TRANSPORTATION SCIENCES
CRASH DATA RESEARCH CENTER

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VERIDIAN ON-SITE ADVANCED OCCUPANT PROTECTION SYSTEM STUDY (AOPSS) AND SIDE IMPACT OCCUPANT PROTECTION INVESTIGATION

VERIDIAN CASE NO. CA01-028

VEHICLES - 2000 FORD TAURUS LX
2001 BMW 325xi

LOCATION - STATE OF NEW YORK

CRASH DATE - MAY, 2001

Contract No. DTNH22-94-D-07058

Prepared for:

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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 are 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.

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16. *Abstract* This on-site investigation focused on the performance of the Advanced Occupant Protection System (AOPS) of a 2000 Ford Taurus LX 4-door sedan and the side impact occupant protection system of a 2001 BMW 325xi 4-door sedan. A right angle impact resulted in deployment of the Ford Taurus' frontal air bag system and BMW's side impact air bag system (head and thorax). The driver of the BMW was operating the vehicle in an easterly direction and exiting a parking lot when she attempted to turn left (north) across the path of the southbound Ford. As the BMW crossed the southbound lanes, the left front side surface was impacted by the frontal area of the Ford resulting in minor damage to both vehicles. The restrained 69 year old female driver of the 2000 Ford Taurus LX initiated a forward trajectory in response to the 12 o'clock impact force and loaded the manual restraint resulting in a small contusion to the lateral right chest. She also sustained a small thermal burn to the posterior right forearm from venting driver air bag gases. The driver of the Ford Taurus refused treatment at the scene. The restrained 17 year old female driver of the 2001 BMW 325xi initiated a lateral trajectory in response to the 9 o'clock impact force as the head and chest loaded the deployed side impact head and thorax air bags. She sustained bilateral contusions to the medial (inside) aspect of the knees from indirect contact to the left front door panel. The driver of the BMW did not seek treatment for her injuries.			
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VERIDIAN ON-SITE ADVANCED OCCUPANT PROTECTION SYSTEM STUDY (AOPSS) AND SIDE IMPACT OCCUPANT PROTECTION INVESTIGATION
VERIDIAN CASE NO. CA01-028
VEHICLES - 2000 FORD TAURUS LX
2001 BMW 325xi
LOCATION - STATE OF NEW YORK
CRASH DATE - MAY, 2001

BACKGROUND

This on-site investigation focused on the performance of the Advanced Occupant Protection System (AOPS) of a 2000 Ford Taurus LX 4-door sedan and the side impact occupant protection system of a 2001 BMW 325xi 4-door sedan. A right angle impact resulted in deployment of the Ford Taurus' frontal air bag system and BMW's side impact air bag system (head and thorax). The driver of the BMW was operating the vehicle in an easterly direction and exiting a parking lot when she attempted to turn left (north) across the path of the southbound Ford. As the BMW crossed the southbound lanes, the left front side surface was impacted by the frontal area of the Ford resulting in minor damage to both vehicles. The restrained 69 year old female driver of the 2000 Ford Taurus LX initiated a forward trajectory in response to the 12 o'clock impact force and loaded the manual restraint resulting in a small contusion to the lateral right chest. She also sustained a small thermal burn to the posterior right forearm from venting driver air bag gases. The driver of the Ford Taurus refused treatment at the scene. The restrained 17 year old female driver of the 2001 BMW 325xi initiated a lateral trajectory in response to the 9 o'clock impact force as the head and chest loaded the deployed side impact head and thorax air bags. She sustained bilateral contusions to the medial (inside) aspect of the knees from indirect contact to the left front door panel. The driver of the BMW did not seek treatment for her injuries.

This investigation was identified by a Veridian Engineering SCI Investigator on Friday, May 18, 2001 and forwarded to NHTSA on Monday, May 21. Due to the involvement of a 2000 Ford Taurus and a 2001 BMW 3-series sedan, an on-site investigative effort was assigned that day. The on-site investigator completed field activities on Tuesday, May 22, 2001.

SUMMARY

Crash Site

This two vehicle crash occurred during the afternoon hours of May, 2001. At the time of the crash, it was daylight with no adverse conditions as the roads were dry. The crash occurred in the southbound lanes of a (straight and level) north/south four-lane urban roadway which was divided by a center left turn lane **(see Figure 12 - page 9)**. The asphalt roadway was bordered by barrier curbs and driveways which provide access to local businesses. No traffic control was present at the scene which had a posted speed limit of 72 km/h (45 mph).

Pre-Crash

The 17 year old female driver of the 2001 BMW 325xi was initially stationary and facing east when she proceeded straight at a (driver reported) speed of 8 km/h (5 mph), in an attempt to turn left (north) onto the main thoroughfare **(Figure 1)**. Traffic stopped in the southbound outboard lane apparently obstructed the driver's full view of the environment as she was reportedly waived into motion by another driver *(looked but did not see)*.

