and the front sensor is going to miss completely. So now we see what that data is so that we can teach the sensor that you not make a decision based on just a single data point. That's why this test is being done.

Q. I understand. You said teaching the system, is that --

A. That's a calibration, sorry.

Q. Let's see -- in real life what is this meant to sort of duplicate?

A. Like if you are hitting a curb, or like in a parking lot you hit a block by mistake, like if your tires miss the side and hit a block or tree stump, when you are going on gravel road you pull over on the side, you hit a tree stump or something. You miss the bumper, but you hit the undercarriage and the cradle significantly. That's what this is supposed to be.

Q. Let's take a look.

A. Just if you can rewind a little bit, please.

(Video played.)

There is the stump that I am talking about. That's iron. That's a steel block. That sticks out of the ground. That's about nine inches tall. And it is designed to skip the bumper and hit the first structural member. And the first structural member is likely the engine cradle. And that's around this point of the location. The significance of that is it is very near the restraint control module. So it's like taking a huge, huge hammer weight of this car, like 3,000

pounds, a 3,000 pound moving hammer and whacking it right there.

Q. So let's take a look.

A. Now you get the signal where you load this excessively. There's zero loading here. And now because it has to compare the data, we want to suppress an airbag in this mode. An occupant does not need an airbag for protection in this type of accident. So we want to suppress the airbag here. Now you have the signal. You impart the signal to see how the difference is going to be and code it or calibrate it into the system.

Q. So the system is engineered, taught when and what types to look for, what types of crashes to deploy, what types of crashes not to deploy, right?

A. Yes.

Q. Going back to this chart it also has to determine which level, correct?

A. Yes. And that's why you run it all the way up to 35 miles per hour into a rigid wall. You test at the low end, you test at the moderate end and you test at the high end.

Q. This crash test they would have -- Ford would have recorded the energy, the forces, the G

traces, all with this crash test?

A. Yes. And that's why you see wires running all along here and there is a cable that is being dragged along like the back. That's the instrumentation that is recording all the data here.

Q. This crash test was 15886. Can I approach, Your Honor?

THE COURT: Yes, sir.

BY MR. GLADD:

Q. Mr. Krishnaswami, what does that appear to be related to crash test 15886?

A. Yes. I can see this number here. And I can see the tracing back. We are gathering the data.

MR. GLADD: Your Honor, we move into evidence Exhibit 76.

MR. VAN GAASBECK: No objection.

MR. GLADD: Point one, it will be crash test 15886 under 76.

THE COURT: 15886?

MR. GLADD: Yes, Your Honor.

THE COURT: Admitted without objection.

(DEF. EXH. 76.1 in evidence.)

BY MR. GLADD:

Q. I think this is the last topic that was covered yesterday, Your Honor -- I am sorry, Mr. Krishnaswami. Let's pull up the bottom only. Yesterday there was a discussion about the longitudinal trace?

A. Yes.

Q. From a particular crash test, 15978?

A. Yes, I remember counsel was describing the G forces recorded in the sensor.

Q. Were G forces recorded in that last test?

A. Yes, it is. That's why you see the unit Gs.

Q. What was the G trace, what were the G forces that were recorded in that?

A. We looked at a maximum and a minimum. The maximum is 31.09. That refers to the value up here. And the minimum is up here. And basically because you are decelerating so it is the direction of the Gs are obviously important. So you see about close to four to six Gs when you go over the curb that -- and by the way, this test is that last test I think you just showed me which is basically you have a tree stump and you're whacking it, going into it about eight miles an hour hitting just the

engine cradle at that speed.

Q. So even at eight miles an hour if you hit a curb, some sort of concrete stump or tree stump it's going to be a big G hit right there localized, right?

A. Right.

Q. Is that what that is showing?

A. Yes.

Q. Do you want an airbag in that?

A. No.

Q. So is it proper to base the decision that being predictive and the decision to fire an airbag based on a G tracing alone?

A. No.

Q. Okay. Your Honor, Ford's limited its topics to yesterday. We'd like to preserve the opportunity to call Mr. Ram Krishnaswami back to the stand the during its case.

THE COURT: Any redirect?

MR. VAN GAASBECK: Yes, sir, there will be. It will be a while just to inform the Court.

THE COURT: Move on with it.

REDIRECT EXAMINATION

BY MR. VAN GAASBECK:

Q. I believe that you were saying that

part of your responsibility was to create computer simulations; is that correct?

A. Yes, I was doing that for several programs.

Q. And that that would be one of the things that you would bring to bear when deciding whether or not what your soft targets will be or what I call requirements would be?

A. Yes.

Q. And that you would -- they would actually give you a high degree of confidence in the correctness of your original targets, does it not?

A. It does. It does afford us decision making, too.

Q. And so one of the other things I was wondering about, because it was mentioned some of the work that you had done. What kind of work have you done with the 2009 Ford Focus in designing its crash sensor system?

A. I was not personally involved in the 2009 sensor at that time. I was -- when that design process was happening I worked on other programs. But the processes we use are similar across multiple vehicles lines. So I am quite

aware of how the team did it.

Q. And if you recall, we had some discussion about how the calibration was that Bosch came back with trying to meet Ford's targets. Some of them were not met; do you recall that?

A. Yes. Initially they didn't match the initial targets and that's when we go back.

Q. Do you recall that?

A. Yes, I do.

Q. Thank you. And so when -- in going back and looking at that, you mentioned that there were some evaluations to determine whether or not you could accept the results that Bosch gave you versus the initial targets; do you recall that?

A. Yes.

Q. Did you take part in that process?

A. No, I did not. My colleagues who were working on the other program -- on that program, they were the ones who took part in that process.

Q. So you are not the one who participated in the decision to allow the airbags to deploy in a crash in which it was not necessary?

A. Well, it was -- I was not involved in the process, but I would disagree with the latter half of the question.

Q. In that it was not necessary?
A. Yes.
Q. It was not necessary for the occupants in that vehicle and in that crash to deploy them. We still agree with that, don't we?
A. Initially only I would agree with that. But you have got to look at the system as a whole. That's why I would disagree with that.
Q. Right. But between us, the decision to deploy the airbag in a crash which you've identified as being very similar to this crash, that was not made to help the people in that? It was made to help people in another crash, right?
A. Yes. And I would agree with that statement given what I just said previously.
Q. Give me a moment, please. I want to pull up that. I can't use theirs. I have to pull mine up, the calibration. So in the calibration for the first crash sensor system, did that keep the same team as the one that worked on the -- I guess the 2008.5? Was that the same team?
A. Mostly, yes. I believe calibration engineers and the crash engineers from the Ford perspective are the same people.
Q. All right. Can we activate my screen,

please.

THE COURT: Mr. Carter, do y'all have the one he is looking for?

MR. CARTER: I'm not sure which one he is looking for.

THE COURT: How about see if you have got it if you can pull it up.

MR. VAN GAASBECK: It's the calibration No. 2.

THE COURT: You got it?

MR. VAN GAASBECK: Yes.

THE COURT: Thank you.

BY MR. VAN GAASBECK:

Q. Is there a sign off page for that that has the names of the people who actually worked on this system?

A. Yes. There are some of my colleagues here.

Q. And does it have the names of the people?

A. Yes, it does. It has the crash supervisor. It has the sensor supervisor, Todd Clark. It has Don Sullivan who was one of the calibration engineers and did some of the vehicle simulations. So those are the people that you list

here. Plus you also see people from the supplier like Ken Century from Bosch whose the supplier who signed and these are all Ford people who signed.

Q. All right. So which of those people still work at Ford?

A. Mr. Sullivan works at Ford, Mr. Carter works at Ford, if you scroll up, Mr. Clark works at Ford. They all work at Ford.

Q. So the people who actually made the decision on how to -- on whether or not you should accept the performance of the crash testing which you deployed an air bag in the initial target of non-deploy, those are the people who would have made that decision?

A. Yes. That's a team decision and the team, I consulted with them to familiarize myself even at the time of our deposition.

Q. And you said they still work for Ford?

A. Yes, sir.

Q. Now, I see a sign off date there. Let's say by Mr. Ken Century up there, 11-2-07; do you see that?

A. Yes.

Q. And so then that was for the single sensor system; is that correct?

A. I'm not sure. You will have to show me another page.

Q. Because this is the second sign off page. There's the original, wouldn't this be for the single?

A. Yes. That would be for the single.

Q. So --

A. It appears to be.

Q. So was the -- I guess then it was finally approved on 11-2-2007 for the 2008 and-a-half?

A. Yes.

Q. So when was job one for 2008 and-a-half?

A. There was not a specific job one for 2008 and-a-half. It was a running change because the two sensor system -- two front crash sensor system and the one front crash sensor sytem were running in parallel. That's why. There is no particular job one, but in talking to some of the hardware engineers, they said that it was a running change anywhere from three to six months after launch we made that change.

Q. Three to six months after launch for 2008?

A. For 2008 which would have happened maybe around June, July of 2007 and then probably later in the year towards December they may have changed.

Q. So I guess what I am trying to figure out is when did they start producing then the 2008.5?

A. See that's -- there was no specific 2008.5 type program since it was a running change. Once parts ran out and once this part was ready it is phased in because the systems are equal.

Q. So that's what happened then, they ran out of the old parts, then just switch to the new ones?

A. When the electrical system is ready. The reason why they waited is the wiring system for a single crash sensor was not ready at the time of launch. So they waited for the wiring system to be ready and then they phased that in. But during the testing phase they were checking in parallel two and one sensor system.

Q. So when did Ford want this implemented?

A. We wanted it implemented if we could by June of that year.

Q. June of?

A. 2007.

Q. So we are already behind that for the one point sensor when these guys are signing off on 11-2?

A. Yes, that's when we had the data, but we couldn't finish the product until the wiring was ready. That's why they waited a few months.

Q. And was the purpose to reduce from a two sensor system to a single sensor system for cost?

A. Well, there would be a reduction in cost, but not cost as in profits. Definitely we had to make sure that the performance was same between two and one. And once that is assured that's when you make the change.

Q. But the answer is the reason you went from two to one was cost?

A. Cost was one of the factors, but definitely performance was not compromised.

Q. And I heard you say that performance was not compromised. So have you seen -- taken a look then at the original calibration with the two sensor system?

A. Yes.

Q. Are there any timing time to fire

changes?

A. There will be very small time to fire changes, but especially for a belted stage one exception they were exactly similar between the two systems.

Q. We have a copy of it here. We will probably introduce it in just a moment. Pull it out. So there were -- when we talk about timing, time relates to the question of timing deployment and that relates to late deployment; is that correct?

A. Well, what you meant by timing you describe late deployment and I think my answer yesterday was you cannot look at it in isolation. You have to determine with respect to occupant movement.

Q. Yes. Thank you. We are talking about the depowered airbag. Can you tell us when the airbags began to be less powerful?

A. Around the 1997, 1998 model year vehicles. That's when the depowering began.

Q. So those depowered bags, initial ones, though, are the ones which are still -- in 1997 are not dual stage?

A. No. They had only one stage of

inflation. What the industry did was they took the power bags and reduced some of the propellants in the gas generator and it was about 80, 70 percent of the original power. So that's how they deployed.

Q. You know NHTSA performed its evaluation as to whether or not this depowering was actually needed; do you recall?

A. Yeah, that's why they went into the depowering.

Q. You don't recall that Ford actually -- NHTSA actually said that it tested the old models against the new models, the new models against the old standards and that new models actually passed the old standard?

A. You lost me there like what is old, what is new. You jumped there twice.

Q. Got you. Are you aware that NHTSA tested the new depowered airbags against --

A. Single stage.

Q. Yes, sir. Against the old standard and that they passed the old standard?

A. Well, they could have. I'm not sure.

Q. You don't know that I guess?

A. No.

Q. Because that would matter as to Ford's -- Ford actually complained that it had to make a more powerful airbag, didn't it, because the government made it do it, right?

A. Well, yes, and I talked to our technical experts at that time, Dr. Prasad and others who were involved in some of the depowering exercise.

Q. I have, too. But in reality you never had to do that? NHTSA said that it did test against the old standard and they passed?

A. Well, there were serious injury in the field that was happening and that's why the industry responded to it. My understanding is about over 150 children were killed in some of these deployments. That is why we went into some of the suppression technology like that.

Q. And that's why you did suppression technology and you still do suppression technology even for today's airbags, don't you?

A. Yes, but before we have the suppression technology ready the immediate answer was depowering.

Q. Actually the immediate answer was put the kids in the back seat?

A. That is also recommended practice, but that is the suggested practice to put kids in the back seat.

Q. So regardless of depowered airbags or not depowered airbags, if this airbag in this car were to go off and hit somebody in the face, is there a potential of an injury to the eye?

A. Well, there is a potential injury to eye from a deploying airbag.

Q. Powered or not?

A. Powered or not and we are aware of it. That's why we take all these efforts in designing these deployments.

Q. And I don't doubt that you feel that way. I have never doubted it at all that you feel that way. But you have not -- you didn't do this car?

A. Yes, I was not -- I did not sign off like that, but as you see their signatures here I have participated in numerous programs that followed exactly same practices where I have signed off.

Q. And then you talked a little bit about suppression?

A. We talked about it, yes.

Q. So I am interested about that. It may come up in this matter. I am pretty familiar with this suppression system and want to ask you am I correct that -- that you have different classifications for suppression?

A. Yes.

Q. So I have seen indeterminate as one of the classifications. Have you seen that?

A. Yes, we have seen indeterminate as a classification. And I can explain to you how that happens.

Q. It's all right because it doesn't matter at this point, but if you feel like you want to go into that later.

THE COURT: He didn't ask you to explain it, okay? Go ahead. Ask the next question.

Q. Is there another classification called child seat or child restraint seat?

A. Yes, there is.

Q. And then is there another classification relating to the small child, 56 pounds or less?

A. Yes, there is.

Q. And there's another one called large,

that means everything that's above what the small child is?

A. No. That is not. That is a small classification and everything above then the next classification would be large.

Q. Yes. So indeterminate child seat small for a child, about small anything, small anything, under 50 some pounds?

A. No, no. About hundred, standing weight of about 105 pounds.

Q. So you are going to go with the fifth percent female below that?

A. Correct.

Q. Anything over that you would still agree that the classification is large?

A. No. Large is another class that is available over that.

Q. But it is a classification, right?

A. It is a classification.

Q. One where you don't suppress the airbag; is that correct?

A. Yes.

Q. So that if we were to look at the different classifications, those which do suppress, those that don't, they would be child seat, small

child and large person?

A. Yes.

Q. Thank you. And --

A. That is generally in the industry that was available, but it is not available in this car actually. There is no classification called large in this particular car, Focus.

Q. Does it have any suppression feature?

A. It has a suppression feature and the suppression feature would be indeterminate is one class. Then it will have empty. Then it will have child and it will have small.

Q. But there is a classification, those are all for non-deployed?

A. Yes. Small is not for suppress. Small is for deploying an airbag.

Q. That's -- do you have any documents which actually say that?

A. No. It is three states and we have that so it is not small as in small passenger. What that actually means is you see in the EDR download is that anybody over a certain standing weight of 105 pounds is going to get the same level of airbag depending on impact severity. That's all it means. It doesn't mean that we are suppressing

for somebody based on how they were sitting, where they are sitting. I don't want you to confuse that.

Q. You are talking about seat track?

A. No, no. On the seat weight sensor.

Q. Honestly can you tell me that you have seen anybody, including Ford's, other than what you say is happening here in the Focus, that does not include an occupant classification status for what's called large to take the position of anybody that's over the weight of the fifth percentile female?

A. Yes, it is a three state occupant classification sensor. So therefore there was no need to classify a large occupant. That's why it is small and above. So small and above gets the same level of airbags. That's what it means.

Q. I appreciate your observations. And so you have never actually seen the large classification in an event data recorder?

A. I have if it is a five state OCS meaning five separate states where the deployment threshold is going to be different between a small occupant and a large occupant, then there is necessary to specify that in the vehicle that has

it. So those may have that distinction.

Q. Thank you. So who is it that decides where the sensors are located?

A. The team along with the prior teams decide where the sensors are located.

Q. So in this case, wasn't the sensor -- Bosch was provided with the locations that they were supposed to use for the up front sensors?

A. Correct. They would have also been involved. They would understand where it is located.

Q. Well, Ken Century from Bosch, are you saying that Ken Century would come in here and he would say that they chose where this sensor was?

A. No, not by themselves, no. It will be in unison with Ford.

Q. So how many were tested, how many positions up front for the Focus system were tested?

A. To my knowledge three positions were tested. Two outboard locations and one center location in the radiator area plus what we call a ride along at different areas in the front area like a little bit above or a little bit below the radiator, hood latch location.

Q. You might have for example, a sensor position here and you will have a sensor there and you might even put one on top of it?

A. Yes, close to it or somewhat nearby.

Q. Well, in this case how many actual sensor positions were actually tested during these crash tests for the three up front sensors and I thought you said three?

A. Yes, there were three up front sensors. Those were the primary locations that were tested, but at the prototype stage they may have monitored other locations.

Q. That's what I am trying to figure out. How many alternative positions were tested?

A. Well, I think there were -- I have seen some early development reports where there were ride along sensors a little above or below the radiator area. But not too for from that general vicinity. So the general vicinity of the radiator was still the same.

Q. Thank you. That was Ford's choice as to the number of different possible locations up front that you could put those sensors?

A. Yes, I would agree with that.

Q. So if it comes back, calibration comes

back and it says you know what, we are firing this in a case where we don't want to fire it, we are doing it because we want to be able to fire in this one, and if we don't let it fire here it is going to have -- it won't fire here and this is important. You get a situation like that, one of the things you could have done is to go and look at other sensor positions and what that data showed and then run that back through the calibrations and maybe you could find a better system that would do both, not deploy when you don't need it and deploy it when you do. Isn't that an option?

A. That is an option only when the calibration separation is too much. But if the calibration signals are close to one another, then it would not make much benefit to look for alternate locations.

Q. But if you have only tested three locations and those are the three you are going to use ultimately, either in the single or two, you really don't have an alternate to go look at?

A. Well, yes. And if those three satisfy the existing conditions what's the point in looking at the alternate?

Q. If they don't, then you have to make an

exception and allow an airbag to deploy in a 20 mile per hour 30 degree barrier crash that the person doesn't need?

A. Well, 25 mile per hour 30 degree barrier was not an exception for belted stage one.

Q. Yes. It wasn't?

A. There is an exception. You are talking about front. It was not an exception.

Q. I am sorry. We are talking about 25 mile per hour, yes.

A. Yes, 25 mile per hour front angle.

Q. Front angle. And your memory is that yesterday we looked at that and it was that the target was not -- to not fire?

A. The initial target was not to fire.

Q. So once again, we are going back to the initial target and that's why we are talking about exceptions. We certainly wouldn't be talking about exceptions if it did meet the initial target, right?

A. Correct. And that exception is a separate location in the calibration report that calls out exceptions.

Q. It's in there?

A. Yes. And this 25 mile per hour front

angle barrier is not listed characteristically as an exception. That's because the overall system is deemed optimized, that's why.

Q. I think we have said that in different ways. But the point is it is not for them, it is for someone else. It is for a different crash?

A. Yes. And my answer to that was you cannot separate the crashes.

Q. So my point is that if in order to keep from accepting non-deployment that you don't -- if instead of accepting a deployment in a crash if you do not want the airbag to deploy and if you have other places that you have tested up front, alternative places that you have tested to put the sensors up front, you could go to those and may possibly find a way to make the thing actually work across the board, yes?

A. Yeah, and you are now extrapolating into architectural issues. I don't see that here at all.

Q. You talked about regulations including the Federal Motor Vehicle Safety Standards; is that correct?

A. Yes.

Q. I want to make sure that you don't want

the jury to think that if you pass the Federal Motor Vehicle Safety Standards your car is not defective?

A. Well --

MR. GLADD: Objection, Your Honor. That is outside the scope of what he talked about, passing regulations, outside the scope of direct.

THE COURT: Overruled. Go ahead.

THE WITNESS: Well, the federal -- you have to comply with those standards to meet -- to sell the vehicles in the market.

BY MR. VAN GAASBECK:

Q. Right. But you're not here to say that if it passes the Federal Motor Vehicle Safety Standards it's not defective?

A. No, that's not my opinion here.

Q. Okay. No additional crash tests were performed when they -- in order to determine whether or not to make an exception in response to the soft target goal not being met?

A. Yes. That's why we do more simulation. Now we have the primary data. We can take it to the sled test. We can take it to computer simulation.

Q. I think you were looking at -- showing

you 15979 crash test; do you recall that?

A. That's the front angle, right?

Q. I think so. I think 15979 and it appears to be a left barrier. I was hoping you knew which one it was. 15797. Thank you. It's a calibration. Which one is that?

MR. GLADD: 25.

Q. That's the 90 degree barrier?

A. Okay.

Q. Do you have it?

A. I have not memorized the number. I will take your word for it.

Q. All right. Can I ask you if you can tell us whether or not that the airbag in that was actually fired by the sensors?

A. No. Many of these early tests were fired remotely because the calibration is not available. It is this data that is gathered and taken back and we use this data to calibrate. The airbags will be fired remotely based on the engineers decision, the teams decision so that as I said the crash is done for multiple purposes. It is run in parallel. Teams are running in parallel. And they do it for multiple purposes. You can fire the airbag remotely without the calibration.

Q. So in this case when you crash this and the airbag comes out, the airbag is not coming out because it is told to by the sensors, or even in a time that it would be told to by the sensors, it's coming out by a predetermined preset just basically programmed in when it is going to fire?

A. Correct. And that is the standard industry practice.

Q. I understand that. I don't think that you're -- that that's fooling anybody. It's whether or not --

A. No, no. It is fired remotely I agree with you and it is not a sensor in the vehicle. At that time the sensor is still being designed. It is not a sensor having it to deploy.

Q. When we start looking at whether or not the occupant kinematics are right and bag deployment is right and all that, we really need to look at the time when it actually did fire?

A. Correct.

Q. So let's see if we can look at it for a second. Can we go ahead and activate my screen? So what I have keyed up the portion of it which is closest to the passenger and you have selected a crash test that has -- is that a five percent

female?

A. Appears to be, but -- appears to be.

Q. Okay. Do you have your test report?

A. I don't have it in front of me. I just have this. I don't have it with me at the stand now.

Q. If there's anything that you need to look at in the report I have no problem you telling me I need to see the report.

A. Okay. Thank you.

Q. I need to -- so I'm going to try to make it go forward a bit from the angle of the position of now. What are we seeing here?

A. We see the very initial stages of airbag. You see the time, 28 milliseconds, and you see the bag coming out.

Q. Let's go all the way to the other side. Do you see?

A. That's the driver side.

Q. Actually the driver's side appears to be further along in the deployment than the passenger side, that little green dot I put there; is that right?

A. Appears to be, but the camera is not square to where it is and you have -- the big

differences if I may --

THE COURT: The question was did it appear to be, okay? Yes or no.

THE WITNESS: Yes, it appears to be, but depends on the placement of where it is out there.

THE COURT: Next question.

BY MR. VAN GAASBECK:

Q. You would agree, though, that driver airbag usually goes quicker than the passenger airbag?

A. Yes, because it is a smaller volume, but you cannot confuse that as placed in the vehicle. The passenger bag is further front of the vehicle because of the IP.

Q. Thank you. So am I looking at right here, the passenger bag?

A. Yes. You have marked it.

Q. Okay. So what I want to look at is how far -- how close to the face in this crash test that bag gets. Are you ready for me to move it?

A. Please. You are asking the questions.

Q. Gets to the face?

A. Yes, but you are seeing the side panel here cover the side of the face. It's appearing up

to the face.

Q. Yes. You can't see the center part?

A. Yes. There is an over the shoulder view you will be able to see it clear.

Q. So do you think that this bag is hitting -- you don't think the bag is hitting this person in the face?

A. It may be. I can't tell. But this dummy or this test dummy is sitting full forward in the seating position. It is not sitting mid or rear.

Q. And in the car that Mr. Newbern was in sometimes a woman can sit in it, that's a fifth percentile female and sits close to it also, right?

A. Full forward, yes. That's why you have the seat track and bag contact the face. Doesn't mean that the bag is hitting the face. And it depends on loading the face. That's what it is. It is unfolding on top of the face.

Q. So if you deploy the bag for a fifth percentile female in this crash, looks pretty much like they are going to get hit in the face?

A. Well, it is going to load the head for sure and it is desired in occupant kinematics to load the head first because you have to stabilize

the neck during the crash process. You have to catch the head to make sure that the neck forces are also low in the crash. That is part of the occupant kinematics.

Q. But you don't want to subject anybody to be hit in the face by an airbag if you don't have to? If the airbag would not have helped them you don't want to do that to them, do you?

A. No, I would disagree with that.

Q. You would want to do that to them even if it didn't help?

A. Yes, because I don't agree with the fact that this is hitting a face.

Q. Let's assume it is just for the moment. Would you agree with me that you do not want to deploy an airbag for somebody that doesn't need it that might actually hit them in the face when it deploys in a normal seated position?

A. In a normal seated position which means are you sitting full forward or full back?

Q. Any normal seated position a human being is likely to be in, which includes a fifth percentile female, a teenager, a tall man, short man, whatever, you don't want to deploy it if that can hit them at the beginning, right, at the

beginning as it punches out?

A. Yes. And this is not punch out.

Q. I understand that punch. You have a term for punch out, which I agree. But I'm talking about -- you sat in during our opening statements; is that correct?

A. Yes.

Q. So you see where I discussed the point that airbag moves forward towards somebody initially as it starts to deploy as it is filling, trying to get out there quickly and then pulls back to the cushion?

A. Yes, because it is tethered.

Q. That's not an area that you want anybody to be in when the airbag deploys?

A. Yes. And that's why it is filling sideways.

Q. One thing that didn't happen in this crash is nobody put the brakes on, right?

A. I don't think so, but you got to ask the reconstruction expert.

Q. In this crash test?

A. In the crash test. Yes. This is going right into the wall. There's no braking here.

Q. So does Ford have an opinion what

happens if somebody is driving 25 miles an hour and your brakes are put on, what happens to their bodies?

A. Their bodies would move forward because you are braking, but at the same time your seat belt is also going to lock because of the brake and it's going to hold you back.

Q. Well, it's going to hold the chest back?

A. It will hold the chest back.

Q. But your head will still come forward?

A. Your head will swing based on your neck trajectory.

Q. Right. So a head can actually be closer because of braking than one who is not to the airbag as it deploys?

A. Yes. The neck is going to come forward. The head is going to come further forward than the chest.

Q. As you said you are supposed to be designing these for a whole set of people --

A. Yes.

Q. -- in the car. I believe you were talking about eight mile an hour crash, kind of seemed to me like a crash, it's a crash test where

we are basically hitting an undercarriage. Now, there's a bunch of sensors that are placed in these vehicles when you are doing testing, some of them are actually on engine mounts?

A. Correct. On the engine mount area.

Q. So when they ran that eight mile an hour and you got 34 Gs on it, that was even -- that's 34 Gs when it hits the engine mount, right?

A. I don't think it hits the engine mount. It hits the cradle on which the engine is supported.

Q. And do you know -- sometimes we misuse the term mount, but the cradle is actually the thing that the engines sits right on?

A. You could say that.

Q. So it's actually hitting the cradle where there are sensors?

A. That could be.

Q. The reason I ask that is that that was I believe you said 34 Gs?

A. 46, depending on -- 34 Gs positive, 46 Gs negative.

Q. 46 deceleration. Okay. Thank you. That's a non-deployment?

A. Right. That's why the point was we

cannot use the Gs alone.

Q. Well, you can use the Gs to say you don't deploy it in that, right?

A. No, you cannot use Gs alone. That was the point.

Q. Well, what were the Gs in the crash that Mr. Newbern was in?

A. Well, that was 23 Gs. That's why you cannot use the Gs to calibrate the entire system.

Q. Not the entire system, but there's only two pieces of information that go in? Aside from the belt sensor there is two items of information, deceleration and time?

A. Yes, but deceleration and time are not the only deciding factors. As I said yesterday, the right quantity from these Gs and time which help us make decisions.

Q. So the two factors that we look at are Gs and time?

A. That is the first gathered fact, yes.

Q. I notice that you had this offset and you call it IIHS crash test. That's because IIHS actually has its own standards and if you don't meet it Ford will not get a good rating with them; is that right?

A. They have their own internal rating, yes.

Q. And in that one they are only looking at a belted driver; is that right?

A. Correct.

Q. When I looked at the test where you actually crashed the test -- crashed the car into that deformable barrier, I looked for a passenger in it.

A. There is no passenger in that test protocol.

Q. It is not required by IIHS, right?

A. Correct.

Q. Because they only test for the driver?

A. Yes.

Q. Why didn't Ford get more information about how this system works, put another instrument dummy right there in this seat?

A. Well, we developed it for that standard protocol. We do another test at 25 miles per hour which is a government test and that we place both driver and passenger in those tests.

Q. Well, did Mr. Newbern -- talking about airbags and whether they are needed, when they are needed and all that. You also took part in a sled

test that had our decelerations in it. Would you agree that that sled test shows that airbag was not needed for Mr. Newbern?

A. No. How can I say it is not needed because what if you're sitting somewhat closer to that seat track?

Q. Well, sir, will you shut my screen off.

MR. GLADD: I have an objection, Your Honor. This would be outside the scope of the direct regarding --

THE COURT: I don't know what he's bringing up.

MR. VAN GAASBECK: I am bringing up the sled test that they ran that duplicates this crash.

THE COURT: I don't think you went into that on cross.

MR. VAN GAASBECK: Your Honor, my thought was is that's talking about the 25 mile an hour.

THE COURT: Well, you didn't go into it on cross.

MR. VAN GAASBECK: Okay. Then I won't. I will not, sir.

THE COURT: Okay.

BY MR. VAN GAASBECK:

Q. I just want to after all the testimony that you have given in answer to Mr. Gladd's questions, I want to be sure, though, do you still agree that Ford has the technology to make sure that airbags don't deploy when they are not supposed to?

A. Yes. That's this technology.

Q. And it had it for the 2009 Ford?

A. Yes.

Q. And the Ford Focus?

A. Yes.

Q. And do you agree that Ford has a responsibility to provide safe sensing devices, I mean occupant restraint devices in its vehicles?

A. I do.

Q. So after this -- all the calibrations have been done and it has all been -- the exceptions have been made and all that, do you agree that according to your own policy in the test that you are trying to do, do you agree that you do not want to deploy an airbag when it is not necessary and when you do you would not want to deploy it late?

A. Yes. That is the consideration here.

Q. Would it be unreasonably dangerous to

provide a person with a system that will deploy airbags when they are not needed?

A. Yes. Depends on the occupant kinematics.

Q. And also to deploy one late, that would be unreasonably dangerous?

A. Yes. And you got to look at the occupant kinematics.

MR. VAN GAASBECK: Thank you.

THE COURT: You may step down. Thank you very much.

Madam forelady, ladies and gentlemen of the jury, it's 1:15. If you will be back in the jury room at 2:45 we will get started at that time. Thank you so very much. Please don't discuss the case. I don't know how wet it is, may be very wet. So we will see you in a little while.

(Thereupon, the jury exited the courtroom at 1:19 p.m.)

MR. CARTER: Your Honor, we have an issue I need to bring to your attention and ask for some guidelines. I believe the next witness is going to be Paul Lewis who is the biomechanic and injury causation witness. The issue that we have, the question that we have is they have not put the

THE COURT: Thank you very much.

PAUL LEWIS

having been duly sworn, testifies as follows:

THE CLERK: Please state your first and last and spell your last name loudly and clearly into the microphone.

THE WITNESS: Paul Lewis, L-E-W-I-S, Jr.

DIRECT EXAMINATION

BY MR. VAN GAASBECK:

Q. Good afternoon.

A. Good afternoon.

Q. Mr. Lewis, I'd like to ask you a few questions initially about your background and what you are here for. Are you associated with any particular profession?

A. Well, I'm a biomechanical engineer.

Q. What is a biomechanical engineer?

A. What I do is I basically do what they call injury causation analysis. So I essentially look at people who are injured in car crashes, basically all kind of traumatic events, whether it is cars, planes, motorcycles, bicycles, UTV's, anything like that and what I do is I look at the injuries that the people have, the environment that

they're in and basically the forces that are involved or the dynamics of the crash and how that may lead to a particular pattern of injury or how that may be prevented.

Q. What's your educational background?

A. I have an undergraduate degree from the University of Alabama in industrial engineering. I have a master's degree in biomedical engineering where I studied what's called biomechanics which essentially is the same thing as looking at injury causation issues. There are other fields that are within that that you can look at where you have people that are designing the actual materials so like your hips, knees, dental implants, all those type of things are people who are designing say the drug delivery system so when you have catheters or MRI machines, CT machines, so mine was looking at injury causation.

Q. How long have you been a biomechanical engineer?

A. Well, I received my master's in 1995. And then after that I was working full time while I was going to graduate school and then I began a two-year internship with the medical examiner's office in Gwinette, Georgia which is basically all

the surrounding areas of metropolitan Atlanta. So while I was doing that I was helping with the investigation of various death scenes whether they were homicides, suicide, going to automobile crashes and helping remove the bodies from the cars. I would also help assist in doing the autopsies with the pathologist where basically depending on what type of traumatic event it was, determining what those injuries were that these people sustained as a result of that.

Q. How did the experience as a medical examiner -- in the medical examiner's office doing the things that you did help you in your profession then as a biomechanics engineer?

A. Well, obviously it gave me an additional understanding because we were basically opening the bodies up. So I got to see firsthand truly what various injuries looked like as a result of anything from car wrecks, electrocutions, stab wounds, pedestrians being run over, gunshot wounds, so it gave you a firsthand knowledge of what that is and also it taught you a lot about injury pattern interpretation which is essentially part of what we do when we are looking at people that have a pattern or spectrum of injuries of how that

actually happened or basically the ways that they can happen or can't happen. So kind of also helping you to rule out things.

Q. So actually in the circumstances that you had professionally you were able to look at a particular incident and you would know facts about that incident that would help you then actually correlate what you're looking at to various types of forces?

A. Correct. You are doing basically a forensic analysis looking at that. And a lot of the time we would also have the police help with doing reconstruction of the scenes whether they may be car wrecks or homicides, so again working with other scientists and all to try and basically put the whole puzzle together.

Q. How does that help you in being able to differentiate between differing opinions as to how something occurred? What would you do if you had different opinions that were presented to you and utilizing your experience and your training, what type of things would you do? How would you evaluate them?

A. Well, I mean part of it if you are looking at a case like this we got -- you have to

have an understanding of what the crash was, what the dynamics or you may have heard already Delta-v or severity of the crash, looking at the speed change that the vehicle may undergo, looking at the PDOF which is the principal direction of forces. So that means that angle that it is occurring. All that gives you an idea of what you may expect as far as injuries the person might sustain. Or more importantly injuries that you wouldn't expect them to sustain based on those parameters and assuming that certain features of the vehicle worked appropriately such as the seats, the seatbelts, the airbags, basically the crash worthiness or structure of the vehicle. So knowing what their particular level of injuries are, that generally gives you the certain mechanics of how that can occur.

Q. Can an injury tell you about itself, how it occurred? Is it possible to learn something from the injury itself without knowing anything else about it?

A. Well, certainly I mean part of what we have to do is look at the causation, you got to have an understanding of what the actual injury is. Because in and of itself the injury tells you that

there has to be a certain means of loading to the body in order to cause that injury. And you have to figure out how they were able to be able to do that type of loading or that load path to their body part to do that.

Q. At some point did you then after I guess you graduated from one of these schools, did you start working professionally as a biomechanic?

A. I did, yes, sir.

Q. And can you explain about that a little bit?

A. Sure. After I did the internship and worked with the medical examiner's office I went to work for a company called Burton and Associates which was a consulting firm in Alpharetta, Georgia, which is again another suburb of the Atlanta, Georgia area. With them I was involved with all kind of biomechanical investigations. Back then there may have been some cases that involved criminal type of incidences to try and determine. We also ran a lot of car sled tests, spit tests, different things looking at evaluating dummies and the forces on them and how they may have been injured.

Q. How long did you do that with Burton?

A. I did that probably for around 15 to 17 years.

Q. Was Dr. Burton also a medical examiner?

A. He was the chief forensic pathologist for all those counties.

Q. While you were with Dr. Burton did you learn anything from him?

A. Well, certainly. I learned a lot about as far as wound interpretations, looking at basically anything as far as cause and manner of death essentially. The injuries to the majority of the people that we are dealing with as the medical examiner had unfortunately sustained fatal injuries. But we also evaluated a lot of child abuse cases which obviously weren't fatalities. So obviously taught me a lot about learning what various injuries are and looking at different wound patterns and what they may be.

Q. Are you with Dr. Burton at this time?

A. No, I'm not.

Q. Did you move on to your own profession?

A. I did.

Q. Your own practice?

A. I did. So I've had my own company for about five years now basically doing the same types

investigation that I do now or used to do.

Q. What's the name of that?

A. It is called Bioforensic Consulting.

Q. Thank you. Have you written any papers or publications in your field?

A. Yes, sir, I have.

Q. I have a list here. Any related directly just to airbags themselves?

A. I have a couple of papers that I have written that deal with looking at airbags and airbag injuries or potential I guess you would say.

Q. Thank you. Do you have -- have you written about basically analyzing any aspects of vehicle crashes and their effects on bodies?

THE COURT: Does anybody have any objection to Mr. Lewis's qualifications?

MR. CARTER: I haven't heard what he is offered as.

MR. VAN GAASBECK: Biomechanics expert.

MR. CARTER: Biomechanics, no, sir.

THE COURT: Thank you very much. Court so finds.

BY MR. VAN GAASBECK:

Q. What type of tools do you have available to yourself that you can go to to help in

some of your investigations involving for example, vehicle type of incidents?

A. Well, I mean we have -- a lot of times we have crash tests that are available that cars have been crash tested a number of times and depending on which direction it is. I use forensic textbooks looking at injury patterns. There's a lot of articles and different literature that's written about injuries and their causation. I do vehicle inspections so I go look at the subject vehicle and look for what we call witness marks or places where maybe the bodies have interacted with the inside of the car. Look at the seat belts, see if they have been worn or not. Obviously in this case looking at airbags.

And then we also at times do what we call surrogate studies as well which we take a car that's not been deformed, we take somebody that's similar height and weight as what the injured person is and we put them in a vehicle and try to evaluate what I call spacial relationships. So looking at how they fit in the car and what they may be in proximity to, kind of how the belt fits them and all to help as far as looking at them. Taking the reconstruction and knowing the

directions that they may be moving, what they may or may not encounter.

Q. Is an accident reconstruction something that's relied upon by experts in your field to aid in forming the opinions that you might come to in a particular case?

A. Yes.

Q. And is that generally the case in your field and other biomechanics experts?

A. Yes, it is. They have a -- their area of specialty so to speak, their expertise is where they are looking at the vehicle and the dynamics and able to translate that to us as what the crash forces on the car and the directions are.

Q. Where can you obtain that information then from the expert? What methods do you have of obtaining the information that you need that you can rely upon to form your opinions?

A. Well, usually it comes from a variety of places. Lot of times we either have disclosures, we have reports, and/or depositions as well.

Q. In this case have you read depositions?

A. There have been depositions taken, yes.

Q. Is there anything -- I guess I would

like to actually ask you how is it that you became familiar with the case that you are on today.

A. Well, I received a phone call like I always do that somebody called and said they had a case where somebody was injured and they basically wanted me to look at it and try to determine how the injuries occurred and potentially how they could have been mitigated or basically eliminated.

Q. And in this case do you recall who it was that called you or what office called you?

A. Yes, it was Mr. Bodiford's office or Bodiford law firm.

Q. Do you know that he had to leave? Your Honor, may we explain?

THE COURT: Ladies and gentlemen, Mr. Bodiford had some medical problems and that's the reason he is not here. He fell this morning and so I have excused him for the day or until he feels better. Not that he doesn't want to be here. He was ill so I excused him.

BY MR. VAN GAASBECK:

Q. Thank you, Your Honor. How long have you been retained if you can recall by Mr. Bodiford's office?

A. Well, I think counting this case I'm

going to say about four times I think.

Q. Over how many years if you can recall?

A. I would say probably over maybe the last three years, maybe four years, something like that.

Q. And have I ever retained you?

A. I don't believe so, no, sir.

Q. I came into the case after you. So let me ask you, there's some things that you have done and took part in that I don't have complete familiarity with. But when you first received the information about the case, what were the concerns or interests that they asked you to address?

A. Well, it was first looking at basically the cause or the manner in which the injury to Mr. Newbern's eye occurred and how that occurred and then ultimately that turned into looking at to whether it was an injury via blunt mechanism of somehow there was some type of sharp object or something that caused a penetrating wound to it that ultimately is what caused the loss of the eye.

Q. So in trying to differentiate between that what type of things did you do?

A. Well, basically going to the medical records and getting an understanding of what

exactly the various descriptions of the different injuries that he had sustained as a result of this particular crash were.

Q. And if I were to ask you about what percentage of the work that you did on this case was related to addressing the allegation that a glass shard penetrated his eye can you tell us what that would have been?

A. I would say that was the majority of the focus because it was looking at whether there was another mechanism other than basically blunt trauma to it.

Q. During opening statements for this case we learned for the first time that --

MR. CARTER: Your Honor, objection to this reference to opening statements. It's not evidence.

THE COURT: Just don't lead the witness. Ask questions. Don't edify, just ask questions.

BY MR. VAN GAASBECK:

Q. At any time -- when is the first time that you learned that Ford was no longer claiming that a glass shard caused the eye injury?

A. I would say just in the past couple of

days.

Q. So sorry you did all that work, but let me ask you anyway just so that it doesn't come back, did you do the work that was necessary to form the opinion as whether or not this injury was caused by a penetrating piece of glass or by blunt trauma?

A. Yes.

Q. By reasonable biomechanical engineering certainties can you say which one it is?

A. Yes, sir, I can.

Q. What is that?

A. That it is definitely an injury that is a result of blunt trauma, that there are two different injuries so to speak that obviously are related to the blunt trauma and there is no evidence of any type of penetrating trauma or any what I would say any residue or any type of residual deposit of any type of substance that could have caused the penetration.

Q. With that particular -- let's leave aside what your initial direction was and ask you then what is it that you decided needed to be done? What steps did you think needed to be done then in order to form your opinions and also to provide an

evaluation of how this injury actually occurred?

A. Well, again, primarily I had to gain a better understanding of exactly what the totality of the injury was and actually there were multiple injuries. So there were both injuries not only to the bony portion of his eye and nose, there was also actual injury to the eyelid and the actual eye itself. So getting an understanding of that and then obviously looking at what else, when looking at the vehicle itself, looking to see if there was any potential for anything of that nature. So when you are looking at this car basically effectively all the windows were intact so we had airbags on the side. We had windows that were intact. There was some fracturing to the front windshield, but that is from the module cover or when the airbag deployed. That's typical that it flips up and it causes the fracture of that.

And then a part of the work would be looking at the surrogate study to see basically what else there could be in the vehicle that might in any way potentially be the cause of that blunt trauma to his right side of his face.

Q. Was there -- aside from the facial injury, was there any other injury that you

considered?

A. Yes. He did have another injury which was he had a sternal fracture. So basically he had a fracture to the center of his chest where the ribs come together. There were a couple of other what I call minor injuries or superficial injuries so he had a little small cut or laceration. He had an abrasion as well, then he had a couple of bruises on his thighs as well. Other than that, obviously the injury around the right part of his eye was the main or most severe injury that he had.

Q. What do you attribute the bruises on the thigh to in your experience and training?

A. Well, given there's really nothing that can interact with it other than potentially the airbag, the seat belt would be posterior or back behind the thighs. So it was described as his thigh so in this crash there shouldn't be something that would be causing him to move backwards relative to the lap belt which rear impact that could be a cause of it depending upon how your seat moves.

Q. So in a front impact injuries to the thighs without some unusual -- I suppose we can find some unusual thing in the car that might cause

that, might be something laying on the dash or --

MR. CARTER: Objection, leading, Your Honor.

THE COURT: Go ahead. What's the question and I'll rule. I haven't heard all the question yet.

BY MR. VAN GAASBECK:

Q. There might be other things in the car that could explain this thigh bruising? What did you do in order to determine what actually would be in that vehicle that might explain that?

THE COURT: Do you have an objection?

MR. CARTER: Not to the way he asked he it that time.

THE WITNESS: Well, I would say that as far as I understand through the deposition testimony there was not anything that was in his lap or anything around. So as far as I know, there's nothing that necessarily would be loose that would be moving around. Frankly that's -- I mean typically otherwise on a thigh contusion would be more likely a rear impact when you are sliding behind the lap belt.

BY MR. VAN GAASBECK:

Q. So when you eliminate as much as you

can from being the cause of these bruises to his thigh, what are you left with?

A. Well, again, there's only one other thing that's basically in front of him. I know that his seat belt system can't bruise, so we got a fracture that's in the middle of his chest so essentially we are looking at these two different things basically could cause that. So that's going to be either seat belt or the airbag, which the airbag has to come over portions of the legs to get anywhere close to the head and chest.

Q. By reasonable biomechanical certainties what is most probably then the cause of the injuries to the thighs?

A. I would say at this point in time given any other information that it seems like the most reasonable or probable explanation.

Q. Thank you. And then you talked about a chest injury. Could you elaborate, please, on that?

A. Well, like I said he has got a sternal fracture. Some of the comments talk about it is comminuted, which means instead of just one line of crack, means it's got multiple bone fractures to it so it means like a bunch of little fractures within

a fracture.

Q. Where is the sternum?

A. Basically the center of your chest, right up in here, so starts right about where you start feeling the soft point which is the xyphoid process and it extends up. So that's basically where all your ribs come together.

Q. So that is the connection area we see on like a skeleton for the ribs?

A. Correct. Your ribs insert both in the back of your vertebral bodies and they come around to the front to the sternum.

Q. What do you look at to determine whether or not the sternum was -- what broke it?

A. Well, again, there's only for this particular crash really only two possible mechanisms. That would be the seat belt that is transversing or going from his right shoulder across to his left hip, that would be coming across a portion of the sternum, or the only other would be some type of blunt trauma to the center of his chest.

Q. And in the factual situation that we have, what mechanisms do we have, what objects do we have that could apply the brunt force trauma to

his chest?

A. That's what I said it would be, the only two possible candidates would be the seat belt and the airbag.

Q. Thank you. That's it. So then you looked at, you evaluated the injuries themselves from I guess medical records. What would be the next step?

A. Well, then again, so we start looking at what possibly could be around or what could cause those injuries. So once we know there's a certain type of injury we've got to look for what are the possible mechanisms. And essentially in this case there's no way the seat belt could create the blunt trauma to the head. The type of injury that it is is one that we have seen before and has been I guess written about as well, eye injuries that are associated with airbag interaction.

So based on the evidence that we had at the time and the pattern of the injury, it appears that the airbag is basically the only other candidate that can be there.

Q. As far as injuries to eyes by airbags, is that something that's known in medical biomechanics circles?

A. Yes.

Q. Can you give us a little idea of how long it has been known or how we have learned about it?

A. I would say probably since the airbags were first being introduced or designed or developed.

Q. Then when we look at an airbag and how it might cause an injury to an eye, what way -- how does it interact with an eye to create certain types of -- is there anything we can look at and say it's helpful in differentiating what caused the injury?

A. Well, obviously it's got to be -- there can be a couple of different ways. Part of it can be if you are right where the module is so as soon as it opens up it's called punch out. So you can see injuries that are from that if you are that close. There is other ways that basically the bag when it's still filling still kind of effectively actively punching but still moving that you can get effectively slap injuries that are associated with that because you're still within the deployment range so to speak or within the deployment envelope. You are still instead of receiving a

fully flat bag, what you are supposed to do or what hopefully they are designed to do you are catching it before it is still fully inflated.

Q. And before it's fully inflated and it's not back in that cushion shape what's going on in that bag?

A. Well, I mean these particular bags they use the windshield to help it form its shape. This one actually when it starts coming out that's why the module cover fractures the windshield and it uses and comes up and then out and then ultimately down. So it's basically following the what we call a longitudinal or horizontal trajectory and ultimately goes down to where it starts filling the vertical where you get then the full face.

Q. And then as it is coming out of the module and gets past those first four or five, six, seven inches but still extending toward the occupant is there any particular identifiable shape it takes or is there anything that's what it looks like or does it change?

A. Well, I mean you can see kind of a line of it as it is coming out and pushing toward where the occupant is. So you can see kind of a line that it has, then ultimately you can see the bottom

end starts to punch down.

Q. Is there any motion that goes on? Can you tell us any motion actually going on in the bag that you might look at and can see that the bag is not completely uniform while it's coming out?

A. Well, I mean you can kind of look at the trajectories. Sometimes there are things about the fold patterns that also help distinguish some of the trajectory that it has.

Q. I might show you a little later on a video and might point to some areas and ask you if you can explain what's going on in this. I'm going to move on for a moment if you don't mind. I would like to get more of your methodology. Did you ever visit then the vehicle at any time?

A. Well, I did both a vehicle inspection and then ultimately I went back and did look at the car again, doing a surrogate study which actually used Mr. Newbern instead of somebody else.

Q. Is a vehicle inspection just going over there taking a look at and seeing well, there's damage here? Is there anything more to it than that?

A. Well, you are trying to document the evidence that's there so you looking at the

deformation of the vehicle. Again a lot of times I am looking to see if people are wearing their seat belts or not. So I am looking at what the belts look like and what kind of deformation is on those. So to kind of confirm somebody is wearing their belt and again I look to see if there is places that maybe they hit their heads or knees or other body parts that either may explain some other injury or not that they may have in the totality of whatever injuries they sustained.

Q. Did you have -- were you able to form any opinion after looking at the seat belt and whatever it is that you look at on the seat belt to determine whether or not -- confirm Mr. Newbern was actually wearing a seat belt as reported?

A. I did, yes.

Q. Did you form an opinion then as to that?

A. Yes.

Q. And by reasonable certainties in your profession, biomechanical engineering, can you state that that was most probably the case?

A. More than probable. Absolutely he was utilizing the seat belt as well as Mrs. Newbern. They both showed what I would say is obvious

forensic evidence that it was being utilized.

Q. Is there something else in the vehicle inspection that I addressed that might help us understand your methodology or should I move on to other places?

A. I mean it's pretty obvious they are belted plus there's other avenues that tell us they are belted.

Q. Did you inspect the airbags itself?

A. I did, yes.

Q. And what did you note there?

A. Well, for Mr. Newbern's I noted that there was a number of areas called blood spatter. So there were multiple droplets of blood that were basically all on different portions of the face of the airbags. So some of them had some horizontal look to them, some more just what we call more droplets or gravitational where is it just sitting near it and dripping. So there was a number of blood spatter. There was also along the center console a lot of blood spatter and there was even some up on the rear view mirror as well. And I am sorry, also, on his seat cushion near the inboard edge of the seat cushion by the console.

Q. Was there anything else in your

inspection that you needed to look at or that made a difference in your opinions or your evaluations or advanced your investigation?

A. No, I think just, you know, from the belt examination and then again there was no belt damage anywhere around his occupant area that showed any kind of contact by any part of his body, whether it was his legs, arms or whatnot.

Q. Thank you. I want to grab an exhibit that's been used. I have been trying to find this. Plaintiff's Exhibit 268. So 268. Is there any blood spatter there?

A. Well, effectively all that is spatter. You have got some that's got a little more directionality than the others. So these here and here actually have more tails. Also that means that they got a little more difference of a directionality going. Some of these others that are just more like the drops, those are a little bit more either just there's no angulation so to speak of the surface that it is going to. So these are more that the face is there and the blood is going straight out whereas these others it's either at somewhat of an angle one way or the other. That's what you get when the blood hits and

continues to travel and that's why you get the tails.

Q. Thank you. You found the clear button?

A. I did.

Q. So then you examined the airbag itself and then as far as work at the vehicle is there anything else that you noted that we need to know about?

A. In just the vehicle? No, sir, I think that's it. Again, I took a bunch of photographs of the seat belt and all its hardware.

Q. What was the next step then that you took in your methodology?

A. Well, then I went back and that's when I did -- looked at the exemplar, did the surrogate study.

Q. I will be using an exhibit.

THE COURT: What number?

MR. VAN GAASBECK: It's 265. They gave me a copy for the court.

THE COURT: Any objection to 265?

MR. CARTER: No objection, Your Honor.

THE COURT: 265 admitted without objection.

(PLF. EXH. 265 in evidence.)

BY MR. VAN GAASBECK:

Q. What is that surrogate study that you did? I know it wasn't really a surrogate, but can you tell us what that surrogate study is?

A. Well, again, it's typically we have the subject vehicle has been crashed so a lot of times there could be deformation and damage to the occupant area. In this particular case the actual what we call survival space or the car itself was well maintained as far as no loss of space where Mr. Newbern was. So we look at the exemplar car, but we also look -- use the actual subject vehicle in this case as well. We took Mr. Newbern and placed him in there because that vehicle actually already had the airbag deployed. We put the seat belt on him and so then we could kind of look at how much belt there is, his proximity to the airbag, and how much -- how the belt and his body movements could get relative to the airbag.

Q. So in order to do that, when you do that, what is it that you're looking for? Is there anything in particular that you are looking for or you initially just get a general idea of what is actually happening in the car?

A. Well, sometimes you actually have

heavier marks that may be on the belt that you can actually even tie in a little better. This one had -- even though there was obvious use marks on the latch plate itself, there was not some other evidence that sometimes we see in other systems. Part of that is just because this one had a really hard metal surface. There wasn't any plastic to melt or abrade like is it on the latch plate. So the latch plate actually had real good evidence because it can build friction and create melting of that. Sometimes you can use this to actually tie in and line up additional marks that may be on the belt if they are present.

Q. What is the latch plate?

A. The latch plate is the part that you actually stick into the buckle so that the D ring I'm talking about is where you pull from if you're driving your left shoulder back down, but it's where the belt typically attaches up on the outside.

Q. Did you do a surrogate study then?

A. We did, using the actual crash vehicle.

Q. And also the actual crash person?

A. That's correct.

Q. And that's not always are you able to

do that, but in this case you were?

A. That's correct.

Q. So what -- I don't know if there is any -- I guess begin the process of a surrogate study, then I guess with the surrogate?

A. Well, typically what you do is you are going to document the height and weight and depending on what type of case it is what you're looking at maybe some other measurements for basically their body measurements. So typically what you want to do is you want to start documenting what that is.

Q. What does height and weight help you with?

A. Well, again, you are normally trying to get somebody as close as you can to whoever the actual injured individual was. In this particular case, we actually had Mr. Newbern so there was a little bit of a weight difference, but obviously he is not going to grow any more, so he was still the same height as what he was.

Q. Thank you. Once you actually measured -- you got the measurements of your surrogate and you are satisfied that they are representative of the person in the car at the time of the accident

what do you do?

A. Well, we take photos of that, then we would get them and place them in the car. Usually we try and place the seat in the same location as what we found in the subject, but in this case since we were using the subject vehicle as far as we know it was still the same and it looked to be the same measurement as when I looked at it previously when I had performed the vehicle inspection.

Q. When you put Mr. Newbern in the vehicle then what were your instructions?

A. Well, so we put tape measures around the seat belt webbing and then ask him to get in the vehicle and basically put the seat belt on so we can start making some measurements of him relative to the interior of the structure looking at where the seat belt is.

Q. And what are you looking at for that? What value is that to you? What opinions would that help you with?

A. Well, the main thing is looking at No. 1, where he is relative to again his occupant space for this particular case, you know, looking at where he is in proximity to the airbag. So

trying to look and see what his particular body movements can be and how close he can get to that relative to the seat belt and the airbag.

Q. So you did actually put him in and I guess you said that you had tape measures. What was your next step after getting him in the seat?

A. Well, then we were looking at getting basically the right side of his face in the right eye area, getting that adjacent to or near the airbag which is the area that I believe is where the injury occurred from and looking at how that related to his seated position.

Q. Did you take any photographs of that?

A. I did, yes.

Q. This is 265. Is there -- can you tell us what set 265 is from?

A. I believe this is looking at just we have got Mr. Newbern relative to the -- obviously the airbag is not inflated now, but relative to the airbag and looking at where he is relative to in his seat itself and obviously unlike a dummy he can articulate and doesn't have a stiff neck so he can move which we see different excursions from an occupant as compared to a dummy. So we are looking at how he potentially can move and get relative to

the airbag itself.

Q. And I think when you say different from a dummy, what is the difference in let's say the portion above your shoulder between a dummy that might be used say in a sled test and a human being?

A. Well, the dummy number one doesn't really bend or articulare much at the pelvis. So it's pretty well fixed there so there is a little bit of motion, but not a lot. And then most importantly, there's no spine there. So that's all stiff. And then the neck itself is only five vertebrae and so even though it can read data, it still effectively doesn't have the same relative movement of the head to the top of the neck or the neck relative to the shoulder. So the dummy unless you just forcefully, you still can't pull it to this, but it's really hard if you have ever had ahold of one to try and even get the head to move relative to the neck. So it's extremely stiff compared to what the human head and neck complex is.

Q. I have seen from this photograph, pointing right here, that Mr. Newbern's back is against the seat; is that correct?

A. Yes.

Q. But his head is actually much further forward than his torso. Can you explain that?

A. Yes. I think this was the photo where actually he is basically just kind of sitting in the seat. We had asked him to lean forward.

Q. So this was a merely leaning forward?

A. Yes.

Q. So then what does that tell you?

A. Well, it's just giving you a good idea of where he can get relative to that airbag, basically depending upon the state that that airbag is or where it is in an inflation period.

Q. Well, that bag is being pulled or held out; is that right?

A. Just being held up, not being stretched in that manner.

Q. And why is it that the torso can be moved forward but doesn't move forward there and that you are not placing the torso forward, but the head is forward? Is there something about -- got a seat belt, so how come his head is not moving?

A. Well, we looked at both obviously. So the first one to see if basically there's no movement of the belt where he could get and that's without any type of belt elongation or belt stretch

of any type of activation of the system in here. So just trying to get an idea roughly what we got dynamically or where he could be relative to that with effectively no seat belt out.

Q. And without -- I assume there's no dynamics from a collision going on -- operating upon the occupant?

A. No, there's not.

Q. You are not trying to replicate what it would look like in a collision at this point or are you?

A. No, not specifically. I am just looking at how close the head and neck can get to there. He is going to have what they call body compliance so there will be compression of the tissues that can allow additional movement. The belt has the capability to stretch as well.

Q. And the bag itself, what capability does it have to stretch when it is during the opening output of the gas stage?

A. Well, it will stretch further than what ultimately the final shape is it takes on.

Q. How about in relation to what we are looking at here? Does it stretch any further than that?

A. No, I don't believe so. It will be similar close around that, it's probably going to be a little bit higher, though, when it is moving.

Q. Then, and this is as you have said the bag changes direction due to the attempt to fill it; is that correct?

A. I believe it is. Again, like I said, I did both so there's somewhere I looked where it got -- we had a few inches of belt out.

Q. Let me show you another photo excerpt and I'm going to focus in on as much as I can of that same exhibit and ask you what are these photos?

A. Well, this is now looking at where there's pulled approximately five inches of belt out from where just the normal standard position is and then again looking at the bag a little bit better we approximated what the final shape may be. Obviously it's not going to be exactly like this because it will be fully inflated. But again looking at essentially the upper part of the head relative to the airbag.

Q. So why do you add or take five inches out in this process?

A. Well, I am looking at there's going to

be between belt stretch, body compliance, this has a torsion bar that can provide its -- from my understanding it's 3,000 Newton torsion bar, means that once you put 674 pounds of load on it it will continue to pull until you no longer have the 674 pounds on it. So it will continue to payout as the crash continues and you maintain that belt load.

So what this is looking at is considering that in this particular crash you can get up to 14 or 15 inches of belt payout depending upon how you interact with the airbag. So this is trying to give a conservative look at what there may be, some of the excursion you may have referral to the airbag.

Q. Thank you. When you -- I guess what other steps or what other things during the surrogate study were you looking at that I may not have covered?

A. Well, I think that was mainly it. Looking at obviously whether he could be around the bag or not. Depending on both without any belt payout or with some what I would say fairly conservative, around five inches of belt.

Q. Okay. And that's -- I guess this is

assuming that this is an airbag deploying in a timely manner?

A. Correct.

Q. So what would be your next step in this process? Is this photograph of any value or should I take it down?

A. No, that's fine.

Q. What would be your next step?

A. Well, then basically the final is taking together what all the injuries are and type of injuries that they are and then evaluating, looking at what the most likely cause is and based on the work that I performed and information I have from others that I have determined that in all probability it's the airbag that caused the injuries to the eye socket, the nose and ultimately to eye as well.

Q. Have you had an opportunity then to see a sled test that was performed by Ford's experts and set up by Mr. Krishnaswami for this purpose?

MR. CARTER: Your Honor, objection, leading again.

THE COURT: He is not leading. He is just setting the stage before he has asked the question. Go ahead. Overruled. Go ahead.

BY MR. VAN GAASBECK:

Q. Did you have an opportunity to see that?

A. Yes, sir.

Q. And after having looked at it let me play it all the way through for you and initially let's go back and talk about it.

THE COURT: Do you have an objection?

MR. CARTER: I don't have an objection to playing it.

THE COURT: It's in evidence, isn't it?

MR. CARTER: Yes. I don't have an objection to playing it now.

BY MR. VAN GAASBECK:

Q. You can see -- so first of all, are you understanding what this is supposed to replicate, this sled test?

A. Well, it's my understanding that it's meant to be the same Delta-v as what our particular crash was and I believe supposed to be the same seat position. Now, obviously it doesn't have any of the rotation in the angulation or the PDOF that we had in our case, nor does it have any of the initial --

MR. CARTER: Your Honor, objection to

this answer. I think he's going beyond the scope of biomechanical engineering or any causation mechanism.

THE COURT: Overruled. Go ahead.

THE WITNESS: Nor does it have and we know there was basically a left-hand steer that occurred before even the crash occurred so all that has some differences in what the kinematics may be and obviously the movements of the body. But in general this is showing the path that that airbag would take and if he stays in that position where he is relative to that.

BY MR. VAN GAASBECK:

Q. So let's look at some things here. One, the neck of a dummy, can you show us where that neck is?

A. (Witness complies with request.)

Q. What's that made of?

A. Those are steel and rubber basically.

Q. And is that similar to a human neck?

A. Well, it's not the same as a human neck, but they have been -- they are used in these types of tests for the data that they have certainly.

Q. For example, compression of the spine

might be measured there and flexion for example, or extension, those kind of things?

A. Correct. They just use them for those, yes, but they obviously don't have the same motion, but they are used readily to record data that we use.

Q. So then let me move it forward a little bit. So now see where the airbag is beginning to deploy?

A. Right. This is kind of what you call punch out.

Q. And were you telling us how this design uses --

MR. CARTER: Objection, leading, Your Honor.

BY MR. VAN GAASBECK:

Q. Would you -- do you recall when you were talking about when the -- about the airbag and this design actually using the windshield?

A. That's what I did describe, yes. That's definitely what the system does, that's how it uses it to shape the bag.

Q. So what would we initially see here as its path?

A. Well, it's effectively going -- still

coming out, but it's starting to go up first.

Q. Let me advance it. Is it now in its cushion shape or what would you call this for our purposes of discussion; what's going on at this point right here?

A. It's still in what you will call the filling stage. That's what I said, it comes up and it starts coming, still coming towards you in a more horizontal fashion. Then later on you will see that starts going down.

Q. And also, you can't see it on this, but just above, I wonder if I could focus it just above the head and to the left, little box with milliseconds.

A. Yes.

Q. It's on this.

A. I can see it. Oh, you can't see it up there.

Q. If I had my choice, I thought you probably had the better idea in the first place. But thank you. So I'm going to go ahead and run this through and I'm going to back it up and run it through at regular speed and I need to ask you something.

A. Okay.

Q. Let me just finish this process right there.

(Video played.)

So let me stop it and now bring it back. I'm going to hold it there for a while. Were you able to -- were you given any data from this test by Ford or people who produced it?

A. Yes.

Q. And so what type of data was available to you in order at least to understand some of the dynamics of the test?

A. Well, again like I said, my understanding is it's similar as far as Delta-v wise and the pulse, but they also instrumented the chest. So we had chest Gs that were able to be read on that as well.

Q. What are chest Gs? What is important to you about that?

A. Well, we have what they call injury assessment reference values so there are different numbers in data that we look at when you are looking at the head, the chest, the femurs, to see if you have certain loads that are above those ranges, then obviously there's an expectation that you are going to have an injury there. So they are

kind of like our thresholds that we are looking at that trying to predict injury or not injury.

Q. Thank you. So were you able to look, was there any other injury data that was available?

A. I think that was all there was that I recall.

Q. Okay, thank you. So I'm going to ask you to look at this and then after I do that I'm going to ask you what your opinion is as to whether this airbag offered any restraint to the occupant of that vehicle.

(Video played.)

I think that's pretty much the end of the dynamics of that. I will ask you did a person -- would a person in that position of that dummy and under the circumstances of this simulation of the crash that Mr. Newbern was in receive any benefit from this airbag?

A. I would say it doesn't appear that there's much, if any. There's just minimal contact. There is a little bit of paint transfer on it. So it doesn't appear that there's a lot of alteration of the head kinematics. Also another thing you don't see is during the main crash phase when the dummy is going forward you don't see the

arms coming up. They are not coming up until you come back to rebound as well.

Q. Why is that important?

A. That's kind of what you would expect when you are in a crash. You are not expecting your hands to come back at you while all your body is trying to move forward because you're stopping the vehicle and your moving at the same speed so everything is trying to move forward.

Q. So you said there was something about chest Gs that was being measured in this crash test or sled test?

A. Correct.

Q. So did you get the data on chest Gs?

A. Yes.

Q. And you also -- are you aware of whether or not there was a question then as to whether the airbag damaged the sternum or the seat belt did?

A. Well, we know that basically there was only two things that can cause that injury in this particular crash.

Q. So when you look at this crash and you look at the G data on it as far as whether or not the seat belt caused this sternum injury, what does

it tell you?

A. Well, it tells you the Gs were 20 Gs on the chest. So typically if you are looking for an FMVSS test of 60 Gs to three inches of compression, so that's significantly below what the standard is so to speak of what the injury threshold for the chest is. So it appears that seems like if it's the belt then either something is different or seems like there must need to be some additional loading.

Q. If you were to look at any test, any crash test where the injury -- where the Gs are 20, would you ever consider that the mechanism for fracturing the sternum by itself?

A. I would say no. I mean I would certainly say that's well below -- I mean if we were getting to it then, you know, it might be more of a possibility, but it's pretty significantly low compared to what the standard is. So it seems that that wouldn't be what you would expect.

Q. If you were trying to rule out the seat belt then and if you were to look at Ford's own test as the seat belt being the cause of the sternum being fractured, in and of itself acting alone, what would your opinion by a reasonable

biomechanical engineering probability be?

A. Well, I would say just on the data alone there again it doesn't appear that it is just the belt, that it seems like there must be some additional loading.

