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ON-SITE REDESIGNED AIR BAG INVESTIGATION

CASE NUMBER - IN-04-042
LOCATION - Texas
VEHICLE - 2004 MAZDA 6
CRASH DATE - October 2004

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The crash investigation process is an inexact science which requires that physical evidence such as skid marks, vehicular damage measurements, and occupant contact points be coupled with the investigator's expert knowledge and experience of vehicle dynamics and occupant kinematics in order to determine the pre-crash, crash, and post-crash movements of involved vehicles and occupants.

Because each crash is a unique sequence of events, generalized conclusions cannot be made concerning the crashworthiness performance of the involved vehicle(s) or their safety systems.

Technical Report Documentation Page

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16. *Abstract* This report covers an on-site investigation of an air bag deployment crash that involved a 2004 Mazda 6 (case vehicle), a1993 Ford Taurus (1st other vehicle) and a 2004 Toyota Camry (2nd other vehicle). This crash is of special interest because the case vehicle was equipped with redesigned front air bags and the case vehicle's front right passenger (24 year-old, male) sustained a police reported "C" (possible) injury, possibly from his deploying passenger air bag. The case vehicle was traveling west in the outside lane of a multiple lane, divided urban trafficway and was approaching a four-leg, signalized intersection. The Ford was traveling east in the left turn lane and was in the process of making a left turn to travel northbound. The Toyota was traveling southbound in the left through lane and was stopped at the intersection waiting for the traffic signal to change. As the Ford was executing the left turn, the case vehicle entered the intersection, and the front of the case vehicle impacted the Ford's right fender and front bumper causing the case vehicle's driver and front right passenger air bags to deploy. The Ford rotated counterclockwise and traveled northwest. The case vehicle rotated clockwise and traveled northwest, crossed the concrete curbed median on the north leg of the intersection, and the front right corner of the case vehicle impacted the front of the Toyota. The Ford came to final rest in the intersection near the mouth of the north leg of the intersection facing northwest. The case vehicle came to rest in the Toyota's travel lane with the front of the case vehicle against the front of the Toyota. The driver (22-year-old, male) was not restrained and sustained no police reported injury. The front right passenger was restrained by his manual, three-point, lap-and-shoulder safety belt. He sustained a police reported "C" (possible) injury and was transported by ambulance to a local hospital. The passenger's injuries could not be determined because no record of treatment was located by the treating hospital.			
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This investigation was brought to NHTSA's attention on or before November 23, 2004 by NASS CDS/GES sampling activities. This crash involved a 2004 Mazda 6 (case vehicle), a 1993 Ford Taurus GL (1st other vehicle) , and a 2004 Toyota Camry (2nd other vehicle). The crash occurred in October, 2004 at 10:20 p.m., in Texas and was investigated by the applicable city police department. This crash is of special interest because the case vehicle was equipped with redesigned front air bags, and the case vehicle's front right passenger [24-year-old, (unknown race and ethnic origin) male] sustained a police reported "C" (possible) injury, possibly from his deploying passenger air bag. This contractor inspected the case vehicle on December 6, 2004, and inspected the crash scene and the Ford on December 7, 2004. No driver interview was conducted because this contractor was unable to contact the case vehicle's driver. This report is based on the police crash report, scene and vehicle inspections, occupant kinematic principles, and this contractor's evaluation of the evidence.

SUMMARY

The case vehicle was traveling west in the outside lane of a multiple lane, divided urban trafficway and was approaching a four-leg, signalized intersection. The case vehicle's approach roadway was curved left. The Ford was traveling east in the left turn lane and was in the process of making a left turn to travel northbound on a multiple lane divided trafficway. The Toyota was traveling southbound in the left through lane and was stopped at the intersection waiting for the traffic signal to change. As the Ford was executing the left turn, the case vehicle entered the intersection, and the front of the case vehicle impacted the Ford's right fender and front bumper causing the case vehicle's driver and front right passenger air bags to deploy. The Ford rotated counterclockwise and traveled northwest. The case vehicle rotated clockwise and traveled northwest, crossed the concrete curbed median on the north leg of the intersection, and the front right corner of the case vehicle impacted the front of the Toyota. The Ford came to final rest in the intersection near the mouth of the north leg of the intersection facing northwest. The case vehicle came to rest in the Toyota's travel lane with the front of the case vehicle against the front of the Toyota.

