CASE: D010-98

Crash Description: **18 Year old, White, Female, Driver, Student**
Impact Type: **Frontal Full**

Case Vehicle:	**1998 Honda Accord LX**		
Crash Type:	Vehicle to Vehicle		
Restraint:	None		
Airbag Deployment (front):	Driver Side: Deployed	Passenger Side:	Deployed
Airbag Deployment (side):	None		
Principle Direction of Force:	11 o'clock		
Total Delta V:	18.6 MPH	Lateral Delta V:	9.30 MPH
		Longitudinal Delta V:	-16.10 MPH
Estimated Speed:	45 MPH		
Intrusion:	L. Toe Pan: 3" (8-cm) L. Ins. Panel: .25" (.6-cm)		
Steering Wheel Deformation:	.00 in.		
Sheer Capsule Movement (left):	.00 in.	(right):	.00 in.
Seat Position:	Mid Range		
Maximum Crush:	17.50 in.	at Position:	C3
Wheelbase:	Pre: 106.9(in.	Post: 97.85 in.	Difference: 9.05 in.

Occupant Measurements:

Height:	64 in.	Torso:	18.0 in.
Weight:	130 lbs.	Knee Up:	18.0 in.
Handed:	Right	Knee Down:	18.5 in.
Eyewear:	None	Elbow Up:	13.0 in.
Shoes:	DMX white sneaker's 8 1/2	Elbow Down	17.0 in.

Conditions:

Crash Date:	12/[redacted]/1998	Crash Time:	19:40
Weather:	Clear, Dark	Posted Speed:	45 MPH
Road Condition:	Dry	Coeff. of Friction:	0.70
Surface Condition:	Blacktop		

Case Vehicle Model:

1998 Honda Accord LX

Vehicle meets 1997 Side Impact Standard: Yes

Case Summary:

Case Summary:

Case vehicle: 1998 Honda Accord
POV: 1982 Buick Park Avenue
Involved in the crash was the case vehicle a 1998 Honda Accord LX equipped with a 3-point manual lap and shoulder restraint. In addition to the manual restraint, the case vehicle is also equipped with driver and right front passenger air bags. The driver of the case vehicle was an 18 year old female, 233-cm (64") tall and 59 kg (130 lbs.). The driver of the case vehicle was not using the available 3-point manual restraint, being protected only by the driver air bag. Also involved in the crash was the primary POV, a 1982 Buick Park Avenue. A 1996 Dodge pick up truck as well as a 1997 Mercedes Benz were contacted by the POV alone. Because these vehicles didn't contact the case vehicle they were not inspected.

The case vehicle was travelling in a southerly direction in the first lane, at an estimated speed of 72 km/h (45 mph). The POV was travelling in a northerly direction, in the left turn lane. The driver intended to turn left at the intersection and travel in a westerly direction. As the case vehicle entered the intersection, the POV turned left across its the. The case vehicle struck the POV in the right side. When the case vehicle was inspected and impression of the POV's right rear wheel was imprinted on the front bumper. This contact was centered at 23 cm (9") left of the bumper centerline. After the case vehicle struck the POV, it rotated in a clockwise direction and slid to a final rest position 26 m (85') south of the point of impact. The case vehicle was facing in a northerly direction across the third southbound lane. After the case vehicle struck the POV in the right side, the POV rotated in a clockwise direction and struck two other vehicles with the left side. The other vehicles were stopped at the stop bar, facing in an easterly direction, in the west leg of the intersection.

Direct damage on the front of the case vehicle was distributed across the full frontal plane, a total distance of 147 cm (58"). This 11 o'clock direction of force impact (CDC: 11-FDEW-2) crushed the frontal structure to a maximum depth of 44 cm (17.5"), which was located at the C3 position. The POV was not available for inspection, as a result the missing vehicle algorithm of the WINSMASH program was used to compute the DeltaV for this impact. WINSMASH calculated a total DeltaV of 50.7 km/h (31.5 mph). The longitudinal component of the DeltaV was -43.9 km/h (-27.3 mph) and the latitudinal component was -25.4 km/h (-15.8 mph). The results of the WINSMASH run seem a little high for the severity of damage sustained by the case vehicle.