Q. In order for -- and in this do you see any additional loading?

A. No.

Q. So once again, the only other thing that would be in there that could cause additional loading for the chest area, what would that be?

A. Well, the only other thing that's in and around that's coming towards the chest would be obviously the airbag.

Q. I am going to back it up again. Somewhere around 65 milliseconds. Stop it there. 46.2 milliseconds, 64.2 milliseconds. What would you describe as far as the excursion at least towards the face of the occupant? What stage in the excursion towards the face would that be?

A. Well, it's still in the filling stage so it's still continuing to project back. It will -- obviously when it gets fully inflated, it will retract back to some extent from that when it takes the final shape.

Q. Is there a place that you saw in the video where I should stop the bag so that it gives you the least furthest excursion while it's getting out or should we work with this one?

A. It's probably fairly close in here.

Q. Okay. I'm going to move it again and I'm going to ask you to stop me if we get to a point where the dummy crosses the green line where the bag was at to a point where you would consider might cause an eye injury by the airbag. Can you tell me when to stop, please.

A. Okay.

(Video played.)

A. Right there.

Q. So at that point where the dummy is now reaching the mark that I put there, is that where you start to be concerned about an eye injury from an airbag?

A. If it was in that position, yes, sir.

Q. How many milliseconds is that up there, 115 milliseconds, you see that?

A. Yes.

Q. Let's do the same for hitting the chest and see if we can find there might be a place the chest makes contact with the bag and a period of

time the bag is unfolding if you consider there to be some concern for helping a seat belt hit the sternum. Tell me when to stop.

(Video played.)

A. All right.

Q. Stop me again when it crosses the green line to the extent that you are concerned about an injury if it does.

A. It is right there now.

Q. Now, what would be the timing on that?

A. 131.

Q. Milliseconds, thank you. Do you consider -- can you consider only one aspect of the injuries that you are seeing? Well, scratch that, please. In your methodology if there are more than one injury from an incident does that -- what do you do in relationship to that in any way that might help you identify how the actual injuries occurred?

A. Well, again, that's what I explained earlier that I am looking at predominantly the eye injury, looking at the multiple different injuries that are involved there. Some are what I will call more exterior as compared to once we get inside the socket. And also considering what is or isn't

ultimately in the socket either and what they are described as well.

Q. So if we are looking at this injury pattern here, we have an injury to the eye and facial, it is not just the eye. What else is it?

A. Well, I mean you have got bones surrounding the inner part of the orbit and then as well the nose right adjacent to it.

Q. And then to the chest and then to the thighs. Do you find any indication or any allegation that some sort of glass tumbler put those marks on the thighs, the bruises?

A. I don't know that anybody said that that caused anything on the thighs, no, sir.

Q. And the same with the chest? Anybody argue or put forward any opinion, factual observation that a glass might have broken the sternum?

A. No, because if it broke the sternum then according to them it couldn't have broken -- caused the eye injury.

Q. So there are three areas in the body here which have been injured? Which mechanism explains all three of them?

A. Well again, I think the majority of all

those injuries have got to be, especially when you are looking at the head or face injuries, got to be from interaction with the airbag.

Q. And can you -- do you hold that opinion by reasonable biomechanical engineering certainties that it is most probably the airbag?

A. Yes, I do.

Q. Just one moment, please. Thank you, Mr. Lewis. I pass the witness.

THE COURT: Ladies and gentlemen of the jury, we are going to take a short break at this time. Leave your note pads in the chair and I'm going to have you back about ten minutes. Please don't discuss the case among yourselves.

(Whereupon the jury exited the courtroom at 4:27 p.m.)

THE COURT: Anything from the Plaintiff before we take a break?

MR. VAN GAASBECK: No, sir.

THE COURT: Anything from the Defendant?

MR. CARTER: No, sir.

THE COURT: Thank you very much. We will take about a 20-minute break.

(A recess transpired.)

my office talked to him. But I ultimately either through the attorneys or communication with him, I gained information what the recon was.

Q. He didn't do a report so do you think you might have read his deposition?

A. I had his notes and everything where he had the calculations and also a diagram basically of what the vehicle interactions were.

Q. Do you accept Andrew Webb's accident reconstruction as being accurate?

A. I do. Again, I'm not a reconstructionist so I don't know how I would critique whether he was right or wrong, but it's very similar as far as I understand what Mr. Toomey's reconstruction is.

Q. You're aware that Mr. Webb testified that he has no issue with the accuracy of the EDR data?

A. I don't know what all he testified to in that regard, no, sir.

Q. You would accept his opinion regarding accident reconstruction?

A. I just said I would, yes, sir.

Q. If he said that he didn't think 43 milliseconds was a late fire time, agree with that?

A. Well, I would agree that's what his opinion is. Whether he is qualified to give that opinion or not regarding fire times or not I don't know, but if that's his opinion that's his opinion.

Q. Well, now just to be clear, you are relying on his opinion. He's the accident reconstructionist, he reconstructs the accident and then you give the injury causation from his reconstruction, that's the way this works, right?

A. I certainly use parts of what the reconstruction is to do that, yes.

Q. Are there any parts of it that you didn't agree with or you thought were inaccurate?

A. Well, I mean there's some things that go into doing that obviously I didn't rely on when I am looking more actually at the severity of it and again PDOF. That's the primary things that I rely on for a reconstruction.

Q. I will ask the question again. Is there any part of his accident reconstruction that you believe to be inaccurate?

A. Again as far as what I am relying on, which is the PDOF and the Delta-v, I don't have any reason to disagree or have any inaccuracies.

Q. Mr. Webb testified that 42.3 miles an

hour frontal that he would expect an airbag; agree with that?

A. Agree that that certainly is sometimes what you can see, yes.

Q. In fact, you have testified in your deposition you would be surprised if you didn't get an airbag at 26 miles an hour Delta-v frontal, didn't you?

A. I did say, yes, sir. I actually said that I have seen some airbags fire like 16 milliseconds for the same vehicle.

Q. The Delta-v in this case is 26 miles an hour?

A. Yes, sir.

Q. Now, one other thing just kind of background, you talked about you describe the sternum fracture as comminuted, right?

A. Well, I guess for clarification, that's what I read from the medical records. So it's technically not my diagnosis.

Q. Did you look at the x-ray?

A. No, I haven't.

Q. Have you ever -- looked at the x-ray? Is this the first time you have seen the x-ray?

A. Correct.

A. Yes, sir.

Q. That's not inconsistent with a fluid being spilled on the bag?

A. It certainly could be. It's on the side there.

MR. CARTER: That's all the questions I have. Thank you, Mr. Lewis.

THE COURT: Redirect?

REDIRECT EXAMINATION

BY MR. VAN GAASBECK:

Q. Can we keep that on for a moment? Looking at 28.8, could that be fluid?

A. Well, that's fluorescing as well as on the front of his shirt. That's actually either fluid or fuzz.

Q. Would that be fluid?

A. Well, it's showing the same color.

Q. Could that be fluid or all not be fluid?

A. Correct.

Q. I'm going to try to get this done so please bear with me if I go fast. When Mr. -- when Dean got into the car there was a position that the seat was already in, correct?

A. Yes.

Q. Did you -- I want to make sure that everyone understood what you did with that seat and why you did what you did with it.

A. As I said, that's the same place I measured it. I think I misspoke. I said I looked at the car in August of 2015. It was 2013, but it was in the same location as where I marked it.

Q. And did Mr. Newbern when he got into it correct you and say this doesn't feel right?

A. No.

Q. The other thing is when an EMS person moves a vehicle, moves a seat to help get somebody out which direction do they move it?

A. Usually they move it rearward and lower the seat back.

Q. So if an EMS person had moved it it would have been further back, not where it is?

A. I would think so, especially considering taking him out feet first.

Q. One of the questions was asked about how high or low the fracture is or the sternum, what that might rule in or out. Do you recall that?

A. Yes.

Q. So you were explaining if it's lower is

it more likely that there is a possibility that the seat belt did damage this?

A. Well, like I said, it only means that actually then the belt has got a path to where it could have caught it. Could be where you could get that fracture, sure.

Q. Does it rule out the fact, the possibility that the airbag and the belt were together?

A. No, not necessarily no, sir.

Q. But when you saw the data from their own test which replicated this crash, the seat belt alone, what did it do?

A. Yes. We know from that that the expectation would not be for that fracture.

Q. You were asked a little bit about an accident reconstruction and somebody gave you a 40 some mile an hour decrease in velocity and if you have -- if you have seen a crash with 47 miles an hour decrease in velocity, could it deploy an air bag and what was your answer?

A. Yes.

Q. If I fly in to this town and I fly at 600 miles per hour at sometime during the flight then I land and I go to zero, what's the Delta-v

there?

A. Usually it's about a 200 Delta-v, but you do it over a mile of runway.

Q. I am talking about if I am flying 600 and go to zero, what's that Delta-v?

A. 600.

Q. So it really matters over what period of time if you are trying to worry about the severity of the crash; is that correct?

A. Well, that's a part of what looks and can make two different same speed crashes can be somewhat different severity given that one is a significant longer pulse than the other.

Q. You weren't in here, but you disagree with Mr. Krishnaswami that the actual measure of severity in a crash is the G level, not the decrease in velocity?

A. Well, I think that's what he said from a design parameter issue.

Q. Thank you.

THE COURT: You may step down. Thank you very much.

Ladies and gentlemen of the jury, I guess today I had two choices, to try to keep you here until 6:00 and let some of the traffic get out

understand that?

MR. CARTER: Yes, sir.

MR. VAN GAASBECK: Yes, sir.

THE COURT: The case doesn't say what I was told it said. It's basically a rendition of 703 and 703 in federal court in South Carolina is saying, it's just you can't use the expert to get in hearsay to form opinions. It's a summary judgment for Christ's sake in district court. Now, I assume that was done unintentionally. I'm not pointing any fingers at anybody, it's my fault for not explaining this to everybody earlier. I have explained it and I will not tolerate that conduct in this courtroom from an officer of this court and that includes pro hac vices. Have a good evening, see you tomorrow.

(These proceedings were adjourned at 5:51 p.m., September 14, 2016, Charleston County, South Carolina.)

CERTIFICATE OF REPORTER

I, Ruth C. Weese, Registered Diplomate Reporter for the State of South Carolina at Large, do hereby certify that the foregoing transcript is a true, accurate, and complete record.

I further certify that I am neither related to nor counsel for any party to the cause pending or interested in the events thereof.

Witness my hand, I have hereunto affixed my official seal this 16th day of December, 2016 at Charleston, Charleston County, South Carolina.

Ruth C. Weese

Ruth C. Weese
Registered Diplomate
Reporter

STATE OF SOUTH CAROLINA — COURT OF COMMON PLEAS

COUNTY OF CHARLESTON — CASE NO. 2013-CP-10-2928

STEVEN NEWBERN AND CLAUDIA NEWBERN,

PLAINTIFFS,

VS.

FORD MOTOR COMPANY,

DEFENDANT.

TRANSCRIPT OF RECORD

SEPTEMBER 15, 2016
CHARLESTON, SC

VOLUME 4 OF 5

B E F O R E:

HONORABLE J.C. NICHOLSON, JUDGE, AND A JURY.

A P P E A R A N C E S:

STEVE VAN GAASBECK, ESQUIRE
RAYMOND BODIFORD, ESQUIRE
WILLIAM APPLEGATE, ESQUIRE

Attorneys for the Plaintiff

J. KENNETH CARTER, ESQUIRE
NICHOLAS GLADD, ESQUIRE
ROBERT WISE, ESQUIRE
CARMELO SAMMATARO, ESQUIRE
Attorneys for the Defendant

* *

Ruth C. Weese, RDR
Official Court Reporter
Ninth Judicial Circuit

I N D E X

	Page
WITNESS	
STEVEN NEWBERN	
DIRECT EXAMINATION BY MR. VAN GAASBECK	667
CROSS-EXAMINATION BY MR. GLADD	734
REDIRECT EXAMINATION BY MR. VAN GAASBECK	746
DAN TOOMEY	
DIRECT EXAMINATION BY MR. CARTER	768
CROSS-EXAMINATION BY MR. VAN GAASBECK	801
PLAINTIFF RESTS	747

E X H I B I T S

	IN EVIDENCE	Page
Defendant's Exhibits		
92A-photo		804
79.6-photo		804
79.9-photo		804
79.24-photo		804
79.26-photo		804
79.27-photo		804
78.12-photo		804
78.16-photo		804
78.40-photo		804
78.60-photo		804
78.63-photo		804
78.20-photo		804
84B1-photo		804
84B3-photo		804
81.3-photo		804
81.1-photo		804
81.19-photo		804
80.39-photo		804
80.29-photo		804
80.30-photo		804
80.35-photo		804
80.36-photo		804

	IN EVIDENCE	Page
80.37-photo		804
84C3-photo		804
84E1-photo		804

(The following proceedings were held September 15, 2016, Charleston County, South Carolina, @ 10:30 a.m.)

MR. WISE: We have the jury instructions.

THE COURT: Okay. If you want to hand them up I appreciate it.

MR. WISE: Yes, Your Honor.

THE COURT: Anything from the Plaintiff before we bring the jury in?

MR. VAN GAASBECK: No, Your Honor.

MR. CARTER: Your Honor, I have one thing. We normally would exchange witnesses that we were going call to today. I got an e-mail from Mr. Van Gaasbeck last night that he's going to call Mr. Newbern and the only thing else in the e-mail was that Ford needs to be ready to call witnesses today. I thought from yesterday that he had intended to call his expert Mr. Nranian and I just wanted to kind of get a feel for what -- we have a witness in town and that's the accident reconstructionist. He would be the person that we would normally put up first if he's ready, but my other two witnesses are in a plane on the way here. I'm not sure what we're doing today or what we got

as far as witnesses.

THE COURT: Mr. Van Gaasbeck, how many more witnesses do you anticipate?

MR. VAN GAASBECK: Mr. Newbern and then probably about 20 pages of a deposition from a tow truck driver.

THE COURT: And --

MR. VAN GAASBECK: For some reason he's not showing up for the subpoena.

THE COURT: I'm trying to find your witness list. How about you are not going to be calling George Waring?

MR. VAN GAASBECK: No, sir.

THE COURT: Michael Nranian?

MR. VAN GAASBECK: No, sir.

THE COURT: And you are not going to be calling --

MR. VAN GAASBECK: Mr. Webb.

THE COURT: Mr. Webb.

MR. VAN GAASBECK: No, sir.

THE COURT: Okay. So you got basically two witnesses.

MR. VAN GAASBECK: Yes, sir. Try to trim it down.

THE COURT: All right. So he is going

THE COURT: Bring us the jury, please.

(Whereupon the jury entered the courtroom at 10:11 a.m.)

THE COURT: Call your next witness, please, sir.

MR. VAN GAASBECK: Yes, Your Honor. I call Steven Dean Newbern.

STEVEN NEWBERN

having been duly sworn, testifies as follows:

THE CLERK: Please state your first and last name and spell your last name loudly and clearly into the microphone.

THE WITNESS: Steven Newbern, S-T-E-V-E-N, N-E-W-B-E-R-N.

DIRECT EXAMINATION

BY MR. VAN GAASBECK:

Q. Mr. Newbern, how old are you?

A. Fifty years old.

Q. And where are you from?

A. Virginia Beach, Virginia.

Q. Can you give us a little an idea then of your profession and also your educational background and let me start with educational background.

A. I graduated from Cox High School in

Virginia Beach. And from there I went -- actually before the military, I got my private pilot's certificate at Tyler Community College waiting for my spot to go to the military and I went through the various trainings in the military as veterans know. And eventually through non-commissioned officer school and after the military I inevitably went into preparatory college which was Tyler Community College to save money going to the university and eventually went to East State University to get my undergraduate in educational history. And in education after that -- I actually missed one after the Air Force. I went through a college to get my AAP license to work an airplanes. That was in 1991, pardon me.

Q. Thank you. And if your throat is dry or if you -- just calm down a little bit. It's all right. Let me ask you, sir, how long did you spend in the Air Force?

A. Four years and three months.

Q. After that did your profession or your employment take any particular direction?

A. After getting out of the Air Force?

Q. Yes, sir.

A. No, not a specific direction. As I

said, I went into the college to get my AAP license so really graduate from that was my focus, so any employment I could do, because that school is rigorous. It's from 5:00 p.m. to midnight every day Monday through Friday. So I basically actually did have a full-time employment now that I remember at Architectural Graphics, Inc., a company in Virginia Beach. So I was burning the candle at both ends.

Q. Why did you choose that school and those courses?

A. Well, just been an aviation guy my whole life. I am into airplanes.

Q. So was that the direction that you were going after the Air Force?

A. Yes, sir.

Q. Just because you don't understand what I ask it's all right. I don't speak that well myself. Can I ask you, sir, at some point -- well, just give us a thumbnail sketch of your employment history up until I know you started working at Boeing?

A. Since I started working at Boeing?

Q. You told me about the Air Force. So between the Air Force and I get you told us about a

graphics company while you are going to school. After that just a thumbnail sketch until you went to Boeing.

A. I went to East State University and got my undergraduate to be an educator. Social studies to round it out. But specifically history. And that's it.

Q. Okay. So when did you join up with Boeing?

A. In 2011.

Q. And so how was it that you were recruited or applied? What were you trying to get to or what were you asking for when you went into that employment?

A. At the present time before going to Boeing I was an instructor at an AAP academy for other people to get their AAP certificates. I was an instructor for almost three years. And but being an educator, you kind of have a ceiling as far as salary goes and I could see the writing was on the wall, that it was a very good job. I liked teaching; however, it was the about the money and Boeing I learned was opening a factory down here and I saw better opportunity or advancement based on my experience in aviation and forth. So I got

together with my wife and to see if she was willing to uproot and relocate to be honest with you for me because she had a good job as an educator in a public school system where we came from. But she actually found a job really quick here before I actually started at Boeing to be honest with you. So we decided to move to Charleston and I took the job with Boeing.

Q. So did you have an entry level type of job or what did you start at?

A. It was not necessarily entry, it was a complex job. After an initial training period having me become basically an aircraft electrician, I was wiring the fuselage, the center portion of the airplane primarily.

Q. Was this for constructing aircraft or for maintenance of aircraft or was there any distinction?

A. There's a big distinction. This is construction which is way different than maintenance.

Q. So just now tell me how the course went, how your employment went up until like the time that we are going to talk about your injury.

A. Yes, sir. I actually was climbing the

ladder as I hoped to do at Boeing. I did the wiring for a year. And once they finally start to complete aircraft, finished product, I was always applying for a flight line position. And what that is is you actually accept the aircraft as it leaves the factory and get it ready for its maiden flight and they did give me a call and say we need you or others and it was a very rigorous interview with two people. They accepted me to leave the wiring department to go out as a flight line tech because one of the requirements is that you had AAP certification to be on the flight line tech and it was an immediate overnight five dollar an hour raise. So obviously, and working on the flight line is what I was used to anyways, not factory work. So I obviously took the job. It is more prestigious also to work on the flight line.

Q. What's the flight line?

A. When the aircraft is finished I am doing air quotes. We have to do a lot to it on the flight line before it gets ready to fly the first time. Wow, I will be as brief as I can. You finish jobs that weren't finished in the factory or have to redo jobs that weren't done right in the factory. And then there's preliminary things you

have to do. Like initial fueling has to be done outside. And I could go on more if you would like.

Q. When you refer to a flight line, what are you referring to?

A. Outside of the factory, working outside in the elements.

Q. So your job then took you to work outside?

A. Yes, sir.

Q. And then so what was the environment in which you worked in?

A. It's called an active flight line.

Q. What is an active flight line?

A. It's very dynamic. It's what you call a live aircraft so you have electricity plugged into the aircraft, alternating current lines. And then eventually it gets to initial fueling. They will start the process for the initial engine run. So you have aircraft, large jet engines running. The plane is static. Run up the engine and there's vehicles, everything from lift equipment to tugs which tow the aircraft around and park them. And it's like I said, you got to really -- it could be a potentially dangerous environment if you are not knowing what you are doing.

Q. So did you stay on the flight line up until the time of the injury?

A. Up until the time of the injury, correct.

Q. Now, did your job change at all while you're on the flight line or did it remain what you started at?

A. No, sir. Didn't change while I was on flight line. I was -- as I learned the job they gave me better and more complex responsibilities.

Q. Thank you. What was your feeling towards the job that you had, your employment?

A. It was good.

Q. Good in what way?

A. I was actually living -- I was -- I got my dream job.

Q. Was there any move up from there? I think you were talking when you're a teacher, no matter how good you are, no matter how hard you work, there's sort of a roof --

A. Yes.

Q. -- ceiling. So did you have a route upwards from the flight line?

A. Most definitely.

Q. What would that have been?

A. Well, the 787 is a unique aircraft. It's the first carbon fiber aircraft, large passenger aircraft ever to be developed in the world in the history of aviation. So to know that aircraft as a speciality and to be very familiar with this aircraft is a specialty in itself so you could actually if you wanted to move around the world and travel to be a 787 specialist because most places that do maintenance on aircraft such as at the current moment A&A Aviation has 50, the most 787's in their fleet. So there will be certain things that a typical AA mechanic will be familiar with a carbon fiber aircraft so they will call the Boeing employees to go there and do the repairs. So I was looking forward to doing some travels as a 787 expert for lack of a better word, but I never got to that point.

Q. Well, now let me ask you a little about your social life. What type of activities did you participate in during -- I know things I have to do to release tension. What did you do?

A. What did I do would be more -- jogs, I was into jogging and mountain biking. Of course there's no mountains here, but I had a mountain bike from when I was in Tennessee which I rode

around and if I could find a gym to lift, just try to keep in shape, but to be honest with you the job kept me in shape itself.

Q. All right. So and then would I be correct in saying then that your own personal activities, at least two of them would be jogging, riding the mountain bike and you also mentioned sometime lifting weights?

A. I failed to mention I was also interested in sharp shooting, not hunting but just long distance sharp shooting.

Q. Target shooting?

A. Yes, sir.

Q. And what type of -- what did you use for that?

A. Remmington 700.

Q. The old style rifle?

A. Yes, sir.

Q. And then did the -- did you buy one?

A. Yes. Before we came here.

Q. Let me ask you about the mountain biking. Did you have a mountain bike?

A. Yes.

Q. Can you describe what you had?

A. It's a special, the brand is

specialized. It has 15 speeds, shock absorbers in the front and rear and knobby tires and spikes on the pedals so you don't slip off.

Q. Is that the description of every mountain bike or is that a little different?

A. That's probably a little bit better. It's a nice bicycle.

Q. What about your interaction with your wife? Did you -- what type of socializing would you do with her?

A. Typical stuff, go out to dinner, movies, saw plays, go to the old theater here in town. Very nice, they have a good play.

Q. So on a particular day we understand that you and she decided to go to a theater?

A. Yes, sir.

Q. And what is -- what was the date of that?

A. December 28th, 2012.

Q. And so take me a little bit through that day if you would.

A. I was -- we were both doing yard work at one point. It was a nice day.

Q. What day of the week would that be?

A. I think it was a Friday. I'm pretty

certain as a matter of fact it was Friday.

Q. Were you taking Friday off?

A. I was on Christmas break. It was in between Christmas and New Years.

Q. December 28th?

A. Yes, sir.

Q. So you were doing yard work. And go ahead and fill me in.

A. Well, it was around six-ish or seven and probably hadn't -- to be honest with you I don't remember. But I was wondering what we were going to do for the rest of the night and I suggested we see a movie.

Q. Do you recall what the movie was?

A. Yes.

Q. What was it?

A. It was The Hobbit.

Q. So what was the time that you had to be there, do you recall?

A. 7:00 or 7:10.

Q. So how long would it take you to get there?

A. Ten minutes.

Q. And if you were -- what did you decide that you needed to bring with you in order to last

that ten minutes?

A. My wallet and I always bring my keys with me in case hers gets lost as a backup.

Q. Did you feel the need to bring a drink of any sort?

A. No, sir.

Q. What do you drink inside a vehicle?

A. Mostly coffee in the morning, especially if it's cold and if it's hot, a bottle of water.

Q. And when you say a bottle of water, could you describe that for me?

A. Just the average bottled water you would get in a convenience store with a cup.

Q. Plastic or glass?

A. Plastic always.

Q. How would you prepare that?

A. I would -- I'm sort of peculiar in my ways, but fill it halfway, put it in the freezer and then when ready to take it with me I would fill it the rest of the way with water so it would kind of stay cold.

Q. So when you say a mug, would you describe the types of mugs that you may have utilized when you are in a car?

A. It's a plastic tumbler more per se.

Q. Okay. Like what? Can you give us a little more description?

A. Well, there was one that wasn't plastic. It was my wife got me for my birthday. It was made out of aluminum and it was shaped to fit into a cup holder. It was -- the base was smaller than the top and it had a cap which was great. And if I wouldn't use that one we had some other ones that were double to keep the beverage either warm or cold. Those also had caps you can put on top of them, usually something with a cap.

Q. Do you have cup holders in that vehicle?

A. Yes, I am certain.

Q. Where are they located?

A. I know there was some in the console and there may have been one in the door. I'm not 100 percent sure.

Q. Did your wife take anything with her to drink on that trip there to the theater?

A. No, sir, I'm almost certain.

Q. Is it a theater where you can take drinks in, big glasses of something?

A. No, sir.

Q. So I guess you were traveling in the direction of the theater. Can you take us through your memory and your perception up until the point where you had the accident?

A. Yes, sir. We had left the house, got on 61 and made a right on to Magwood and were probably only a half a mile on to Magwood and there are neighborhoods flanking Magwood. Someone was turning left into one of those neighborhoods. I don't know if he was waiting to turn left at a full stop or whether he was at a slow roll because it was dark. Unfortunately they claim they didn't see us and it was unavoidable. They just pulled right out in front of my wife. And I could see the image of the car pulling out in front of her and you, just know, if anybody's been in an accident when it's clearly unavoidable that you are not going to get out of that situation. And I even remember saying no way, but I didn't get to finish the sentence. And after that it's really being in a dream state after the impact.

Q. So were you able to -- if you think today can you identify what kind of vehicle it was?

A. That pulled out in front of us? It was a large vehicle. Like a full sized.

Q. Where was the contact point on that vehicle?

A. I would guess it would be right behind the right front wheel because my last image I remember clearly was being able to see the tire of the car like a snapshot photo in my brain. And after seeing the wheel that's when I kind of just everything just -- hard to describe like.

Q. It wasn't head on?

A. By no means, no, sir, no.

Q. So do you know anything that your wife may have done just prior to the accident, any maneuvering she might have done if you know?

A. I do recall, yes. She did try to stop. She applied the brakes. I felt a little bit of a surge, but as I said, he just -- it was so close proximity. There was no way no matter what kind of braking system you had that we were going to be able to stop.

Q. Was the amount of braking, the time that you had that you tried to brake, was a long time or what?

A. No, sir. Was not long.

Q. So you take us where you see the tire in front of you. Then what is your -- what are the

next actual remembrances that you have of this either visually or audibly, physically, just let us know.

A. Looking to my left to see if my wife was okay.

Q. Could you see out of your left eye at that time?

A. Yes, as a matter of fact I could.

Q. And so what did you see?

A. I don't actually remember her sitting there. It's kind of strange. I may have been unconscious briefly, but I went to ask her if she was okay and I don't recall seeing her to be honest with you.

Q. So the first thing that you do is look for your wife. You don't recall much about that to observe her. What about what are you hearing?

A. It was odd. It was loud. I couldn't figure out why it was so loud. I realized the alarm system was triggered to the car, the horn was constantly going. And I could hear some people talking I think and it was actually the person talking was a man and I learned later that it was actually lucky for us it was an EMT that was -- had gotten off work and almost been right there when

the accident happened. So I didn't even have a chance to attempt to open the door. He had gotten there before I even reached that point. Was assisting me.

Q. Who took your seat belt off?

A. I unlatched it. That's when I felt the crunching sensation in my chest.

Q. Could you describe what you meant by crunching sensation?

A. Yes. It was -- I knew something wasn't right. It was deep. I have never felt it before. I just know wasn't right. I mean I don't want -- I knew something was broken. I could literally feel the crunching sensation in my chest when I reached across to unlatch the seat belt.

Q. At any point did you -- did your begin to perceive pain or discomfort?

A. Yes.

Q. When in this process did you start to have the wherewithal to feel pain or discomfort?

A. That's what we just discussed, probably the first time.

Q. And so let me -- kind of give me an idea what your sensations were. You have told about what you saw, about what you heard initially.

And you now started to tell us about something you felt. Can you continue with that, give us sort of an all around observation from that moment that you were there?

A. Well, I was in what you call flight mode when you are in a situation that it's fight or flight. So I in my mind wanted to get out of the vehicle. It is just a reflex that humans have. So in my attempt to get out of the car, because you don't know if you're going to catch fire, you know, weird things go through your mind. But once I undid the seat belt in order to get out of the car, and felt a crunching sensation, I did remember thinking that maybe it would be best if I stayed put and at that time there was somebody there oddly enough telling me not to move. It was kind of surreal.

Q. What, if anything, did you know about your eye at that time?

A. No, sir.

Q. Nothing?

A. I did have pain in my face, but I couldn't -- I didn't know what was going on.

Q. Let me ask you, before the crash -- you were here during the opening statements. And you

heard Mr. Carter say that you were holding a glass in your hand. Do you recall that?

A. No, sir.

Q. Do you remember him saying that?

A. Oh, yes.

Q. Were you holding a glass in your hand?

A. No, sir.

Q. What were you holding in your hand, if anything?

A. During the accident? Nothing.

Q. Okay. So let me then take you to the next moment you said you started to feel pain in your face. I assume that -- I won't assume anything. Let's say that what kind of conversations did you have or did you have conversations with anybody there? Start with that. There was a fellow that came to help you. Do you know what his name is?

A. No, sir.

Q. What -- after he told you to sit still then what's the next thing that you recall?

A. He asked me what was wrong, what injuries I had, what sensation I felt. And I told him about the crunching in my chest. I said there's some crunching in my chest and I started to

reach up to my face to tell him pain in my face and he said don't touch your face. And then I noticed tackiness on my hand and anybody ever cut their hand or busted their knuckle can feel the blood between the fingers. I told him that I could actually feel a flap of skin. I thought there may have been something in there. I told him I could have glass in my hand.

Q. Why would you think that you would have glass in your hand?

A. I was in my mind visualizing what may have happened during the accident. One of the things I thought may have happened is the windows breaking. So I thought it could have gotten on me or in me somehow.

Q. In fact, did the windshield break?

A. Yes, sir.

Q. And did it -- what did breaking of the windshield do as far as any physical manifestation that it broke?

A. The airbag mechanism I believe is what broke the windshield and just as windshields do many small pieces of glass just kind of scattered.

Q. If you could -- I know you said small, and who knows what you mean by small. So could you

just give us an idea of how small it is? Just show the jury what these pieces were that you were seeing?

A. Well, I couldn't see them. But I seen previously windshields break and they break into small squares for safety measure.

Q. Since then did you see your interior of your vehicle at all at any point?

A. At what point?

Q. Any point after that did you see the interior?

A. Oh, yes, sir.

Q. Was there anything like the little pieces of glass that you were talking about?

A. Yes.

Q. So when you did that and what did you tell this fellow?

A. I told him I had a crunching sensation in my chest.

Q. When you felt the thumb?

A. Oh, yes. Well, I didn't know, I couldn't see at this point. Because I could only see for I would say maybe 30 seconds after the crash. I guess it was a reflex action both eyes closed. I don't know, I guess it's like I said

human protective, I am just guessing, I'm not a doctor, but I couldn't see out of the either eye. Pain, it was a powerful airbag. I don't know. But I was just feeling the tackiness between my fingers and I said I may have I felt loose skin because I could feel it with my other finger. I thought there may have been some piece of glass from the wreckage in there.

Q. Where is that piece? Where was that cut? Can you show us?

A. I couldn't see it like I said, but I could feel it with my other finger. It was somewhere either on the side or the top of my thumb.

Q. Can you hold your hand up so the jury can see and is it on the inside of the hand or the outside of the hand?

A. I remember playing with it with my index finger, just from anywhere I would say here up. I can't remember exactly.

Q. Top of your thumb?

A. Yes.

Q. And when you told that to him what did he say?

A. Nothing.

Q. And what was going on regarding the horn that you had mentioned at that time? Is it still going?

A. Yes, sir.

Q. Or alarm or whatever it is?

A. Yes, sir.

Q. So after what's the -- what would be the next step if you can remember that occurred out there.

A. He must have had one of those neck braces in his vehicle because he immediately slapped one of those around my neck I think even before the ambulance got there.

Q. All right. And so then the next thing, next step that has any import to you?

A. Yes. When they finally either opened the door or cut the side airbag and the cold air came into the car and it hit the side of my face I remember it felt like daggers getting jabbed in me when that this cold air hit the side of my face. I knew something was wrong. I remember that very graphically.

Q. Were you able to get out and stand up then?

A. No, sir.

Q. What prevented you from doing that?

A. At this point the EMTs were in control.

Q. So what was the course of events for you once you realized that you had something happening in your face that was causing that pain you are talking about that the cold air hit it?

A. Well, I really put my faith in the hands of the EMTs and let them follow their instructions.

Q. So any more conversation with you out there on the scene? I mean I know they may have given instructions. Were you talking to them? Were you describing anything or did you have any conversation with them?

A. No, sir. I remember I was in and out of consciousness after they put me into the ambulance. It was almost like the woman that was in the back portion where the patient is was on a radio. I could just hear it at this point. I couldn't see anything. I am just listening so I am very -- my ears are wide open metaphorically speaking. She was on a radio and the instructions were almost military like she was like giving heart rate measurements to somebody I guess at the hospital. They were responding back. She says

permission, it was like receiving firing orders when you were in the military, permission to inject CCs morphine, and they will come back permission. It was like permission granted. Was very specific. Something I can relate to. Once I was injected with morphine and if I wasn't in a dream state before that, after that point I was completely in a dream state, just in and out of consciousness.

Q. So what was your next moment then of clarity?

A. Every time that the ambulance had to brake, put on the brakes hard it would wake me up because it was a very -- my whole torso I guess would move and it was so painful, the pain went beyond the morphine and I actually remember telling the woman that was in the cab could you tell him to go easy on the brakes.

Q. All right. Did they?

A. No.

Q. After that where did you go?

A. It's my understanding that we went directly to MUSC.

Q. Directly to where?

A. MUSC trauma.

Q. So and what was the course of events

there?

A. I remember waking up and hearing voices around me. Was like I was in a large room with other patients seemed around me like I was in some type of war hospital after a battle. I could hear other people moaning and other doctors making comments. And eventually my wife arriving there.

Q. Do you know whether or not she was with you in the ambulance?

A. I learned later that she rode in the front.

Q. So did you receive -- do you know if you received any initial treatments then in the ER room before she showed up?

A. Just the timed intervals of morphine injections. I recall when they would do it it was a strange feeling.

Q. Did you have more than one morphine injection?

A. Oh, yes, sir.

Q. Over what period of time?

A. To be honest with you, it would be a guess.

Q. So ultimately your wife came in?

A. Yes.

Q. Now, did you ever hear anything that stuck in your mind as to that event or at the time that you are in the ER room that you have accounted in your deposition?

A. Yes. I recall people saying various things and someone within close approximate to me commented that we have a culprit and just it was an odd comment. I was curious what that meant and that's why I remembered I guess.

Q. Was it -- do you know if it was even directed to you? Do you know first of all, who said it or do you know?

A. No, it was just something I heard.

Q. Do you know male or female?

A. It was a female.

Q. Then was there a response from anybody?

A. No, sir.

Q. And do you know if it was -- what it was about? Do you know what it was about, a person, a thing or do you know?

A. No, sir.

Q. Was there anything led you to believe it was about anything related to you?

A. No, sir.

Q. So what is the next thing -- how long

do you stay in that room where you hear all this stuff happening?

A. That is -- then again, I would be guessing, seemed like an eternity because I was going in and out of consciousness from the morphine I would surmise.

Q. So let's -- unless there is something in that event that I might miss that we probably need to know about, could we go to the point where you begin to at least get some semblance of yourself and some understanding of the surroundings and some ability to take part in moving yourself around and getting yourself ready for the next steps?

A. I have no control over what was going on. I was -- I was totally in the -- under the control of the hospital personnel. And there's specific things I do remember. One is when they snatched my pants off because it created another tremendous sensation of pain in my chest. Must have been one person on each pant leg. They just (indicating) and but oddly enough there again I do not remember them removing my jacket or shirt. I don't remember that which I should have remembered, but like I said I was just in and out of

consciousness.

Q. Okay. So can you take us in the next event that sticks in your mind, something that wherever it is your treatment begins or how the course of treatment goes?

A. As they were -- I don't know why, because of the trauma or the morphine, I was super, super thirsty. I kept requesting water and my wife at that point was there. So she announced that she was there which I was relieved to know. She was okay. And the only thing that the nurse would let her do was wet my lips with a little sponge because I could feel the sponge and she told me that's what she was doing. And then after that that's when they had removed my pants and I do actually -- I believe recall going through the CT scanner. That was to do a complete body CT scan. And I remember a little bit, I'm guessing, like I said seemed like the guys that were going to do an operation on me because he asked me -- that's right. He asked me questions to see how cognizant I guess so he could administer anesthesia. He said how much do you weigh. And I told him 200 pounds and he said that's the right answer. And then that's when they put me under to operate on me.

Q. Was that operation on your chest or on your eye or do you even know?

A. I didn't know at that point. I do now, that it was on my eye.

Q. So you had an operation on your eye. Were you -- did you stay in the hospital over any period of time or were you released? Can you help us with that?

A. Seemed like I was there for a week. But then I found out was actually only a day or two.

Q. So you are in the hospital a day or two. You already had an operation on your eye. And what happened? What was it they actually did with the eye at that time?

A. I learned they tried to save it. I have learned they sutured the actual eyeball, it was I believe close to 30 stitches on the actual eye itself and there was on the exterior eye ridge of my eyelid where my eye had swelled up so much actually stretched my eyelid to the point of tearing it just a little bit where the eyelashes are and they put three minute stitches right there.

Q. Then when did they release you? I mean what did you do after being released?

A. I was -- when I was released my wife called our neighbor to help us out to give us a ride. And I was blind. I couldn't see. So I am visualizing in my mind what's going on and they were going to put me in the front seat of his truck and I said is this the front passenger seat. They said yes. And I said please don't put me...

Q. You didn't want to ride in the front seat. Now, I guess that gives me a little bit of idea how it's affected you at that time, but you did -- were they able to get you home?

A. Yes, sir.

Q. And then I want to go back for just a moment and ask you some technical questions about the vehicle itself. Was that vehicle purchased new or used?

A. New.

Q. So you were the only owners of the vehicle up until the time of the accident?

A. Yes.

Q. What type of maintenance did it have on it?

A. It was still under warranty so I know that you don't do anything yourself until it runs out, warranty runs out because they could say that

the warranty is rendered null and void if you do anything to it yourself.

Q. At any time was there any warning lights from the airbag system come on in the car and stay on?

A. No, sir.

Q. What about any check engine light would come on or stay on?

A. Not to my knowledge, sir.

Q. Did you alter the vehicle and its electronics in any way?

A. No, sir.

Q. Did anybody else?

A. No, sir, not -- oh, it was in a crash so there was -- you have to ask the guys that worked on it. But like I said, it was covered under warranty and the crash was not my wife's fault. Somebody hit her in the back end, had to replace the rear end so I am guessing probably did an overall check of the electronic systems with the machinery they have that can do a full diagnostic.

Q. A rear end collision, not a front?

A. Yes, sir.

Q. And it was repaired?

A. Yes.

Q. Where was it repaired?

A. At the dealership.

Q. Dealership.

A. Yes, sir.

Q. So did they do an on-board diagnostic scan?

A. I hope they did, yes.

Q. And at any time anyone say well, looks like there is some problem with your airbag system, wiring system, your event data recorder, your RCM, anything like that?

A. No, sir.

Q. So now you have come home, your friend has helped you. Your neighbor across the street helped you. What -- are you at this time having any hope that you will -- the repair of the eye, the rupture was going to possibly save your sight or what was the understanding that you went home with?

A. Well, yes. Of course was hoping that it would heal, however, I accepted the fact that more than likely it would not because now that you asked the question, one of the surgeons that operated on it, the trauma surgeons after I regained consciousness he came into the room and

said hope for the best, but expect the worst. I knew what he was saying. And my family was there at that point and they said oh, you will be fine. I didn't say anything, but I knew at that point.

Q. What about trying to -- what about potential for at least saving the appearance of your eye? Did you have any hope for that?

A. Yes.

Q. And so what then -- then what happened or what events transpired that led us to the next step with your eye? What was going on that led you there?

A. The terminology Dr. Eiseman said I can't remember, but it was my left eye which I was completely relying on was constantly watering and I was extremely sensitive to especially sunlight. And there was gunk that would always build up in my right eye, like the left eye I was losing clarity in it.

Q. Did that lead then ultimately to have your eye enucleated?

A. Yes, that was my understanding.

Q. And when was that that you had your eye removed? Do you have a date for that?

A. We have a specific date, but it was

approximately six weeks I believe, five to six weeks after I was released from the hospital.

Q. That's how long it took you to give up on the eye?

A. Well, I never gave up on it, but it was deemed necessary.

Q. Well now, since they -- you had this surgery to remove the eye, was there any residual pain after that surgery?

A. Yes.

Q. Can you describe that for us?

A. Well, my facial bones were broke so they were actually waiting for those to heal. That would lead to another operation where they had to rebreak those to reconstruct my sinus cavity so I had pain there. And then the eye itself where the globe would be they had like a temporary prosthetic which wasn't a custom fit so that was not comfortable.

Q. How did your nose come out of this accident?

A. My nose was broke.

Q. What, if anything, then was done with the sternum injury?

A. It was nothing they could do. It was

just I had to remain as still as possible in bed for two months.

Q. Then so you did have the enucleation. You did have -- did you undergo any type of surgery for either the sinuses or the nose or the other facial bones around your eye?

A. Yes, sir.

Q. How many of those were there?

A. There was one which lasted six hours, but I had to go back because there was a postop on infection and they had -- this is kind of gross, go in and drain out the infection.

Q. Fluids?

A. Yes, they did that. Actually it was -- I was -- I wasn't even -- I don't think they gave me a local. Because when the male surgeon that was -- there was a male surgeon that did one part and a female surgeon I believe that did the cosmetic part. When the male surgeon went back for the followup, saw that it was an infection I remember it was not good because he literally ran out of the room and got Doctor I want to say Patel, and she came in I think out of surgery. She had like a belt like a carpenter would have except it had surgical tools and she had surgery clothes on and

they had to immediately fix that infection and it was not fun.

Q. It was a hostile infection is what you are saying?

A. Yes, sir.

Q. So one surgery for repairing your facial injuries?

A. Yes, sir.

Q. Okay. Now, after -- did the same people who worked on the -- well, it was the same injury that they worked on the orbit and the sinuses and the nose?

A. I believe so.

Q. So then what restrictions have you got at this time as far as your own from the doctor what you can do and cannot do?

A. The doctor has placed permanent restrictions on me that says I am not to be on lift equipment, either operating or working from the lifting equipment or I cannot operate any high impact tools such as a rivet gun and it's kind of interesting. I didn't know this. He said that the vibrations carry through to your body and it's not good for your eyes when you use like a piece of machinery that vibrates a lot. Now that I only

have one eye, I have to be extremely protective of it.

Q. Is that why you are wearing your glasses?

A. Yes, sir.

Q. So you have restrictions that you will wear glasses, safety glasses and try to avoid high vibrations at work. Were you able to go back to work?

A. Yes, sir. But the glasses, I never had to wear glasses corrective lenses prior to the accident. My right eye was my dominant and my left eye I realize was just -- because I'm right handed so these are actually corrective lenses as well as protective lenses. I am sorry to interrupt, but can you ask the question again.

Q. Well, you ultimately attempted to go back to work; is that correct?

A. Yes.

Q. Can you give us an idea of the time frame, when that was that you were trying to go back to work?

A. I went -- the first time went back believe it or not was in March. So three months after the accident. But they said you're going

back to your old job which was the flight line. And my manager was intelligent enough to say, time out. Just take care of the tools. Help the guys with what they need as far as tools go. He wasn't going to put me out on the flight line doing work because he knew that I'd just lost half my vision.

Q. You got an eye. You got the skills, you got the technological knowledge, you have the experience, you got everything else working. What is it about one eye that can keep you from being on just a flight line?

A. Well, it's the dynamics of a flight line is not a place you want to be when you're learning to live with monocular vision.

Q. Tell us about that. That's what I was wondering about really. Living on the flight line, how is that with one eye.

A. It was frightening because you have to be aware of your surroundings completely and with just having one eye you really aren't aware of your complete surroundings. You are limited in vision so I really focused on -- just even walking here to the court we had to park at a different spot and focusing on where I am stepping because that's all I can really do. So there could be something going

on to my right. I can't even see past this monitor right now. So if there was a piece of machinery that's moving or somebody waving to me because there's an emergency on the flight line or anything because you have to rely on your vision because it is very loud. Sometimes you have hearing protection. You are relying on your vision a lot on an active flight line.

Q. I was interested in what you just said about the monitor. If you look right at me?

A. Yes, sir.

Q. Don't move your head. Tell me how far is it you can see?

A. I can see half of the monitor.

Q. I'm talking about me.

A. No.

Q. Do it again.

A. Okay.

Q. I don't have a model's walk, but watch me. Don't turn your head. I want to get an idea of what your field of vision is?

A. Yes, sir.

You are gone. I can kind of see.

Q. Okay. I am going back to the podium. Thank you. Now, how does that affect your personal

life? I think you have told us that well, things are moving around, you can't see them. I think you are concerned about bumping into things as you walk around. What about living in your home and living with your wife. Give me an idea about how that might affect your interaction with your wife?

A. At home it's not as bad as the outside world because it's set up in a familiar manner. I'm not blind. But as I guess you could relate my situation to a blind person. They can get around in a home where they know where things are fairly well such as I can, however, in unfamiliar -- well, you said about my home so I will just stay there. The things that move are pets sometimes and I don't know where they are. Actually bumped into them a couple of times.

Q. What kind of pets have you got?

A. I got two cats.

Q. So you might bump into your cats. I am wondering about what any -- I think I want to ask you about how it affects your actual interaction with your wife as in relation to if she's sitting somewhere in the house. If you are moving from somewhere regarding the type of whether you are a solitary man, whether you're a social man, give me

an idea of how it can or did affect your ability to feel abnormal with your family?

A. It's -- thank you. It's -- there is a sensation that I now have that's extremely psychologically difficult and that is anyone sitting to the right of me I can't see them. And the way our den is situated I actually can come out of the bedroom into the hallway and into the den, walk through the den, make a right turn into the kitchen and my wife is sitting there on the couch and I never see her. And it's almost as if she is not there, but she's there. But it's actually a sensation of being alone more so than when you can see somebody in your peripheral vision, but when you can't see them. It's hard to describe. A better example would be if I am actually -- I can drive. If I am driving and she's in the passenger seat it's almost as if I'm in the car by myself unless she touches me on the arm or says something.

Q. You wanted to make a point, told about one time being separated from people. Do you know, is that something about what you're describing right now? How does that -- how far does that extend, being separated from people?

A. I want to know what's next to me to my

right if I can, sorry, but it's kind of embarrassing if I turn because I think someone will think I am staring at them, but I can't see over there. And I am physically, visually and psychologically separated from half the room.

Q. Let me --

A. Embarrassing.

Q. I want to take you away from the flight line for a second. How long did they try to keep you on the flight line?

A. It was a short period of time. They realized that -- Boeing, it's a big company so the bigger the company the slower things happen seems. They realized visually that I was actually in violation of my medical restrictions and sent me back home on medical leave.

Q. So now you go home. And you're on medical leave. Where was your circle of friends? What circle of friends had you developed in Charleston?

A. Just at work primarily.

Q. So what was your ability to interact with the people who were your friends?

A. None when I was at home because we had just bought the house. We were only -- it was a

new neighborhood. We were only there for three months when this happened so the only person I met was somewhat of an elderly gentleman that had a vintage car that he was working on and I would go for walks to keep myself occupied when I was on medical leave around the neighborhood best I could and I would strike up conversations with him, but other than that that's about it.

Q. Well, was your wife working at the time?

A. Yes, sir.

Q. What was the -- would be the time that she would be away or would go to work?

A. Seemed like an eternity, but she would leave early at around 6:30, 7:00, come home sometimes after dark and at the same time around 6:00, 6:30 sometimes.

Q. Well, how long did that go on before you were able to go back to work?

A. Over two and-a-half years.

Q. Did you make any attempt to get back to work earlier?

A. Absolutely.

Q. What was it you were doing? What type of efforts were you making to get back to work?

A. I actually was making contact with -- eventually they put me under the responsibility of someone in a reassignment role. She had a job where somebody has to reassign people into new positions that are injured, can no longer do the job that they used to do.

And I would -- oh, I set up an automated system with the company. You put in your resume qualifications because actually like you're on unemployment, you are your own company, just kind of a strange thing and I would get e-mails automatically when the job opening came up that my qualification -- I was qualified to do. And I would call them and say hey, but to be quite honest with you actually it got to the point where I think I might have annoyed them and because I wanted to get back to work and do something.

But it's -- I think the buddy system goes on there somewhat and those jobs, they post them. I think they already knew they wanted to hire, actually interviewed for two jobs I was more than qualified to do and they gave it to other people. I was just so puzzled and irritated and it got to the point where they sent me a certified letter that I had to sign it and said if you don't

send us an updated resume, which I actually had already done, so we can continue to the process of reassignment and then if I mentioned getting into the reassignment how did they word it, they said if I mentioned getting into the actual process of being into reassignment they just wanted to do everything themselves. That they would terminate me.

Q. Well, how could you go back to work and try to get a job when you got the medical restrictions and they told you to go home on?

A. I had to do something.

Q. So instead of working with what you knew, flight line job, you had to get a -- try to get I guess a less restrictive job that would fit your medical condition?

A. I was passed around I would say once every eight or nine months. I would look at my profile on my internet and there was a special password that tells you who your manager is and your HR representative is. And every time it would change, I don't know why, I would call him and introduce myself. This is who I am. This is my situation. I would want to come back to work. Eventually I came across a new HR rep and she was a

young lady. And she was wanting to do the right thing. She did find me a job and it's obviously not my dream job like I said earlier on the flight line. I am just passing out tools to other people now so we can work.

Q. Did you ever approach Dr. Eiseman for aid to try to get back to work?

A. Yes. As a matter of fact the medical restrictions that he placed on me were more than the two that I said I currently have and I actually was willing to put myself in a little bit more of a risk. I told him to remove some of them and just limit it to those two because I was told that I had too many medical restrictions that was possibly hindering me from getting back into doing something. So I actually went and told him to take some of those restrictions off, but he said he couldn't go against my wishes if I was willing to go into the factory and be around an environment that I was unfamiliar with, that was up to me. But I was willing to take -- to push through that here so I could be active.

Q. So when did you finally go back to work then with someone who was going to keep you in that position?

A. It was around a year ago. I believe was August or September of 2015.

Q. So what are you doing there? Are you doing the same thing now as you were doing in September 2015?

A. It's in the same department, but it is not exactly the same thing.

Q. So what did you go back to do then?

A. I would stand behind a counter basically and someone that needed a tool that wasn't in their work area, a specialty type of tool, we kept them locked in a locked cage. I was literally in a cage inside the factory for security purposes and they would ask for this tool and I would just get it out of the drawer and scan the badge, scan it and then put it back.

Q. What are you doing now?

A. Now I am in charge of making sure -- in a different building making sure that tools that require calibration they have an expiration date and I am in charge of going into toolboxes and tool kits and I have a list of tools they want me look at to make sure that the sticker on them has not expired. We have to send them to a calibration department and I collect them and put them in a

special area and someone else brings them to another building where this calibration area is for them to be recalibrated. When they return I put them back in the box.

Q. As of today do you have any -- do you have -- can you tell us whether or not the pain, the physical pain from these injuries has gone away or is there any residual relating to any of them?

A. There is residual.

Q. So what would that be?

A. I have noticed correlates with the low pressure cells when they come into the area. I have a sinus pain which I am usually able to massage out.

Q. And regarding the eye itself, not the eye, but like I see -- I know you are wearing a patch now. Is there any -- what would you prefer to do if you didn't have to worry about anything else, what would you prefer to do, prefer to go without a patch, without a prosthetic or without a patch, no prosthetic? What would be your preference?

A. Depends on the environment.

Q. Tell me about that.

A. If I am in an unfamiliar environment my

preference is to have my prosthetic and wear the patch.

Q. And why is that?

A. It's because the prosthetic is a very good one, looks very real. People don't actually know I have lost my eye. So if someone gestures to me or is speaking to me, and this has happened actually quite a few times, and I don't respond to them, they are on my right side, they think I'm ignoring them or just being rude. And I've actually had some abrasive situations where I walked in front of people accidentally without realizing it when I did not have my patch on, just the prosthetic on, they said something like were you just going to keep going? It happened recently at work. And I had to explain to the guy I am blind in this eye. This is just a prosthetic. I didn't see you. So preferably I prefer not to wear the patch because it is not necessarily comfortable, however, I have been told looks cool. Some people said that. But I'm not a jewelry person. I don't wear -- I don't have tattoos. I don't like excessive things hanging off my body. So I prefer not to wear it, but there's a double edge sword. It is good if I do wear it. But then

if I don't wear it I have to explain myself.

Q. Thank you for that insight. So how does the eye look with the prosthetic?

A. Oh.

Q. Can we see that?

A. I actually did not wear the prosthetic. I thought you would want to see the injury. I would have to go to the bathroom and put the prosthetic in.

Q. Well, how do people react to the injured eye without the prosthetic and without the patch?

A. Without the patch? You can find out. (Demonstrating.) It is not pretty. This is me.

Q. Is an eyelid still there?

A. Yes, sir.

Q. What have they done to the eyelid?

A. This eyelid they didn't do anything. Like I said, they had just stitches you can hardly even see. Was three of them, just put the edge of the eyelid back together.

Q. So in what position is your eyelid now?

A. It's naturally the way it rests.

Q. So it not sewed in or for example, attached? Just rests naturally the way it would?

A. Yes.

Q. The way it would I guess considering the restrictions it has got.

A. Yes, sir.

Q. Is there a drooping?

A. I believe there is.

Q. So now, where did you get the prosthetic?

A. It's not -- they're not doctors. Mr. Robert Henderlite, he's my ocularist. It's not a fun process because they have to pour material into the eye socket to get a mold and pull it back out after it hardens and then he customizes a custom fit prosthetic which is actually hand painted and they put it in your head and they ask you how it feels. You tell them where it kind of feels like it's jabbing into your socket and they might remove some, put it back in, how does it feel now until they finally have the conformity to where is it as comfortable as it can be.

Q. How comfortable is it then?

A. It's -- I know it is there all the time. I can feel it pressing against my eye socket.

Q. How does it react to things in the

environment, hot, cold, movement? Is there anything -- any differences there? Does it just pretty much feel the same all the time?

A. No, sir. I believe it absorbs cold air and transfers back to the rear of eye socket and it is extremely painful and I found that out when I went back to work and was walking across the flight line to go to one of the buildings because I still have passage and it was easier access and a blast of wind came across and it's a long walk so it didn't happen right away. So I think after this piece of plastic got to the point of the ambient outside air temperature and transferred to the back of my eye socket I had to put my hand over there and try to warm it up as best I could.

Q. Does it change -- would you sleep in it? You will take it out to sleep, won't you?

A. No. I will leave it in.

Q. How has that changed your perception if it all when you change your position like a horizontal to vertical?

A. It can actually without me knowing it can rotate and be like I am looking over here like a chameleon or something. It's embarrassing. And at night my eyelid doesn't close all the way so it

builds up a dry piece of crust or in the morning I have to take eye drops and reconstitute it and take a piece of tissue and get off of there and basically prep it for the day.

Q. I understand one reason why this eye was taken out because of the way it was affecting the other eye. Hopefully you don't have a problem with the left eye, is that true?

A. Yes, sir. That is constantly on my mind.

Q. Well, I know you want to protect it, but at least it is good to know that it wasn't a procedure you went through for nothing. So what's your upward now path at Boeing?

A. Just I do apply for jobs. I am still under the automated system and I get e-mails that jobs are available that I am qualified to do because of my background and I apply for them. But I have never got any response because I'm capable of doing much more than the rather mundane job that I am doing currently, but I don't see any upward mobility. I hope I can move up, but I don't have any control over that.

Q. You have seen photos of a piece of glass that was a couple of pieces of glass?

A. Yes, I have seen those.

Q. When did you first see those?

A. It was when we first got the deposition, in 2014.

Q. So when someone showed that you?

A. Yes.

Q. Did they ask you -- let me ask you, when is the first time you ever heard that someone was claiming that a piece of glass went into your eye?

A. It was when I saw an eye doctor I had never seen before because I guess they wanted more than one opinion with regard to removing the eye. And she said, I believe it was her, can't remember the last name. I only seen her once. She said -- I think she made a comment you are the guy that had the cut eye or something of that nature. I said pardon me? She said something about having -- being cut by a piece of glass. And I asked her what she was talking about. And then when we were -- like we started asking questions about that, but so this is five to six weeks after the accident.

Q. Somehow a piece of glass got into your medical records?

A. Yes.

Q. Do you know who put that information into the medical record?

A. No, sir.

Q. Okay. Now, since then have you learned that there was EMS people that say that they found broken glass depending on what location it might be in or what conditions it might be in, but that they had broken glass they saw in your car that probably was not windshield glass?

A. That's what I have been told, yes.

Q. Who told you that?

A. I believe it was yourself or Ray.

Q. So you don't have any grudges with EMS people, do you?

A. No, sir.

Q. EMS people have any grudges with you that you know of?

A. No, sir.

Q. Did EMS people even know you before this?

A. No, sir.

Q. So is there any reason for them to be lying about finding glass in your car?

A. I wouldn't believe.

Q. Do you think they are lying about it?

A. No, sir.

Q. So do you know how the glass got in the car?

A. No, sir.

Q. We know something occurred. We will get there with other witness, but let me ask you then are you here to say that anybody who said that there was glass in the car is a liar?

A. No, I wouldn't say that.

Q. And were you holding a glass in your hand on the way to the theater or did you have a glass anywhere on your person on the way to the theater?

A. No, sir.

Q. Did you have a glass anywhere in your hand, pocket, was it sitting on the instrument panel, on your lap, as you had that crash?

A. No, no, sir.

Q. I guess ultimately you found out that it wasn't glass that got in your eye, right?

A. Yes. They didn't find anything in there.

Q. So as you go on today you told us that you are looking for an upward path still from your employment and for a more fulfilling employment.

Are there any other -- you told us about some instance where you might have pain. Is that pretty much then what you have, the continuing physical pain is the type of situations that you are telling us about, uncomfortable and moving the wrong way, cold, things like that, have we covered those things?

A. Yes, sir.

Q. No continuing problem with your chest?

A. No, sir.

Q. Or with the facial bones that you were aware of?

A. Well, in the face, yes. You know, it's just an overall in the cheek area it's just a sudden stabbing sensation and I have to actually massage it to the point to where inevitably my prosthetic rotates. I will have to usually go to the bathroom and readjust it so it is not like cocked off to the side.

Q. What kind of person would you describe yourself as prior to the accident?

A. Good.

Q. Aside from good do you have any traits that you are proud are, not proud of, personality? Let me ask you this, is your personality the same

now? Have you crossed that point in your life where that you met that car and you met that airbag to after it?

A. To answer your question, unfortunately I have changed.

Q. Were you in the Air Force?

A. Yes, I see where you are going.

Q. Were you proud of your service?

A. Yes.

Q. Did you hear your wife talk about sounds, concerns that you have around the house now that you might -- how they may affect you or how you basically monitor your house? Have you heard that?

A. Yes, I went through sort of like stages of recovery. After the accident I did two things that were out of character. I installed cameras around the exterior of the house and bought a shotgun because I was -- excuse me -- I was under the impression that I could no longer protect the house and my wife as a male role. (Crying.)

Q. So in some respect at least you doubted some of your ability; is that what you are describing?

A. I'm not -- I would never -- I could

never be into any type of physical confrontation. To defend myself I would have just to run. These things have gone through my head if something hits me and my prosthetic is jammed back into my head because I have seen things on the news people get hit for no reason just randomly. So people are looking at somebody the wrong way.

Q. Do you have to take care of that other eye?

A. Yes, the other eye and the fake eye.

Q. What about your ability not just to -- the concern I have got, the eye, I got to protect it, what about your own confidence in yourself? Has there been any effect from this injury from that?

A. Now that you mention it I guess I have a lack of confidence. It is not psychological, it's an actual hindrance not having your two eyes. I can't -- I have no depth perception. I have no peripheral vision. I have to slow down and be careful and like I can -- just pouring water into a cup I have to make sure that what I am pouring out is touching the rim or I have actually missed the glass I mean. I could go on and on. It's -- I didn't realize it would affect a person as bad as

this, but especially probably later in life as opposed to losing an eye when you are younger it is a difficult adjustment.

Q. The difference between losing your eye when you're younger versus being an older person, is that what you just mentioned?

A. Yes. Because I have talked to people. I have seeked them out for advice and the one person that sticks out in my mind, he lost his eye when he was 13. And he was like oh, you will be fine. I'm like what are you talking about? I am far from fine. And that's about as far as the conversation went. He was just -- because he was on his way out from work, and one other person that actually lost their eye in his I believe 20s that works there at Boeing. I sought him out. And he has problems. He is very distraught also. So I have discovered that the age you are when a person loses their eye actually is more detrimental as the older you get.

Q. I do not want to go over everything how your life has changed on a day-to-day basis. Just to give an idea of what it is that you are living with, is there anything that I should or that you would like the jury to know that doesn't touch on

what we have already discussed? Is there any particular effect on you that I have missed, you or your family for that matter?

A. Well, you have touched on a lot of things. If I could run you through a day of work it would be probably a good example of anything you may not ask me about. The factory is an assembly line so things change when I go back the next day. They are not where they are the previous day. So even though I know where things are in the building that I am working in, the first hour of work is nerve-racking for lack of a better word. It's I'm like a long-tailed cat in a room full of rocking chairs because they usually do the moves of the product at night. So I have to get familiar with my surroundings. That can take me about an hour until I know where they have moved things until I feel actually comfortable and safe to do my tasks.

Q. You mentioned an assembly line?

A. Yes, sir.

Q. What is being assembled on that line?

A. It's actually the building I am in they assemble the tail section of the aircraft.

Q. How big is it?

A. It's maybe the length of this room and

it tapers and it's possibly a cylindric. It's a perfect circle as round as this room.

Q. It does move? Is it moving when you say assembly line?

A. It's not an assembly line like you would think as a fast moving assembly line. I believe they produce 2.5 aircraft a month. So the moves are done usually on the second shift. I have actually been on the second shift. And kind of like jumps like one day and then the next day it will jump, but the things, they don't go the exact same spot because they are actually fabricating the tail section from scratch here in Charleston so there's actually slices of it and these toolings that they move around and they just kind of put them anywhere they can because they have so many of them. So they can really be anywhere.

Q. So you are working on an assembly line. You have to get used to what the lay of the land is. Once you have done that are you pretty much settled?

A. Then I have to deal with the fact of whether I am comfortable. I have days I have kind of a term, it's a good eye or a bad eye day. Sometimes I wear my patch because I describe it as

a good eye day. Maybe's it's psychological confidence wise my ability to move around without bumping into someone or walking in front of them. And if I don't feel confident I will put my patch on, but if I feel confident for whatever reason I don't know. I will not put my patch on.

Q. Thank you, Mr. Newbern. I am sorry to have had to intrude, but this is your one time to tell anybody that matters. So thank you. Pass the witness.

THE COURT: Madam forelady, ladies and gentlemen of the jury, we are going to take a break at this time. Please leave your note pads in your chair. Do not discuss the case among yourselves. I will see you back in about 20 minutes.

(Thereupon, the jury exited the courtroom at 11:48 a.m.)

THE COURT: Mr. Newbern, you may step down. Don't discuss the case during the break with anyone. Anything from the Plaintiff before we take a break?

MR. VAN GAASBECK: No, sir. We want to know if you heard from Mr. Blofeld.

MR. GLADD: Sure. I was able to talk to him. I couldn't tell y'all because the jury was

drinking glass in the vehicle with you on the evening of December 28th, 2012?

A. Correct.

Q. If witnesses found a drinking glass in the vehicle very close to you you would disagree with that, right?

A. No, I wouldn't disagree.

Q. You wouldn't disagree with that?

A. If that's what they found that's what they found.

Q. But you wouldn't know what they were talking about?

A. No, sir.

Q. Now, regarding the airbag, you know the airbag deployed in the crash, right?

A. Yes, sir.

Q. You agree that you don't know whether or not you made contact with that airbag in the collision, right?

A. At the time of the collision? I am sorry.

Q. Do you know -- have you been asked do you know whether or not you made contact with that airbag during the collision?

A. I know I made contact with the airbag

A. Yes, sir.

Q. That right thumb, I couldn't quite tell exactly where you were pointing to. Where exactly? Can you hold that up for me again?

A. Had to be somewhere in that region if I can touch with my index finger because I remember being able to feel it with my index finger.

Q. I wrote down a note there when you were testifying. Do you think maybe you were holding on to some glass and that's what cut your right thumb?

A. No.

Q. Possible?

A. I wasn't holding any glass.

Q. You mentioned windshield glass and you said -- I wrote this note down -- that the windshield breaks into -- breaks into small pieces for safety measure; is that what you said?

A. Yes, sir.

Q. That's how a windshield breaks?

A. Yes, sir. Side window I think breaks that way also.

Q. You believe the side windows in your vehicle were broken?

A. They were not.

Q. They were not, right. Correct. Also I

Q. You said that you didn't know at the time the airbag -- that you were touching the airbag or hit the airbag, you said now that you do. Do you remember that. Now, do you actually have any recollection of actually going forward and hitting an airbag during this incident?

A. No, sir. It was a dream state at that point.

Q. But have you since then looked at crash videos with us about the motion of people in cars which have airbags?

A. Yes, sir.

Q. And in those have you observed whether or not the people eventually hit an airbag?

A. Yes, sir.

Q. Thank you.

MR. VAN GAASBECK: Nothing further, Your Honor.

THE COURT: Okay. You may step down. Thank you, Mr. Newbern. Can I see the attorneys up here just a second.

(Off-the-record conference.)

THE COURT: Madam forelady, ladies and gentlemen of the jury, before I get there, does the Plaintiff have any further witnesses they plan on

calling?

MR. VAN GAASBECK: No, sir, Your Honor, we don't. We rest.

THE COURT: Plaintiffs rests?

MR. VAN GAASBECK: Yes, sir.

THE COURT: Ladies and gentlemen of the jury, I'm going to let you go to lunch. I have got to hear some motions at this time. And because of the timing, plan on being back in the jury room at 2:30. And we will get started back at that time. Please don't discuss the case. Leave your note pads in the chair and I will see you at 2:30.