The CDCs for the case vehicle were determined to be **11-FYEW-1** (**340** degrees) for the initial impact with the Ford and **12-FRE?-1** (**0** degrees) for the impact with the Toyota. Character six of the CDC for the impact with the Toyota could not be determined because the front bumper fascia was off of the case vehicle and could not be located. The CDC for the Ford was determined to be **02-RFEW-3** (**50** degrees). No CDC could be assigned to the Toyota because it was not inspected. The WinSMASH reconstruction program, missing vehicle algorithm, calculated the case vehicle's Total, Longitudinal and Lateral Delta Vs respectively as: 12.0 km.p.h, (7.5 km.p.h.) -11.3 km.p.h. (-7.0 m.p.h.) and 4.1 km.p.h (2.5 m.p.h.). The collision fits the reconstruction model, but the results appear low.

Immediately prior to the crash, the case vehicle's driver [22-year-old, Black, (unknown if Hispanic) male] was seated in an unknown posture. He had a least one hand on the steering wheel, but the position of his feet is not known. The case vehicle was equipped with electric seat adjusters, and at the time of the inspection the driver's seat track was found in its full forward

position, the seat back was slightly reclined and the steering column was adjusted to its full up position. The case vehicle's driver was not restrained by his manual, three-point, lap-and-shoulder safety belt system.

The case vehicle's impact with the Ford caused the driver to continue forward and slightly leftward along a path opposite the case vehicle's 340 degree direction of principal force as the case vehicle decelerated, and the driver's face and chest most likely impacted his deployed air bag. The driver most likely rebounded off the air bag and continued to move left as the case vehicle rotated clockwise, and he may have contacted his door. He most likely remained in his seat and probably moved forward and up and down as the case vehicle traveled over the raised curbed median. The case vehicle's front impact with the Toyota then caused the driver to move forward along a path opposite the case vehicle's 0 degree direction of principal force as the case vehicle decelerated, and he may have made minor contact with his now deflated air bag and underlying steering wheel. The driver most likely remained in his seat and was able to exit the case vehicle under his own power. The police crash report indicated that the driver was not injured and was not transported to a medical facility. The deployment of the driver's air bag mitigated his interaction with the case vehicle's interior frontal components and most likely prevented him from being injured.

Immediately prior to the crash the case vehicle's front right passenger [24-year-old, (unknown race and ethnic origin) male] was seated in an unknown posture, and the position of his hands and feet are unknown. The case vehicle was equipped with electric seat adjusters, and at the time of the inspection the front right passenger's seat track was located in it's rearmost position and the seat back was slightly reclined. The front right passenger was restrained by his manual, three-point, lap-and-shoulder, safety belt system.

The case vehicle's impact with the Ford caused the front right passenger to continue forward and slightly leftward along a path opposite the case vehicle's 340 degree direction of principal force as the case vehicle decelerated. The passenger's safety belt retractor locked due to the impact, and he loaded the safety belt, and his face and chest most likely contacted his deployed air bag. The front right passenger most likely rebounded off the air bag and continued to move slightly left as the case vehicle rotated clockwise. He remained restrained in his seat and most likely moved forward and up and down as the case vehicle traveled over the concrete curbed median. The case vehicle's front impact with the Toyota then caused the front right passenger to move forward along a path opposite the case vehicle's 0 degree direction of principal force as the case vehicle decelerated, and he again loaded his safety belt. The front right passenger remained in his seat as the case vehicle came to final rest against the front of the Toyota. It is not known if he was able to exit the vehicle under his own power. The police crash report indicated that the front right passenger sustained a "C" (possible) injury and was transported by ambulance to a local hospital. The front right passenger's use of his safety belt system and the deployment of his air bag mitigated his interaction with the case vehicle's interior frontal components and most likely prevented more serious injury.