Because of this high estimate another WINSMASH run was obtained using a Barrier Equivalent Speed. The results of the B.E.S. run are more consistent with the severity of damage sustained. B.E.S. calculated the total DeltaV to be 30.0 km/h (18.6 mph). The longitudinal component of the DeltaV was -26.0 km/h (-16.1 mph) and the latitudinal component was 15.0 km/h (9.3 mph). The results of the B.E.S. run are coded in the CRASH CARE system.

Kinematics Summary:

Occupant Kinematics:

At impact, the driver moved forward with respect to the decelerating vehicle and in a path consistent with the 11 o'clock direction of force impact. The driver was not using the available 3-point lap and shoulder restraint, being protected only by the driver air bag. The driver is 168-cm (66") tall and was sitting with the left front seat forward. The driver seat was located between the mid point of travel and the full forward position. The driver and right front passenger air bags deployed at impact. Because the driver was sitting in close proximity to the steering assembly, she was contacted by the deploying air bag. The driver was contacted in the neck and torso by the air bag. As a result of this contact she sustained a contusion to the left chest, just below the clavicle. She also sustained a contusion to the right chest, over the right clavicle. The driver also sustained a dicing type laceration to the left side of the neck. This can be attributed to the air bag contacting the neck and necklace worn around the neck.

The driver was also struck in the abdomen by the deploying air bag. As a result of this contact the driver sustained a grade V liver laceration, which involved an avulsion to the left lobe and a transection of the hepatic artery. The steering assembly showed no signs of loading and the shear capsules had not moved in the collision. As a result the steering wheel rim has been ruled out as the injury mechanism for the liver injury. In addition the driver leg contacts on the left instrument panel may have prevented her abdomen from loading the lower steering wheel rim.

The driver contacted and loaded the lower left instrument panel with her lower extremities. The location of the contacts suggests that the driver had her left foot on the foot rest mounted on the toe pan and her right foot on the brake pedal at impact. The left leg contacted the instrument panel 60-cm (23.5") left of the vehicle centerline and 30-cm (12") down from the top plane of the instrument panel. The bolster cover had been broken away and the reinforcing beam had been dented from the loading of the left knee. As a result of the contact the driver sustained a contusion to the antero-medial aspect of the distal left thigh. The contact suggests that the driver's left leg submarined slightly under the bolster. The driver also contacted the left instrument panel with her right leg. This contact was located under the steering column where it passes through the left instrument panel. The contact was in line with the brake pedal indication that braking was taking place at impact. This contact was 29-cm (11.5") left of the centerline and 32-cm (12.5") down from the top plane. The contact consisted of a denim cloth transfer. As a result of this contact the driver sustained a contusion to the anterior surface of the right knee. The driver also sustained an avulsion of the soft tissue on the anterior aspect of the right knee. This injury can be attributed to contact

with the broken plastic bolster cover.

The driver's left hand struck the windshield as a result of the air bag deployment. This contact was located 47-cm (18.5") left of the windshield centerline and 33-cm (13") above the top plane of the instrument panel. The windshield was cracked at this location and skin oil could be seen. The driver did not sustain an injury from this contact.