(Thereupon, the jury exited the courtroom at 12:41 p.m.)

THE COURT: Let me take a 15-minute break and then we will listen to any motions Plaintiff has and any motions the Defendant has. Give me about 15 minutes. Okay?

(A recess transpired.)

THE COURT: Any motions from the Plaintiff?

MR. VAN GAASBECK: No motions, Your Honor.

THE COURT: From the Defendant?

MR. WISE: Yes, Your Honor. Rob Wise

for Ford Motor Company. First, Your Honor, I wanted to inquire, has Your Honor received a letter from the Supreme Court yet? Has Your Honor received a letter from the Supreme Court yet concerning --

THE LAW CLERK: I called them today and they confirmed they received it and processed it, mailed it on the 12th so it should have come in today. I checked downstairs in the clerk's office. They don't have it so it is either still in the mail or --.

MR. WISE: That's fine. The reason for my question was I was hoping to proceed with that motion, Your Honor, I want to make sure that was okay.

THE COURT: That's fine. I am not trying to keep you from participating just because I haven't got the letter. I was just reluctant to sign my order until I get the letter.

They did confirm it? I will go ahead and sign it and back date it to when you started making your arguments. Monday? Tuesday?

MR. WISE: Was Monday, yes. At this time Ford Motor Company moves for a directed verdict under Rule 50A.

THE COURT: First of all, I have got it written down somewhere, what cause of action -- first of all, let me ask the Plaintiff what cause of action are you planning on moving forward with on this at this point in time?

MR. VAN GAASBECK: At this point in time, Your Honor, I did not present enough evidence of late deployment.

THE COURT: Of what?

MR. VAN GAASBECK: Late deployment.

THE COURT: Are you moving forward on negligent design?

MR. VAN GAASBECK: Yes, sir.

THE COURT: Strict liability?

MR. VAN GAASBECK: Yes, sir, I am.

THE COURT: You got a warranty action I know.

MR. VAN GAASBECK: No.

THE COURT: You are not moving forward on the warranty. Any other action you are moving forward with other than negligent design and strict liability?

MR. VAN GAASBECK: I think there was an attempt at a warning and we are not moving forward on that either so just --

THE COURT: What?

MR. VAN GAASBECK: There was an attempt I think to put in a warning allegation. That's not there either. So it's just the negligent design and strict liability.

THE COURT: So please limit your discussion. He is withdrawing those others. So we are talking about those two causes of action.

MR. WISE: That is helpful, Your Honor.

THE COURT: Go ahead and please limit your discussion to those two. Which one is first?

MR. WISE: Yes. First I will start with design defect because the Supreme Court in Branham established in -- South Carolina Supreme Court established that preliminary for any product design case is proof of a defect in the first place. If there was no proof of defect there cannot be liability under either strict liability or negligence. It is a necessary predicate on both theories. So for that reason I am starting there.

Branham also says that to prove a defect that the risk utility test applies and a necessary element of that is an alternative feasible design. I will start there because if the Court searchs its memory and its notes it will

recall there is no evidence in this case of an alternative feasible design. In particular, there has been no expert evidence from the Plaintiff of any alternative feasible design.

In fact, there was no expert evidence whatsoever from the Plaintiff on design. Mr. Nranian was the Plaintiff's expert. He was in the courthouse. The Plaintiff rested without calling him. We have no such evidence. The only evidence they have presented on design at all was from Mr. Krishnaswami who testified clearly that this design was reasonably safe and nondefective. So as to that first element without an alternative feasible design, there can be no design defect. And since there can be no design defect, both of the only two remaining claims fail.

Under the South Carolina Supreme Court decision in Watson as well it stated that when you are dealing with highly technical matters expert testimony is required to prove a product liability case. We have no expert evidence whatsoever from the Plaintiffs on design. Mr. Krishnaswami, while Ford's corporate representative, was never qualified or offered as an expert witness by the Plaintiff.

THE COURT: I am sorry, what did you just say?

MR. WISE: Mr. Krishnaswami --

THE COURT: He was never qualified as an expert by either party.

MR. WISE: That's correct, Your Honor.

THE COURT: All right.

MR. WISE: Going back to the alternative feasible design, I mean the starting point is there was no such evidence. But there was no evidence once you dig down beyond the first layer into what's required on that. What's required is to show proof of the costs, safety and functionality associated with alternative feasible design. That was wholly lacking as well. So that element fails on multiple levels. To the extent that Plaintiff would present that you could have just thrown more sensors in or something like that, that falls under the category of a mere conceptual design that has not been established, proven. There's no analysis of those factors I mentioned such as cost, safety or functionality. So there's simply a lack of evidence on that point on multiple levels.

As the Holland v. Morbark case says in

the court of appeals here, 407 S.C. 227 at page 237, the requirement of proving a reasonable alternative design in a design defect case is mandatory. We have heard the Plaintiff say the late deployment theory is out and I am glad to hear that, because there wasn't evidence on that. As to non-deployment in terms of an actual specific defect theory, there is insufficient evidence on that as well. Mr. Krishnaswami did not support that this was a late deployment, sorry, this is a non-deployment event. Moreover, Plaintiff's biomechanic, Mr. Lewis, relying on their not called accident reconstructionist Mr. Webb confirmed that they expected this would be a deployment event in this crash. Plaintiff's own evidence establishes this was a deployment event.

We heard reference I think at times maybe in some of the papers to bag shape, I'm not sure what's going to be thrown out, but bag shape perhaps was an issue here. There's no evidence concerning bag shape, much less an alternative feasible design on bag shape.

MR. VAN GAASBECK: That's agreed, Your Honor.

MR. WISE: Thank you. Concerning the

sensors, we believe that's out as well for the reasons I have --

THE COURT: What?

MR. WISE: The sensors as an alternative feasible design, there has been no evidence of that. And there is no evidence of causation in terms of in this crash with two sensors, three sensors, five sensors, would it have made a difference and how, much less any evidence to support that and crash testing, any other vehicle testing, anything like that that would have shown in these crash circumstances different, more, what have you of sensors would have made a difference.

Given some things were taken off the table I want to make sure I don't miss anything in my notes because I was prepared to address a little bit more. If you will give me one second.

So at this time, Your Honor, we think the evidence is wholly insufficient to prove a design case as required under South Carolina law and therefore we move for a directed verdict on all of the Plaintiff's claims and for judgment in favor of Ford.

THE COURT: Okay. Thank you very much.

Yes, sir.

MR. VAN GAASBECK: Yes, Your Honor. The party opponent spokesman, Mr. Krishnaswami, testified very directly and I very carefully made certain that I -- when I asked him, we asked him about is there any way that you can deploy an airbag, design to where it will deploy the airbag when we need to deploy and not deploy them where they are not needed versus what's happening where they are deploying them where they are needed and having to deploy them when they are not needed just to be able to cover the other one.

THE COURT: Where did he say that the design of the sensors in this particular automobile was defective? Where did he say it could have been done differently?

MR. VAN GAASBECK: Yes.

THE COURT: That's sort of the crux of what we are talking about. Now, he talked an awful lot and I can't sit here and tell you I remember everything he said because he really rambled a lot.

MR. VAN GAASBECK: So he agreed that if you deploy an airbag when you shouldn't deploy an airbag that is unreasonably dangerous.

THE COURT: He never said this

particular car it was deployed unreasonably, did he?

MR. VAN GAASBECK: Well, he said -- yes, Your Honor, he did.

THE COURT: At the very end of the testimony you sort of asked him assuming it was a late deployment -- early deployment or no deployment would that be an unreasonably dangerous and he said yes. And you sat down.

MR. VAN GAASBECK: So then you are wondering where is our evidence that it should not have deployed there. Well, first of all, from their own crash test where it is 25 miles an hour into the angle barrier that is a non-deploy. He agreed that is a non-deploy and he agreed that the only reason that they did deploy it was not to help the people in the car. Did not benefit them. It only benefitted the fact they could crash -- they could deploy in a different crash. So I asked him.

Now, if were you -- when you find that you have violated your rule, the no deploy for this crash test, you had two options. Yes, he agrees. One of your options would be to create a crash path between the sensors. Yes. He agreed. Or you could have maybe put the sensors in a different

position. Yes.

THE COURT: Was this after you had asked him about the calibration from Bosch to him didn't meet their specifications and then how that could be corrected when you were talking about how it was corrected? You went into that area, is that what you are talking about?

MR. VAN GAASBECK: Yes, sir, time wise and structure wise it would have been right after that.

THE COURT: Okay.

MR. VAN GAASBECK: So here's what we did. We put together a colloquy about well, if you then did that you could have done that, the answer is yes, you could have done that. One reason why you can't do it, though, is because when you put together this system and you ran those 200 crashes what you did was you only put three sensors up there. And those were going to be the three choices of places that you were going to use. So they didn't crash the test -- the cars with enough sensors up front in order to later go back and say okay, we just got calibration back here that doesn't work. What can we do? They could not go back and say well, let's use the data from this

sensor and sensor, but there was no alternative sensors.

So they made an exception to their requirement, never changed their requirement. They made an exception. So they failed to meet their requirement on this. And they didn't do it for the benefit of those people in that car. They did it for the benefit of another crash that they could not meet but for this. So the answer was I asked could you have used different positions of the sensors or created a crash path and he said yes, we could. But they did not do that.

THE COURT: They didn't do the crash test when they made the adjustments to the calibration if I remember correctly.

MR. VAN GAASBECK: Yes. And they never did then crash test it afterwards to create --

THE COURT: How is that presenting to the jury an alternative plan? That's sort of a packet, the Ford Focus plan. How can the jury possibly understand that's the alternative plan?

MR. VAN GAASBECK: If nothing other than creating a path.

THE COURT: Creating what?

MR. VAN GAASBECK: Creating the crash

path to the sensors would have solved the problem. You didn't have actually different sensors. You really didn't have to do that. He agreed that you could create a crash path.

THE COURT: But you didn't have anybody testify to the effect where to place the three sensors, two sensors or however many were necessary here, here and here and go into the cost of it and feasibility of it.

MR. VAN GAASBECK: Here's what I did do.

THE COURT: Well, that was a reasonable alternative. I mean --

MR. VAN GAASBECK: Can I tell you one more?

THE COURT: I want to hear you.

MR. VAN GAASBECK: One more sentence. I also asked him in 2009 did Ford have the technology in order to deploy an airbag in the crash that you wanted to deploy it in and not deploy it in the crash that you did not want it in and was it technically and economically feasible as of 2009. Answer was yes. So I think that covers the overall point. And then we covered it in detail wise by way of doing it, creating crash path

sensors or just moving your sensors. Either way you do that you are going to get it done. They chose to and we know why. Job one is coming up.

THE COURT: What?

MR. VAN GAASBECK: Job one was coming up. So he agrees there was two ways of doing it.

THE COURT: Okay.

MR. VAN GAASBECK: That's the best I got, Your Honor. I don't have anything else on that.

THE COURT: Mr. Wise?

MR. WISE: Yes, Your Honor. To address the point about the 2009, when he asked him could you have designed it so that it wouldn't deploy if you didn't want it, would deploy when you did want to, ignores the fact that Mr. Krishnaswami specifically answered yes, we did that in this vehicle. He is not saying there was something else that we didn't do. Mr. Krishnaswami's testimony was this vehicle met those criteria. As to the point about the assertion --

THE COURT: I may remember it wrong. I may interpret it wrong, but I guess I was under the impression that Ford required certain specifications for the sensors that were produced

by Bosch. When Bosch produced those they didn't meet the Ford specifications per se. So instead of going back to Bosch and say change it they decided to move the sensors. But they never ran any tests to see if that calibration or change in the sensors would effectively meet the original specs for the sensors. I may be using the wrong terminology because I'm not real versed in the vernacular of airbag terminology as the two of y'all are.

MR. WISE: Terminology is important here.

THE COURT: It is. I may have used some of the wrong terms.

MR. WISE: No, that's fine.

THE COURT: I think you got the gist what I am trying to ask you.

MR. WISE: Mr. Krishnaswami did speak an awful lot as you said. But the terminology that was used by the Plaintiff's counsel which is not evidence was that those were requirements. The terminology used by Mr. Krishnaswami is that it soft target, this was an iterative process. He talked about the chicken and the egg, starting somewhere going, testing, calibrating, retesting, that type of thing. So the initial numbers given

to Bosch were not specifications meaning you had to get here, you didn't get here and we are going to ignore that. Those were soft targets as part of the iterative process. So I don't think that can be used to say that they did not meet the specification.

THE COURT: Well, I understand they are saying it was a soft start and you didn't have to hit it exactly, but the difficulty I have is once they try to make the adjustment why didn't they test it to see if it worked? My understanding is they didn't; is that correct, Mr. Van Gaasbeck?

MR. VAN GAASBECK: Your Honor, I have got to be honest with you. It is not.

THE COURT: Okay. I will withdraw the question then. Go ahead.

MR. WISE: Thank you, Your Honor. The calibration report, Exhibit 50, the calibration report, that's what that shows, is that iteration, the fact that they were calibrating, they were meeting their specifications and their designs. The point of the one test being an exception, Mr. Krishnaswami rejected that motion that it was an exception and explained that in his testimony.

We didn't hear any -- the only rebuttal

on alternative feasible design didn't meet the standard and we don't think there is anything here to keep the case alive, Your Honor. I will be happy to answer any other questions.

THE COURT: Thank you.

MR. VAN GAASBECK: It is an exception and it's an exception in that --

THE COURT: I am sorry?

MR. VAN GAASBECK: When they allowed this airbag to deploy when it shouldn't, it was an exception and it is noted as an exception. He has the wrong test. When Mr. Krishnaswami was asked about a test, was that an exception. No. The one that was an exception was the one that they said was closest to ours, that's the 30-degree right oblique angle at 25 miles an hour. And that is listed as an exception as he testified, as an exception in order to allow another crash test, another crash to meet its goals. So they allowed this one to fail its goals and allowed this one to meets its goals to do so and he agreed you didn't have to do that. What you could do is change the position of the sensors, or create a crash path to those sensors. That crash path as he would know gets the information from the sensor back to the

RCM quicker through the center of the vehicle and he understands what that meant. He agreed. That's the way you do it, especially if you didn't do the testing you were supposed to do with other alternative positions with alternative sensors which you could have then just run a new calibration. He agreed you could do that. But they didn't and then they also didn't create the crash path. Instead, not changing their requirements, they made an exception to their requirements which they did not need to do. And, yes, he may call it a soft target. That was the last target Bosch was ever given and it never changed.

THE COURT: When you are talking about soft targets and targets, was the last target before production?

MR. VAN GAASBECK: That was it, Your Honor. That was the final one. In fact, they had already changed it one time just before that. Just a couple of months before and now they are only a few months from job one. They decide we are not going to change.

THE COURT: What do you mean when you say job one? You all use terminology. This is the

first time I have heard some of this. I don't remember it all.

MR. VAN GAASBECK: Sorry, Your Honor.

THE COURT: You got to excuse my ignorance, okay?

MR. VAN GAASBECK: Job one is when they want that car to go into production with that sensor system. So he said we wanted to get that done. We wanted to get that done quickly. And he didn't say there was any reason why he couldn't do it and ultimately he admitted to me they did have the technology in 2009 to deploy when you should deploy and not deploy when you don't want to deploy.

THE COURT: I'm going to take this under advisement and give it some thought. I will probably take it under advisement and not rule until after I hear the Defendant's case at least during lunch. Thank you all so very much. If there is anything you want to say, anything crucial for me to hear I will be able to hear before we go to lunch, but don't go into all this again.

MR. WISE: There was one point with regard to the alternative feasible design with regard to the test.

THE COURT: Alternative what?

MR. WISE: Feasible design in terms of doing different crashes testing. There still is no evidence from any expert that it would have made a difference in this instance, that a different crash path would have made a difference to Mr. Newbern on the day of this crash. So even if there was some -- even if Mr. Newbern believes that he has proved design defect, he hasn't proved specific causation defect. That would nonetheless be fatal to his claim here. Would anything have made any difference. That's what required expert testimony and that among other things is what is wholly missing.

THE COURT: Thank you so very much. You want to say something?

MR. VAN GAASBECK: I could expound if you want me to, but I will go away if you want me to.

THE COURT: I will be glad to listen to you if you think I need to hear it. Be very brief. I don't want you to regurgitate what you said.

MR. VAN GAASBECK: They have -- everyone agrees their airbag they fired did not offer any protection for our client. They agreed

to that. Because it doesn't even touch the guy until after he already moved forward. There's no cushion. So in that respect we know it shouldn't have fired. But we know it did fire and that is when it shouldn't have fired and doesn't help him, the glass even -- and according to their theory a glass goes back and hits him, that's their theory that that's what caused it. It's caused by the airbag. So firing when it should not fire. So our theory is the airbag hitting him, we have excellent expert testimony about how you have marks here, here and here and the only thing that can do that is the airbag.

THE COURT: Thank you all very much. See you at 2:30.

(A luncheon recess transpired.)

THE COURT: Bring us the jury, please.

MR. CARTER: We have already stipulated to an agreement all of his exhibits are in evidence.

THE COURT: Okay. Has she marked them all?

MR. CARTER: I have marked them all. I will make sure that you know what the numbers are.

THE COURT: Thank you, sir.

(Whereupon the jury entered the courtroom at 2:56 p.m.)

THE COURT: If you will call your first witness, please.

MR. CARTER: Ford calls Dr. Dan Toomey.

THE COURT: Thank you, sir.

DAN TOOMEY

having been duly sworn, testifies as follows:

THE CLERK: Please state your first and last name and spell your last name loudly and clearly into the microphone.

THE WITNESS: Daniel Toomey, last name is T-O-O-M-E-Y.

DIRECT EXAMINATION

BY MR. CARTER:

Q. Do you need some water, Dr. Toomey?

A. That would be great.

Q. Dr. Toomey, could you tell us where you are from and what you do?

A. Sure. I live in metro Detroit in Michigan and work for a company called Design Research Engineering. We are in Novi, Michigan. It's kind of on the northwest side of metro Detroit. And I am a biomechanical engineer and so most of my work or analysis is when clients like

CERTIFICATE OF REPORTER

I, Ruth C. Weese, Registered Diplomate Reporter for the State of South Carolina at Large, do hereby certify that the foregoing transcript is a true, accurate, and complete record.

I further certify that I am neither related to nor counsel for any party to the cause pending or interested in the events thereof.

Witness my hand, I have hereunto affixed my official seal this 16th day of December, 2016 at Charleston, Charleston County, South Carolina.

Ruth C. Weese

Ruth C. Weese
Registered Diplomate
Reporter

STATE OF SOUTH CAROLINA — COURT OF COMMON PLEAS

COUNTY OF CHARLESTON — CASE NO. 2013-CP-10-2928

STEVEN NEWBERN AND CLAUDIA NEWBERN,

PLAINTIFFS,

VS.

FORD MOTOR COMPANY,

DEFENDANT.

TRANSCRIPT OF RECORD

SEPTEMBER 16, 2016
CHARLESTON, SC

VOLUME 5 OF 5

B E F O R E:

HONORABLE J.C. NICHOLSON, JUDGE, AND A JURY.

A P P E A R A N C E S:

STEVE VAN GAASBECK, ESQUIRE
RAYMOND BODIFORD, ESQUIRE
WILLIAM APPLEGATE, ESQUIRE

Attorneys for the Plaintiff

J. KENNETH CARTER, ESQUIRE
NICHOLAS GLADD, ESQUIRE
ROBERT WISE, ESQUIRE
CARMELO SAMMATARO, ESQUIRE
Attorneys for the Defendant

* *

Ruth C. Weese, RDR
Official Court Reporter
Ninth Judicial Circuit

E X H I B I T S

Court's 1-stipulation Page 820

(The following proceedings were held September 16, 2016, Charleston County, South Carolina, @ 9:31 a.m. outside the presence of the jury.)

THE COURT: I'm going to go back to the Defendant's motion for directed verdict. I'm going to ask the Plaintiff some questions. I want you to give me some answers, okay?

MR. VAN GAASBECK: Yes, sir.

THE COURT: I want you to walk me through the risk utility test and how you have proven the danger of using the airbag outweighed the usefulness of the product. I want you to tell me how you have proven that.

MR. VAN GAASBECK: Yes, sir. The usefulness of an airbag sensor system is to deploy an airbag when it should because that's a benefit. It should not deploy the airbag when --

THE COURT: I understand all that. My question to you is where and when did you prove that in your case? That's my question to you. I understand the law. You don't have to tell me that. I want to know factually how you have proven that and when you have proven it.

MR. VAN GAASBECK: Mr. Krishnaswami

testified that an airbag -- if an airbag deploys in a crash it should not deploy in, that is unreasonable danger. That would be a disbenefit and if it does so in a crash, if it deploys in a crash where it is needed that is a benefit. An airbag system that will not do either one of those is a greater benefit and less risk than one which would do both of those.

THE COURT: All right. Assuming for argument purposes that you have proven a reasonable and feasible alternative design existed, how have you proven the alternative design would have prevented the product from being unreasonably dangerous?

MR. VAN GAASBECK: If they had --

THE COURT: You said we had -- you said you did prove alternative design. Answer my second question.

MR. VAN GAASBECK: Well, one thing is we used the sled test to prove that it would not have injured him. We provided evidence of Mr. Lewis by reasonable medical -- or biomechanical engineering that it would not have injured him. We have their crash test which they admit is the closest to ours. And they admit that the person is

not injured from that one either. And we have their evidence that the reason that they did allow it to deploy in this was of no benefit to the people in the car. Those people did not benefit by their deployment of that airbag. It was done so that they could meet somebody's else criteria in another crash. Never comes in contact with the Plaintiff. It doesn't cushion him as you can see by the video. When it deploys it is out fully deployed and he moves -- ultimately he moves into it as it is the cushion, the top of his head.

THE COURT: How have you proven causation? Specifically how have you proven the failure to use an alternative design caused the injury or the use of the alternative design would have prevented the injury?

MR. VAN GAASBECK: Yes, sir. The alternative design would have prevented the airbag from deploying.

THE COURT: I understand that. Where have you proven that? That's my problem with your case, okay? I understand the law. I'm concerned about how you factually have proven, from what witness you have proven that.

MR. VAN GAASBECK: I am trying to -- I

thought maybe you were asking me why is our theory -- what would be different.

THE COURT: I understand your theory. I am just not sure you have proven your theory.

MR. VAN GAASBECK: Are you asking me --

THE COURT: That's where I am coming from, okay?

MR. VAN GAASBECK: Are you asking me what would have been different if it had not deployed, how would that changed?

THE COURT: I am just asking how your alternative design that you just told me about would have prevented this injury?

MR. VAN GAASBECK: Because everyone agrees that no one would have been injured but for the fact that airbag went off. Mr. Lewis said that. Their theory is that it was a cut, glass.

THE COURT: I'm not worried about their theory. They haven't fully developed their theory yet. They are still in the process of it.

MR. VAN GAASBECK: Either theory, under any theory at all, the only way the injury occurs if is the airbag goes off. His eye is not injured by anything. If they say his eye was injured by the airbag then that proves the case. If they say

it was injured by something blowing back into his face by the airbag, that proves the case also. And Lewis, our biomechanic expert, testified that the airbag is the cause of the injury. He testified that had it not deployed that it would not have caused an injury.

THE COURT: Why do you think an expert opinion is not needed to prove your case under Rules of Evidence 701 (C) and 702?

MR. VAN GAASBECK: Thank you, Your Honor. Well initially, we have to go from the fact from the question can a party admit an element of fact. One of the elements which would lead to a verdict which would be in your favor. Yes. They can admit that. We know that the request for admissions can be served upon a witness. I mean a party can eliminate any number of facts, even elements and proceed forward with the case. So the question is not can they do it, then goes to did they do it. And in this case they did admit it through their corporate rep for purposes of this trial who they have designated as such, put him up there and he established that there was an alternative design. And --

THE COURT: I guess what I am asking

you is also he was a lay witness.

MR. VAN GAASBECK: Sir, he was a party.

THE COURT: He was a lay witness, okay? Nobody offered him an as expert. I understand his background. I understand his knowledge. But he's still a lay witness. He was never offered as an expert. He never gave an expert opinion. So my question to you is how could he possibly admit to something that required an expert opinion as a lay person, assuming he did make an admission by opposing parties.

MR. VAN GAASBECK: So the CEO of Ford is a lay person, not an expert. If I asked him for an admission on the stand that this airbag had a -- that it was possible to not deploy the airbag, there was an alternative design. He said so on the stand, even as a lay person he said it for the company. He says it for the company. This man said it for the company in the shoes of the company and a manufacturer is deemed to be an expert who has knowledge of the materials in its -- has expert knowledge of the materials that go into his product and the process in which the product is designed.

And that's in jury charges. That's in your actual jury charge, that they are held to that

standard. So not only is he speaking for the company, which I believe is good enough for the company to make an admission, but he is even deemed to be an expert when doing so. And then ultimately when I made the question -- when asked the question which was according to them required to be given by -- an opinion to be given by an expert, they did not object. So they waived their objection to this issue anyway.

THE COURT: I guess that's where you and I disagree, okay? I just don't see where Mr. Krishnaswami's testimony was admission. I mean he did answer some of your questions yes or no, then he gave an explanation which qualified the answer. I never viewed him as a party per say or as you suggested earlier I believe in chambers about request to admit.

So I disagree with you there. But thank you for answering my questions. Now, would the defense like to address anything that I have raised concerning the directed verdict in response to his answers? I will be glad to hear from you. I won't exclude you from this discussion, okay?

MR. WISE: Yes, Your Honor, thank you. May it please the Court, first of all, we agree

with Your Honor's analysis, final analysis, we hope it is, but we agree that Mr. Krishnaswami was not offered as an expert. We disagree that we had any obligation to object to the Plaintiff's undisclosed expectation that he might be considered as an expert. That was never made known to anyone here. So we had no obligation to object, thereby there should be no waiver deemed at all.

The Plaintiff's brief starts out by reciting some of the law which Your Honor is familiar with, including the Branham case talking about whether an alternative feasible design would have prevented the product from being unreasonably dangerous. And a specific causation question that you were asking I don't think was answered, at least not to my way of understanding what that inquiry would be, which is if you had an alternative feasible design what would the design have done in this crash? There was no evidence whatsoever of what this vague conceptual alternative feasible design would have done under the circumstances of this crash.

Mr. Krishnaswami certainly never answered any such question or can be extrapolated fairly from his testimony. So that question is

wholly unanswered. That question alone defeats the Plaintiff's case.

But there are a number of other problems, including the fact that Mr. Krishnaswami never admitted there was a defect. And any discussion of any alternatives was entirely vague and conceptual. We still don't have the evidence concretely of what are those designs. Is it two sensors, three sensors, how many sensors? Where, what would they have done. What was the cost benefit risk utility analysis under the factors elaborated yesterday? Cost benefit, risk benefit, looking at cost, looking at functionality of it, looking at all the different safety. As Mr. Krishnaswami testified, these systems are designed to -- not to prevent all injuries, but to provide optimal protection across a variety of crash modes. That's why you cannot look simply at the Newbern crash which nobody has evaluated here from a design standpoint.

Moreover, the crash test that Plaintiff is relying on, the litigation crash test arguing that the occupant never makes contact with the bag, first, the occupant does make contact with the bag. But if in their argument they are saying your crash

test shows that this bag doesn't get to the occupant, well, then it never could have caused this injury which is their entire defect theory. So I am really puzzled as to how they are relying on that evidence since it directly undermines their own case.

So for these reasons, Your Honor, we think that we are still despite Plaintiff's best efforts still having major gaps in the case here which require summary judgment or directed verdict in this case, sorry. No evidence of defect, no other risk utility, no evidence of alternative feasible design to the standard required, not some vague concept.

THE COURT: He can argue and say he did prove the crash test and other questions and Mr. Krishnaswami did offer an alternative design. I think I agree with you, it was never clear as to whether talking about one sensor moving or two sensors or three sensors or what as far as a specific design. But go ahead. I didn't mean to interrupt you. It's a major problem from my perspective of causation anyways.

MR. WISE: Yes, good point about there being no expert evidence. There was also in the

negligence claim, no evidence of a violation of the standard of care in the industry with respect to design of these vehicles. The whole reasonableness and the reasonably prudent manufacturer analysis was wholly lacking. And the elements of causation Your Honor mentioned. So for those reasons we ask the Court to grant a directed verdict.

THE COURT: Thank you very much. Yes, sir.

MR. VAN GAASBECK: Very briefly. Perhaps I have not -- the idea and I think it is crystalizing now that you have to have expert testimony to prove this, that's not what the cases say. The case -- even in the cases that I think -- the Branham case, it's agreed to have been circumstantial evidence which would actually prove without expert testimony. I believe in the Grace versus Ford case I believe they point that out.

THE COURT: I agree with that, but I don't think this is that situation. Okay? But go ahead.

MR. VAN GAASBECK: As far as the causation, because I guess that is something else that bothers you, Mr. Lewis tells us that nobody would have been injured if the airbag didn't go

off. That's it. The design --

THE COURT: That's sort of a res ipsa argument. We don't have that in South Carolina.

MR. VAN GAASBECK: Yes, but it's not that because nothing would have been blown back into his face. Either the bag would not have hit his face or the glass would not have hit his face. Nothing would hit his face. It is exactly the type of injury that Mr. Krishnaswami said you have to avoid by not deploying airbags including having a coffee cup going back in your face which is the exact scenario I gave him. He said yes, that is one of the dangers in airbags. That's why you don't deploy airbags when they are not needed. I understand the Court's reservations.

THE COURT: Okay. I'm going to grant the Defendant's motion for directed verdict on all causes of action. Thank you all very much.

MR. GLADD: There was two EMTs here under subpoena. Can they be released?

THE COURT: Yes. For the record, I'm going to -- by stipulation of the parties if you want to file the stipulation agreement and mark it as Court's Exhibit No. 1. I'm going to seal Defendant Exhibit's 50. Okay?

MR. CARTER: Yes, sir.

THE COURT: You got your stipulations you can mark. I will mark it as Court's Exhibit No. 1.

(COURT'S EXH. 1, stipulation, was marked for identification.)

(These proceedings were concluded at 9:57 a.m., September 16, 2016, Charleston County, South Carolina.)

CERTIFICATE OF REPORTER

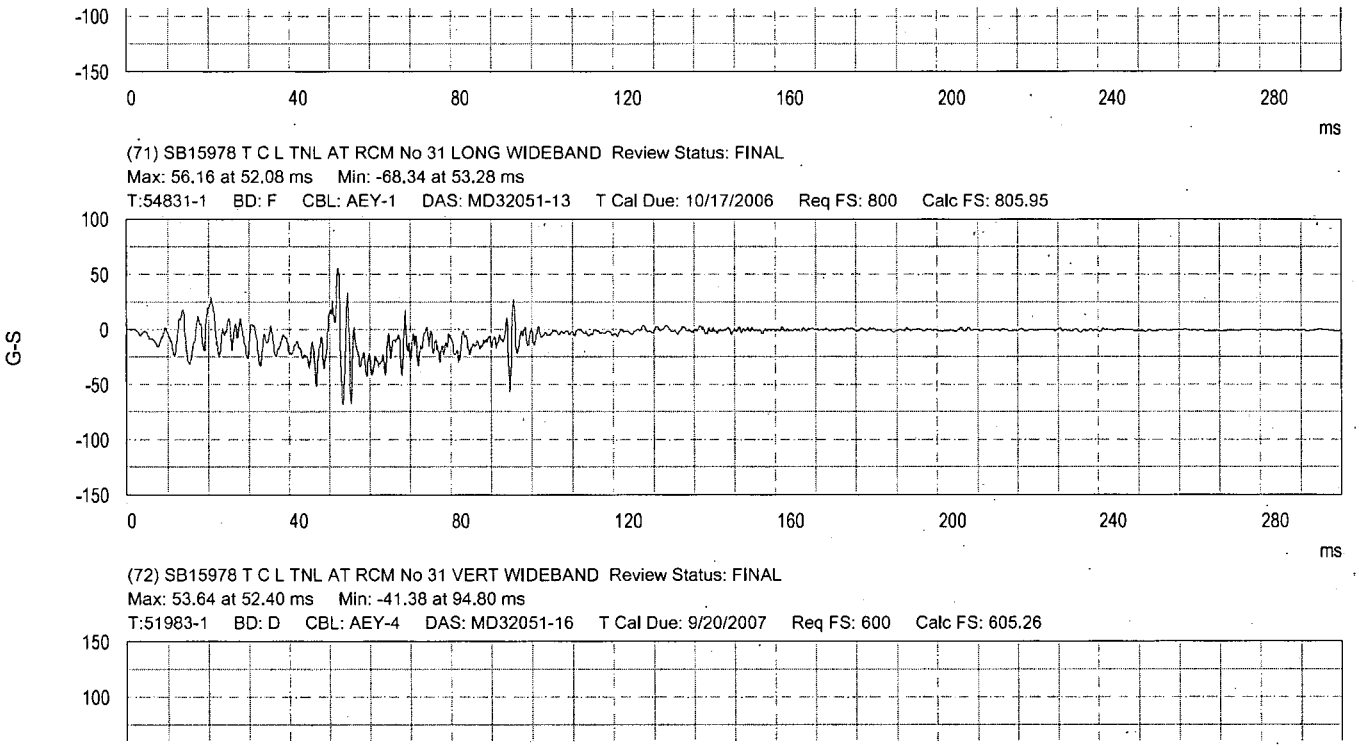
I, Ruth C. Weese, Registered Diplomate Reporter for the State of South Carolina at Large, do hereby certify that the foregoing transcript is a true, accurate, and complete record.

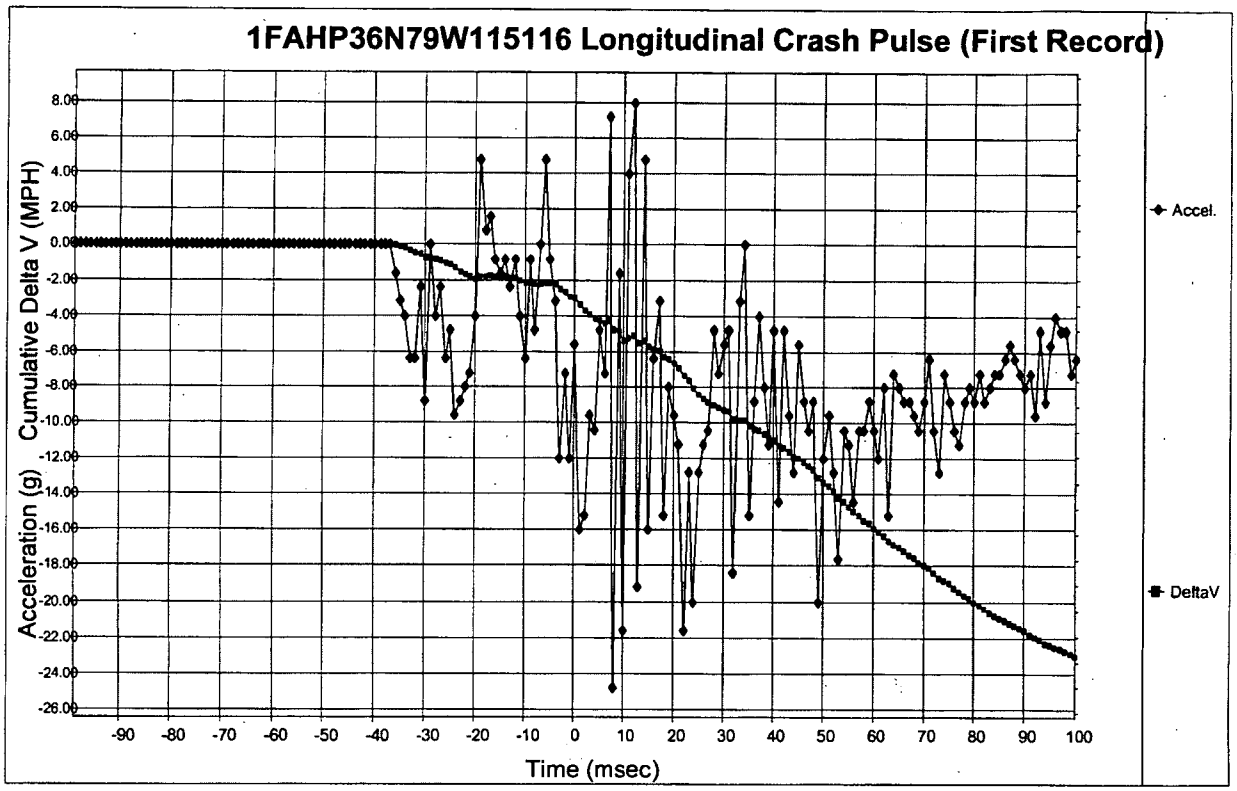
I further certify that I am neither related to nor counsel for any party to the cause pending or interested in the events thereof.

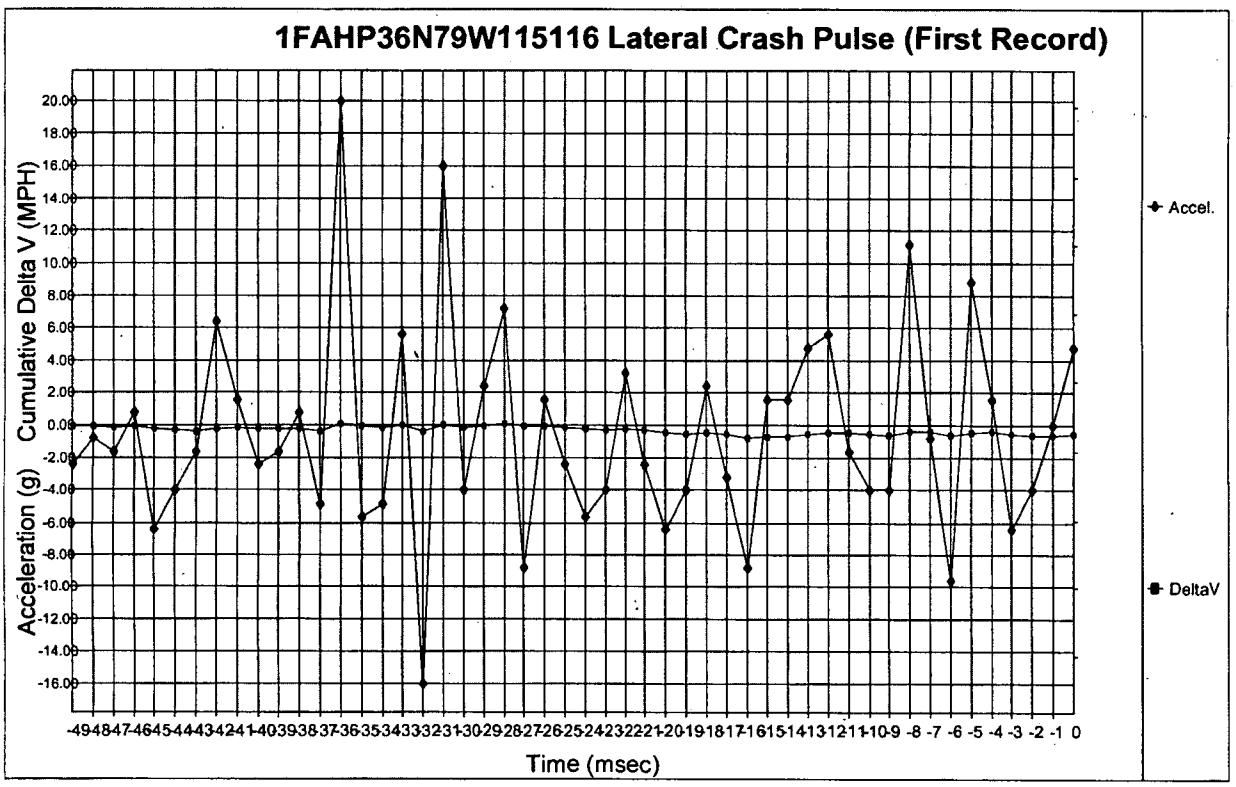
Witness my hand, I have hereunto affixed my official seal this 16th day of December, 2016 at Charleston, Charleston County, South Carolina.

Ruth C. Weese

Ruth C. Weese
Registered Diplomate
Reporter


-100
-150
0
40
80
120
160
200
240
280
ms
(71) SB15978 T C L TNL AT RCM No 31 LONG WIDEBAND Review Status: FINAL
Max: 56.16 at 52.08 ms Min: -68.34 at 53.28 ms
T:54831-1 BD: F CBL: AEY-1 DAS: MD32051-13 T Cal Due: 10/17/2006 Req FS: 800 Calc FS: 805.95
100
50
0
-50
-100
-150
G-S
0
40
80
120
160
200
240
280
ms
(72) SB15978 T C L TNL AT RCM No 31 VERT WIDEBAND Review Status: FINAL
Max: 53.64 at 52.40 ms Min: -41.38 at 94.80 ms
T:51983-1 BD: D CBL: AEY-4 DAS: MD32051-16 T Cal Due: 9/20/2007 Req FS: 600 Calc FS: 605.26
150
100


1FAHP36N79W115116 Longitudinal Crash Pulse (First Record)
Cumulative Delta V (MPH)
Acceleration (g)
Time (msec)
Accel.
DeltaV

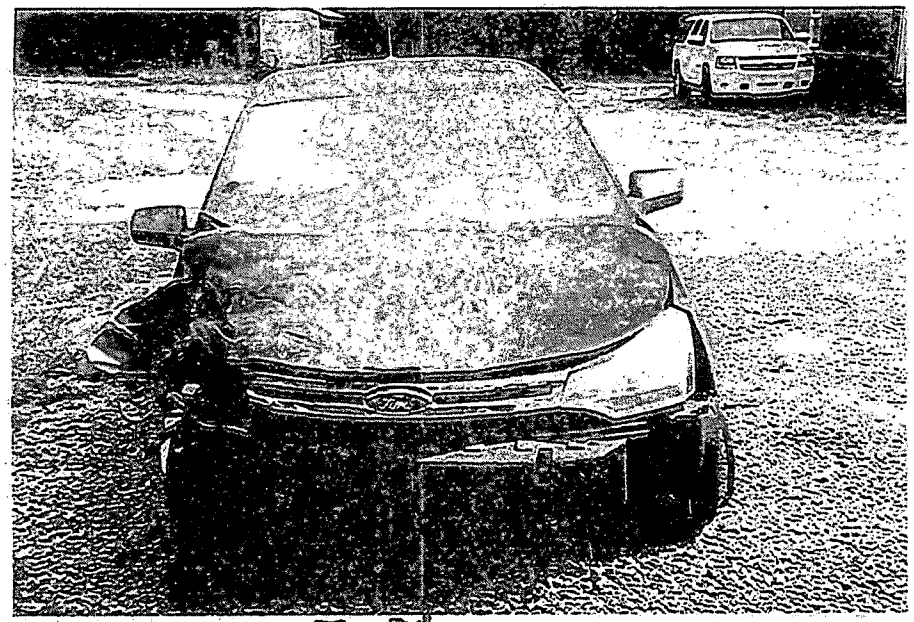

1FAHP36N79W115116 Lateral Crash Pulse (First Record)
Cumulative Delta V (MPH)
Acceleration (g)
Time (msec)
Accel.
DeltaV

PLAINTIFF'S EXHIBIT 93

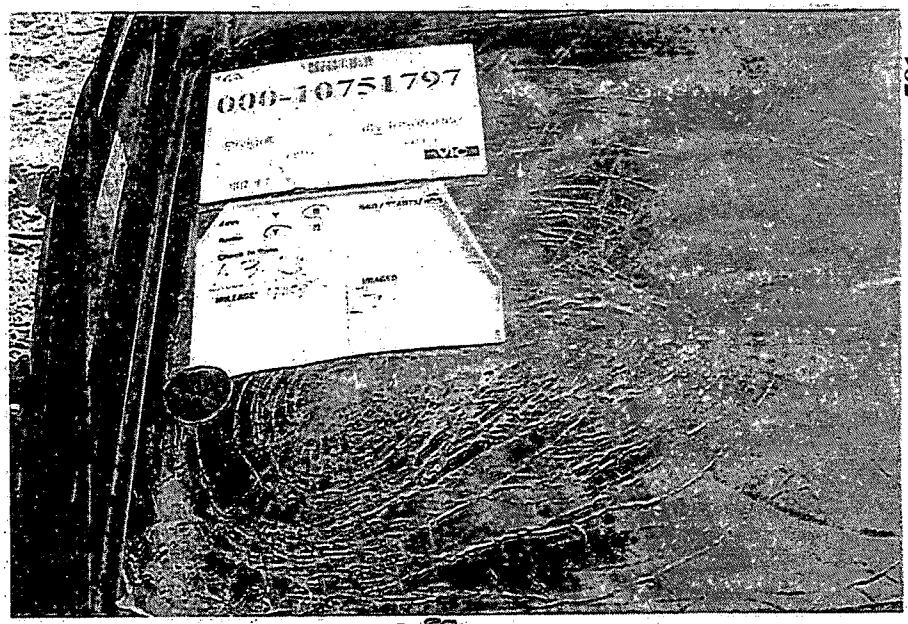
SLED Test Video H35175-SLD-19506 Camera 5

Submitted to the Court on a CD

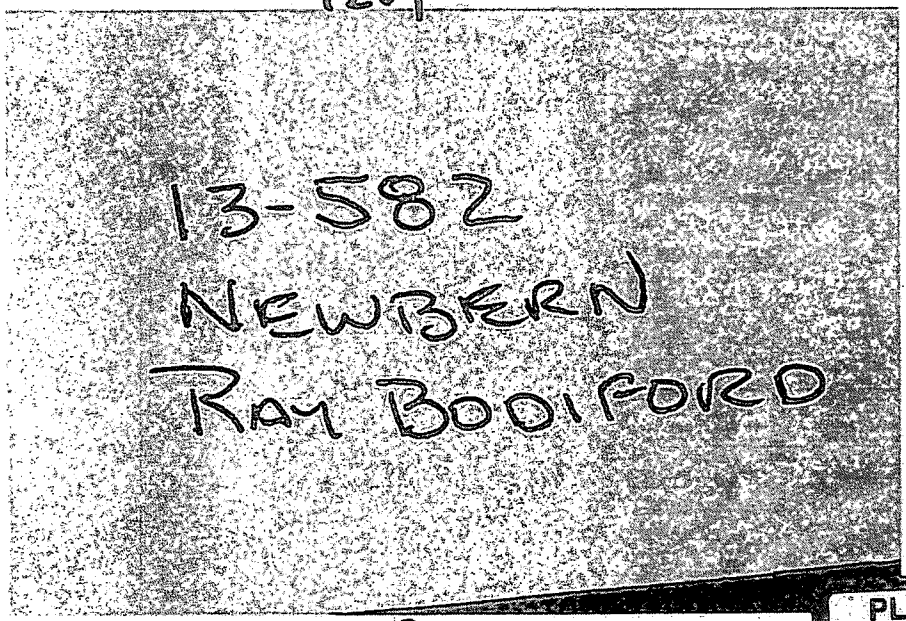
13-582 Newbern Biohrensic Vehicle Exam Photos