Crash Environment: The trafficway on which the case vehicle and the Ford were traveling was an eight-lane, divided, city street, traversing in an east-west direction, and both vehicles were approaching a four-leg intersection. On the east leg of the intersection, the trafficway consisted of three westbound through lanes and three eastbound through lanes and was curved to the south. The westbound roadway also had two left turn lanes, one right turn channel with a raised island. The east leg was divided by a 1.4 meters (4.6 feet) wide curbed median, and the average lane width was 3.2 meters (10.5 feet). On the west side of the intersection, the trafficway consisted of three westbound through lanes and three eastbound through lanes. The eastbound roadway also had one left turn lane and one right turn channel with a raised island. The left turn lane was separated from the eastbound through lanes by a 2.7 meters (8.9 feet) wide painted median. The west leg was divided by a 1.5 meters (4.9 feet) wide curbed median, and the average lane width was 3.3 meters (10.8 feet). The trafficway on which the Toyota was traveling was an seven-lane, divided city street traversing in a north-south direction, and the Toyota was stopped at the intersection. The north leg of the intersection had three northbound through lanes and three southbound through lanes. The southbound roadway also had one left turn lane and one right turn lane. The north leg was divided by a 1.4 meters (4.6 feet) wide curbed median, and the average lane width was 3.2 meters (10.5 feet). The south leg of the intersection consisted of three northbound and three southbound through lanes. The northbound roadway also had one left turn lane, and the trafficway was divided by a 1.3 meters (4.3 feet) wide curbed median. The average lane width was 3.3 meters. Pavement marking consisted of broken white lane lines, which became solid white lane lines as they approached the intersection, and solid white turn lane lines. In addition, the left turn lane on the west side of the intersection was separated from the eastbound through lane by a painted median marked with white chevrons. The intersection was controlled by three-phase traffic signals, and the speed limit for the three vehicle's was 56 km.p.h. (35 m.p.h). At the time of the crash the light condition was dark, but illuminated by overhead street lamps, the atmospheric condition was clear, and the roadway pavement was dry concrete with an estimated coefficient of friction of 0.70. The roadway grade for the approach of the case vehicle was approximately 2% positive. Traffic density was not determined and the site of the crash was a combination of residential and commercial. See the Crash Diagram at end of this report.

Pre-Crash: The case vehicle was traveling west in the outside through lane (**Figure 1**), and the driver was intending to continue straight through the intersection. The Ford was traveling east in the left turn lane (**Figure 2** below), and the driver was in the process of making a left turn to travel north. The Toyota was southbound in the left through lane and was stopped at the traffic signal, and the driver was intending to continue southbound. It is unknown if the case vehicle's driver made any avoidance maneuvers prior to the crash. The crash occurred in the four-leg intersection of the two trafficways.

Figure 1: Case vehicle approach to impact area, indicated by arrow

Crash: The front of the case vehicle (**Figure 3**) impacted the right front of the Ford (**Figure 4**), causing the case vehicle's driver and front right passenger air bags to deploy. The case vehicle was deflected to the right, rotated clockwise, traveled over the concrete curbed median in the mouth of the north leg of the intersection (**Figure 5**) and the front of the case vehicle impacted the front of the Toyota. It is not known whether more than one stage of the case vehicle's dual-stage air bags activated.

Figure 2: Approach of Ford in left turn lane to impact area, indicated by arrow

Figure 3: Damage to front of case vehicle due to impact with Ford and Toyota

Figure 4: Damage to right fender of Ford Taurus due to impact with case vehicle, each stripe on rods is 5 cm (2 in)

Figure 5: Arrow shows area of impact and final rest of case vehicle and Toyota

Post-Crash: The case vehicle came to rest in the mouth of the intersection in the Toyota's travel lane (**Figure 5**) facing northwest with the front of the vehicle against the front of the Toyota. As a result of the impact with the case vehicle, the Ford rotated counterclockwise and came to rest in the intersection near the case vehicle facing northwest (**Figure 6** below).

CASE VEHICLE

The 2004 Mazda 6 was a front wheel drive, four-door sedan (VIN: 1YVFP80C445------) equipped with a 2.3L, I4 engine and an automatic transmission. The front seating row was equipped with bucket seats with adjustable head restraints, redesigned front air bags with dual

stage inflators and driver and front right passenger manual, three point, lap-and-shoulder safety belt systems with adjustable upper anchors, retractor-mounted pretensioners and belt force load limiters. The back seating row was equipped with a bench seat with outboard integral head restraints and three point, lap-and-shoulder safety belt systems in all three rear seat positions. In addition, the case vehicle was equipped with a LATCH system for securing child safety seats. Anti-lock brakes were an option for this model, but the case vehicle was not so equipped. The case vehicle's mileage is not known because the case vehicle was equipped with an electronic odometer. The case vehicle's wheelbase was 268 centimeters (105.5 inches).