The 69 year old female driver of the 2000 Ford Taurus LX was operating the vehicle southbound on the inboard lane **(Figure 2)** at a (driver reported) speed of 56 km/h (35 mph) when she observed the BMW cross her path of travel from the right. The driver reported no avoidance maneuvers in anticipation of the impending crash.

Figure 1. Eastbound approach for the 2001 BMW 325xi.

Figure 2. Southbound approach for the 2000 Ford Taurus LX.

Crash

As the BMW crossed the southbound lanes of the multi-lane urban roadway, the left front side surface was impacted by the frontal area of the Ford resulting in minor damage to both vehicles. Although the BMW driver reported no avoidance maneuvers prior to impact, the combined damage patterns suggested a slight vehicle angularity during approach across the southbound lanes. The damage algorithm of the WinSMASH reconstruction program computed velocity changes of 13.8 km/h (8.6 mph) for the Ford and 14.2 km/h (8.8 mph) for the struck BMW. The longitudinal component for the Ford was -13.6 km/h (-8.5 mph). The latitudinal component for the BMW was 14.0 km/h (8.7 mph). Impact resulted in deployment of the Ford's Advanced Occupant Protection System and BMW's side impact air bag system. The Ford's Event Data Recorder (EDR) recorded a longitudinal element of -20.1 km/h (-12.5 mph) as a *first stage deployment* **(see Figures 13 & 14 - page 10)**. The Ford Taurus rotated counterclockwise approximately 5 degrees and came to rest in close proximity to the point of impact in the inboard southbound lane facing south. The BMW 325xi rotated clockwise approximately 15 degrees and came to rest in close proximity to the point of impact across the southbound lanes facing southeast.

Post-Crash

The driver of the Ford Taurus exited the vehicle through the left front door *(initially jammed)* with some assistance from a bystander. The driver of the of the BMW exited the vehicle through the right front door under her own power. Treatment was rendered at the scene by fire department and rescue personnel, however, both drivers refused subsequent transport to a local hospital. The BMW was towed from the scene with disabling damage as the Ford Taurus was towed with non-disabling damage.

VEHICLE DATA

The 2000 Ford Taurus LX was manufactured on 11/99 and identified by the vehicle identification number (VIN): 1FAFP52U9YG (production number deleted). The driver was reported by police as

the owner of the vehicle which was purchased locally in March, 2000. The vehicle was a 4-door sedan equipped with front-wheel drive and a 3.0 liter, V-6 engine. At the time of the crash, the odometer had recorded 19,825 km (12,319 miles). The seating was configured with front bucket and rear bench seats. The driver reported no previous crashes or maintenance on the Ford's frontal air bag system. No cell phone or adjustable pedals were present in the vehicle.

The 2001 BMW 325xi was manufactured on 11/00 and identified by the vehicle identification number (VIN): WBAAV33431EE (production number deleted). The driver's father was reported by police as the owner of the vehicle. The vehicle was a 4-door sedan equipped with ABS, all wheel drive and a 2.5 liter, 6 cylinder engine. The odometer reading was unknown at the time of the crash. The seating was configured with front bucket and rear bench seats. The driver (and owner) reported no previous crashes or maintenance on the BMW's side impact air bag system.

VEHICLE DAMAGE

Exterior - 2000 Ford Taurus LX

The 2000 Ford Taurus LX sustained minor frontal damage as a result of the impact with the BMW **(Figure 3)**. The direct contact damage began at the front right bumper corner and extended 104.0 cm (40.9 in) inboard. The impact deformed the full frontal width resulting in a combined direct and induced damage length (Field L) of 144.0 cm (56.7 in). Six crush measurements were documented at the level of the bumper, however, they were projected to the *reinforcement bar* as the bumper fascia recoiled outward: C1= 1.0 cm (0.4 in), C2= 2.0 cm (0.8 in), C3= 5.0 cm (2.0 in), C4= 9.0 cm (3.5 in), C5= 6.0 cm (2.4 in), C6= 3.0 cm (1.2 in). The Collision Deformation Classification (CDC) for this impact to the Ford was 12-FDEW-1 with a principal direction of force of (+)10 degrees. The hood was displaced slightly up and rearward from engagement against the side surface of the BMW *(headlights and grille remained undamaged)*. Brown paint transfers were documented along the direct contact damage. Induced damage was noted to the forward aspect of the left front door seam from a forced opening post-crash. Reduction in the left wheelbase measured 1.5 cm (0.6 in). The windshield and tempered glazings remained undamaged.

Figure 3. Frontal damage to the 2000 Ford Taurus LX.

Figure 4. Left side surface damage to the 2001 BMW 325xi.