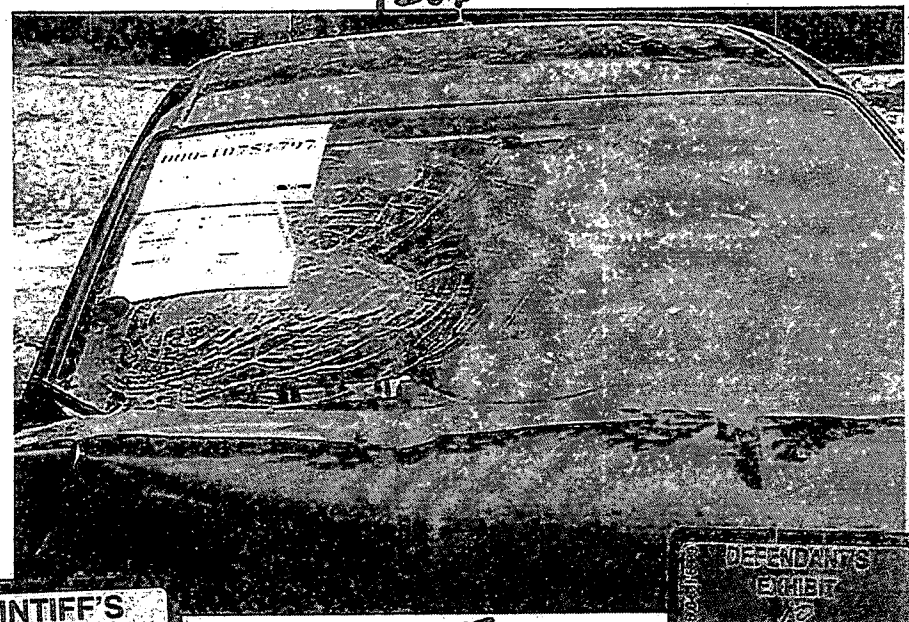
7284



7286



7283



7285

PLAINTIFF'S EXHIBIT 240

DEFENDANT'S EXHIBIT

728

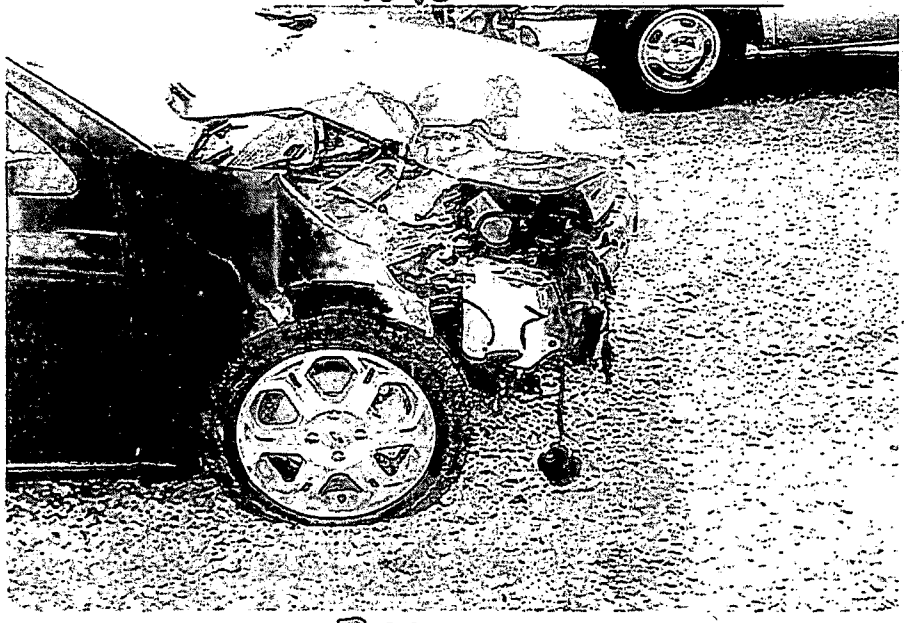
729

727

728

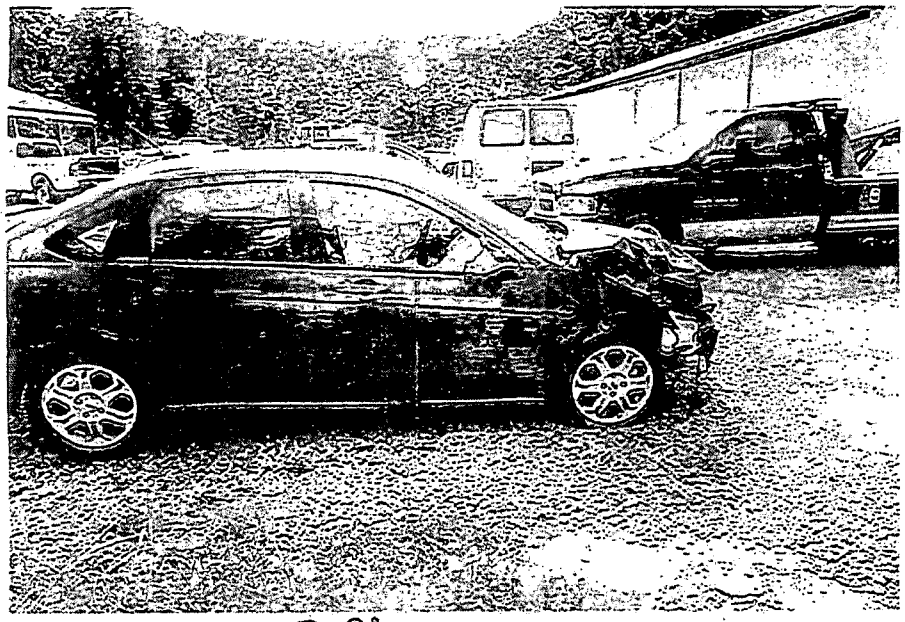
7292

7294

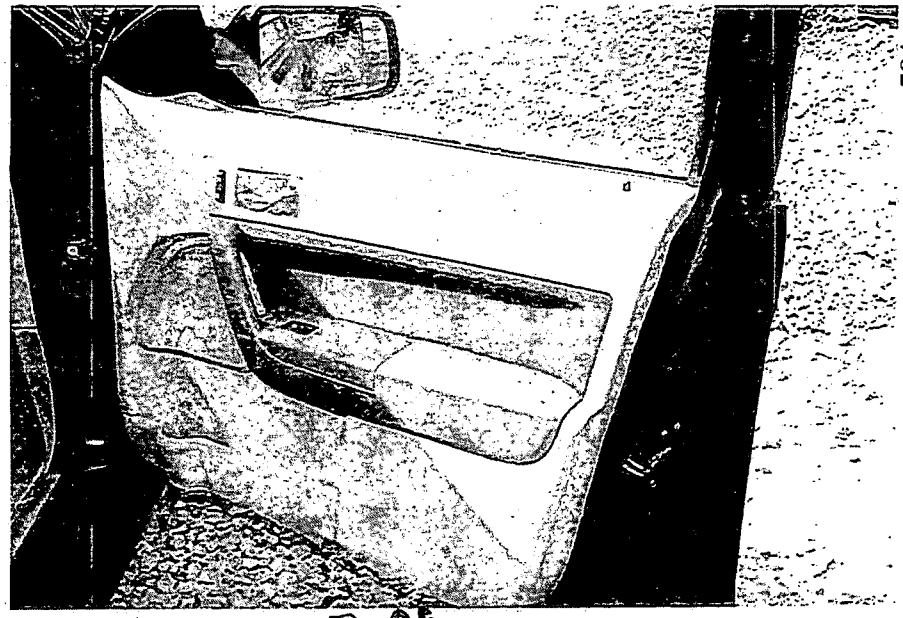


7291

7293



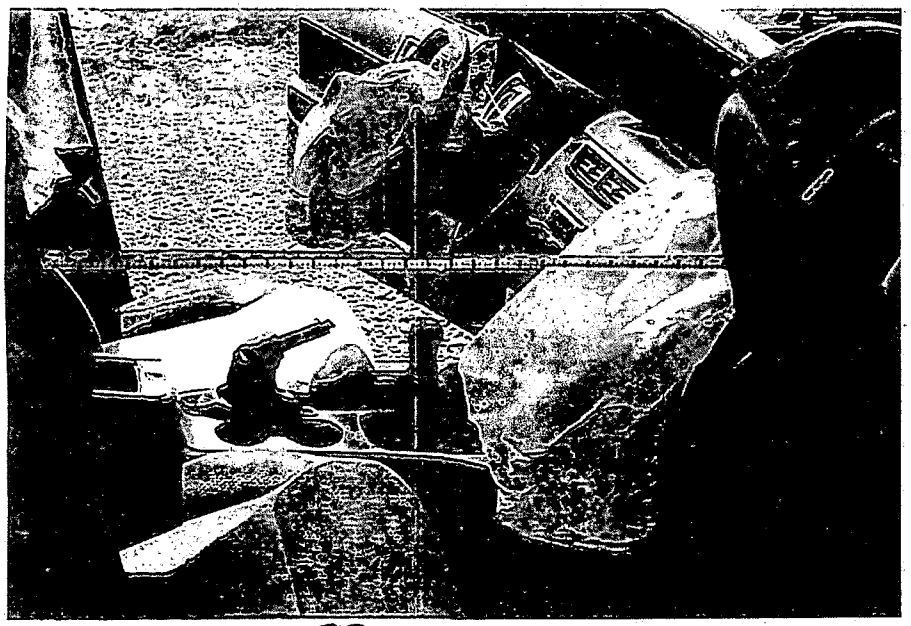
7296



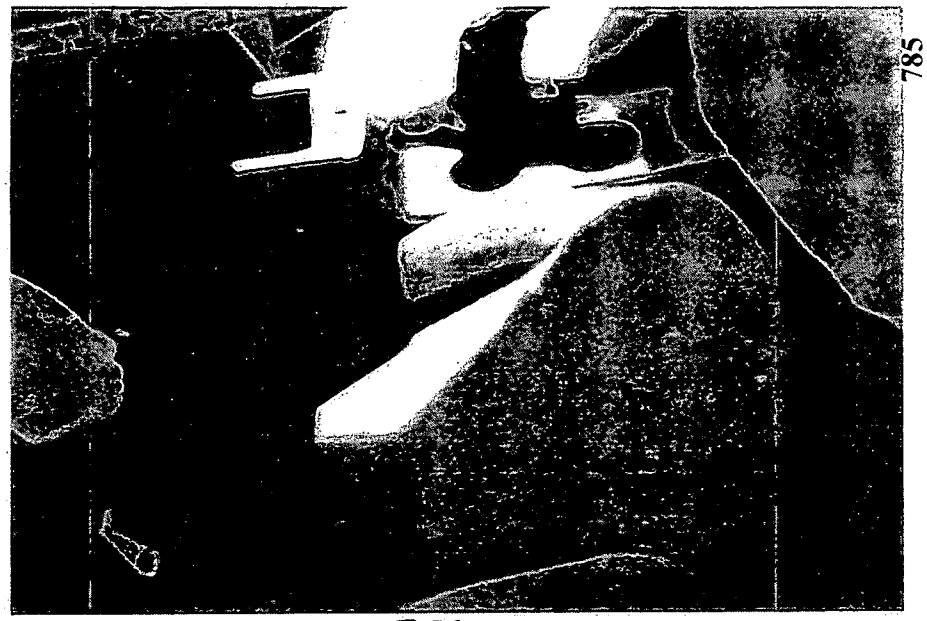
7298

7295

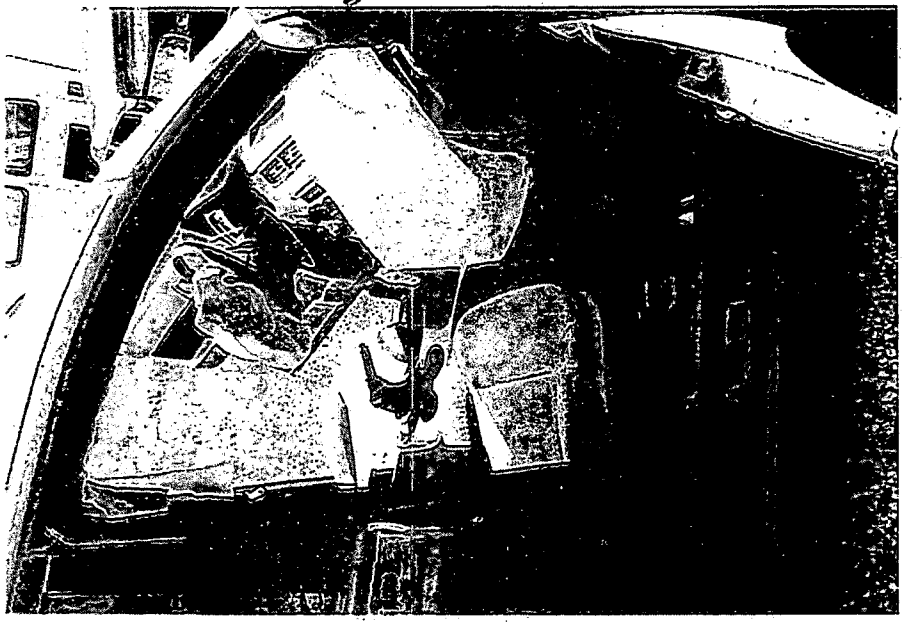
7297



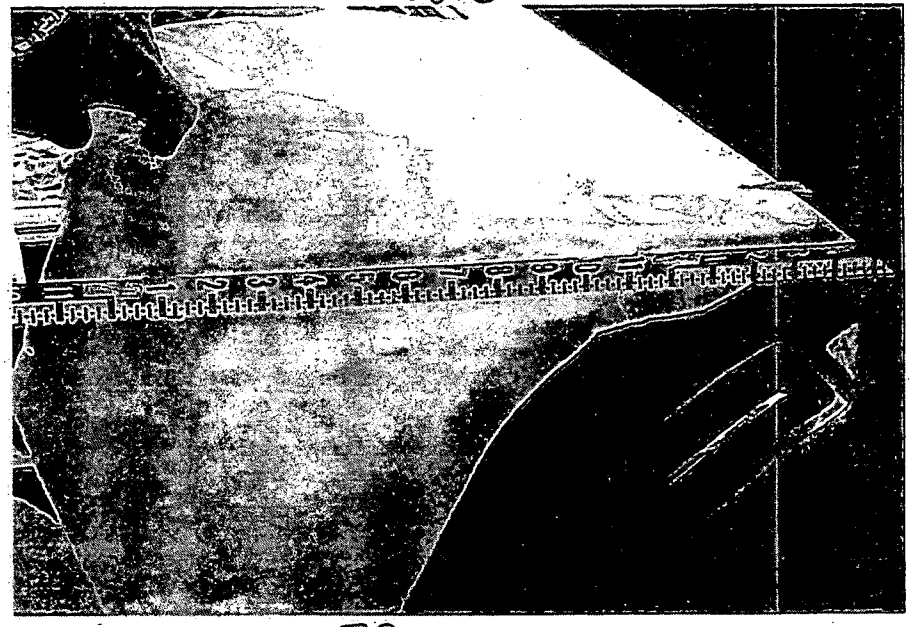
7300



7302



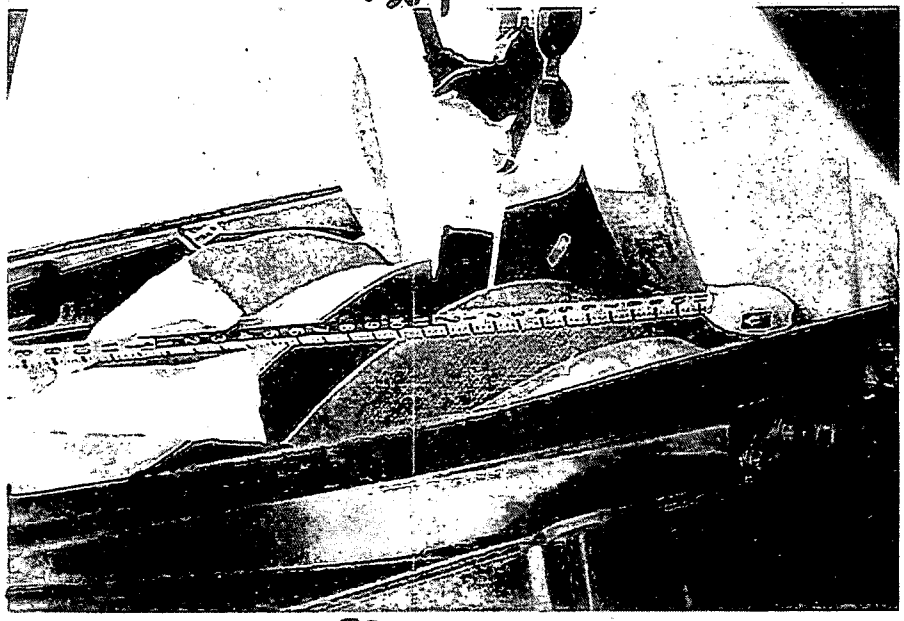
7299



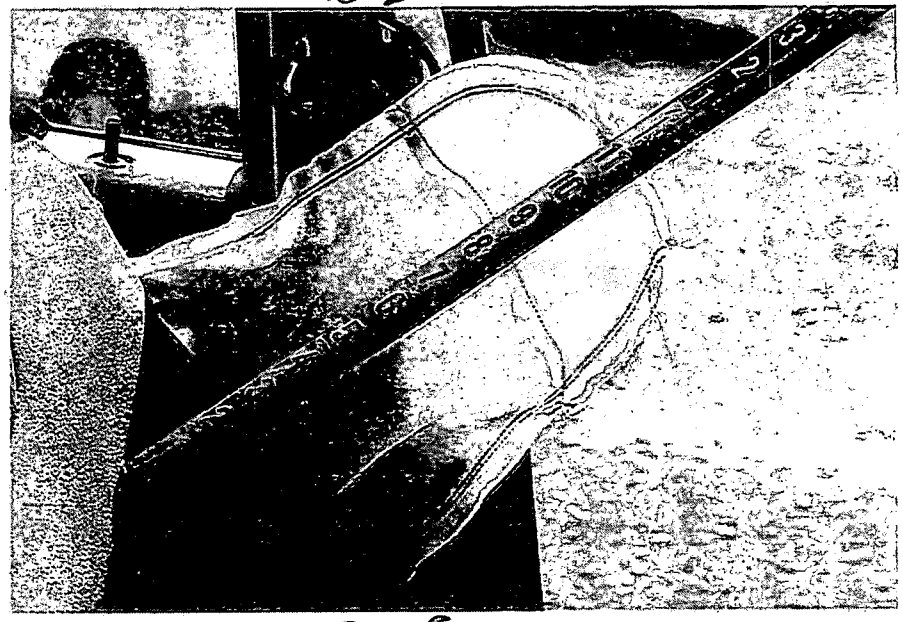
7301

7304

7306



7303



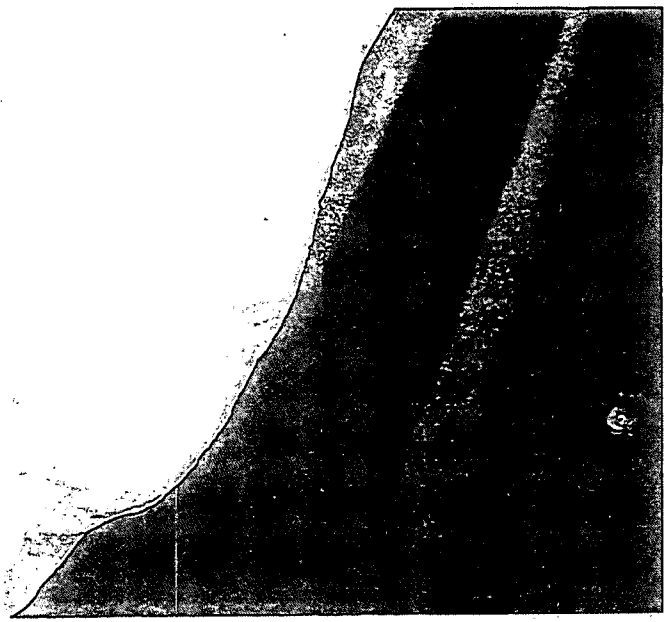
7305

T308

T310

T307

T309

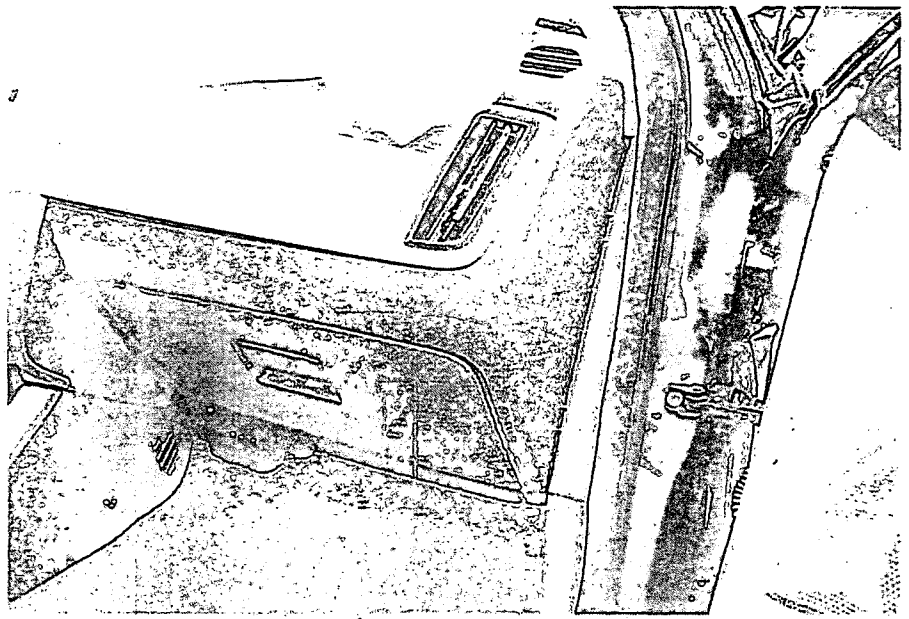


7312

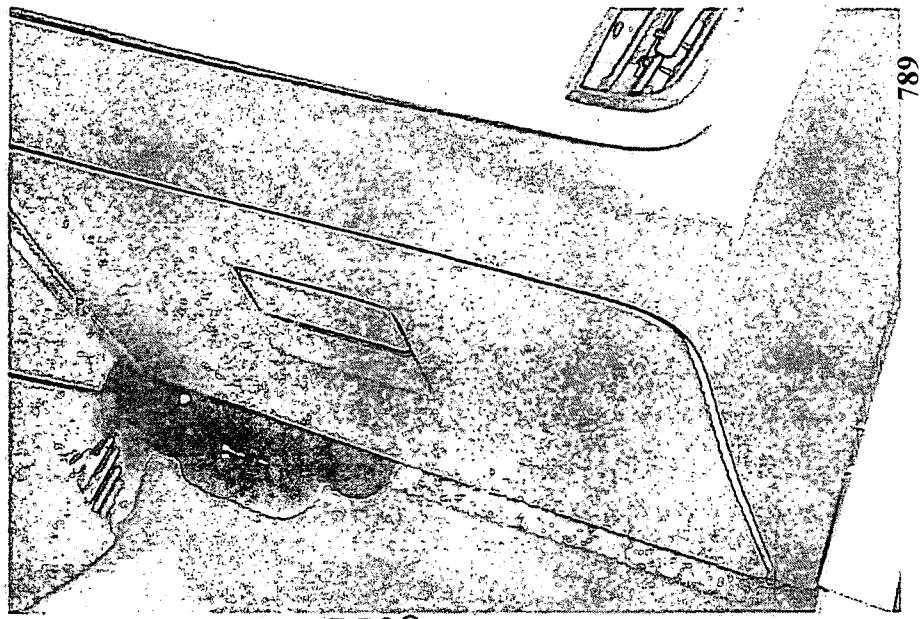
7314

7311

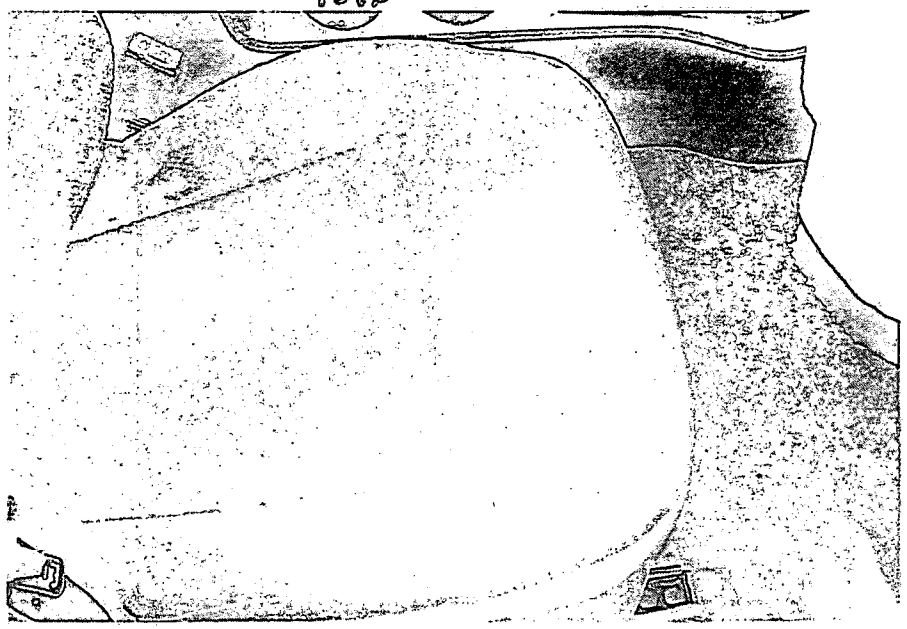
7313



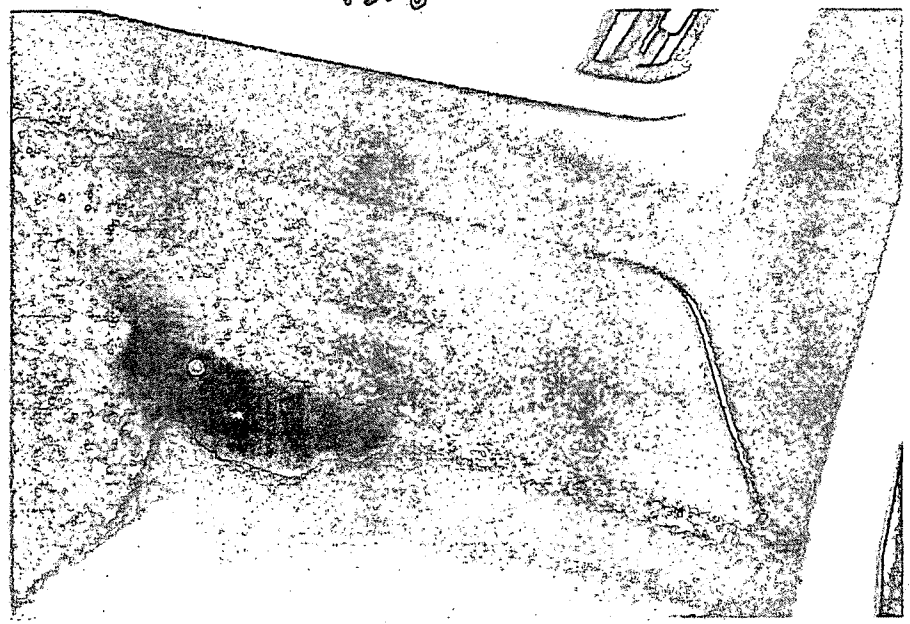
7316



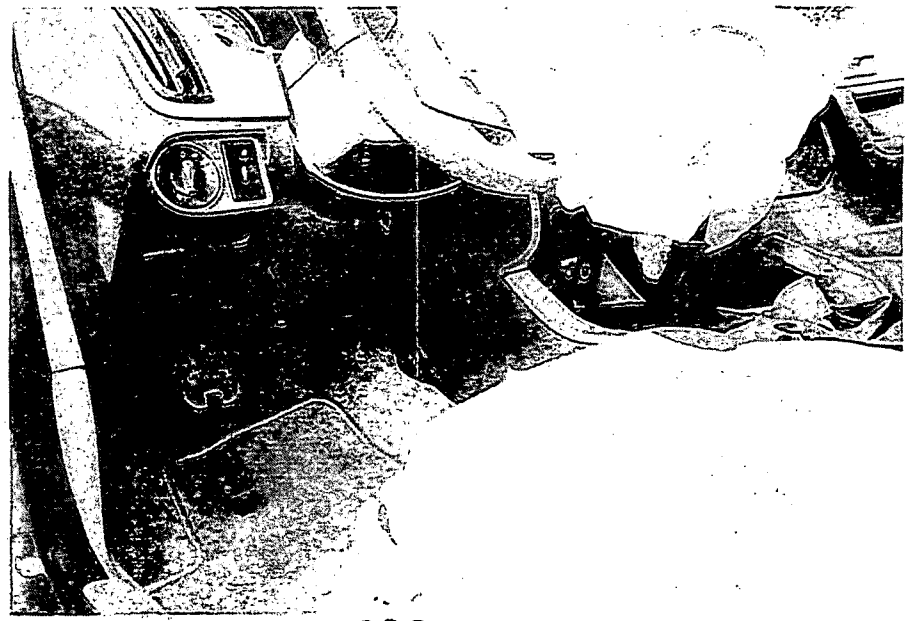
7318



7315



7317



7320

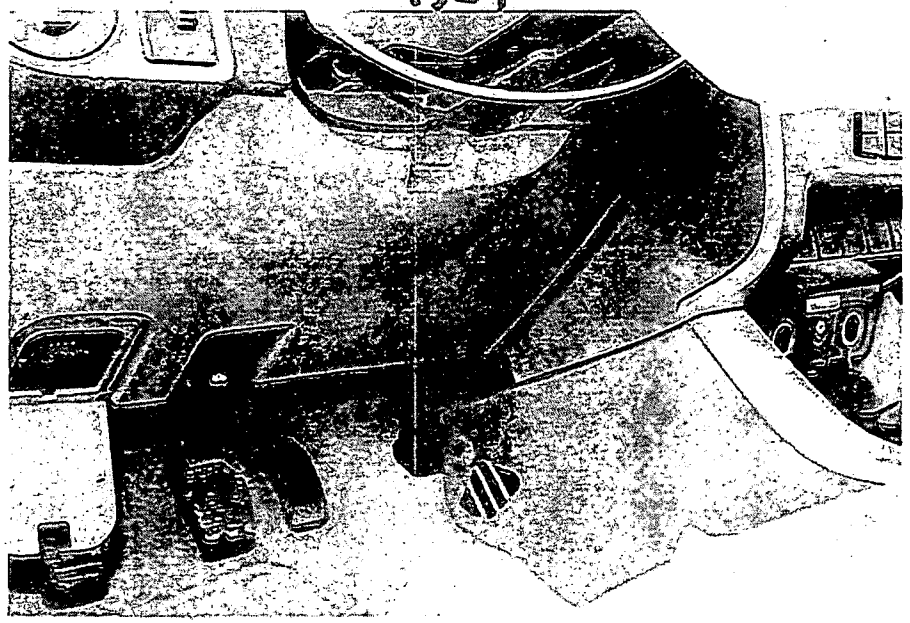
7322

7319

7321

7324

7326

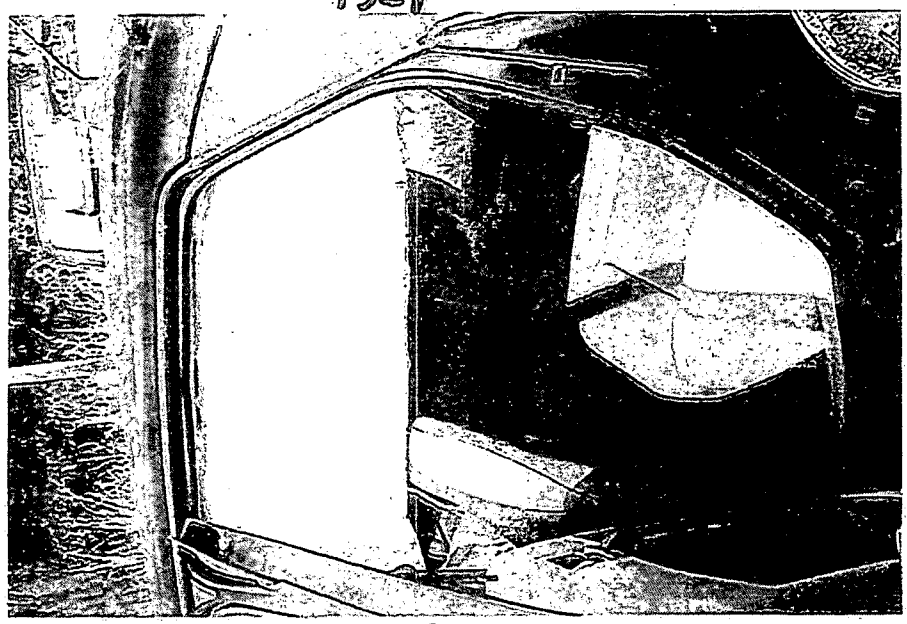


7323

7325

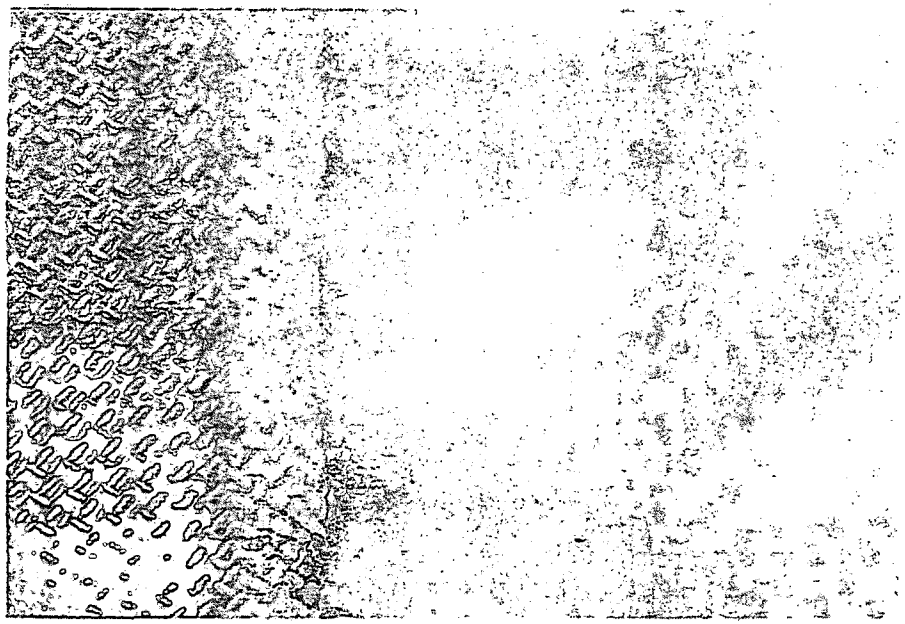
7328

7330

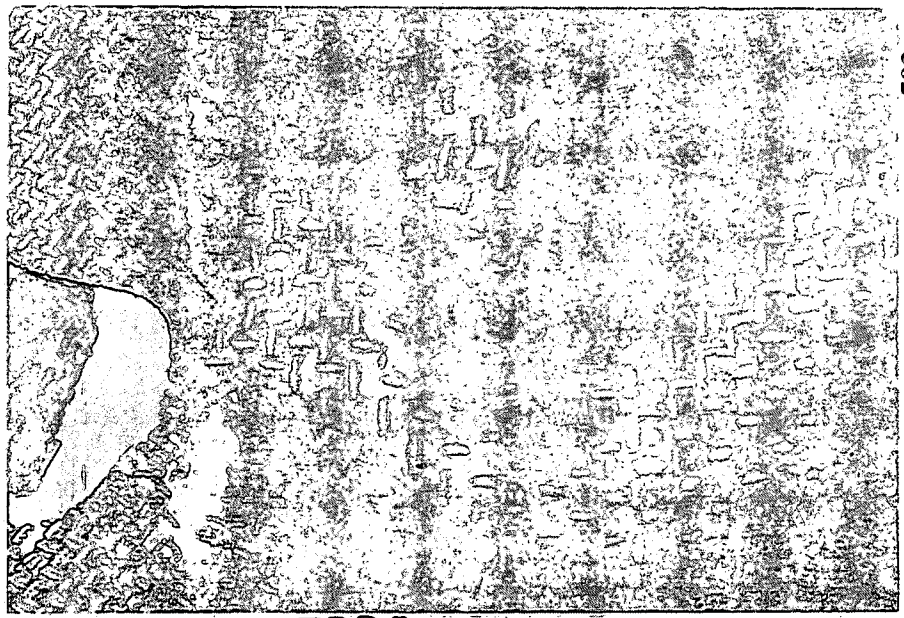


7327

7329

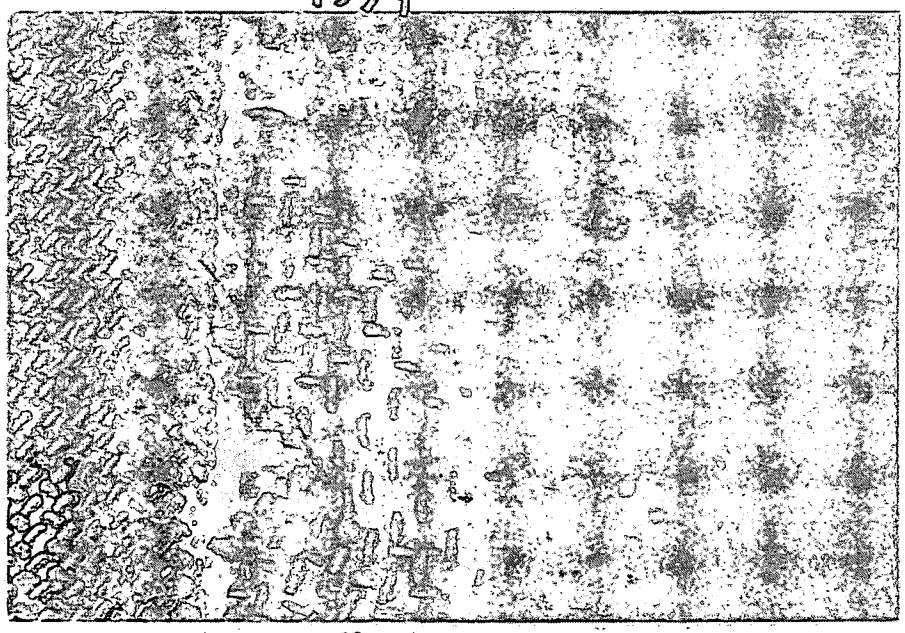


7332

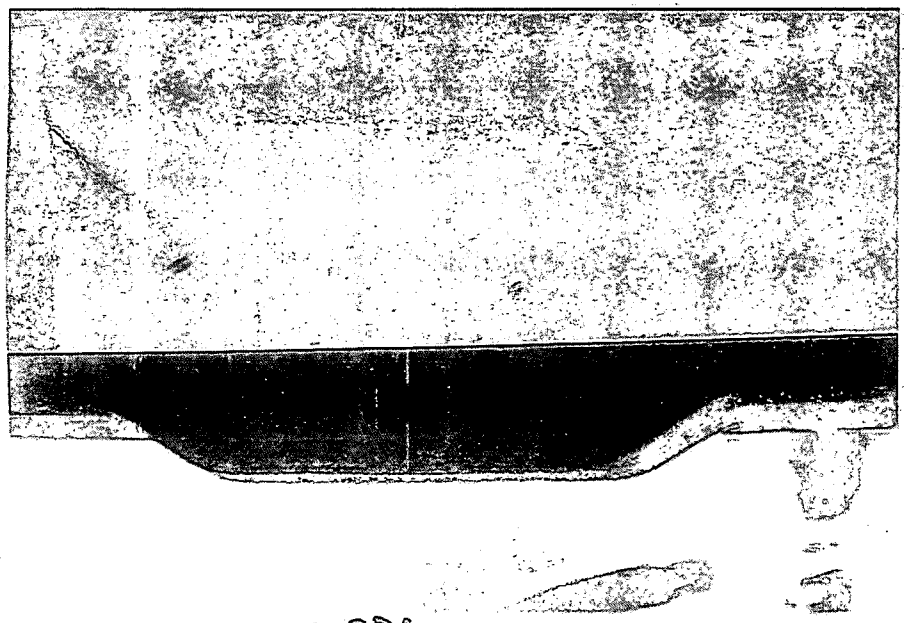


7334

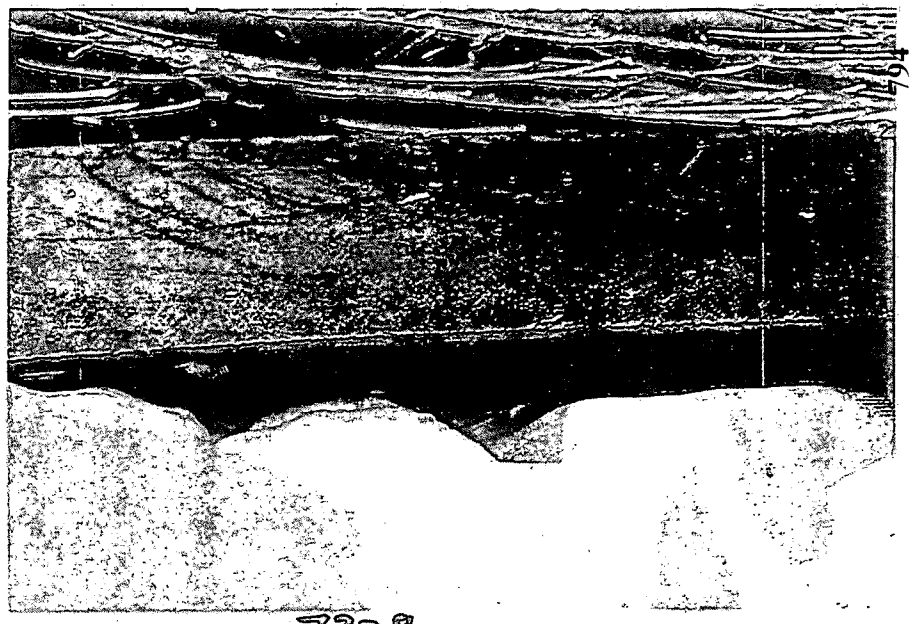
7331



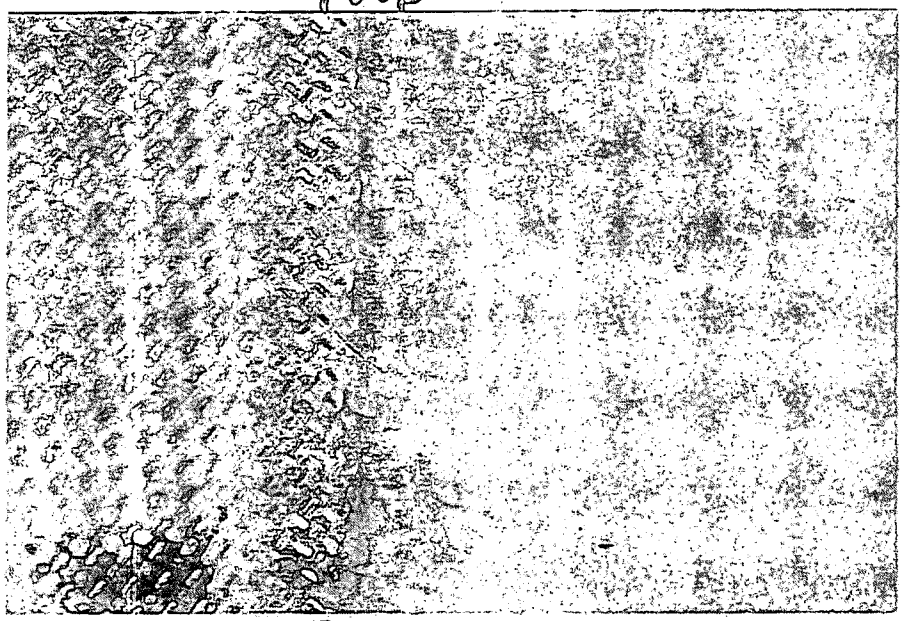
7333



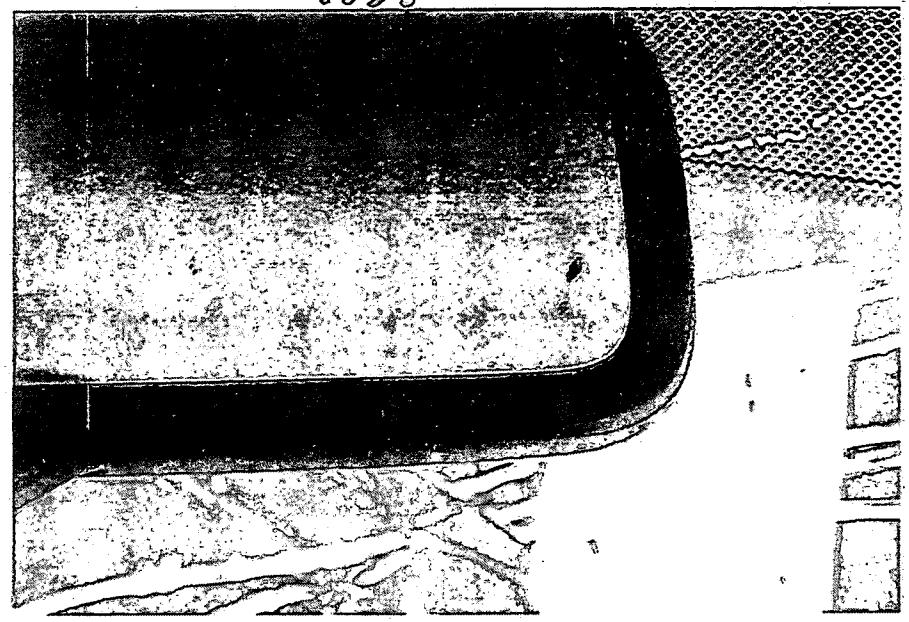
7336



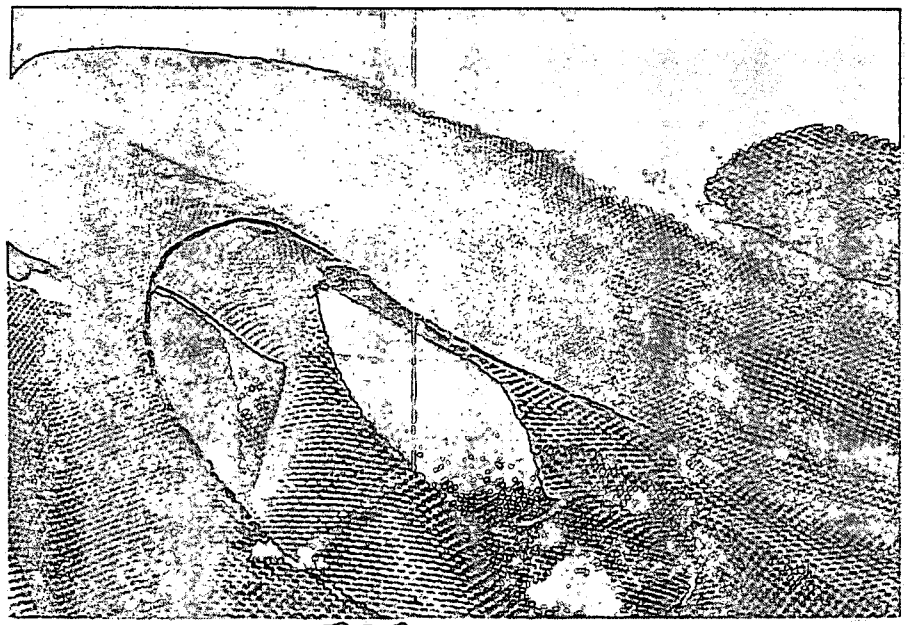
7338



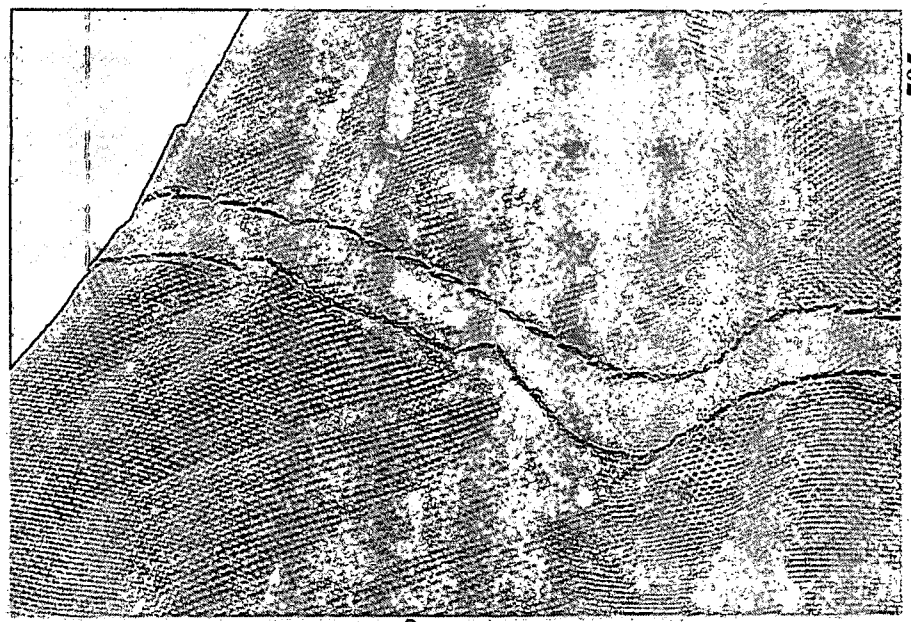
7335



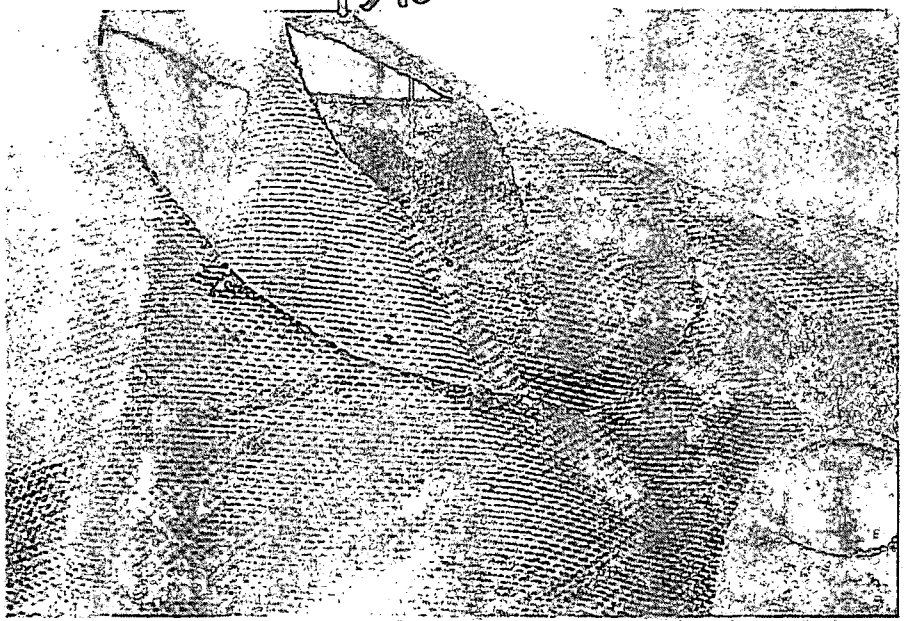
7337



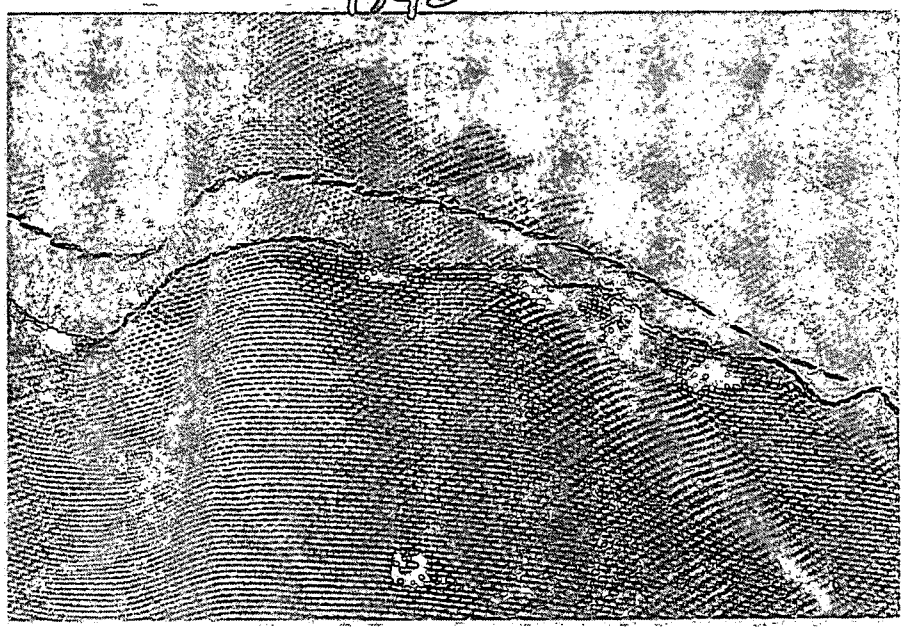
7340



7342

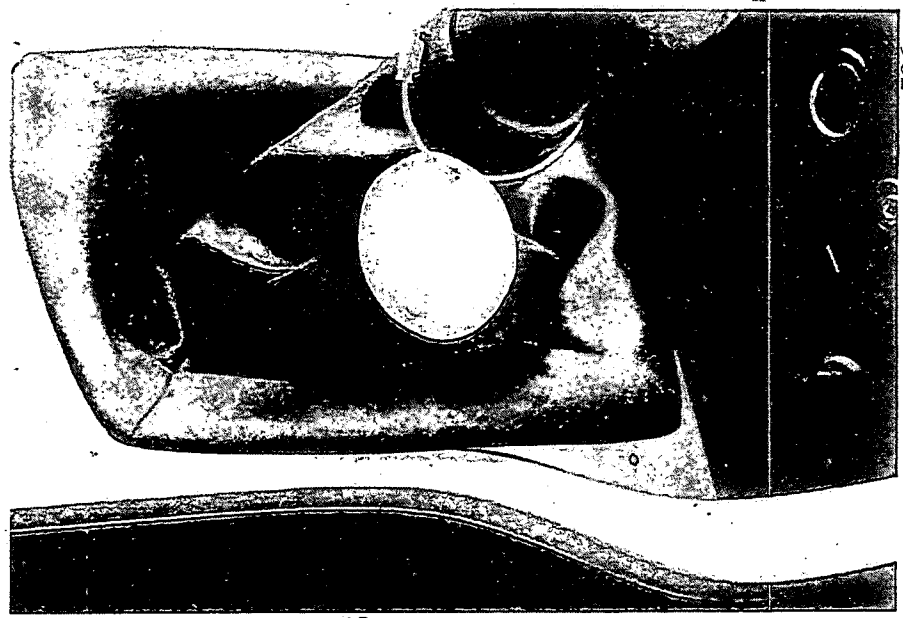


7339

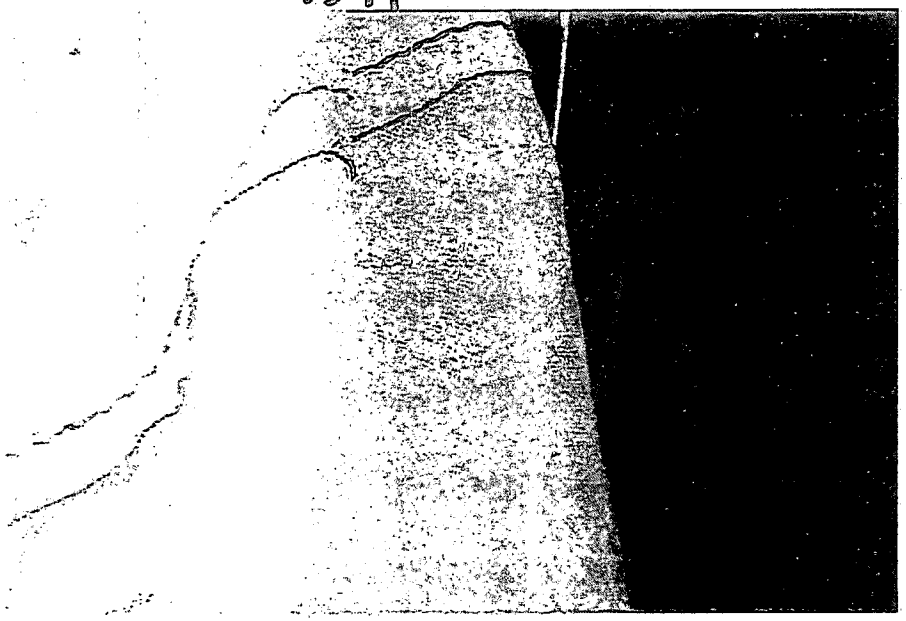


7341

7394

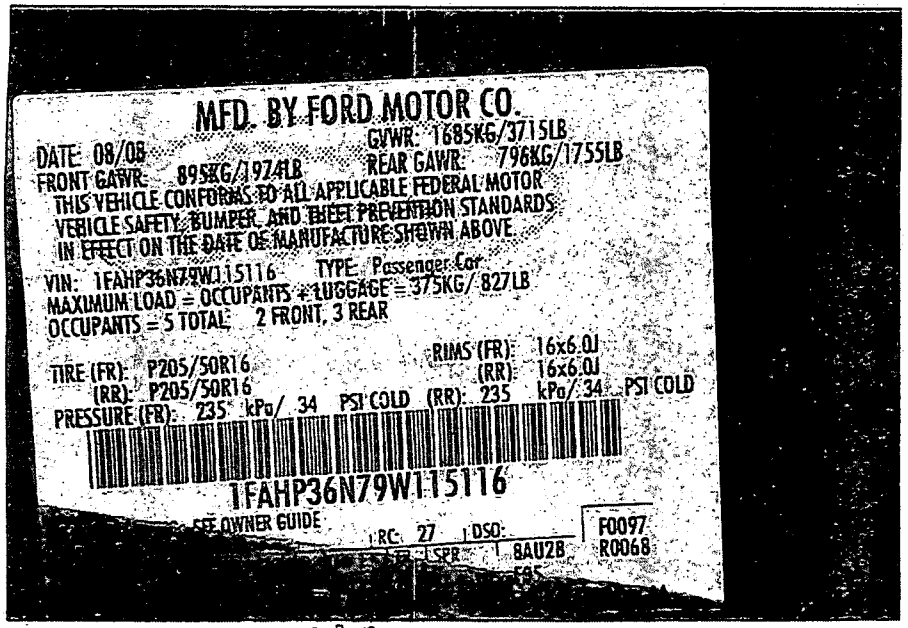


7396

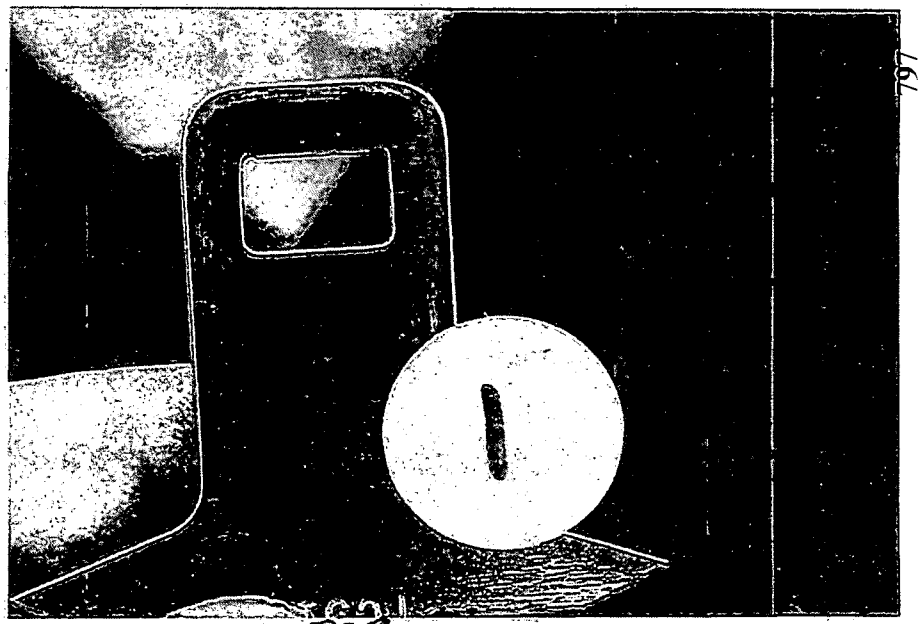


7393

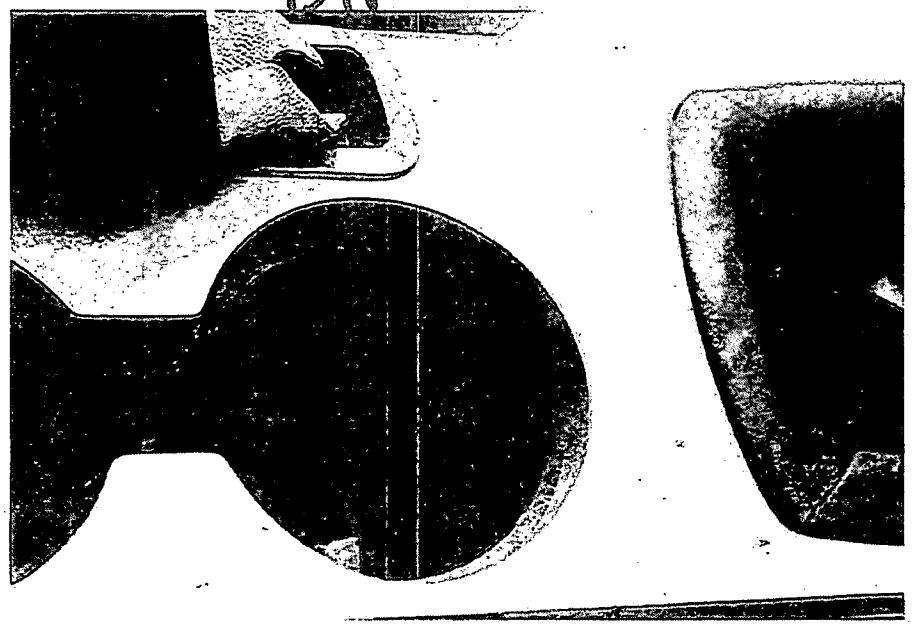
7395



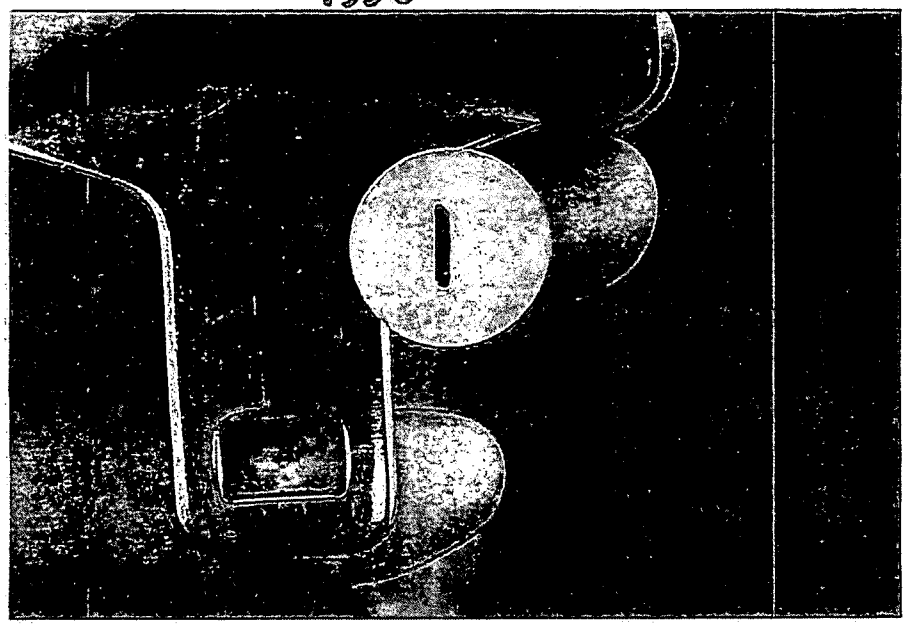
T348



T350



T347



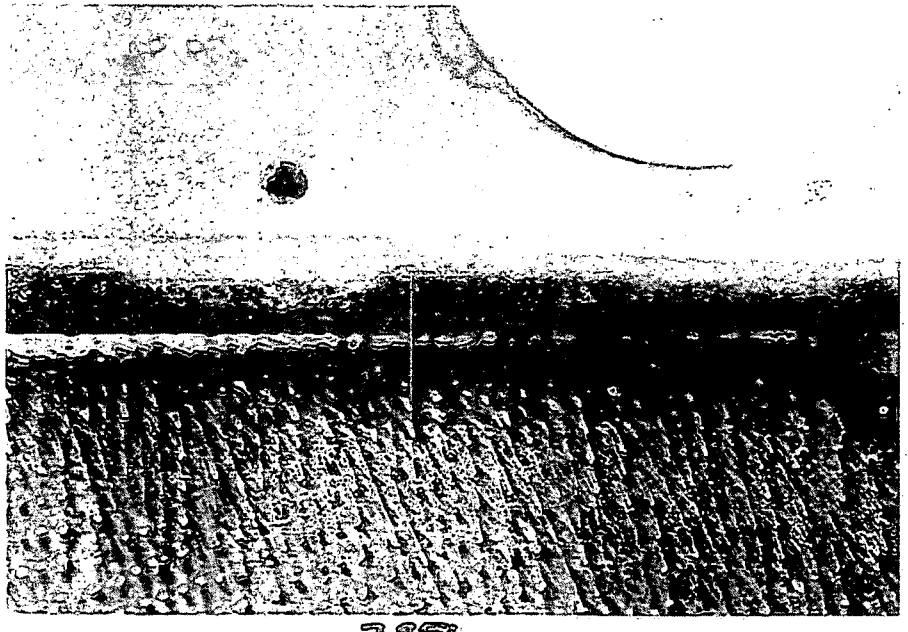
T349

7352

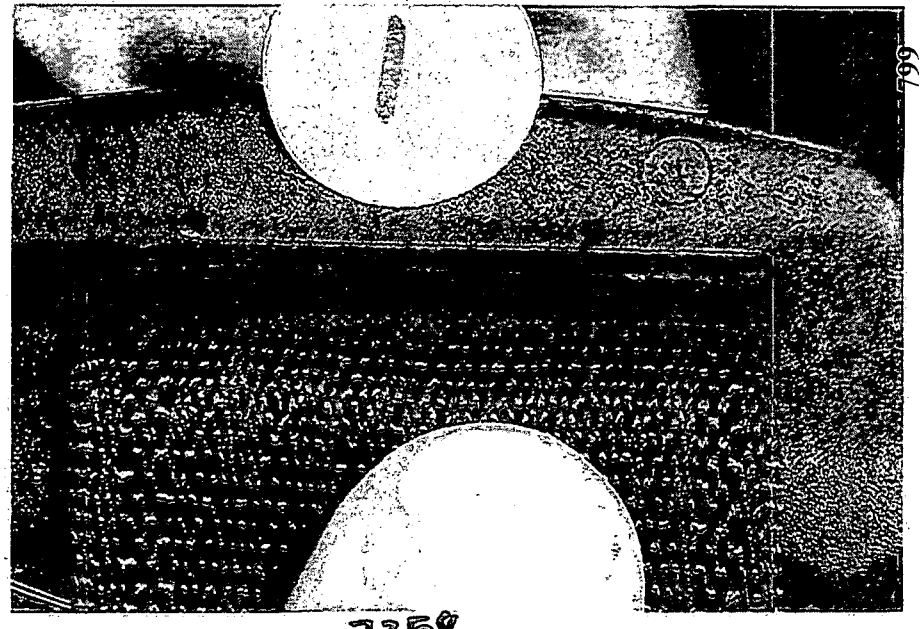
7354

7351

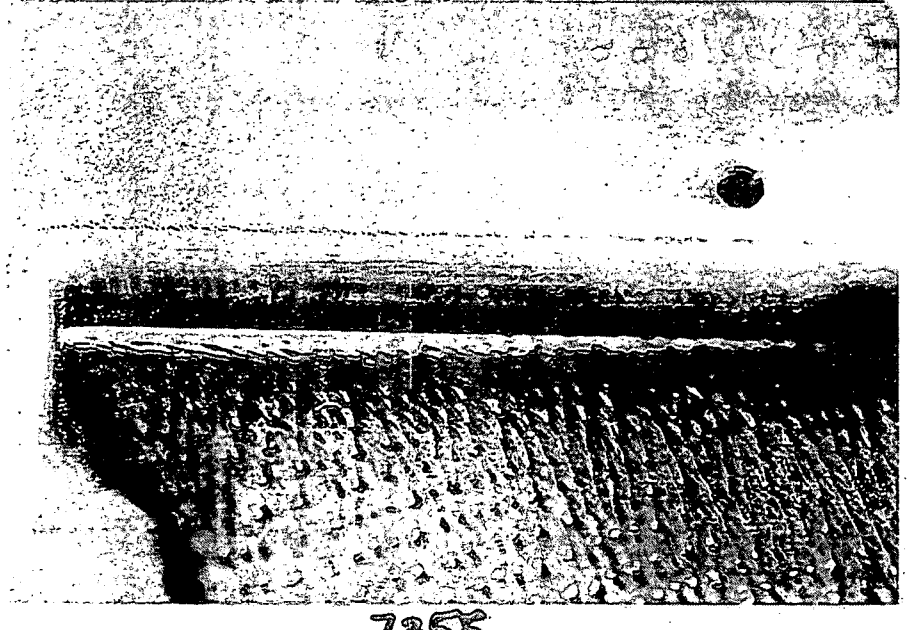
7353



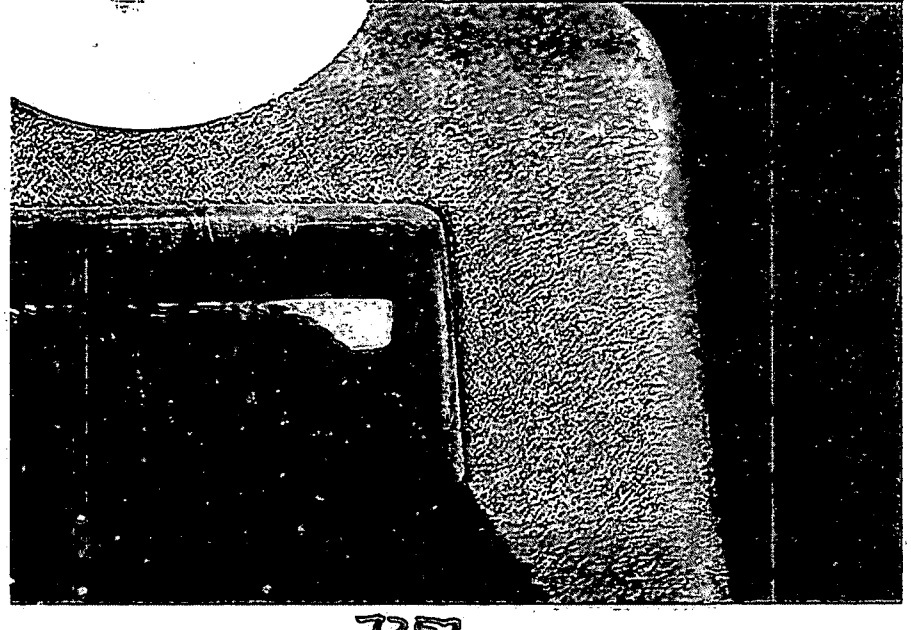
7356



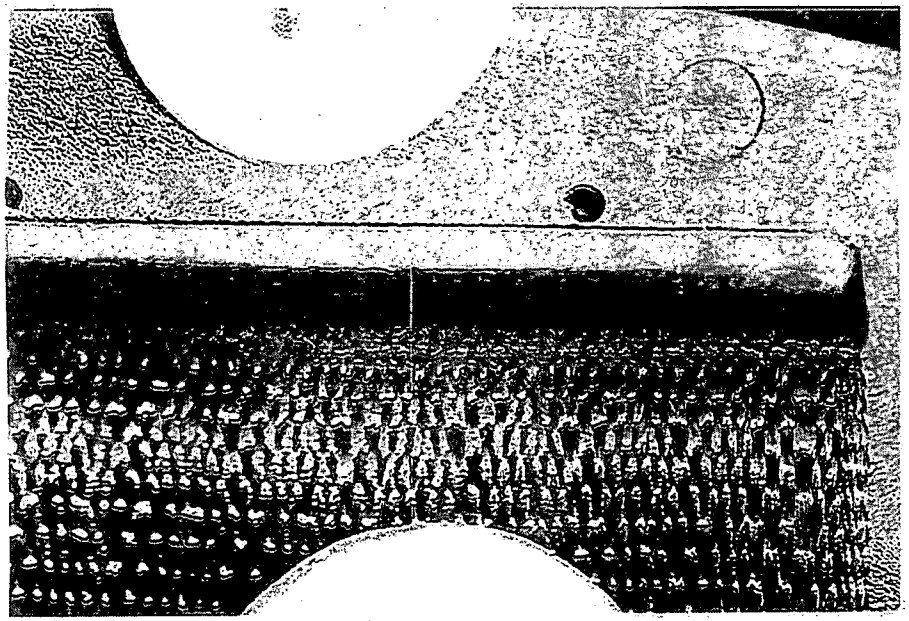
7358



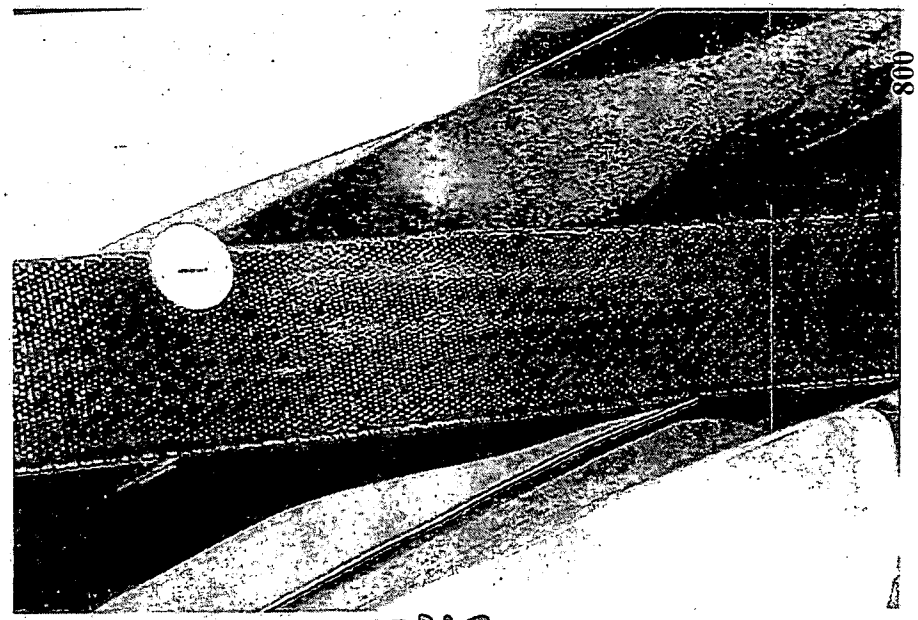
7355



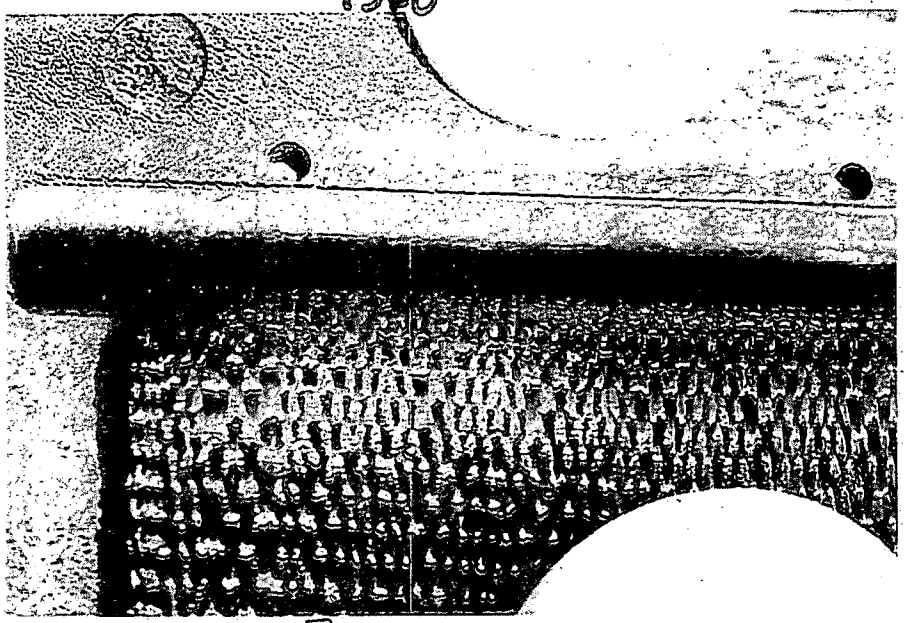
7357



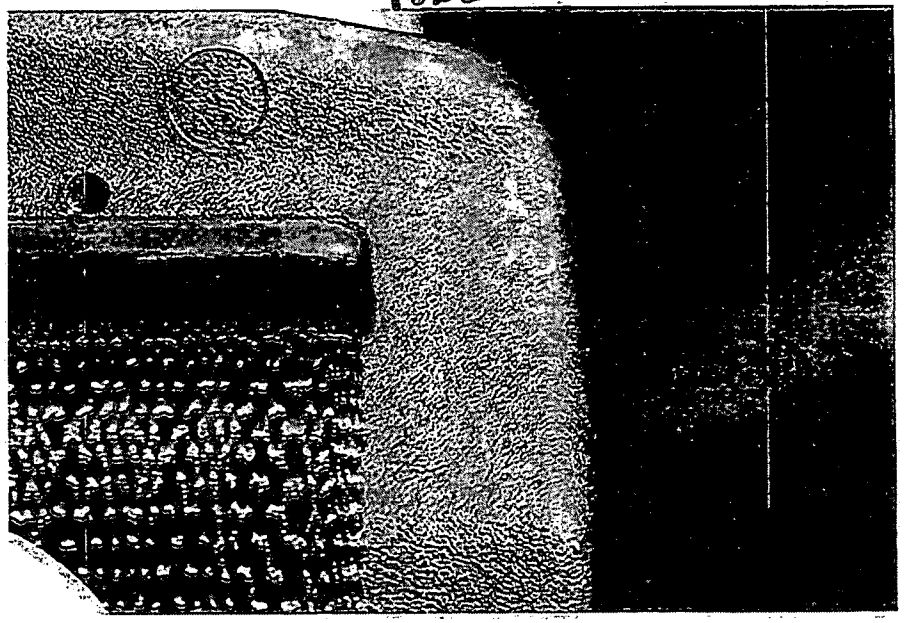
7360



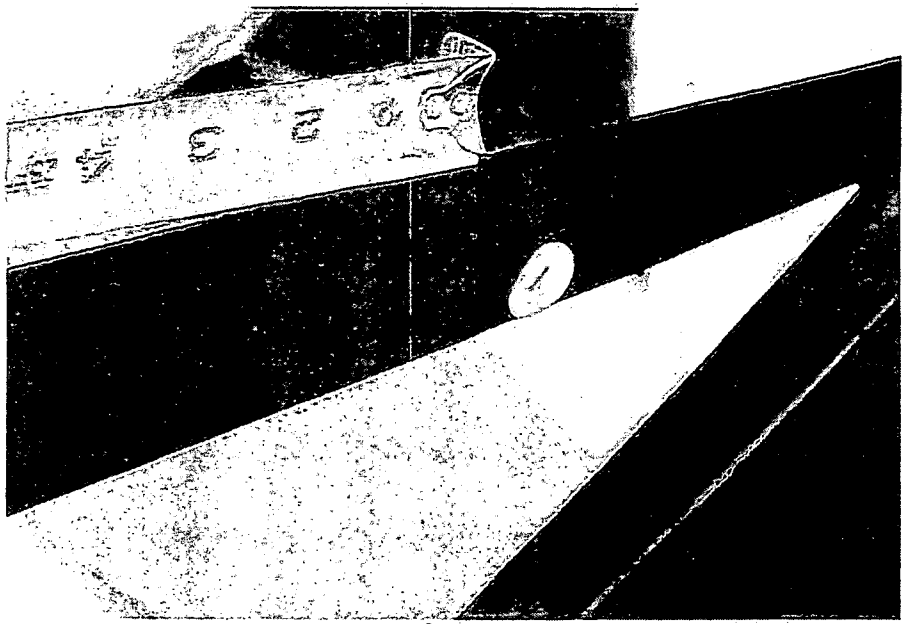
7362



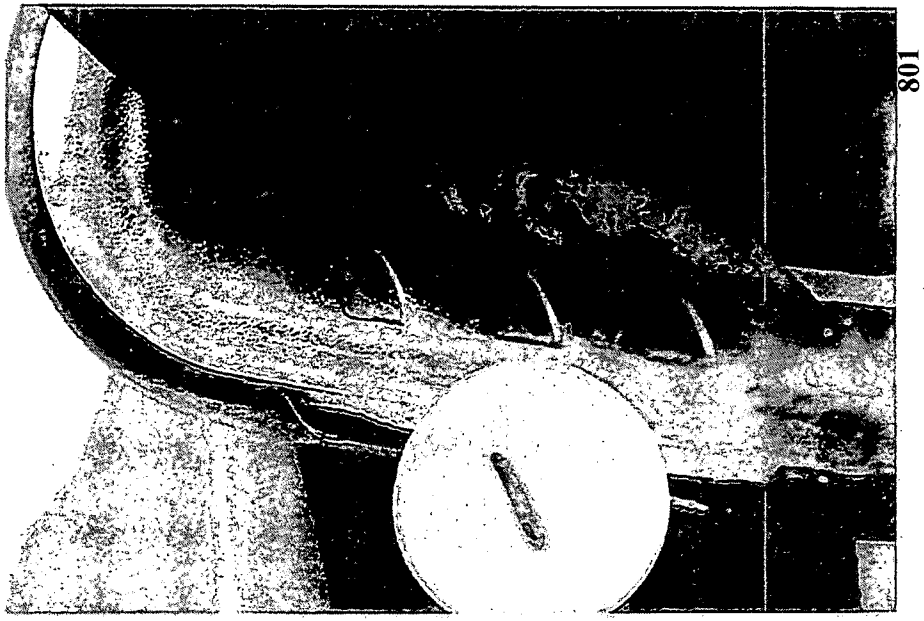