Figure 6: View northeast along Ford's approach to impact area with case vehicle (single head arrow) and area of final rest of Ford (double head arrow)

CASE VEHICLE DAMAGE

Exterior Damage: The case vehicle's initial contact with the Ford involved the front plane as did the second impact with the Toyota. The front bumper, bumper fascia, grille, hood, left fender, and both headlamp/ turn lamp assemblies were directly damaged and crushed rearward. The bumper fascia was removed from the case vehicle and was not present at the inspection, so the specific length of the direct damage for each impact could not be determined. One set of measurements was taken to determine the totality of the crush to the front end. Based on the direct damage above the bumper level, it appeared that the two impacts directly damaged approximately the full width of the case vehicle's front bumper, which was 166 centimeters (65.4 inches). The crush measurements were taken along the metal bumper bar, and the residual maximum crush (**Figure 7**) was measured as 18 centimeters (7.1 inches) occurring at C_2. The table below shows the case vehicle's crush profile.

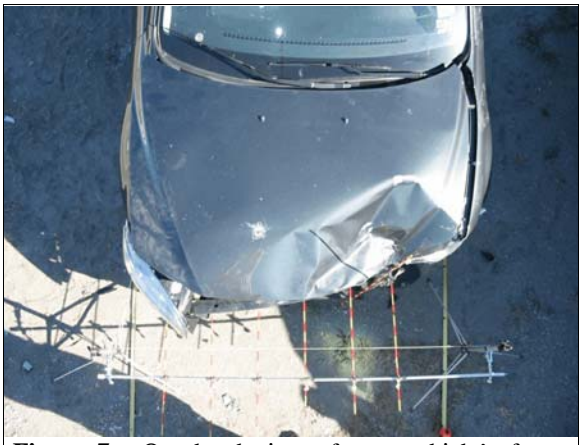


Figure 7: Overhead view of case vehicle's front crush, each stripe on rods is 5 cm (2 in)

Units	Event	Direct Damage		Field L	C_1	C_2	C_3	C_4	C_5	C_6	Direct	Field L
		Width CDC	Max Crush								±D	±D
cm	1	166	25	112	17	18	12	8	5	7	0	0
in		65.4	9.8	44.1	6.7	7.1	4.7	3.2	2.0	2.8	0.0	0.0

The impact reduced the case vehicle's left side wheelbase 9 centimeters (3.5 inches) while the right side wheelbase was reduced 1 centimeters (0.4 inches). There was induced damage to the right headlamp/turn lamp assembly, hood, and both fenders. No other induced damage or remote buckling was noted.

The recommended tire size was: P205/60R16, and the case vehicle was equipped with tires of this size. The case vehicle's tire data are shown in the table below.

Tire	*Measured Pressure*		*Recommend Pressure*		*Tread Depth*		*Damage*	*Restricted*	*Deflated*
	kpa	psi	kpa	psi	milli-meters	32nd of an inch			
LF	214	31	221	32	6	8	None	No	No
RF	234	34	221	32	6	8	None	No	No
LR	241	35	221	32	7	9	None	No	No
RR	234	34	221	32	7	9	None	No	No

Vehicle Interior: Inspection of the case vehicle's interior (**Figures 8** and **9**) revealed no evidence of occupant contact. There were also no occupant compartment intrusions, no compression of the energy absorbing steering column and no deformation of the steering wheel (**Figure 10** below).

Figure 8: Overview of steering wheel and instrument panel from case vehicle's driver door

Figure 9: Overview of front right instrument panel, front right air bag in top of instrument panel

Damage Classification: Based on the vehicle inspection, the CDCs for the case vehicle were determined to be: **11-FYEW-1** (**340** degrees) for the initial impact with the Ford and **12-FRE?-1** (**0** degrees) for the impact with the Toyota. Due to the missing bumper fascia, the length of the direct damage from the impact with the Toyota could not be determined and character six of the CDC is unknown.