Exterior - 2001 BMW 325xi

The 2001 BMW 325xi sustained minor left side damage as a result of the impact with the Ford Taurus **(Figure 4)**. The direct contact damage began 3.0 cm (1.2 in) aft of the front left bumper corner and extended 144.0 cm (56.7 in) rearward. The combined direct and induced damage length (Field L) began 3.0 cm (1.2 in) aft of the front left bumper corner and extended 213.0 cm (83.9 in) rearward.

Six crush measurements were documented at the level of the mid-door: C1= 0 cm, C2= 4.0 cm (1.6 in), C3= 11.0 cm (4.3 in), C4= 11.0 cm (4.3 in), C5= 1.0 cm (0.4 in), C6= 0 cm. *A maximum crush value of 12.0 cm (4.7 in) was identified 14.0 cm (5.5 in) aft of the C4 position.* The Collision Deformation Classification (CDC) for this impact to the BMW was 09-LYEW-2 with a principal direction of force of (-)80 degrees. White/blue paint transfers were documented along the direct contact damage with pocketing noted aft of the left front wheel/tire. The pocketing tapered into surface scratching forward to the bumper area, which allowed for use of the body contour crush documentation method. Induced damage to the left front door produced outward buckling to the upper window frame area *(no passenger compartment integrity loss)*. Reduction in the right wheelbase measured 2.5 cm (1.0 in) as the left wheelbase was elongated 1.5 cm (0.6 in). The windshield and tempered glazings remained undamaged.

Interior - 2000 Ford Taurus LX

There was no damage to the interior surfaces of the Ford Taurus from occupant contact or component intrusions.

Interior - 2001 BMW 325xi

Interior damage to the BMW was minimal and was attributed to component intrusions. Lateral intrusions into the driver space involved 9.0 cm (3.5 in) of door panel intrusion, 6.5 cm (2.6 in) of kick panel intrusion, and 5.5 cm (2.2 in) of sill intrusion.

MANUAL RESTRAINT SYSTEMS

2000 Ford Taurus LX

The interior of the Ford Taurus consisted of a six passenger seating configuration with front bucket (with a "flip and fold" center console that converted to a center seat position) and rear bench seats. The driver 3-point manual lap and shoulder belt system consisted of a continuous loop belt webbing with a sliding latchplate and dual mode retractors (inertial lock/belt sensitive). Although slight dimpling was noted to the shoulder portion of the driver restraint, no loading evidence was identified on the webbing or D-ring in this low severity crash. The front right 3-point manual lap and shoulder belt system consisted of a continuous loop belt webbing with a sliding latchplate and a retractor equipped with an inertial and switchable lock mechanism. The front center seat ("flip and fold" console) was equipped with a 2-point manual lap belt and a locking latchplate. The rear seated positions were equipped with 3-point manual lap and shoulder belt systems which consisted of a continuous loop belt webbing with a sliding latchplate that retracted into an inertial sensitive and switchable locking retractor.

2001 BMW 325xi

The interior of the BMW 325xi consisted of a five passenger seating configuration with front bucket and rear bench seats. The driver 3-point manual lap and shoulder belt system consisted of a continuous loop belt webbing with a sliding latchplate and dual mode retractors (inertial lock/belt sensitive). No loading evidence was identified on the webbing or D-ring in this low severity crash. The front right 3-point manual lap and shoulder belt system consisted of a continuous loop belt webbing with a sliding latchplate and a retractor equipped with an inertial and switchable lock mechanism. The rear outboard seated positions were equipped with 3-point manual lap and shoulder belt systems which consisted of a continuous loop belt webbing with a sliding latchplate that retracted into an inertial sensitive and switchable locking retractor. The center rear position was equipped with a 2-point manual lap belt system with a locking latchplate.

FORD ADVANCED OCCUPANT PROTECTION SYSTEM (AOPS)

The 2000 Ford Taurus LX was equipped with dual stage frontal air bags for the driver and front right passenger positions. The air bags deployed as a result of the crash **(Figure 5)**. The driver air bag was identified by the following part number: P5206000-00D with a bar coded lot number of: TXM993070143. The air bag was housed in the center of the steering wheel with a horizontally oriented flap tear seam (H-configuration). The flaps were nearly symmetrical in shape as the upper flap measured 17.3 cm (6.8 in) in width and 7.0 cm (2.8 in) in height while the lower flap measured 17.3 cm (6.8 in) in width and 5.5 cm (2.2 in) in height. No contact evidence was identified on the air bag or exterior surface of the module cover flaps. The diameter of the driver air bag measured 58.2 cm (22.9 in) in its deflated state **(Figure 6)**. The bag was tethered by two internal straps and vented by two 3.3 cm (1.3 in) diameter ports located at the 10 o'clock and 2 o'clock sectors on the rear aspect of the air bag. Rearward air bag excursion measured 29.0 cm (11.4 in) from the steering wheel hub.