7359



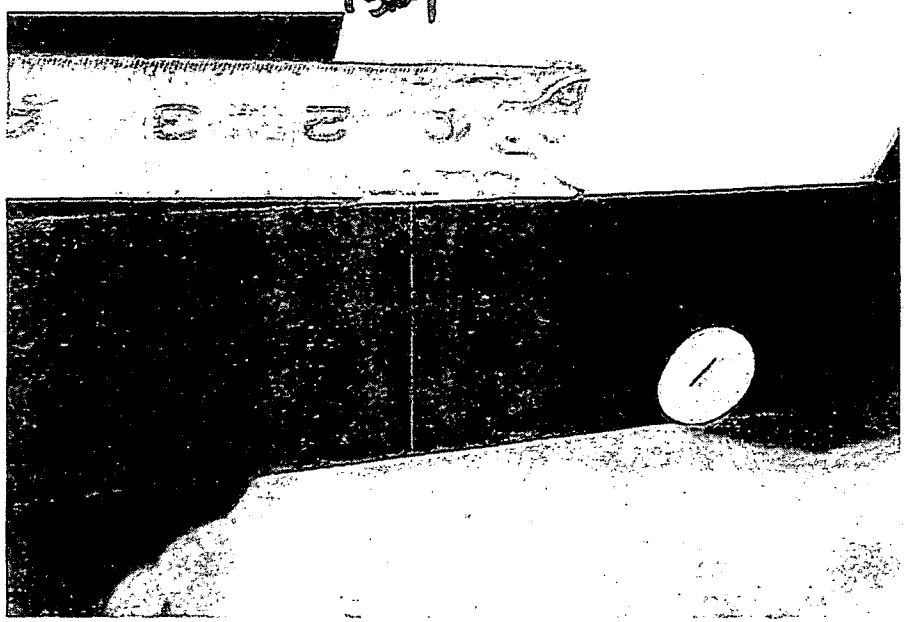
7361



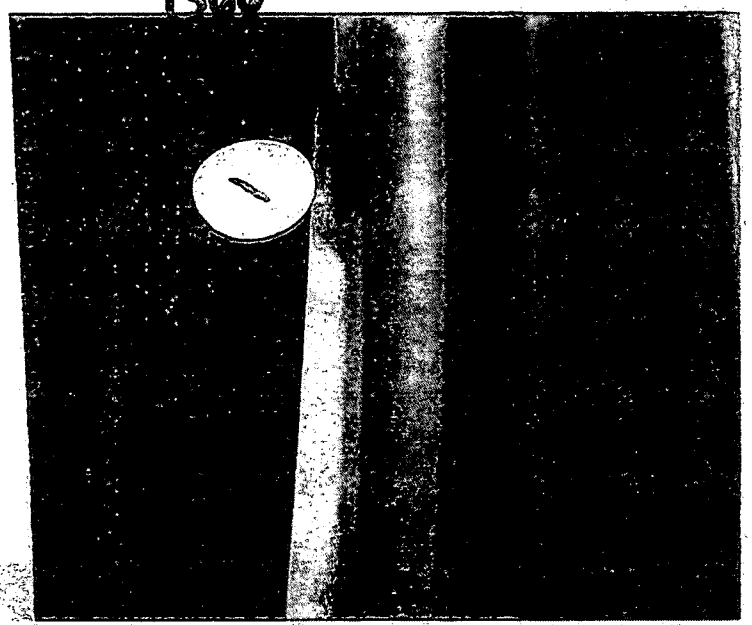
T364



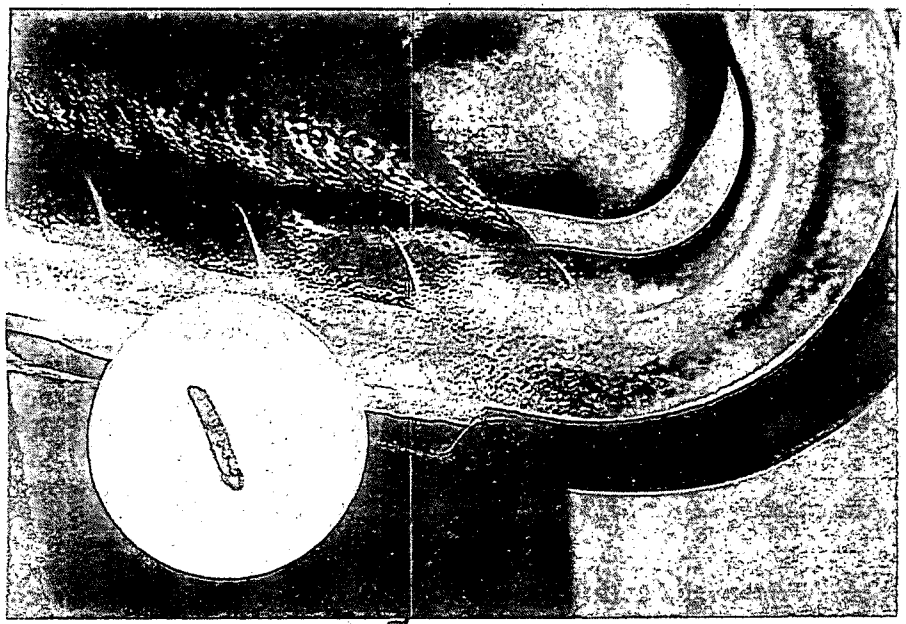
T366



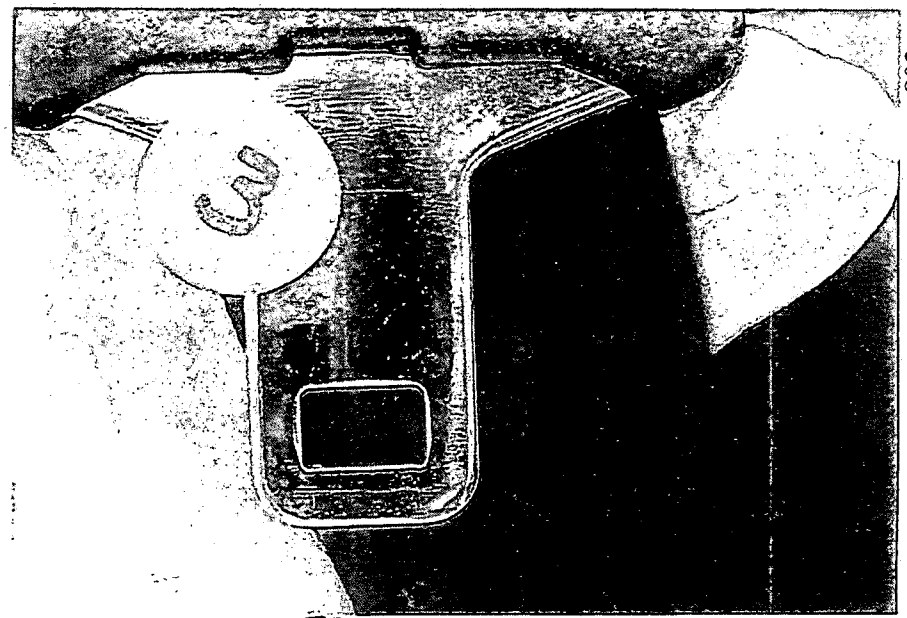
T363



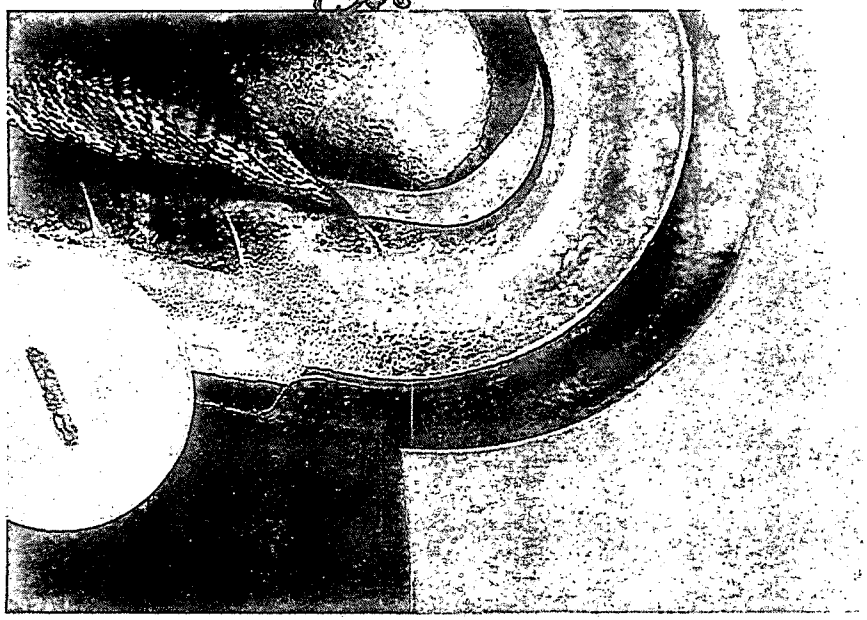
T365



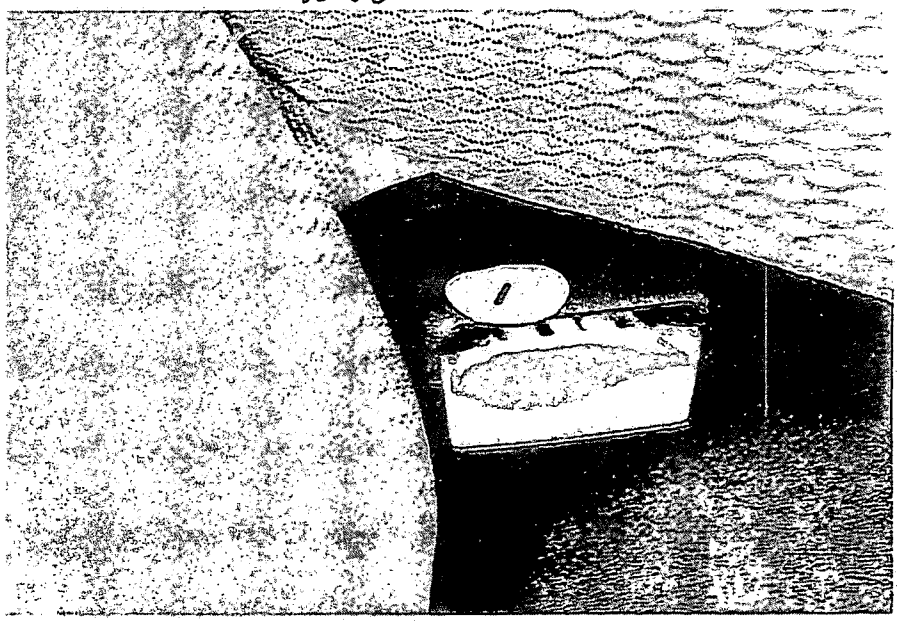
7368



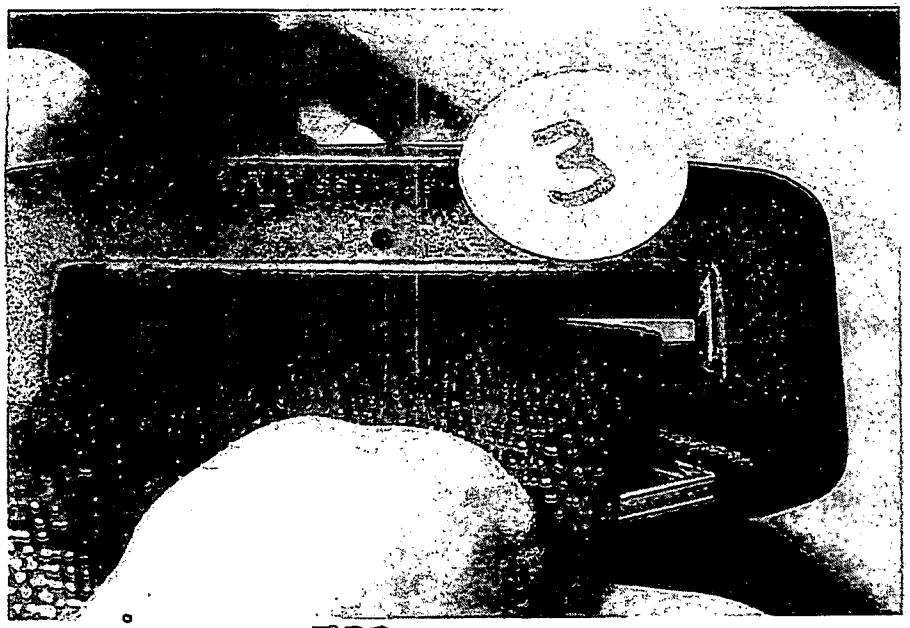
7370



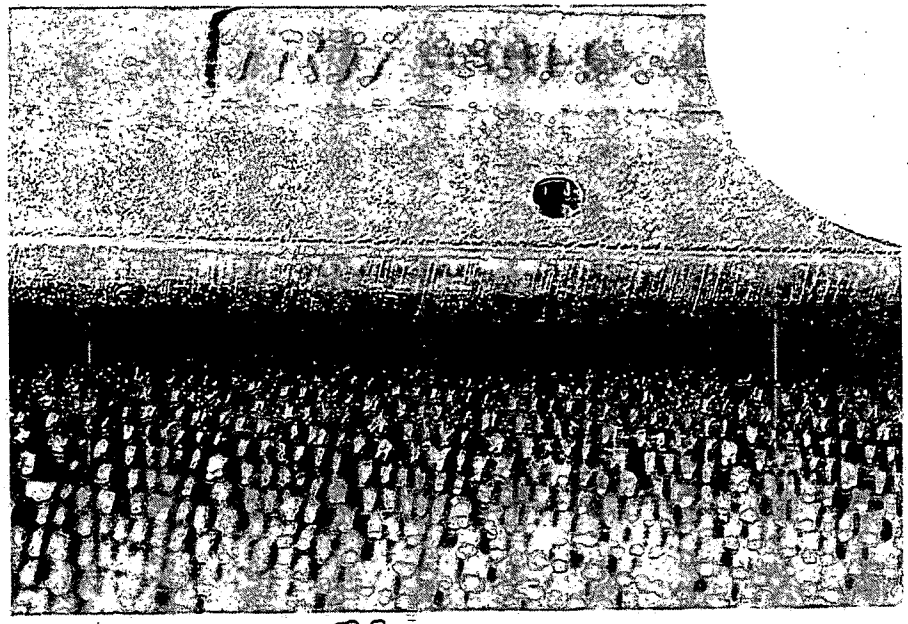
7367



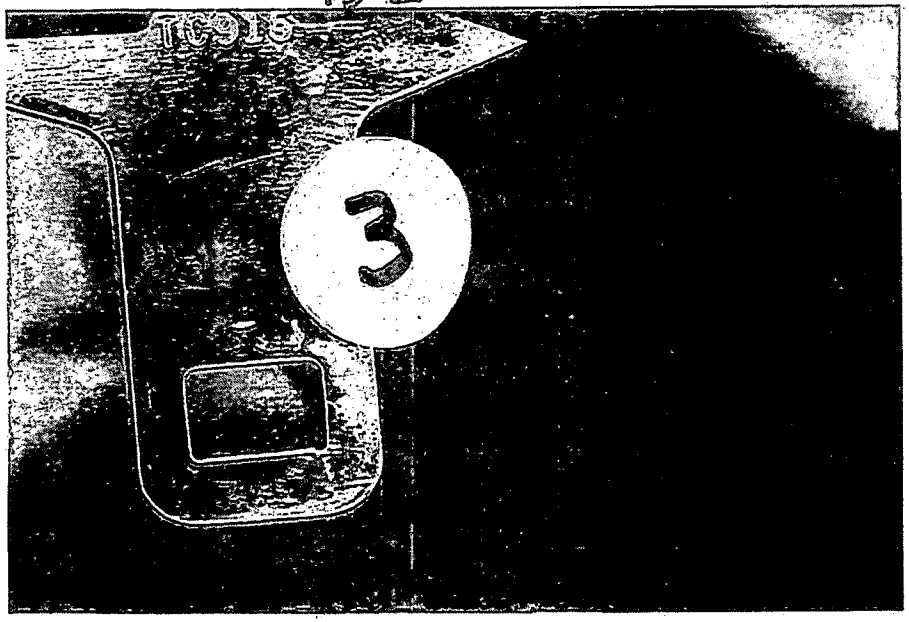
7369



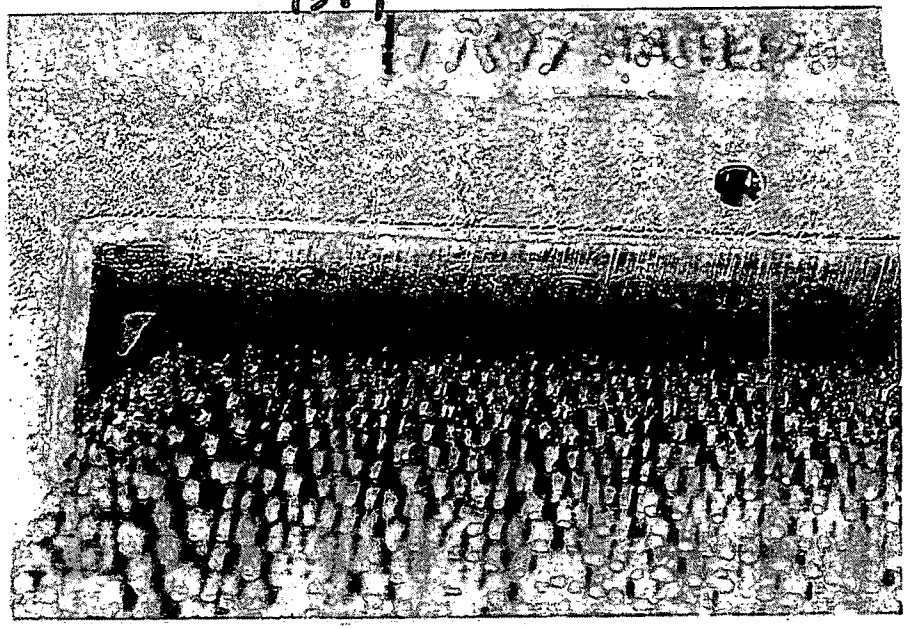
7372



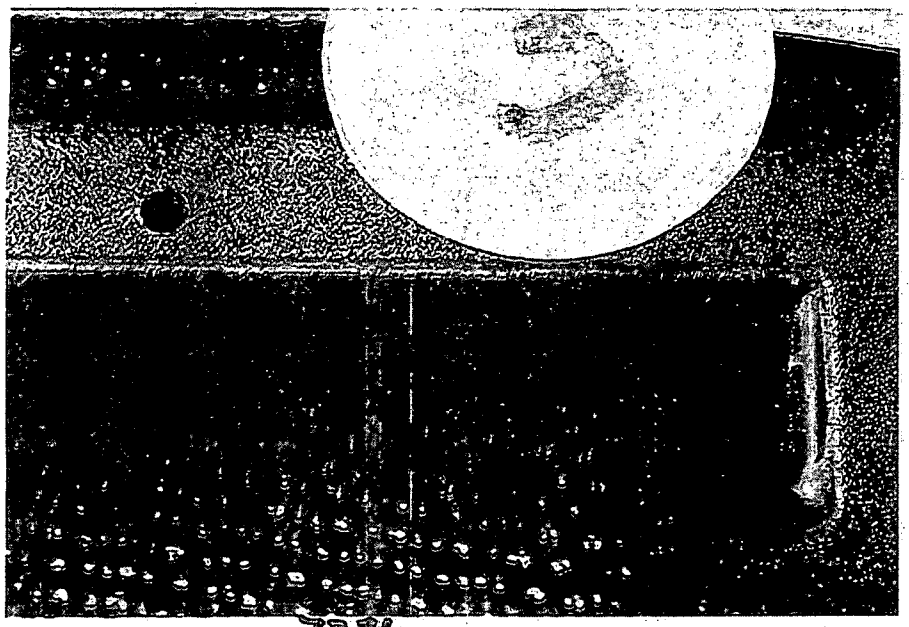
7374



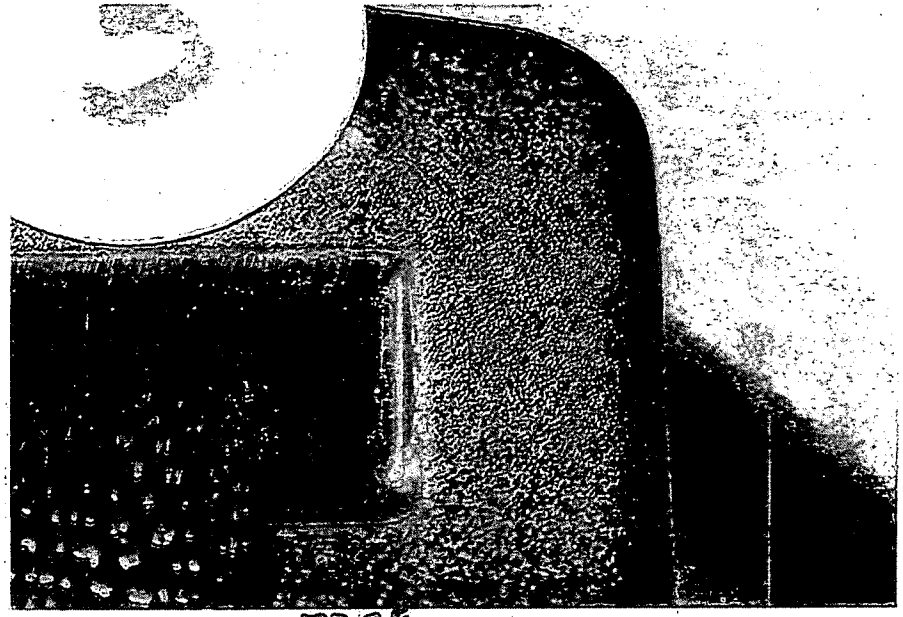
7371



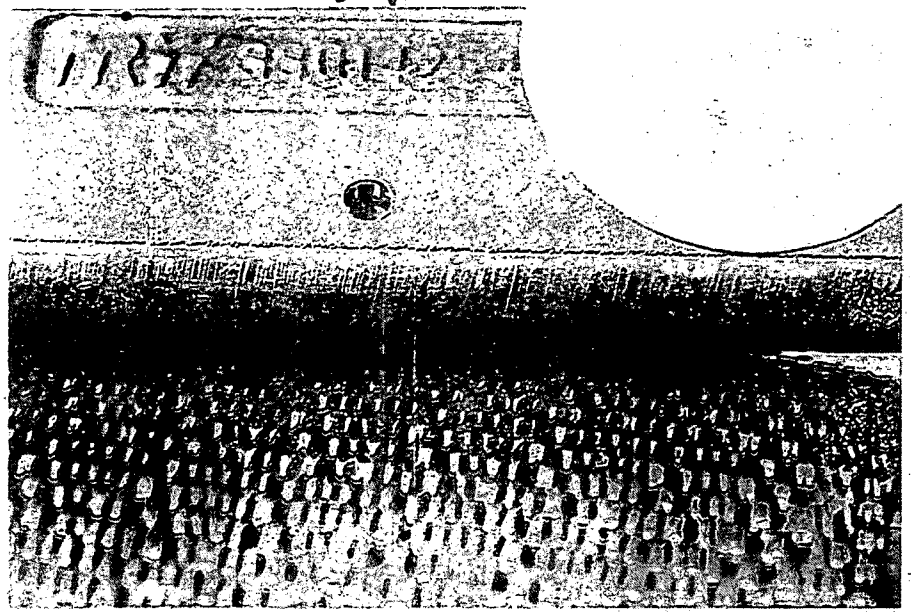
7373



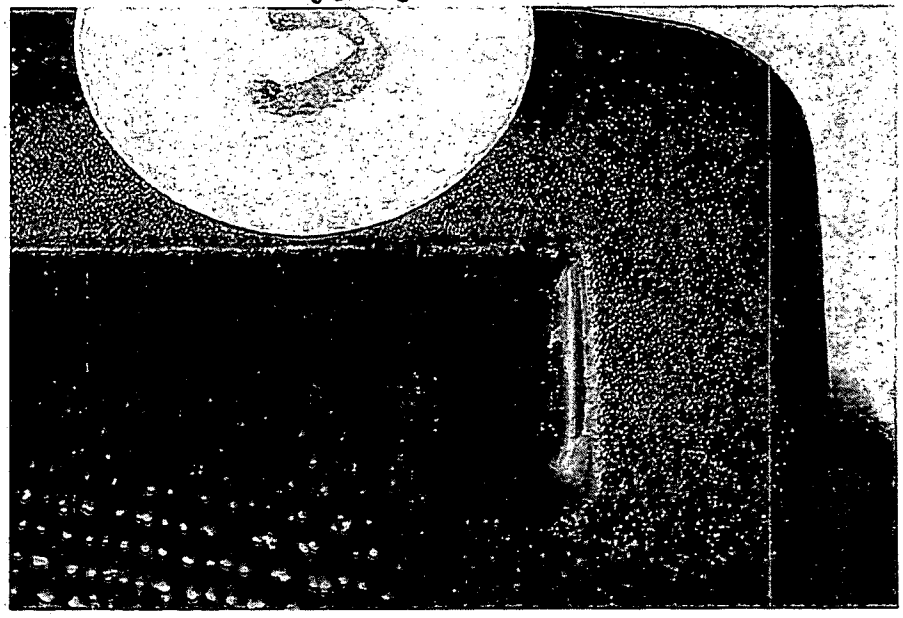
7376



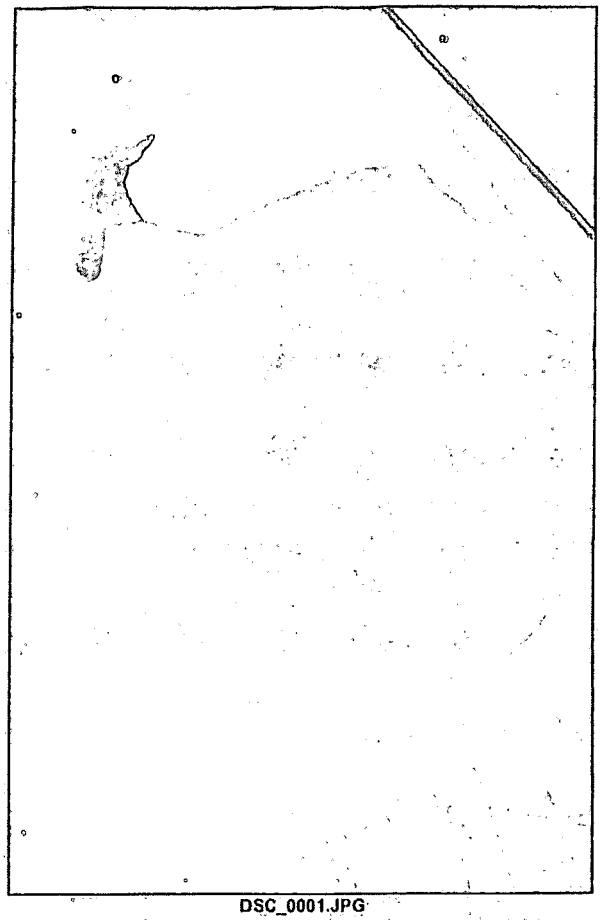
7378



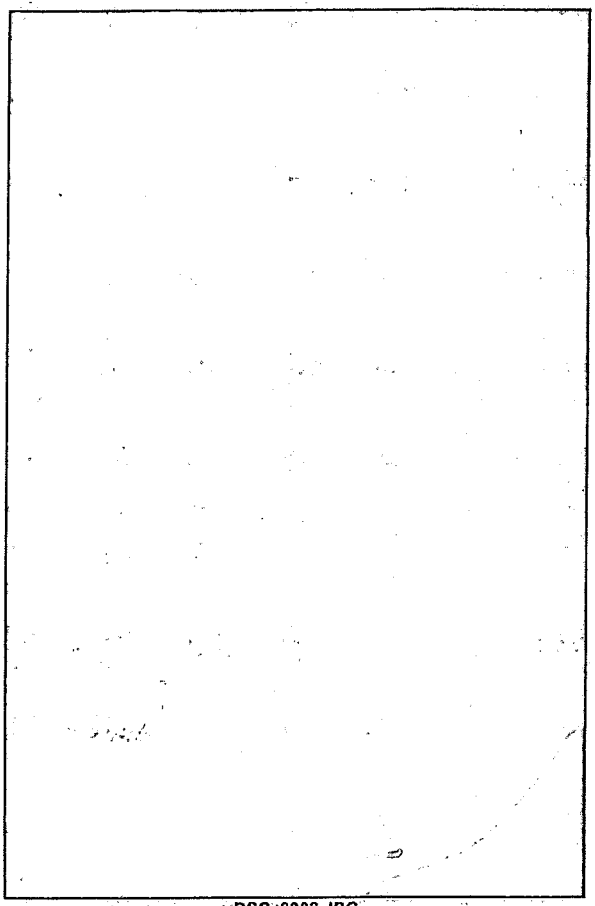
7375



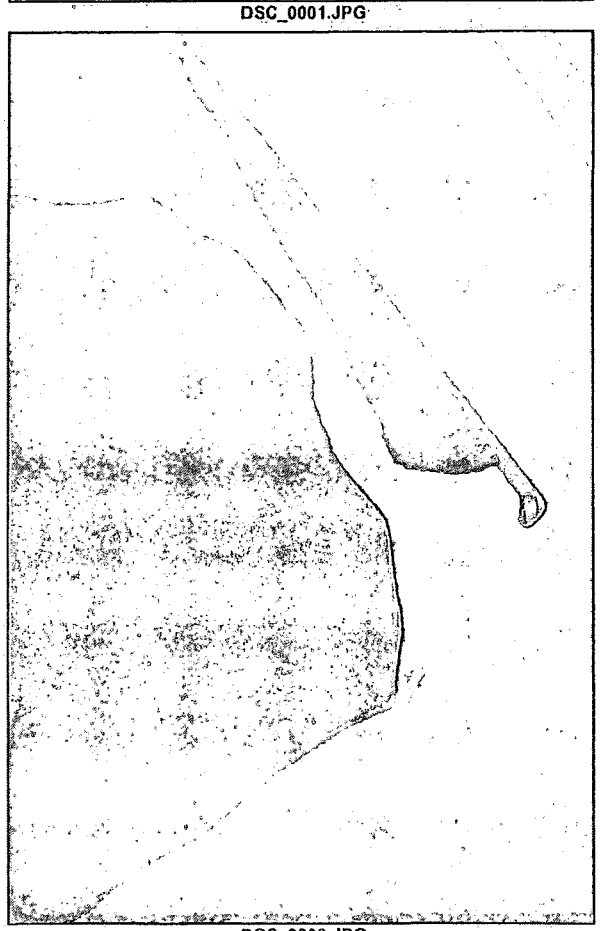
7377



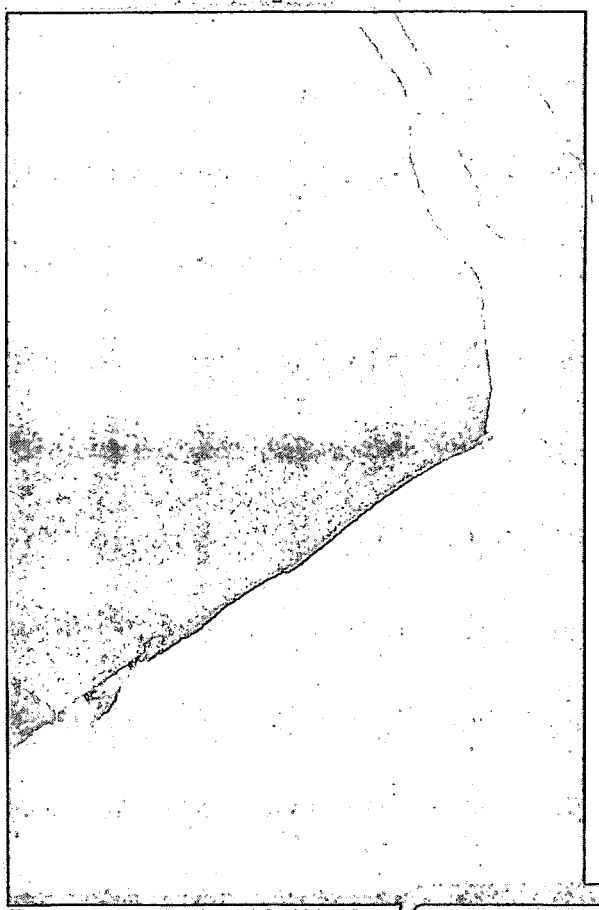
DSC_0001.JPG



DSC_0002.JPG



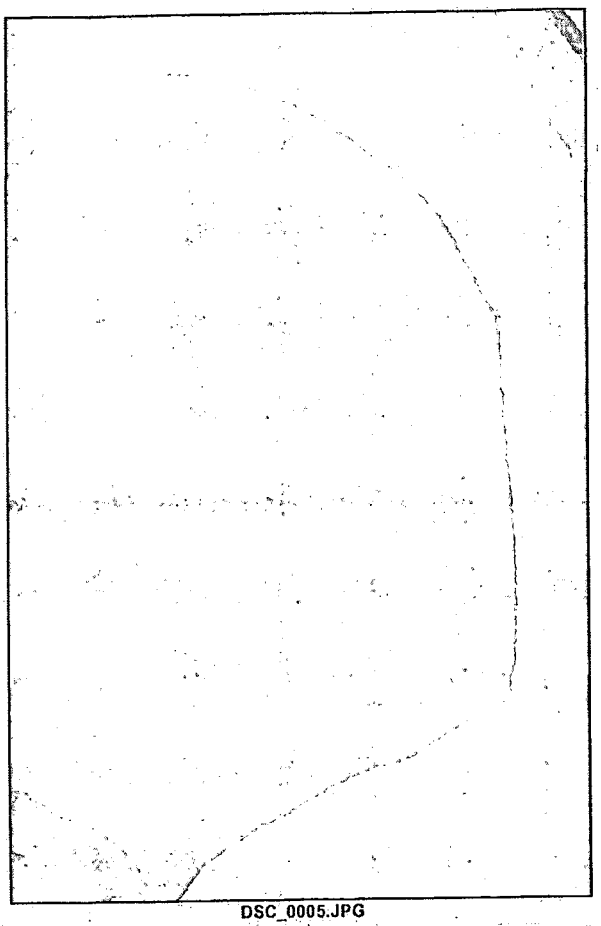
DSC_0003.JPG



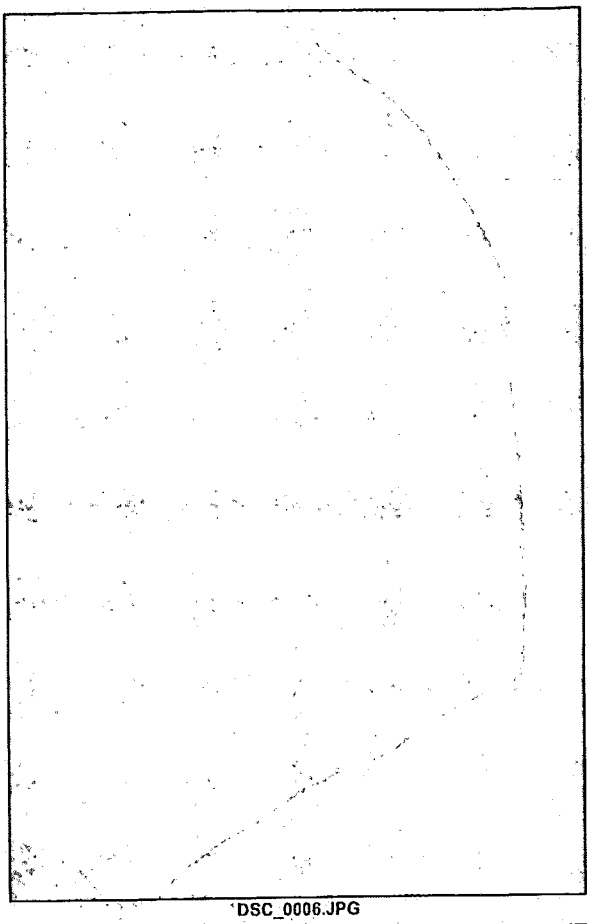
DSC_0004.JPG

Bioforensic Consulting Photographs- 13-582 Newbern Surrogate

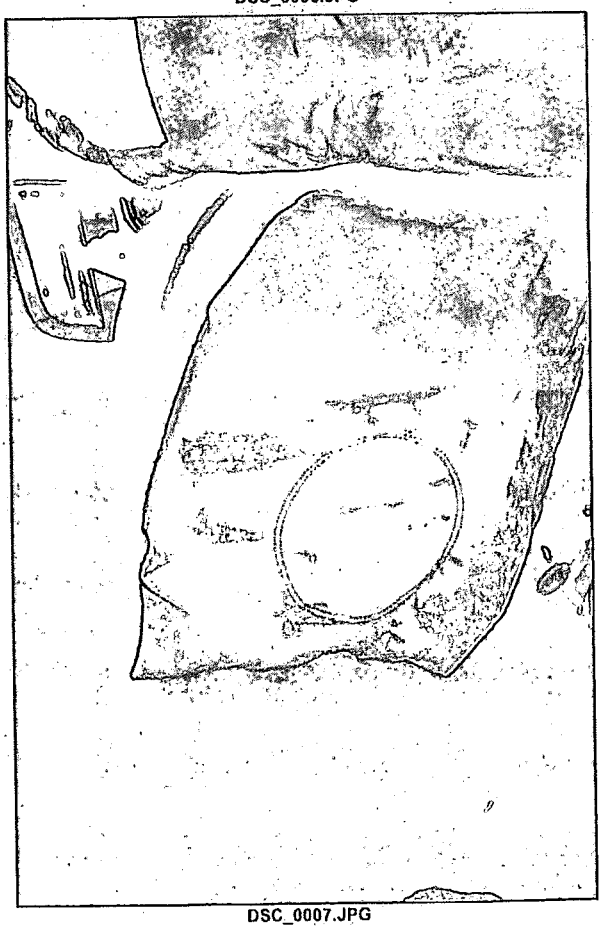
PLAINTIFF'S EXHIBIT 265



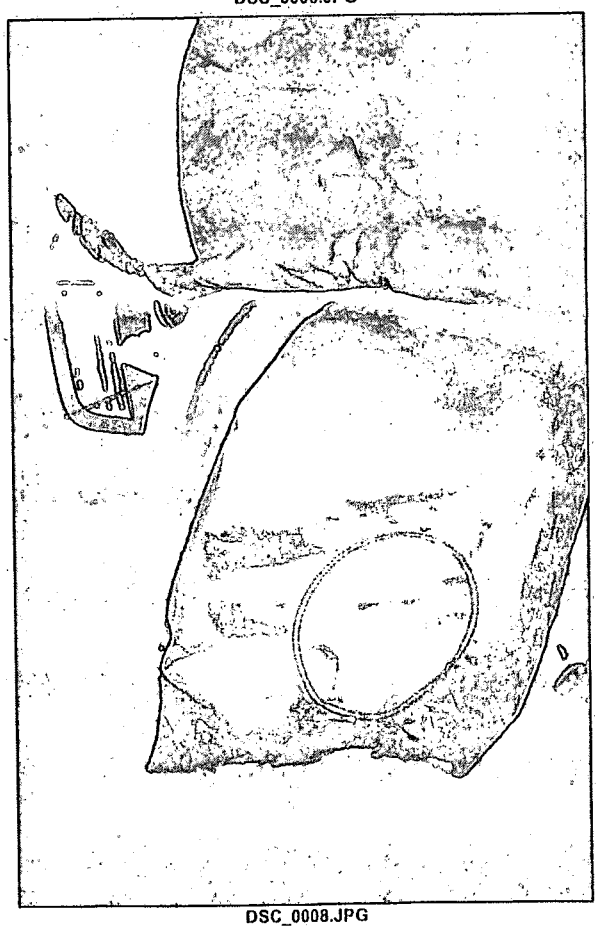
DSC_0005.JPG



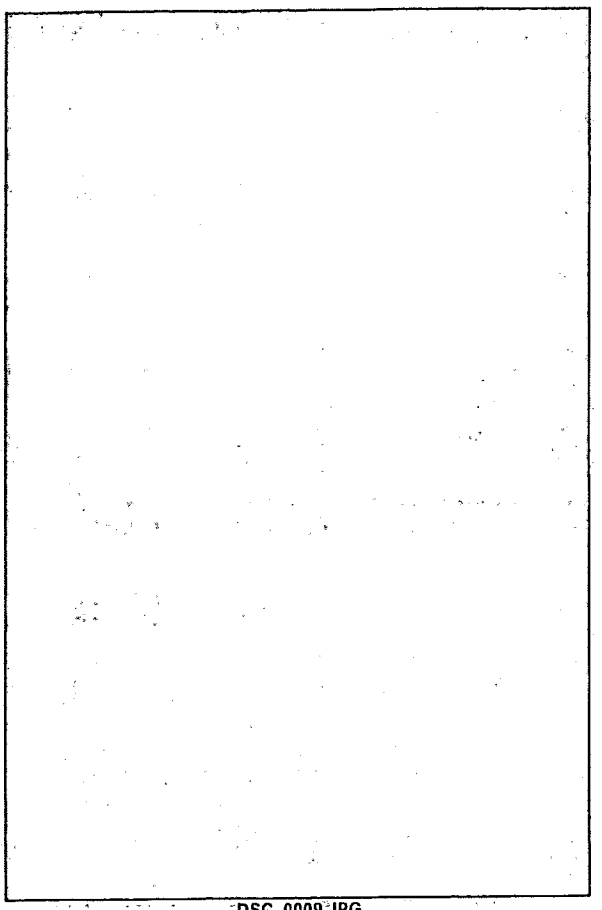
DSC_0006.JPG



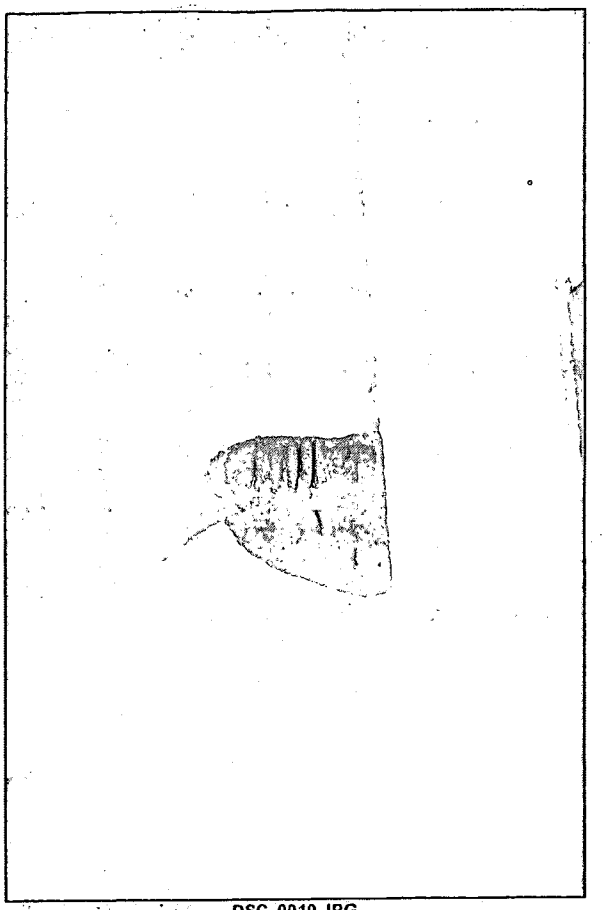
DSC_0007.JPG



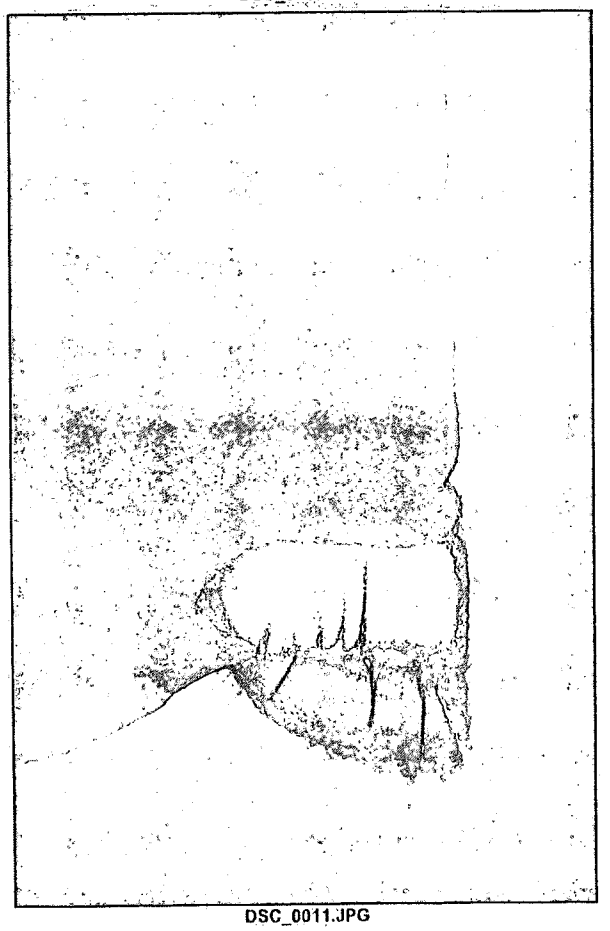
DSC_0008.JPG



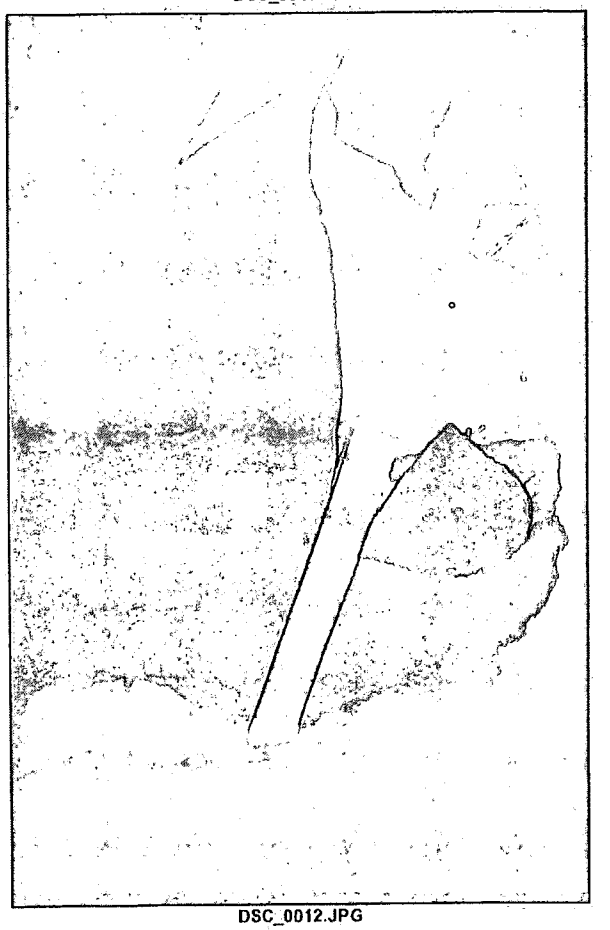
DSC_0009.JPG



DSC_0010.JPG



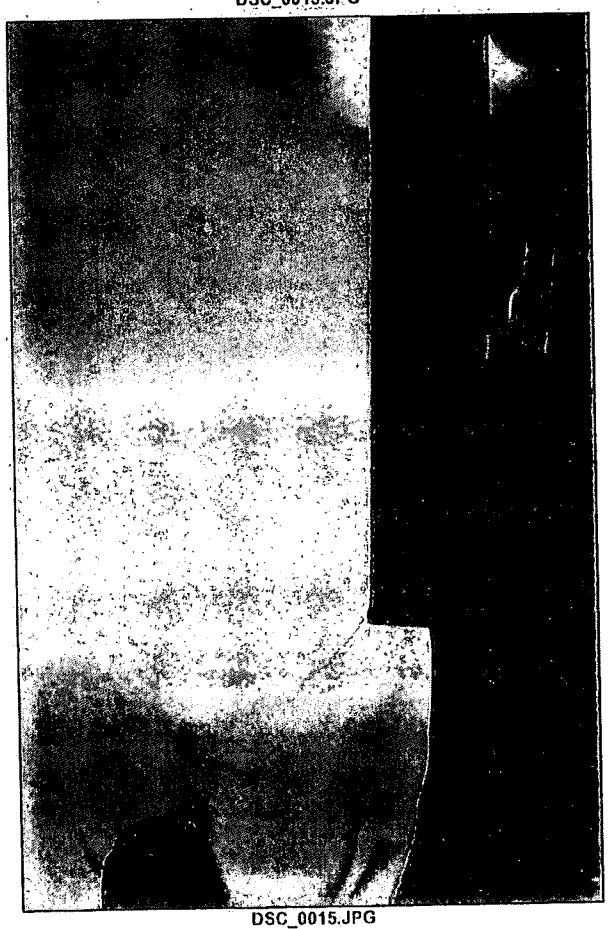
DSC_0011.JPG



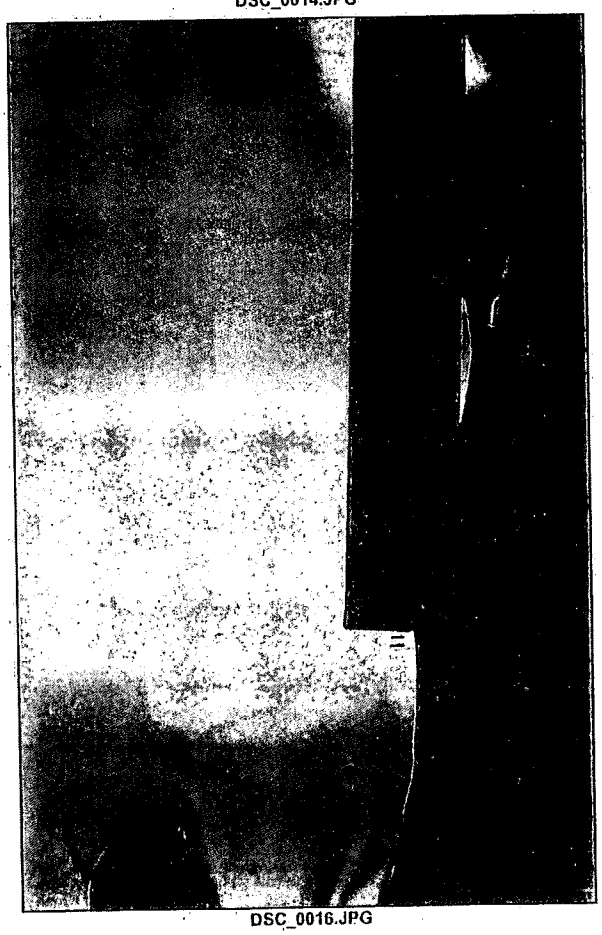
DSC_0012.JPG

DSC_0013.JPG

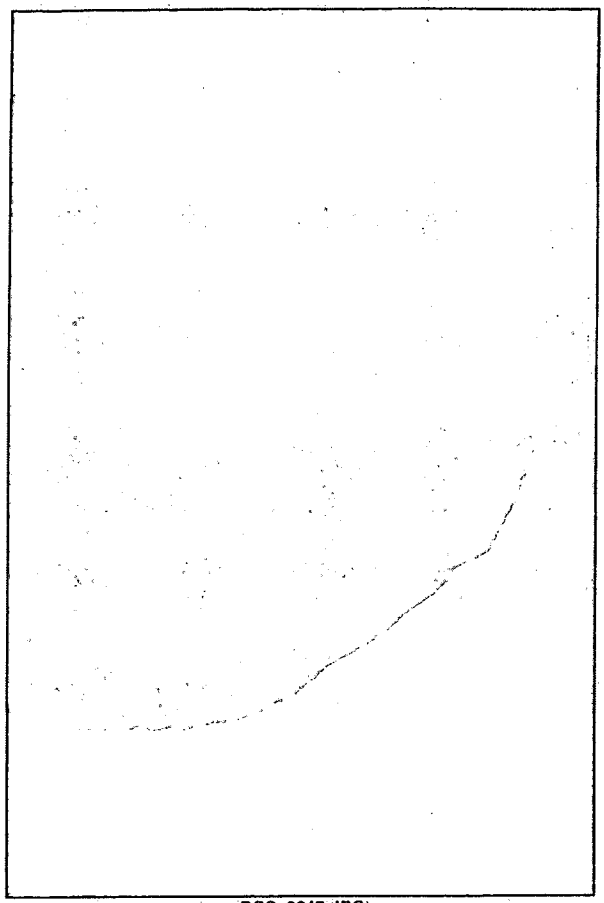
DSC_0014.JPG



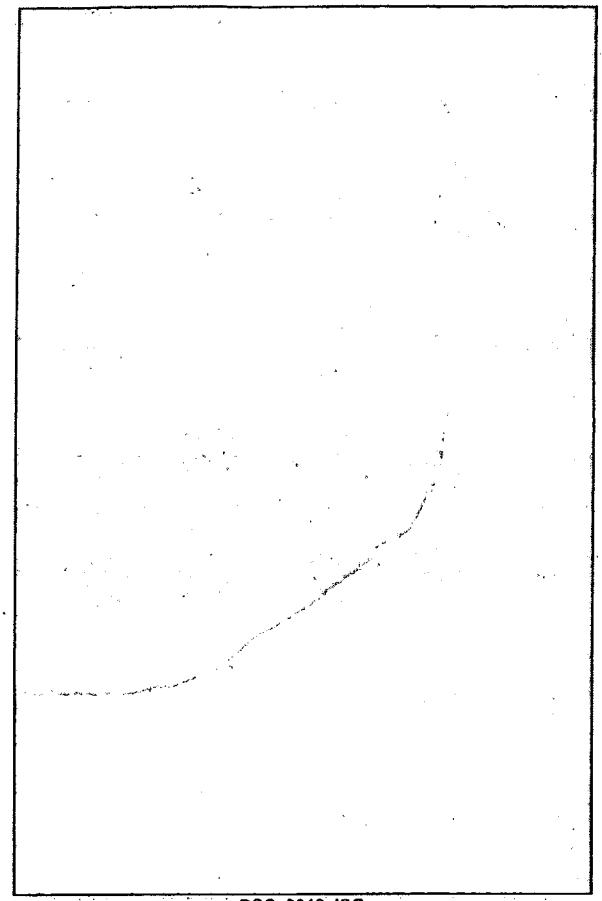
DSC_0015.JPG



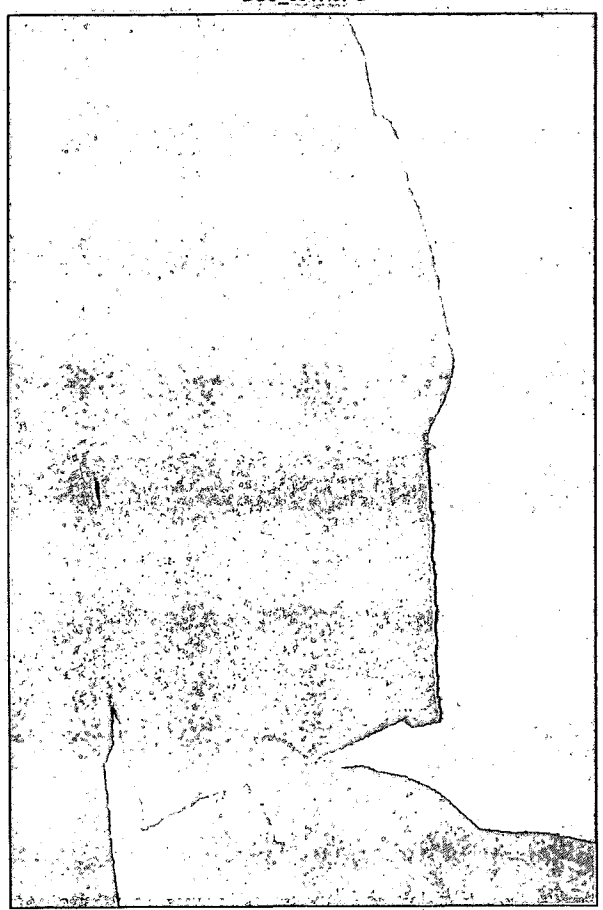
DSC_0016.JPG



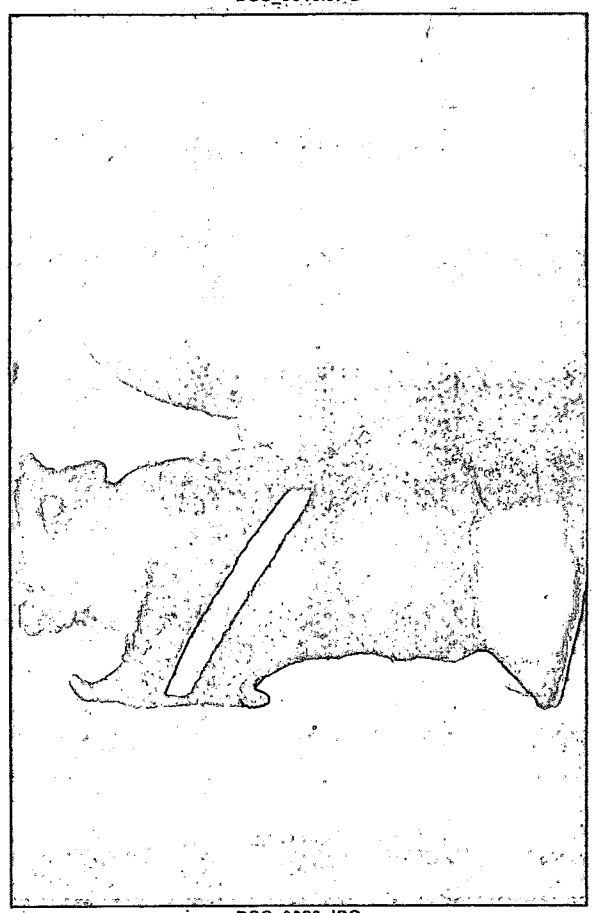
DSC_0017.JPG



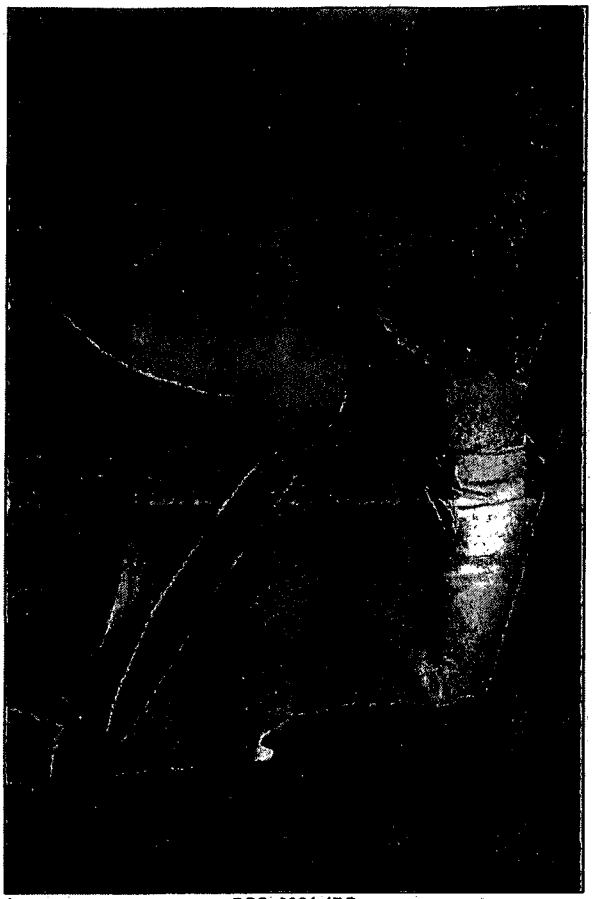
DSC_0018.JPG



DSC_0019.JPG



DSC_0020.JPG



DSC_0021.JPG

DSC_0022.JPG

DSC_0023.JPG

DSC_0024.JPG

DSC_0025.JPG

DSC_0026.JPG

DSC_0027.JPG

DSC_0028.JPG

DSC_0029.JPG

DSC_0030.JPG

DSC_0031.JPG

DSC_0032.JPG

DSC_0033.JPG

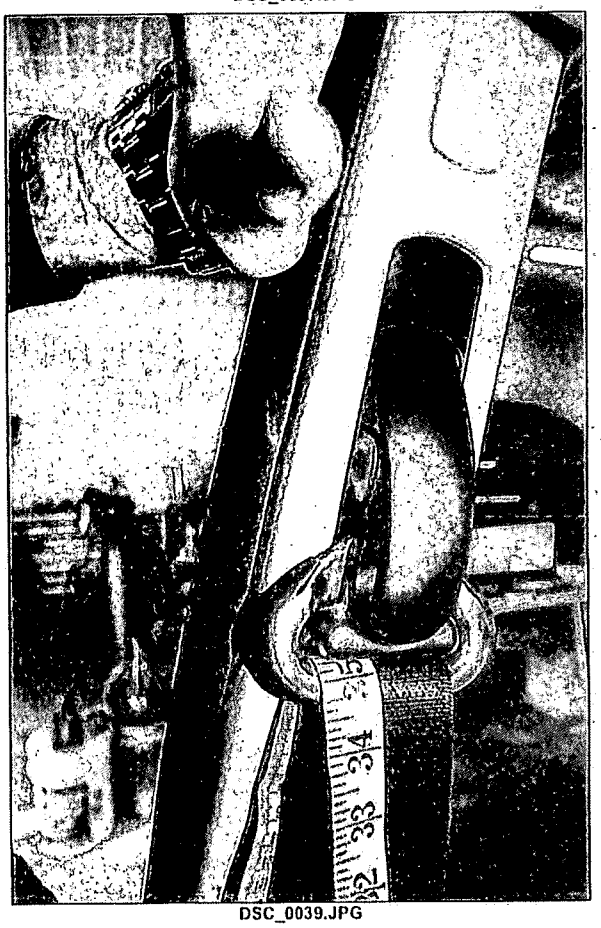
DSC_0034.JPG

DSC_0035.JPG

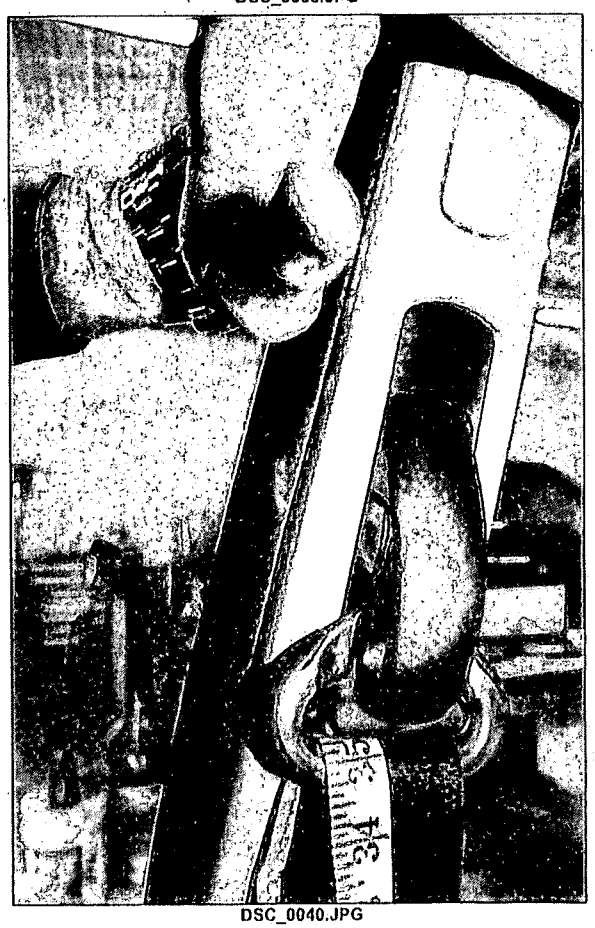
DSC_0036.JPG

DSC_0037.JPG

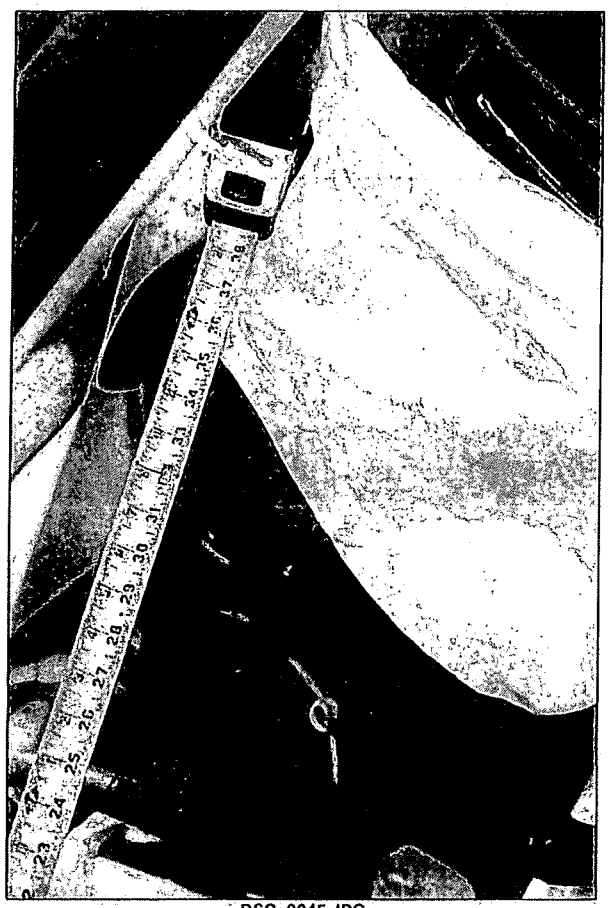
DSC_0038.JPG



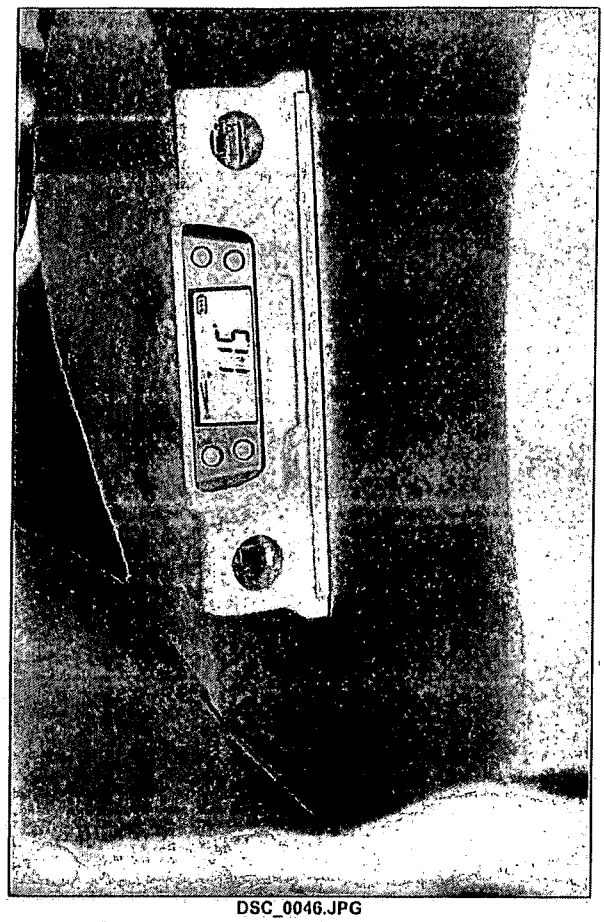
DSC_0039.JPG



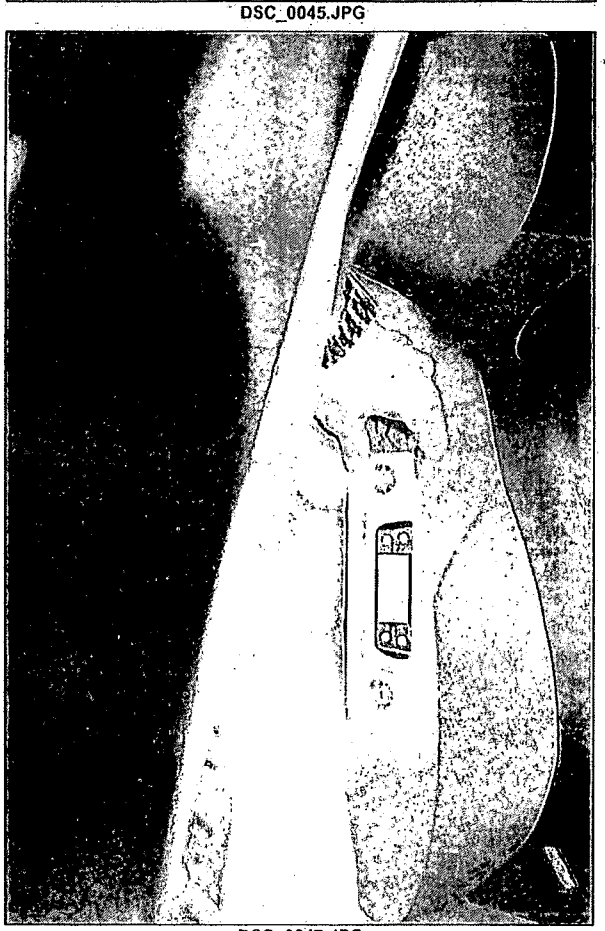
DSC_0040.JPG



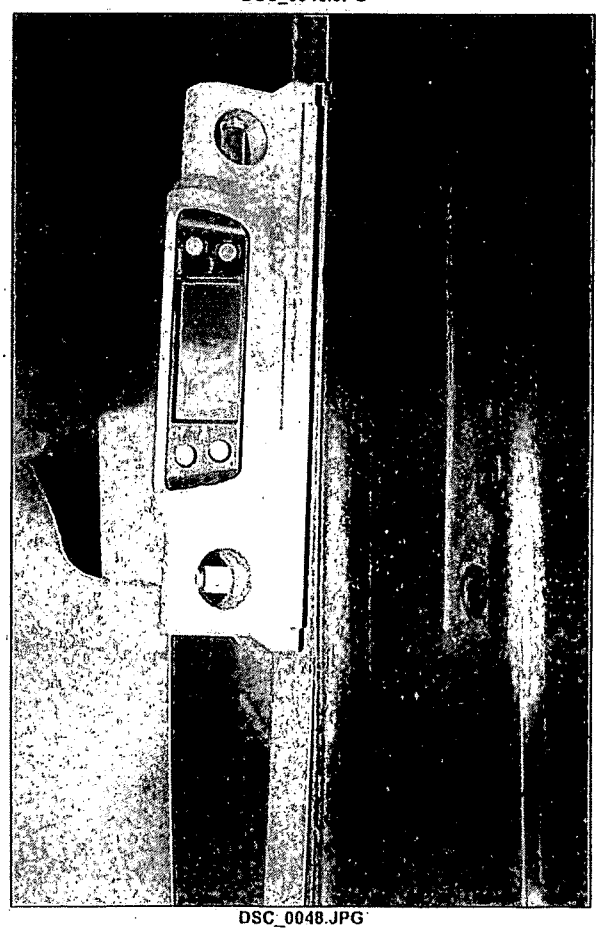