The WinSMASH reconstruction program, missing vehicle algorithm, was used to reconstruct the case vehicle's Delta-V for the impact with the Ford. The missing vehicle algorithm was used due to the overlapping damage to the front of the case vehicle from the impacts with the Ford and the Toyota. The Total, Longitudinal, and Lateral Delta Vs are, respectively: 12.0 km.p.h. (7.5 m.p.h.), -11.3 km.p.h. (-7.0 m.p.h.), and 4.1 km.p.h. (2.5 m.p.h.). The collision fits the reconstruction model, but the results appear low.

Figure 10: Case vehicle's steering column and steering wheel showing lack deformation

AUTOMATIC RESTRAINT SYSTEM

The case vehicle was equipped with redesigned air bags at the driver and front right passenger positions. Both air bags deployed as a result of the impact with the Ford.

Figure 11: Case vehicle's steering wheel and air bag module flaps

The case vehicle's driver air bag was located in the steering wheel hub. An inspection of the air bag module's cover flaps and the air bag's fabric revealed that the cover flaps opened at the designated tear points (**Figure 11**). There was no evidence of damage during the deployment to the air bag or the cover flaps. The module cover consisted of three flaps made of pliable vinyl. The top flap was 17 centimeters in width and had a rounded contour in the center of the flap to accommodate the Mazda emblem. The height of the top flap, measured at the center of the flap, was 7 centimeters (2.8 inches). Each of the two bottom flaps were irregularly shaped. Each flap was constructed with a concave contour in the center that mated to the top flap's Mazda emblem. The outer edge of each flap was 6 centimeters (2.4 inches) in length. The top of each flap was approximately 5.5 centimeters (2.2 inches) in length, the bottom was approximately 4.5 centimeters (1.8 inches) in length, and the distance across each concave contour was approximately 4 centimeters (1.6 inches). The deployed driver's air bag (**Figure 12** below) was round with a diameter of approximately 57 centimeters (22.4 inches), and was designed without any tethers. The driver's air bag had two vent ports (**Figure 13** below), each approximately 3 centimeters (1.2 inches) in diameter, located at the 11 and 1 o'clock positions. An inspection of the driver's air bag fabric revealed no evidence of occupant

Figure 12: Case vehicle's driver air bag

contact. In addition, a few scuffs were noted on the air bag that appeared related to the deployment. The front surface of the driver's air bag at full excursion touched the mid-center of driver's seat back. The driver's seat adjustment was electric and the seat was found positioned to its full forward position at the vehicle inspection, and the seat back was slightly reclined.

Figure 13: Top back portion of case vehicle's driver air bag showing vent ports

The front right passenger's air bag was located in the top of the instrument panel (**Figure 14)**. An inspection of the air bag module's cover flaps and the air bag's fabric revealed that the cover flaps opened at the designated tear points. There was no evidence of damage during the deployment to the air bag or the cover flaps. The two cover flaps were rectangular in shape, and each flap was 27.5 centimeters (10.8 inches) in width and 4.5 centimeters in height (1.8 inches). The deployed front right air bag (**Figure 15** below) was trapezoidal in shape with a top width of approximately 44 centimeters (17.3 inches), a center width of approximately 34 centimeters (13.3 inches), a bottom width of approximately 30 centimeters (11.8 inches), and a height of approximately 66 centimeters (26 inches). The front right passenger's air bag was designed without any tethers. The front right air bag had two vent ports, each approximately 6 centimeters (2.4 inches) in diameter, located at the 9:30 and 2:30 o'clock positions. The distance between the face of the instrument panel and the first module flap was approximately 19 centimeters (7.5 inches). The distance between the mid-center of the front right passenger's seat back, as positioned at the time of the inspection (i.e., the rear most track position), and the front surface of the passenger air bag at full excursion was 44 centimeters (17.3 inches). An inspection of the front right passenger's air bag fabric revealed no evidence of occupant contact. The air bag contacted and cracked the windshield during deployment (**Figure 14)**.

Figure 14: Front right passenger air bag module flaps and cracked windshield from air bag deployment

CASE VEHICLE DRIVER KINEMATICS

Immediately prior to the crash, the case vehicle's driver [22-year-old, Black, (unknown if Hispanic) male; (unknown height and weight)] was seated in an unknown posture. He had a least one hand on the steering wheel, but the position of his feet is not known. The case vehicle was equipped with electric seat adjusters and at the time of the inspection, the driver's seat track was found in its full forward position, the seat back was slightly reclined and the adjustable steering column was located in its full up position.