Figure 5. 2000 Ford Taurus LX deployed frontal air bags.

The front right passenger air bag deployed from the right top instrument panel area with a single cover flap design hinged at the forward aspect. The cover flap was rectangular in shape and measured 27.5 cm (10.8 in) in width and 12.5 cm (4.9 in) in height. Although no contact evidence was identified on the exterior surface of the module cover flap, multiple black vinyl transfers were noted across the face of the bag from expansion within the module. The passenger air bag measured 58.6 cm (23.1 in) in width and 45.0 cm (17.7 in) in height in its deflated state **(Figure 7)**. The bag was vented by two 5.6 cm (2.2 in) diameter ports located at the 9 o'clock and 3 o'clock sectors on the side aspect of the bag. No internal tether straps were present. Rearward air bag excursion measured 46.0 cm (18.1 in) from the aft portion of the right instrument panel.

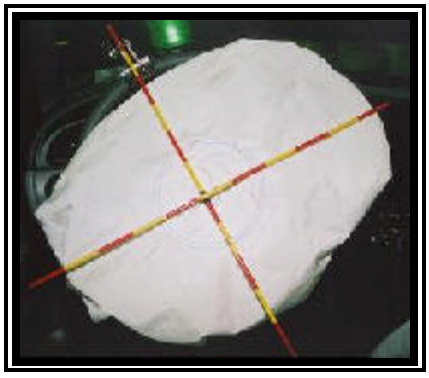


Figure 6. 2000 Ford Taurus LX deployed driver air bag.

Figure 7. 2000 Ford Taurus LX deployed passenger air bag.

The front outboard restraint systems also included buckle pretensioners mounted longitudinally alongside the seat cushions. The activation of the driver side pretensioner resulted in 60.0 mm (2.4 in) of piston movement. The piston pulls a cable which lowers the height of the buckle assembly, reducing slack in both the lap and shoulder belt webbing. The front right seating position was not occupied, therefore, the buckle pretensioner did not activate.

The Ford was also equipped with side impact air bags for the front outboard seated positions. The air bags did not deploy as a result of the crash. The air bag modules were housed in the outboard side aspect of the front seat backs.

BMW SUPPLEMENTAL RESTRAINT SYSTEMS

The 2001 BMW 325xi was equipped with redesigned frontal air bags for the driver and front right passenger positions which did not deploy as a result of the crash. The driver air bag was housed in the center of the steering wheel with a horizontally oriented flap tear seam (H-configuration). The front right passenger air bag was housed in the right mid-instrument panel area with a single cover flap design hinged at the top aspect.

The 2001 BMW 325xi was equipped with door mounted side impact air bags for the front seated positions. The left front side impact air bag deployed as a result of the crash **(Figure 8)**. The air bag modules were housed in the door panel above the armrest [32.0 cm (12.6 in) above floor level] with a single cover flap design hinged at the lower aspect. The flap was rectangular in shape and measured 25.0 cm (9.8 in) in width and 10.0 cm (3.9 in) in height. No contact evidence was identified on the exterior surface of the module cover flap, however, a small smudge mark was documented along the centered portion of the air bag face. The air bag was rectangular in shape and measured 49.0 cm (19.3 in) in width and 21.4 cm (8.4 in) in height in its deflated state. The bag was tethered by a horizontal stitch pattern which extended across the face of the membrane into a circular figure. No vent ports were present. The side impact air bag sensors were located in the front door cavities.

The BMW was also equipped with a head protection air bag for the front seated positions. The left side head protection air bag deployed as a result of the crash **(Figure 9)**. The head air bag was housed between the interior roof headliner and structural roof side rail with a horizontal seam measuring 146.0 cm (57.5 in) in length (separation of the headliner versus an actual flap). The air bag measured 7.0 cm (2.8 in) in diameter and 104.0 cm (40.9 in) in length in its deflated state. The air bag was tethered by 22.0 cm (8.7 in) external straps connected to the left A-pillar and left rear roof side rail.

Figure 8. 2001 BMW 325xi deployed left front side impact air bag.

Figure 9. 2001 BMW 325xi deployed head protection air bag.

The front outboard restraint systems also included buckle pretensioners mounted longitudinally alongside the seat cushions. The piston pulls a cable which lowers the height of the buckle assembly, reducing slack in both the lap and shoulder belt webbing. The buckle pretensioners did not activate as a result of the side impact crash.