DSC_0045.JPG



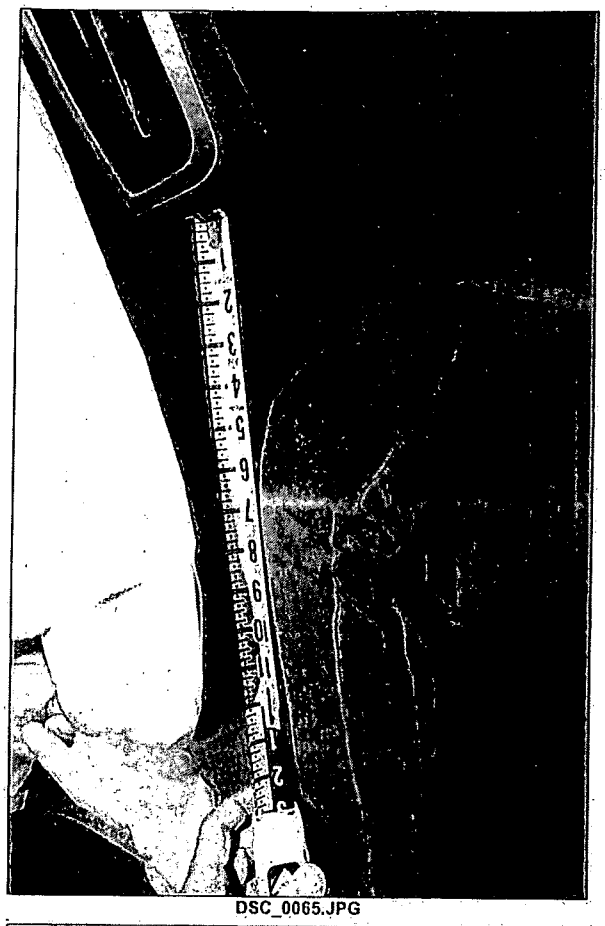
DSC_0046.JPG



DSC_0047.JPG



DSC_0048.JPG



DSC_0065.JPG

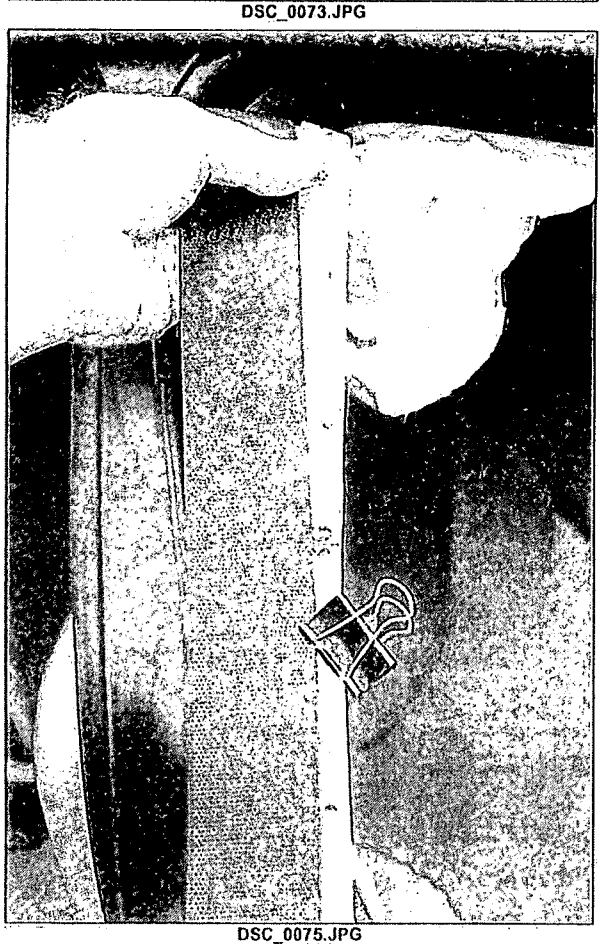
DSC_0066.JPG

DSC_0067.JPG

DSC_0068.JPG

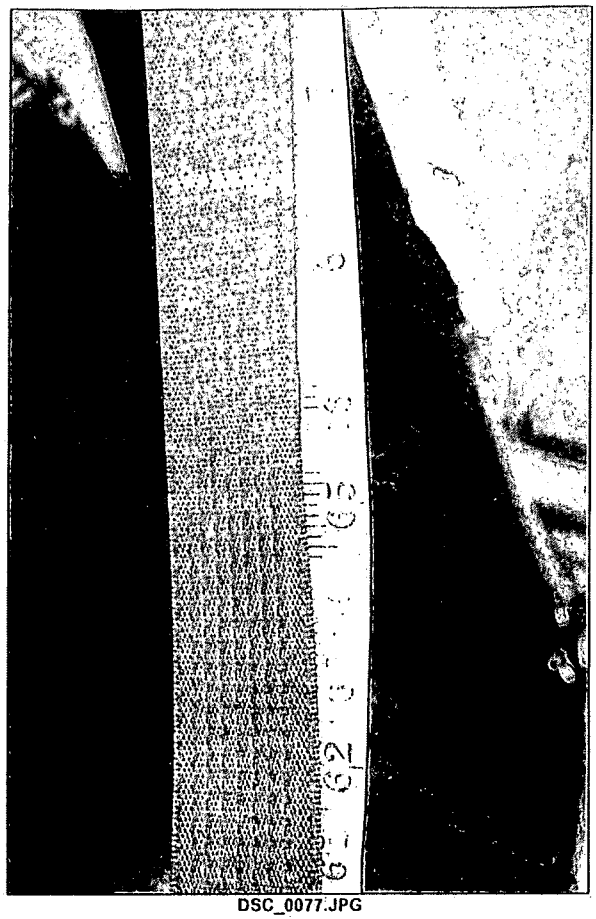
DSC_0073.JPG

DSC_0074.JPG

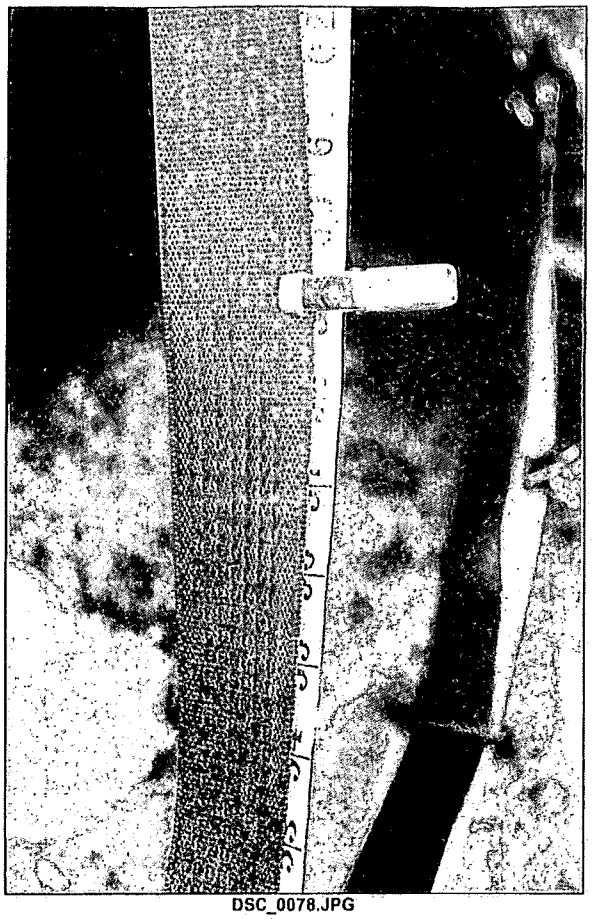


DSC_0075.JPG

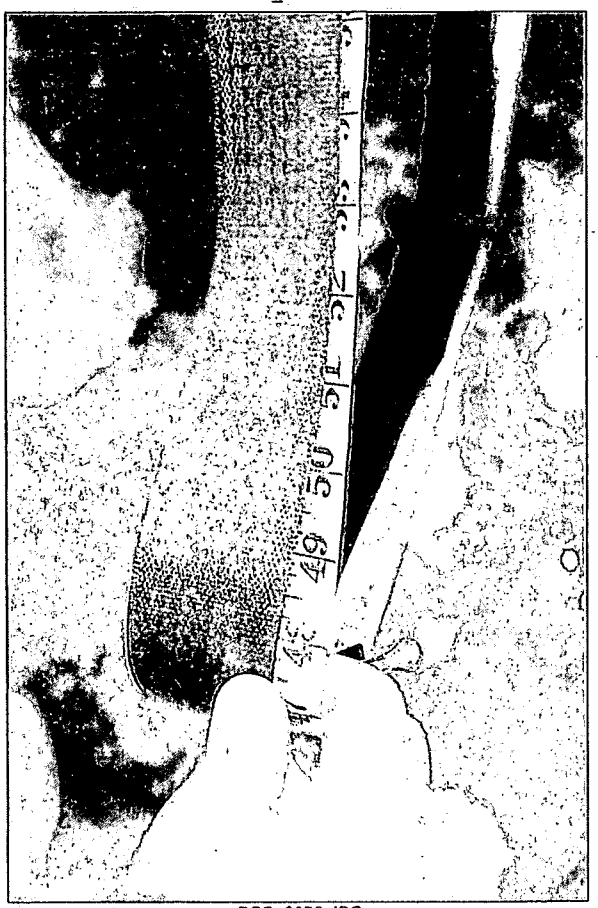
DSC_0076.JPG



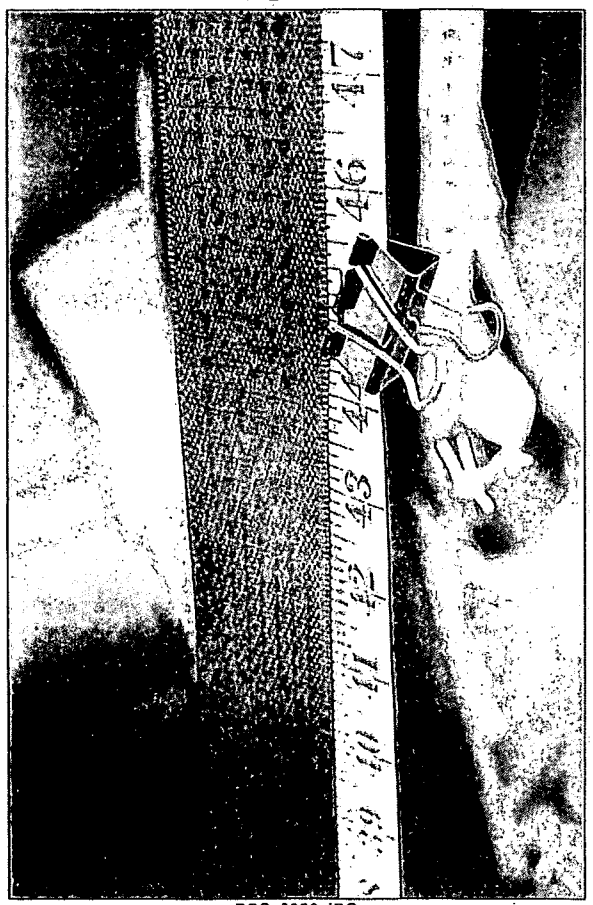
DSC_0077.JPG



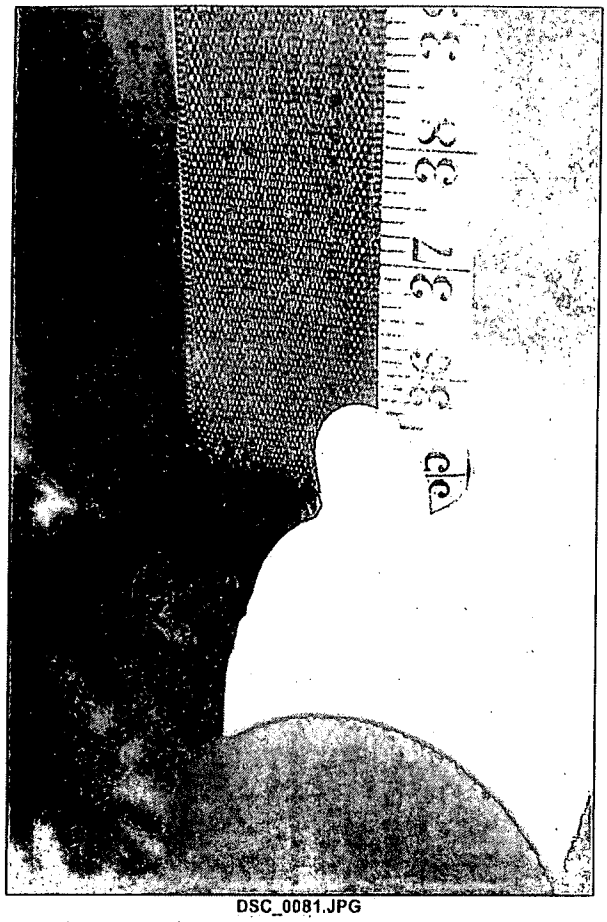
DSC_0078.JPG



DSC_0079.JPG

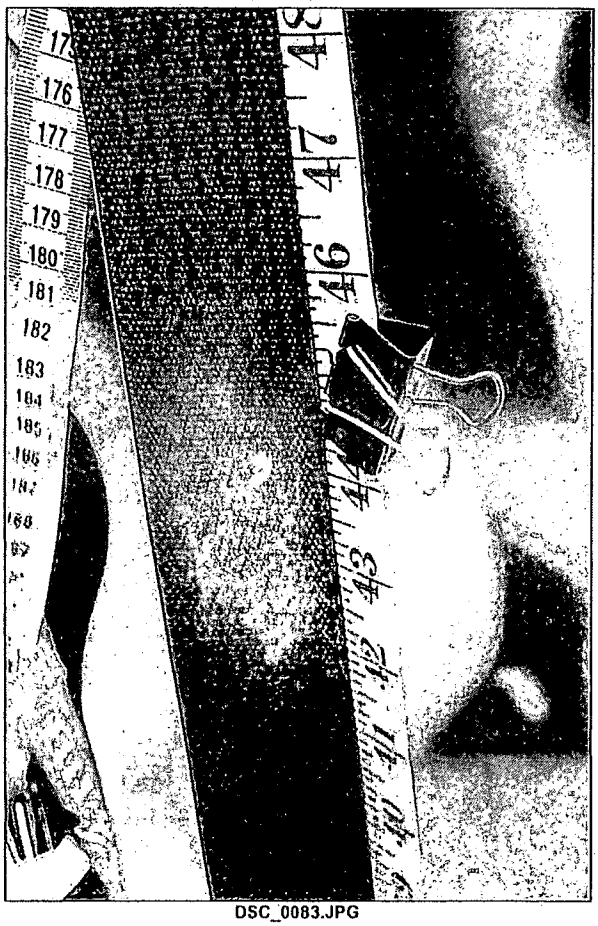


DSC_0080.JPG

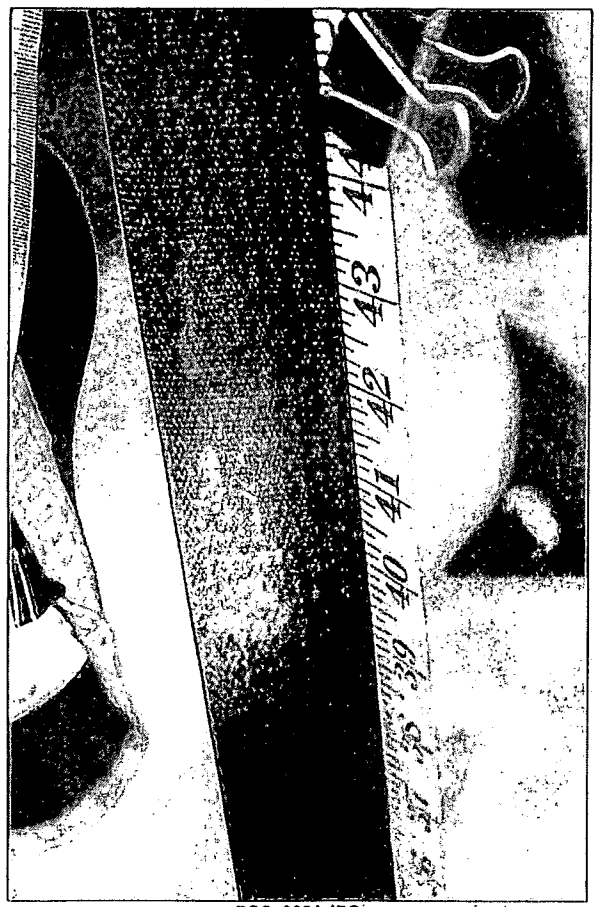


DSC_0081.JPG

DSC_0082.JPG



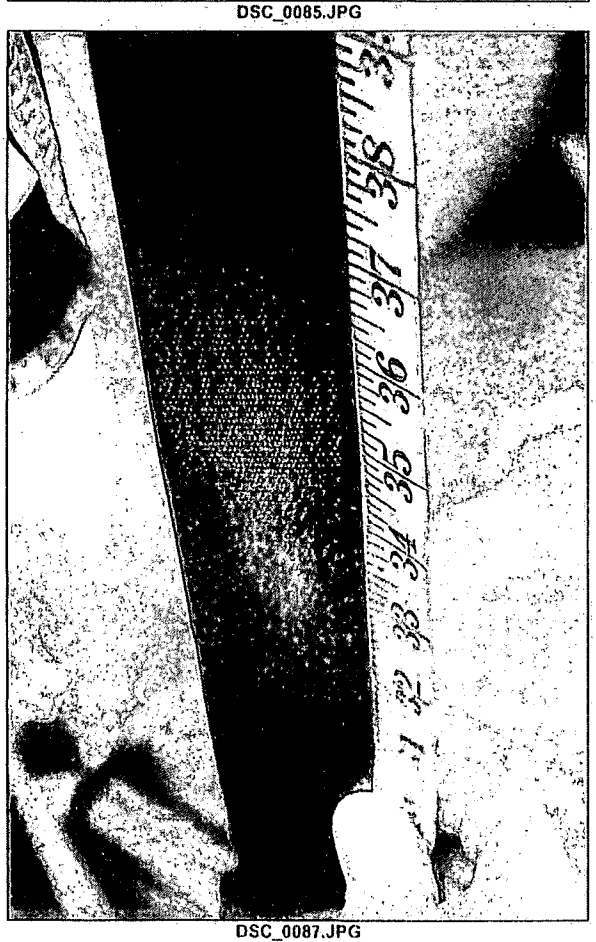
DSC_0083.JPG



DSC_0084.JPG

DSC_0085.JPG

DSC_0086.JPG

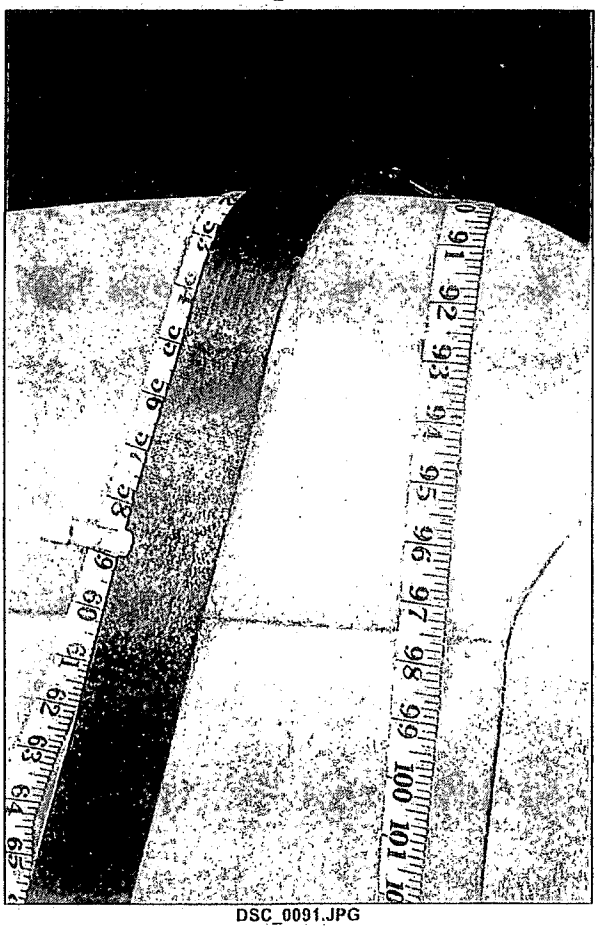


DSC_0087.JPG

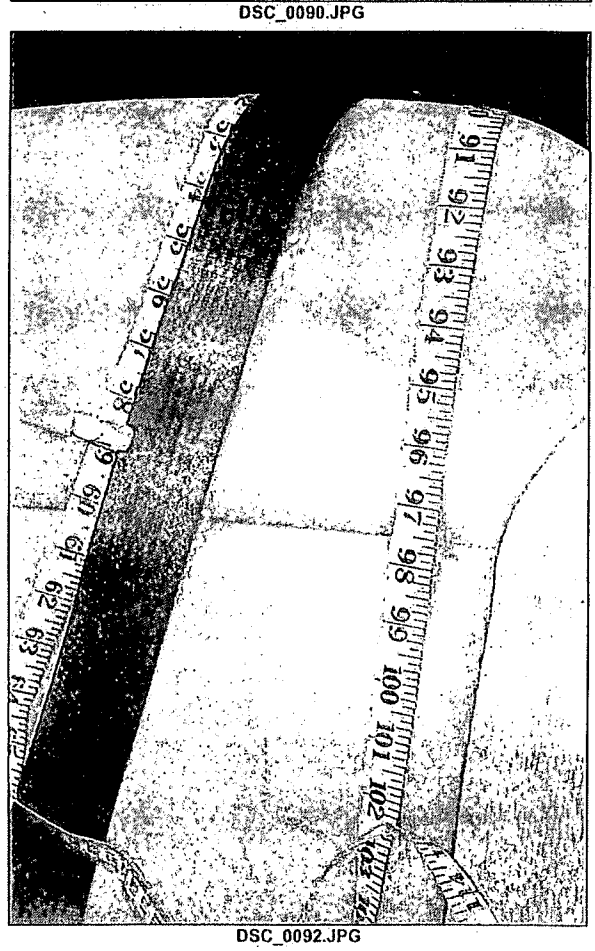
DSC_0088.JPG

DSC_0089.JPG

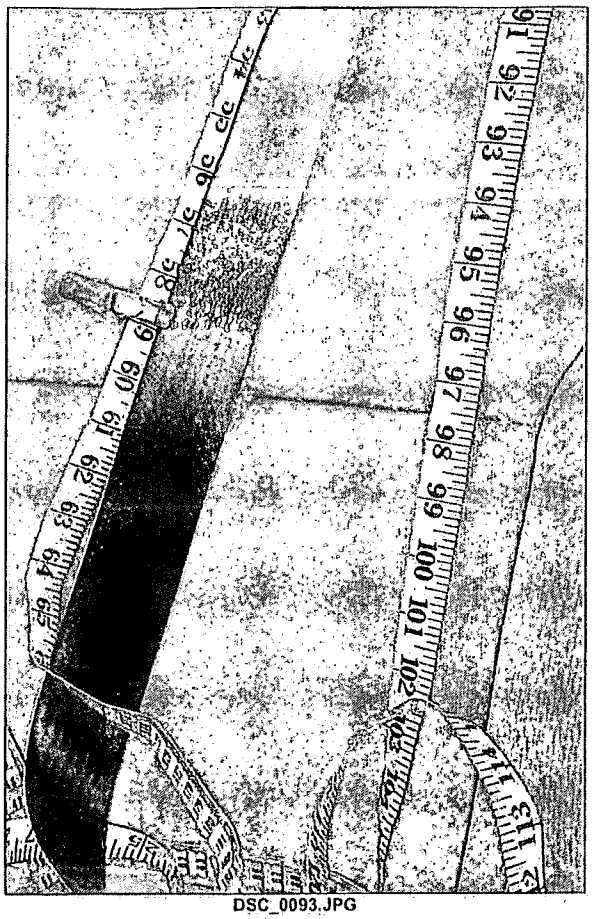
DSC_0090.JPG



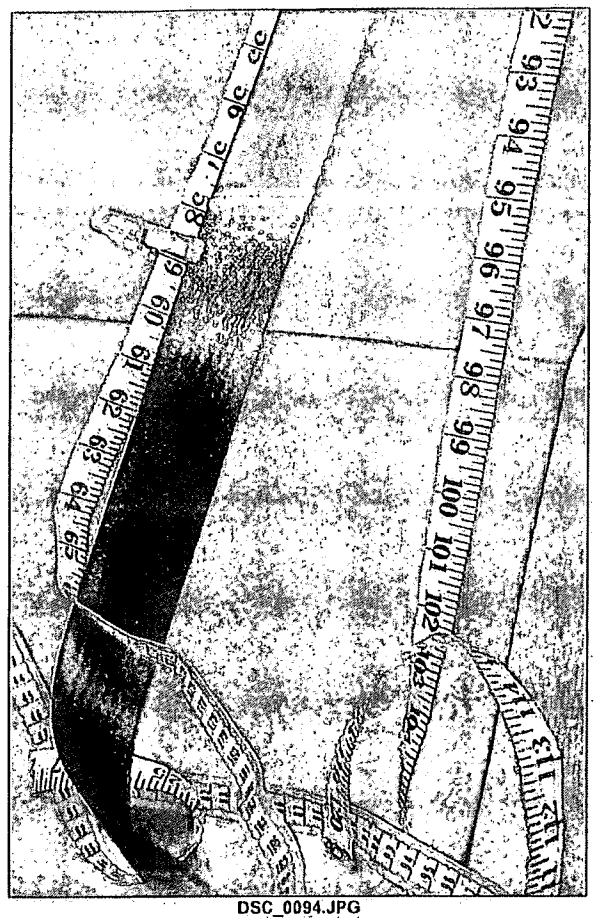
DSC_0091.JPG



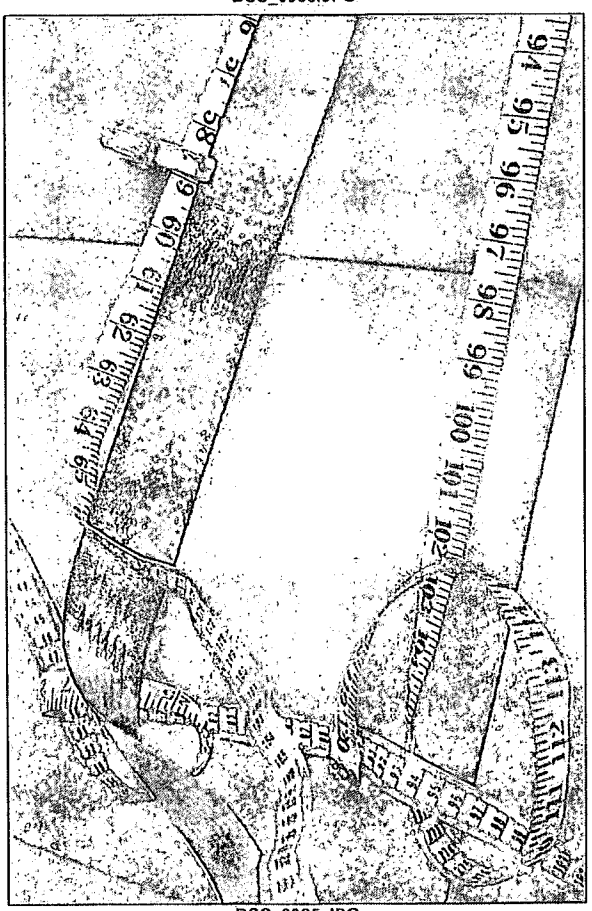
DSC_0092.JPG



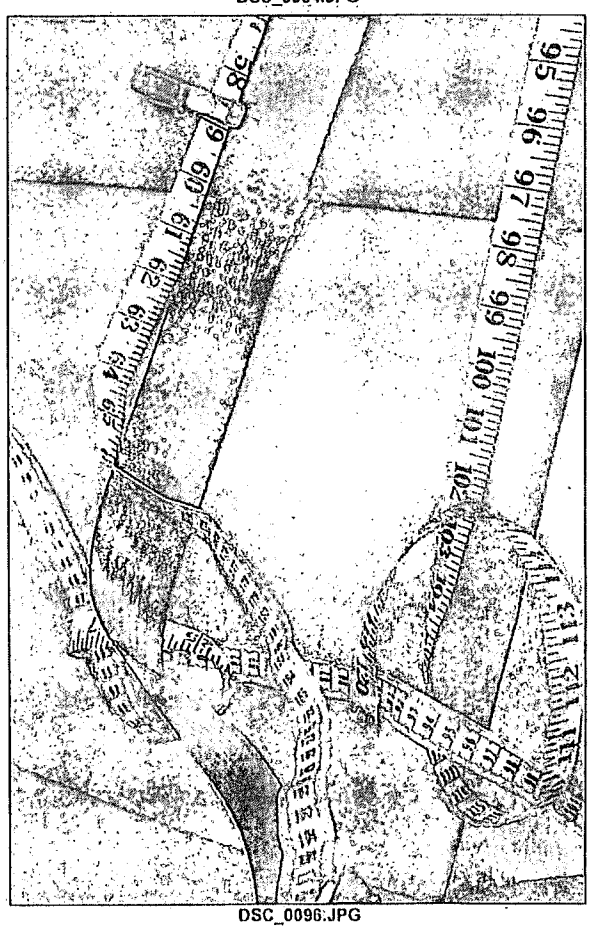
DSC_0093.JPG



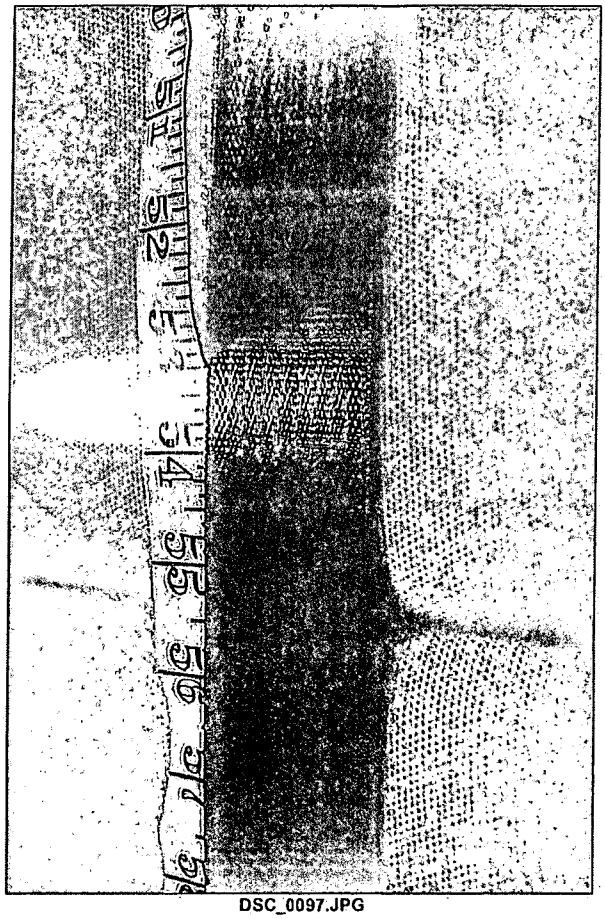
DSC_0094.JPG



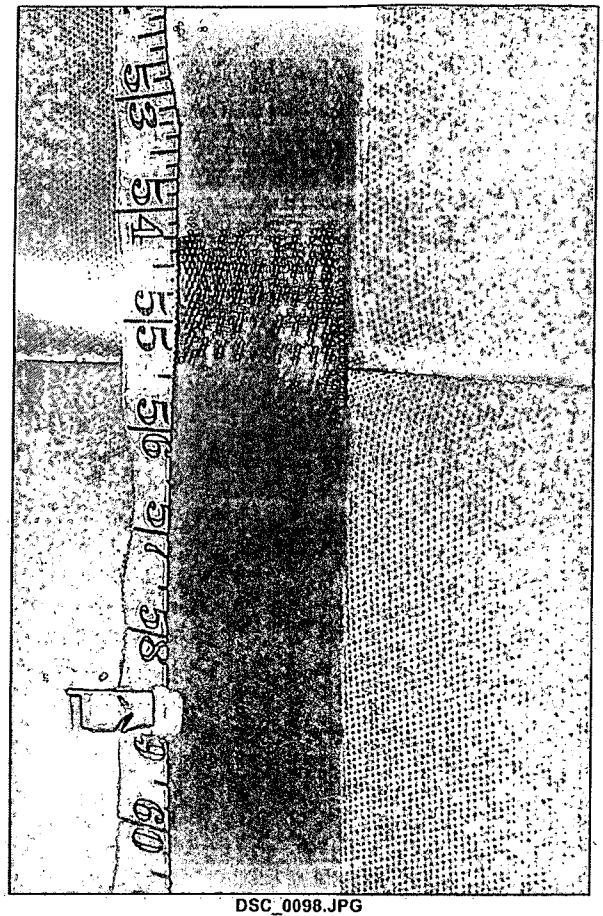
DSC_0095.JPG



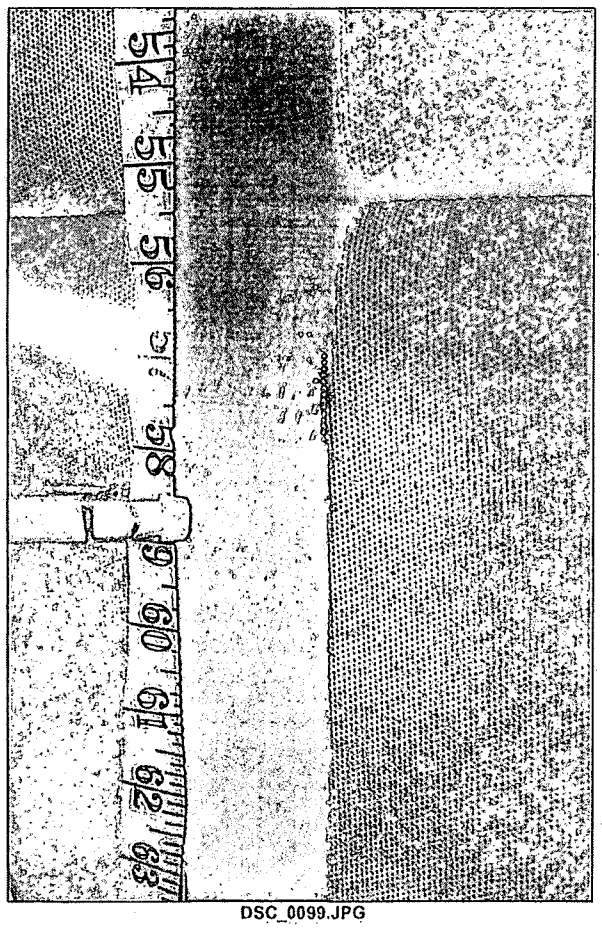
DSC_0096.JPG



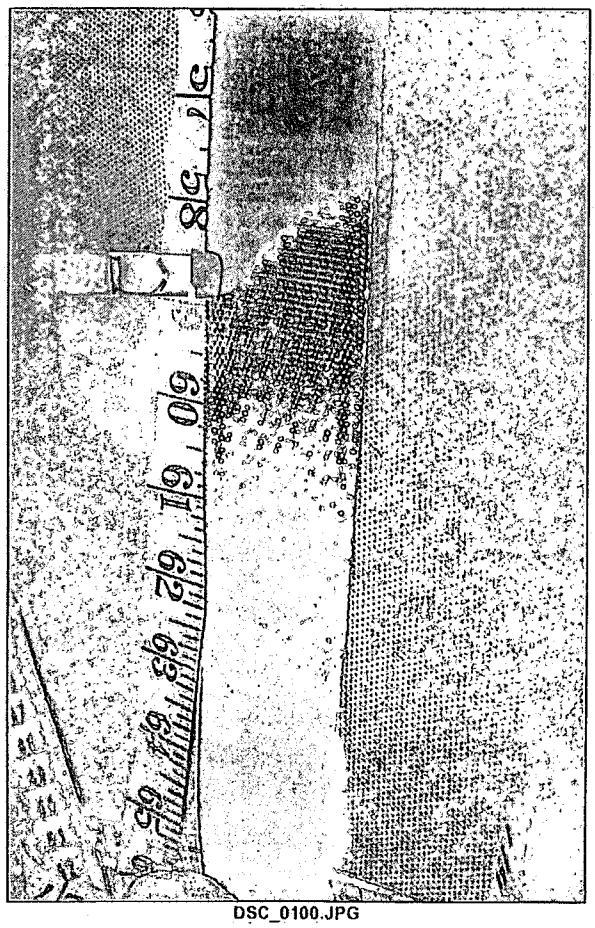
DSC_0097.JPG



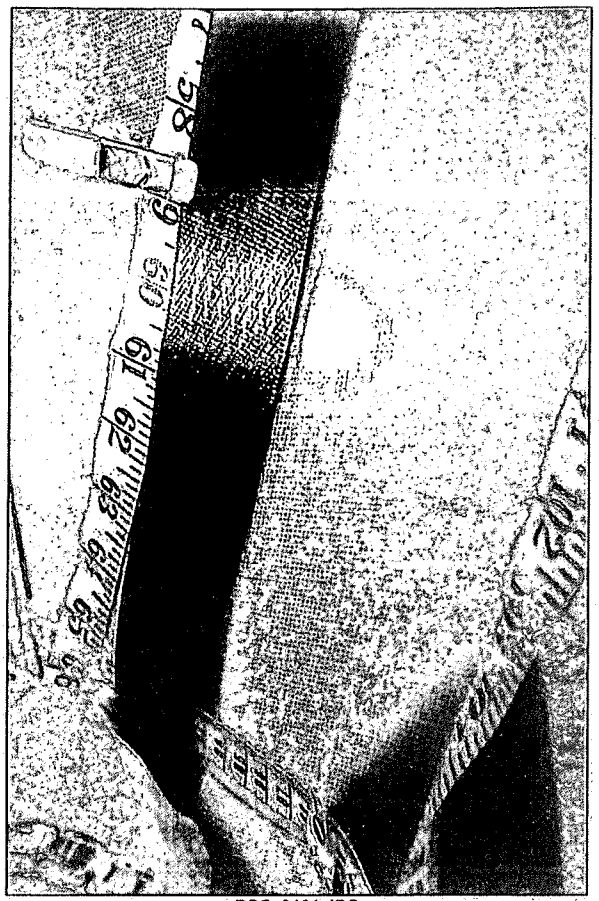
DSC_0098.JPG



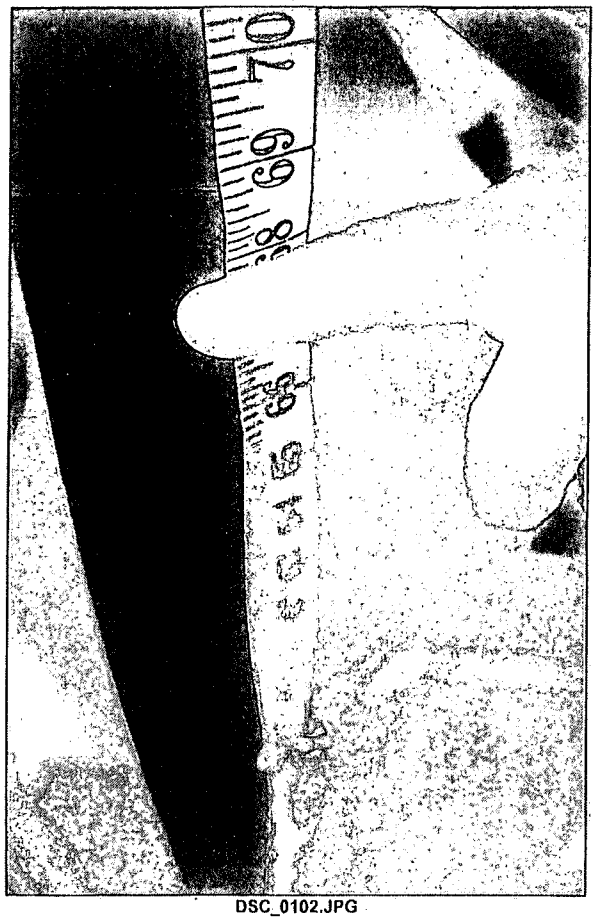
DSC_0099.JPG



DSC_0100.JPG

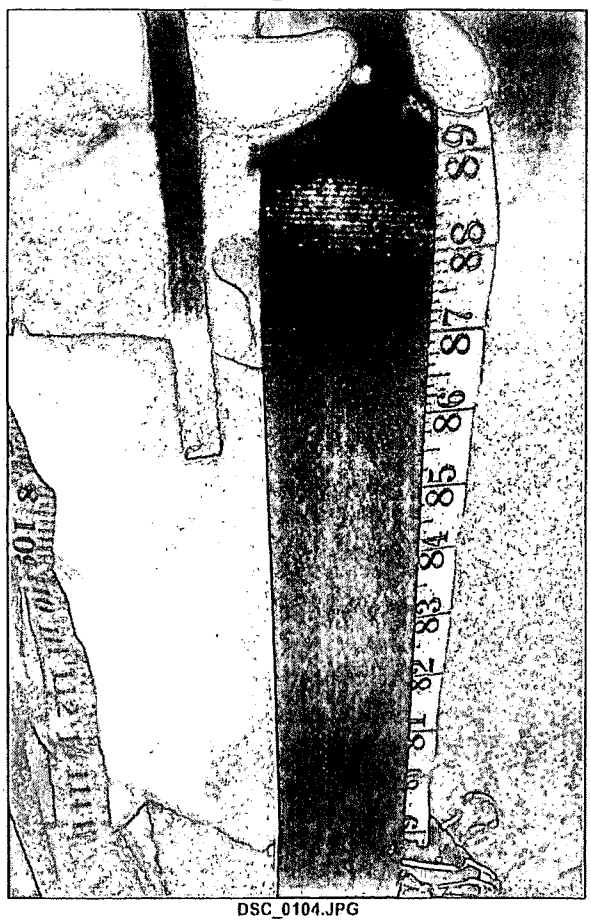


DSC_0101.JPG



DSC_0102.JPG

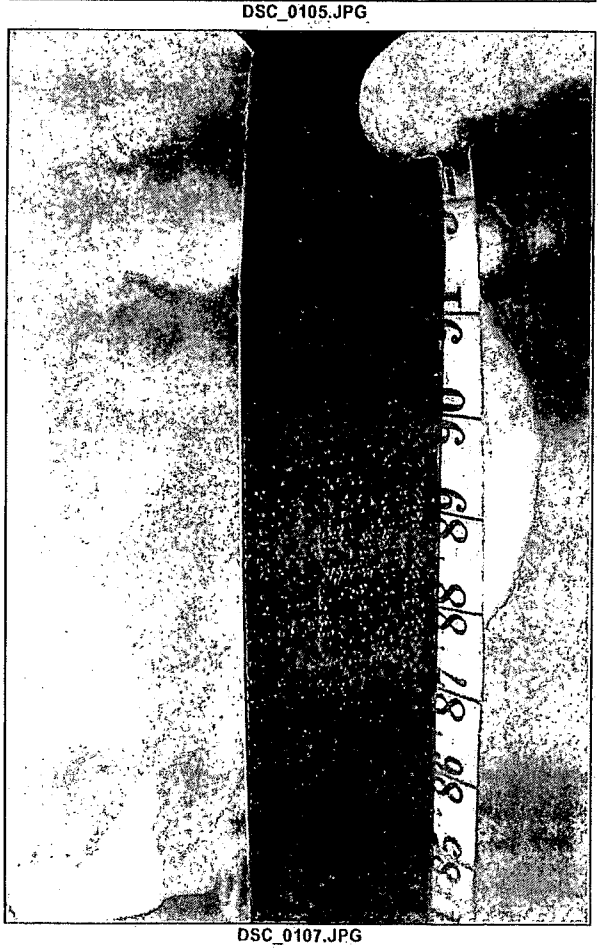
DSC_0103.JPG



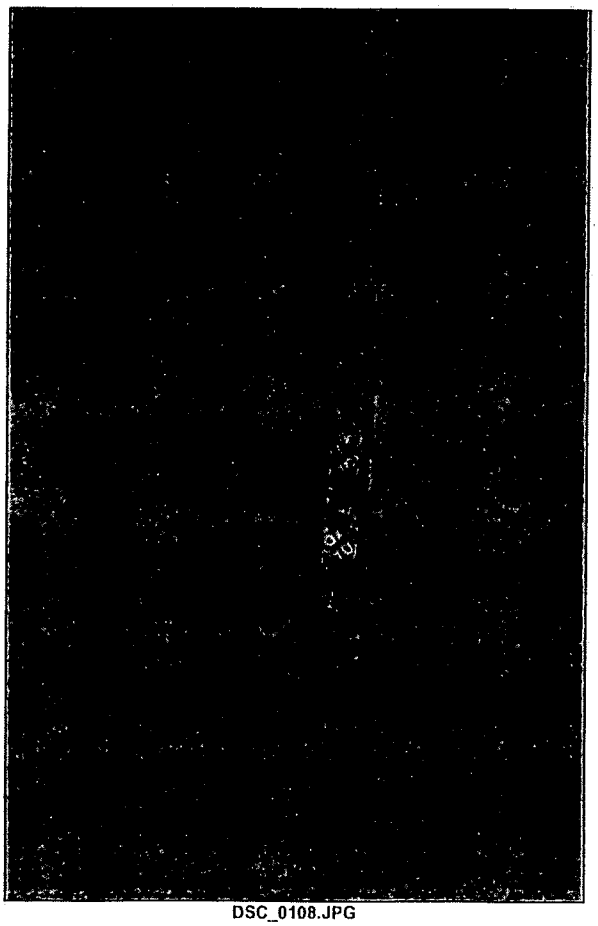
DSC_0104.JPG

DSC_0105.JPG

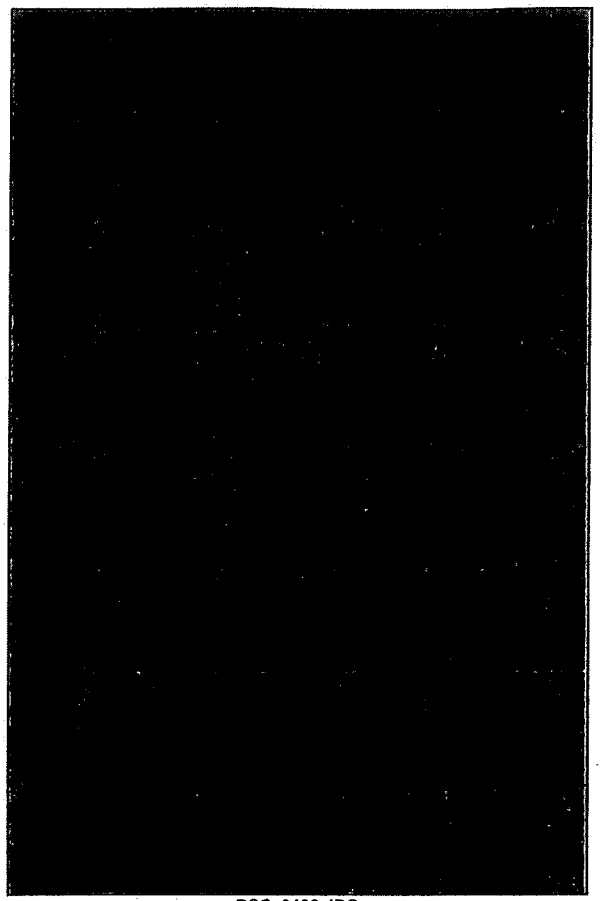
DSC_0106.JPG



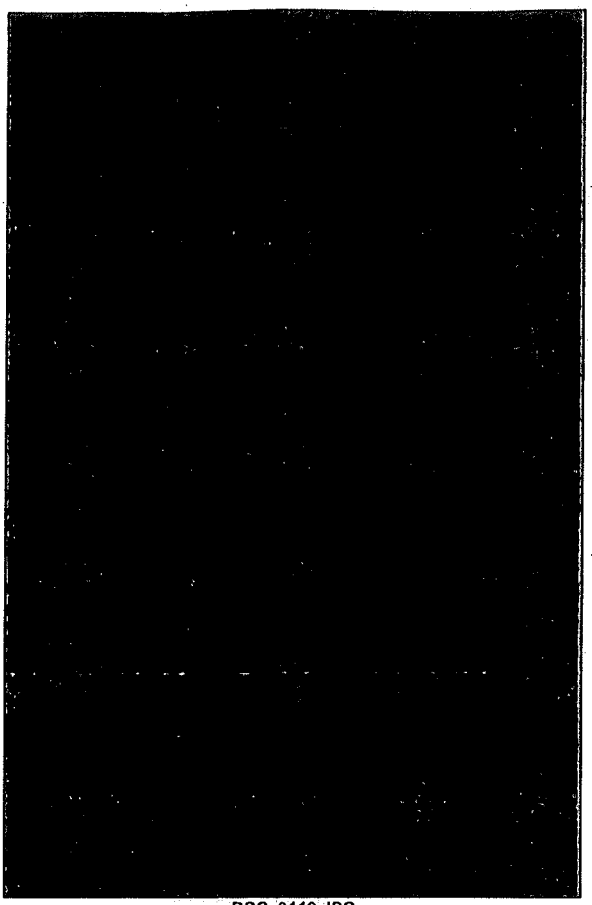
DSC_0107.JPG



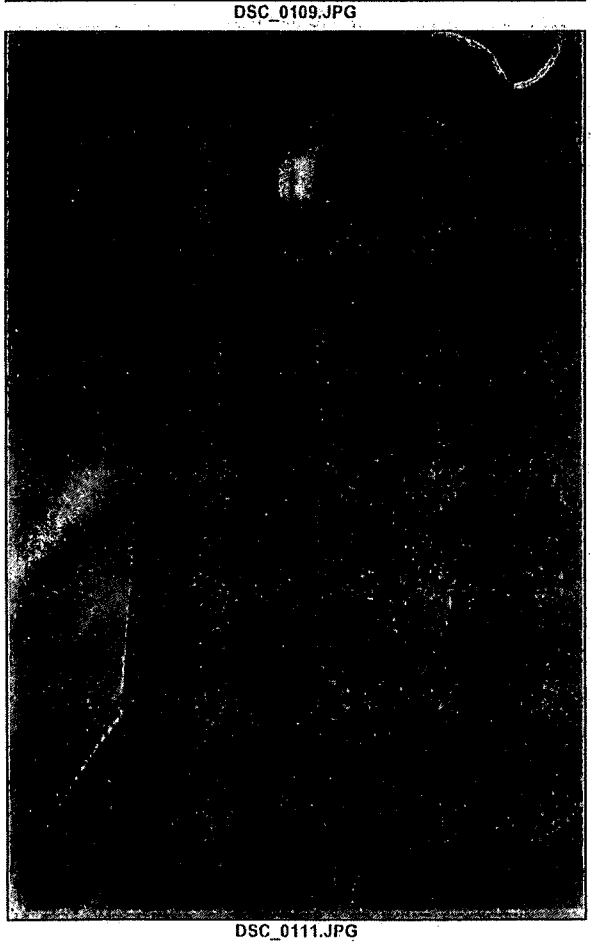
DSC_0108.JPG



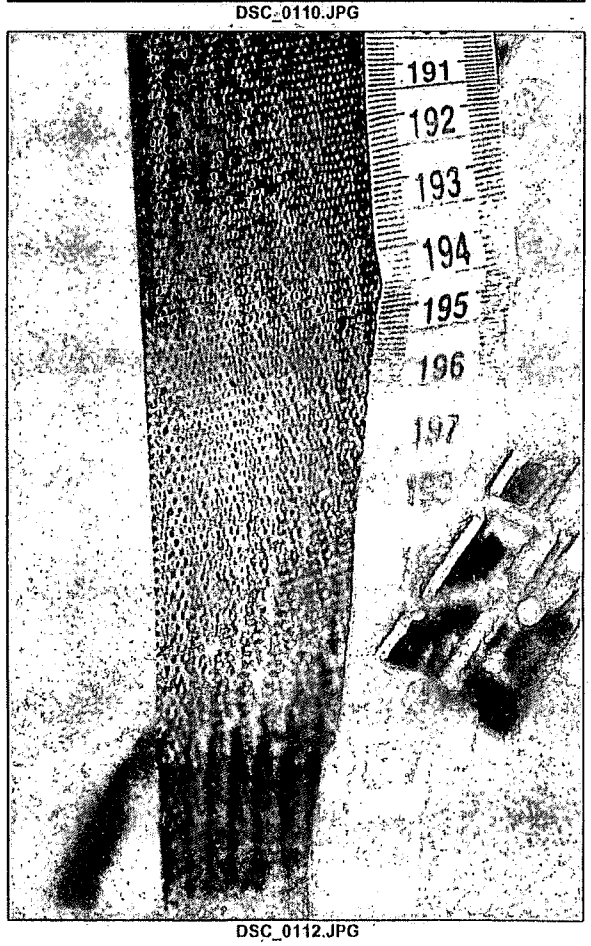
DSC_0109.JPG



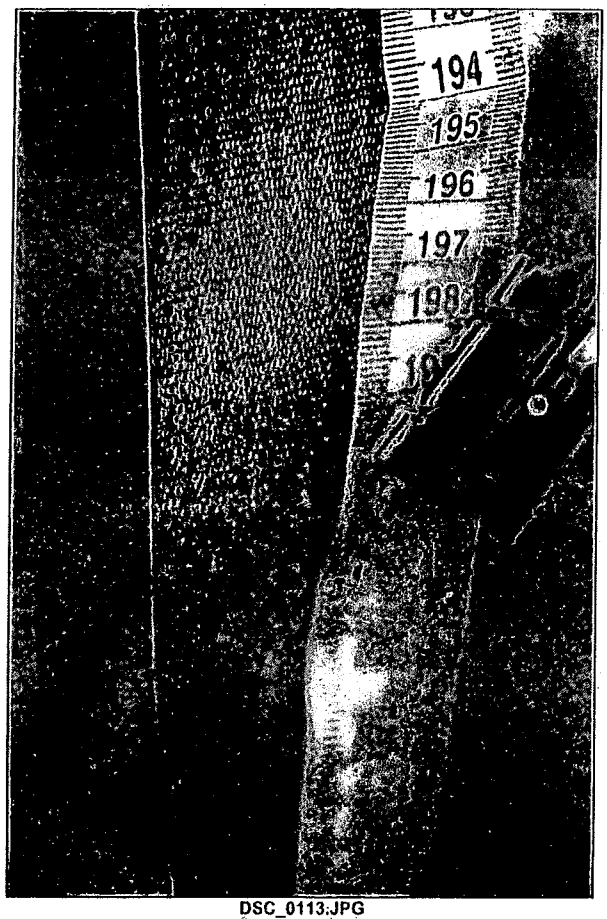
DSC_0110.JPG



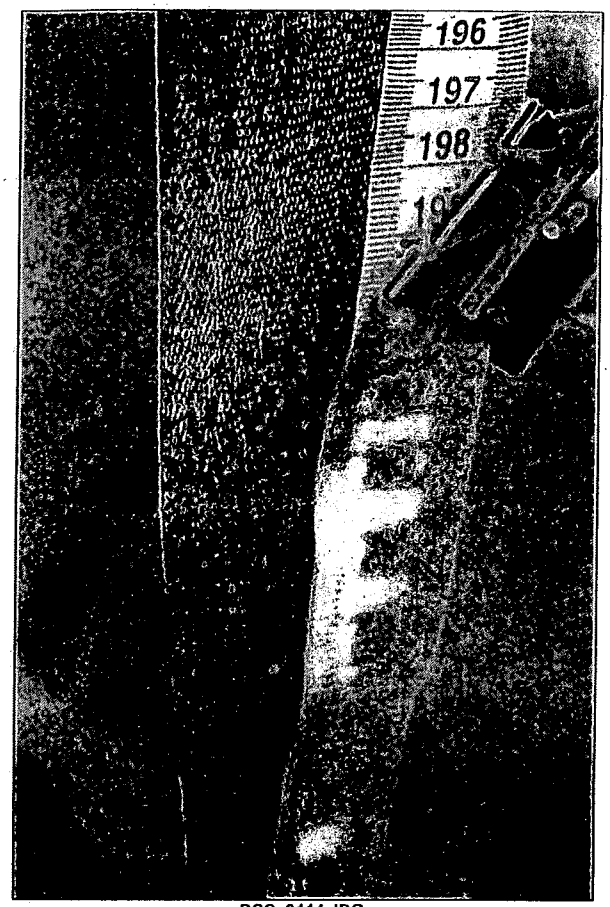
DSC_0111.JPG



DSC_0112.JPG

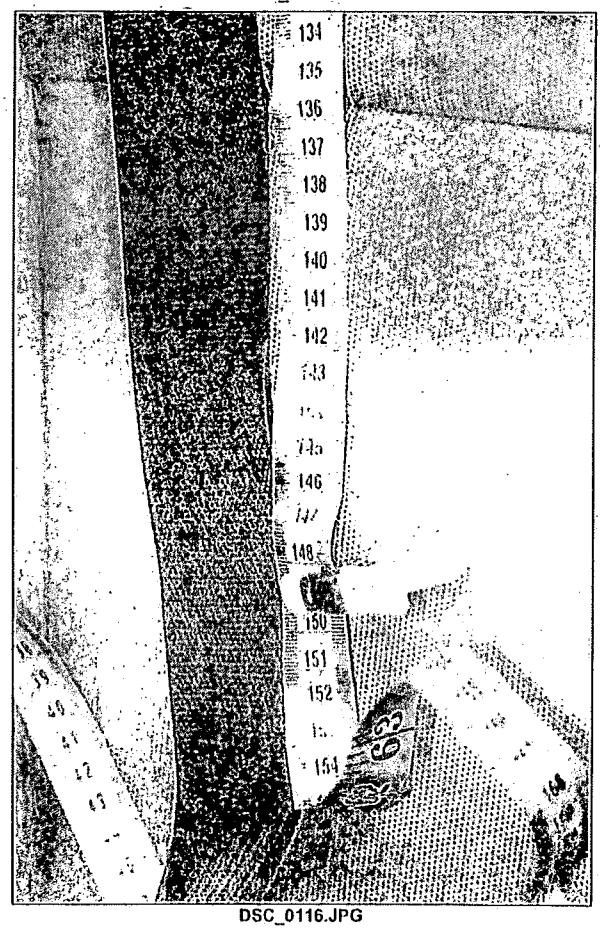


DSC_0113.JPG

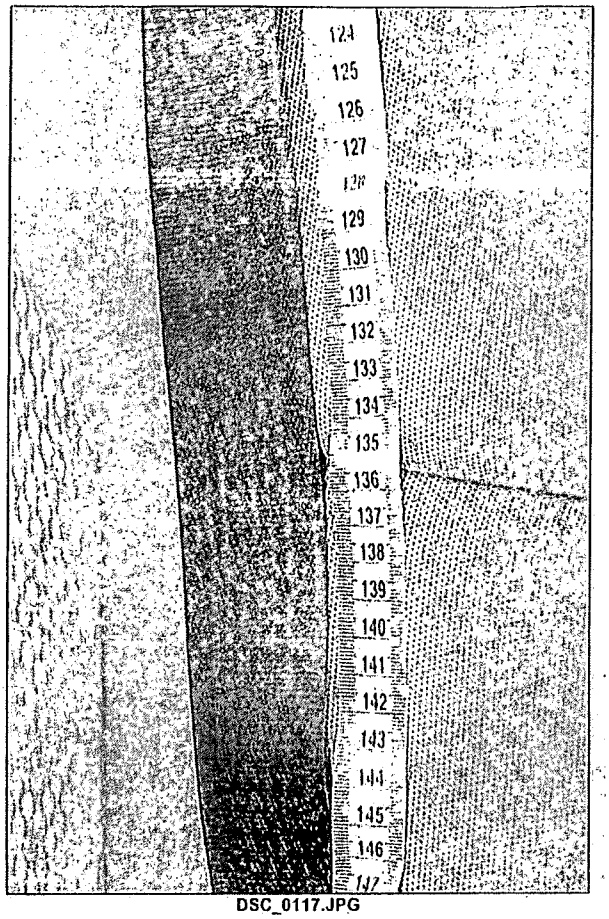


DSC_0114.JPG

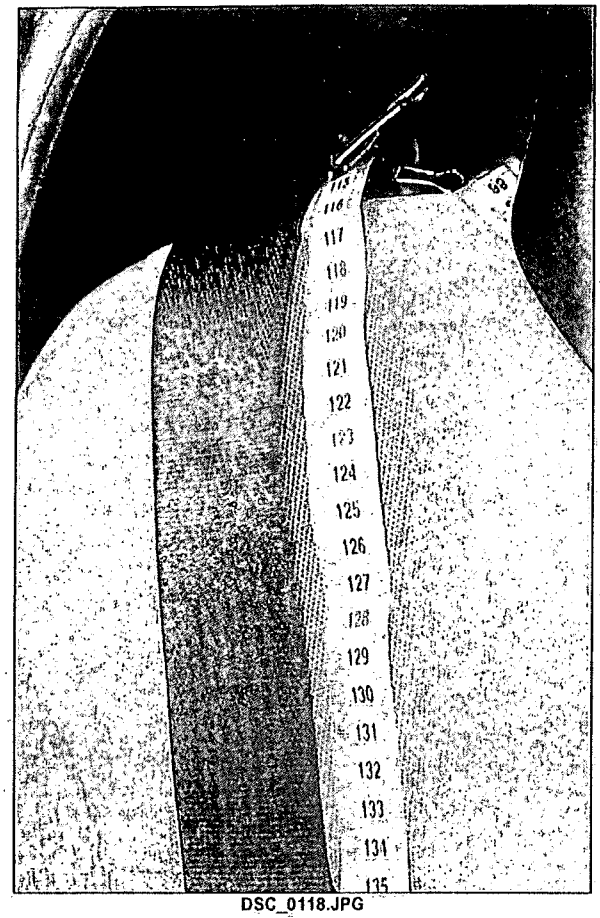
DSC_0115.JPG



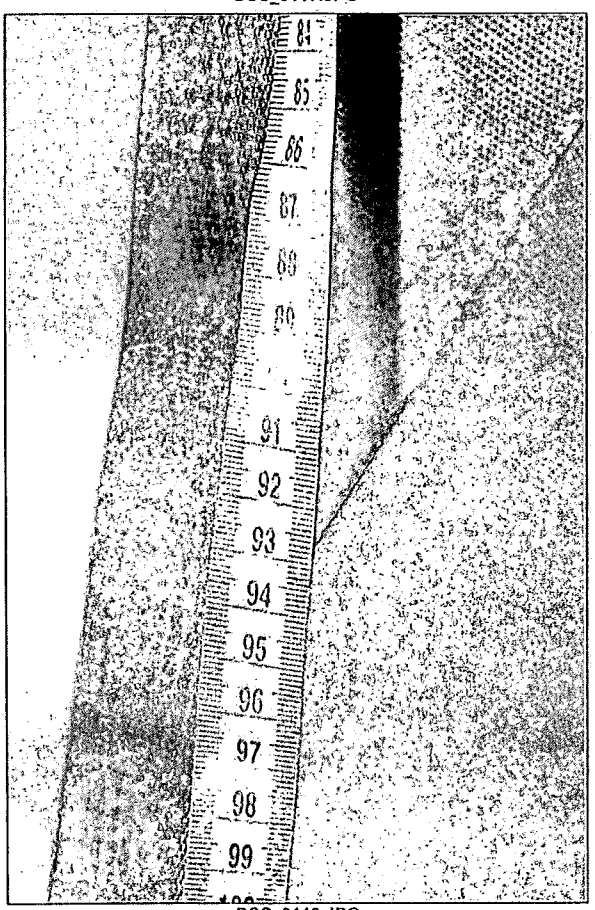
DSC_0116.JPG



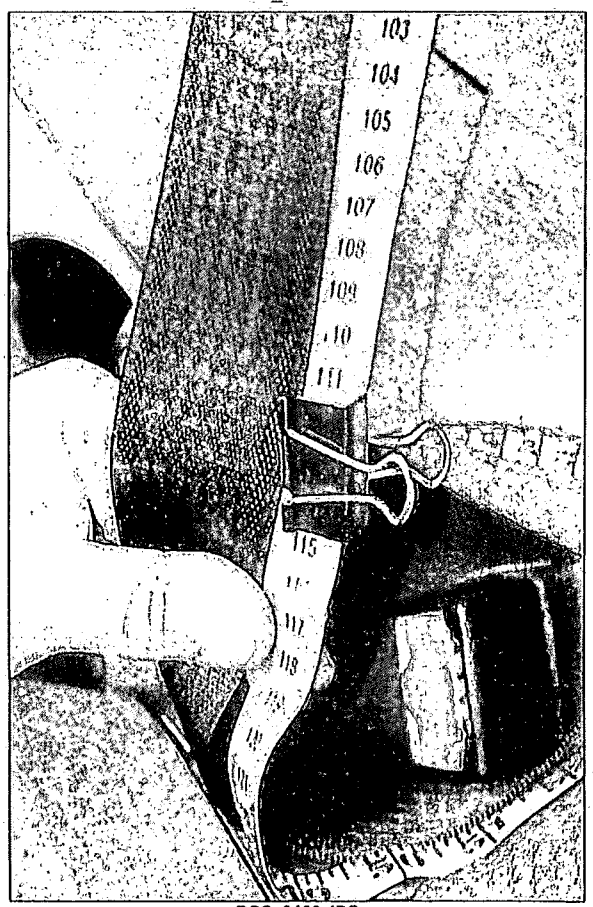
DSC_0117.JPG



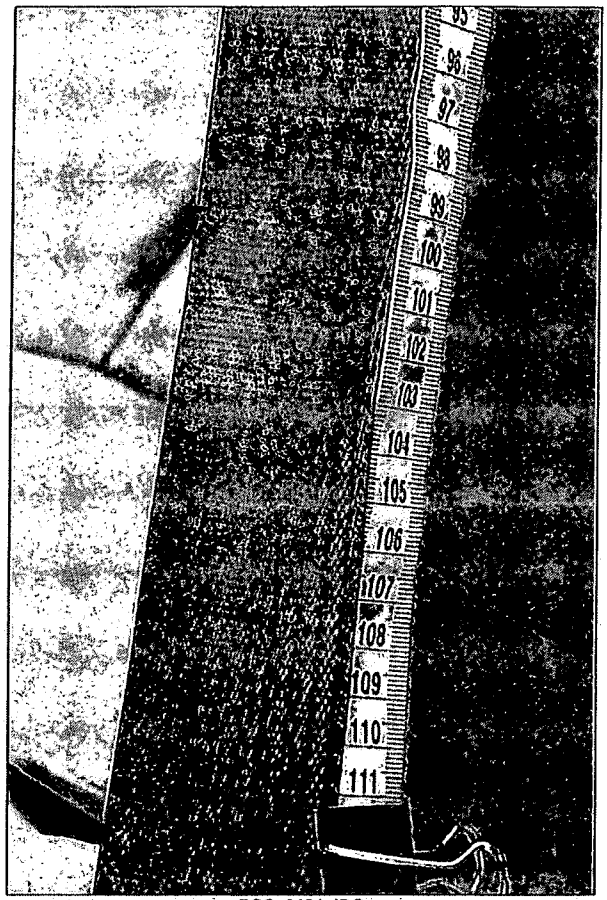
DSC_0118.JPG



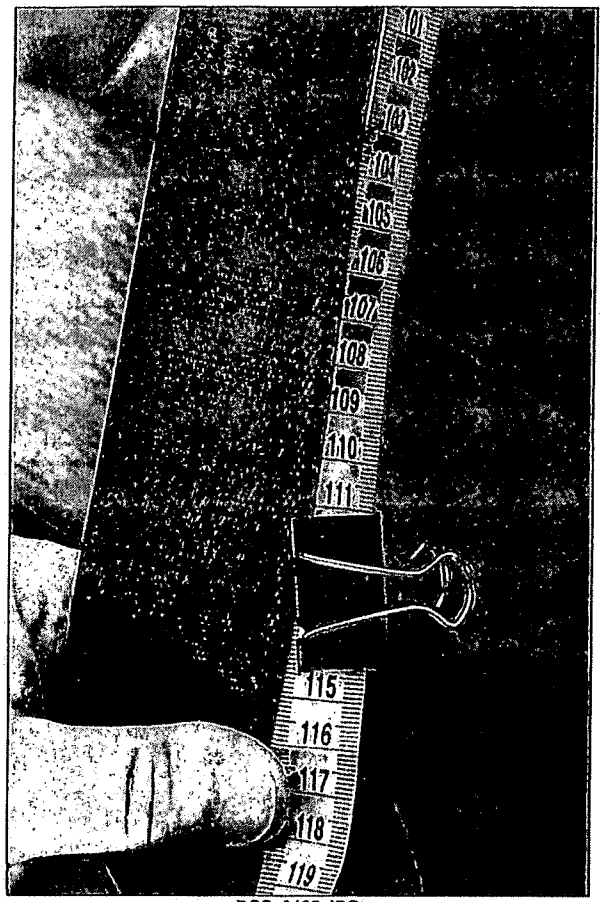
DSC_0119.JPG