Based on this contractor's vehicle inspection, the case vehicle's driver was not using his manual, three-point, lap-and-shoulder safety belt system. Inspection of the driver's safety belt webbing, "D"-ring, and latch plate revealed no evidence of loading. In addition, there was no evidence that the driver's safety belt pretensioner activated.

Figure 15: Front right passenger air bag

The case vehicle's impact with the Ford caused the driver to continue forward and slightly leftward along a path opposite the case vehicle's 340 degree direction of principal force as the case vehicle decelerated, and the driver's face and chest most likely impacted his deployed air bag. The driver most likely rebounded off his air bag and continued to move left as the case vehicle rotated clockwise, and he may have contacted his door. He most likely remained in his seat and probably moved forward and up and down as the case vehicle traveled over the concrete curbed median. The case vehicle's front impact with the Toyota then caused the driver to again move forward along a path opposite the case vehicle's 0 degree direction of principal force as the case vehicle decelerated, and he may have made minor contact with his now deflated air bag and the underlying steering wheel. The driver most likely remained in his seat and was able to exit the case vehicle under his own power. The deployment of the driver's air bag mitigated his interaction with the case vehicle's interior frontal components and most likely prevented him from being injured.

CASE VEHICLE DRIVER INJURIES

The police crash report indicated that the driver was not injured and was not transported to a medical facility. It is not known if the driver missed any work days as a result of the crash, or made any visits to a medical facility subsequent to the crash.

CASE VEHICLE FRONT RIGHT PASSENGER KINEMATICS

Immediately prior to the crash the case vehicle's front right passenger [24- year-old (unknown race and ethnic origin), male (unknown height and weight)] was seated in an unknown posture, and the position of his hands and feet are unknown. The case vehicle was equipped with electric seat adjusters and at the time of the inspection, the front right passenger's seat track was located in it's rearmost position and the seat back was slightly reclined.

Based on this contractor's vehicle inspection, the case vehicle's front right passenger was restrained by his manual, three-point, lap-and-shoulder, safety belt system. The inspection of the

front right passenger's safety belt webbing, "D"-ring, and latch plate revealed load marks on the shoulder belt webbing (**Figure 16**). In addition, the front right passenger's safety belt was found spooled out of the retractor, and the retractor was jammed indicating the pretensioner had actuated (**Figure 17**).

Figure 16: Load abrasion on front right passenger's shoulder belt, indicated by yellow tape

Figure 17: Front right passenger's safety belt, it would not spool out or retract

The case vehicle's impact with the Ford caused the case vehicle's front right passenger to continue forward and slightly leftward along a path opposite the case vehicle's 340 degree direction of principal force as the case vehicle decelerated. The passenger's safety belt retractor locked due to the impact and he loaded the safety belt, and his face and chest most likely contacted his deployed air bag. The front right passenger most likely rebounded off his air bag and continued to move left as the case vehicle rotated clockwise. He remained restrained in his seat and most likely moved forward and up and down as the case vehicle traveled over the concrete curbed median. The case vehicle's front impact with the Toyota then caused the front right passenger to move forward along a path opposite the case vehicle's 0 degree direction of principal force as the case vehicle decelerated, and he again loaded his safety belt. The front right passenger remained in his seat as the case vehicle came to final rest against the front of the Toyota. It is not known if he was able to exit the vehicle under his own power. The front right passenger's use of his safety belt system and the deployment of his air bag mitigated his interaction with the case vehicle's interior frontal components and most likely prevented more serious injury.

CASE VEHICLE FRONT RIGHT PASSENGER INJURIES

The police crash report indicated that the front right passenger sustained a "C" (possible) injury and was transported by ambulance to a local hospital. His injuries and level of treatment are not known. His medical records were requested, but no record of treatment was found. It is

not known if the front right passenger missed any work days as a result of the crash, or made any follow-up visits to a medical facility.

1ST OTHER VEHICLE

The 1993 Ford Taurus GL was a front wheel drive, four-door sedan (VIN: 1FACP52U7PA------). The Ford was equipped with a driver air bag, which did not deploy as a result of this vehicle's impact with the case vehicle.