DRIVER DEMOGRAPHICS - 2000 FORD TAURUS LX

Age/Sex:	69 year old female
Height:	170 cm (67 in)
Weight:	77 kg (170 lb)
Seat Track Position:	Middle position
Manual Restraint Use:	3-point lap and shoulder belt system
Usage Source:	Vehicle inspection, police report, driver interview
Eyeware:	Prescription glasses
Type of Medical Treatment:	Refused

Driver Injuries

Injury	***Severity (AIS 90)***	***Injury Mechanism***
Thermal burn posterior aspect right forearm (2.0 cm diameter)	Minor (792000.1,1)	Venting driver air bag gases (non-contact injury)
Contusion lateral right chest	Minor (490402.1,1)	Shoulder belt webbing

Driver Kinematics

The 69 year old female driver of the 2000 Ford Taurus LX was restrained by the available 3-point manual lap and shoulder belt system and seated in an upright posture with her hands placed at the 9 o'clock and 5 o'clock positions on the steering wheel rim. The seat track was adjusted to the middle position with the seat back angled 22 degrees off vertical **(Figure 10)**. The driver stated she was belted, further evidenced by the deployment of the buckle pretensioner. It should also be noted that the driver was wearing a long sleeve blouse and a heavy sweater.

Figure 10. Interior view of the 2000 Ford Taurus LX.

At impact, the driver initiated a forward trajectory in response to the 12 o'clock impact force and loaded the manual restraint resulting in a small contusion to the right mid-lateral chest area. This injury mechanism was evidenced by the location of the injury relative to the placement of the shoulder harness diagonally across the chest. She also sustained a small thermal burn to the posterior aspect of the right forearm from venting driver air bag gases. This injury mechanism was evidenced by the driver's stated placement of the right hand at the 5 o'clock position on the steering wheel rim pre-crash, which exposed the posterior aspect of the forearm to the adjacent

air bag vent port during the deployment sequence. The driver reported that the burn mark went completely through the sweater and long sleeve blouse (not charred), however, she referred to the injury as more of a *"welt"* or *"mosquito bite"*. She also complained of facial skin irritation post-crash, which was treated (with a towel and saline solution) by ambulance personnel. She refused further treatment. The Advanced Occupant Protection System provided adequate protection against further contact to the steering wheel hub/rim, thus preventing serious injury.

DRIVER DEMOGRAPHICS - 2001 BMW 325xi

Age/Sex:	17 year old female
Height:	160 cm (63 in)
Weight:	45 kg (100 lb)
Seat Track Position:	Mid-to-forward position
Manual Restraint Use:	3-point lap and shoulder belt system
Usage Source:	Vehicle inspection, police report, driver interview
Eyeware:	None
Type of Medical Treatment:	None

Driver Injuries

Injury	*Severity (AIS 90)*	*Injury Mechanism*
Bilateral contusions medial knees	Minor (890402.1,3)	Left front door panel (indirect contact injury)

Driver Kinematics

The 17 year old female driver of the 2001 BMW 325xi was restrained by the available 3-point manual lap and shoulder belt system, and seated in an upright posture (out-of-position) leaned slightly forward with her head turned left to observe on-coming traffic. Her hands were placed at the 10 o'clock and 2 o'clock positions on the steering wheel rim. The seat track was adjusted to a mid-to-forward position with the seat back angled 15 degrees off vertical **(Figure 11)**.

Figure 11. Interior view of the 2001 BMW 325xi.

At impact, the driver initiated a lateral trajectory in response to the 9 o'clock impact force. Her head loaded the deployed head protection air bag and the lateral aspect of her torso loaded the deployed thorax side impact air bag. She sustained bilateral contusions to the medial (inside) aspect of the knees which was probably an indirect result of *lateral* knee contact to the left front door panel (knees "knocking" together). The BMW driver did not seek treatment for her injuries. The deployed head and thorax air bags provided adequate protection against direct contact to left side components, thus preventing potential injury.