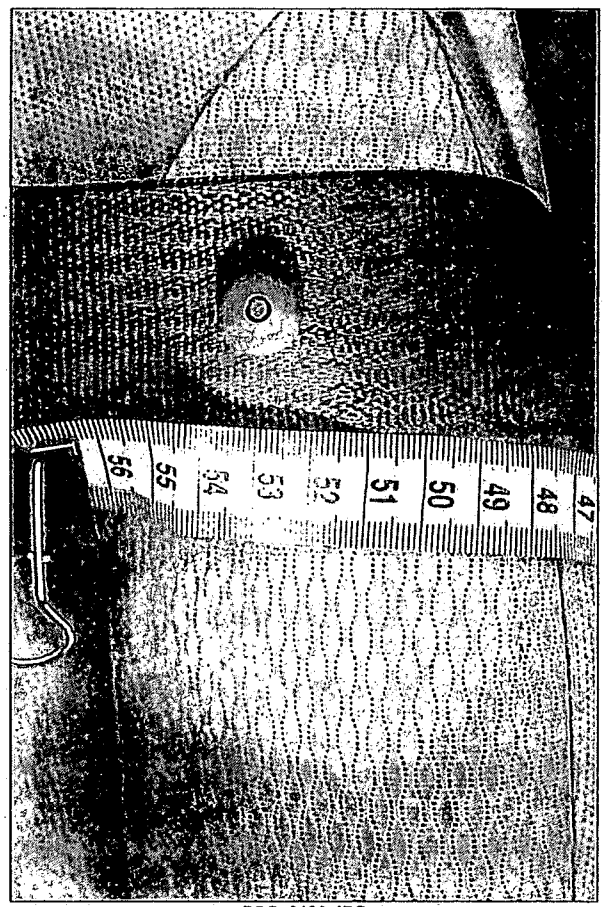
DSC_0120.JPG



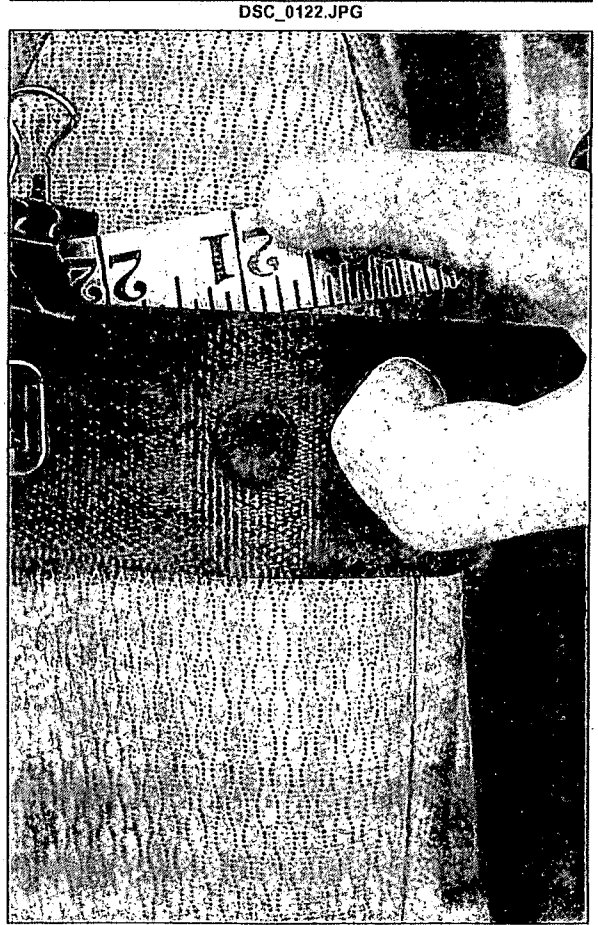
DSC_0121.JPG



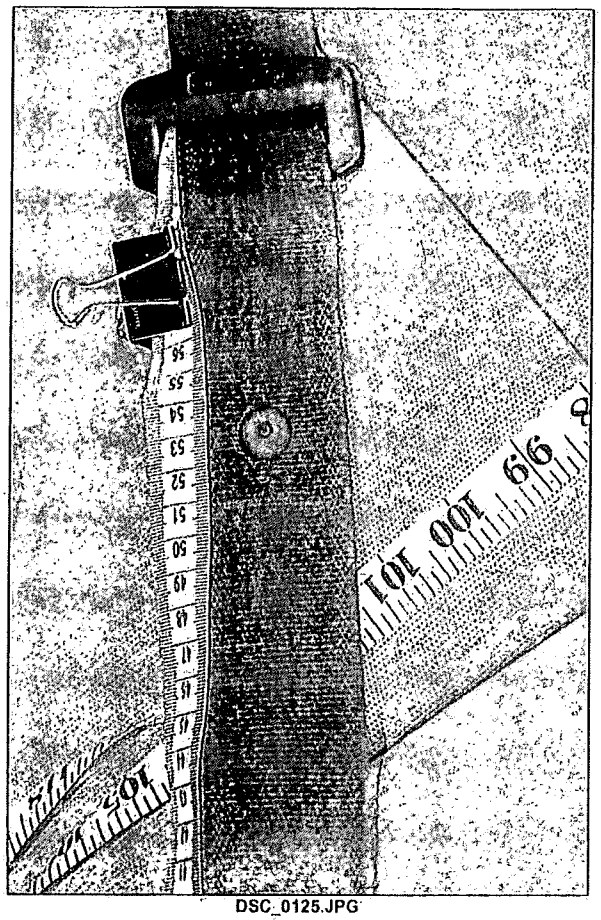
DSC_0122.JPG



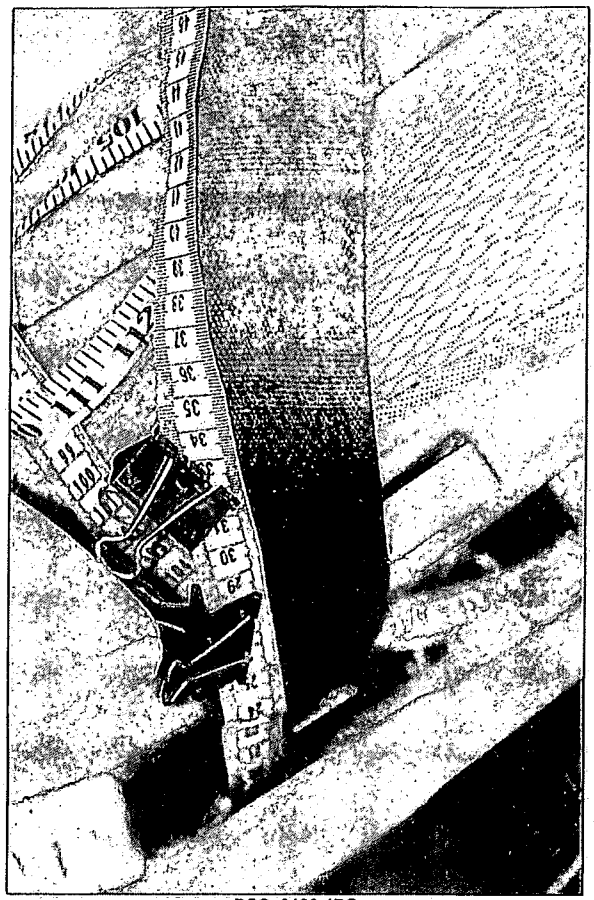
DSC_0123.JPG



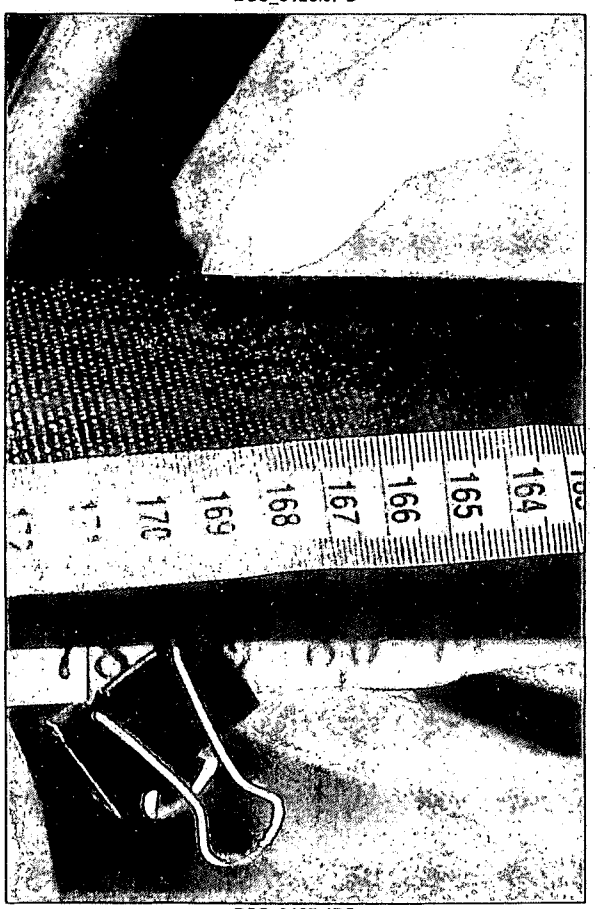
DSC_0124.JPG



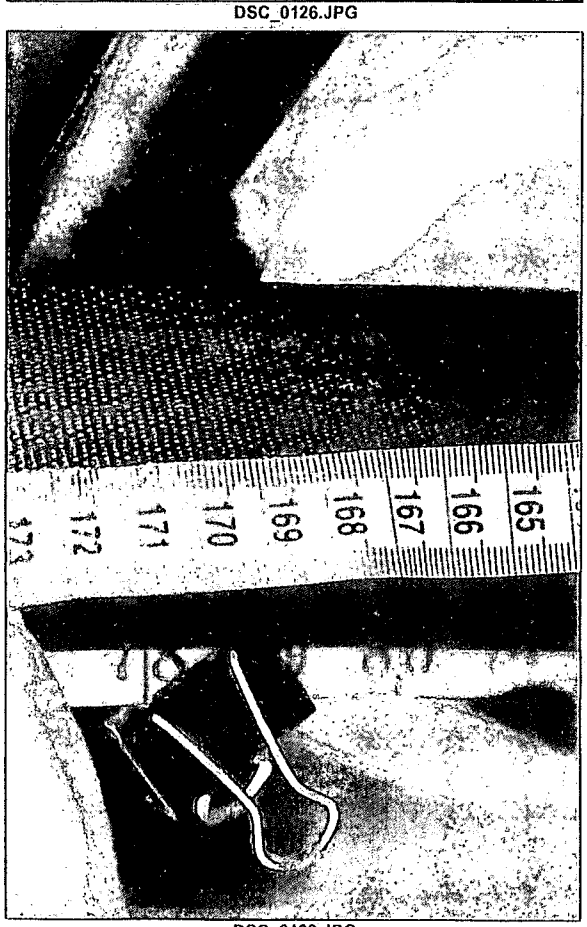
DSC_0125.JPG



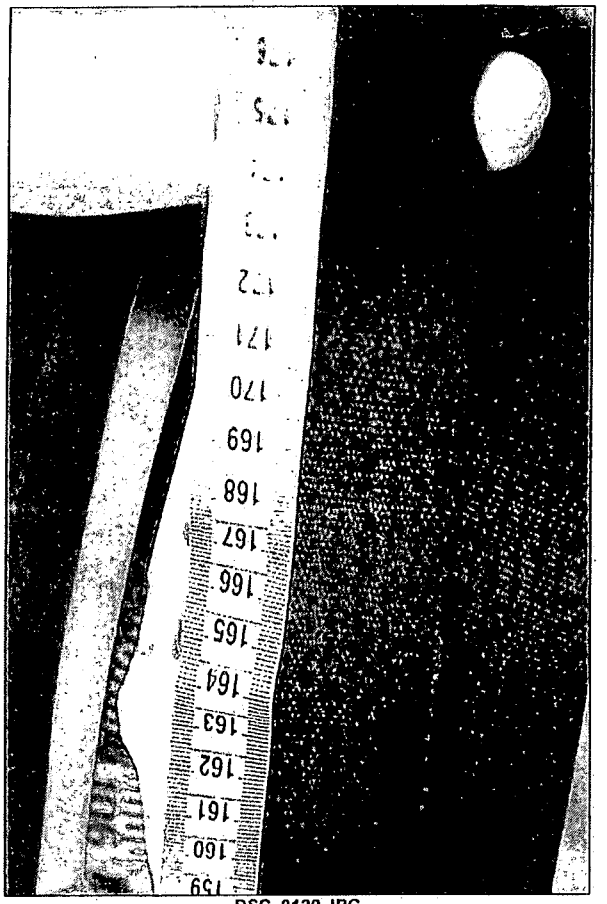
DSC_0126.JPG



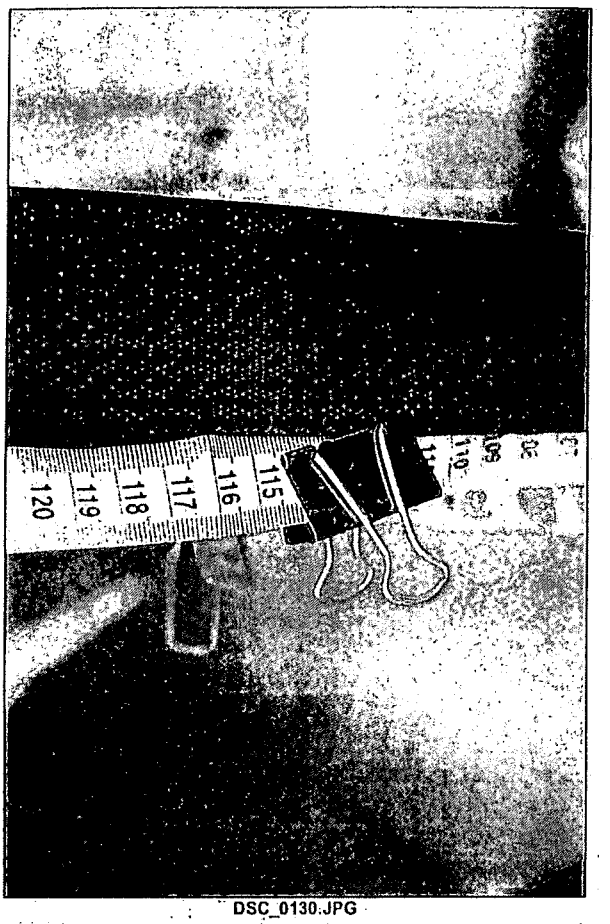
DSC_0127.JPG



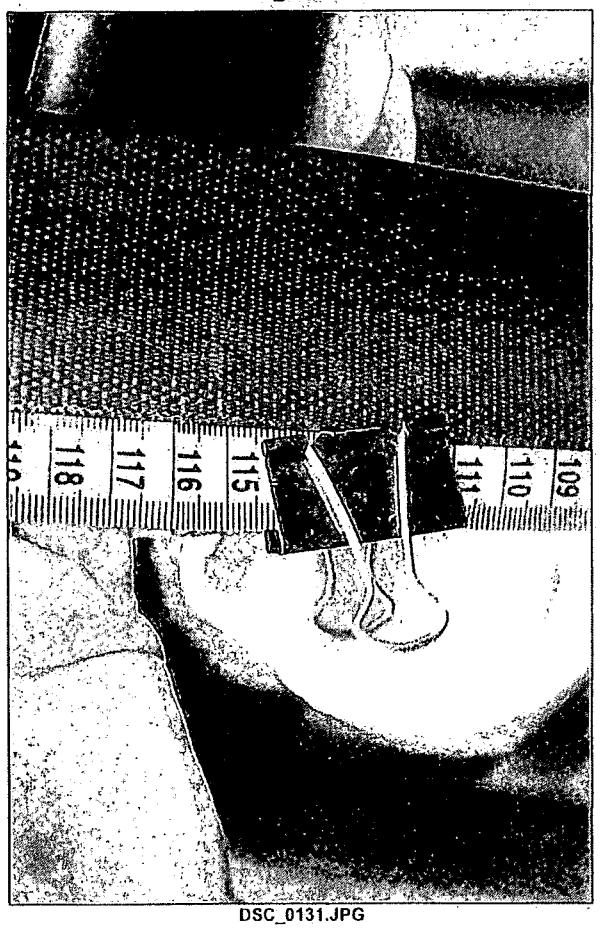
DSC_0128.JPG



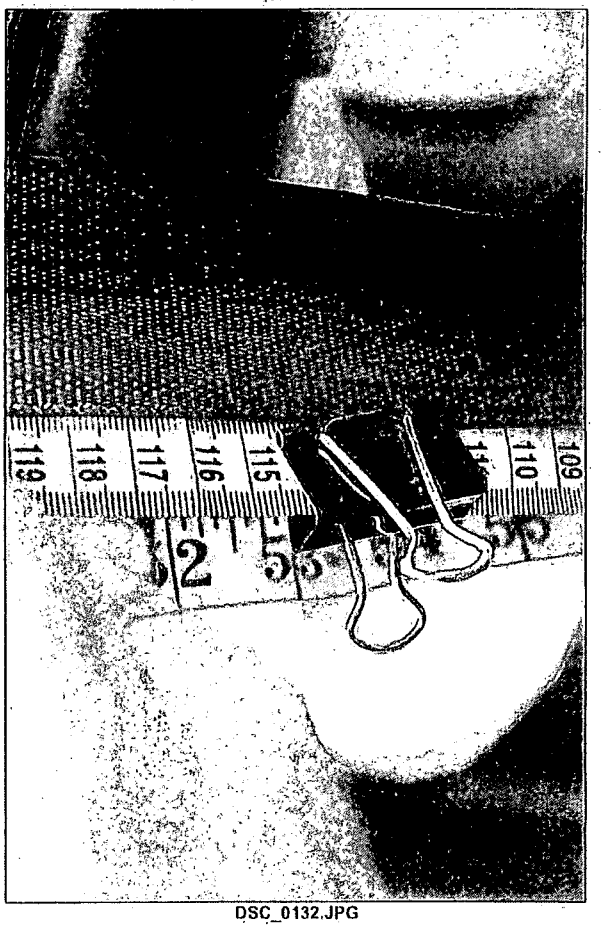
DSC_0129.JPG



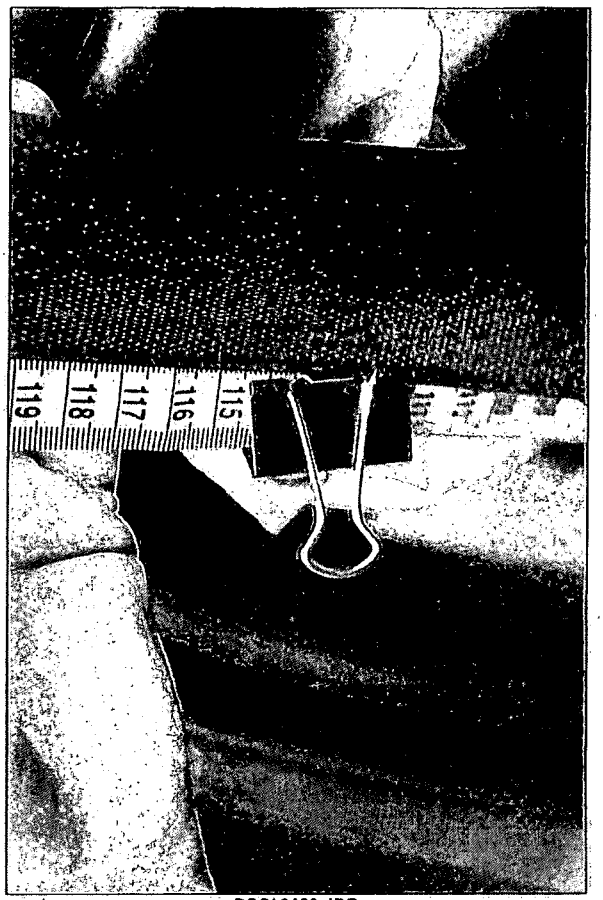
DSC_0130.JPG



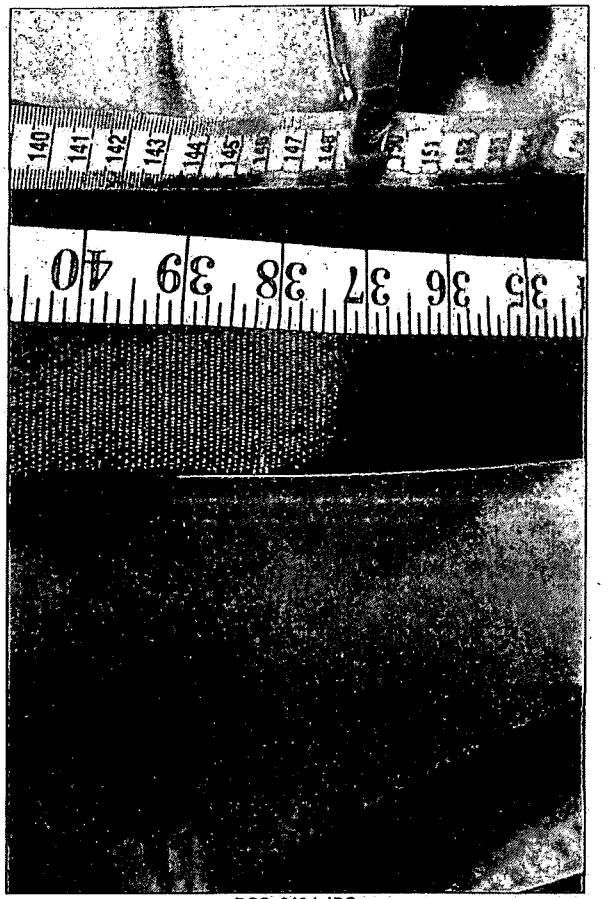
DSC_0131.JPG



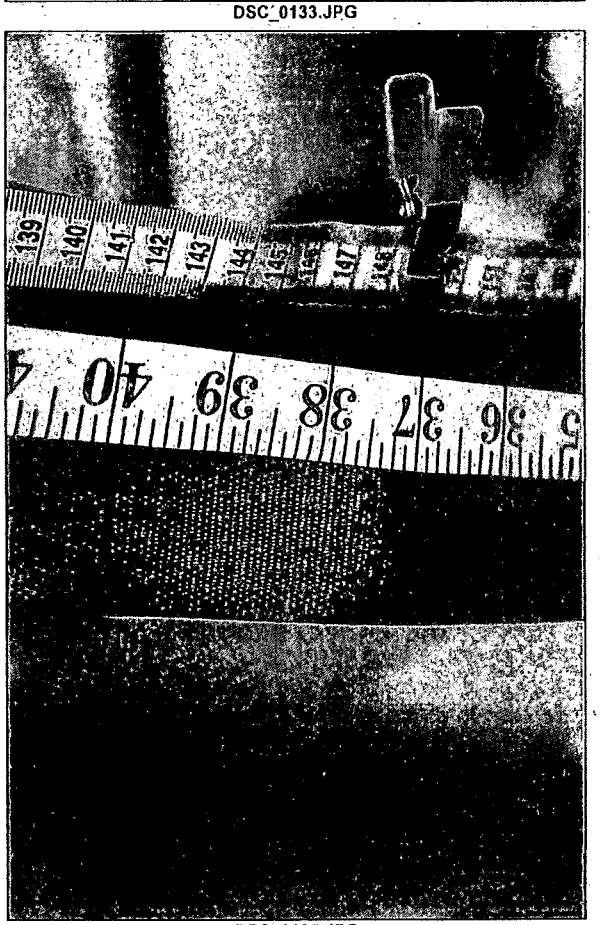
DSC_0132.JPG



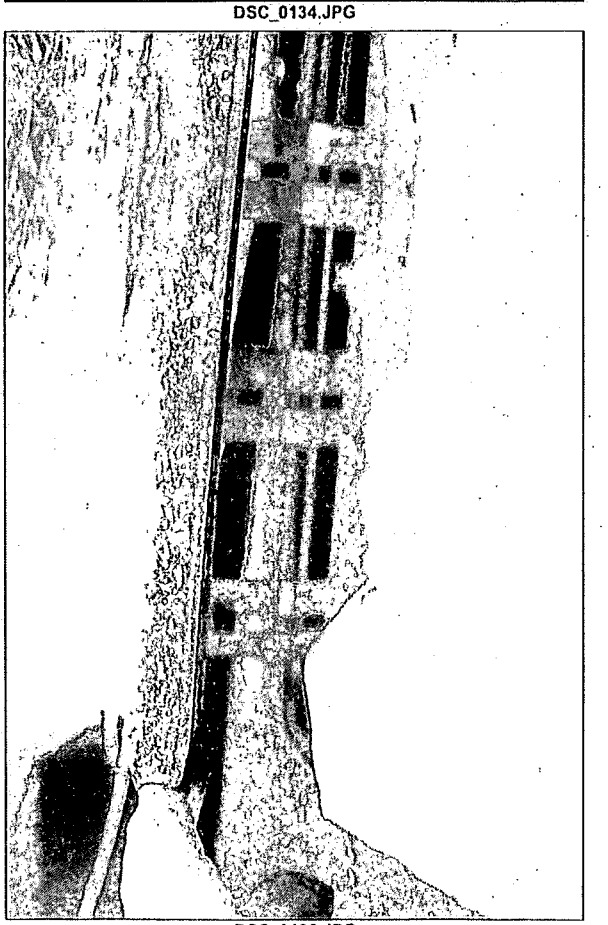
DSC_0133.JPG



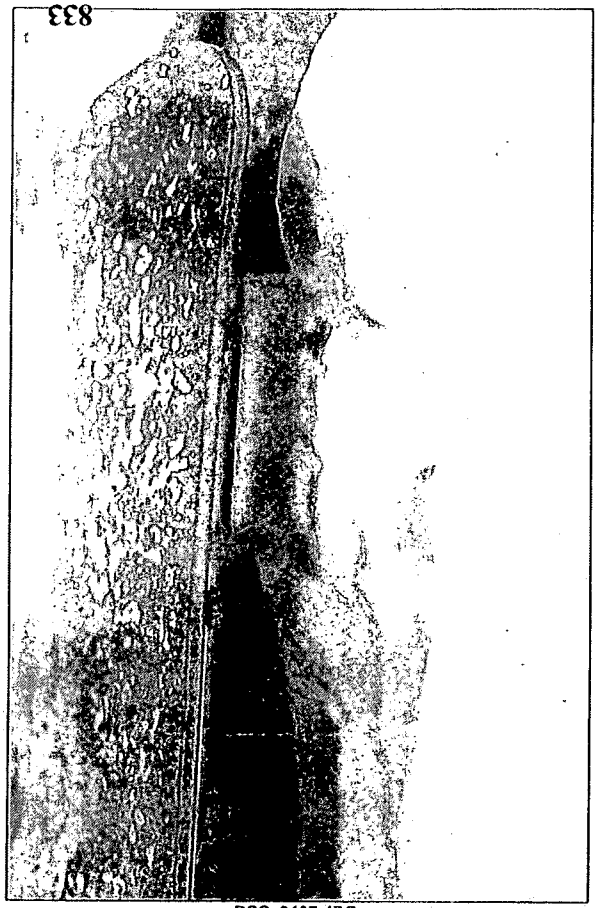
DSC_0134.JPG



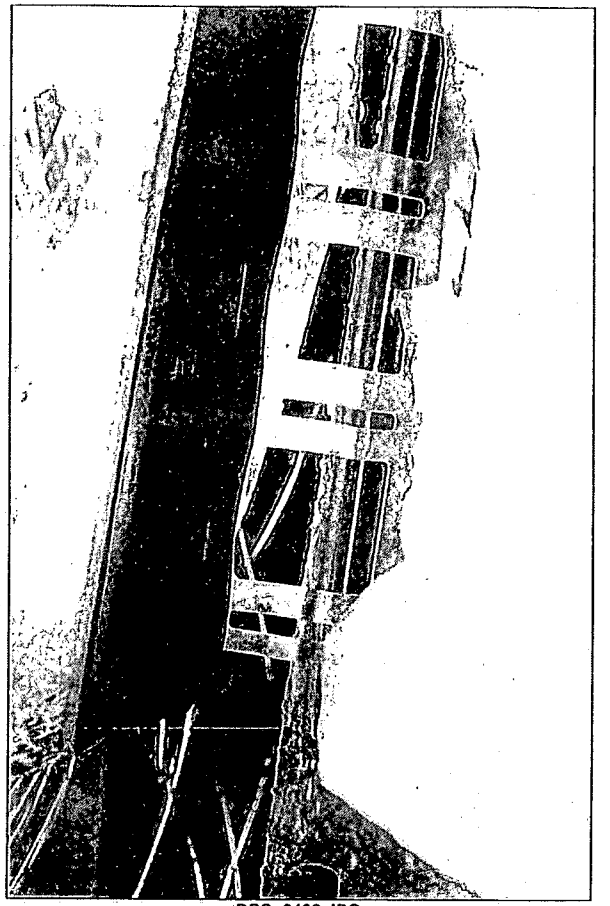
DSC_0135.JPG



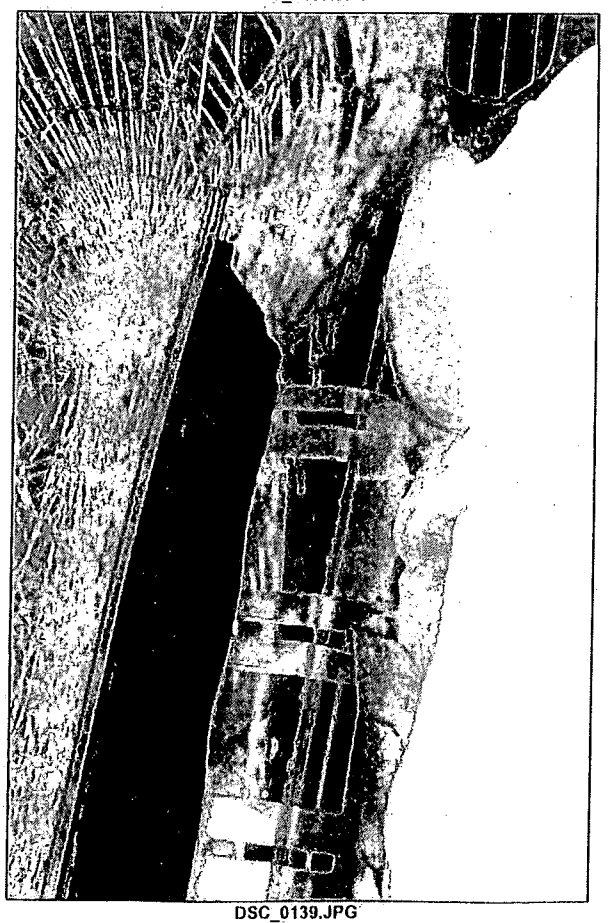
DSC_0136.JPG



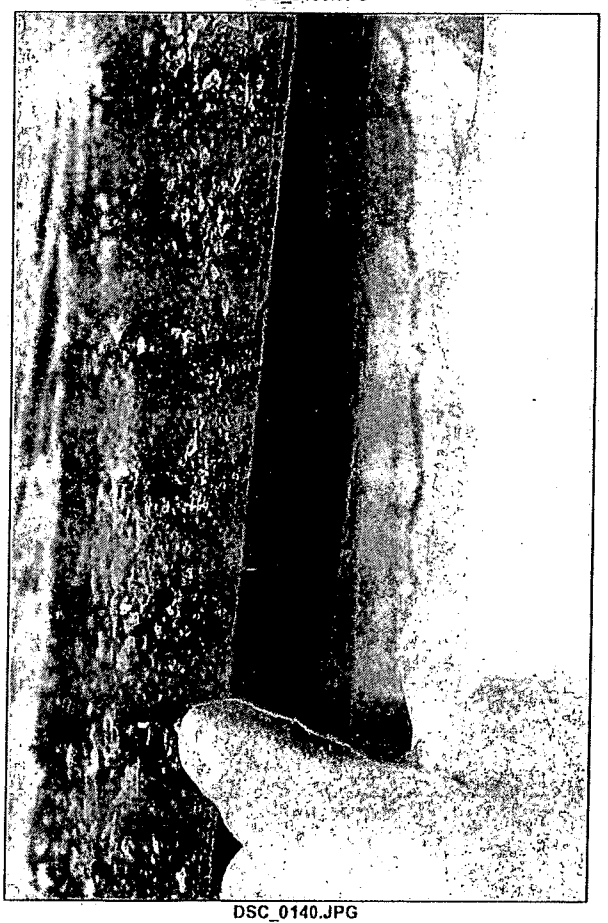
DSC_0137.JPG



DSC_0138.JPG



DSC_0139.JPG

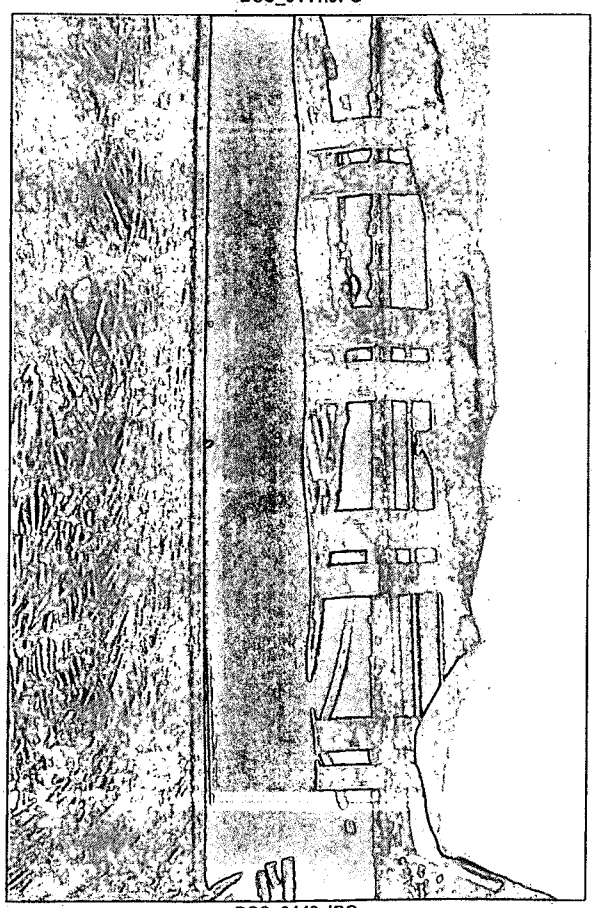


DSC_0140.JPG

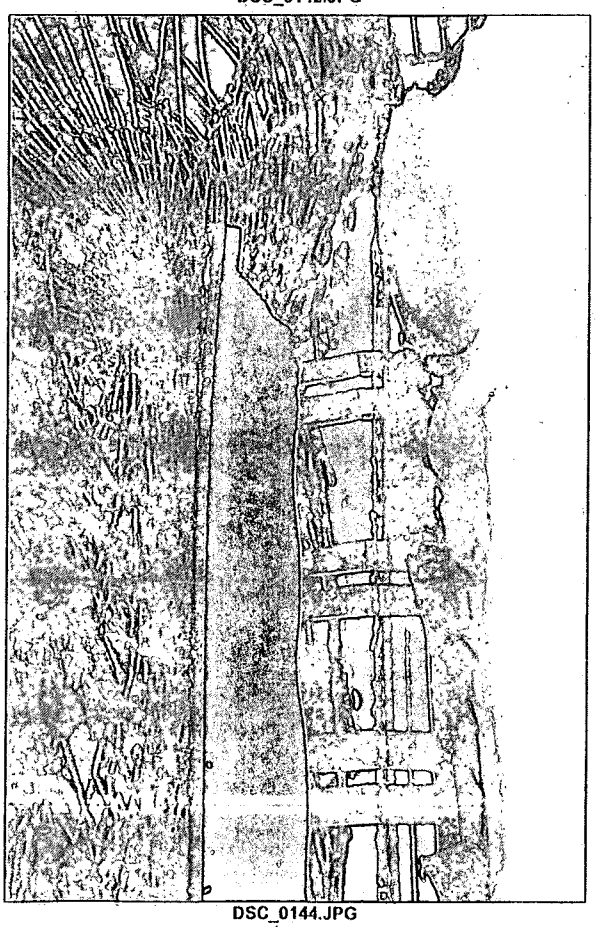
Bioforensic Consulting Photographs- 13-582 Newbern Surrogate

DSC_0141.JPG

DSC_0142.JPG



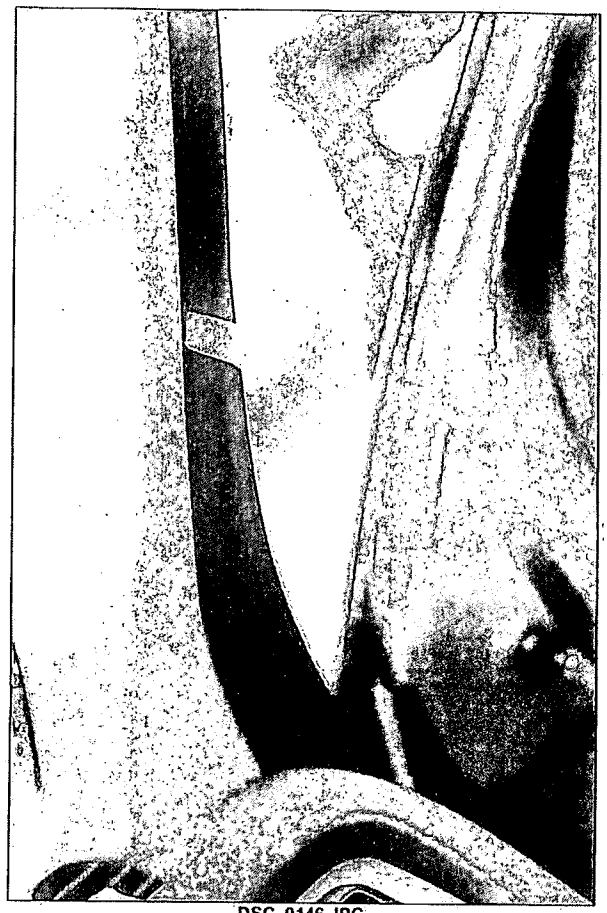
DSC_0143.JPG



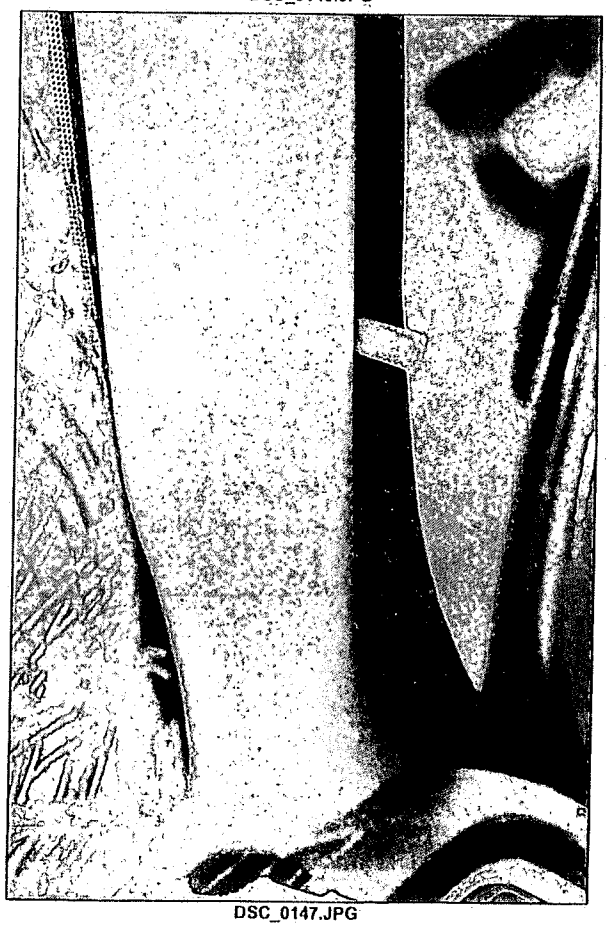
DSC_0144.JPG

Bioforensic Consulting Photographs- 13-582 Newbern Surrogate

DSC_0145.JPG



DSC_0146.JPG

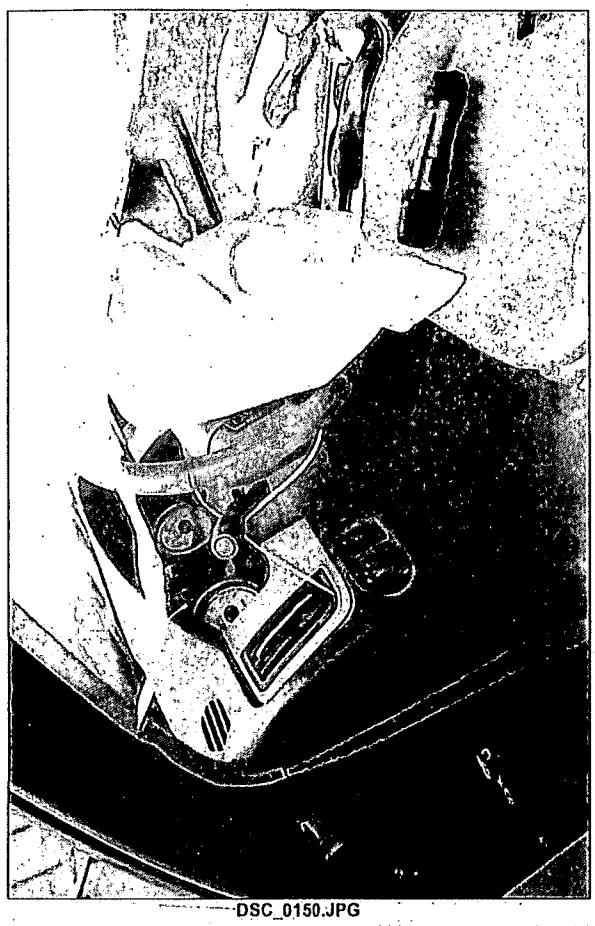


DSC_0147.JPG

DSC_0148.JPG

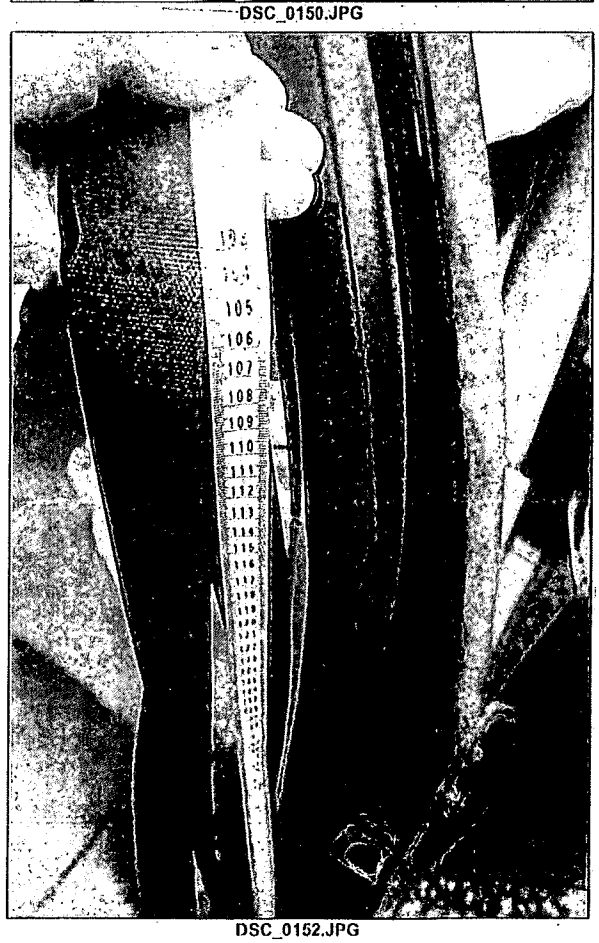
Bioforensic Consulting Photographs- 13-582 Newbern Surrogate

DSC_0149.JPG



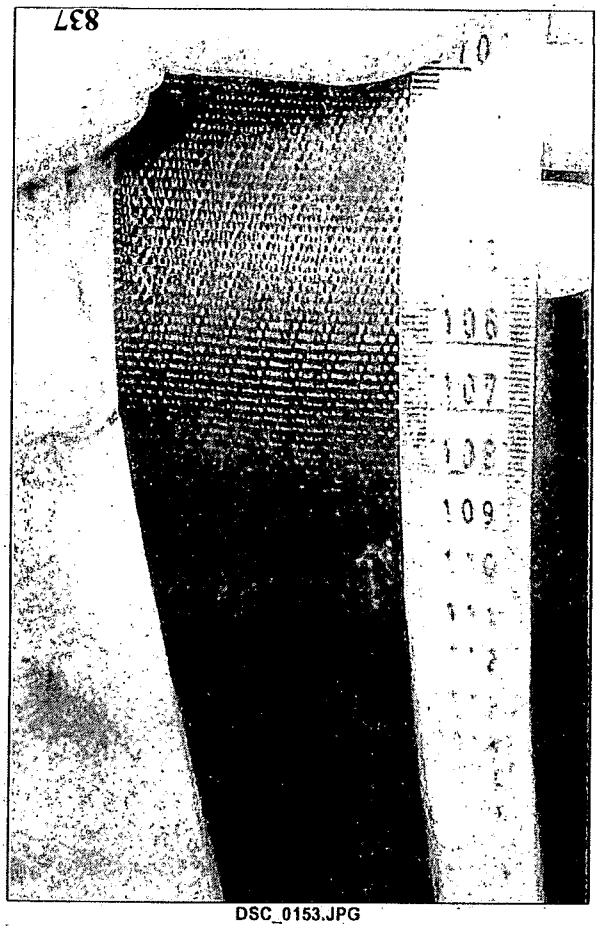
DSC_0150.JPG

DSC_0151.JPG

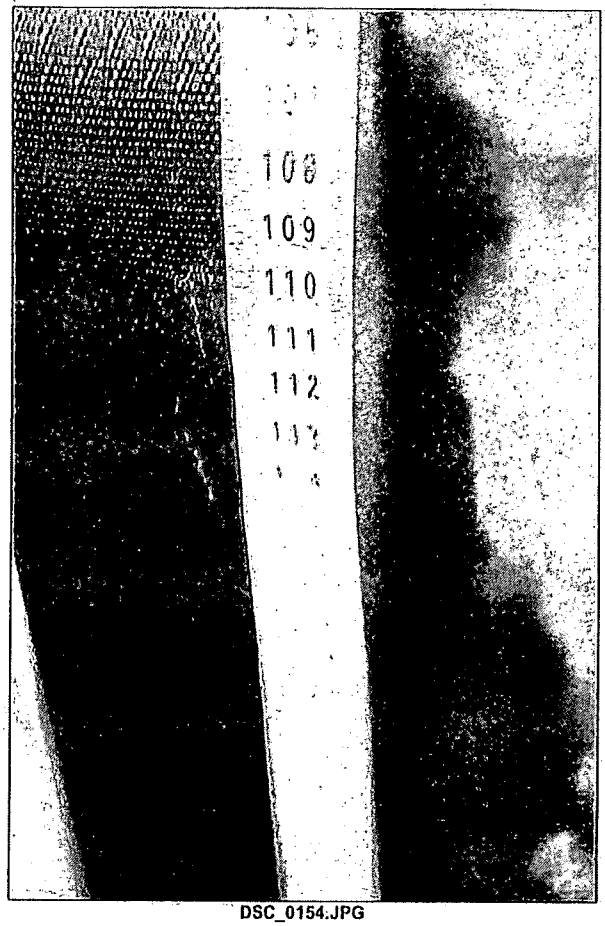


DSC_0152.JPG

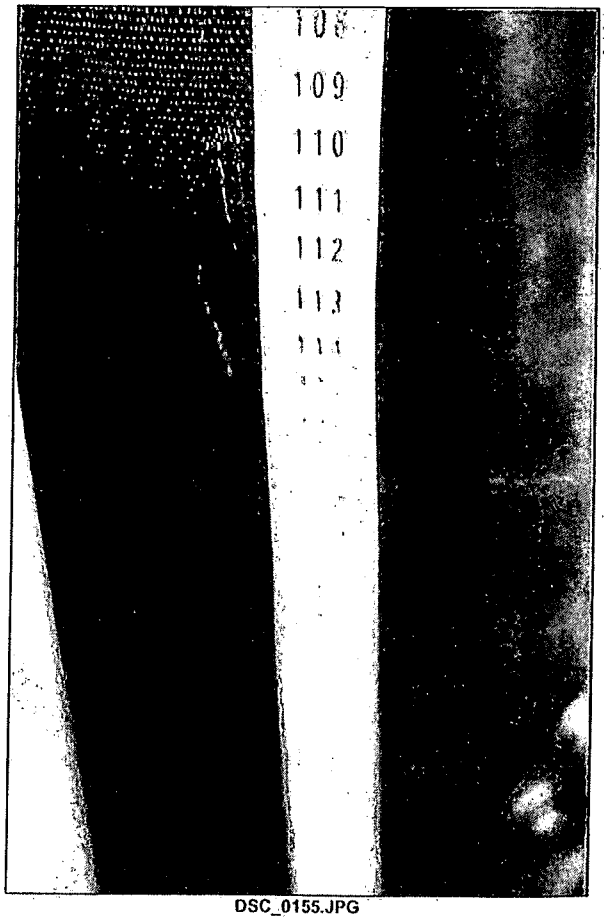
Bioforensic Consulting Photographs- 13-582 Newbern Surrogate



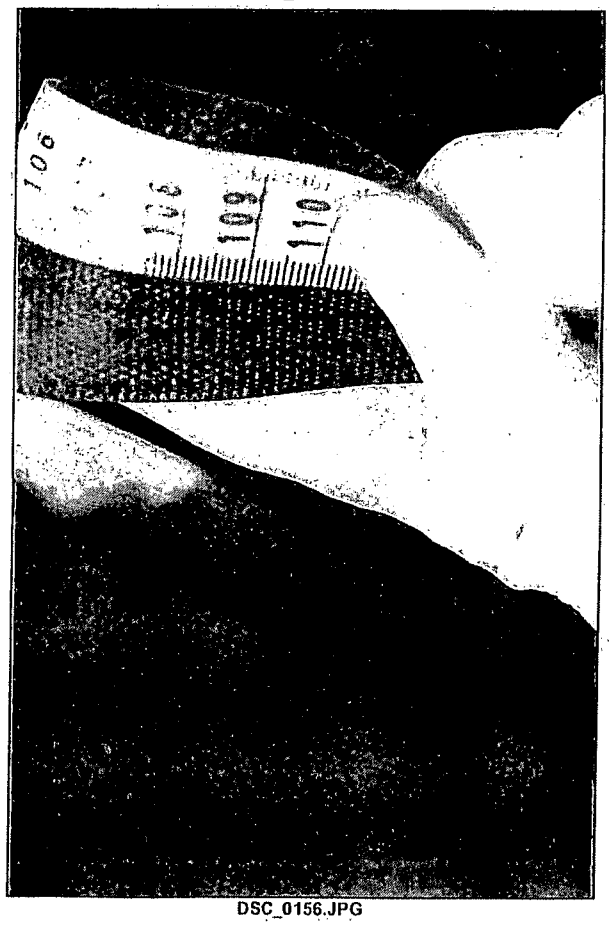
DSC_0153.JPG



DSC_0154.JPG

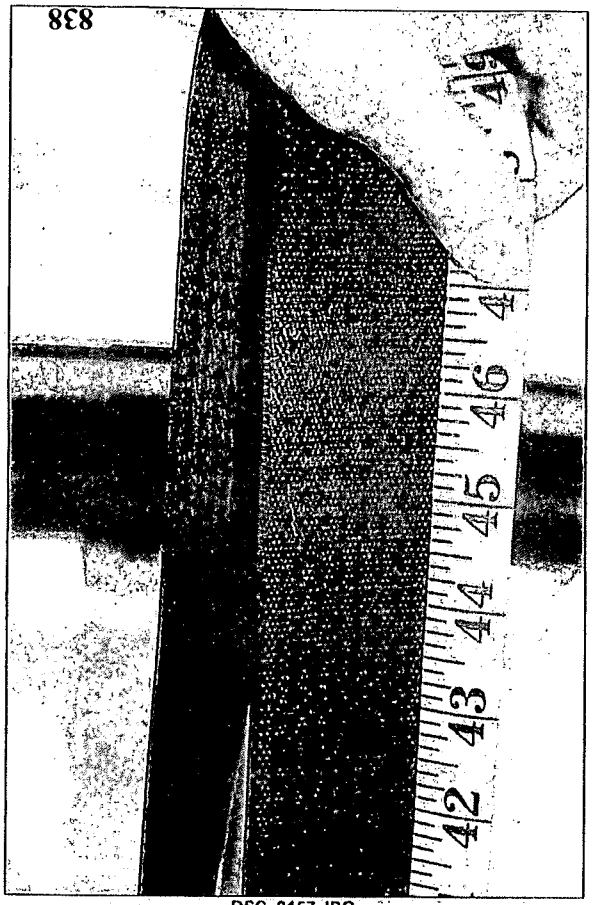


DSC_0155.JPG

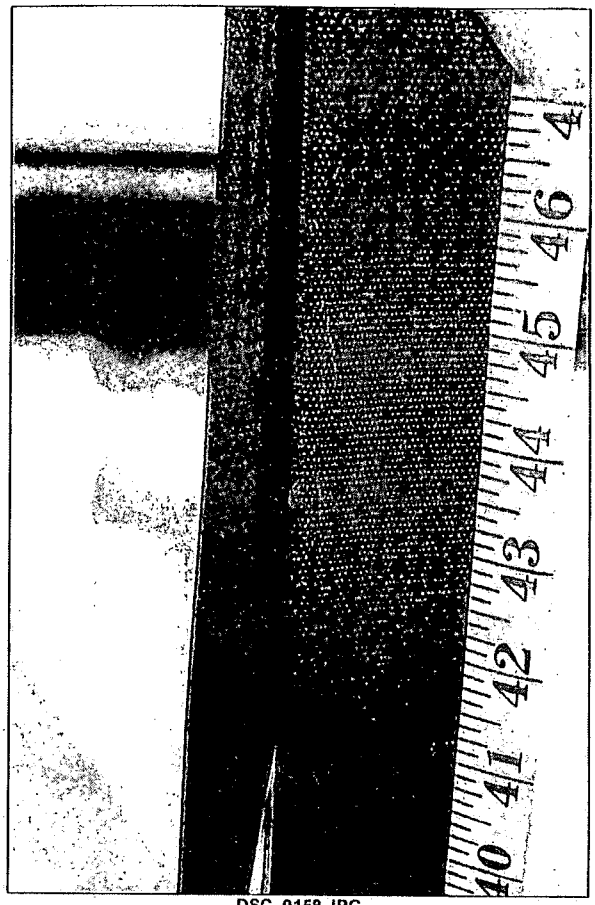


DSC_0156.JPG

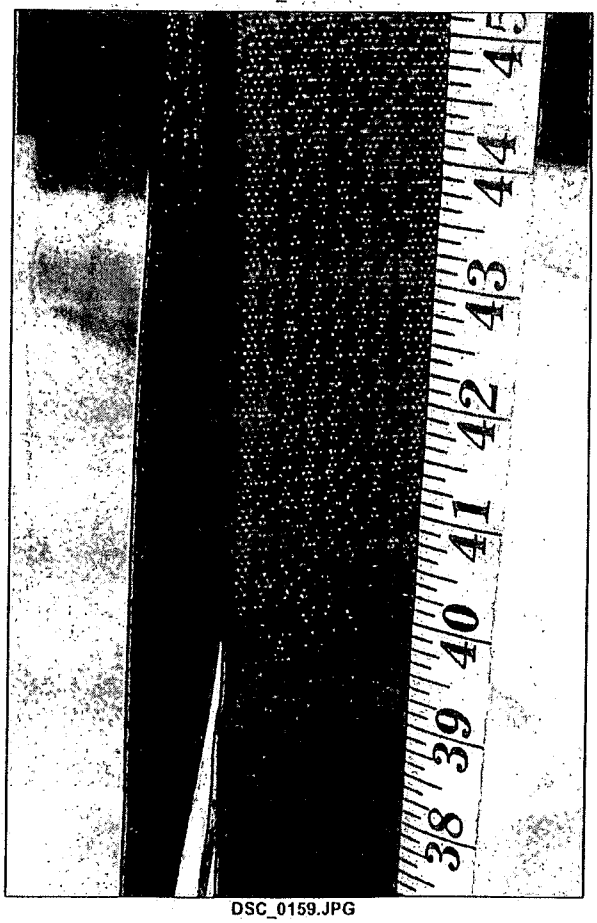
Bioforensic Consulting Photographs- 13-582 Newbern Surrogate



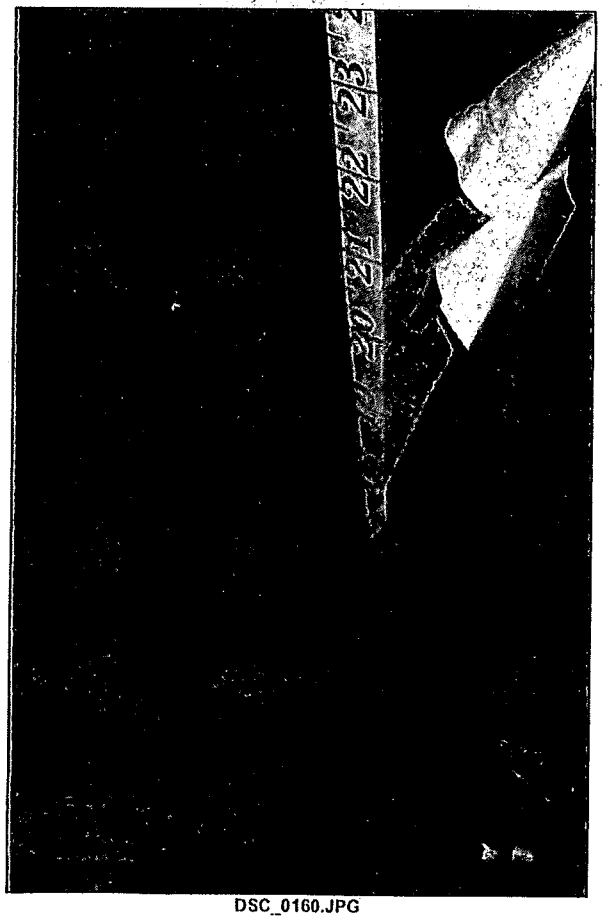
DSC_0157.JPG



DSC_0158.JPG

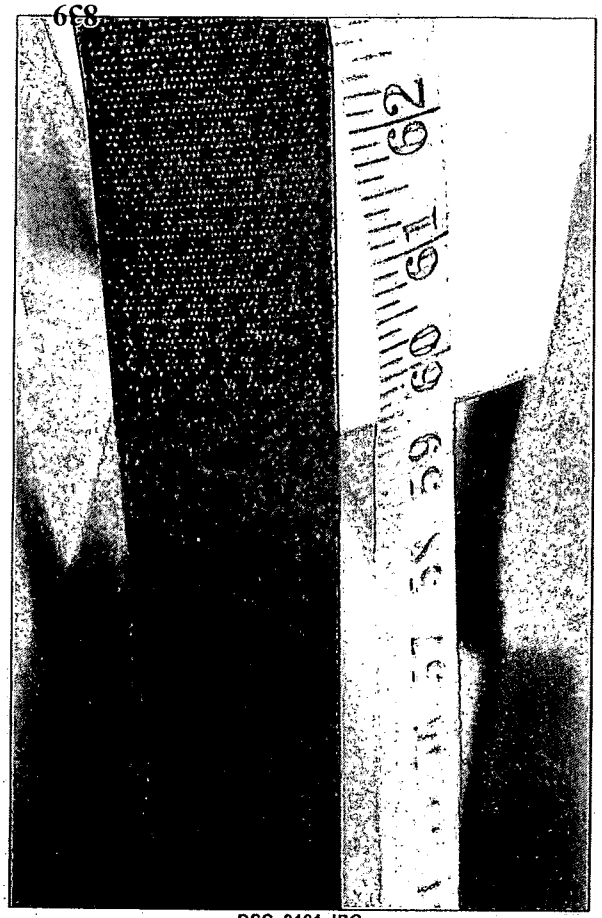


DSC_0159.JPG

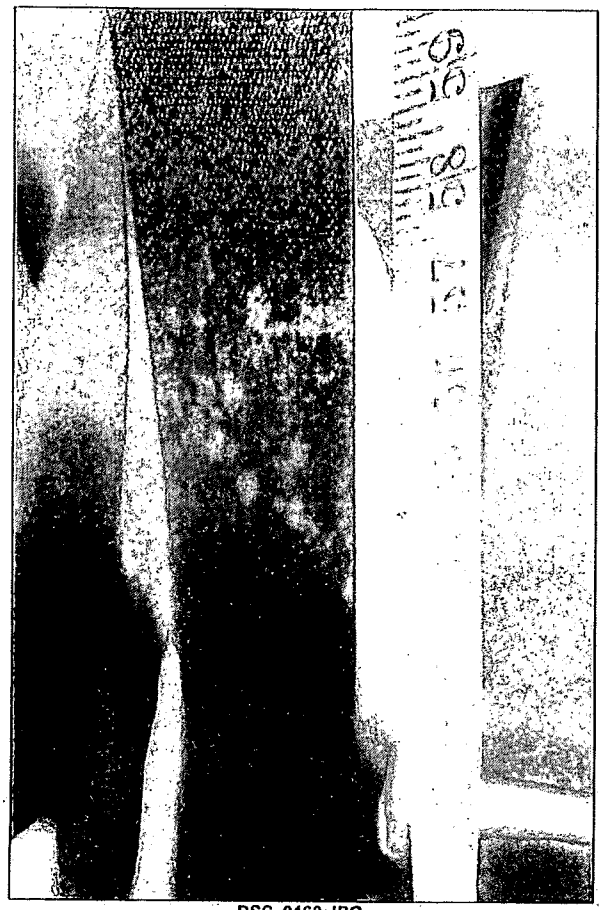


DSC_0160.JPG

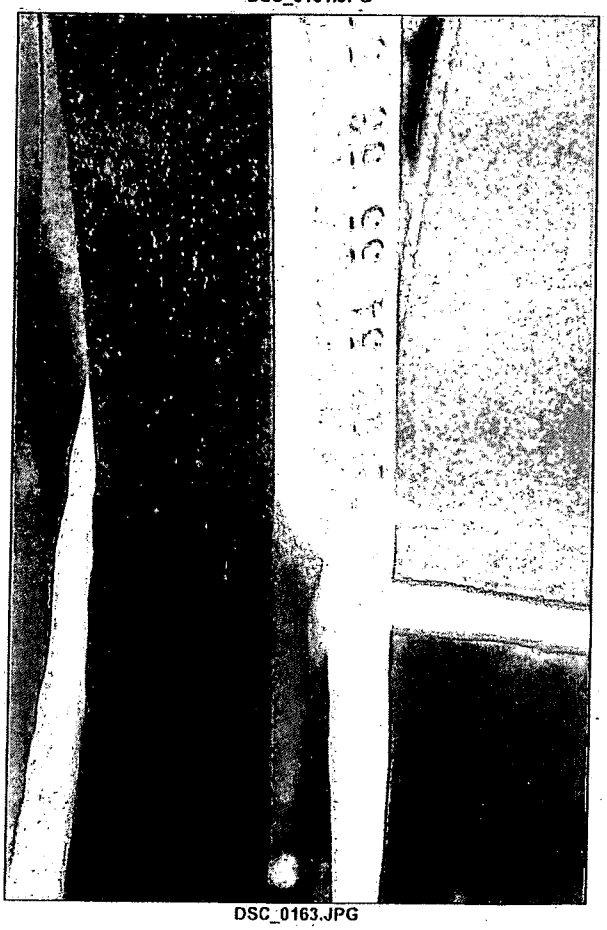
Bioforensic Consulting Photographs- 13-582 Newbern Surrogate