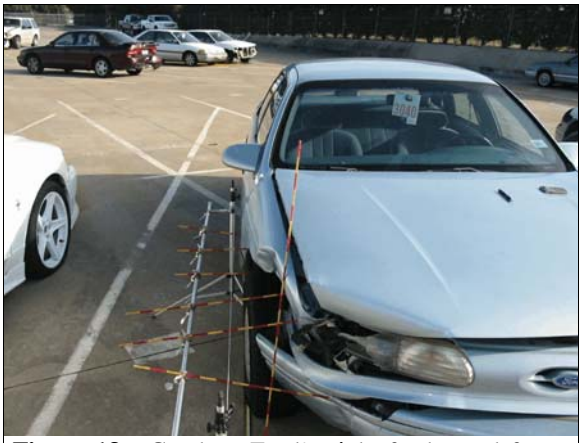


Figure 18: Crush to Ford's right fender and front bumper corner due to impact with case vehicle

Exterior Damage: The Ford's impact with the Mazda involved the right fender and right corner of the hood and front bumper. The right corner of the Ford's front bumper and hood were directly damaged and crushed inward and rearward. The right fender was directly damaged and crushed inward. The direct damage began 244 centimeters (96 inches) forward of the right rear axle and extended 92 centimeters (36.2 inches) along the right fender and front bumper corner. The maximum crush to the Ford (**Figure 18**) was measured as 18 centimeters (7.1 inches) occurring at C_6. The Ford was towed due to damage. The table below shows the Ford's crush profile.

Units	Event	Direct Damage		Field L	C_1	C_2	C_3	C_4	C_5	C_6	Direct	Field L
		Width CDC	Max Crush								±D	±D
cm	1	92	18	116	0	4	6	17	13	18	155	143
in		36.2	7.1	45.7	0.0	1.6	2.4	6.7	5.1	7.1	61.0	56.3

The Ford's right side wheelbase was extended 1 centimeter (0.4 inch) and the left side wheelbase was reduced 2 centimeters (0.8 inch). The induced damage involved the hood, front bumper, left fender and right fender.

Damage Classification: Based on the vehicle inspection, the CDC for the Ford was determined to be: **02-RFEW-3** (**50** degrees).

The WinSMASH reconstruction program, missing vehicle algorithm was used to reconstruct the Ford's Delta-V. The Total, Longitudinal, and Lateral Delta Vs are, respectively: 11.0 km.p.h. (6.8 m.p.h.), -7.1 km.p.h. (-4.4 m.p.h.), and -8.4 km.p.h. (-5.2 m.p.h.). The collision fits the reconstruction model, but the results appear low.

The Ford's recommended tire size was: P205/70R14, and the vehicle was equipped with tires of this size. The Ford's tire data are shown in the table below.

Tire	*Measured Pressure*		*Recommend Pressure*		*Tread Depth*		*Damage*	*Restricted*	*Deflated*
	kpa	psi	kpa	psi	milli-meters	32nd of an inch			
LF	207	30	241	35	5	6	None	No	No
RF	193	28	241	35	3	4	None	No	No
LR	193	28	241	35	3	4	None	No	No
RR	0	0	241	35	1	1	None visible	No	No