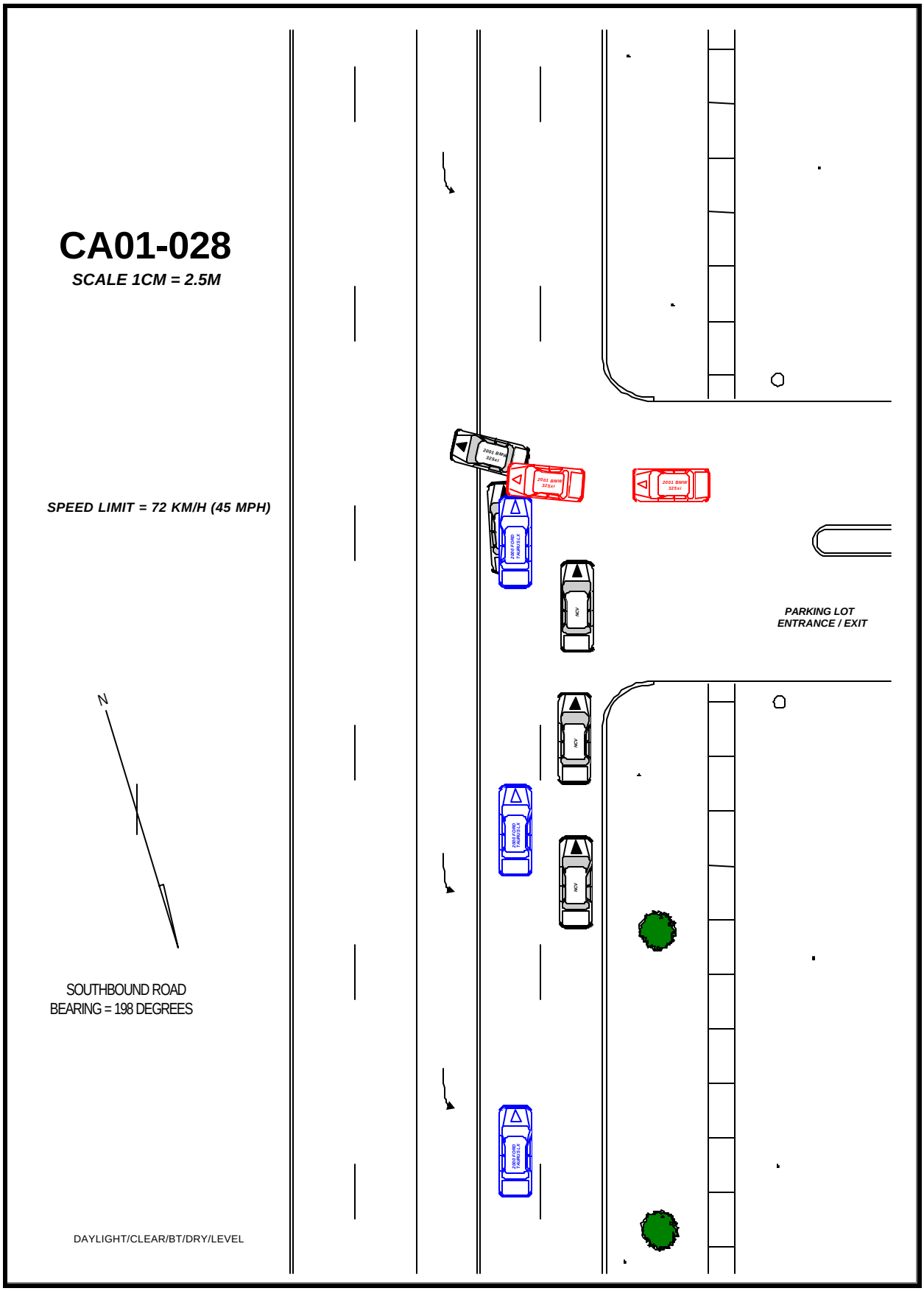
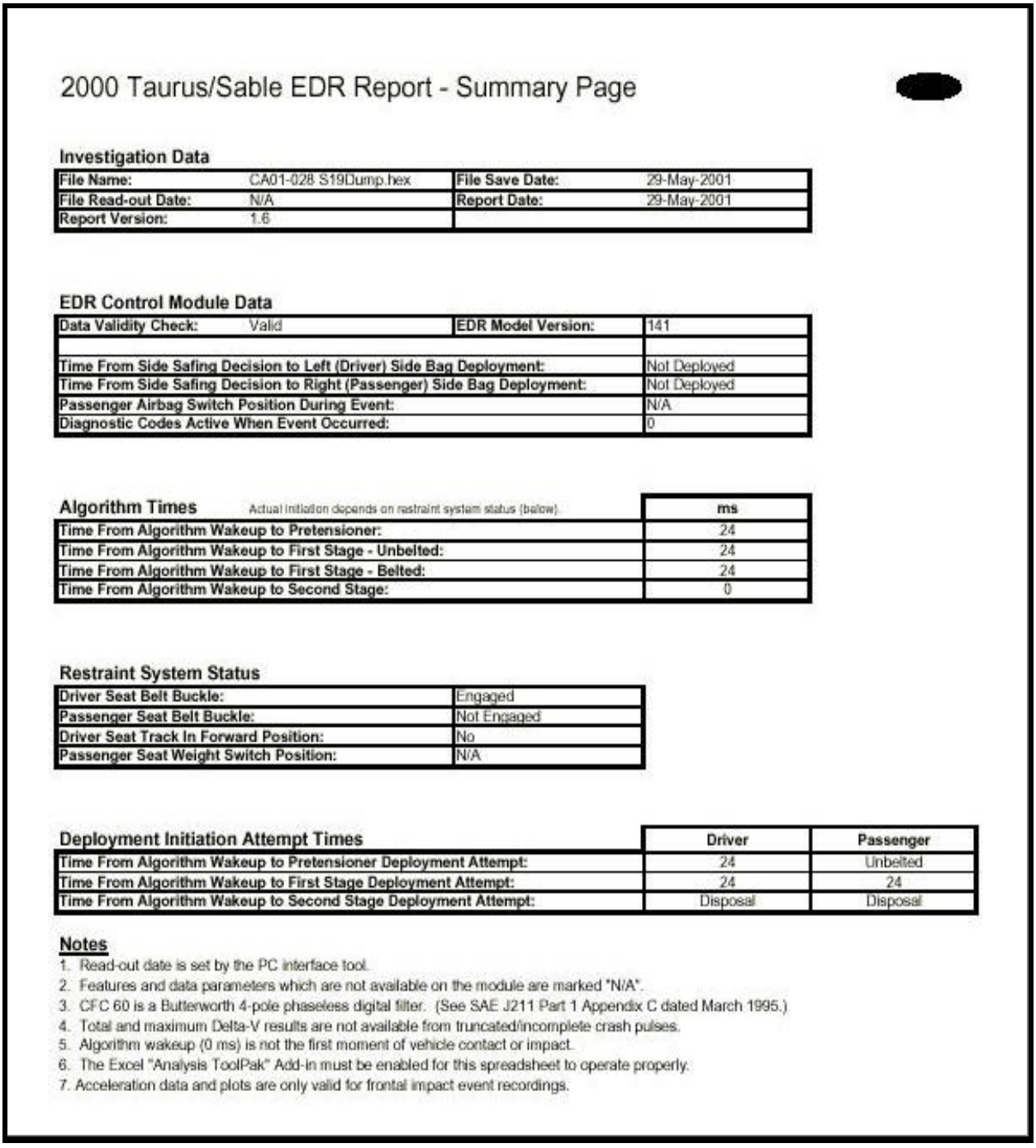