Arrival Data:

ED Arrival Date: 12/[redacted]1998 Time: 20:30
Trauma Criteria: 02 SBP <90

	E.D.	Scene:
Systolic blood pressure:	150	60
Pulse:	100	Unk.
Respiration:	22	Unk.
Glasgow Coma Score:	15	15
BAC:	Not Done	
Drug Screen:	Cocaine	

Past Medical History:

PMH:None
PSH:None

Psycho-Social:

12/[redacted]98: Pt is a eighteen Year old WF. Pt. lives with parent's which are very helpful with our study.(LS)

Other Hospital Data:

Time to first OR: 00:47 hrs.
Hosp. Length of Stay 9.00 days
ICU Length of Stay: 3 Days
Disposition: Home / Routine
Hospital Charges:

Injury Severity:

ISS Score: 27

Maximum AIS: 541828.5
caused by injury: Major laceration to the Anterior Right Medial segment of left lobe of liver

Occupant Injuries and Contacts:

Contact Point	Injury	Mechanism of Inj.	AIS Severity
Air bag-driver side	• Contusion to the Anterior Left Skin of infraclavicular region	Direct Contact	1
	• Contusion to the Anterior Right Skin of clavicular region	Direct Contact	1
	• Major laceration to the Anterior Right Medial segment of left lobe of liver	Compression	5
Air bag-driver side and jewelry	• Dilaceration to the Anterior Skin of neck	Direct Contact	1
Knee bolster	• Avulsion to the Anterior Right Skin of knee	Direct Contact	1
	• Contusion to the Anterior Right Skin of knee	Direct Contact	1
	• Contusion to the Anterior Left Skin of anterior surface of thigh	Direct Contact	1

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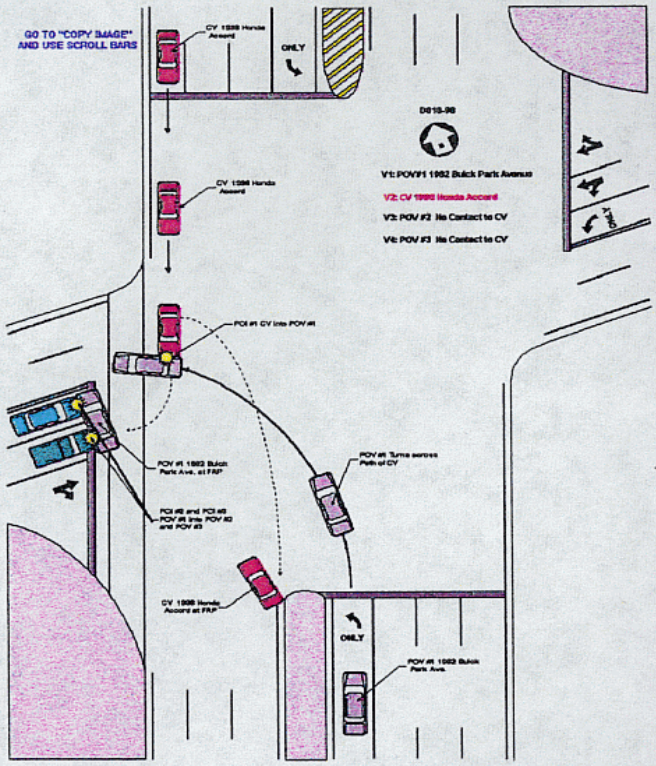

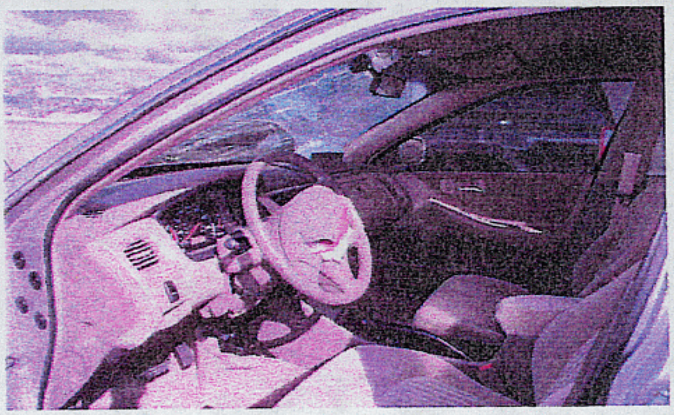

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