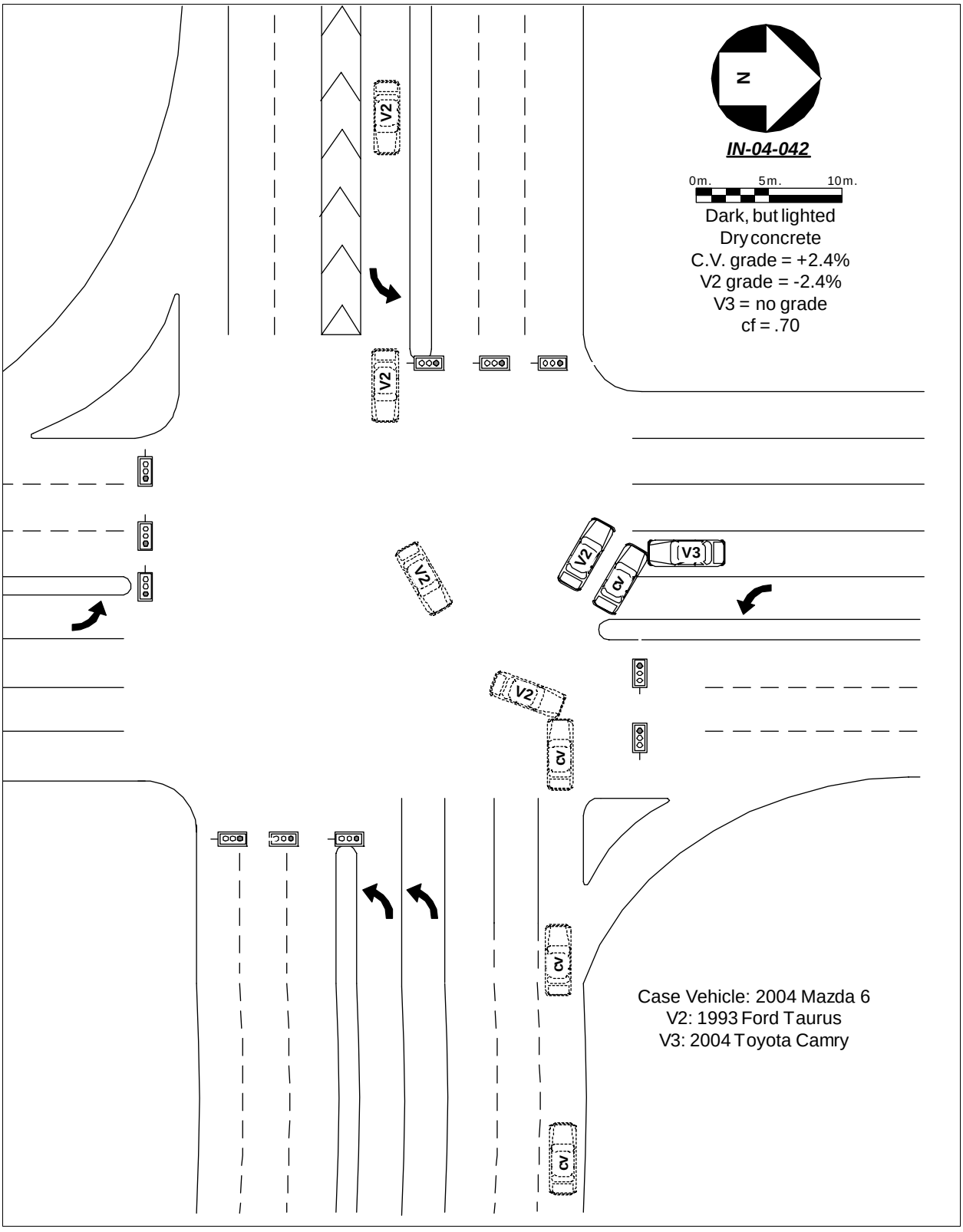
Ford's Occupants: According to the police crash report, the Ford's driver [22-year-old, White (unknown if Hispanic) male] was restrained by his manual, three-point, lap-and-shoulder safety belt system. The police crash report also indicated that the driver was not injured and was not transported to a hospital.

2nd Other Vehicle

The 2004 Toyota Camry was a front wheel drive, four-door sedan (VIN: 4T1BE32K44U------). The Toyota was equipped with a Certified Advanced 208-Compliant air bag system for the driver and front right passenger, which did not deploy as a result of the impact with the case vehicle.

Exterior Damage: The Toyota was not inspected. Without photographs of the damaged vehicle a CDC could not be assigned. The Toyota was driven from the scene by the driver.

Toyota's Occupants: According to the police crash report, the Toyota's driver [62-year-old, White, (unknown if Hispanic) female] was restrained by only the lap portion of her manual, three-point, lap-and-shoulder safety belt system. The police crash report also indicated the driver was not injured and was not transported to the hospital.


N
IN-04-042
0m. 5m. 10m.
Dark, but lighted
Dry concrete
C.V. grade = +2.4%
V2 grade = -2.4%
V3 = no grade
cf = .70
V2
V2
V2
V2
V3
CV
CV
CV
CV
Case Vehicle: 2004 Mazda 6
V2: 1993 Ford Taurus
V3: 2004 Toyota Camry