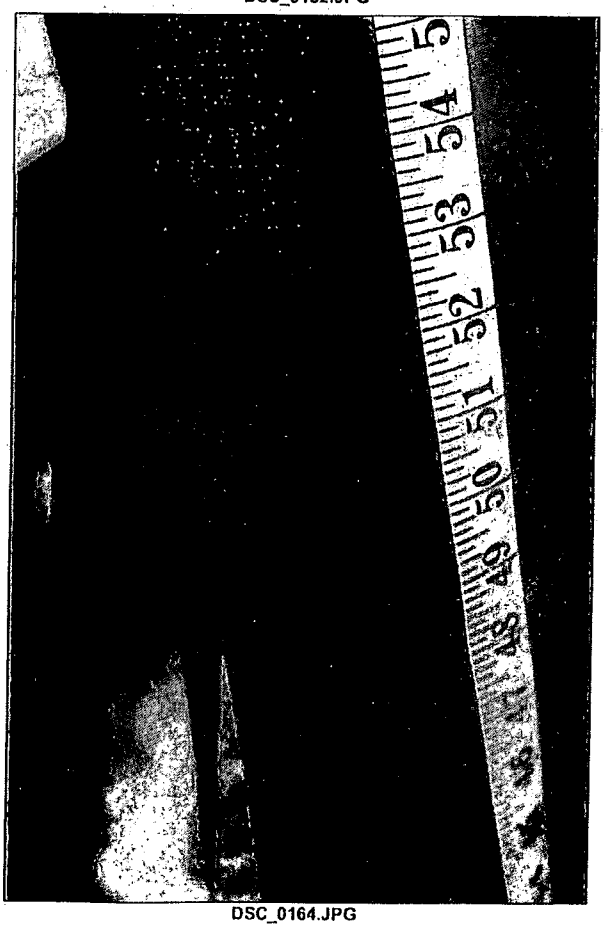
DSC_0161.JPG



DSC_0162.JPG



DSC_0163.JPG

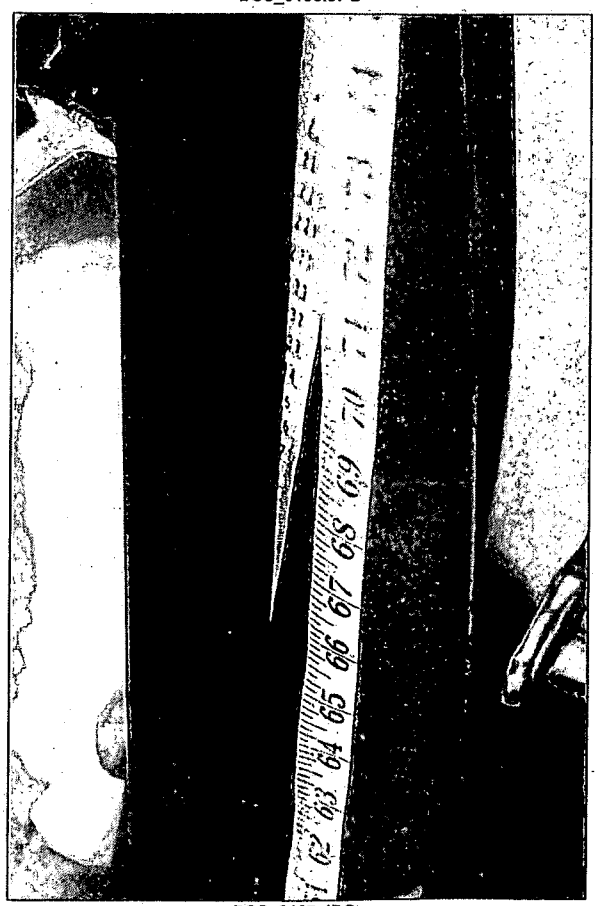


DSC_0164.JPG

Bioforensic Consulting Photographs- 13-582 Newbern Surrogate

DSC_0165.JPG

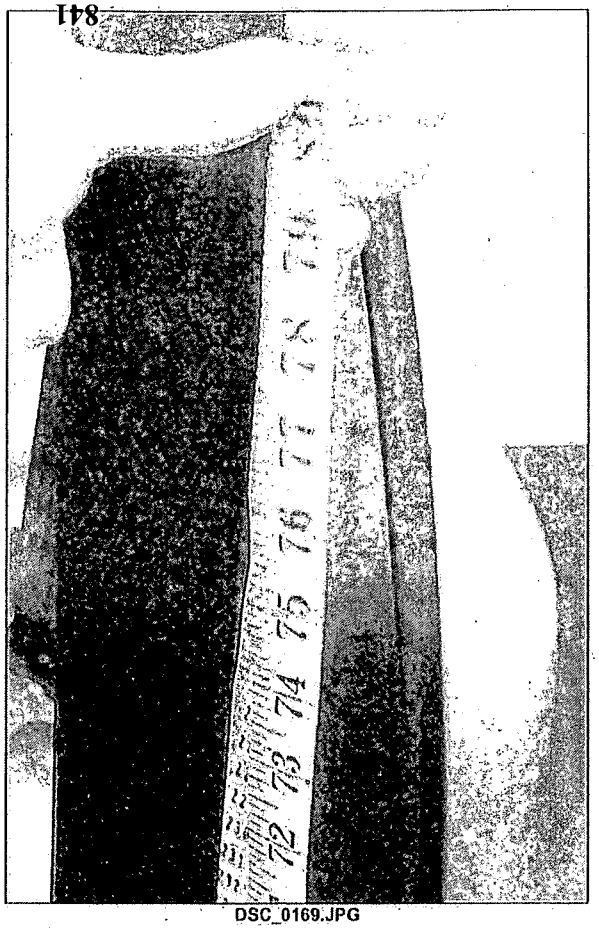
DSC_0166.JPG



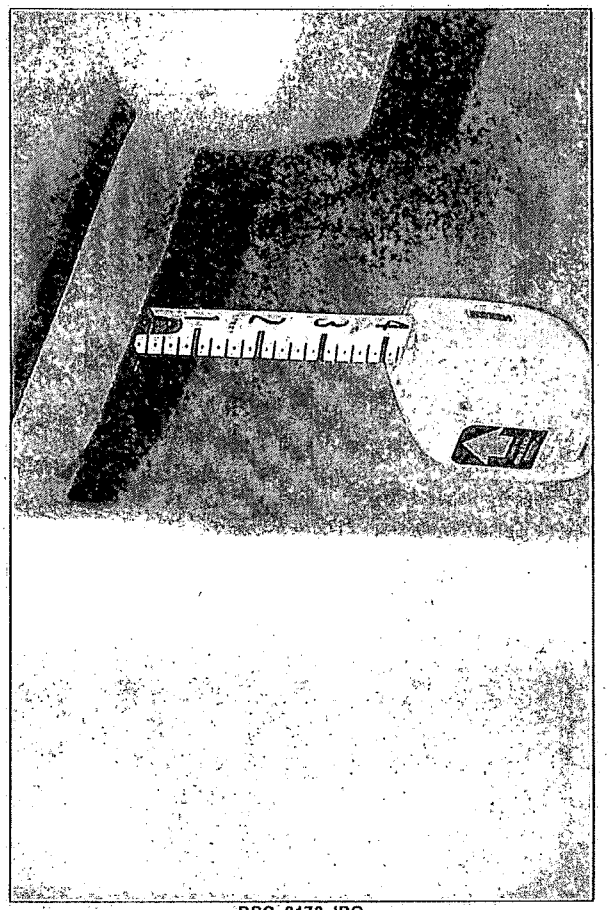
DSC_0167.JPG

DSC_0168.JPG

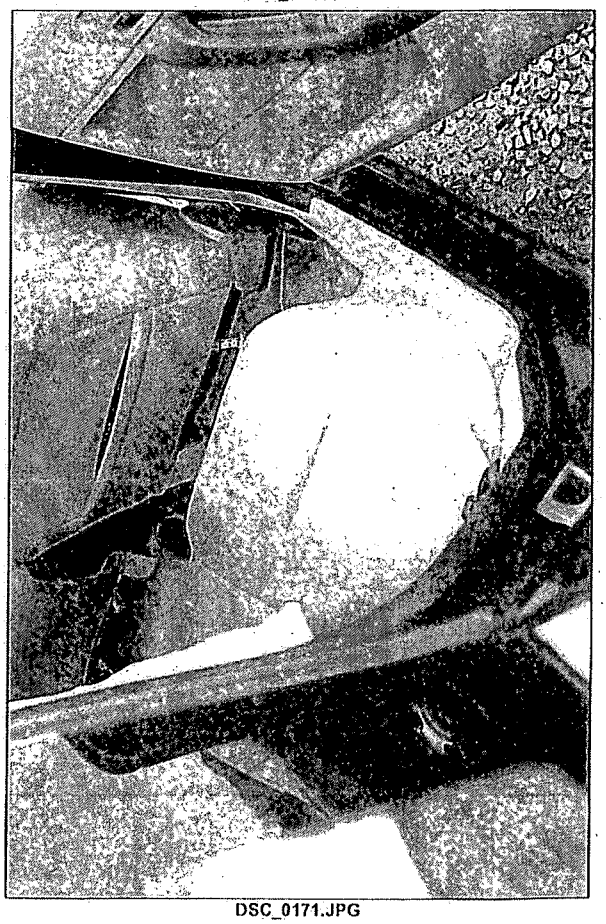
Bioforensic Consulting Photographs- 13-582 Newbern Surrogate



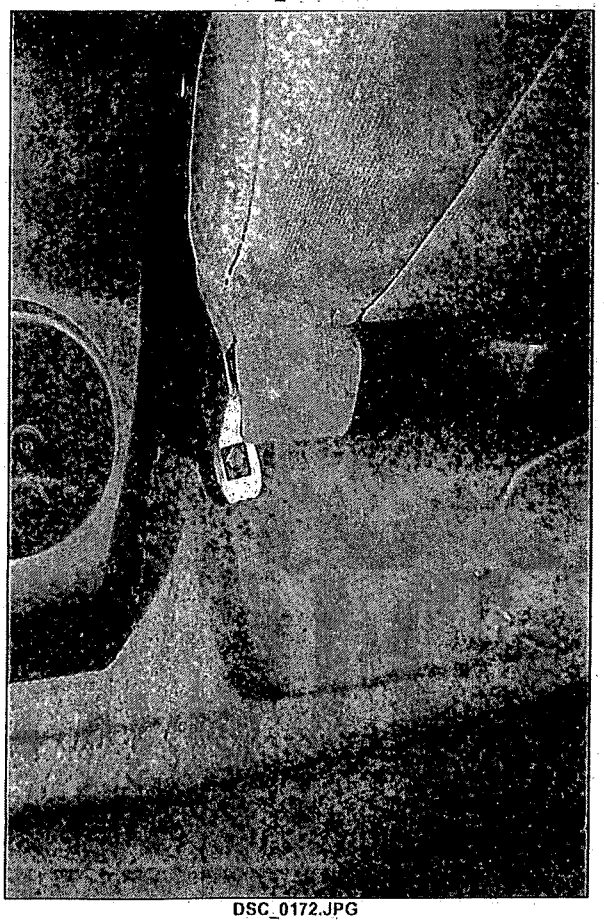
DSC_0169.JPG



DSC_0170.JPG

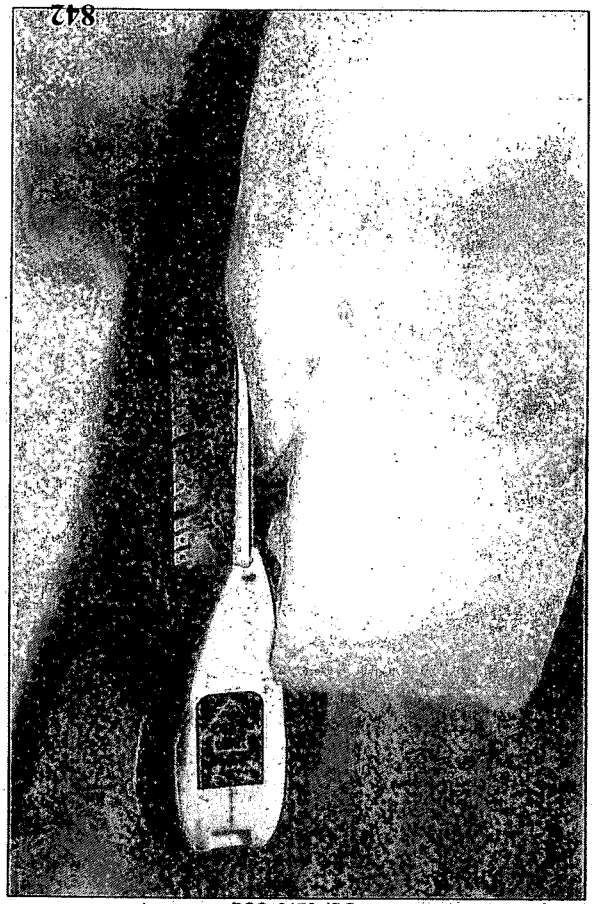


DSC_0171.JPG

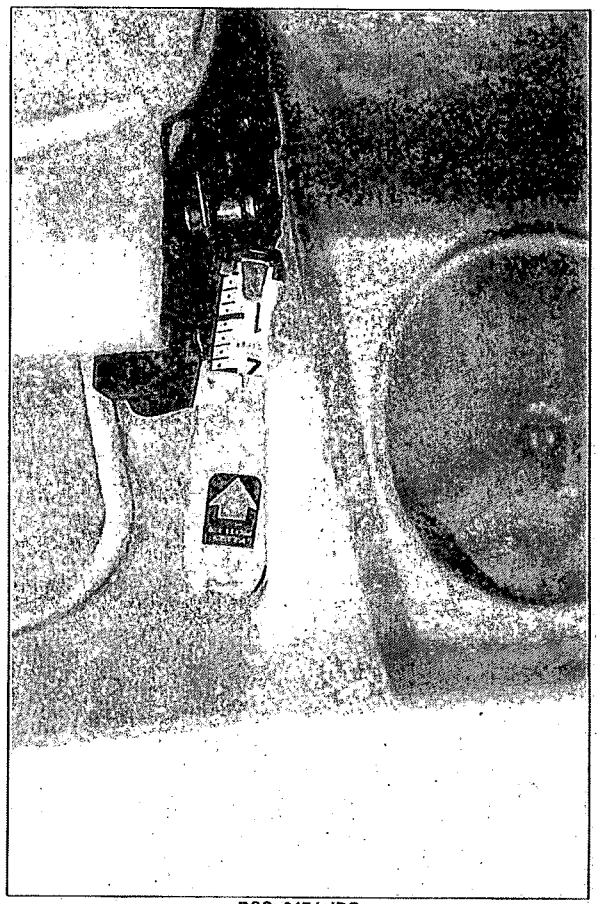


DSC_0172.JPG

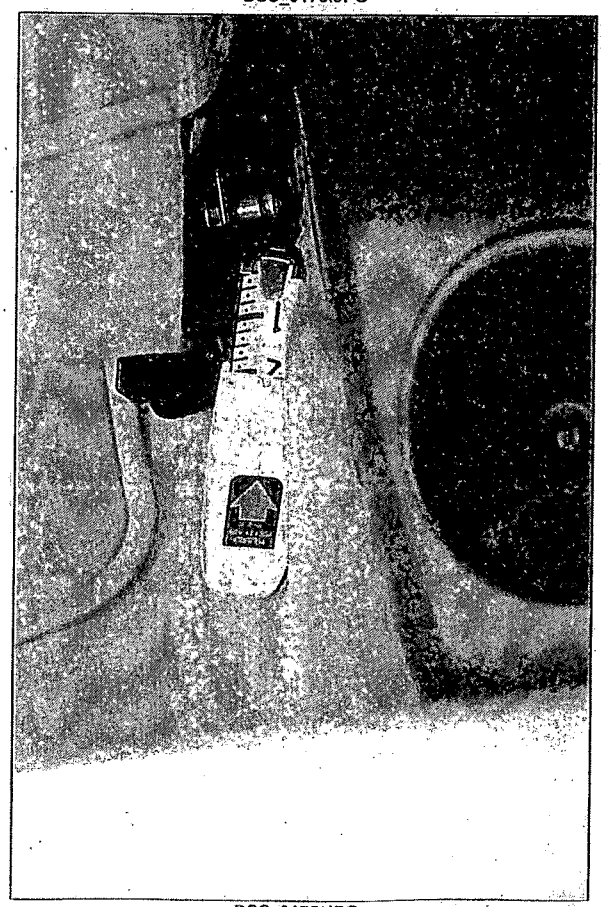
Bioforensic Consulting Photographs- 13-582 Newbern Surrogate



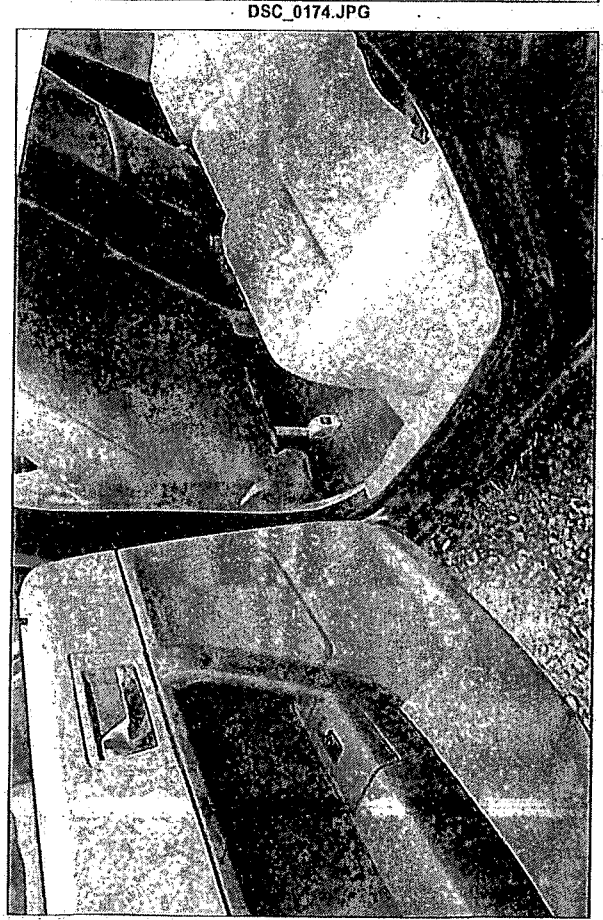
DSC_0173.JPG



DSC_0174.JPG

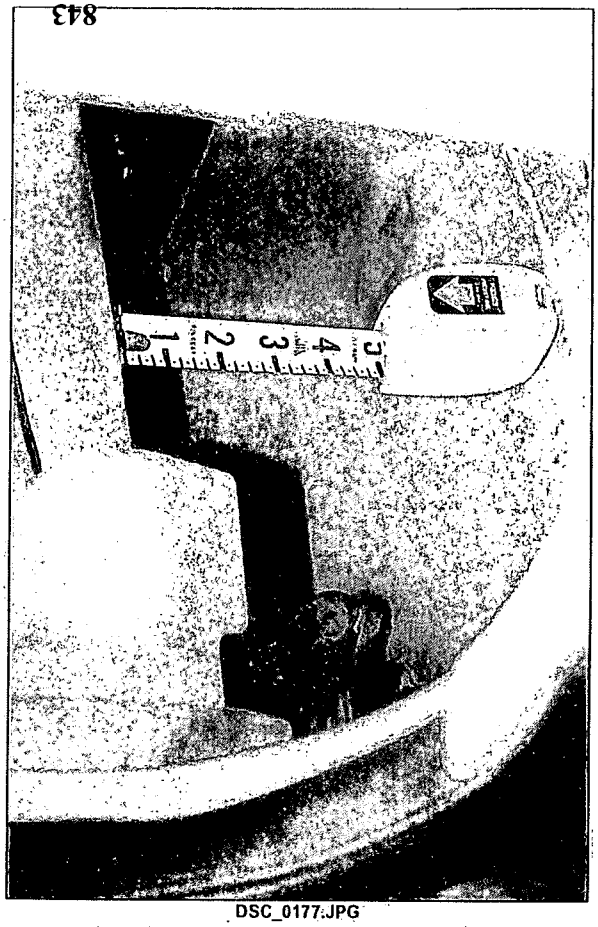


DSC_0175.JPG

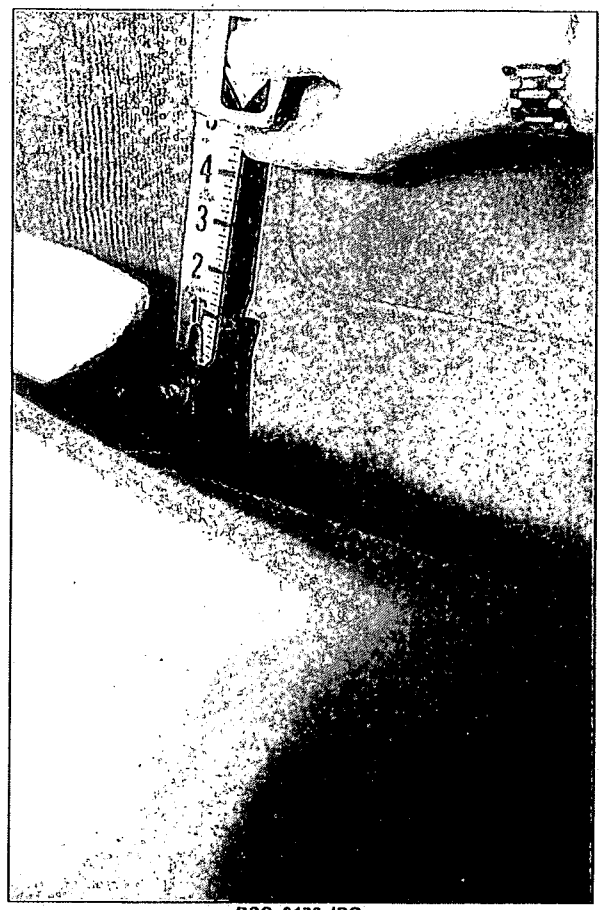


DSC_0176.JPG

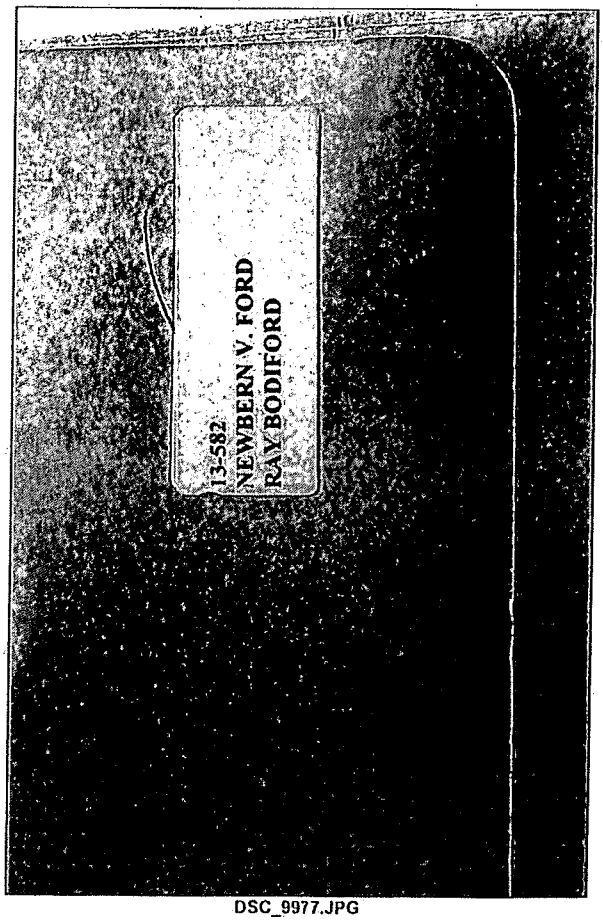
Bioforensic Consulting Photographs- 13-582 Newbern Surrogate



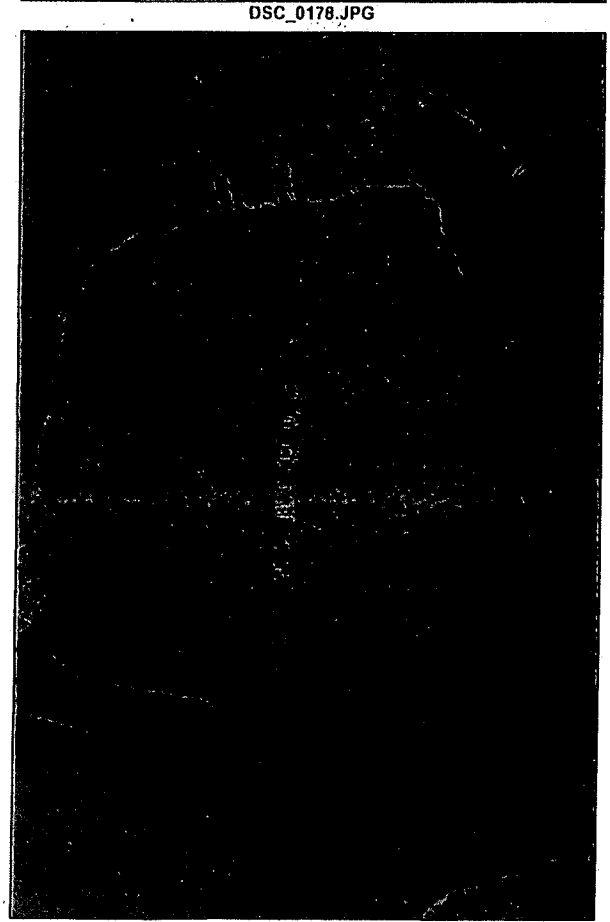
DSC_0177.JPG



DSC_0178.JPG

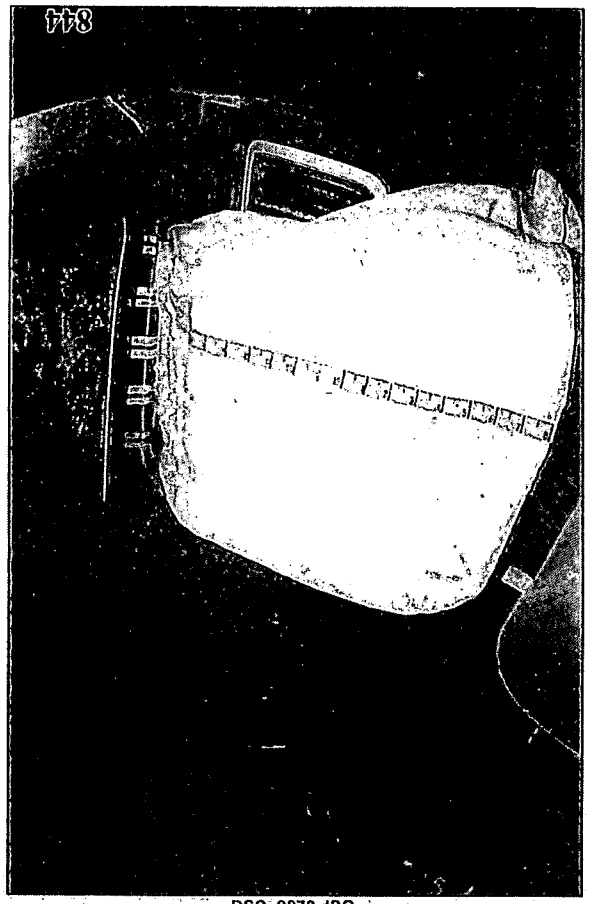


DSC_9977.JPG

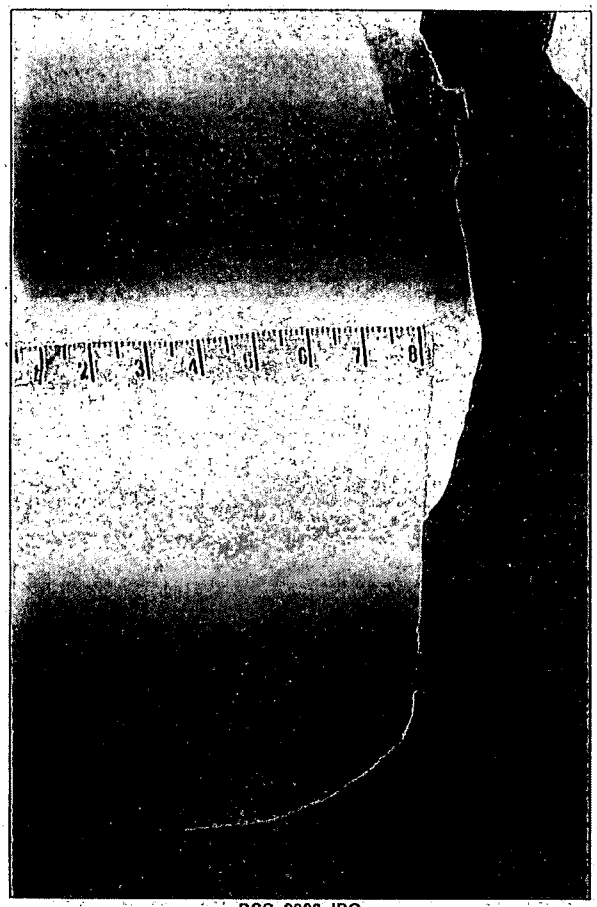


DSC_9978.JPG

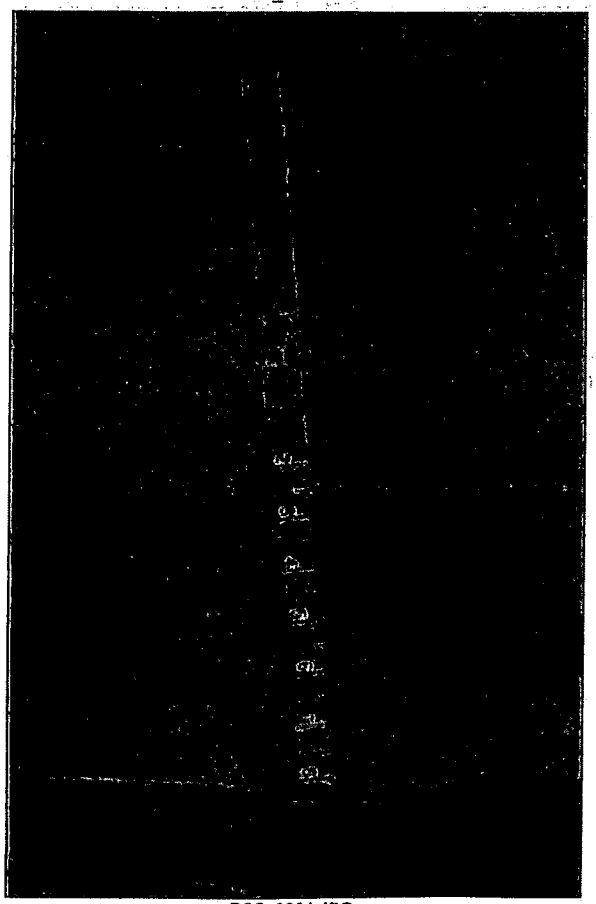
Bioforensic Consulting Photographs- 13-582 Newbern Surrogate



DSC_9979.JPG



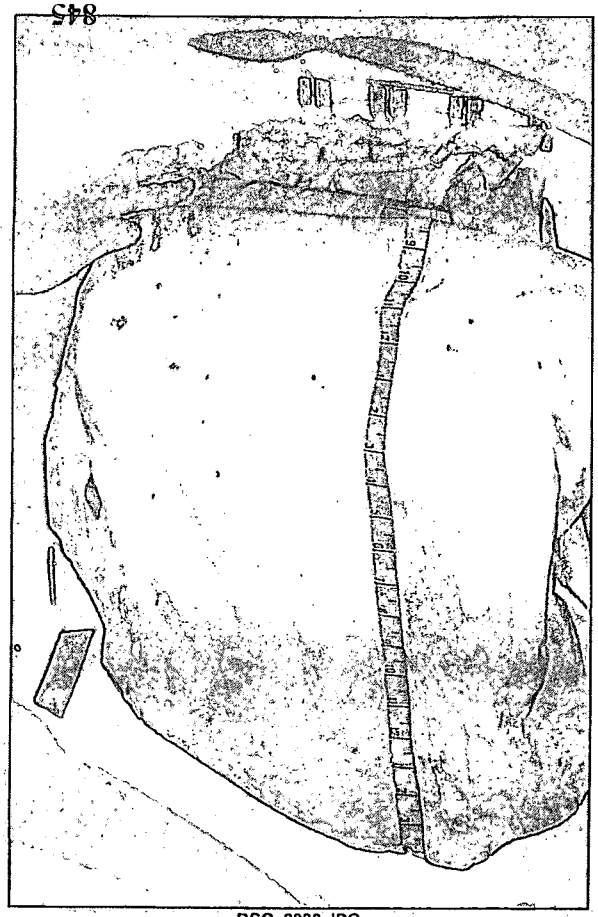
DSC_9980.JPG



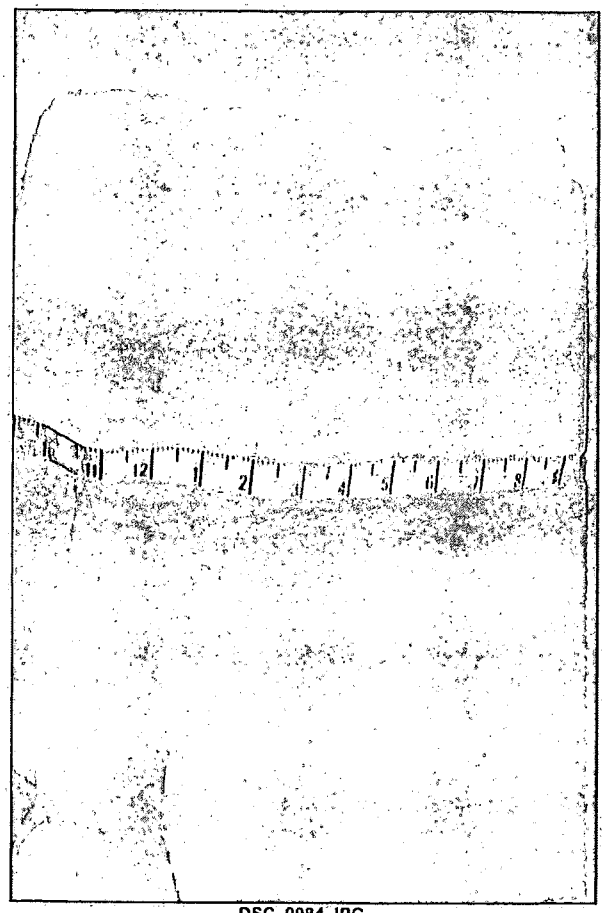
DSC_9981.JPG

DSC_9982.JPG

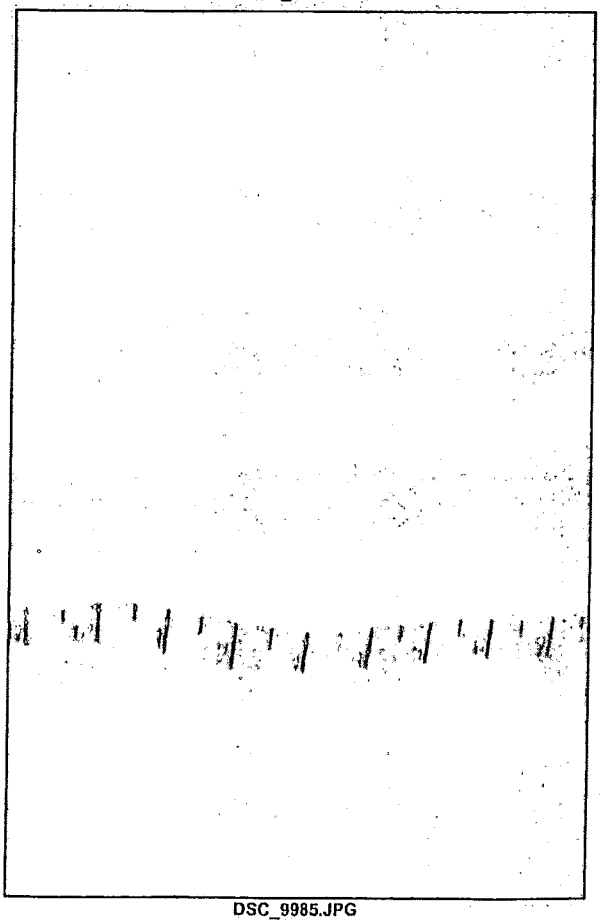
Bioforensic Consulting Photographs- 13-582 Newbern Surrogate



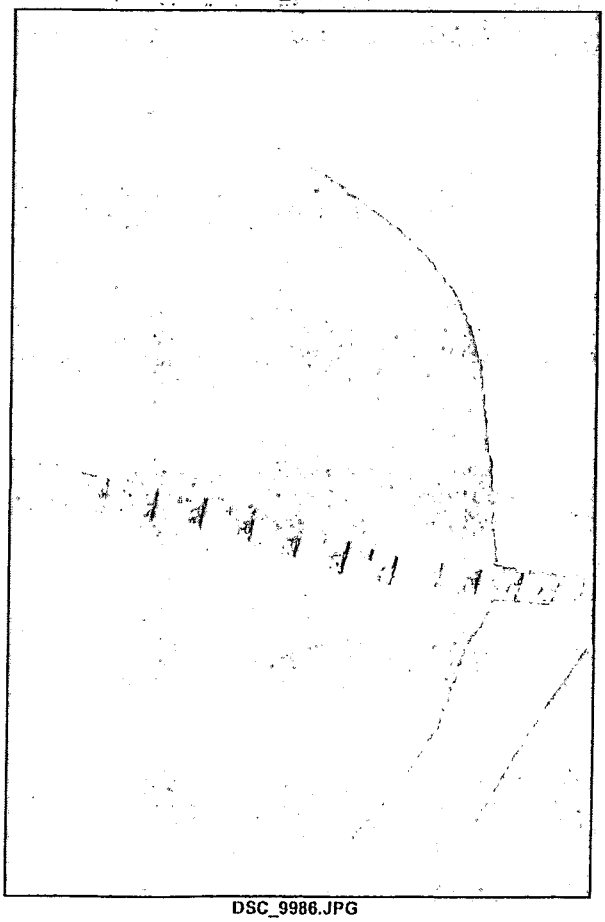
DSC_9983.JPG



DSC_9984.JPG



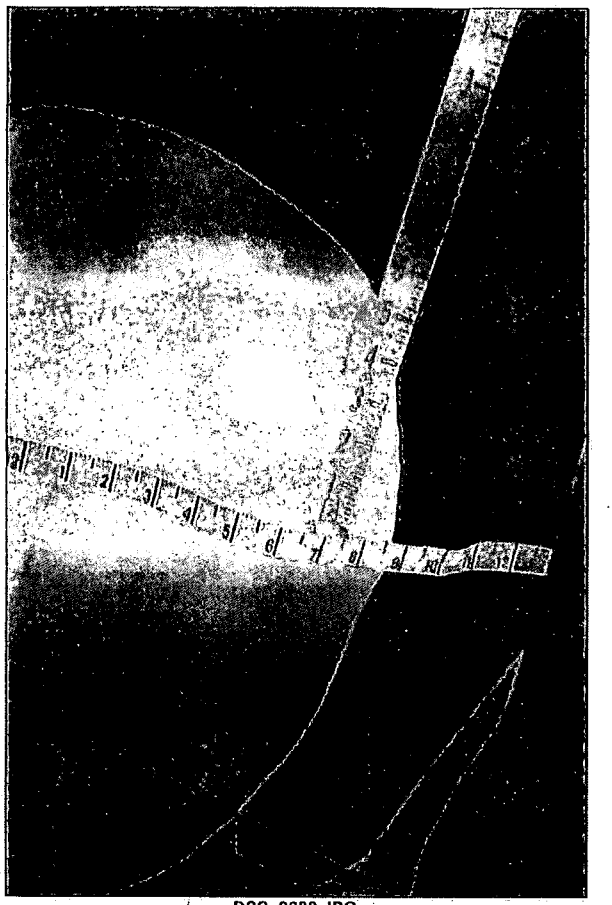
DSC_9985.JPG



DSC_9986.JPG

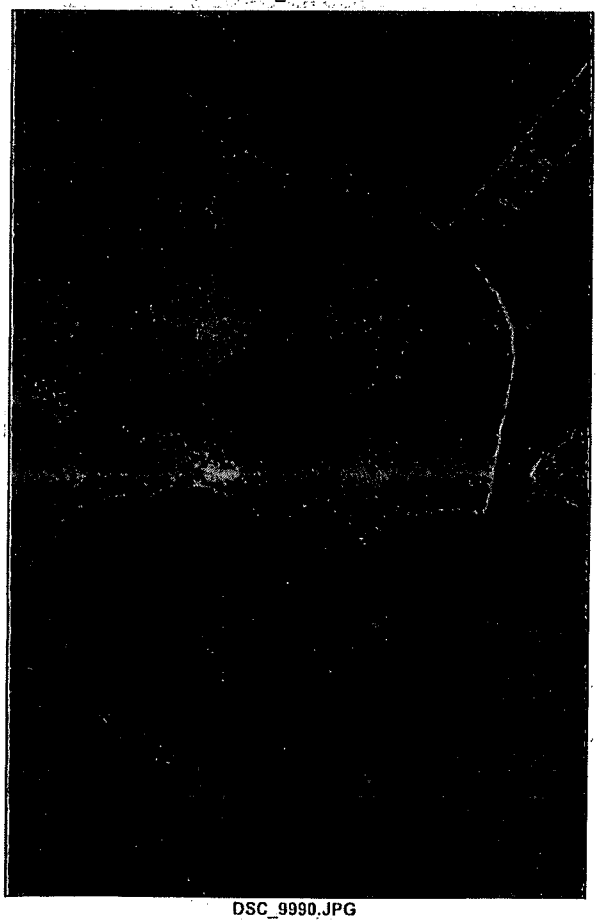
Bioforensic Consulting Photographs- 13-582 Newbern Surrogate

DSC_9987.JPG



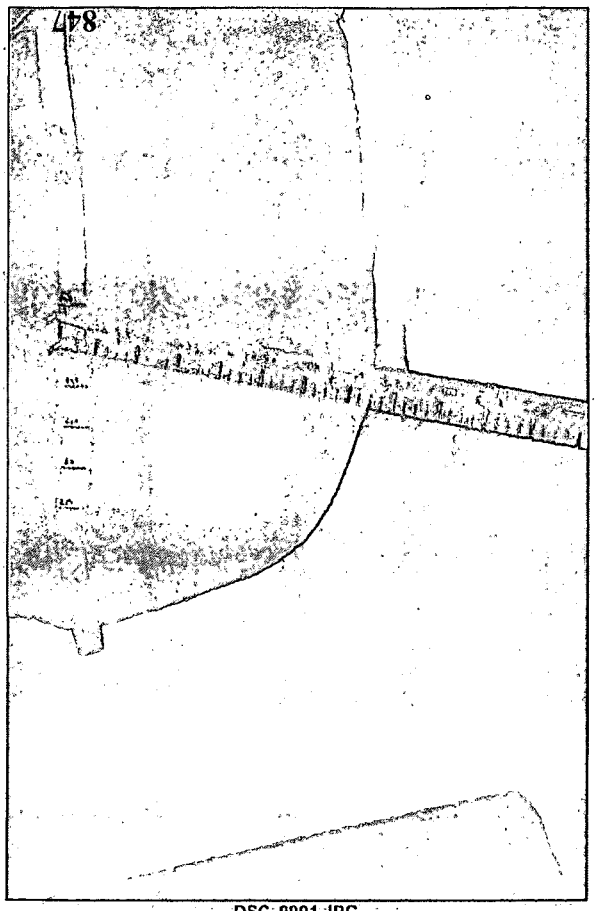
DSC_9988.JPG

DSC_9989.JPG



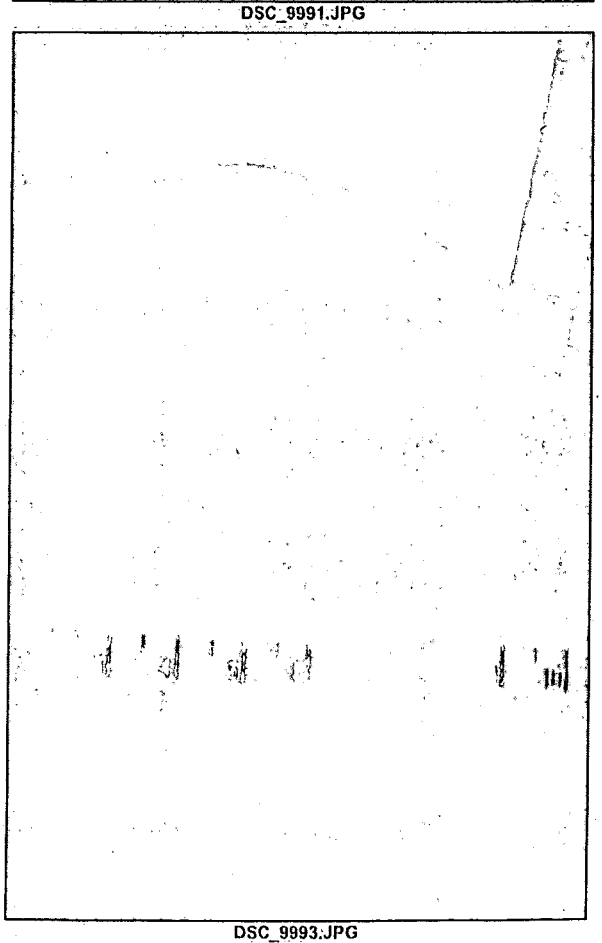
DSC_9990.JPG

Bioforensic Consulting Photographs- 13-582 Newbern Surrogate

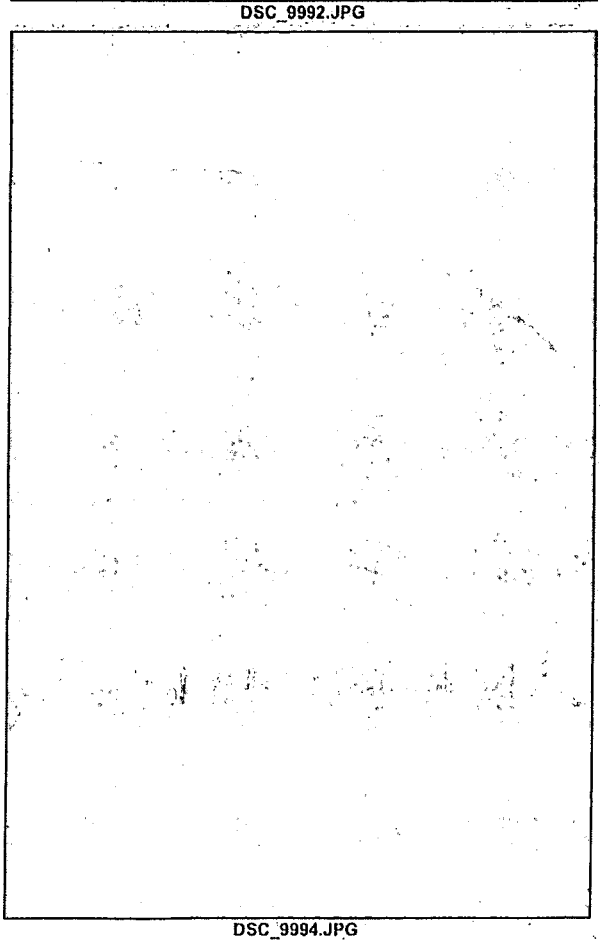


DSC_9991.JPG

DSC_9992.JPG

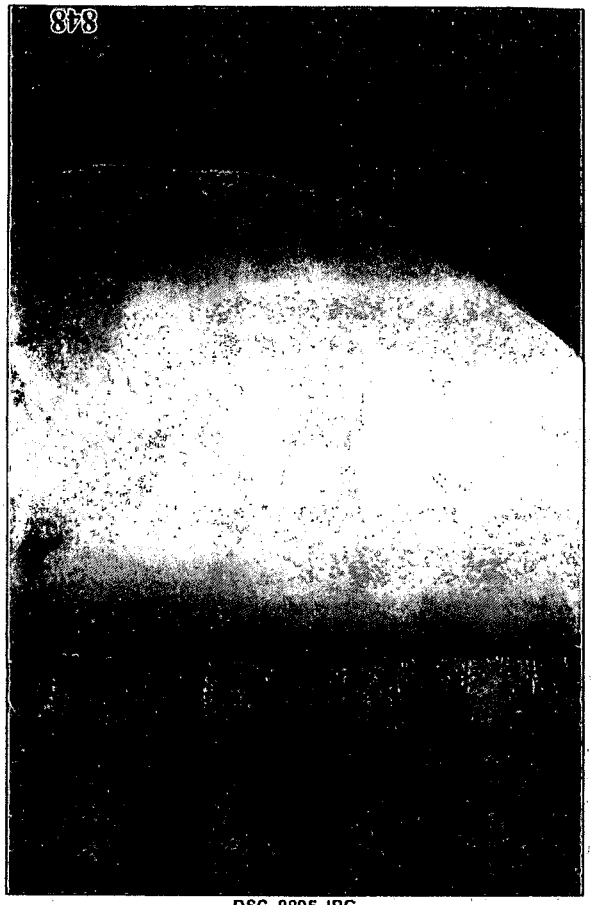


DSC_9993.JPG

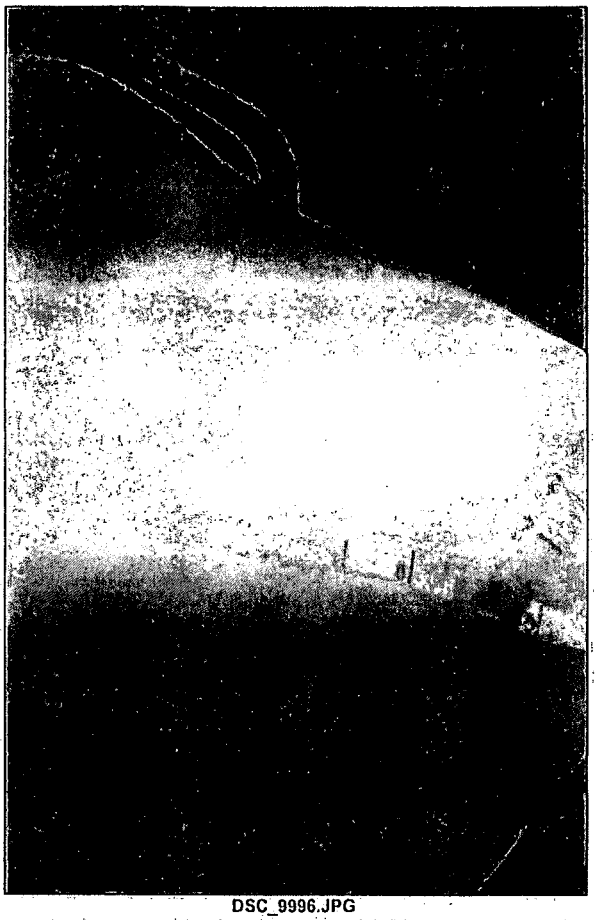


DSC_9994.JPG

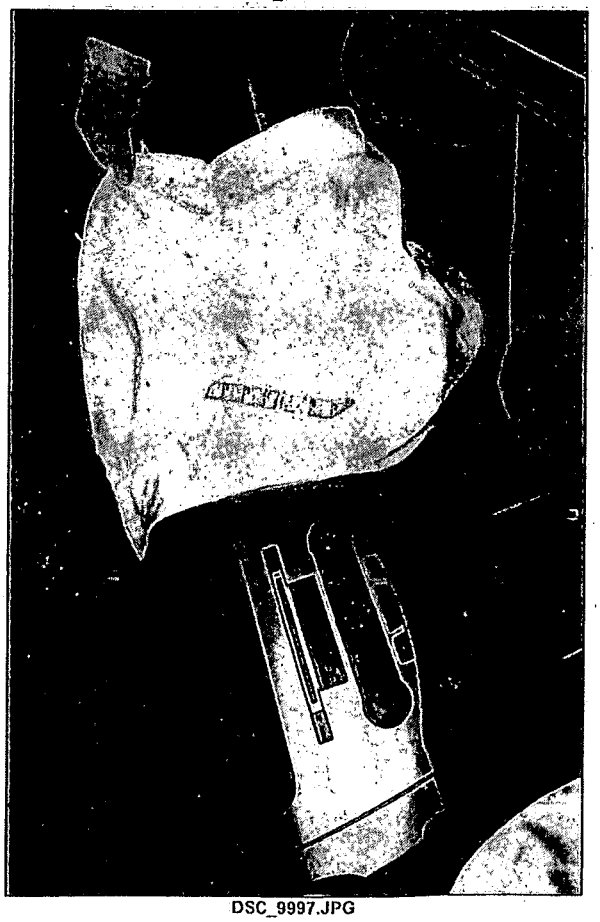
Bioforensic Consulting Photographs- 13-582 Newbern Surrogate



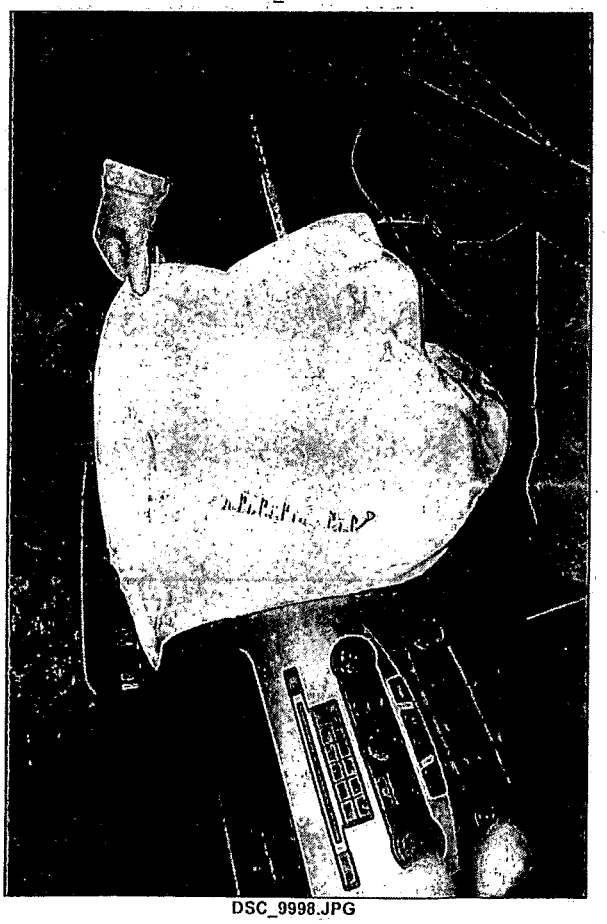
DSC_9995.JPG



DSC_9996.JPG

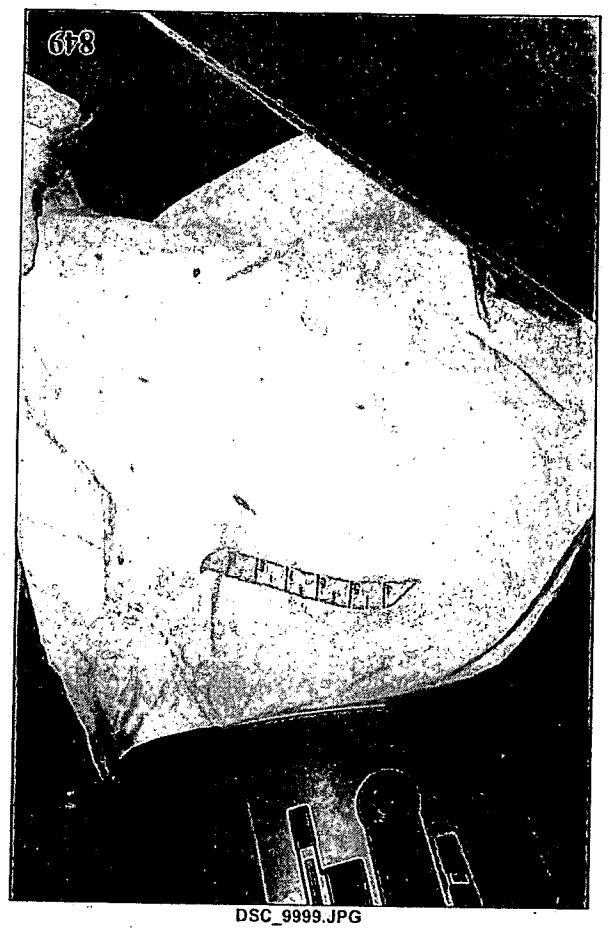


DSC_9997.JPG



DSC_9998.JPG

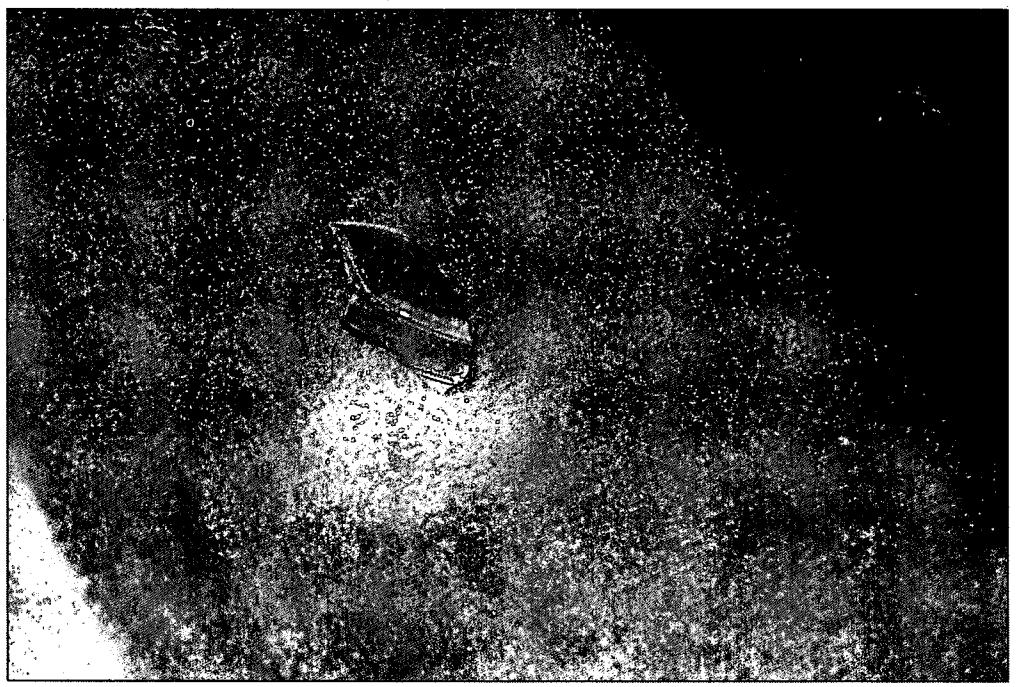
Bioforensic Consulting Photographs- 13-582 Newbern Surrogate



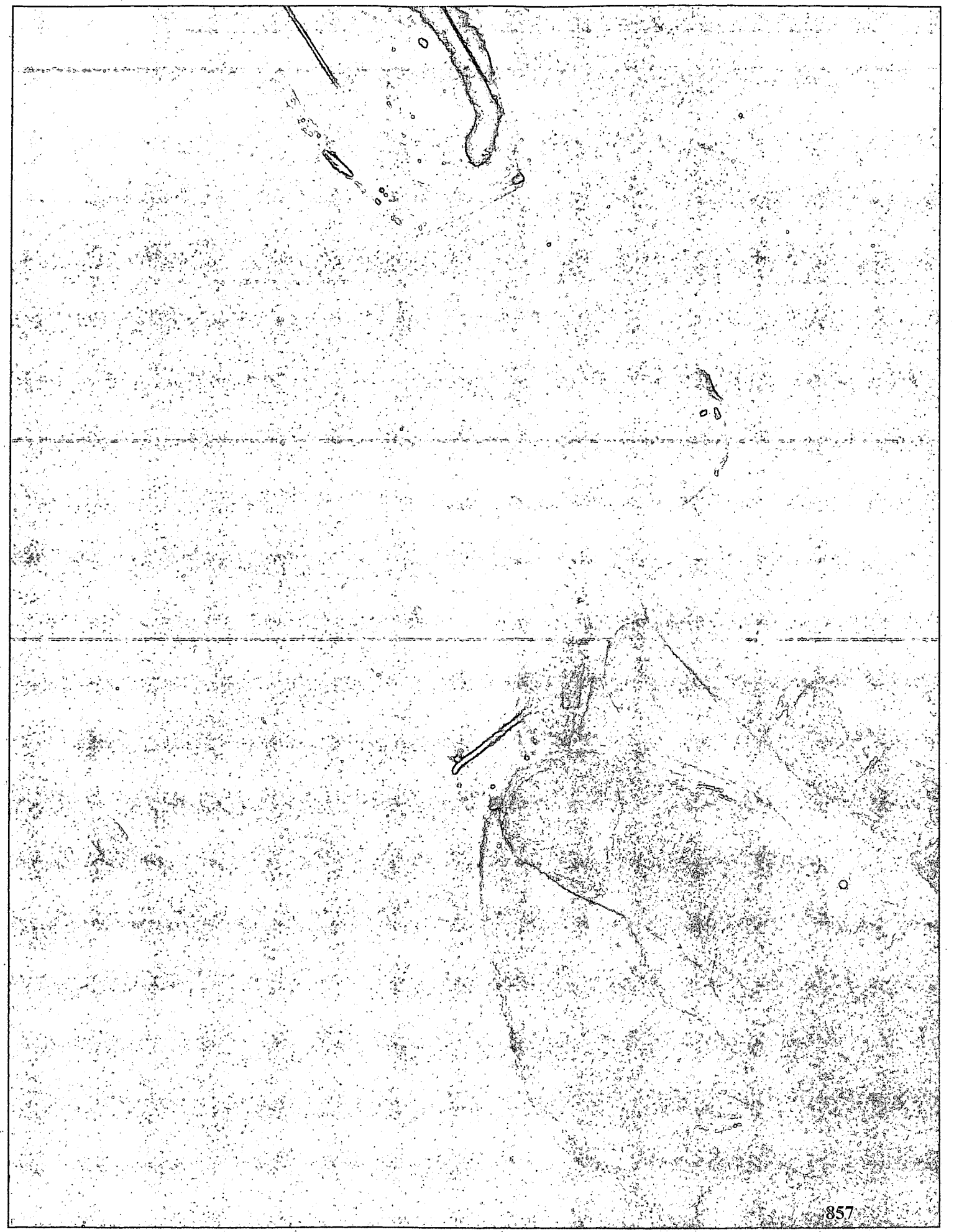
DSC_9999.JPG

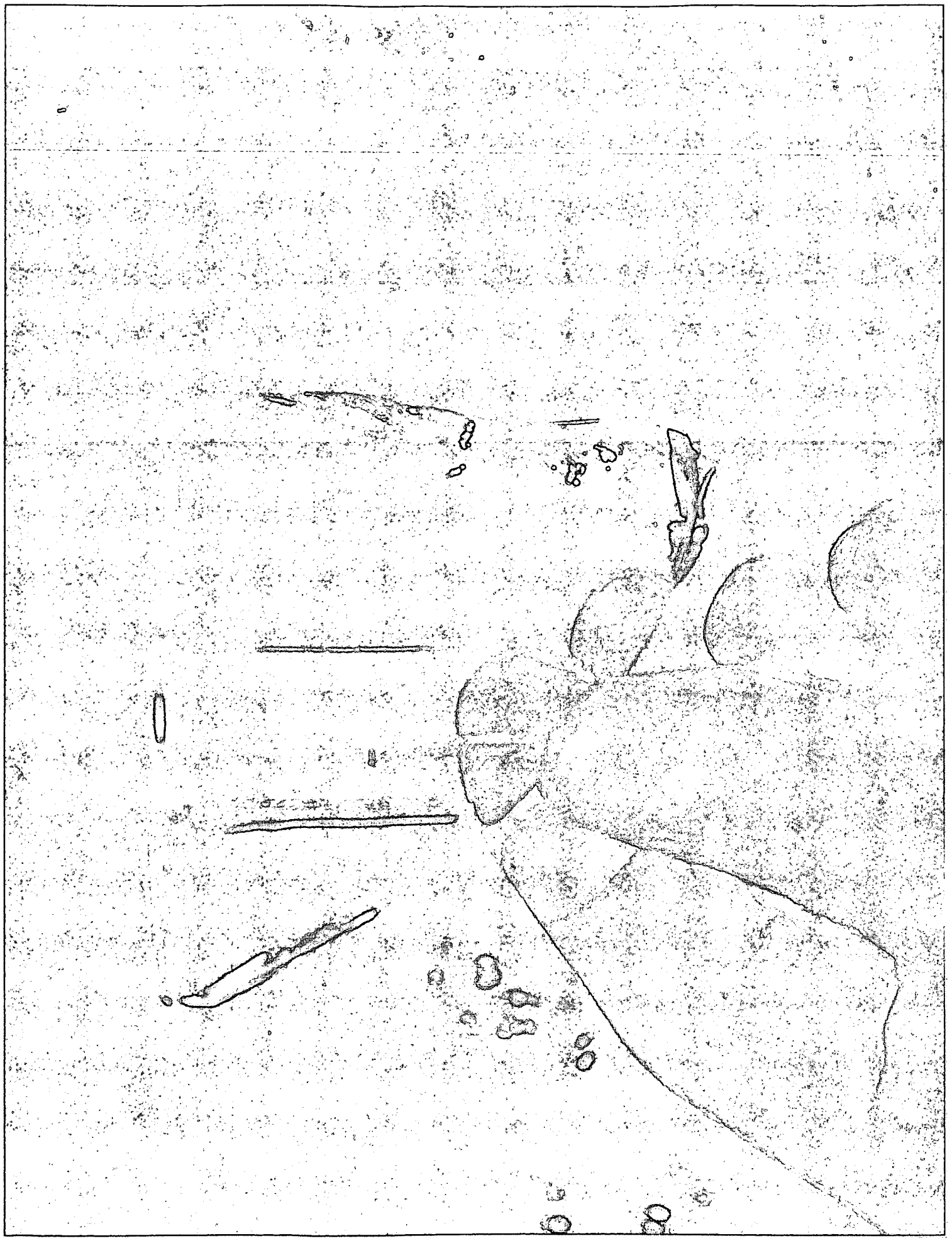
PLAINTIFF'S
EXHIBIT
208

MILEAGE
IMAGED



DEPOSITION EXHIBIT
Newbern
855
6-6-14
PENGAD 800-631-6989


857



Defendant's Exhibit 50

Calibration Report

Filed under seal pursuant to the Court's June 7, 2017 Order

THE STATE OF SOUTH CAROLINA
In The Court of Appeals

APPEAL FROM CHARLESTON COUNTY
Court of Common Pleas

The Honorable J.C. Nicholson, Jr.

Appellate Case No. 2016-002209

Steven Newbern and Claudia Newbern,..... Appellants,

v.

Ford Motor Company,.....Respondent.

CERTIFICATE OF COUNSEL

The undersigned counsel hereby certifies that the Record on Appeal contains all material proposed to be included by any of the parties and not any other material.

[*Signature block appears on the following page.*]

RECEIVED
AUG 02 2017
SC Court of Appeals

July 5, 2017

Kathleen C. Barnes

Kathleen Chewning Barnes, SC Bar No. 78854
BARNES LAW FIRM, LLC
P.O. Box 897
Hampton, SC 29924
803-943-4529

Stephen E. Van Gaasbeck
LAW OFFICES OF STEPHEN E. VAN GAASBECK
19815 Helotes Creek road
Helotes, TX 78023
Phone: 210-924-9294
Fax: 210-260-4021

Raymond O. Bodiford
121 South Orange Ave., Suite 1150
Orlando, FL 32801
Phone: 407-423-9728
Fax: 407-648 1899

William Applegate
YARBOROUGH APPLEGATE
291 East Bay St., Second Floor
Charleston, SC 29401
Phone: 843-972-0150
Fax: 843-277-6691
Attorneys for Appellants