Figure 12. Scene Diagram.



2000 Taurus/Sable EDR Report - Summary Page

Investigation Data

File Name:	CA01-028 S19Dump.hex	File Save Date:	29-May-2001
File Read-out Date:	N/A	Report Date:	29-May-2001
Report Version:	1.6		

EDR Control Module Data

Data Validity Check:	Valid	EDR Model Version:	141
Time From Side Safing Decision to Left (Driver) Side Bag Deployment:			Not Deployed
Time From Side Safing Decision to Right (Passenger) Side Bag Deployment:			Not Deployed
Passenger Airbag Switch Position During Event:			N/A
Diagnostic Codes Active When Event Occurred:			0

Algorithm Times (Actual initiation depends on restraint system status (below))	ms
Time From Algorithm Wakeup to Pretensioner:	24
Time From Algorithm Wakeup to First Stage - Unbelted:	24
Time From Algorithm Wakeup to First Stage - Belted:	24
Time From Algorithm Wakeup to Second Stage:	0

Restraint System Status

Driver Seat Belt Buckle:	Engaged
Passenger Seat Belt Buckle:	Not Engaged
Driver Seat Track In Forward Position:	No
Passenger Seat Weight Switch Position:	N/A

Deployment Initiation Attempt Times	Driver	Passenger
Time From Algorithm Wakeup to Pretensioner Deployment Attempt:	24	Unbelted
Time From Algorithm Wakeup to First Stage Deployment Attempt:	24	24
Time From Algorithm Wakeup to Second Stage Deployment Attempt:	Disposal	Disposal

Notes

1. Read-out date is set by the PC interface tool.
2. Features and data parameters which are not available on the module are marked "N/A".
3. CFC 60 is a Butterworth 4-pole phaseless digital filter. (See SAE J211 Part 1 Appendix C dated March 1995.)
4. Total and maximum Delta-V results are not available from truncated/incomplete crash pulses.
5. Algorithm wakeup (0 ms) is not the first moment of vehicle contact or impact.
6. The Excel "Analysis ToolPak" Add-in must be enabled for this spreadsheet to operate properly.
7. Acceleration data and plots are only valid for frontal impact event recordings.

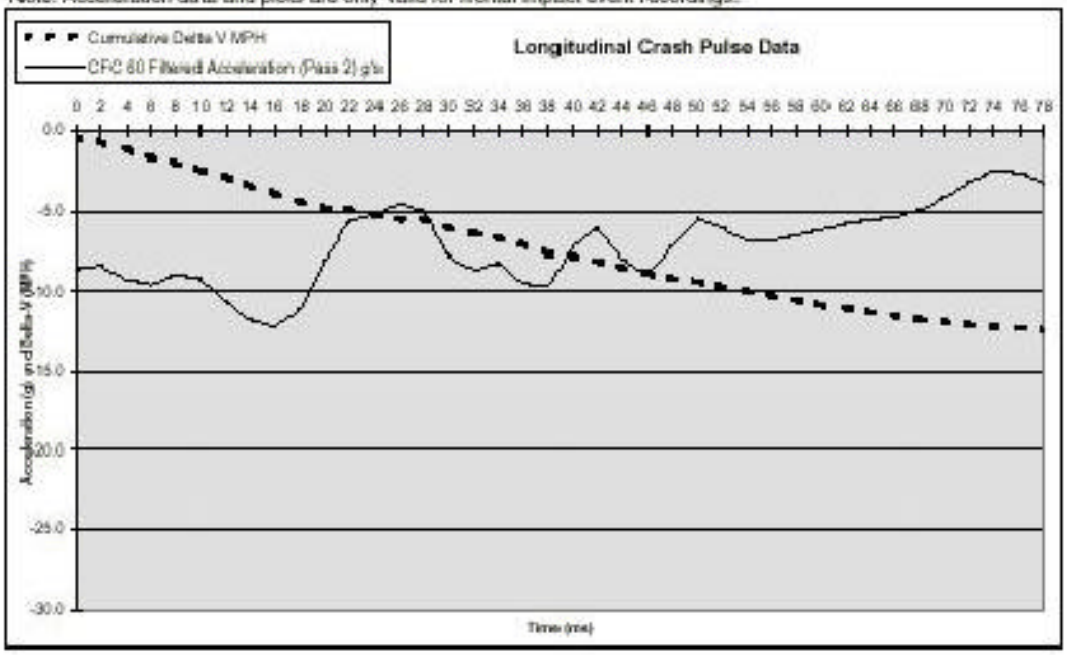
Figure 13. 2000 Ford Taurus LX EDR report.

2000 Taurus/Sable EDR Report - Charts

Longitudinal Cumulative Delta-V

Time (ms)	0	10	20	30	40	50	60	70	78
Delta-V (MPH)	-0.4	-2.4	-4.8	-6.1	-7.4	-9.4	-10.9	-12.0	-12.5

Note: Accelleration data and plots are only valid for frontal impact event recordings.



Lateral Cumulative Delta-V

Time (ms)	0	10	20	30	40	50	60	70	78
Delta-V (MPH)	0.0	-0.1	-0.5	-1.2	-1.8	-2.2	-2.8	-3.8	-4.5

Note: Accelleration data and plots are only valid for frontal impact event recordings.

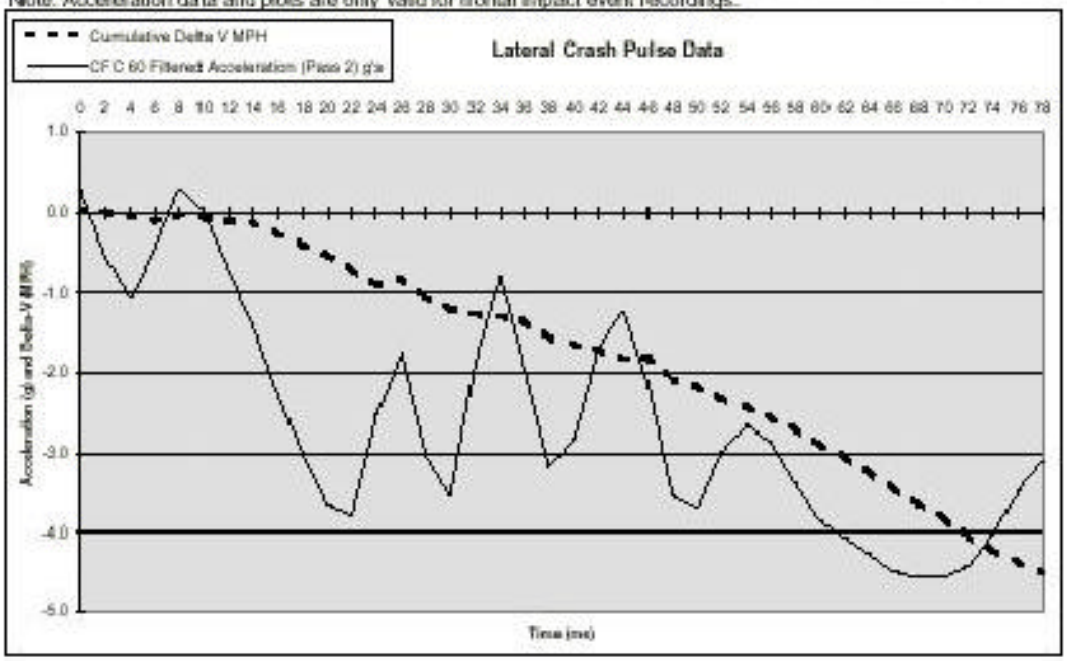


Figure 14. 2000 Ford Taurus LX EDR report.